



TECHNICAL MANUAL

VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS (OUTDOOR UNIT)

KXZM series (Heat pump type)

Standard series

- Single use (Used also for combination)
FDC280KXZE2M, 335KXZE2M, 400KXZE2M, 450KXZE2M,
475KXZE2M, 500KXZE2M, 560KXZE2M
- Combination use
FDC615KXZE2M, 670KXZE2M, 735KXZE2M, 800KXZE2M,
850KXZE2M, 900KXZE2M, 950KXZE2M, 1000KXZE2M,
1060KXZE2M, 1120KXZE2M, 1200KXZE2M, 1250KXZE2M,
1300KXZE2M, 1350KXZE2M, 1425KXZE2M, 1450KXZE2M,
1500KXZE2M, 1560KXZE2M, 1620KXZE2M, 1680KXZE2M
- High-COP combination use
FDC560KXZXE2M (FDC280KXZE2M+FDC280KXZE2M),
FDC850KXZXE2M (FDC280KXZE2M+FDC280KXZE2M+FDC280KXZE2M),
FDC900KXZXE2M (FDC280KXZE2M+FDC280KXZE2M+FDC335KXZE2M),
FDC950KXZXE2M (FDC280KXZE2M+FDC335KXZE2M+FDC335KXZE2M),
FDC1000KXZXE2M (FDC335KXZE2M+FDC335KXZE2M+FDC335KXZE2M),
FDC1060KXZXE2M (FDC335KXZE2M+FDC335KXZE2M+FDC400KXZE2M),
FDC1120KXZXE2M (FDC335KXZE2M+FDC400KXZE2M+FDC400KXZE2M)

• Notes :

- (1) Regarding the indoor unit series, refer to the TECHNICAL MANUAL No.'19 • KX-T-310, No.'20 • KX-T-347 & No.'20 • KX-T-348.
- (2) Regarding the floor standing-2way type(FDFW), refer to the No.'17 • KX-T-266.

PREFACE

Combination table for KX series

| Category | Outdoor unit | Indoor unit | | | | | | | | | |
|--|----------------------|--|-------------|-------------|-------------|--------------|--------------|---|---|---|---|
| | | Connectable remote control | Same series | Same series | Same series | Mixed series | Mixed series | Mixed series | Same or Mixed series | Mixed series | Same series |
| | | RC-E1 | KXE4 | KXE4(A) | KXE4A | KXE4A | KXE4A | KXE4A | KXE4R KXE4BR KXE5R | KXE4R KXE4BR KXE5R | KXE4R KXE4BR KXE5R |
| 3-wire type | RC-E1R | | | | | | | KXE4R KXE4BR KXE5R | KXE4R KXE4BR KXE5R | KXE4R KXE4BR KXE5R | KXE4R KXE4BR KXE5R |
| | 2-wire type | RC-E3 RC-E4 RC-E5 RC-EX1A RC-EX3 | | | | | | KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1 | KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1 | KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1 | KXE6 KXE6A KXE6B KXE6D KXE6F KXZE1 |
| Heat pump (2-pipe) systems | FDCA-HKXE4 5HP | YES [C] | YES [C] | YES [C] | NO | NO | NO | NO | NO | NO | NO |
| | FDCA-HKXE4 8-48HP | NO | YES [C] | YES [C] | NO | NO | NO | NO | NO | NO | NO |
| | FDCA-HKXE4A 5HP | NO | YES [C] | YES [C] | YES [C] *1 | NO | NO | YES [C] *1 | NO | NO | NO |
| | FDCA-HKXE4R 5.6HP | | | | | | | | | | |
| | FDCA-HKXE4A 8-48HP | | | | | | | | | | |
| | FDCA-HKXE4R 8-48HP | NO | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] |
| | FDCA-HKXE4BR 8-48HP | | | | | | | | | | |
| | FDCA-HKXE4D 8-48HP | | | | | | | | | | |
| | FDC-KXE6 4.5,6HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] *6 |
| | FDC-KXE6M 4.5,6HP | | | | | | | | | | |
| | FDC-KXE6 8-48HP | NO | NO | NO | NO | NO | NO | NO | YES [B] | YES [B] | YES [A] |
| | FDC-KXE6M 8-48HP | | | | | | | | | | |
| | FDC-KXZE1 4.5,6HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] *6 |
| | FDC-KXZE1 10-60HP | | | | | | | | | | |
| | FDC-KXZPE1 8,10HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] |
| FDC-KXZA1 10-60HP | | | | | | | | | | | |
| FDC-KXZE1M 10-60HP | | | | | | | | | | | |
| FDC-KXZME1 8-12HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] | |
| FDC-KXZEN/S1 4HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] | |
| FDC-KXZE2 10-60HP | | | | | | | | | | | |
| FDC-KXZA2 10-60HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] | |
| FDC-KXZE2M 10-60HP | | | | | | | | | | | |
| Heat recovery (3-pipe) systems [Note(3)] | FDCA-HKXRE4 8-48HP | NO | NO | YES [C] | NO | NO | NO | NO | NO | NO | NO |
| | FDCA-HKXRE4A 8-48HP | | | | | | | | | | |
| | FDCA-HKXRE4R 8-48HP | NO | NO | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] | YES [C] |
| | FDCA-HKXRE4BR 8-48HP | | | | | | | | | | |
| | FDCA-HKXRE4D 8-48HP | | | | | | | | | | |
| | FDC-KXRE6 8-48HP | NO | NO | NO | NO | NO | NO | NO | YES [B] | YES [B] | YES [A] |
| | FDC-KXZRE1 8-60HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] |
| FDC-KXZRE2 8-60HP | NO | NO | NO | NO | NO | NO | NO | NO | NO | YES [A] | |

Notes (1) YES: Connectable (See following table in detail), NO: Not connectable

*1 except FDKA71KXE5R

| | Outdoor unit | Connected Indoor unit | | DIP switch setting of outdoor unit KXE6 | Superlink protocol | Limitation |
|------------|--------------|-----------------------|--------------------|---|--------------------|--------------------|
| | | Same series | Mixed series | | | |
| YES [A] *2 | KXE6 & KXZ | KXE6 & KXZ | | II (New) | New (for KXZ/KX6) | New (for KXZ/KX6) |
| YES [B] | | KXE4 series | KXE6 & KXE4 series | I (Previous) | Previous (for KX4) | Previous (for KX4) |
| YES [C] | KXE4 series | KXE4 series | KXE4 series | | Previous (for KX4) | Previous (for KX4) |

*2 If outdoor unit system (YES [A]) is connected to other outdoor unit systems (YES [B] and/or YES [C]) in one Superlink network, the DIP switch of outdoor unit KXZ/KX6 of (YES [A]) should be set from II (New) to I (Previous). In this case the Superlink protocol and limitation of outdoor unit system (YES [A]) are switched to Previous (for KX4).

(2) Combination with new central control, PC windows central control and BMS interface unit

| | Connectable I/U | Central control, PC windows central control and BMS interface unit | | | | | |
|-------------------|-----------------------|--|------------|---------------|---------------|--------------|---------------|
| | | SC-SL1N-E | SC-SL2NA-E | SC-SL4N-AE/BE | SC-WGWN-A/B | SC-LGWN-A | SC-BGWN-A/B |
| YES [A] | Superlink protocol | 16 | 64 | 128 (128x1) | 128 (64x2) *3 | 128 (48x2) | 128 (64x2) *3 |
| | Connectable network | New | New | New | New | New | New |
| YES [B] & YES [C] | Connectable I/U | 1 | 1 | 1 | 2 | 2 | 2 |
| | Superlink *5 protocol | 16 | 48 | 144 (48x3) | 96 *4 (48x2) | 96 *4 (48x2) | 96 *4 (48x2) |
| | Connectable network | Previous | Previous | Previous | Previous | Previous | Previous |
| | | 1 | 1 | 3 | 2 | 2 | 2 |

Note:
KXZ2 and KXZ1 cannot be mixed in the same outdoor unit combination (Twin or triple).

*3 Maximum number of AC cell is limited up to 96.

In case the number of connected indoor units are more than 96, some AC cells should hold 2 or more indoor units.

*4 In case of other central control like SC-SLxN-E is connected in the same network, the connectable indoor unit is limited up to 64 (32x2).

*5 In case of previous Superlink protocol, the Superlink mode of new central control should be set "Previous".

*6 In case of YES[A], previous central control is available to use. But the limitation of connectable indoor unit and so on is complied with the rule of previous Superlink.

<For heat recovery only>

(3) The compatibility of PFD (refrigerant flow branching control) is mentioned in following table.

| Connectable PFD control | Outdoor unit | Indoor unit | |
|--------------------------------|--------------|--------------------|---------------------|
| | | KXE4 & KXE5 series | KXE6 & KXZE1 series |
| KXRE4 series | PFD-E | PFD-E | PFD-E PFD ***3-E |
| | PFD-ER | PFD-ER | PFD-ER PFD ***4-E |
| | | | |
| KXRE6 series | PFD-E | PFD-E | PFD ***3-E |
| | PFD-ER | PFD-ER | PFD ***4-E |
| KXZRE1 series KXZRE2 series | | | PFD ***3-E |
| | | | PFD ***4-E |

Note:
All indoor unit downstream PFD box must be same series, KXZR, KX6 series or KX4/5 series

(4) Compatibility of the PFD control extension cables is as per the following table.

| PFD-control series | PFD-control series | |
|--------------------|--------------------|-------------|
| | PFD *** 3-E | PFD *** 4-E |
| PFD-15WR-E | Yes | No |
| PFD4-15WR-E | No | Yes |

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1. GENERAL INFORMATION

1.1 Specific features

Connectable indoor capacity

Capacity from 50% to 130% is possible.

| Model \ Item | Number of connectable units | Connectable capacity |
|---------------|-----------------------------|----------------------|
| FDC280KXZE2M | 1 to 24 | 140 — 364 |
| FDC335KXZE2M | 1 to 29 | 168 — 435 |
| FDC400KXZE2M | 1 to 34 | 200 — 520 |
| FDC450KXZE2M | 1 to 39 | 225 — 585 |
| FDC475KXZE2M | 1 to 41 | 238 — 617 |
| FDC500KXZE2M | 1 to 43 | 250 — 650 |
| FDC560KXZE2M | 1 to 48 | 280 — 728 |
| FDC615KXZE2M | 2 to 53 | 308 — 799 |
| FDC670KXZE2M | 2 to 58 | 335 — 871 |
| FDC735KXZE2M | 2 to 63 | 368 — 955 |
| FDC800KXZE2M | 2 to 69 | 400 — 1040 |
| FDC850KXZE2M | 2 to 73 | 425 — 1105 |
| FDC900KXZE2M | 2 to 78 | 450 — 1170 |
| FDC950KXZE2M | 2 to 80 | 475 — 1235 |
| FDC1000KXZE2M | 2 to 80 | 500 — 1300 |
| FDC1060KXZE2M | 2 to 80 | 530 — 1378 |
| FDC1120KXZE2M | 2 to 80 | 560 — 1456 |
| FDC1200KXZE2M | 3 to 80 | 600 — 1560 |
| FDC1250KXZE2M | 3 to 80 | 625 — 1625 |
| FDC1300KXZE2M | 3 to 80 | 650 — 1690 |
| FDC1350KXZE2M | 3 to 80 | 675 — 1755 |
| FDC1425KXZE2M | 3 to 80 | 713 — 1852 |
| FDC1450KXZE2M | 3 to 80 | 725 — 1885 |
| FDC1500KXZE2M | 3 to 80 | 750 — 1950 |
| FDC1560KXZE2M | 3 to 80 | 780 — 2028 |
| FDC1620KXZE2M | 3 to 80 | 810 — 2106 |
| FDC1680KXZE2M | 3 to 80 | 840 — 2184 |

<High-COP combination>

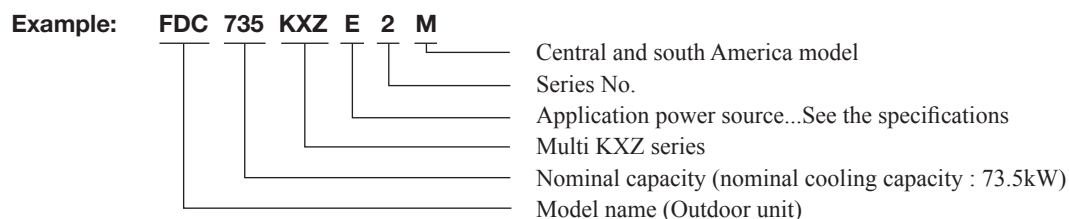
| Model \ Item | Number of connectable units | Connectable capacity |
|---------------|-----------------------------|----------------------|
| FDC560KXZE2M | 2 to 48 | 448 — 728 |
| FDC850KXZE2M | 3 to 73 | 680 — 1105 |
| FDC900KXZE2M | 3 to 78 | 720 — 1170 |
| FDC950KXZE2M | 3 to 80 | 760 — 1235 |
| FDC1000KXZE2M | 3 to 80 | 800 — 1300 |
| FDC1060KXZE2M | 3 to 80 | 848 — 1378 |
| FDC1120KXZE2M | 3 to 80 | 896 — 1456 |

Note

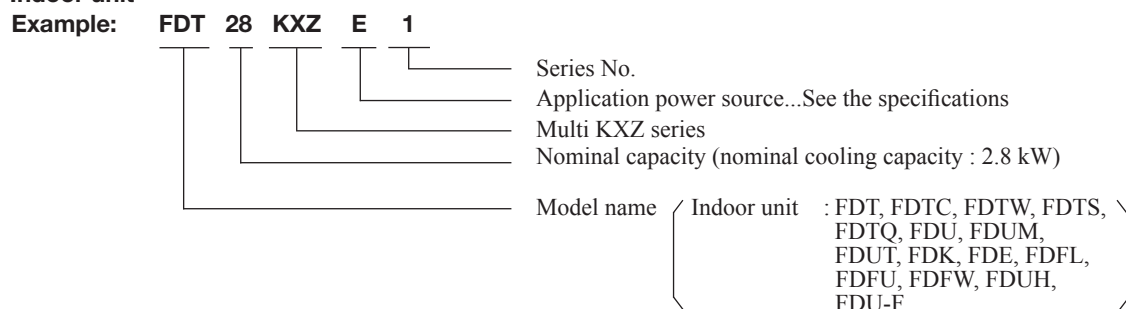
For outdoor unit, EN61000-3-2 and EN61000-3-12 are not applicable as consent by the utility company or notification to the utility company is given before usage.

1.2 How to read the model name

(1) Outdoor unit



(2) Indoor unit



1.3 Table of models

| Model | Capacity | | | | | | | | | | | | | |
|---|----------------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|--|
| | 15 | 22 | 28 | 36 | 45 | 56 | 71 | 90 | 112 | 140 | 160 | 224 | 280 | |
| Ceiling cassette-4 way type (FDT) | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| Ceiling cassette-4 way compact type (FDTC) | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | |
| Ceiling cassette-2 way type (FDTW) | | | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | | | |
| Ceiling cassette-1 way type (FDTS) | | | | | ○ | | ○ | | | | | | | |
| Ceiling cassette-1 way compact type (FDTQ) | | ○ | ○ | ○ | | | | | | | | | | |
| Duct connected-High static pressure type (FDU) | | | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| Duct connected-Low/Middle static pressure type (FDUM) | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | |
| Duct connected (thin)-Low static pressure type (FDUT) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | |
| Wall mounted type (FDK) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | |
| Ceiling suspended type (FDE) | | | | ○ | ○ | ○ | ○ | | ○ | ○ | | | | |
| Floor standing (with casing) type (FDFL) | | | | | | | ○ | | | | | | | |
| Floor standing (without casing) type (FDFU) | | | ○ | | ○ | ○ | ○ | | | | | | | |
| Floor standing-2 way type (FDFW) | | | ○ | | ○ | ○ | | | | | | | | |
| Duct connected-compact and flexible type (FDUH) | | ○ | ○ | ○ | | | | | | | | | | |
| Outdoor air processing unit (FDU-F) | | | | | | | | ○ | | ○ | | ○ | ○ | |
| Outdoor units to be combined (FDC) | FDC280KXZE2M-FDC1680KXZE2M | | | | | | | | | | | | | |

Note (1) Reference No. of data book : No.'19-KX-T-310, No.'20-KX-T-347, No.'20-KX-T-348

1.4 Outdoor units combination table

| Model | Item | Combination Outdoor unit models | | | | | | Indoor unit | |
|---------------|------|---------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------|
| | | FDC280 KXZE2M | FDC335 KXZE2M | FDC400 KXZE2M | FDC450 KXZE2M | FDC475 KXZE2M | FDC500 KXZE2M | FDC560 KXZE2M | Connectable capacity |
| FDC615KXZE2M | | 1 | 1 | - | - | - | - | 308 — 799 | 2 to 53 units |
| FDC670KXZE2M | | - | 2 | - | - | - | - | 335 — 871 | 2 to 58 units |
| FDC735KXZE2M | | - | 1 | 1 | - | - | - | 368 — 955 | 2 to 63 units |
| FDC800KXZE2M | | - | - | 2 | - | - | - | 400 — 1040 | 2 to 69 units |
| FDC850KXZE2M | | - | - | 1 | 1 | - | - | 425 — 1105 | 2 to 73 units |
| FDC900KXZE2M | | - | - | - | 2 | - | - | 450 — 1170 | 2 to 78 units |
| FDC950KXZE2M | | - | - | - | - | 2 | - | 475 — 1235 | 2 to 80 units |
| FDC1000KXZE2M | | - | - | - | - | - | 2 | 500 — 1300 | 2 to 80 units |
| FDC1060KXZE2M | | - | - | - | - | - | 1 | 530 — 1378 | 2 to 80 units |
| FDC1120KXZE2M | | - | - | - | - | - | 2 | 560 — 1456 | 2 to 80 units |
| FDC1200KXZE2M | | - | - | 3 | - | - | - | 600 — 1560 | 3 to 80 units |
| FDC1250KXZE2M | | - | - | 2 | 1 | - | - | 625 — 1625 | 3 to 80 units |
| FDC1300KXZE2M | | - | - | 1 | 2 | - | - | 650 — 1690 | 3 to 80 units |
| FDC1350KXZE2M | | - | - | - | 3 | - | - | 675 — 1755 | 3 to 80 units |
| FDC1425KXZE2M | | - | - | - | - | 3 | - | 713 — 1852 | 3 to 80 units |
| FDC1450KXZE2M | | - | - | - | - | 2 | 1 | 725 — 1885 | 3 to 80 units |
| FDC1500KXZE2M | | - | - | - | - | - | 3 | 750 — 1950 | 3 to 80 units |
| FDC1560KXZE2M | | - | - | - | - | - | 2 | 780 — 2028 | 3 to 80 units |
| FDC1620KXZE2M | | - | - | - | - | - | 1 | 810 — 2106 | 3 to 80 units |
| FDC1680KXZE2M | | - | - | - | - | - | - | 840 — 2184 | 3 to 80 units |

<High-COP combination>

| Model | Item | Combination Outdoor unit models | | | | | | Indoor unit | |
|----------------|------|---------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------------|
| | | FDC280 KXZE2M | FDC335 KXZE2M | FDC400 KXZE2M | FDC450 KXZE2M | FDC475 KXZE2M | FDC500 KXZE2M | FDC560 KXZE2M | Connectable capacity |
| FDC560KXZXE2M | | 2 | - | - | - | - | - | 448 — 728 | 2 to 48 units |
| FDC850KXZXE2M | | 3 | - | - | - | - | - | 680 — 1105 | 3 to 73 units |
| FDC900KXZXE2M | | 2 | 1 | - | - | - | - | 720 — 1170 | 3 to 78 units |
| FDC950KXZXE2M | | 1 | 2 | - | - | - | - | 760 — 1235 | 3 to 80 units |
| FDC1000KXZXE2M | | - | 3 | - | - | - | - | 800 — 1300 | 3 to 80 units |
| FDC1060KXZXE2M | | - | 2 | 1 | - | - | - | 848 — 1378 | 3 to 80 units |
| FDC1120KXZXE2M | | - | 1 | 2 | - | - | - | 896 — 1456 | 3 to 80 units |

(1) Outdoor unit side branch pipe set (Option)

| Outdoor unit | Branch pipe set |
|---|-----------------|
| For two units (for FDC615KXZE2M-1120KXZE2M, 560KXZXE2M) | DOS-2A-3 |
| For three units (for FDC1200KXZE2M-1680KXZE2M, 850-1120KXZXE2M) | DOS-3A-3 |

Note (1) Be sure to use this when combining units.

(2) Branch pipe set (Option)

| Total capacity downstream | Branching pipe set |
|-------------------------------|--------------------|
| Less than 180 | DIS-22-1G |
| 180 or more but less than 371 | DIS-180-1G |
| 371 or more but less than 540 | DIS-371-1G |
| 540 or more | DIS-540-3 |

(3) Header pipe set (Option)

| Total capacity downstream | Header set model type | Number of branches |
|-------------------------------|-----------------------|------------------------|
| Less than 180 | HEAD4-22-1G | 4 branches at the most |
| 180 or more but less than 371 | HEAD6-180-1G | 6 branches at the most |
| 371 or more but less than 540 | HEAD8-371-2 | 8 branches at the most |
| 540 or more | HEAD8-540-3 | 8 branches at the most |

2. OUTDOOR UNIT

2.1 Specifications

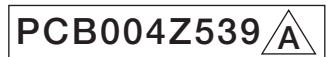
• Single use (Used also for combination)

| Models | FDC280KXZE2M | FDC335KXZE2M | FDC400KXZE2M | FDC450KXZE2M | FDC475KXZE2M | FDC500KXZE2M | FDC560KXZE2M |
|---|---|--------------|----------------|--------------|-----------------|--------------|-----------------|
| Nominal cooling capacity*1 | 28.0 | 33.5 | 40.0 | 45.0 | 47.5 | 50.0 | 56.0 |
| Nominal heating capacity*2 | 31.5 | 37.5 | 45.0 | 50.0 | 53.0 | 56.0 | 63.0 |
| Maximum heating capacity | 31.5 | 37.5 | 45.0 | 50.0 | 53.0 | 56.0 | 63.0 |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | | | |
| Power consumption | 7.25 | 8.98 | 10.98 | 13.98 | 13.97 | 14.01 | 17.50 |
| Cooling | 7.41 | 9.03 | 10.23 | 12.50 | 12.99 | 13.56 | 16.15 |
| Heating | 20.7 | 25.3 | 30.3 | 36.6 | 39.1 | 39.1 | 48.9 |
| Running current | 21.1 | 25.5 | 28.9 | 35.3 | 36.3 | 37.9 | 45.1 |
| Cooling | 92 | 93 | 95 | 95 | 94 | 94 | 94 |
| Heating | 92 | 93 | 93 | 93 | 94 | 94 | 94 |
| EER | 3.86 | 3.73 | 3.64 | 3.22 | 3.40 | 3.57 | 3.20 |
| COP | 4.25 | 4.15 | 4.40 | 4.00 | 4.08 | 4.13 | 3.90 |
| Sound pressure level. (Cooling/Heating) | 56 / 57 | 63 / 62 | 60 / 62 | 61 / 62 | 61 / 61 | 61 / 62 | 63 / 64 |
| Sound power level. (Cooling/Heating) | 75 / 76 | 82 / 81 | 80 / 82 | 81 / 82 | 81 / 81 | 81 / 82 | 82 / 83 |
| Starting current | 5 | | | | | | |
| Maximum current | 33.0 | | | | | | |
| Exterior dimensions | 1697 x 1350 x 720 | | | | | | |
| Height x Width x Depth | 2052 x 1350 x 720 | | | | | | |
| Exterior appearance (Munsell color) | Stucco white (4.2Y7.5/1.1) & Dark silver (0.5Y4.3/0.1) near equivalent | | | | | | |
| Net weight | 293 | | | | | | |
| Refrigerant equipment compressor type & Qty | GTC5150NC47BF*1 | | GUC5185ND47B*1 | | GTC5150NC47BF*2 | | |
| Motor | 4.76x1 | 5.94x1 | 7.32x1 | 9.32x1 | 4.64x2 | 4.91x2 | 5.36x2 |
| Starting method | Direct line starting | | | | | | |
| Crankcase heater | 40x1 | | | | | | |
| Refrigerant equipment Heat exchanger | M fin & inner grooved tubing | | | | | | |
| Refrigerant control | Electronic expansion valve | | | | | | |
| Refrigerant type | R410A | | | | | | |
| Refrigerant amount | 11.0 | | | | | | |
| Refrigerant oil | 2.25 (M-MA32R) | | 2.9 (M-MA32R) | | 4.2 (M-MA32R) | | |
| Defrost control | Microcomputer controlled De-Icer | | | | | | |
| Air handling equipment fan type & Qty | Propeller fan x2 386x2 | | | | | | |
| Motor | Direct start | | | | | | |
| Starting method | Max.50 | | | | | | |
| Air flow (Standard) | 225 / 225 | 284 / 283 | 304 / 304 | 300 / 300 | 300 / 300 | 300 / 284 | 300 / 284 |
| Available external static pressure | Rubber mount (for compressor) | | | | | | |
| Shock & vibration absorber | Compressor overheat protection / overcurrent protection / power transistor overheating protection / abnormal high pressure protection | | | | | | |
| Safety equipment | Compressor overheat protection / overcurrent protection / power transistor overheating protection / abnormal high pressure protection | | | | | | |
| Installation data | Liquid Line | min (in) | φ9.52 (3/8") | φ25.4 (1") | φ25.4 (1") | φ25.4 (1") | φ28.58 (1 1/8") |
| Refrigerant piping size | Gas line | min (in) | φ22.22 (7/8") | φ25.4 (1") | φ25.4 (1") | φ25.4 (1") | φ28.58 (1 1/8") |
| Connecting method | Gas line : Brazing / Liquid line : Flare | | | | | | |
| MAX. Pressure | High 4.15 Low 2.21 | | | | | | |
| Drain | Hole for drain (φ 20x10pcs. φ45x3pcs.) | | | | | | |
| Insulation for piping | Necessary (both Liquid & Gas line) | | | | | | |
| IP number | IP24 | | | | | | |
| Accessories | - | | | | | | |
| Exterior dimensions | PCB004Z543 | PCB004Z543 | PCB004Z544 | PCB004Z544 | PCB004Z544 | PCB004Z544 | PCB004Z544 |
| Electrical wiring | PCB004Z545 | PCB004Z545 | PCB004Z546 | PCB004Z546 | PCB004Z547 | PCB004Z547 | PCB004Z547 |

(4) Refrigerant piping size applicable to European installations are shown in parentheses.
 (5) This air-conditioner is adapted RoHS directive.

| Item | Indoor air temperature | | Outdoor air temperature | | Standards |
|-----------|------------------------|------|-------------------------|------|----------------|
| | DB | WB | DB | WB | |
| Operation | 27°C | 19°C | 35°C | 24°C | ISO5151-T1, H1 |
| Cooling | 20°C | - | 7°C | 6°C | |

(2) This air-conditioner is manufactured and tested in conformity with the ISO.
 (3) Sound level indicates the value in an anechoic chamber.
 During operation these values are somewhat higher due to ambient conditions.



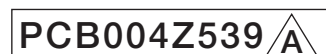
• Combination use

| | | | | | |
|----------------------------|----------------------------|--|----------------------------|----------------------------|----------------------------|
| Models | FDC615KXE2M | FDC670KXE2M | FDC735KXE2M | FDC800KXE2M | FDC850KXE2M |
| Combination unit | FDC280KXE2M FDC335KXE2M | FDC335KXE2M FDC400KXE2M | FDC335KXE2M FDC400KXE2M | FDC400KXE2M FDC450KXE2M | FDC400KXE2M FDC450KXE2M |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | |
| Nominal cooling capacity*1 | 61.5 | 67.0 | 73.5 | 80.0 | 85.0 |
| Nominal heating capacity*2 | 69.0 | 75.0 | 82.5 | 90.0 | 95.0 |
| Power consumption | Cooling | 16.23 | 17.96 | 19.96 | 21.96 |
| | Heating | 16.44 | 18.06 | 19.26 | 20.46 |
| Running current | Cooling | 46.0 | 50.6 | 55.6 | 60.6 |
| | Heating | 46.6 | 51.0 | 55.4 | 57.8 |
| Power factor | Cooling | 93 | 93 | 94 | 95 |
| | Heating | 93 | 93 | 94 | 93 |
| Net weight | 585 | 585 | 629 | 673 | 673 |
| Refrigerant piping size | Liquid line | ϕ 12.7 (1/2") | | | |
| | Gas line | ϕ 28.58 (1 1/8") | | | |
| | Oil equalization | ϕ 9.52 (3/8") | | | |
| Models | FDC900KXE2M | FDC950KXE2M | FDC1000KXE2M | FDC1060KXE2M | FDC1120KXE2M |
| Combination unit | FDC450KXE2M | FDC475KXE2M | FDC500KXE2M | FDC560KXE2M | FDC560KXE2M |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | |
| Nominal cooling capacity*1 | 90.0 | 95.0 | 100.0 | 106.0 | 112.0 |
| Nominal heating capacity*2 | 100.0 | 106.0 | 112.0 | 119.0 | 126.0 |
| Power consumption | Cooling | 27.96 | 28.02 | 31.51 | 35.00 |
| | Heating | 25.00 | 25.98 | 27.12 | 29.71 |
| Running current | Cooling | 77.2 | 78.0 | 78.2 | 88.0 |
| | Heating | 70.6 | 72.6 | 75.8 | 83.0 |
| Power factor | Cooling | 95 | 94 | 94 | 94 |
| | Heating | 93 | 94 | 94 | 94 |
| Net weight | 673 | 767 | 767 | 767 | 767 |
| Refrigerant piping size | Liquid line | ϕ 15.88 (5/8") | | | |
| | Gas line | ϕ 31.75 (1 1/4") (ϕ 34.92 (1 3/8")) | | | |
| | Oil equalization | ϕ 9.52 (3/8") | | | |

• Combination use

| Models | FDC1200KXE2M | FDC1250KXE2M | FDC1300KXE2M | FDC1350KXE2M | FDC1425KXE2M | |
|----------------------------|----------------------------|------------------------------------|--------------|--------------|--------------|--|
| Combination unit | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | |
| | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | |
| | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | FDC400KXE2M | |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | | |
| Nominal cooling capacity*1 | 120.0 | 125.0 | 130.0 | 135.0 | 142.5 | |
| Nominal heating capacity*2 | kW | 135.0 | 140.0 | 145.0 | 150.0 | |
| | Cooling | 32.94 | 35.94 | 38.94 | 41.94 | |
| Power consumption | kW | 30.69 | 32.96 | 35.23 | 37.50 | |
| | Heating | 90.9 | 99.2 | 107.5 | 115.8 | |
| Running current | A | 86.7 | 93.1 | 99.5 | 105.9 | |
| | Cooling | 95 | 95 | 95 | 95 | |
| Power factor | % | 93 | 93 | 93 | 93 | |
| | Heating | 1009 | 1009 | 1009 | 1009 | |
| Net weight | kg | 1009 | 1009 | 1009 | 1151 | |
| Refrigerant piping size | Liquid line | φ 19.05 (3/4") | | | | |
| | Gas line | φ 38.1 (1 1/2") (φ 34.92 (1 3/8") | | | | |
| | Oil equalization | φ 9.52 (3/8") | | | | |

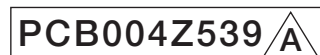
| Models | FDC1450KXE2M | FDC1500KXE2M | FDC1560KXE2M | FDC1620KXE2M | FDC1680KXE2M | |
|----------------------------|----------------------------|------------------------------------|--------------|--------------|--------------|--|
| Combination unit | FDC475KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | |
| | FDC475KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | |
| | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | FDC500KXE2M | |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | | |
| Nominal cooling capacity*1 | 145.0 | 150.0 | 156.0 | 162.0 | 168.0 | |
| Nominal heating capacity*2 | kW | 162.0 | 168.0 | 175.0 | 182.0 | |
| | Cooling | 41.95 | 42.03 | 45.52 | 49.01 | |
| Power consumption | kW | 39.54 | 40.68 | 43.27 | 45.86 | |
| | Heating | 117.1 | 117.3 | 127.1 | 136.9 | |
| Running current | A | 110.5 | 113.7 | 120.9 | 128.1 | |
| | Cooling | 94 | 94 | 94 | 94 | |
| Power factor | % | 94 | 94 | 94 | 94 | |
| | Heating | 1151 | 1151 | 1151 | 1151 | |
| Net weight | kg | 1151 | 1151 | 1151 | 1151 | |
| Refrigerant piping size | Liquid line | φ 19.05 (3/4") | | | | |
| | Gas line | φ 38.1 (1 1/2") (φ 34.92 (1 3/8") | | | | |
| | Oil equalization | φ 9.52 (3/8") | | | | |



• High-COP combination use

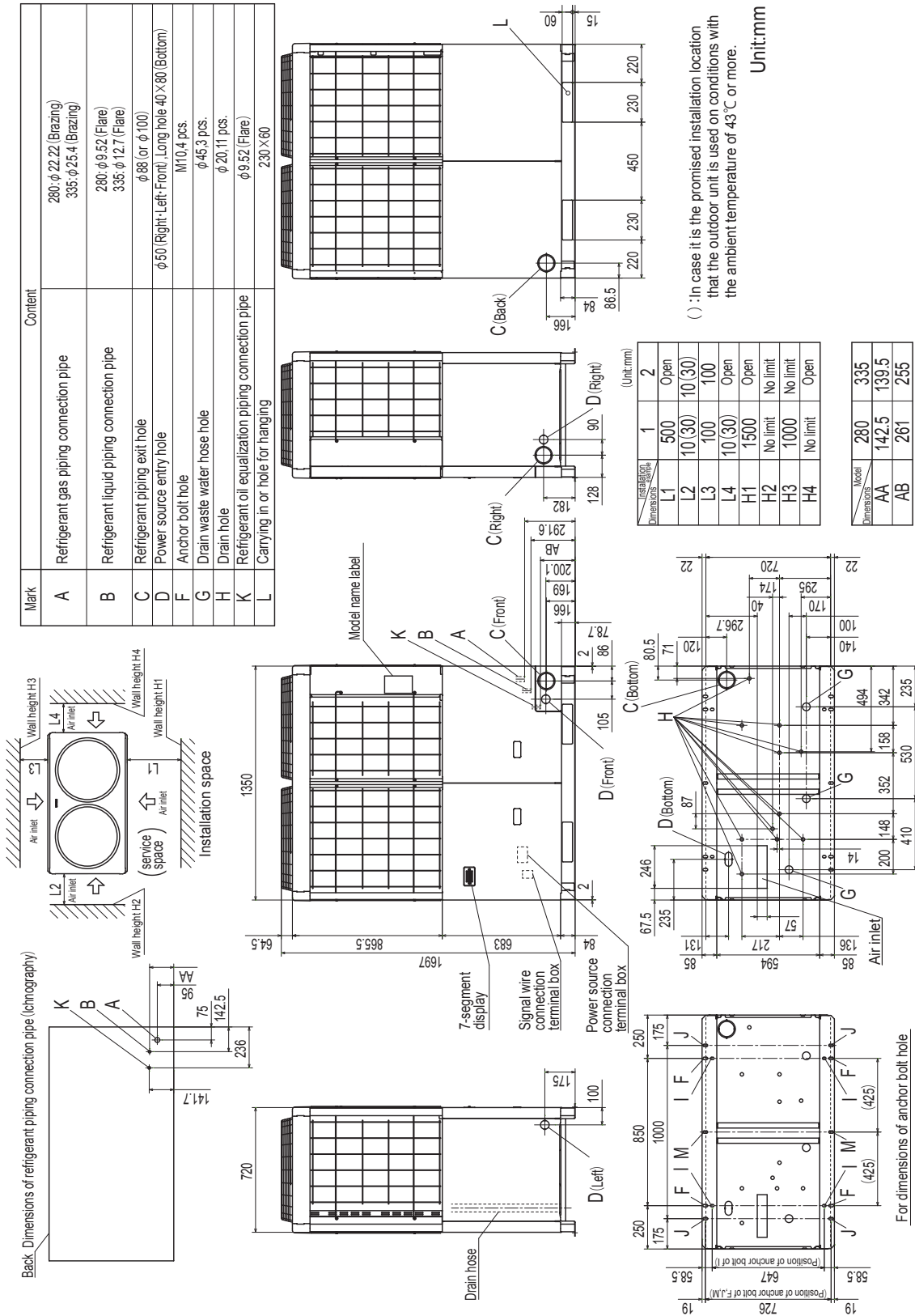
| | |
|----------------------------|--|
| Models | FDC560KXZE2M |
| Combination unit | FDC280KXZE2M FDC280KXZE2M |
| Power source | 3 Phase 3 wiring 220V 60Hz |
| Nominal cooling capacity*1 | 56.0 |
| Nominal heating capacity*2 | 63.0 |
| Power consumption | 14.50 |
| Running current | 41.4 |
| Power factor | 92 |
| Net weight | 585 |
| Refrigerant piping size | φ 12.7 (1/2") φ 28.58 (1 1/8") φ 9.52 (3/8") |

| | | | | | | |
|----------------------------|--|--|--|--|--|--|
| Models | FDC850KXZE2M | FDC900KXZE2M | FDC950KXZE2M | FDC1000KXZE2M | FDC1060KXZE2M | FDC1120KXZE2M |
| Combination unit | FDC280KXZE2M FDC280KXZE2M FDC280KXZE2M | FDC280KXZE2M FDC280KXZE2M FDC335KXZE2M | FDC280KXZE2M FDC335KXZE2M FDC335KXZE2M | FDC335KXZE2M FDC335KXZE2M FDC335KXZE2M | FDC335KXZE2M FDC335KXZE2M FDC335KXZE2M | FDC335KXZE2M FDC335KXZE2M FDC335KXZE2M |
| Power source | 3 Phase 3 wiring 220V 60Hz | | | | | |
| Nominal cooling capacity*1 | 84.0 | 89.5 | 95.0 | 100.5 | 107.0 | 113.5 |
| Nominal heating capacity*2 | 94.5 | 100.5 | 106.5 | 112.5 | 120.0 | 127.5 |
| Power consumption | 21.75 | 23.48 | 25.21 | 26.94 | 28.94 | 30.94 |
| Running current | 62.1 | 66.7 | 71.3 | 75.9 | 80.9 | 85.9 |
| Power factor | 92 | 92 | 93 | 93 | 94 | 94 |
| Net weight | 878 | 878 | 878 | 878 | 922 | 966 |
| Refrigerant piping size | φ 31.75 (1 1/2") (φ 34.92 (1 3/8")) φ 15.88 (5/8") φ 9.52 (3/8") | | | | | |



2.2 Exterior dimensions

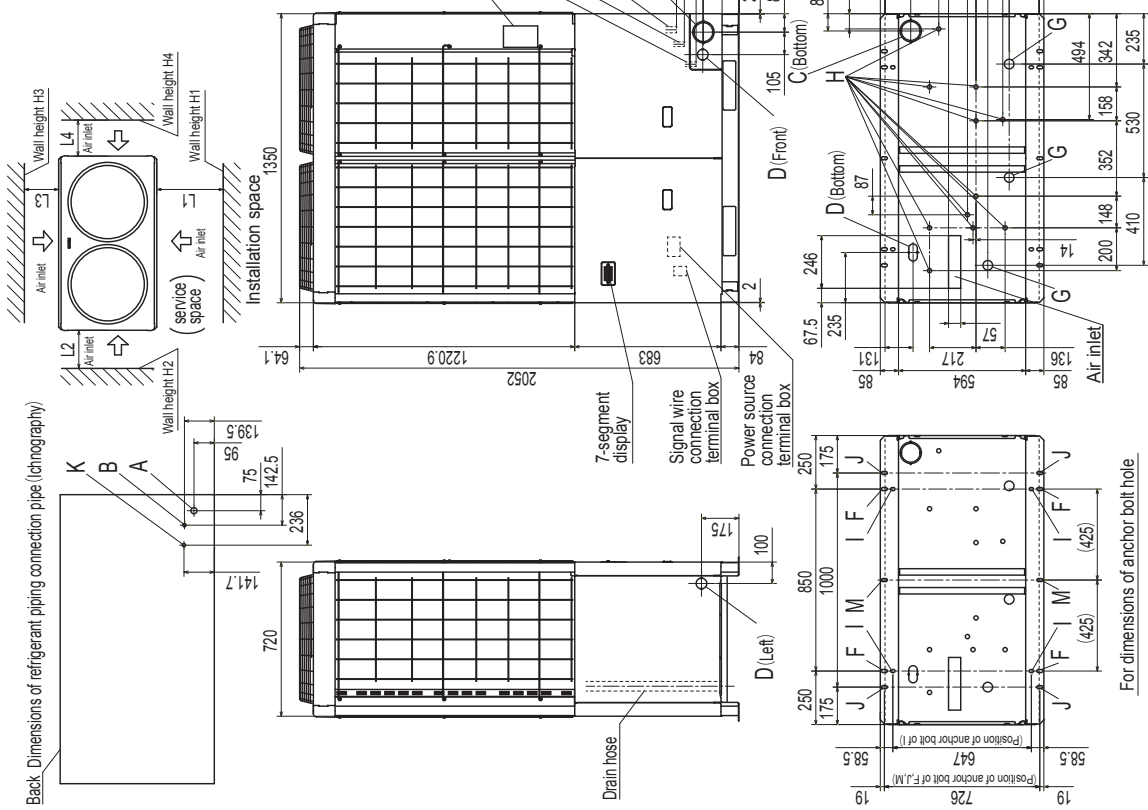
Models FDC280KXZE2M, 335KXZE2M



PCB004Z543

Models FDC400KXZE2M, 450KXZE2M, 475KXZE2M, 500KXZE2M, 560KXZE2M

| Mark | Content |
|------|--|
| A | Refrigerant gas piping connection pipe 400: φ25.4 (Brazing) 450, 475, 500, 560: φ28.58 (Brazing) |
| B | Refrigerant liquid piping connection pipe φ12.7 (Flare) |
| C | Refrigerant piping exit hole φ88 (or φ100) |
| D | Power source entry hole φ50 (Right-Left- Front) Long hole 40×80 (Bottom) |
| F | Anchor bolt hole M10, 4 pcs. |
| G | Drain waste water hose hole φ45, 3 pcs. |
| H | Drain hole φ20, 11 pcs. |
| K | Refrigerant oil equalization piping connection pipe φ9.52 (Flare) |
| L | Carrying in or hole for hanging 230×60 |



() : in case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43°C or more.

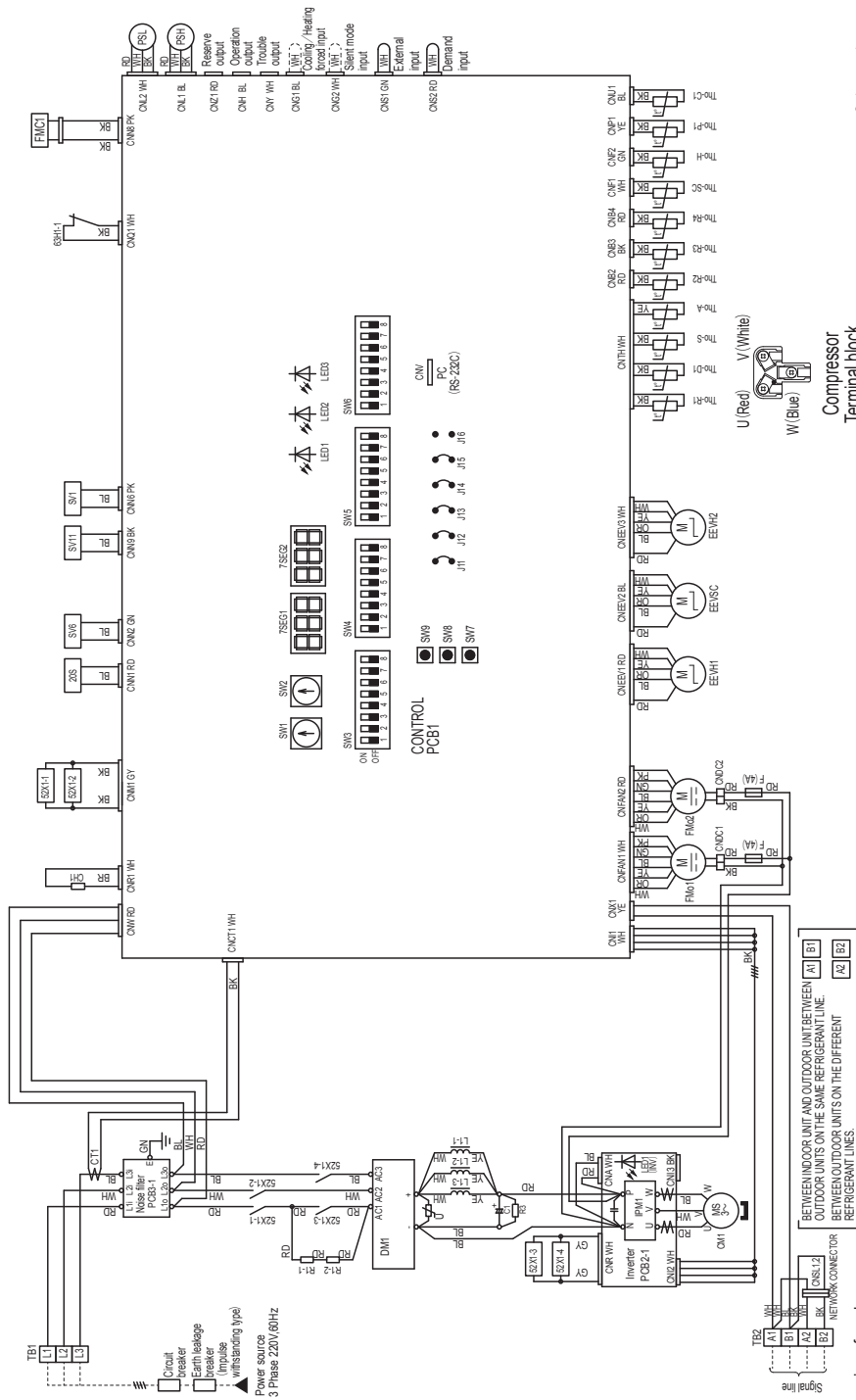
Unit:mm

| Dimensions | 1 | 2 |
|------------|----------|----------|
| L1 | 500 | Open |
| L2 | 10(30) | 10(30) |
| L3 | 100 | 100 |
| L4 | 10(30) | Open |
| H1 | 1500 | Open |
| H2 | No limit | No limit |
| H3 | 1000 | No limit |
| H4 | No limit | Open |

PCB004Z544

2.3 Electrical wiring

Models FDC280KXZE2M, 335KXZE2M



Color marks

| Mark | Color |
|------|----------------|
| BK | Black |
| BL | Blue |
| BR | Brown |
| GN | Green |
| GY | Gray |
| OR | Orange |
| RD | Red |
| WH | White |
| YE | Yellow |
| PK | Pink |
| Y/G | Yellow / Green |

Terminal block

| Mark | Parts name |
|---------|---|
| TB1,2 | Terminal block |
| Tho-A | External air temperature sensor |
| Tho-C1 | Under-dome temperature sensor |
| Tho-D1 | Discharge pipe temperature sensor |
| Tho-H | Subcooling coil temperature sensor 2 |
| Tho-P1 | Power transistor |
| Tho-R1 | Heat exchanger temperature sensor (exhaust) |
| Tho-R2 | Heat exchanger temperature sensor (inlet) |
| Tho-R3 | Heat exchanger temperature sensor (inlet) |
| Tho-R4 | Heat exchanger temperature sensor (inlet) |
| Tho-S | Suction pipe temperature sensor |
| Tho-SC | Subcooling coil temperature sensor 1 |
| 2/S | 4-way valve |
| 5X1,1-4 | Solenoid for CM |
| 6SH1-1 | High pressure switch (for protection) |
| 7SEG1 | 7-segment L.E.D. (function indication) |
| 7SEG2 | 7-segment L.E.D. (data indication) |

| Mark | Model setting | Parts name |
|---------|---------------------------------------|------------|
| SW4-1-4 | Model setting | |
| SW4-5 | Spare | |
| SW4-6 | Spare | |
| SW4-7 | Address setting (master-slave) | |
| SW4-8 | Address setting switch (master-slave) | |
| SW4-8 | Address setting switch (master-slave) | |
| SW5-1 | ON Trial operation | |
| SW5-1 | OFF Regular operation | |
| SW5-2 | ON Trial operation mode / cooling | |
| SW5-2 | OFF Trial operation mode / heating | |
| SW5-3 | ON Pump down operation | |
| SW5-3 | OFF Regular operation | |
| SW5-4 | Spare | |
| SW5-5 | ON Superlink communication | |
| SW5-5 | OFF Superlink II communication | |
| SW5-6-8 | Spare | |
| SW5-6-3 | Spare | |
| SW6-4 | ON High Head | |
| SW6-4 | OFF Standard | |
| SW7 | Data clear / insert | |
| SW8 | 7-segment indicate (unit's place) | |
| SW9 | 7-segment indicate (left's place) | |

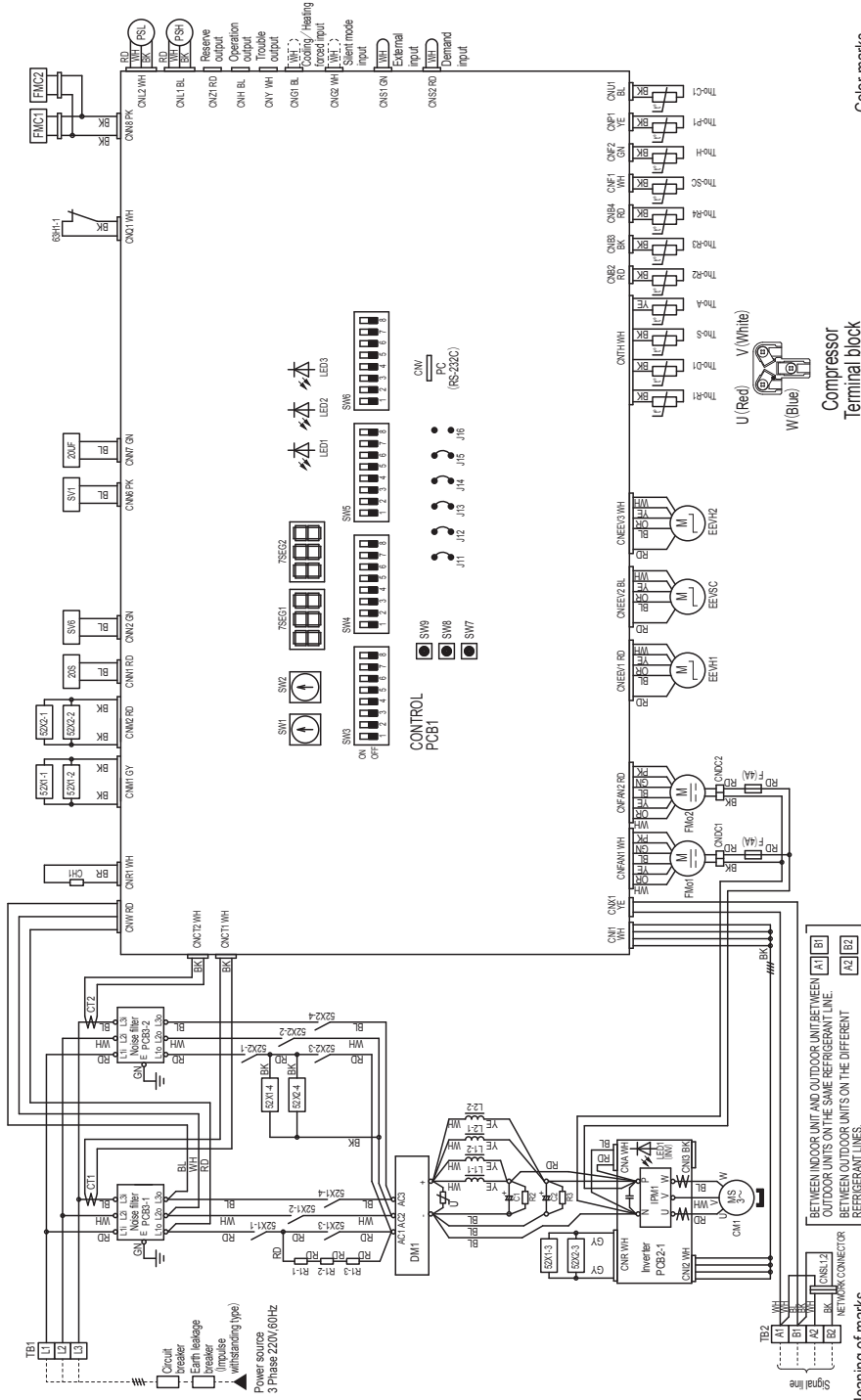
| Mark | Parts name |
|--------|--|
| PSH | High pressure sensor |
| PSL | Low pressure sensor |
| PCB1-3 | Printed wiring board (PCB) |
| RT-1,2 | Rush current suppression resistor |
| R3 | Discharge resistor |
| SV1 | Solenoid valve (CM1 bypass) |
| SV6 | Solenoid valve (oil separator CM1) |
| SV11 | Solenoid valve (gas bypass) |
| SV12 | Address setting SW outdoor unit No.1 (digit) |
| SV13 | Address setting SW outdoor unit No.2 (digit) |
| SV14 | Address setting SW outdoor unit No.1 (digit) |
| SV15 | Address setting SW outdoor unit No.2 (digit) |
| SV16 | Address setting SW outdoor unit No.1 (digit) |
| SV17 | Address setting SW outdoor unit No.2 (digit) |
| SV18 | Address setting SW outdoor unit No.1 (digit) |
| SV19 | Address setting SW outdoor unit No.2 (digit) |
| SV20 | Address setting SW outdoor unit No.1 (digit) |
| SV21 | Address setting SW outdoor unit No.2 (digit) |
| SV22 | Address setting SW outdoor unit No.1 (digit) |
| SV23 | Address setting SW outdoor unit No.2 (digit) |
| SV24 | Address setting SW outdoor unit No.1 (digit) |
| SV25 | Address setting SW outdoor unit No.2 (digit) |
| SV26 | Address setting SW outdoor unit No.1 (digit) |
| SV27 | Address setting SW outdoor unit No.2 (digit) |
| SV28 | Address setting SW outdoor unit No.1 (digit) |
| SV29 | Address setting SW outdoor unit No.2 (digit) |
| SV30 | Address setting SW outdoor unit No.1 (digit) |
| SV31 | Address setting SW outdoor unit No.2 (digit) |
| SV32 | Address setting SW outdoor unit No.1 (digit) |
| SV33 | Address setting SW outdoor unit No.2 (digit) |
| SV34 | Address setting SW outdoor unit No.1 (digit) |
| SV35 | Address setting SW outdoor unit No.2 (digit) |
| SV36 | Address setting SW outdoor unit No.1 (digit) |
| SV37 | Address setting SW outdoor unit No.2 (digit) |
| SV38 | Address setting SW outdoor unit No.1 (digit) |
| SV39 | Address setting SW outdoor unit No.2 (digit) |
| SV40 | Address setting SW outdoor unit No.1 (digit) |
| SV41 | Address setting SW outdoor unit No.2 (digit) |
| SV42 | Address setting SW outdoor unit No.1 (digit) |
| SV43 | Address setting SW outdoor unit No.2 (digit) |
| SV44 | Address setting SW outdoor unit No.1 (digit) |
| SV45 | Address setting SW outdoor unit No.2 (digit) |
| SV46 | Address setting SW outdoor unit No.1 (digit) |
| SV47 | Address setting SW outdoor unit No.2 (digit) |
| SV48 | Address setting SW outdoor unit No.1 (digit) |
| SV49 | Address setting SW outdoor unit No.2 (digit) |
| SV50 | Address setting SW outdoor unit No.1 (digit) |
| SV51 | Address setting SW outdoor unit No.2 (digit) |
| SV52 | Address setting SW outdoor unit No.1 (digit) |
| SV53 | Address setting SW outdoor unit No.2 (digit) |
| SV54 | Address setting SW outdoor unit No.1 (digit) |
| SV55 | Address setting SW outdoor unit No.2 (digit) |
| SV56 | Address setting SW outdoor unit No.1 (digit) |
| SV57 | Address setting SW outdoor unit No.2 (digit) |
| SV58 | Address setting SW outdoor unit No.1 (digit) |
| SV59 | Address setting SW outdoor unit No.2 (digit) |
| SV60 | Address setting SW outdoor unit No.1 (digit) |
| SV61 | Address setting SW outdoor unit No.2 (digit) |
| SV62 | Address setting SW outdoor unit No.1 (digit) |
| SV63 | Address setting SW outdoor unit No.2 (digit) |
| SV64 | Address setting SW outdoor unit No.1 (digit) |
| SV65 | Address setting SW outdoor unit No.2 (digit) |
| SV66 | Address setting SW outdoor unit No.1 (digit) |
| SV67 | Address setting SW outdoor unit No.2 (digit) |
| SV68 | Address setting SW outdoor unit No.1 (digit) |
| SV69 | Address setting SW outdoor unit No.2 (digit) |
| SV70 | Address setting SW outdoor unit No.1 (digit) |
| SV71 | Address setting SW outdoor unit No.2 (digit) |
| SV72 | Address setting SW outdoor unit No.1 (digit) |
| SV73 | Address setting SW outdoor unit No.2 (digit) |
| SV74 | Address setting SW outdoor unit No.1 (digit) |
| SV75 | Address setting SW outdoor unit No.2 (digit) |
| SV76 | Address setting SW outdoor unit No.1 (digit) |
| SV77 | Address setting SW outdoor unit No.2 (digit) |
| SV78 | Address setting SW outdoor unit No.1 (digit) |
| SV79 | Address setting SW outdoor unit No.2 (digit) |
| SV80 | Address setting SW outdoor unit No.1 (digit) |
| SV81 | Address setting SW outdoor unit No.2 (digit) |
| SV82 | Address setting SW outdoor unit No.1 (digit) |
| SV83 | Address setting SW outdoor unit No.2 (digit) |
| SV84 | Address setting SW outdoor unit No.1 (digit) |
| SV85 | Address setting SW outdoor unit No.2 (digit) |
| SV86 | Address setting SW outdoor unit No.1 (digit) |
| SV87 | Address setting SW outdoor unit No.2 (digit) |
| SV88 | Address setting SW outdoor unit No.1 (digit) |
| SV89 | Address setting SW outdoor unit No.2 (digit) |
| SV90 | Address setting SW outdoor unit No.1 (digit) |
| SV91 | Address setting SW outdoor unit No.2 (digit) |
| SV92 | Address setting SW outdoor unit No.1 (digit) |
| SV93 | Address setting SW outdoor unit No.2 (digit) |
| SV94 | Address setting SW outdoor unit No.1 (digit) |
| SV95 | Address setting SW outdoor unit No.2 (digit) |
| SV96 | Address setting SW outdoor unit No.1 (digit) |
| SV97 | Address setting SW outdoor unit No.2 (digit) |
| SV98 | Address setting SW outdoor unit No.1 (digit) |
| SV99 | Address setting SW outdoor unit No.2 (digit) |
| SV100 | Address setting SW outdoor unit No.1 (digit) |

Meaning of marks

| Mark | Parts name |
|------------|-------------------------------------|
| CH1 | Crankcase heater |
| CM1 | Compressor motor |
| CMA-Z | Compressor |
| C11 | Current sensor |
| C1 | Current sensor |
| DM1 | Diode module |
| EEV1,2 | Expansion valve for heating |
| EEV/SC | Expansion valve for SC |
| F | Fuse |
| FAN1 | Fan for IPM |
| IPM1,2 | Blower motor |
| IPM | Intelligent power module |
| J11,12 | Set up model (volt) |
| J13 | External input select level / pulse |
| J14 | Defrost sensor temperature |
| J15 | Defrost sensor temperature |
| J16 | Spare |
| LED1 | Inspection (Red) |
| LED1 (INV) | Normal (Yellow) - Flashing |
| LED2 | Normal (Green) |
| LED3 | Service (green for service) |
| L1,1-3 | D.C. reactor |

PCB004Z545

Models FDC400KXZE2M, 450KXZE2M



Color marks

| Mark | Color |
|--------|----------------|
| BK | Black |
| BL | Blue |
| BR | Brown |
| GN | Green |
| GY | Gray |
| OR | Orange |
| RD | Red |
| WH | White |
| YE | Yellow |
| PK | Pink |
| YE/ GN | Yellow / Green |

Terminal block

| Mark | Parts name |
|------------|---|
| TB1.2 | Terminal block |
| Tho-A | External air temperature sensor |
| Tho-C1 | Under-dome temperature sensor |
| Tho-D1 | Discharge pipe thermostat sensor |
| Tho-H | Subcooling coil temperature sensor 2 |
| Tho-P1 | Power transistor temperature sensor |
| Tho-R1 | Heat exchanger temperature sensor (exhaust) |
| Tho-R2 | Heat exchanger temperature sensor (exhaust) |
| Tho-R3 | Heat exchanger temperature sensor (inlet) |
| Tho-R4 | Heat exchanger temperature sensor (inlet) |
| Tho-S | Suction pipe temperature sensor |
| Tho-SC | Subcooling coil temperature sensor 1 |
| 2US | 4-way valve |
| 20UF | Capacitor control |
| 52X1.1-2.4 | Solenoid for CM1 |
| 63H1.1 | High pressure switch (for protection) |
| 7SEG1 | 7-segment L.E.D. (function - indication) |
| 7SEG2 | 7-segment L.E.D. (data - indication) |

| Mark | Parts name |
|---------|---------------------------------------|
| SW4-1-4 | Model setting |
| SW4-5 | Spare |
| SW4-6 | Spare |
| SW4-7 | Address setting switch (master/slave) |
| SW4-8 | Address setting switch (master/slave) |
| SW5-1 | ON Trial operation |
| SW5-2 | OFF Regular operation |
| SW5-3 | ON Trial operation mode / cooling |
| SW5-4 | OFF Trial operation mode / heating |
| SW5-5 | ON Pump down operation |
| SW5-6 | OFF Regular operation |
| SW5-7 | OFF Regular operation |
| SW5-8 | OFF Superlink communication |
| SW5-9 | ON Superlink II communication |
| SW6-1-8 | Spare |
| SW6-1-3 | Spare |
| SW6-4 | ON High Head |
| SW6-5 | OFF Standard |
| SW7 | Data clear / insert |
| SW8 | 7-segment indicate (unit's place) |
| SW9 | 7-segment indicate (left's place) |

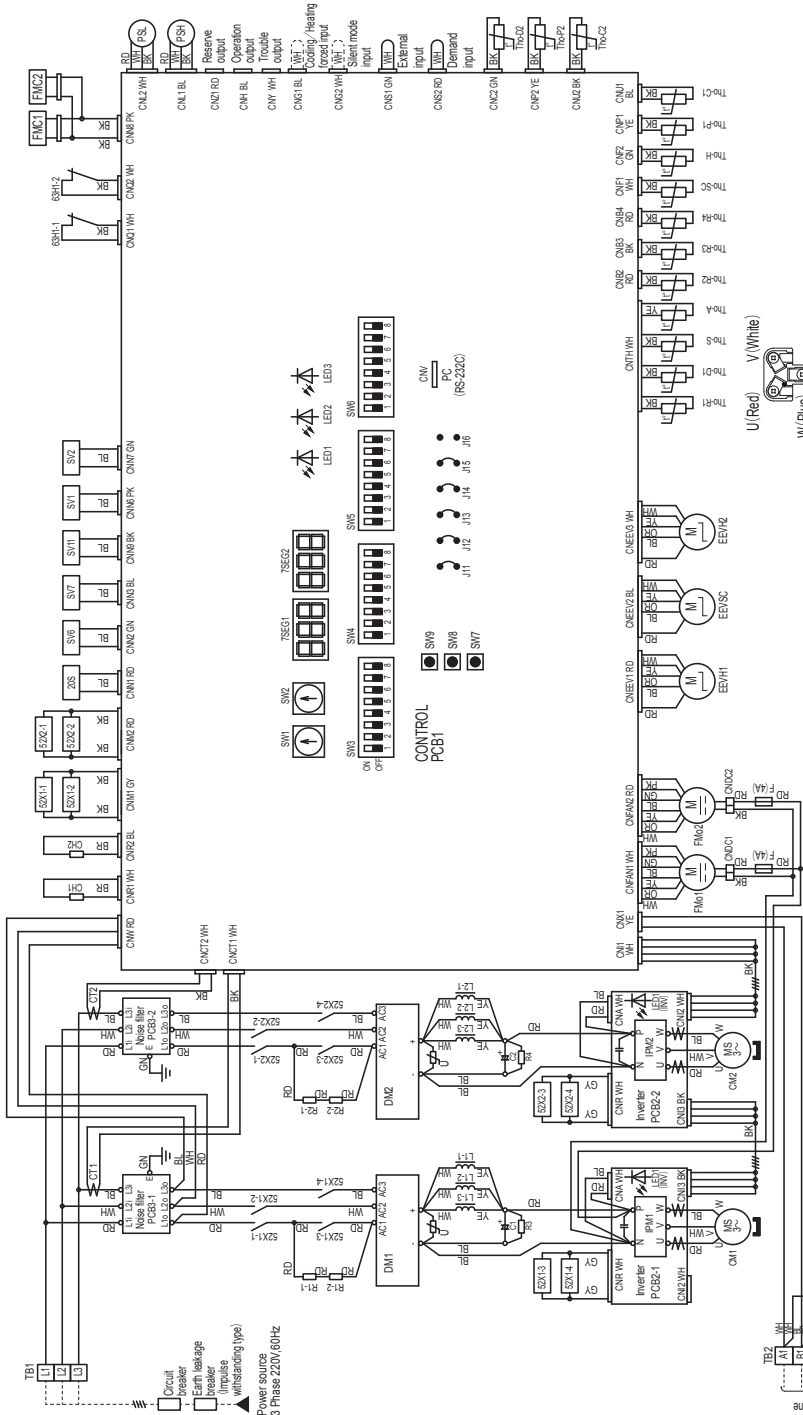
| Mark | Parts name |
|--------|---|
| PSH | High pressure sensor |
| PSL | Low pressure sensor |
| PCB1-3 | Printed wiring board (PCB) |
| RT1-3 | Rush current suppression resistor |
| RZ.3 | Discharge resistor |
| SV1 | Solenoid valve (CM1 bypass) |
| SV6 | Solenoid valve (oil separator CM1) |
| SW1 | Address setting SW outdoor unit No. 2 (digit) |
| SW2 | Address setting SW outdoor unit No. 1 (digit) |
| SW3-1 | Inspection LED reset |
| SW3-2 | ON Auto backup operation |
| SW3-3 | OFF Regular operation |
| SW3-4 | Spare |
| SW3-5 | ON Refrigerant quantity check |
| SW3-6 | OFF Regular operation |
| SW3-7 | ON Check operation |
| SW3-8 | OFF Regular operation |
| SW3-9 | ON Check operation |
| SW3-10 | OFF Regular operation |
| SW3-11 | ON Check operation / heating |
| SW3-12 | OFF Regular operation |
| SW3-13 | Spare |

Meaning of marks

| Mark | Parts name |
|------------|-------------------------------------|
| CH1 | Crankcase heater |
| CM1 | Compressor motor |
| CNA-Z | Connector |
| C1.2 | Current sensor |
| DM1 | Diode module |
| EEVH1.2 | Expansion valve for heating |
| EEVSC | Expansion valve for SC |
| F | Fuse |
| FAN for PM | Fan for PM |
| FM1.2 | Blower motor |
| IPM1.2 | Inverter power module |
| I1.12 | Set Up model (coil) |
| I1.3 | External input select level / pulse |
| I4.4 | Defrost recover temperature |
| I4.5 | Defrost start temperature |
| I4.6 | Spare |
| LED1 | Inspection (Red) |
| LED1 (INV) | Normal (Yellow)-Flashing |
| LED2 | Normal (Green) |
| LED3 | Service (green) (for service) |
| L1-1-2.2 | D.C. reactor |

PCB004Z546

Models FDC475KXZE2M, 500KXZE2M, 560KXZE2M



Color marks

| Mark | Color |
|-------|----------------|
| BK | Black |
| BL | Blue |
| BR | Brown |
| GN | Green |
| GY | Gray |
| OR | Orange |
| RD | Red |
| WH | White |
| YE | Yellow |
| PK | Pink |
| YE/GN | Yellow / Green |

| Mark | Parts name |
|-----------|---|
| TB1.2 | Terminal block |
| Tro-A | External air temperature sensor |
| Tro-C1.2 | Under-dome temperature sensor |
| Tro-D1.2 | Discharge pipe temperature sensor |
| Tro-H | Successing coil temperature sensor |
| Tro-PT.2 | Power transistor temperature sensor |
| Tro-R1 | Heat exchanger temperature sensor (exhaust) |
| Tro-R2 | Heat exchanger temperature sensor (inlet) |
| Tro-R4 | Heat exchanger temperature sensor (inlet) |
| Tro-S | Subcooling coil temperature sensor |
| Tro-SC | Subcooling coil temperature sensor 1 |
| ZIS | 4-way valve |
| 5X1-1-2-4 | Solenoid for CM |
| 63H1-1-2 | High pressure switch (for protection) |
| 7SEG1 | 7-segment L.E.D. (function indication) |
| 7SEG2 | 7-segment L.E.D. (data indication) |

| Mark | Parts name |
|-----------|---------------------------------------|
| SW3.8 | Spare |
| SW4.5-4 | Modal setting |
| SW4.5 | Spore |
| SW4.6 | Spore |
| SW4.7 | Address setting switch (master-slave) |
| SW4.8 | Address setting switch (master-slave) |
| SW5-1 ON | Tide operation |
| SW5-2 OFF | Regular operation |
| SW5-3 ON | Tide operation mode / cooling |
| SW5-3 OFF | Tide operation mode / heating |
| SW5-3 ON | Pump down operation |
| SW5-3 OFF | Regular operation |
| SW5-4 | Spore |
| SW5-5 ON | Superlink I communication |
| SW5-5 OFF | Superlink II communication |
| SW5-6-8 | Spore |
| SW6-1-3 | Spore |
| SW6-4 ON | High Head |
| SW6-4 OFF | Standard |
| SW7 | Data clear / insert |
| SW8 | 7-segment indicate (unit's place) |
| SW8 | 7-segment indicate (tent's place) |

| Mark | Parts name |
|-----------|--|
| PSH | High pressure sensor |
| PSL | Low pressure sensor |
| PO/BI-3 | Printed wiring board (PCB) |
| RL1-2.2 | Fast current suppression resistor |
| RS.4 | Discharge resistor |
| SV1 | Solenoid valve (CM1: bypass) |
| SV2 | Solenoid valve (CM2: bypass) |
| SV6 | Solenoid valve (oil separator CM1) |
| SV7 | Solenoid valve (oil separator CM2) |
| SV11 | Solenoid valve (gas bypass) |
| SV12 | Address setting SW outdoor unit No. 1 (opt.) |
| SW3-1 ON | Auto backup operation |
| SW3-2 OFF | Regular operation |
| SW3-3 ON | Refrigerant quantity check |
| SW3-3 OFF | Regular operation |
| SW3-5 ON | Check operation |
| SW3-5 OFF | Regular operation |
| SW3-6 | Spore |
| SW3-7 ON | Forced cooling / heating |
| SW3-7 OFF | Regular operation |

| Mark | Parts name |
|------------|-------------------------------------|
| CH1.2 | Crankcase heater |
| CM1.2 | Compressor motor |
| CM1A.2 | Compressor |
| C1.2 | Current sensor |
| DM1.2 | Electrolytic capacitor |
| DM1.1.2 | Diode module |
| EE/CH1.2 | Expansion valve for heating |
| EE/SC | Expansion valve for SC |
| F | Fuse |
| FMC1.2 | Fan for IPM |
| FMC1.2 | Blower motor |
| IPM | Intelligent power module |
| J1.1.2 | Set up model (vot) |
| J1.3 | External input select level / pulse |
| J1.4 | Defrost recover temperature |
| J1.5 | Defrost start temperature |
| J1.6 | Spore |
| LED1 | Inspection (Red) |
| LED1 (INV) | Normal (Yellow - Flashing) |
| LED2 | Normal (Green) |
| LED3 | Service (green for service) |
| L1.1-2.3 | D.C. reactor |

Meaning of marks

BETWEEN INDOOR UNIT AND OUTDOOR UNIT (IF BETWEEN INDOOR AND OUTDOOR UNITS ON THE SAME REFRIGERANT LINE, BETWEEN OUTDOOR UNITS ON THE DIFFERENT REFRIGERANT LINES).



Compressor Terminal block



PCB004Z547

2.4 Noise level

Measured based on JIS B 8616

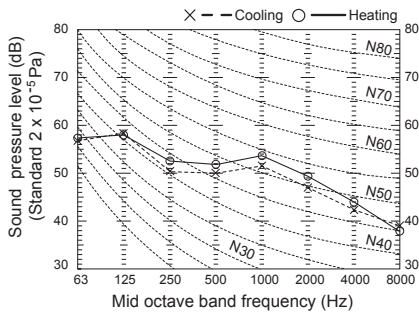
Mike position as highest noise level in position as below

Distance from front side 1m

Height 1m

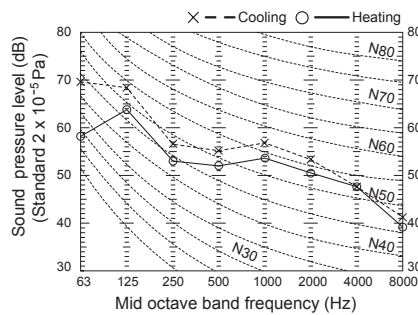
Model FDC280KXZE2M

Noise level 56 dB (A) at cooling
57 dB (A) at heating



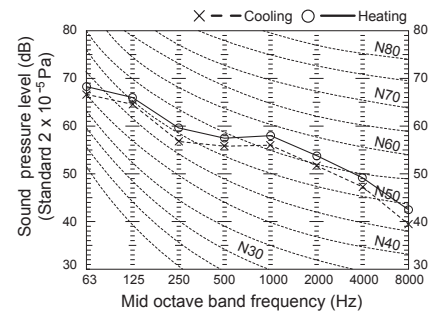
Model FDC335KXZE2M

Noise level 63 dB (A) at cooling
62 dB (A) at heating



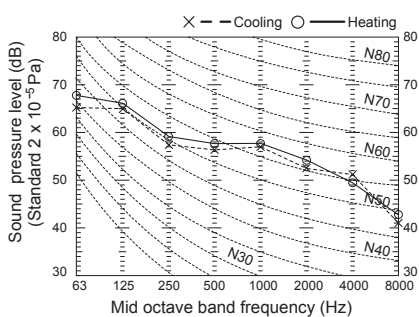
Model FDC400KXZE2M

Noise level 60 dB (A) at cooling
62 dB (A) at heating



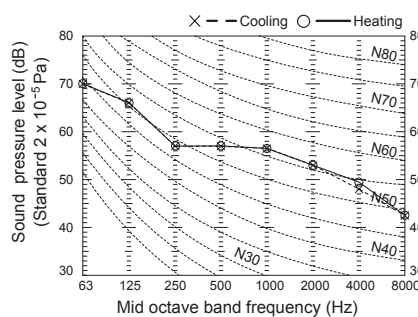
Model FDC450KXZE2M

Noise level 61 dB (A) at cooling
62 dB (A) at heating



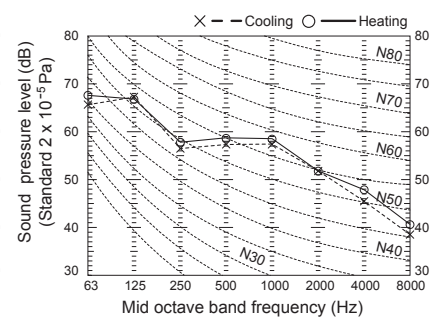
Model FDC475KXZE2M

Noise level 61 dB (A) at cooling
61 dB (A) at heating



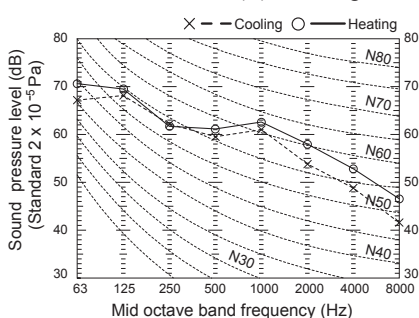
Model FDC500KXZE2M

Noise level 61 dB (A) at cooling
62 dB (A) at heating



Model FDC560KXZE2M

Noise level 63 dB (A) at cooling
64 dB (A) at heating



3. RANGE OF USAGE & LIMITATIONS

• Single use (also for combined use)

| Item | | System | FDC280KXZE2M | FDC335KXZE2M | FDC400KXZE2M |
|--|-------------------------------------|--------|---|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | |
| Outdoor air temperature (Upper, lower limits) | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 1 to 24 units | 1 to 29 units | 1 to 34 units |
| | Connectable capacity ⁽¹⁾ | | 140 - 364 | 168 - 435 | 200 - 520 |
| Total piping length ⁽²⁾ | | | 1000m or less | | |
| Main pipe length | | | 130m or less | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max. 90m or less) ^{(5),(7)} | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max. 30m or less) ⁽⁸⁾ | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity (Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F) | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | |
| | Stop time | | 3 min or more | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | |
| | Voltage drop during start | | Within -15% of rated voltage | | |
| | Phase unbalance | | Within 3% | | |

| Item | | System | FDC450KXZE2M | FDC475KXZE2M | FDC500KXZE2M | FDC560KXZE2M |
|--|-------------------------------------|--------|---|---------------|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | | |
| Outdoor air temperature (Upper, lower limits) | | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 1 to 39 units | 1 to 41 units | 1 to 43 units | 1 to 48 units |
| | Connectable capacity ⁽¹⁾ | | 225 - 585 | 238 - 617 | 250 - 650 | 280 - 728 |
| Total piping length ⁽²⁾ | | | 1000m or less | | | |
| Main pipe length | | | 130m or less | | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max. 90m or less) ^{(5),(7)} | | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max. 30m or less) ⁽⁸⁾ | | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity (Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F) | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | | |
| | Stop time | | 3 min or more | | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | | |
| | Voltage drop during start | | Within -15% of rated voltage | | | |
| | Phase unbalance | | Within 3% | | | |

Notes (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

(4) If Superlink 1 (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07-KX-KXR-T-114.). In addition to above limitations, all of new functions for KX6 and KXZ such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(5) When it is required to install in a range of 50 to 90m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

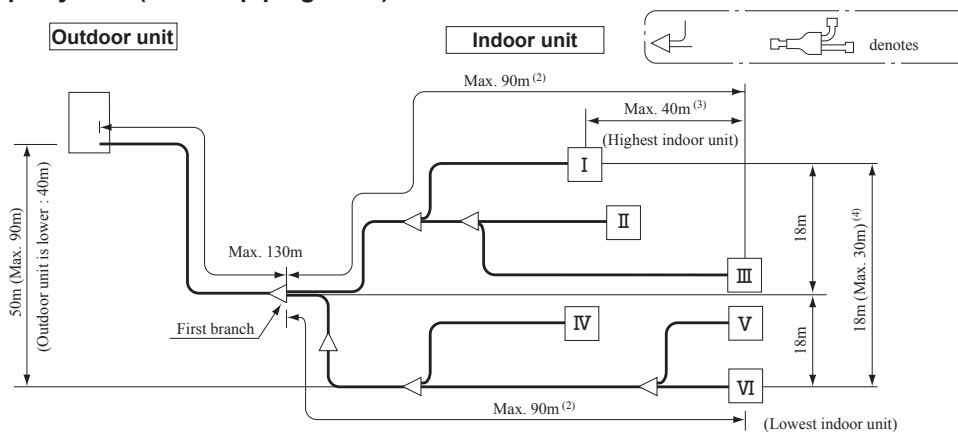
(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

(7) It must be 40m or less, when it is required to use at the outdoor air temperature higher than 43°C.

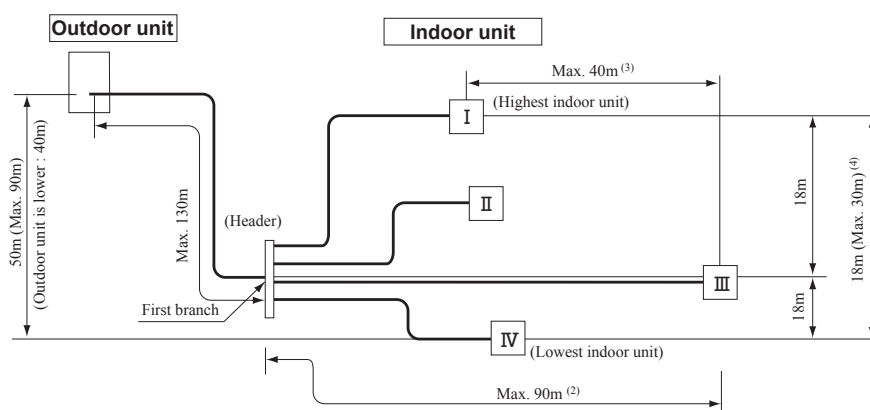
(8) If the difference in the elevation is 18 to 30m, the limitation of use, etc. are different from those described here. For details, refer to page 22.

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

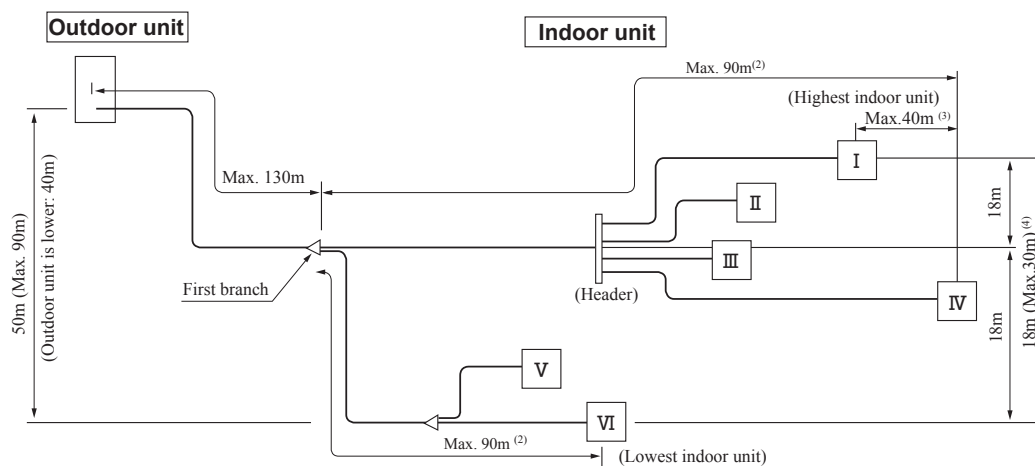
(1) Branch pipe system (Branch piping used)



(2) Header system (Header used)



(3) Mixed system (Branch piping and header used)



- Notes (1) A branch piping system cannot be connected after a header system.
 (2) 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽³⁾)
 (3) When it is required to install the difference between the longest and shortest piping more than 40m, refer to page 21.
 (4) When it is required to install the difference in the elevation 18 to 30m, refer to page 22.

Important When the additional refrigerant quantity (P+I) is over the following table, please separate the refrigerant line.

| Outdoor unit | P + I (kg) |
|--------------|------------|
| 280-670 | 40 |
| 735-1350 | 80 |
| 1425-1680 | 100 |

P: Additional refrigerant quantity for piping (kg)
 I: Additional refrigerant quantity for indoor units (kg)

● In case when the outdoor unit capacity is 475—560 and the pipe length (X,Y) is in the following conditions, please calculate the reduction refrigerant quantity (E). See page 221.

- X < 20m and Y < 10m. (X : The length from the outdoor unit to the furthest indoor unit. Y : Main pipe length.)

• Combination use

| Item | | System | FDC615KXZE2M | FDC670KXZE2M | FDC735KXZE2M | FDC800KXZE2M | FDC850KXZE2M |
|---|-------------------------------------|--------|---|---------------|---------------|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | | | |
| Outdoor air temperature (Upper, lower limits) | | | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 2 to 53 units | 2 to 58 units | 2 to 63 units | 2 to 69 units | 2 to 73 units |
| | Connectable capacity ⁽¹⁾ | | 308 - 799 | 335 - 871 | 368 - 955 | 400 - 1040 | 425 - 1105 |
| Total piping length ⁽²⁾ | | | 1000m or less | | | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | | | |
| Main pipe length | | | 130m or less | | | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max.90m or less) ^{(5),(7)} | | | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max.30m or less) ⁽⁸⁾ | | | | |
| Difference in height between outdoor units (Same system) | | | MAX. 0.4m | | | | |
| Difference between an outdoor unit and on outdoor unit side branch pipe | | | MAX. 5m | | | | |
| Length of oil equalization piping | | | MAX. 10m | | | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | | | |
| | Stop time | | 3 min or more | | | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | | | |
| | Voltage drop during start | | Within -15% of rated voltage | | | | |
| | Phase unbalance | | Within 3% | | | | |

| Item | | System | FDC900KXZE2M | FDC950KXZE2M | FDC1000KXZE2M | FDC1060KXZE2M | FDC1120KXZE2M |
|---|---------------------------|--------|---|---------------|---------------|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | | | |
| Outdoor air temperature (Upper, lower limits) | | | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 2 to 78 units | 2 to 80 units | 2 to 80 units | 2 to 80 units | 2 to 80 units |
| | Connectable capacity | | 450 - 1170 | 475 - 1235 | 500 - 1300 | 530 - 1378 | 560 - 1456 |
| Total piping length ⁽²⁾ | | | 1000m or less | | | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | | | |
| Main pipe length | | | 130m or less | | | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max.90m or less) ^{(5),(7)} | | | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max.30m or less) ⁽⁸⁾ | | | | |
| Difference in height between outdoor units (Same system) | | | MAX. 0.4m | | | | |
| Difference between an outdoor unit and on outdoor unit side branch pipe | | | MAX. 5m | | | | |
| Length of oil equalization piping | | | MAX. 10m | | | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | | | |
| | Stop time | | 3 min or more | | | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | | | |
| | Voltage drop during start | | Within -15% of rated voltage | | | | |
| | Phase unbalance | | Within 3% | | | | |

Notes (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

(4) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07-KX-KXR-T-114.). In addition to above limitations, all of new functions for KX6 and KXZ such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(5) When it is required to install in a range of 50 to 90 m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

(7) It must be 40m or less, when it is required to use at the outdoor air temperature higher than 43°C.

(8) If the difference in the elevation is 18 to 30m, the limitation of use, etc. are different from those described here. For details, refer to page 22.

| Item | | System | FDC1200KXZE2M | FDC1250KXZE2M | FDC1300KXZE2M | FDC1350KXZE2M | FDC1425KXZE2M |
|---|-------------------------------------|--------|---|---------------|---------------|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | | | |
| Outdoor air temperature (Upper, lower limits) | | | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 3 to 80 units | 3 to 80 units | 3 to 80 units | 3 to 80 units | 3 to 80 units |
| | Connectable capacity ⁽¹⁾ | | 600 – 1560 | 625 – 1625 | 650 – 1690 | 675 – 1755 | 713 – 1852 |
| Total piping length ⁽²⁾ | | | 1000m or less | | | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | | | |
| Main pipe length | | | 130m or less | | | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max.90m or less) ^{(5), (7)} | | | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max.30m or less) ⁽⁸⁾ | | | | |
| Difference in height between outdoor units (Same system) | | | MAX. 0.4m | | | | |
| Difference between an outdoor unit and on outdoor unit side branch pipe | | | MAX. 5m | | | | |
| Length of oil equalization piping | | | MAX. 10m | | | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | | | |
| | Stop time | | 3 min or more | | | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | | | |
| | Voltage drop during start | | Within -15% of rated voltage | | | | |
| | Phase unbalance | | Within 3% | | | | |

| Item | | System | FDC1450KXZE2M | FDC1500KXZE2M | FDC1560KXZE2M | FDC1620KXZE2M | FDC1680KXZE2M |
|---|---------------------------|--------|---|---------------|---------------|---------------|---------------|
| Indoor air temperature (Upper, lower limits) | | | Refer to page 19. | | | | |
| Outdoor air temperature (Upper, lower limits) | | | | | | | |
| Indoor units that can be used in combination | Number of connected units | | 3 to 80 units | 3 to 80 units | 3 to 80 units | 3 to 80 units | 3 to 80 units |
| | Connectable capacity | | 725 – 1885 | 750 – 1950 | 780 – 2028 | 810 – 2106 | 840 – 2184 |
| Total piping length ⁽²⁾ | | | 1000m or less | | | | |
| Single direction piping length | | | Actual length : 160m or less, Equivalent length : 185m or less | | | | |
| Main pipe length | | | 130m or less | | | | |
| Allowable pipe length from the first branching | | | 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽⁶⁾) | | | | |
| Elevation difference between the first branching point and the indoor unit | | | 18m or less | | | | |
| Difference in height between indoor and outdoor units | Outdoor unit is higher | | 50m or less (Max.90m or less) ^{(5), (7)} | | | | |
| | Outdoor unit is lower | | 40m or less ⁽³⁾ | | | | |
| Difference in the elevation of indoor units in a system | | | 18m or less (Max.30m or less) ⁽⁸⁾ | | | | |
| Difference in height between outdoor units (Same system) | | | MAX. 0.4m | | | | |
| Difference between an outdoor unit and on outdoor unit side branch pipe | | | MAX. 5m | | | | |
| Length of oil equalization piping | | | MAX. 10m | | | | |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT, FDTC, FDTW, FDTS, FDTQ, FDU, FDUM, FDUT, FDUH, FDU-F | | | Dew point temperature 28 °C or less, relative humidity 80% or less (FDE, FDK, FDFL, FDFU, FDFW : Dew point temperature 23 °C or less, relative humidity 80% or less) | | | | |
| Compressor stop/start frequency | 1 cycle time | | 5 min or more (from stop to stop or from start to start) | | | | |
| | Stop time | | 3 min or more | | | | |
| Power source voltage | Voltage fluctuation | | Within ±10% of rated voltage | | | | |
| | Voltage drop during start | | Within -15% of rated voltage | | | | |
| | Phase unbalance | | Within 3% | | | | |

Notes (1) When connecting the indoor unit type FDK, FDFL, FDFU or FDFW Series, limit the connectable capacity not higher than 130%.

(2) When the pipe extension length exceeds 510 m, additional refrigerant oil must be charged (1,000 cc).

(3) It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

(4) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable indoor capacity and connectable number of indoor unit but also of the piping length, operating temperature range and etc., become same as those of KX4 (See technical manual '07-KX-KXR-T-114.). In addition to above limitations, all of new functions for KX6 and KXZ such as automatic address setting function for multiple refrigerant systems and etc. will be cancelled.

(5) When it is required to install in a range of 50 to 90 m, the limitation of use, etc. are different from those described here. For details, refer to page 20.

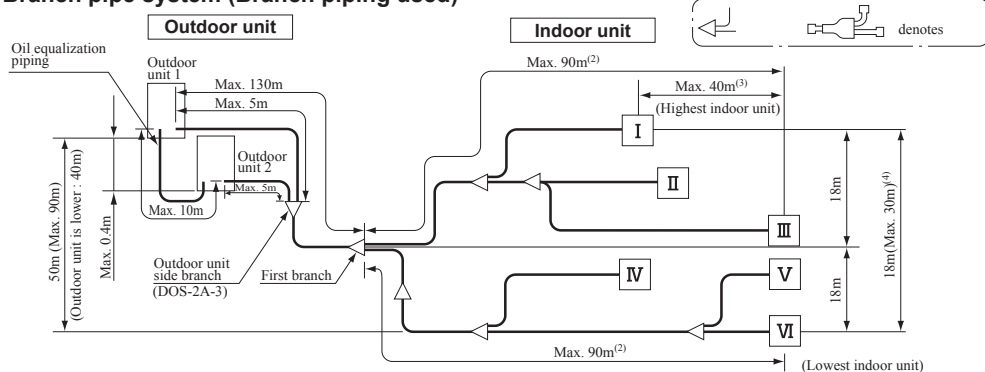
(6) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to page 21.

(7) It must be 40m or less, when it is required to use at the outdoor air temperature higher than 43°C.

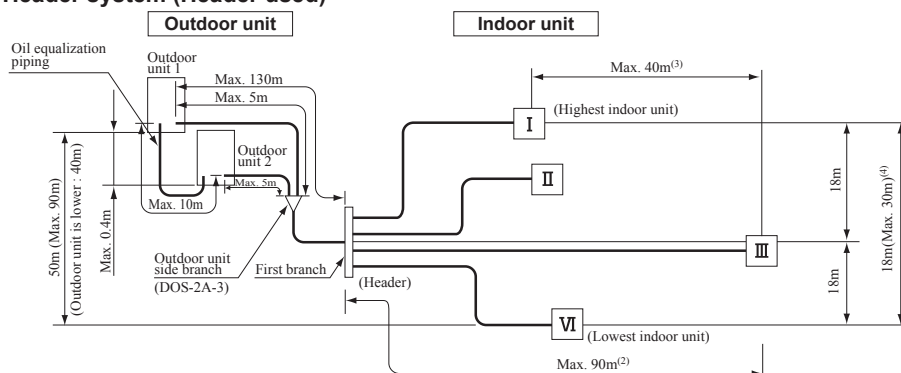
(8) If the difference in the elevation is 18 to 30m, the limitation of use, etc. are different from those described here. For details, refer to page 22.

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

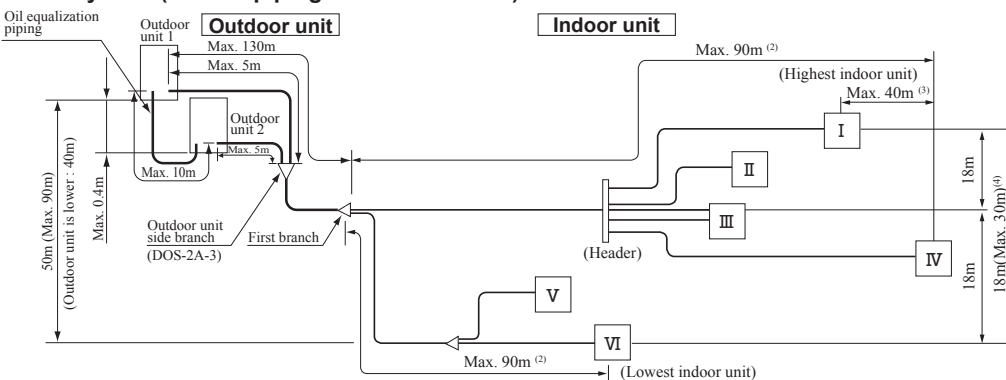
(1) Branch pipe system (Branch piping used)



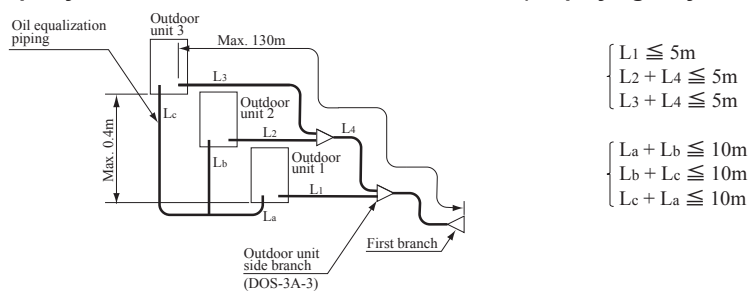
(2) Header system (Header used)



(3) Mixed system (Branch piping and header used)



(4) Pipe system for combination of 3 outdoor units (Displaying only outdoor units)



- Note (1) A branch piping system cannot be connected after a header system.
- (2) 90m or less (However, difference between the longest and shortest piping : 40m or less ⁽³⁾)
- (3) When it is required to install the difference between the longest and shortest piping more than 40m, refer to page 21.
- (4) When it is required to install the difference in the elevation 18 to 30m, refer to page 22.

Important When the additional refrigerant quantity (P+I) is over the following table, please separate the refrigerant line.

| Outdoor unit | P + I (kg) |
|--------------|------------|
| 280-670 | 40 |
| 735-1350 | 80 |
| 1425-1680 | 100 |

P: Additional refrigerant quantity for piping (kg)
I: Additional refrigerant quantity for indoor units (kg)

● In case when the outdoor unit capacity is 475—560 and the pipe length (X,Y) is in the following conditions, please calculate the reduction refrigerant quantity (E). See page 221.

• X < 20m and Y < 10m. (X : The length from the outdoor unit to the furthest indoor unit. Y : Main pipe length.)

<Pipe size selection(for normal practice)>

(1) Outdoor unit – Outdoor unit side branching pipe:

Please use a pipe conforming to the pipe size specified for outdoor unit connection.
Indoor unit connecting pipe size table

| Outdoor unit | Outdoor unit outlet pipe specifications | | | | | |
|--------------|---|-------------------|----------------|-------------------|----------------------|-------------------|
| | Gas pipe | Connection method | Liquid pipe | Connection method | Oil equalizing pipe | Connection method |
| 280 | φ 22.22 × t 1.0 | Blazed | φ 9.52 × t 0.8 | Flare | φ 9.52 × t 0.8 ※1 | Flare |
| 335 | φ 25.4 (φ 22.22) × t 1.0 | | | | | |
| 400 | φ 25.4 (φ 28.58) × t 1.0 | | | | | |
| 450 | φ 28.58 × t 1.0 | | | | | |
| 475 | | | | | | |
| 500 | | | | | | |
| 560 | | | | | | |

Pipe sizes applicable to European installations are shown in parentheses.

Please use C1220T-1/2H for φ 19.05 or larger pipes.

※1: Please connect the master and slave units with an oil equalization pipe, when they are used in a combined installation.
(It is not required, when a unit is used as a standalone installation)

When three outdoor units combination, please connect using a tee joint. (If contains in a branching pipe set for three units.)

(2) Main (Outdoor unit side branching pipe – Indoor unit side first branching pipe):

If the longest distance (measured between the outdoor unit and the farthest indoor unit) is 90m or longer (actual length), please change the main pipe size according to the table below.

| Outdoor unit | Main pipe size (normal) | | Pipe size for an actual length of 90m or longer | |
|--------------|--|-----------------|---|-----------------|
| | Gas pipe | Liquid pipe | Gas pipe | Liquid pipe |
| 280 | φ 22.22 × t 1.0 | φ 9.52 × t 0.8 | φ 25.4 (φ 22.22) × t 1.0 | φ 12.7 × t 0.8 |
| 335 | φ 25.4 (φ 22.22) × t 1.0 | φ 12.7 × t 0.8 | | |
| 400 | φ 25.4 (φ 28.58) × t 1.0 | | | |
| 450 | φ 28.58 × t 1.0 | φ 12.7 × t 0.8 | φ 31.8 × t 1.1 (φ 28.58 × t 1.0) | φ 15.88 × t 1.0 |
| 475 | | | | |
| 500 | | | | |
| 560 | | | | |
| 615 | | | | |
| 670 | | | | |
| 735 | | | | |
| 800 | φ 31.8 × t 1.1 (φ 34.92 × t 1.2) | φ 15.88 × t 1.0 | φ 19.05 × t 1.0 | |
| 850 | | | | |
| 900 | | | | |
| 950 | | | | |
| 1000 | φ 38.1 × t 1.35 (φ 34.92 × t 1.2) | φ 19.05 × t 1.0 | φ 38.1 × t 1.35 (φ 34.92 × t 1.2) | φ 22.22 × t 1.0 |
| 1060 | | | | |
| 1120 | | | | |
| 1200 | | | | |
| 1250 | | | | |
| 1300 | | | | |
| 1350 | | | | |
| 1425 | | | | |
| 1450 | | | | |
| 1500 | | | | |
| 1560 | | | | |
| 1620 | | | | |
| 1680 | | | | |

Please use C1220T-1/2H for φ 19.05 or larger pipes.

Pipe sizes applicable to European installations are shown in parentheses.

(3) Indoor unit side first branching pipe – Indoor unit side branching pipe:

Please choose from the table below an appropriate pipe size as determined by the total capacity of indoor units connected downstream, provided, however, that the pipe size for this section should not exceed the main size (Section B in Figure 1).

| Total capacity of indoor units | Gas pipe | Liquid pipe |
|--------------------------------|-------------------------------------|-----------------|
| Less than 70 | φ 12.7 × t 0.8 | φ 9.52 × t 0.8 |
| 70 or more but less than 180 | φ 15.88 × t 1.0 | |
| 180 or more but less than 371 | φ 19.05 × t 1.0 *1 | φ 12.7 × t 0.8 |
| 371 or more but less than 540 | φ 25.4 × t 1.0 (φ 28.58) | φ 15.88 × t 1.0 |
| 540 or more but less than 700 | φ 28.58 × t 1.0 | |
| 700 or more but less than 1100 | φ 31.8 × t 1.1 (φ 34.92 × t 1.2) | φ 19.05 × t 1.0 |
| 1100 or more | φ 38.1 × t 1.35 (φ 34.92 × t 1.2) | |

Please use C1220T-1/2H for φ 19.05 or larger pipes.

Pipe sizes applicable to European installations are shown in parentheses.

*1: When connecting indoor units of 280 at the downstream and the main gas pipe is of φ 22.22 or larger, use the pipe of φ 22.22 × t 1.0.

(4) Indoor unit side branching pipe – Indoor unit:

Indoor unit connection pipe size table

| Indoor unit | Capacity | Gas pipe | Liquid pipe |
|-----------------------|----------|-----------------|----------------|
| | | 15, 22, 28 | φ 9.52 × t 0.8 |
| 36, 45, 56 | | φ 12.7 × t 0.8 | |
| 71, 90, 112, 140, 160 | | φ 15.88 × t 1.0 | φ 9.52 × t 0.8 |
| 224 | | φ 19.05 × t 1.0 | |
| 280 | | φ 22.22 × t 1.0 | |

Please use C1220T-1/2H for φ 19.05 or larger pipes.

(5) Selection of pipe between outdoor branch pipes for 3-unit combination:

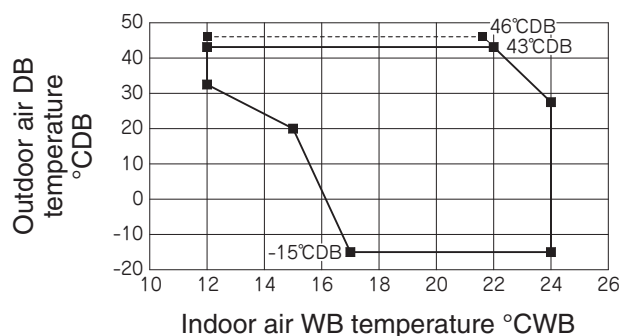
Size of pipe between outdoor branch pipes varies depending on the capacity of outdoor unit which is connected to second branch pipe in the outdoors.
Select it from the following table.

| Total capacity of outdoor units connected to second branch pipe in the outdoors | Size of pipe between branch pipes | |
|---|------------------------------------|-----------------|
| | Gas pipe | Liquid pipe |
| 580, 615, 670 | φ 28.58 × t 1.0 | φ 12.7 × t 0.8 |
| 735, 800, 850, 900, 950 | φ 31.8 × t 1.1 (φ 34.92 × t 1.2) | φ 15.88 × t 1.0 |
| 975, 1000 | φ 38.1 × t 1.34 | |
| 1060, 1120 | (φ 34.92 × t 1.2) | φ 19.05 × t 1.0 |

Use C1220T-1/2H material for φ 19.05 or larger.

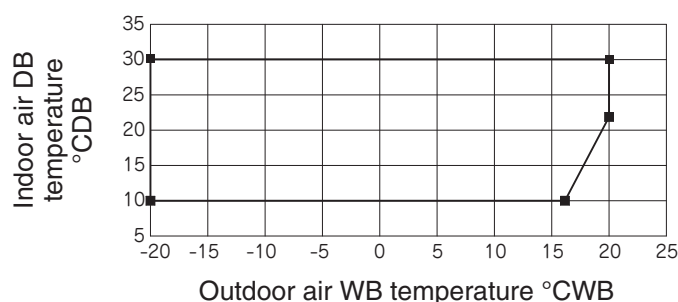
Operating temperature range

Cooling operation



*In case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43°C or more, refer to pages 8 and 9 (2.2 Exterior dimensions).

Heating operation



“CAUTION” Cooling operation under low outdoor air temperature conditions

KXZM models can be operated in cooling mode at low outdoor air temperature condition within above temperature range. However in case of severely low temperature conditions if the following precaution is not observed, it may not be operated in spite of operable temperature range mentioned above and cooling capacity may not be established under certain conditions.

[Precaution]

In case of severely low temperature condition

- 1) Install the outdoor unit at the place where strong wind cannot blow directly into the outdoor unit.
- 2) If there is no installation place where can prevent strong wind from directly blowing into the outdoor unit, prepare a windbreak fence or something like that locally in order to divert the strong wind from the outdoor unit.

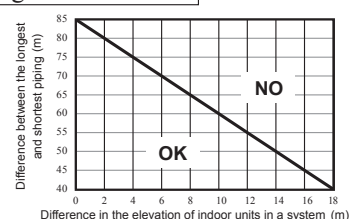
[Reason]

Under the low outdoor air temperature conditions of -5°C or lower, if strong wind directly blow into the outdoor unit, the outdoor heat exchanger temperature will drop, even though the outdoor fan is stopped by outdoor fan control. This makes high and low pressures to drop as well. This low pressure drop makes the indoor heat exchanger temperature to drop and will activate anti-frost control at indoor heat exchanger at frequent intervals, that cooling operation may not be established for any given time.

Specification for installation with the difference between the longest and shortest piping more than 40m

When the difference between the longest and shortest piping is longer than 40m, adjust the difference in the elevation of indoor units in a system such that it will fall in the OK range on the following graph. When the difference in the elevation between the indoor and the outdoor units is 50m – 90m or difference in the elevation of indoor units in a system is 18m – 30m, the difference between the longest and shortest piping cannot exceed 40m. Reduce it to less than 40m.

If the refrigerant quantity over occurs when the difference between the longest and shortest piping is longer than 40m, there is a risk that the heating capacity becomes insufficient. Take sufficient care to adjust the additional refrigerant quantity at correct value.



Specification for installation with large head difference (Applicable to: FDC280 - 1680KXZE2M)

In case when the outdoor unit is installed at a higher place and **the difference in the elevation between the indoor and the outdoor units is larger than 50m and smaller than 90m**, the limitation on application differs partially from ordinary applications and, instead, the following specification applies. The pipe size, refrigerant amount and way of switch setting become also different.

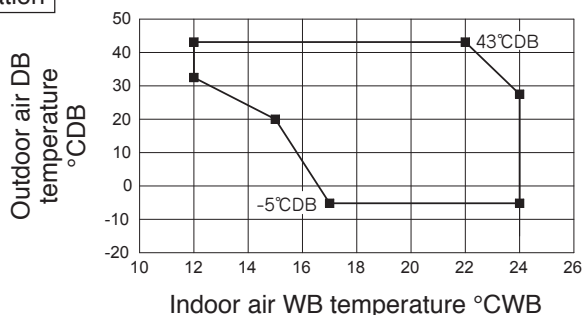
In the range of use, **the outdoor air temperature (lower limit), indoor units allowed to combine, total piping length and difference in the elevation between indoor units in the same system** are different from ordinary applications.

Table 1 Range of use

| Item | | FDC280-1680KXZE2M |
|---|--|--|
| Indoor air temperature (Upper, lower limits) | | Refer to Table 2 |
| Outdoor air temperature (Upper, lower limits) | | |
| Indoor units that can be used in combination | Number of connected units | Refer to Table 3 |
| | Connectable capacity | |
| Total piping length | | 510m or less |
| Main pipe length | | 130m or less |
| Single direction piping length | | Actual length : 160m or less, Equivalent length : 185m or less |
| Allowable pipe length from the first branching | | 90m or less (However, difference between the longest and shortest piping : 40m or less) |
| Allowable difference in the elevation | Elevation difference between the first branching point and the indoor unit | 18m or less |
| | Outdoor unit is higher | 50m or more-90m or less |
| | Outdoor unit is lower | 40m or less |
| | Difference in the elevation of indoor units in a system | 15m or less |
| Limitation on piping from outdoor unit to branching pipe at outdoor unit side | Difference in the elevation | 0.4m or less |
| | Elevation from outdoor unit to branching pipe at outdoor unit side | 5m or less |
| | Oil equalizing pipe length | 10m or less |
| | Length between outdoor branching pipes for a combination of 3 units | 5m or less |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT,FDTC,FDTW,FDTQ,FDTS,FDU,FDUM,FDUH,FDUT | | Dew point temperature 28°C or less, relative humidity 80% or less (FDT,FDK,FDL,FDU,FDW : Dew point temperature 28°C or less, relative humidity 80% or less) |
| Compressor stop/start frequency | 1 cycle time | 5 min or less (from stop to stop or from start to start) |
| | Stop time | 3 min or more |
| Power source voltage | Voltage fluctuation | Within ±10% of rated voltage |
| | Voltage drop during start | Within -15% of rated voltage |
| | Phase unbalance | Within 3% |

Table 2 Indoor air temperature/Outdoor air temperature

Cooling operation



Heating operation

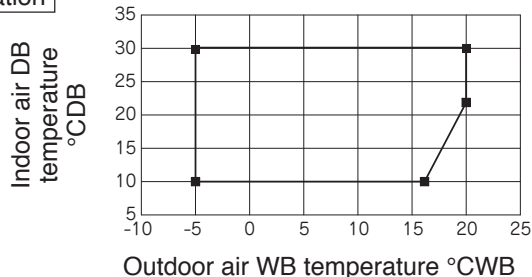


Table 3 Number of connectable indoor units and capacity range

| Model/Item | Number of connectable units | Connectable capacity |
|---------------|-----------------------------|----------------------|
| FDC280KXZE2M | 1 to 1 8 | 140 - 280 |
| FDC335KXZE2M | 1 to 2 2 | 168 - 335 |
| FDC400KXZE2M | 1 to 2 6 | 200 - 400 |
| FDC450KXZE2M | 1 to 3 0 | 225 - 450 |
| FDC475KXZE2M | 1 to 3 1 | 238 - 475 |
| FDC500KXZE2M | 1 to 3 3 | 250 - 500 |
| FDC560KXZE2M | 1 to 3 7 | 280 - 560 |
| FDC615KXZE2M | 2 to 4 1 | 308 - 615 |
| FDC670KXZE2M | 2 to 4 4 | 335 - 670 |
| FDC735KXZE2M | 2 to 4 9 | 368 - 735 |
| FDC800KXZE2M | 2 to 5 3 | 400 - 800 |
| FDC850KXZE2M | 2 to 5 6 | 425 - 850 |
| FDC900KXZE2M | 2 to 6 0 | 450 - 900 |
| FDC950KXZE2M | 2 to 6 3 | 475 - 950 |
| FDC1000KXZE2M | 2 to 6 6 | 500 - 1000 |
| FDC1060KXZE2M | 2 to 7 0 | 530 - 1060 |
| FDC1120KXZE2M | 2 to 7 4 | 560 - 1120 |
| FDC1200KXZE2M | 3 to 8 0 | 600 - 1200 |
| FDC1250KXZE2M | 3 to 8 0 | 625 - 1250 |
| FDC1300KXZE2M | 3 to 8 0 | 650 - 1300 |
| FDC1350KXZE2M | 3 to 8 0 | 675 - 1350 |
| FDC1425KXZE2M | 3 to 8 0 | 713 - 1425 |
| FDC1450KXZE2M | 3 to 8 0 | 725 - 1450 |
| FDC1500KXZE2M | 3 to 8 0 | 750 - 1500 |
| FDC1560KXZE2M | 3 to 8 0 | 780 - 1560 |
| FDC1620KXZE2M | 3 to 8 0 | 810 - 1620 |
| FDC1680KXZE2M | 3 to 8 0 | 840 - 1680 |

<Pipe size selection>

In the figure for pipe selection, sizes of main pipe and the pipe between the branch at the indoor side and the indoor unit are selected on the basis different from normal practice.

(1) Main pipe (branch of the outdoor unit – first branch at the indoor side)

Size of liquid pipe is different. Change the size of main pipe according to Table 4.

When the maximum length (from the outdoor unit to the furthest indoor unit) is larger than 90m (actual length), change the size of main pipe according to Table 4.

Table 4 Main pipe size

| Outdoor unit | Main pipe size (normal) | | Pipe size for an actual length of 90m or longer | |
|--------------|---|--|---|---------------------------|
| | Gas pipe | Liquid pipe | Gas pipe | Liquid pipe |
| 280 | $\phi 22.22 \times t 1.0$ | $\phi 12.7 \times t 0.8$ | $\phi 25.4 (\phi 22.22) \times t 1.0$ | $\phi 15.88 \times t 0.8$ |
| 335 | $\phi 25.4 (\phi 22.22) \times t 1.0$ | $\phi 15.88 \times t 1.0$ | | |
| 400 | $\phi 25.4 (\phi 28.58) \times t 1.0$ | | | |
| 450 | $\phi 28.58 \times t 1.0$ | | $\phi 28.58 \times t 1.0$ | |
| 475 | | | | |
| 500 | | | $\phi 31.8 \times t 1.1$ ($\phi 28.58 \times t 1.0$) | |
| 560 | | | | $\phi 15.88 \times t 1.0$ |
| 615 | | | | |
| 670 | | | | |
| 735 | $\phi 31.8 \times t 1.1$ ($\phi 34.92 \times t 1.2$) | | $\phi 19.05 \times t 1.0$ | |
| 800 | | | | |
| 850 | | | | |
| 900 | | | | |
| 950 | | $\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$) | | $\phi 22.22 \times t 1.0$ |
| 1000 | | | | |
| 1060 | | | | |
| 1120 | | | | |
| 1200 | | | | |
| 1250 | | | | |
| 1300 | | | | |
| 1350 | | | | |
| 1425 | | | | |
| 1450 | | | | |
| 1500 | | | | |
| 1560 | | | | |
| 1620 | | | | |
| 1680 | | | | |

(2) Between branch at the indoor side and indoor unit

Size of gas pipe for indoor unit with capacity larger than 112 is different. Change the size of pipe connected to indoor unit according to Table 5.

Table 5 Indoor unit connecting pipe size

| Indoor unit | Capacity | Gas pipe | Liquid pipe |
|---------------|----------|---------------------------------------|--------------------------|
| | | 15, 22, 28 | $\phi 9.52 \times t 0.8$ |
| 36, 45, 56 | | $\phi 12.7 \times t 0.8$ | |
| 71, 90 | | $\phi 15.88 \times t 1.0$ | $\phi 9.52 \times t 0.8$ |
| 112, 140, 160 | | $\phi 19.05 \times t 1.0$ | |
| 224 | | $\phi 22.22 \times t 1.0$ | |
| 280 | | $\phi 25.4 (\phi 28.58) \times t 1.0$ | |

(3) Refrigerant quantity

In addition to normal charge quantity for refrigerant pipes, charge quantity for the difference in capacity between the indoor and the outdoor units, and standard additional refrigerant quantity, measure and charge the additional refrigerant quantity for the installation with the difference in the elevation being over 50m and less than 90m.

Table 6 Additional refrigerant quantity for the installation with the difference in the elevation being over 50m and less than 90m

| Outdoor unit | (kg) | Outdoor unit | (kg) | Outdoor unit | (kg) | Outdoor unit | (kg) | ※High-COP combination | |
|--------------|------|--------------|------|--------------|------|--------------|------|-----------------------|------|
| 280 | 0.3 | 615 | 0.8 | 1000 | 1.6 | 1425 | 2.4 | Outdoor unit | (kg) |
| 335 | 0.5 | 670 | 1.0 | 1060 | 1.7 | 1450 | 2.4 | 560 | 0.6 |
| 400 | 0.6 | 735 | 0.9 | 1120 | 1.8 | 1500 | 2.4 | 850 | 0.9 |
| 450 | 0.7 | 800 | 1.2 | 1200 | 1.8 | 1560 | 2.5 | 900 | 1.1 |
| 475 | 0.8 | 850 | 1.3 | 1250 | 1.9 | 1600 | 2.6 | 950 | 1.3 |
| 500 | 0.8 | 900 | 1.4 | 1300 | 2.0 | 1680 | 2.7 | 1000 | 1.5 |
| 560 | 0.9 | 950 | 1.6 | 1350 | 2.1 | | | 1060 | 1.6 |
| | | | | | | | | 1120 | 1.7 |

(4) Microcomputer control

Setting of microcomputer control needs to be changed when the outdoor unit is installed upwards and the difference in elevation is larger than 50m and less than 90m. Make sure to set SW6-4 at ON position on both the master and slave units, before turning the power on.

Table 7 Setting of microcomputer control

| Elevation difference | Setting | |
|----------------------|---------|---------------|
| | SW6-4 | 7-segment F32 |
| 50m - 70m | ON | 0 |
| 70m - 90m | | 1 |

Specification for installation with large head difference between indoor units (Applicable to: FDC280 - 1680KXZE2M)

In case of **the difference in the elevation between the indoor unit in a system is larger than 18m and smaller than 30m**, the limitation on application differs partially from ordinary applications and, instead, the following specification applies.

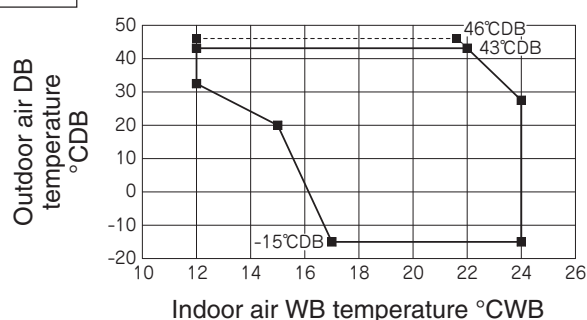
In the range of use, **indoor units allowed to combine, and allowable difference in the elevation between outdoor unit and indoor units in the same system** are different from ordinary applications.

Table 1 Range of use

| Item | | FDC280-1680KXZE2M |
|---|--|--|
| Indoor air temperature (Upper, lower limits) | | Refer to Table 2 |
| Outdoor air temperature (Upper, lower limits) | | |
| Indoor units that can be used in combination | Number of connected units | Refer to Table 3 |
| | Connectable capacity | |
| Total piping length | | 1000m or less |
| Main pipe length | | 130m or less |
| Single direction piping length | | Actual length : 160m or less, Equivalent length : 185m or less |
| Allowable pipe length from the first branching | | 90m or less (However, difference between the longest and shortest piping : 40m or less) |
| Allowable difference in the elevation | Elevation difference between the first branching point and the indoor unit | 18m to 30m |
| | Outdoor unit is higher | 50m or less |
| | Outdoor unit is lower | 40m or less |
| Difference in the elevation of indoor units in a system | | 18m to 30m |
| Limitation on piping from outdoor unit to branching pipe at outdoor unit side | Difference in the elevation | 0.4m or less |
| | Elevation from outdoor unit to branching pipe at outdoor unit side | 5m or less |
| | Oil equalizing pipe length | 10m or less |
| Length between outdoor branching pipes for a combination of 3 units | | 5m or less |
| Indoor unit atmosphere (behind ceiling) temperature and humidity Only models FDT,FDTG,FDTW,FDTQ,FDTs,FDU,FDUm,FDUH,FDUt | | Dew point temperature 28°C or less, relative humidity 80% or less (FDT,FDK,FDL,FDU,FDW : Dew point temperature 28°C or less, relative humidity 80% or less) |
| Compressor stop/start frequency | 1 cycle time | 5 min or less (from stop to stop or from start to start) |
| | Stop time | 3 min or more |
| Power source voltage | Voltage fluctuation | Within ±10% of rated voltage |
| | Voltage drop during start | Within -15% of rated voltage |
| | Phase unbalance | Within 3% |

Table 2 Indoor air temperature/Outdoor air temperature

Cooling operation



Heating operation

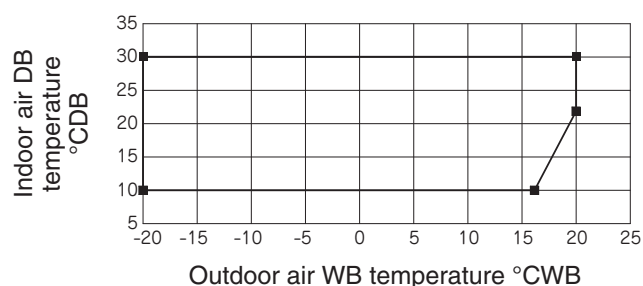


Table 3 Number of connectable indoor units and capacity range

| Model/Item | Number of connectable units | Connectable capacity |
|---------------|-----------------------------|----------------------|
| FDC280KXZE2M | 1 to 1 8 | 140 - 280 |
| FDC335KXZE2M | 1 to 2 2 | 168 - 335 |
| FDC400KXZE2M | 1 to 2 6 | 200 - 400 |
| FDC450KXZE2M | 1 to 3 0 | 225 - 450 |
| FDC475KXZE2M | 1 to 3 1 | 238 - 475 |
| FDC500KXZE2M | 1 to 3 3 | 250 - 500 |
| FDC560KXZE2M | 1 to 3 7 | 280 - 560 |
| FDC615KXZE2M | 2 to 4 1 | 308 - 615 |
| FDC670KXZE2M | 2 to 4 4 | 335 - 670 |
| FDC735KXZE2M | 2 to 4 9 | 368 - 735 |
| FDC800KXZE2M | 2 to 5 3 | 400 - 800 |
| FDC850KXZE2M | 2 to 5 6 | 425 - 850 |
| FDC900KXZE2M | 2 to 6 0 | 450 - 900 |
| FDC950KXZE2M | 2 to 6 3 | 475 - 950 |
| FDC1000KXZE2M | 2 to 6 6 | 500 - 1000 |
| FDC1060KXZE2M | 2 to 7 0 | 530 - 1060 |
| FDC1120KXZE2M | 2 to 7 4 | 560 - 1120 |
| FDC1200KXZE2M | 3 to 8 0 | 600 - 1200 |
| FDC1250KXZE2M | 3 to 8 0 | 625 - 1250 |
| FDC1300KXZE2M | 3 to 8 0 | 650 - 1300 |
| FDC1350KXZE2M | 3 to 8 0 | 675 - 1350 |
| FDC1425KXZE2M | 3 to 8 0 | 713 - 1425 |
| FDC1450KXZE2M | 3 to 8 0 | 725 - 1450 |
| FDC1500KXZE2M | 3 to 8 0 | 750 - 1500 |
| FDC1560KXZE2M | 3 to 8 0 | 780 - 1560 |
| FDC1620KXZE2M | 3 to 8 0 | 810 - 1620 |
| FDC1680KXZE2M | 3 to 8 0 | 840 - 1680 |

<Pipe size selection>

In the figure for pipe selection, sizes of the pipe between the first branch and the branch at the indoor side, and the pipe between the branch at the indoor side and the indoor unit are selected on the basis different from normal practice.

(1) The pipe between the first branch and the branch at the indoor side

Size of gas pipe is different that includes the lower indoor unit more than 18m downstream.

Change the size of pipe according to Table 4.

Table 4 Middle branch pipe size

| Total capacity of indoor units | Gas pipe | Liquid pipe |
|--------------------------------|--|--------------------------|
| less than 70 | $\phi 9.52 \times t0.8$ | $\phi 9.52 \times t0.8$ |
| more than 70 - less than 180 | $\phi 12.7 \times t0.8$ | |
| more than 180 - less than 371 | $\phi 19.05 \times t1.0$ | $\phi 12.7 \times t0.8$ |
| more than 371 - less than 540 | $\phi 25.4(\phi 28.58) \times t1.0$ | $\phi 15.88 \times t1.0$ |
| more than 540 - less than 700 | $\phi 28.58 \times t1.0$ | |
| more than 700 - less than 1100 | $\phi 31.8 \times t1.1(\phi 34.92 \times t1.2)$ | |
| more than 1100 | $\phi 38.1 \times t1.35(\phi 34.92 \times t1.2)$ | $\phi 19.05 \times t1.0$ |

(2) The pipe between the branch at the indoor side and the indoor unit

Size of gas pipe is different that includes the lower indoor unit more than 18m downstream.

Change the size of pipe according to Table 5.

Table 5 Indoor unit pipe size

| Capacity | | Gas pipe | Liquid pipe |
|-------------|-----------------------|--------------------------|-------------------------|
| Indoor unit | 22 | $\phi 6.35 \times t0.8$ | $\phi 6.35 \times t0.8$ |
| | 28 | $\phi 9.52 \times t0.8$ | |
| | 36, 45 | $\phi 9.52 \times t0.8$ | |
| | 56 | $\phi 12.7 \times t0.8$ | |
| | 71 | $\phi 12.7 \times t0.8$ | $\phi 9.52 \times t0.8$ |
| | 80, 90, 112, 140, 160 | $\phi 15.88 \times t1.0$ | |
| | 224 | $\phi 19.05 \times t1.0$ | |
| | 280 | $\phi 22.22 \times t1.0$ | |

(3) Microcomputer control

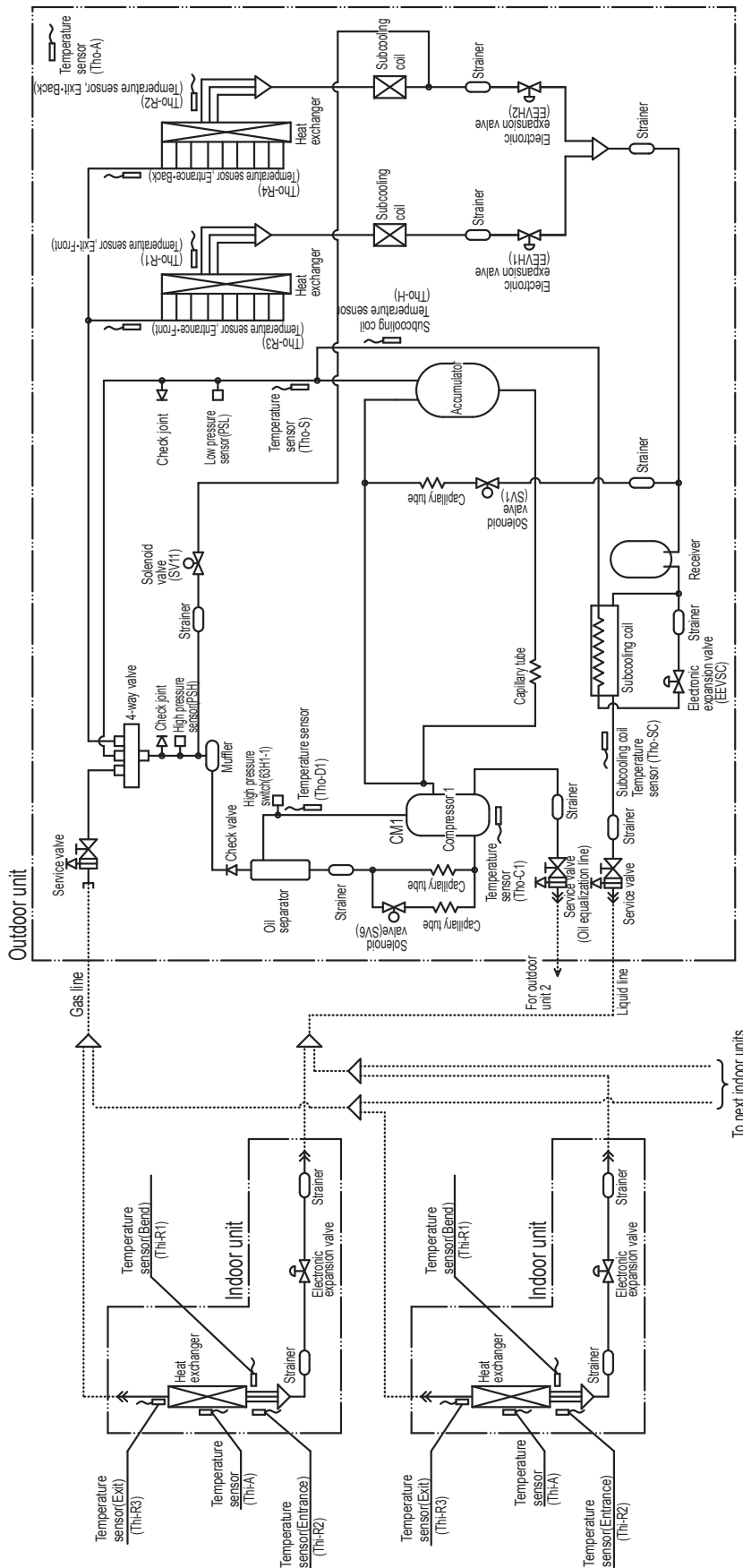
Setting of microcomputer control needs to be changed when the indoor unit is installed and the difference in elevation is larger than 18m and less than 30m.

Table 6 Setting of microcomputer control

| Elevation difference | Setting |
|----------------------|---------------|
| | 7-segment F33 |
| 0m - 18m | 0 |
| 18m - 30m | 1 |

4. PIPING SYSTEM

Models FDC280KXZE2M, 335KXZE2M



Notes (1) Preset point of protective devices

63H1-1 : Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of temperature sensor

PSH : For compressor control
3.70 ON (MPa)

PSL : ON 0.18MPa, OFF 0.20MPa
(For compressor control)

ON 0.134MPa, OFF 0.18MPa
(For protection)

Tho-R1, R2 : Heating operation : Indoor fan control

Cooling operation : Frost prevention control
Superheat control

Tho-R3 : For superheat control of cooling operation

Tho-D : For control of discharge pipe temperature

Tho-C : For control of under-dome temperature

Tho-S : For control of suction pipe temperature

Tho-R1, R2 : For control of defrost operation

Tho-A : For control of defrost operation

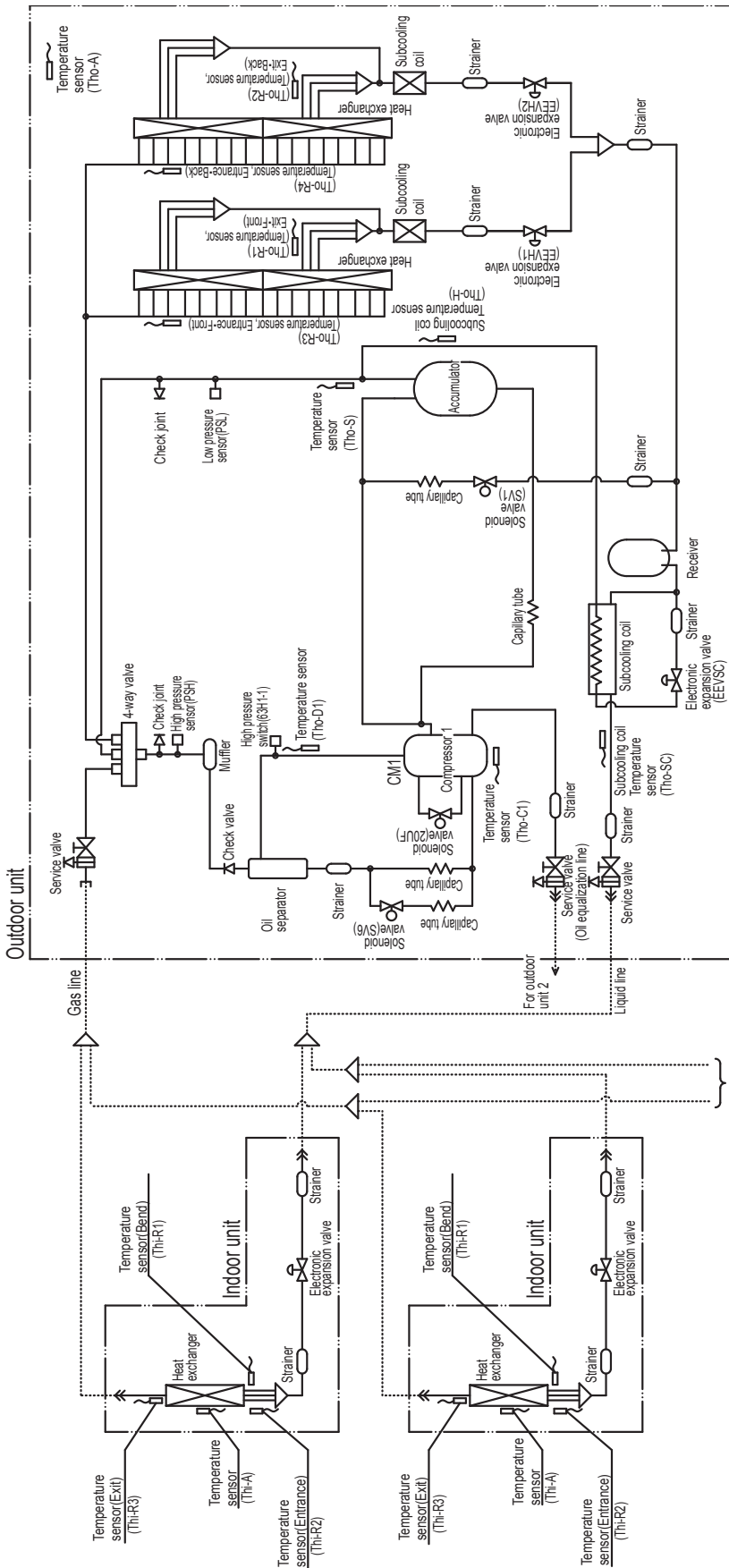
Tho-R3, R4 : Electronic expansion valve (EEVH1, 2) control of heating operation

Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation

Tho-H : For superheat control of subcooling coil

PCB004Z548

Models FDC400KXZE2M, 450KXZE2M



Notes (1) Preset point of protective devices

63HI-1 : Open 4.15MPa, Close 3.15MPa

(For protection)

(2) Function of temperature sensor

PSH : For compressor control

3.70 ON (MPa)

PSL : ON 0.18MPa, OFF 0.20MPa

(For compressor control)

ON 0.134MPa, OFF 0.18MPa

(For protection)

Tho-R1, R2 : Heating operation : Indoor fan control

Tho-R3 : Superheat control

Tho-D : For superheat control of cooling operation

Tho-C : For control of discharge pipe temperature

Tho-S : For control of under-dome temperature

Tho-R1, R2 : For control of suction pipe temperature

Tho-A : For control of defrost operation

Tho-R3, R4 : For control of defrost operation

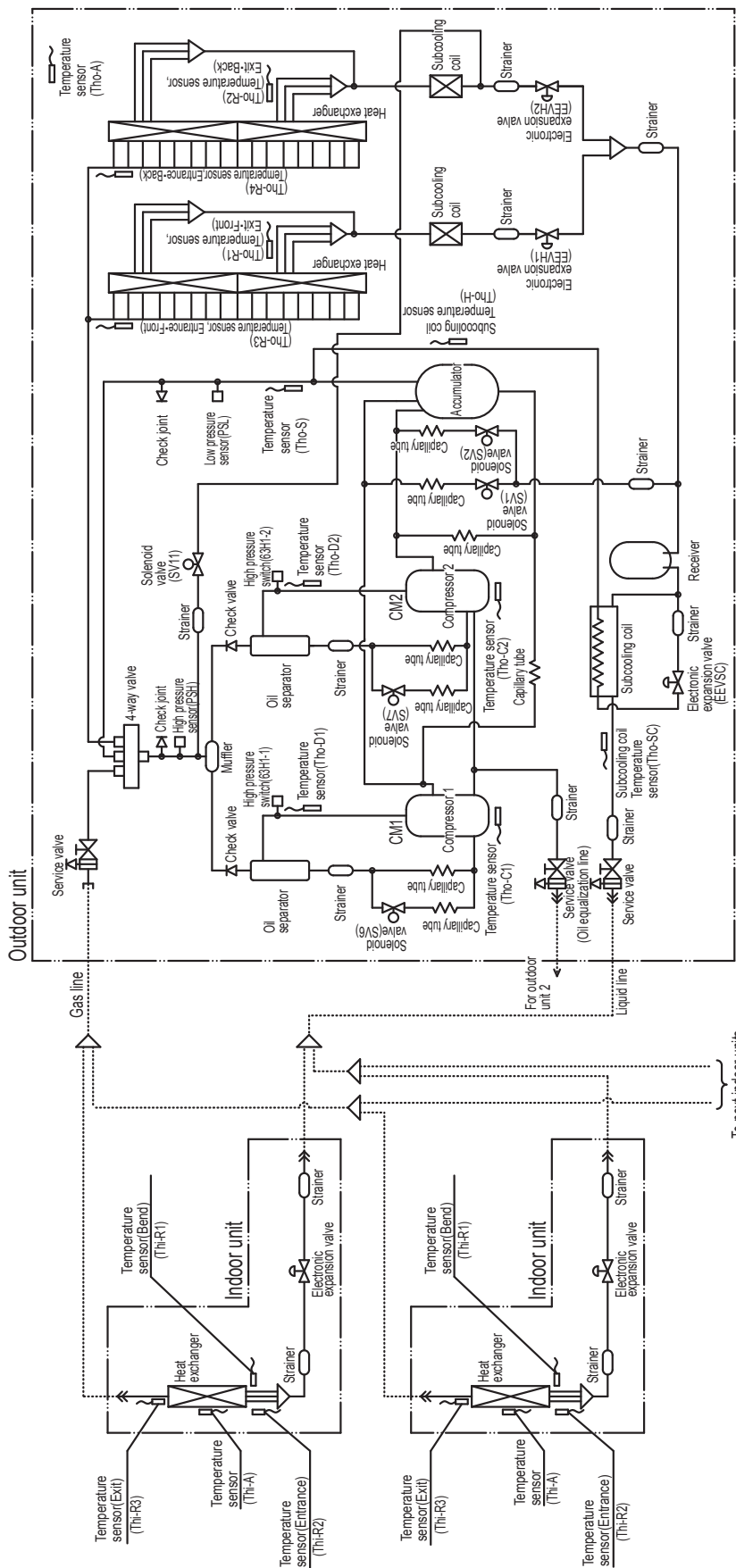
Tho-SC : Electronic expansion valve (EEVH1, 2) control of heating operation

Tho-H : Electronic expansion valve (EEVSC) control of cooling operation

Tho-H : For superheat control of subcooling coil

PCB004Z549

Models FDC475KXZE2M, 500KXZE2M, 560KXZE2M

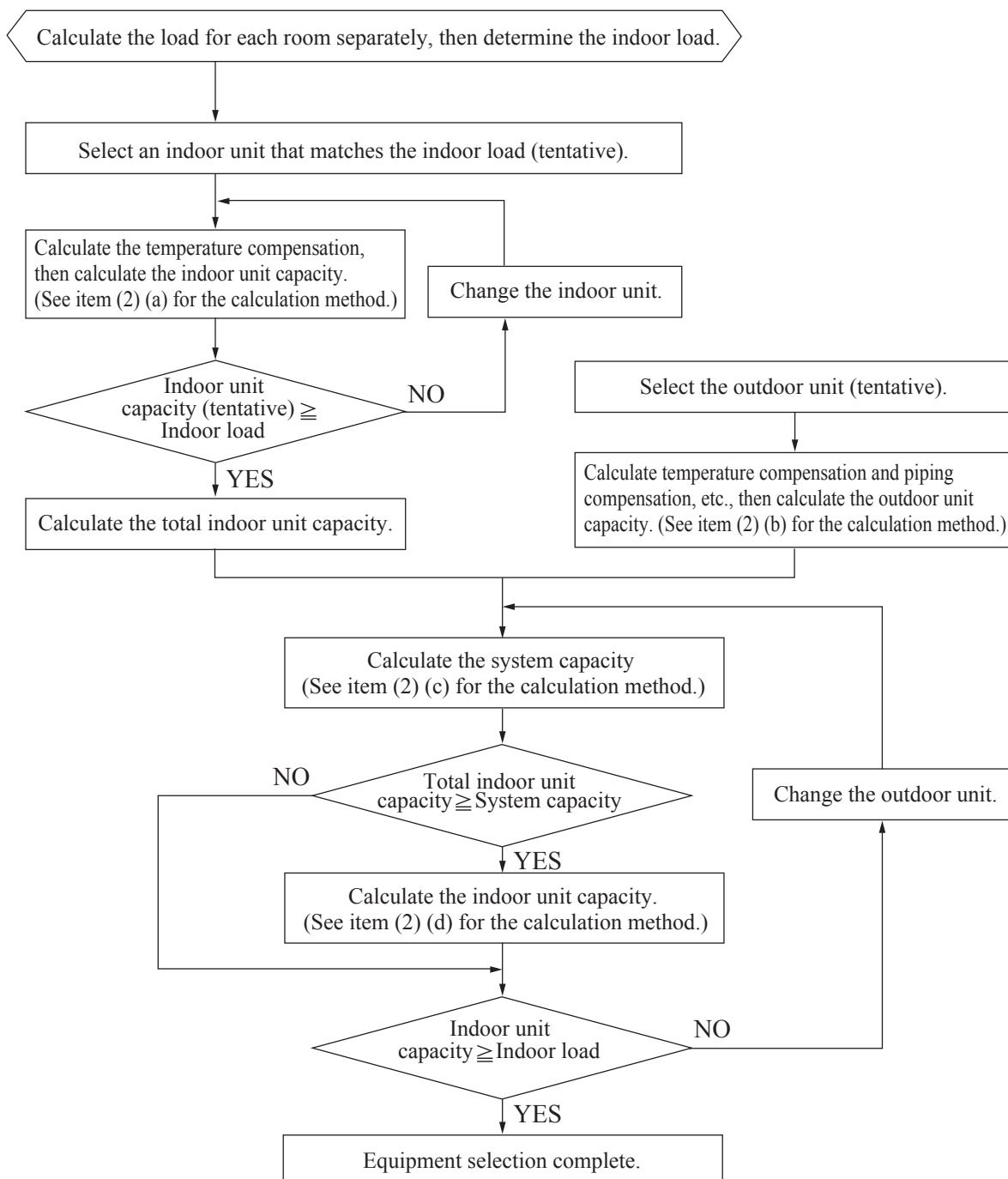


- Notes (1) Preset point of protective devices
 63HI-1, 2 : Open 4.15MPa, Close 3.15MPa
 (For protection)
- (2) Function of temperature sensor
 PSH : For compressor control
 3.70 ON (MPa)
 PSL : ON 0.18MPa, OFF 0.20MPa
 (For compressor control)
 ON 0.134MPa, OFF 0.18MPa
 (For protection)
- Thi-R1, R2 : Heating operation : Indoor fan control
 Cooling operation : Frost prevention control
 Superheat control
- Thi-R3 : For superheat control of cooling operation
 Tho-D1, D2 : For control of discharge pipe temperature
 Tho-C1, C2 : For control of under-dome temperature
 Tho-S : For control of suction pipe temperature
 Tho-R1, R2 : For control of defrost operation
 Tho-A : For control of defrost operation
 Tho-R3, R4 : Electronic expansion valve (EEVH1, 2) control of heating operation
 Tho-SC : Electronic expansion valve (EEVSC) control of cooling operation
 Tho-H : For superheat control of subcooling coil

PCB004Z550

5. SELECTION CHART

(1) Equipment selection flow



(2) Capacity calculation method

(a) Calculating the indoor unit capacity compensation

Indoor unit capacity (cooling, heating) = Indoor unit total rated capacity

× Capacity compensation coefficient according to temperature conditions

See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

(b) Calculating the outdoor unit capacity compensation

Outdoor unit capacity (cooling, heating) = Outdoor unit rated capacity (rated capacity when 100% connected)

× Capacity compensation coefficient according to temperature conditions

× Capacity compensation coefficient according to piping length

× Capacity compensation coefficient according to height difference

- × Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger
- × Capacity compensation coefficient according to indoor unit connection capacity
- × Correction of cooling capacity in relation to the anti-frost on the indoor unit heat exchanger

- ① See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.
- ② See item (3) (b) concerning the capacity compensation coefficient according to piping length.
- ③ See item (3) (c) concerning the capacity compensation coefficient according to height difference. This compensation should be carried out only in cases where the outdoor unit is lower during cooling and higher during heating.
- ④ See item (3) (d) correction of heating capacity in relation to the frost on the outdoor unit heat exchanger. This compensation should be carried out only when calculating the heating capacity.
- ⑤ See item (3) (e) concerning the capacity compensation coefficient according to indoor unit connected capacity. This compensation should be carried out only in cases where the indoor unit total capacity is 100% or higher.
- ⑥ See item (3) (f) correction of cooling capacity in relation to the anti-frost on the indoor unit heat exchanger. This compensation should be carried out only when calculating the cooling capacity.

(c) Calculating system capacity

Compare the capacities determined in items (a) and (b) above and let the smaller value be the system capacity (cooling, heating).

- ① In cases where indoor unit total capacity (cooling, heating) > outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Outdoor unit capacity (cooling, heating)
- ② In cases where indoor unit total capacity (cooling, heating) < outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Indoor unit capacity (cooling, heating)

(d) Calculating indoor unit capacity [item (c) ① only]

Indoor unit capacity (cooling, heating) = System capacity (cooling, heating)
× [(Indoor unit capacity) / (Indoor unit total capacity)]

Capacity calculation examples

Example 1

Cooling (when the indoor unit connected total capacity is less than 100%)

- Outdoor unit FDC450KXZE2M 1 unit
- Indoor unit FDT56KXZE1 7 units, All fan tap: P-Hi
- Piping length 60m (Equivalent length)
- Indoor, outdoor unit height difference 15m (Outdoor unit is lower.)
- Temperature conditions Outdoor temperature: 33°C DB
- Temperature conditions Indoor temperature: 19°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation

- Indoor unit rated cooling capacity: 5.6 kW
- Capacity compensation coefficient according to temperature conditions:
1.02 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB); (See page 30.)
Indoor unit cooling capacity: 5.6 kW × 1.02 = 5.7 kW
- Indoor unit total cooling capacity calculation;
indoor unit total cooling capacity: 5.7 kW × 7 units = 39.9 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- Outdoor unit rated cooling capacity: 45.0 kW
- Capacity compensation coefficient according to temperature conditions:
1.02 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB); (See page 30.)
Outdoor unit cooling capacity: 45.0 kW × 1.02 = 45.9 kW
- Capacity compensation coefficient according to piping length: 0.94 (calculated according to 60m length); (See page 32.)
45.9 kW × 0.94 = 43.1 kW
- Correction of cooling capacity in relation to the anti-frost: 1.0 (calculated according to outdoor 33°C DB, Total capacity of concurrently operating indoor unit: (56 × 7) / 450 = 87%); (See page 50.)
Outdoor unit cooling capacity: 43.1 kW × 1.0 = 43.1 kW
- Capacity compensation coefficient according to height difference: 0.97 (calculated according to 15m difference); (See page 36.)
43.1 kW × 0.97 = 41.8 kW
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (56 × 7) / 450 < 100%)
No compensation

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

- Indoor unit total cooling capacity: 39.9 kW
 - Outdoor unit maximum cooling capacity: 41.8 kW
- ⇒ System cooling capacity: 39.9 kW

<Indoor unit capacity compensation> No compensation (5.7 kW)**Example 2****Cooling (when the indoor unit connected total capacity is 100% or higher)**

- Outdoor unit FDC450KXZE2M 1 unit
- Indoor unit FDT56KXZE1 10 units, All fan tap: P-Hi
- Piping length 60m (Equivalent length)
- Indoor, outdoor unit height difference 15m (Outdoor unit is higher.)
- Temperature conditions Outdoor temperature: 35°C DB
- Temperature conditions Indoor temperature: 18°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation

- Indoor unit rated cooling capacity: 5.6 kW
- Capacity compensation coefficient according to temperature conditions:
0.95 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB); (See page 30.)
- Indoor unit cooling capacity: 5.6 kW × 0.95 = 5.3 kW
- Indoor unit total cooling capacity calculation;
indoor unit total cooling capacity: 5.3 kW × 10 units = 53.0 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- Outdoor unit rated cooling capacity: 45.0 kW
- Capacity compensation coefficient according to temperature conditions:
0.95 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB); (See page 30.)
- Outdoor unit cooling capacity: 45.0 kW × 0.95 = 42.8 kW
- Capacity compensation coefficient according to piping length: 0.94 (calculated according to 60m length); (See page 32.)
42.8 kW × 0.94 = 40.2 kW
- Collection of cooling capacity in relation to the anti-frost: 1.0 (calculated according to outdoor 35°C DB, Total capacity of concurrently operating indoor unit: (56 × 10) / 450 = 124%); (See page 50.)
40.2 kW × 1.0 = 40.2 kW
- Capacity compensation coefficient according to height difference: 1.0 (the outdoor unit is higher during cooling)
No compensation
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.04 ← (56 × 10) / 450 = 124%); (See page 38.)
40.2 kW × 1.04 = 41.8 kW

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

- Indoor unit total cooling capacity : 53.0 kW
 - Outdoor unit maximum cooling capacity : 41.8 kW
- ⇒ System cooling capacity: 41.8 kW

<Indoor unit cooling capacity compensation>: Item (2) (d) calculation

$$\frac{41.8 \text{ kW} \times 5.3 \text{ kW}}{53.0 \text{ kW}} = 4.2 \text{ kW}$$

Example 3**Heating (when the indoor unit connected total capacity is 100% or higher)**

- Outdoor unit FDC450KXZE2M 1 unit
- Indoor unit FDT56KXZE1 10 units
- Piping length 60m (Equivalent length)
- Indoor, outdoor unit height difference 20m (Outdoor unit is higher.)
- Temperature conditions Outdoor temperature: 6°C WB
- Temperature conditions Indoor temperature: 19°C DB

<Indoor unit total heating capacity>: Item (2) (a) calculation

- Indoor unit rated heating capacity: 6.3 kW
- Capacity compensation coefficient according to temperature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 31.)
- Indoor unit heating capacity: 6.3 kW × 1.04 = 6.6 kW
- Indoor unit total heating capacity calculation;
indoor unit total heating capacity: 6.6 kW × 10 units = 66.0 kW

<Outdoor unit maximum heating capacity> : Item (2) (b) calculation

- Outdoor unit rated heating capacity: 50.0 kW
- Capacity compensation coefficient according to temperature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 31.)
Outdoor unit heating capacity: 50.0 kW × 1.04 = 52.0 kW
- Capacity compensation coefficient according to piping length: 0.982 (calculated according to 60m length); (See page 35.)
52.0 kW × 0.982 = 51.0 kW
- Capacity compensation coefficient according to height difference: 0.96 (calculated according to 20m difference); (See page 36.)
51.0 kW × 0.96 = 49.0 kW
- Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger:
1.0 (calculated according to 6°C WB); (See page 36.)
49.0 kW × 1.0 = 49.0 kW.
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (56 × 10) / 450 = 124%; (See page 38.)
49.0 kW × 1.0 = 49.0 kW.

<System heating capacity> : Item (2) (c) calculation

Compare the indoor unit total heating capacity and the outdoor unit maximum heating capacity. The smaller value is the actual system heating capacity.

- Indoor unit total heating capacity : 66.0 kW ⇒ System heating capacity: 49.0 kW
- Outdoor unit maximum heating capacity : 49.0 kW

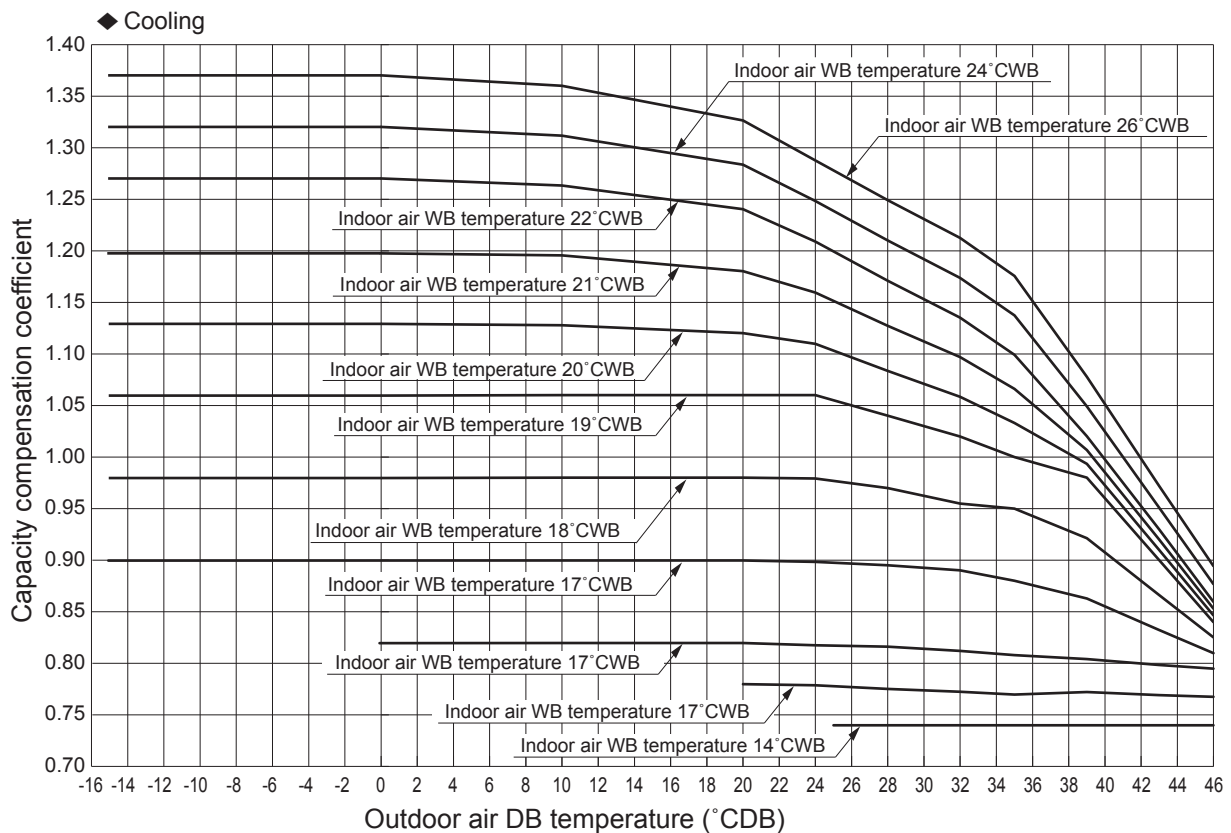
<Indoor unit heating capacity compensation> : Item (2) (d) calculation

$$\frac{49.0 \text{ kW} \times 6.6 \text{ kW}}{66.0 \text{ kW}} = 4.9 \text{ kW}$$

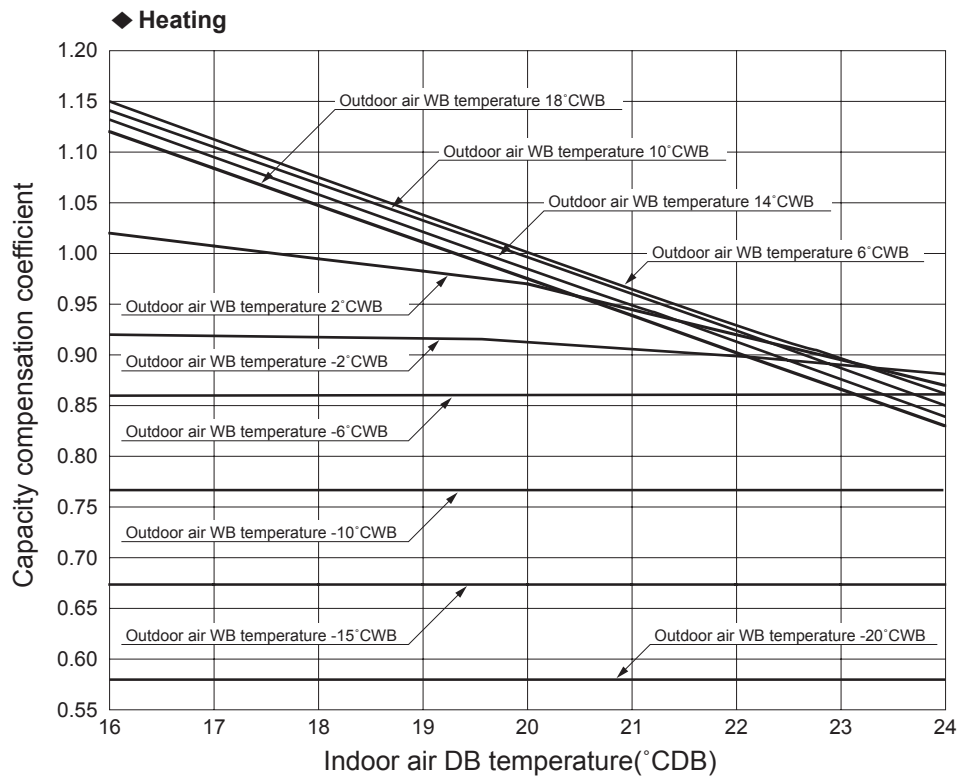
(3) Capacity compensation coefficient

(a) Capacity compensation coefficient and power consumption compensation coefficient according to indoor and outdoor temperature conditions

(i) Capacity compensation coefficient

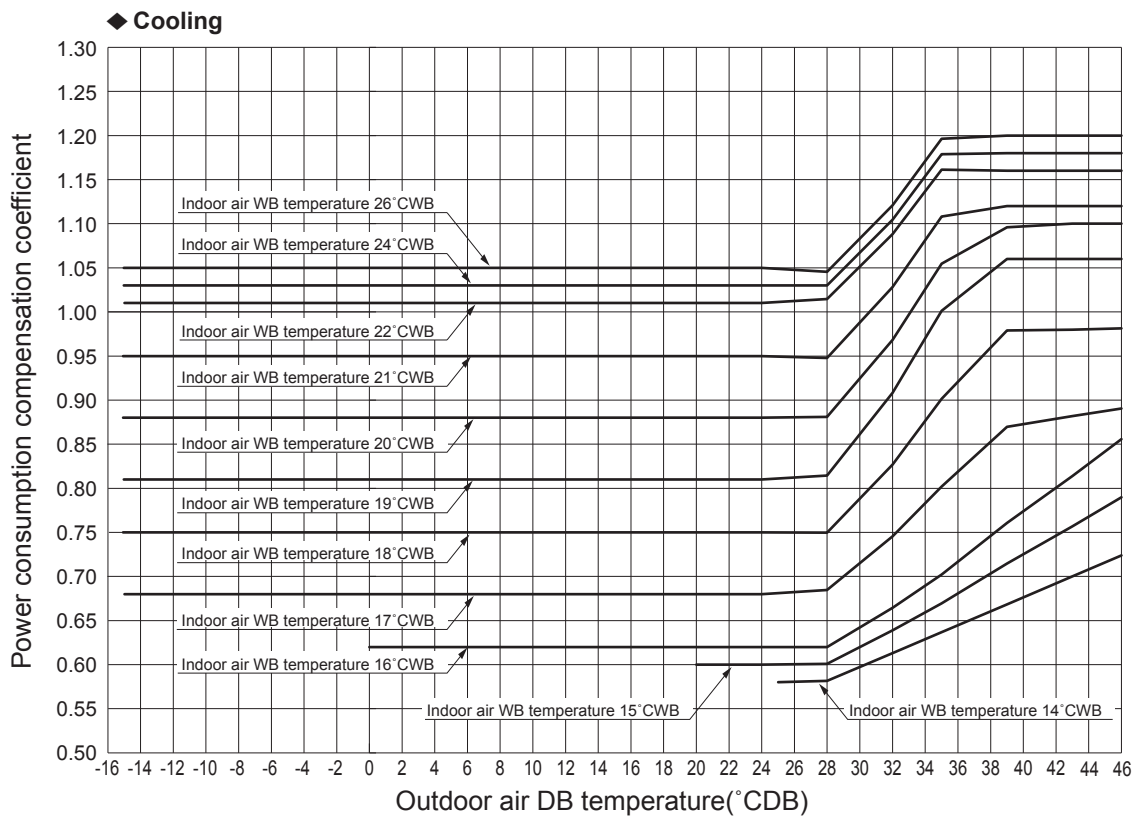


- Notes (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.
 (2) When performing the cooling operation with the outdoor air temperature being -5°C or under, a windbreak fence must be installed.
 (3) The cooling capacity may decrease by frequent actuation of anti-frost control in low outdoor temperature. Please avoid using the air-conditioners for computer rooms or industrial uses which require annual cooling operation.

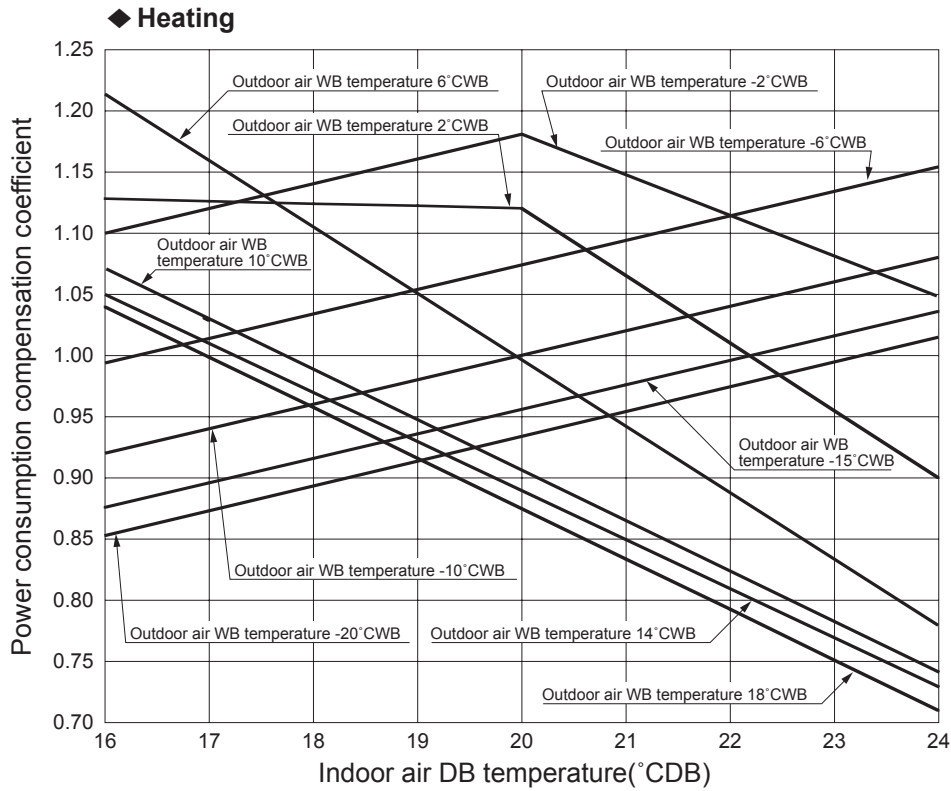


Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

(ii) Power consumption correction factor



Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

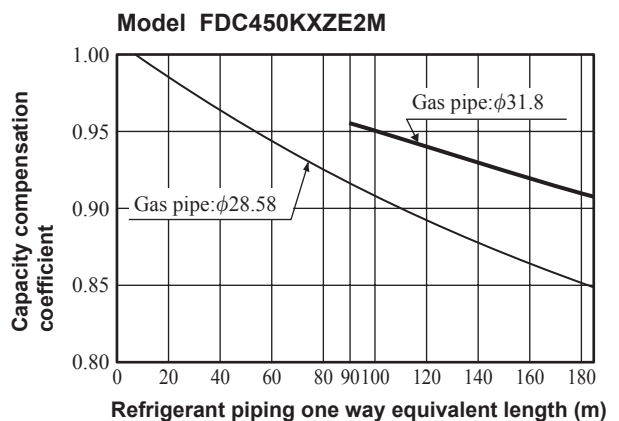
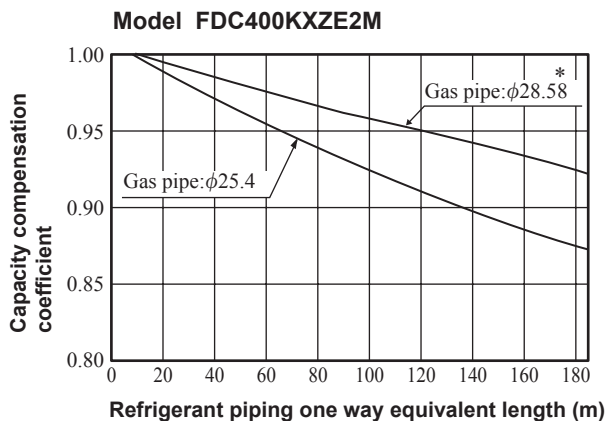
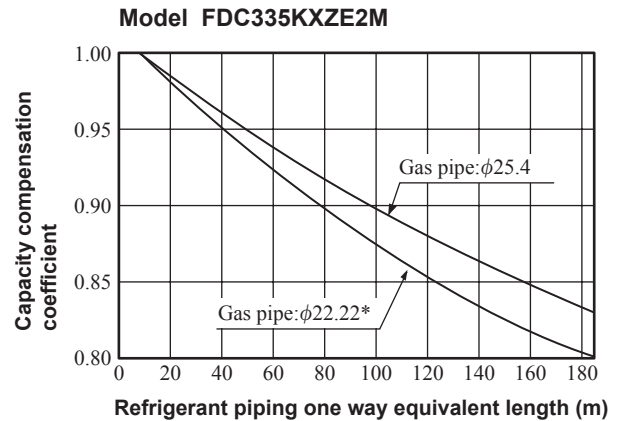
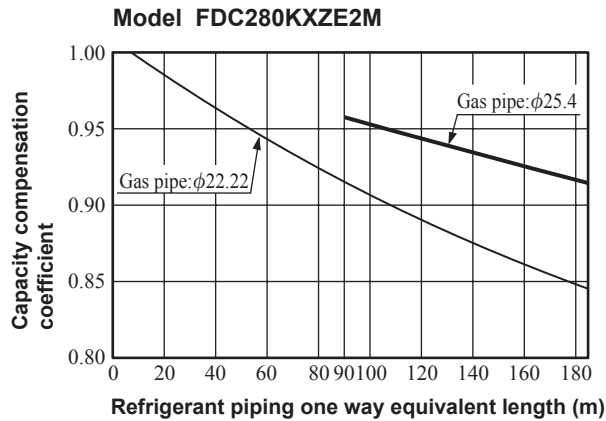


Note (1) The above-mentioned table shows a typical condition among conditions to occur via controlling an air-conditioning equipment.

(b) Correction of cooling and heating capacity in relation to one way length of refrigerant piping

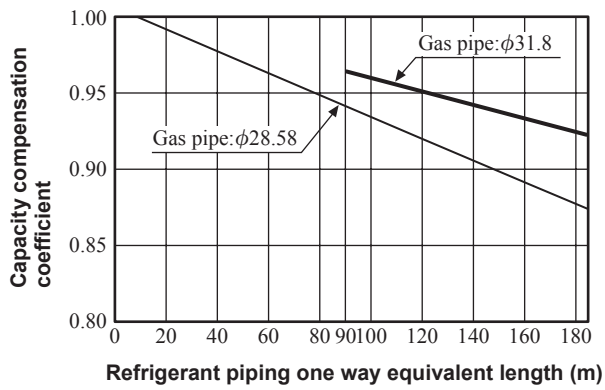
(Note) This table is for reference only. If the refrigerant piping one way equivalent after the first branch is extended longer than 40m, it could drop further by about 10% in the worst case.

(i) Cooling

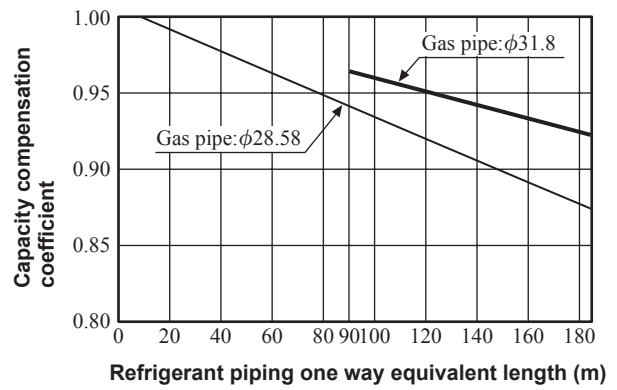


Note (1) Parts with the * mark show the alternative piping size.

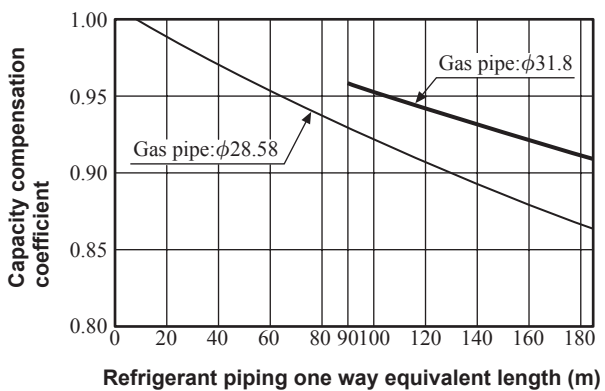
Model FDC475KXZE2M



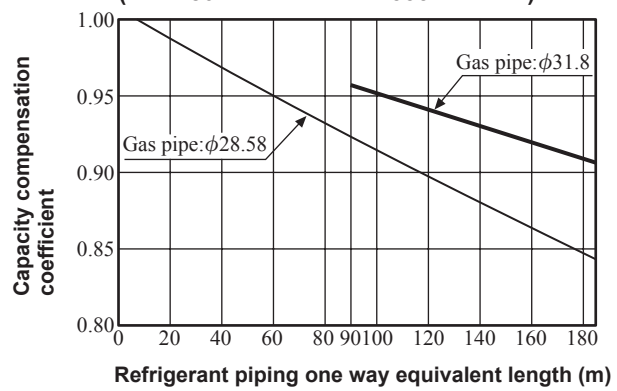
Model FDC500KXZE2M



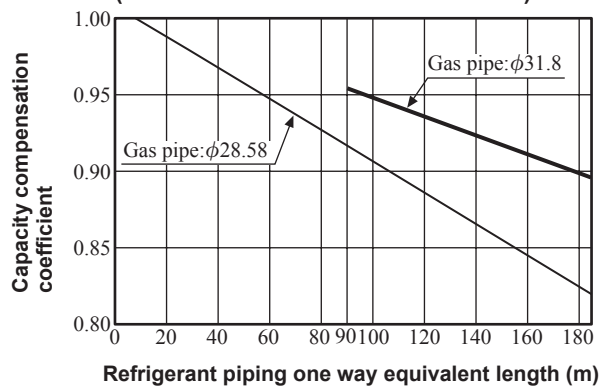
Model FDC560KXZE2M



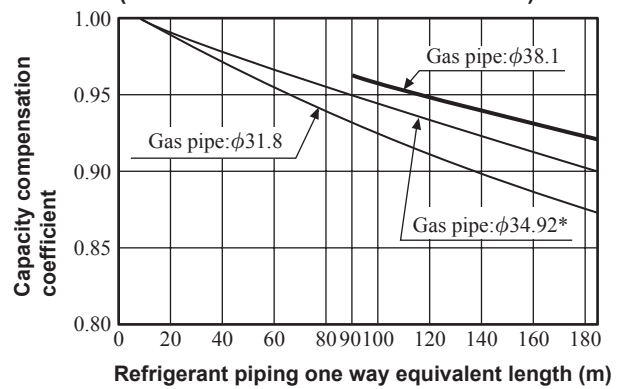
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(FDC280KXZE2M + FDC335KXZE2M)**



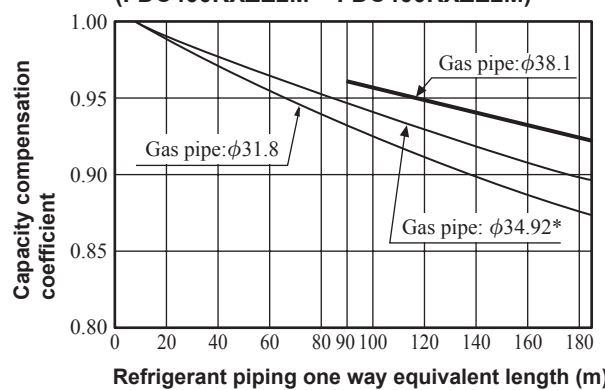
**Model FDC670KXZE2M
(FDC335KXZE2M + FDC335KXZE2M)**



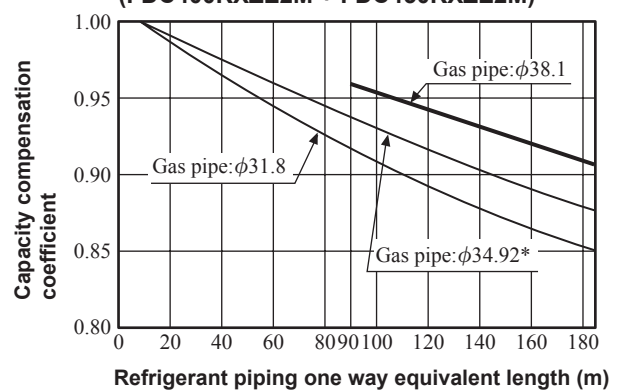
**Model FDC735KXZE2M
(FDC335KXZE2M + FDC400KXZE2M)**



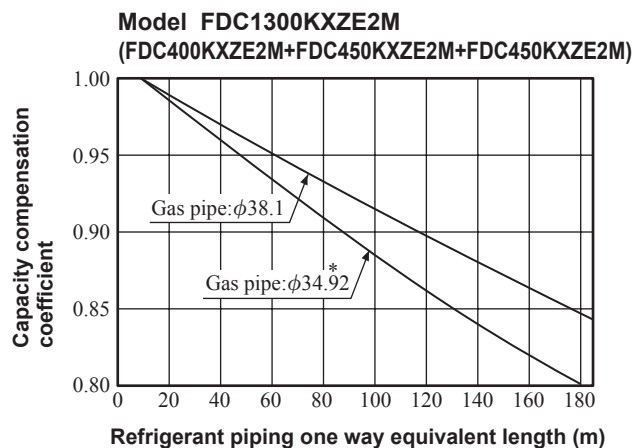
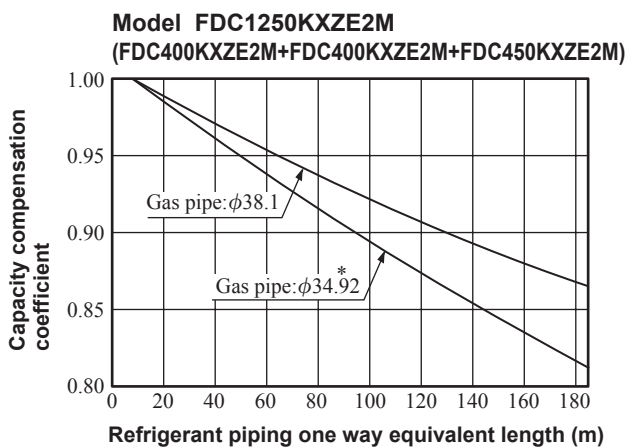
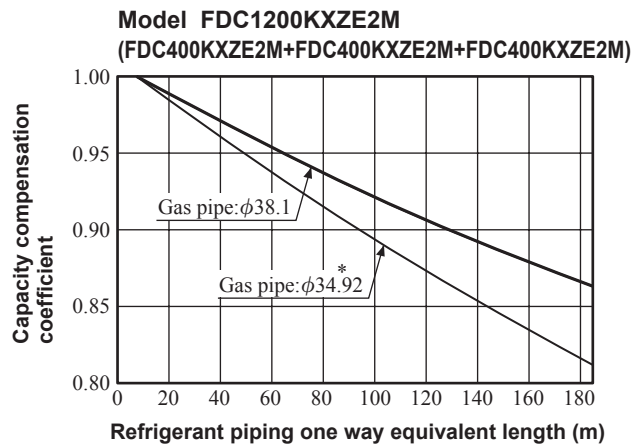
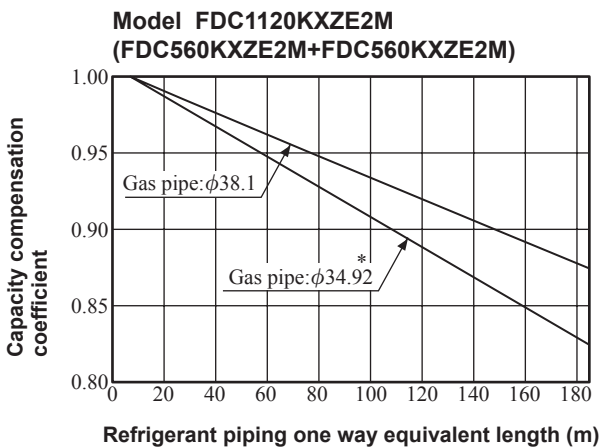
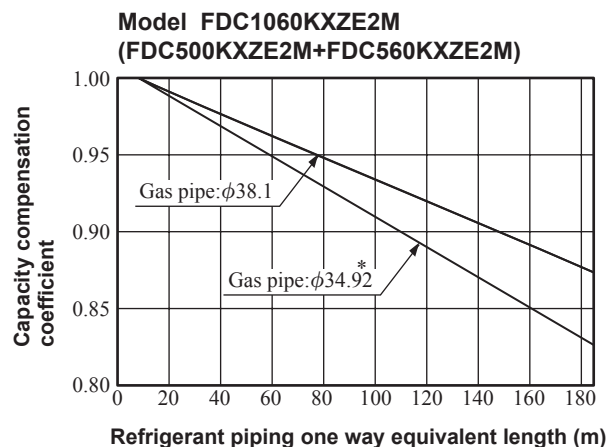
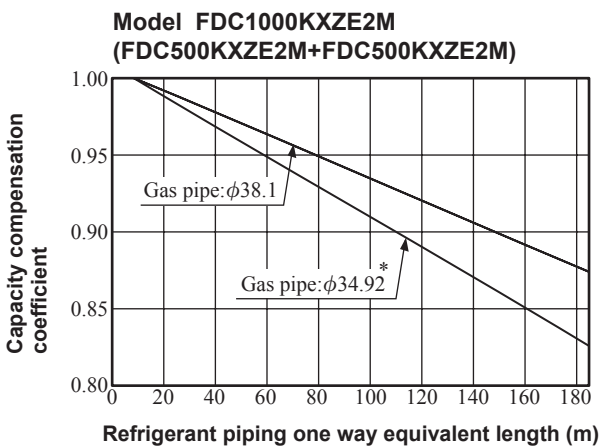
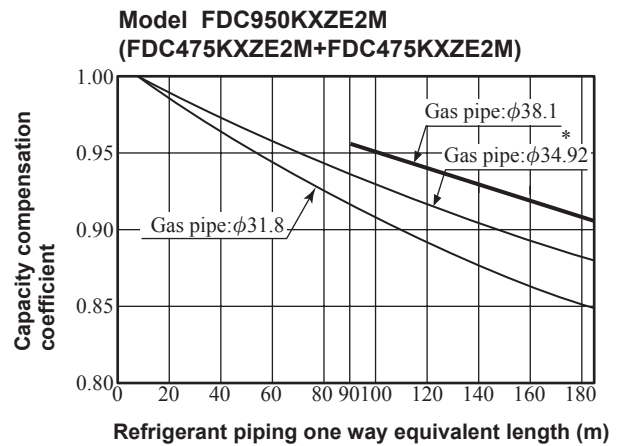
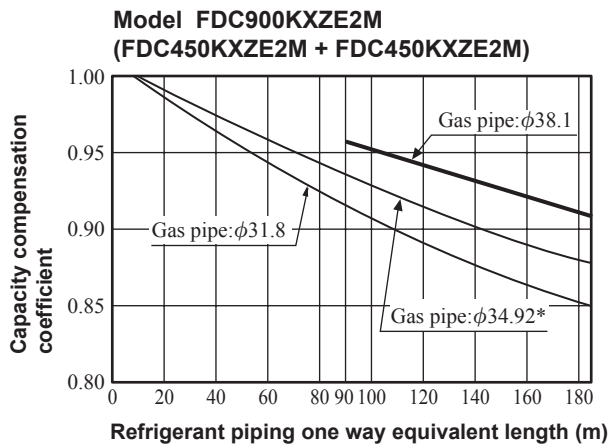
**Model FDC800KXZE2M
(FDC400KXZE2M + FDC400KXZE2M)**



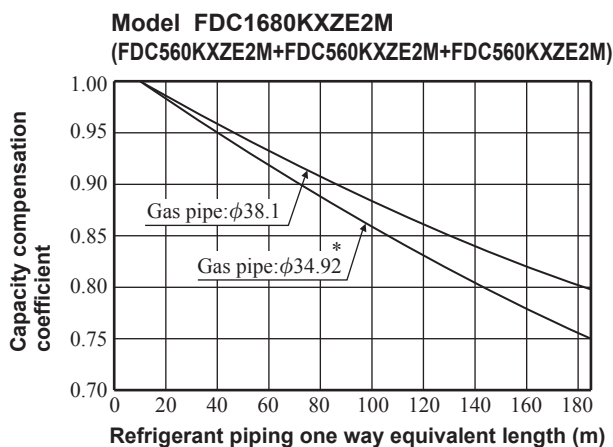
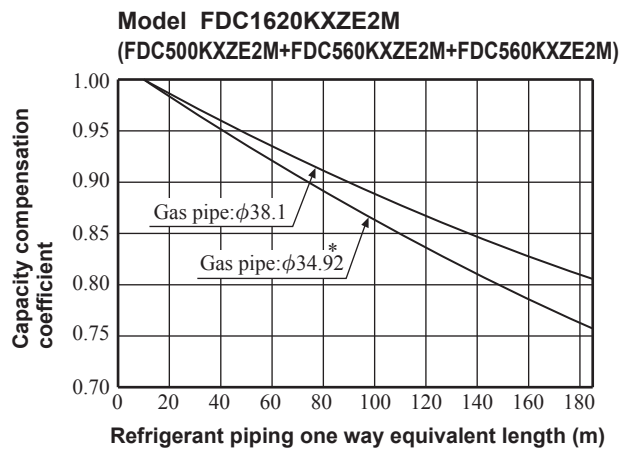
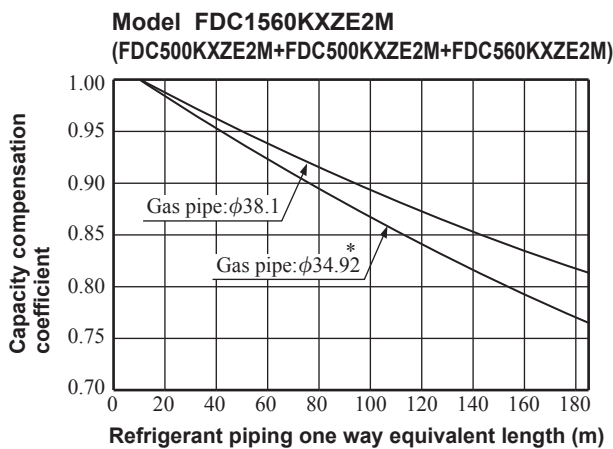
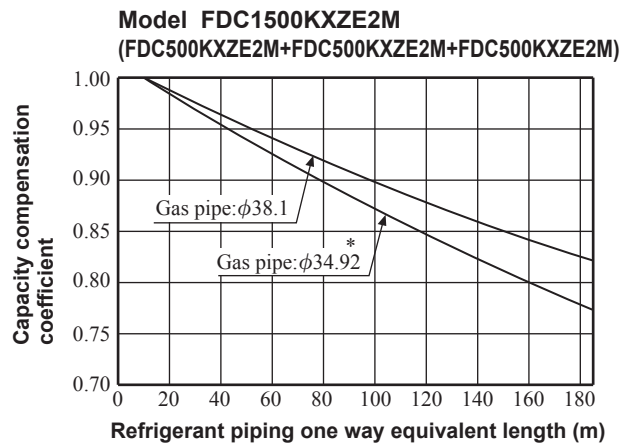
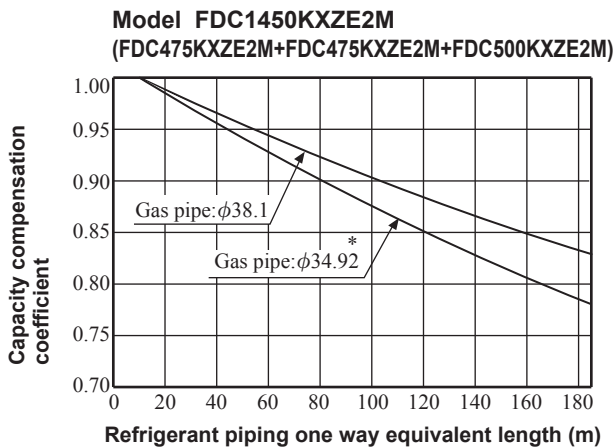
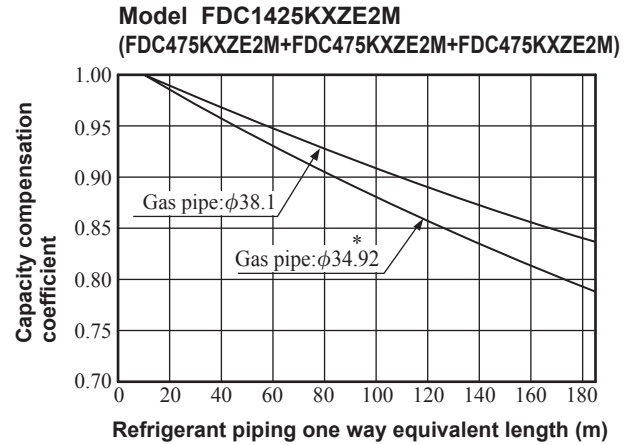
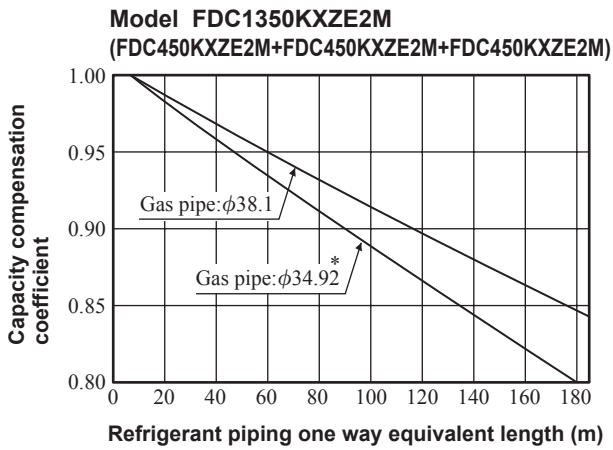
**Model FDC850KXZE2M
(FDC400KXZE2M + FDC450KXZE2M)**



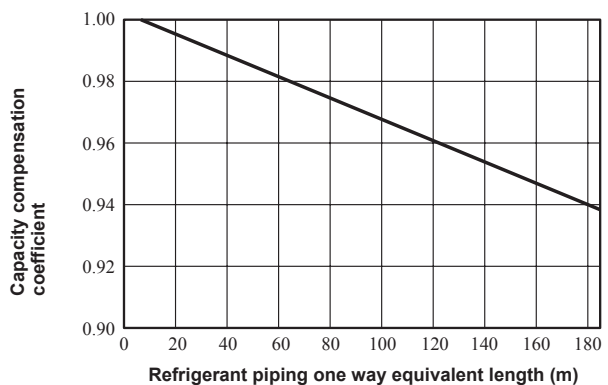
Note (1) Parts with the * mark show the alternative piping size.



Note (1) Parts with the * mark show the alternative piping size.



(ii) Heating



Note (1) Parts with the * mark show the alternative piping size.

Note (1) Equivalent piping length can be obtained by calculating as follows.

$$\text{Equivalent piping length} = \text{Real gas piping length} + \text{Number of bends in gas piping} \times \text{Equivalent piping length of bends}$$

Equivalent length of each joint

Unit : m/one part

| | | | | | | | | |
|-------------------|--------|--------|--------|-------|--------|-------|--------|-------|
| Gas piping size | φ15.88 | φ19.05 | φ22.22 | φ25.4 | φ28.58 | φ31.8 | φ34.92 | φ38.1 |
| Joint (90° elbow) | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.55 | 0.60 | 0.65 |

- (c) When the outdoor unit is located at a lower height than the indoor unit in cooling operation and when the outdoor unit is located at a higher height than the indoor unit in heating operation, the following values should be subtracted from the values in the above table.

| | | | | | | | |
|--|------|------|------|------|------|------|------|
| Height difference between the indoor unit and outdoor unit in the vertical height difference | 5 m | 10 m | 15 m | 20 m | 25 m | 30 m | 35 m |
| Adjustment coefficient | 0.99 | 0.98 | 0.97 | 0.96 | 0.95 | 0.94 | 0.93 |

| | | | | | | | |
|--|------|------|------|------|------|------|------|
| Height difference between the indoor unit and outdoor unit in the vertical height difference | 40 m | 45 m | 50 m | 55 m | 60 m | 65 m | 70 m |
| Adjustment coefficient | 0.92 | 0.91 | 0.90 | 0.89 | 0.88 | 0.87 | 0.86 |

| | | | | |
|--|------|------|------|------|
| Height difference between the indoor unit and outdoor unit in the vertical height difference | 75 m | 80 m | 85 m | 90 m |
| Adjustment coefficient | 0.85 | 0.84 | 0.83 | 0.82 |

- (d) Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger

| | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|-----------|
| Air inlet temperature of outdoor unit in °C WB | -20 | -15 | -13 | -11 | -9 | -7 | -5 | -3 | -1 | 1 | 3 | 5 or more |
| Adjustment coefficient | 0.96 | 0.96 | 0.96 | 0.95 | 0.94 | 0.93 | 0.91 | 0.88 | 0.86 | 0.87 | 0.92 | 1 |

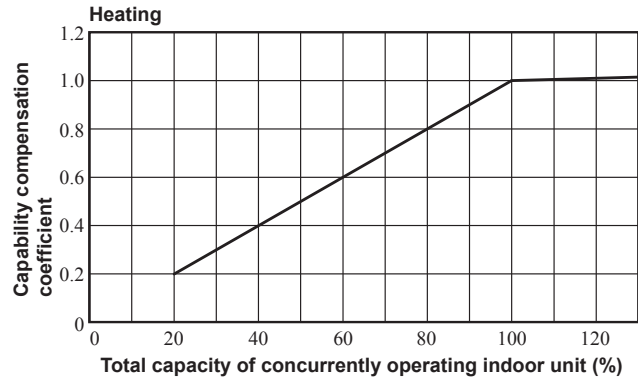
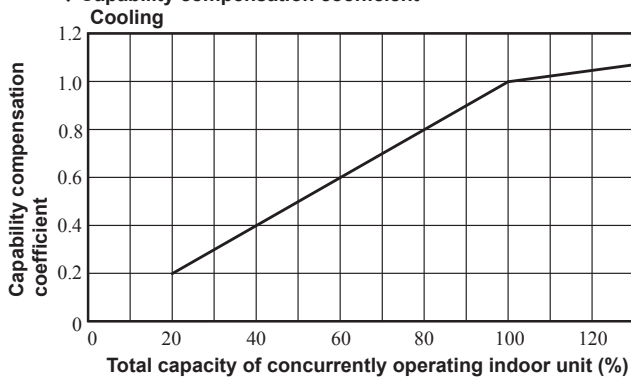
The correction factors will change drastically according to weather conditions. So necessary adjustment should be made empirically according to the weather data of the particular area.

- (e) The capacity compensation coefficient and power consumption compensation coefficient vary according to the total capacity of concurrently operating indoor units, as shown below.

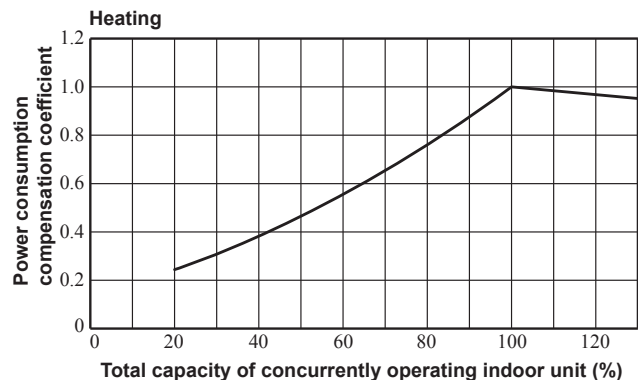
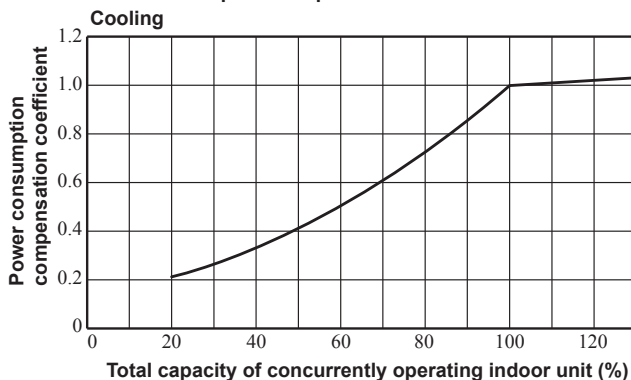
(Note) This table shows typical values.

Model FDC280KXZE2M

◆ **Capability compensation coefficient**



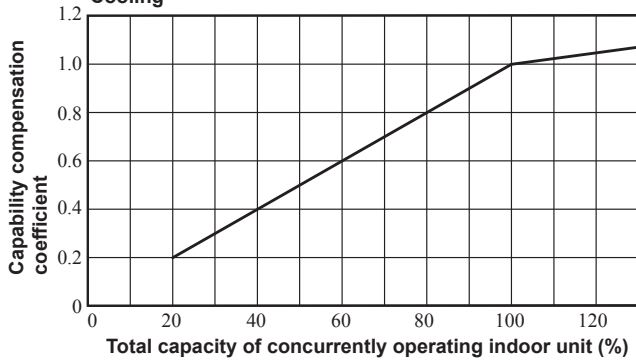
◆ **Power consumption compensation coefficient**



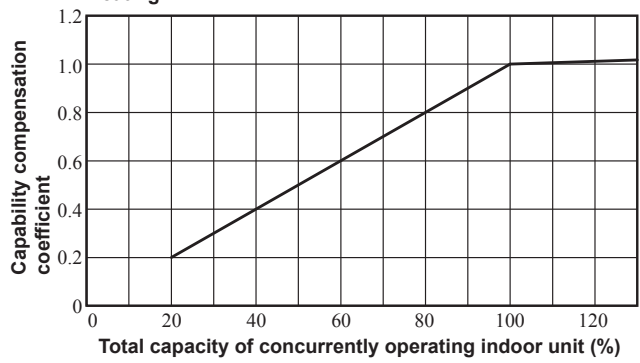
Model FDC335KXZE2M

◆ **Capability compensation coefficient**

Cooling

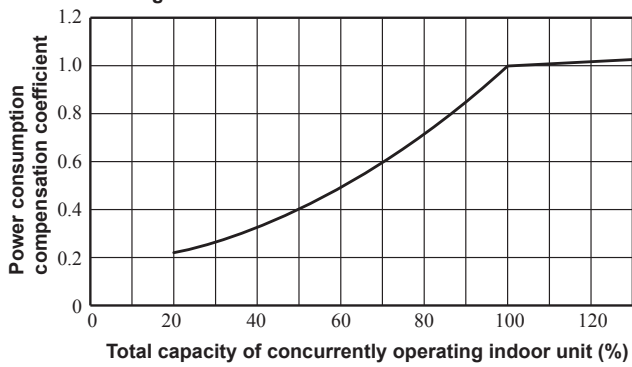


Heating

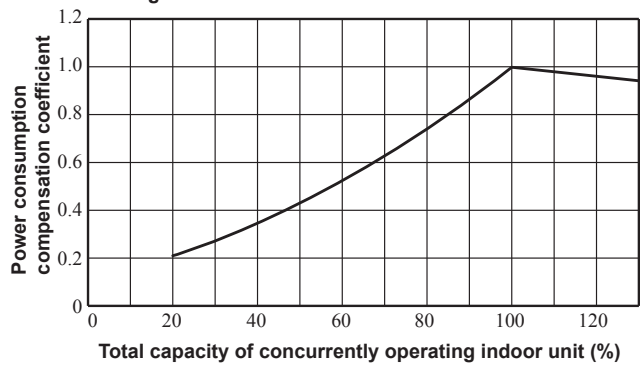


◆ **Power consumption compensation coefficient**

Cooling



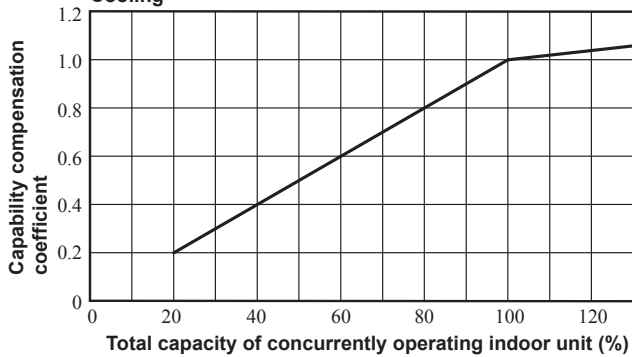
Heating



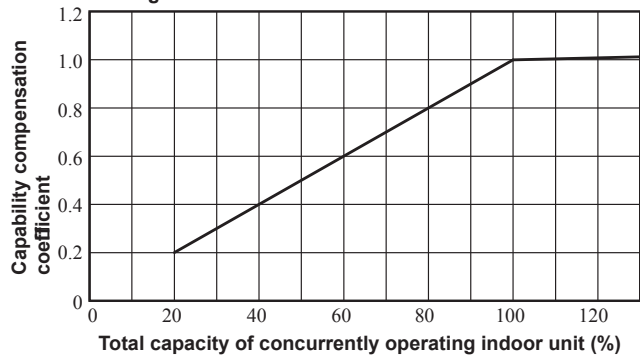
Model FDC400KXZE2M

◆ **Capability compensation coefficient**

Cooling

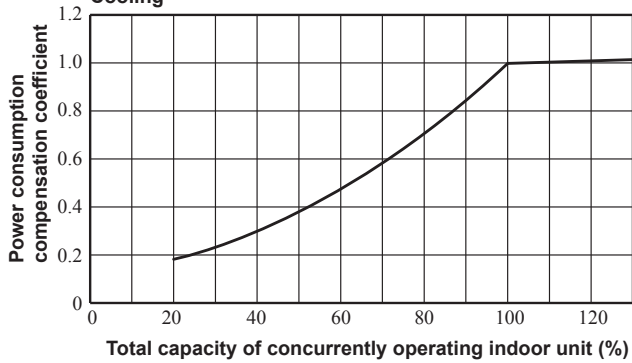


Heating

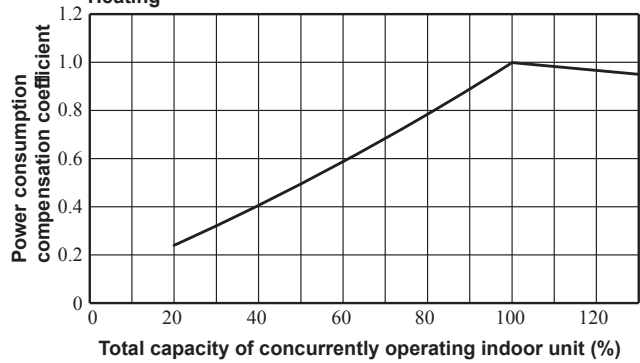


◆ **Power consumption compensation coefficient**

Cooling

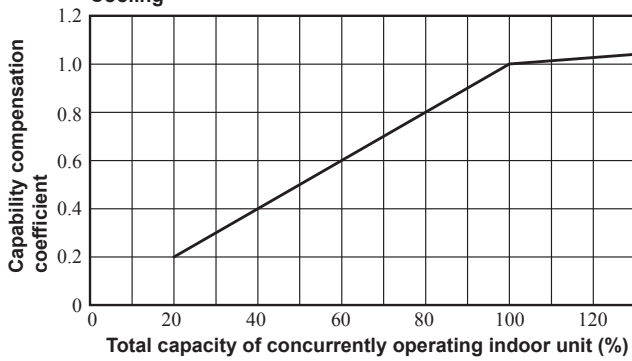


Heating

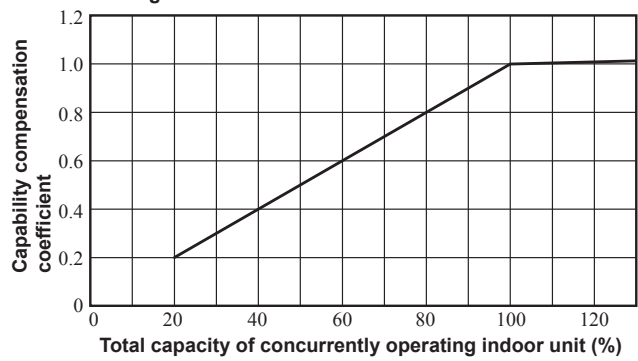


Model FDC450KXZE2M

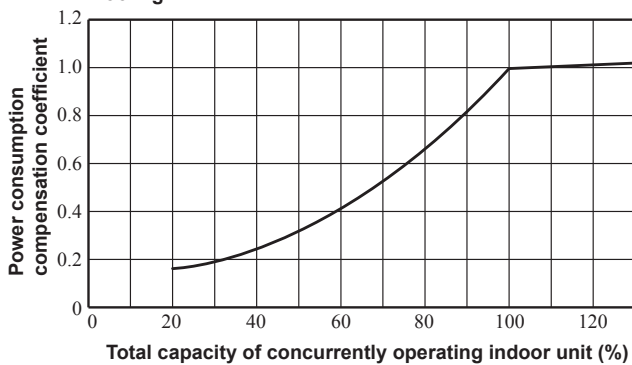
◆ **Capability compensation coefficient**
Cooling



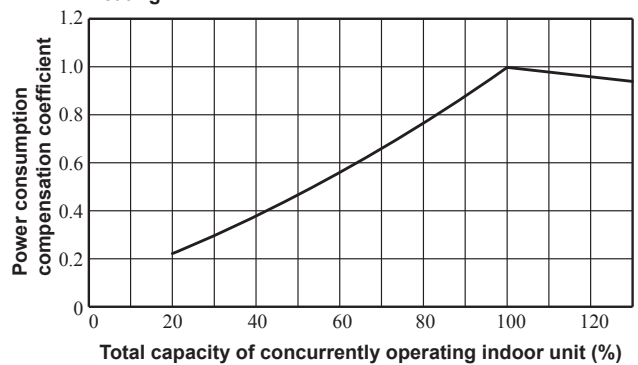
Heating



◆ **Power consumption compensation coefficient**
Cooling

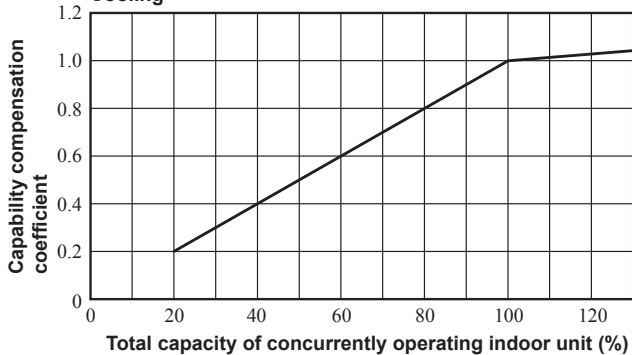


Heating

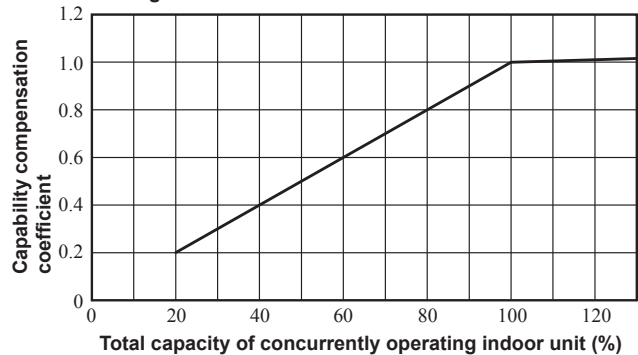


Model FDC475KXZE2M

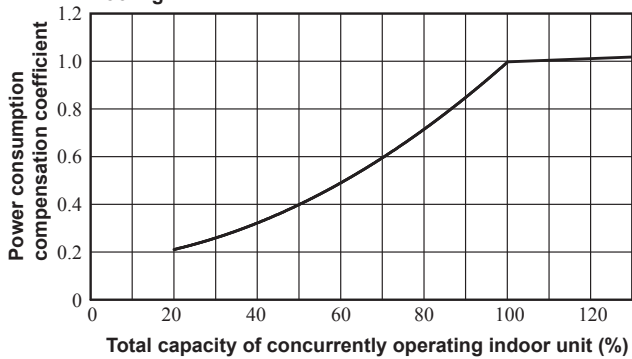
◆ **Capability compensation coefficient**
Cooling



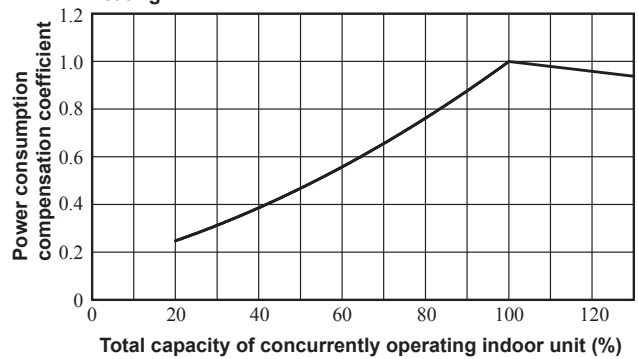
Heating



◆ **Power consumption compensation coefficient**
Cooling

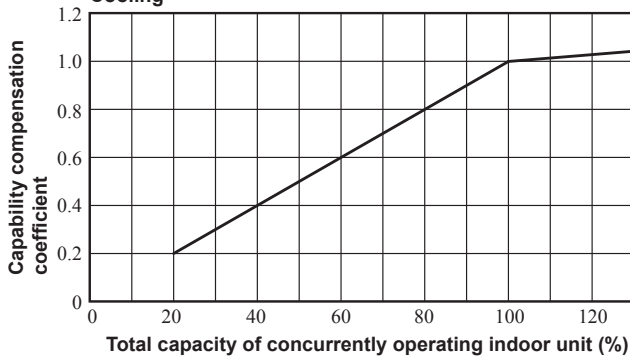


Heating

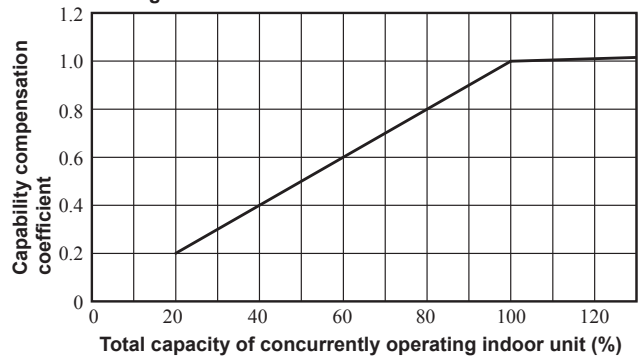


Model FDC500KXZE2M

◆ **Capability compensation coefficient**
Cooling

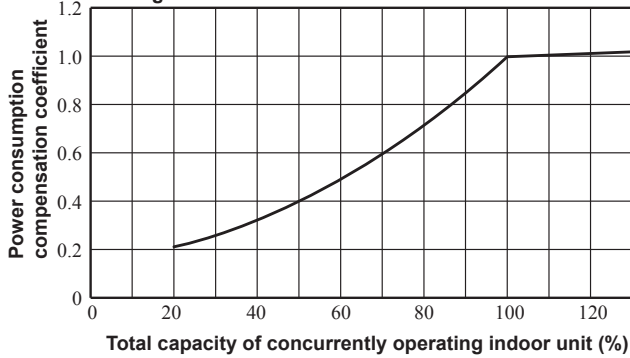


Heating

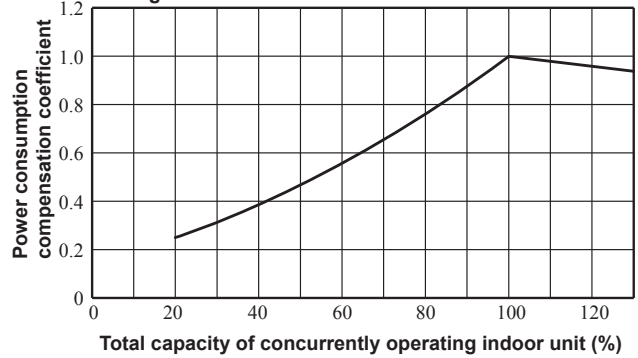


◆ **Power consumption compensation coefficient**

Cooling

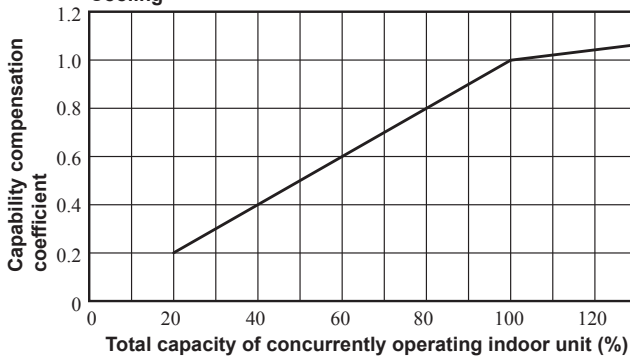


Heating

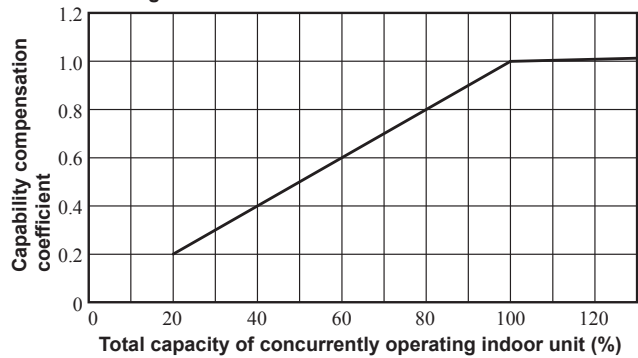


Model FDC560KXZE2M

◆ **Capability compensation coefficient**
Cooling

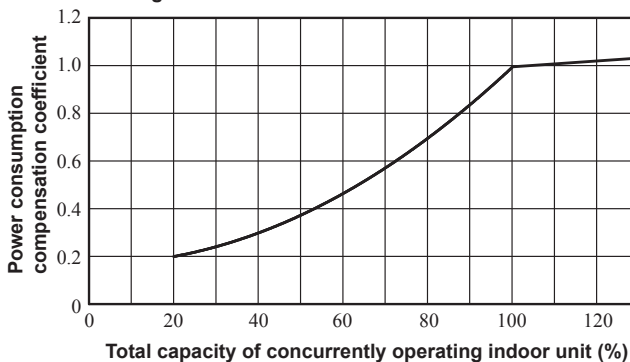


Heating

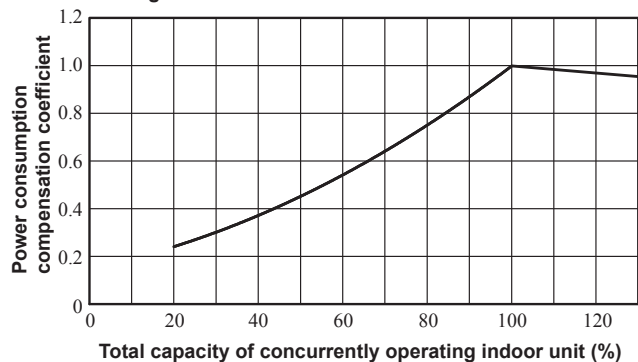


◆ **Power consumption compensation coefficient**

Cooling

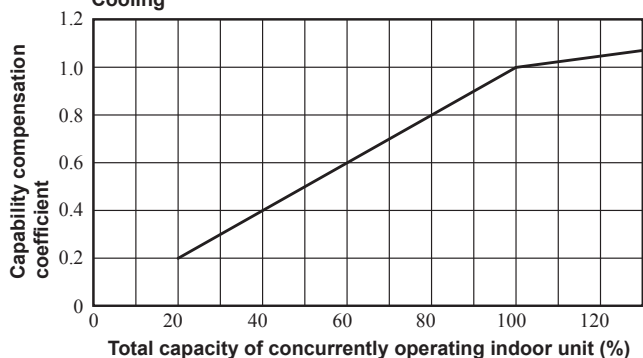


Heating

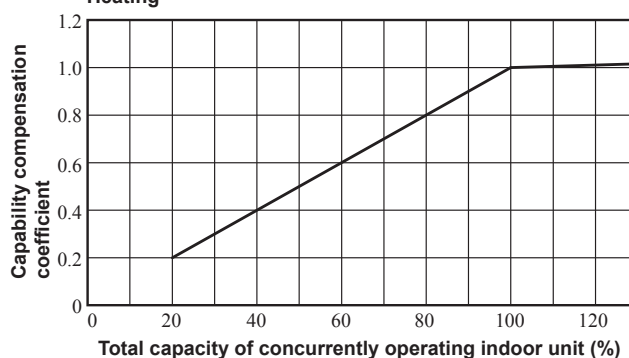


Model FDC615KXZE2M

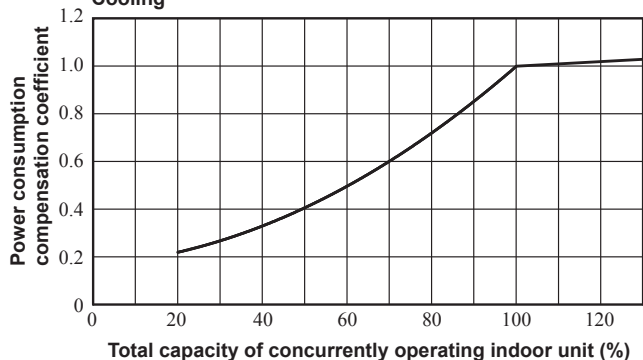
◆ **Capability compensation coefficient**
Cooling



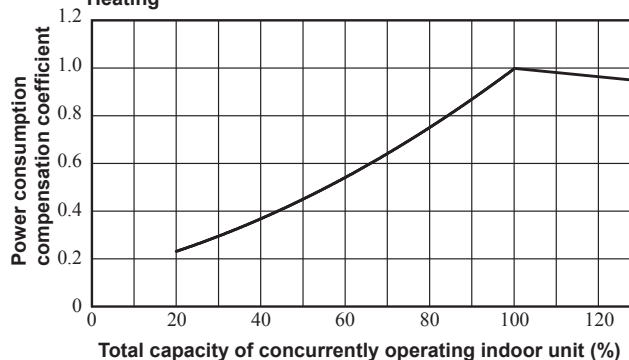
Heating



◆ **Power consumption compensation coefficient**
Cooling

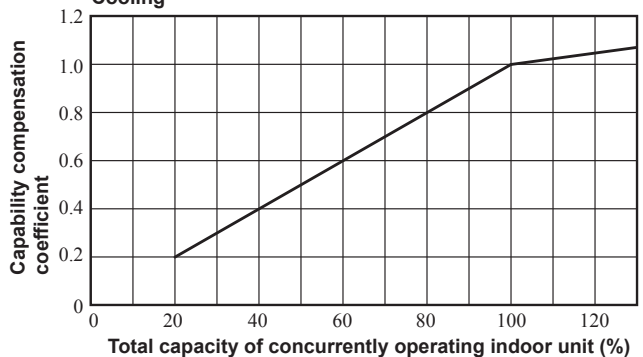


Heating

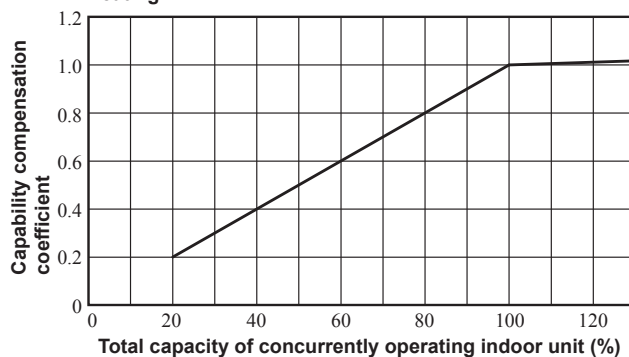


Model FDC670KXZE2M

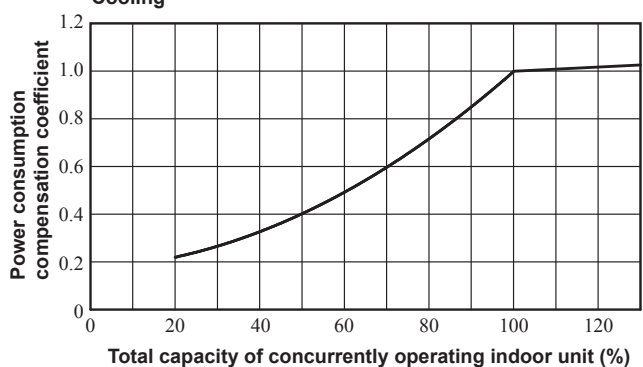
◆ **Capability compensation coefficient**
Cooling



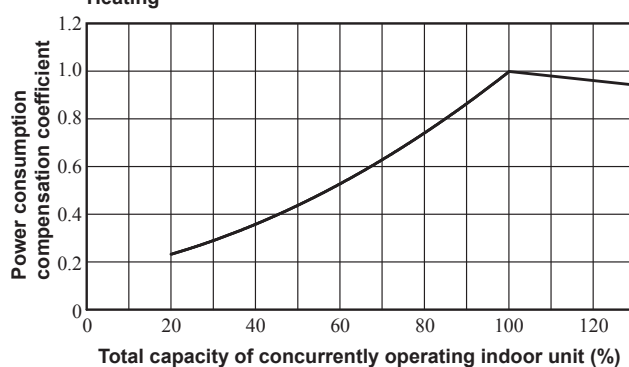
Heating



◆ **Power consumption compensation coefficient**
Cooling



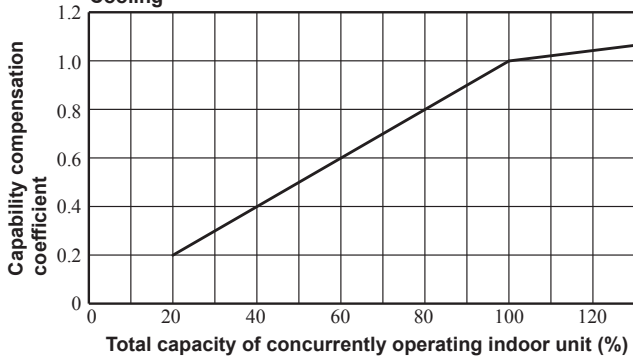
Heating



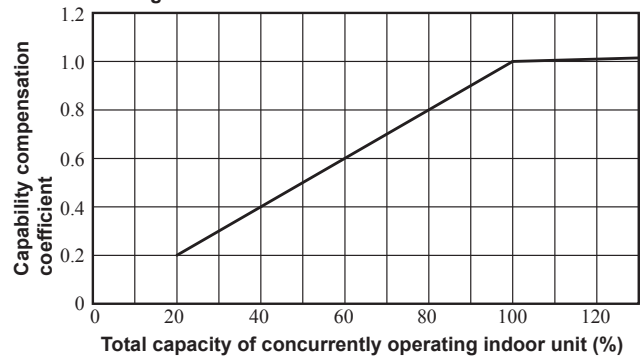
Model FDC735KXZE2M

◆ **Capability compensation coefficient**

Cooling

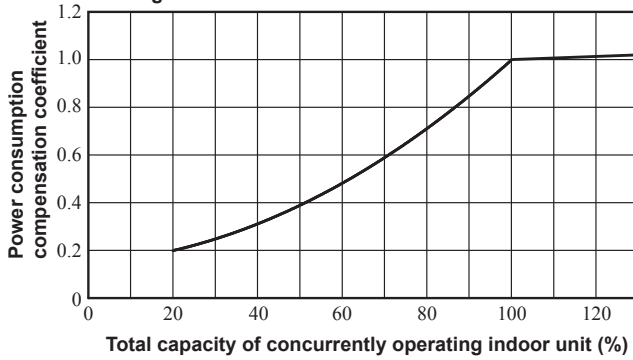


Heating

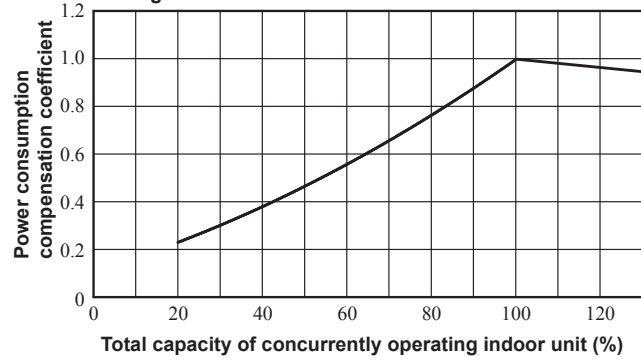


◆ **Power consumption compensation coefficient**

Cooling



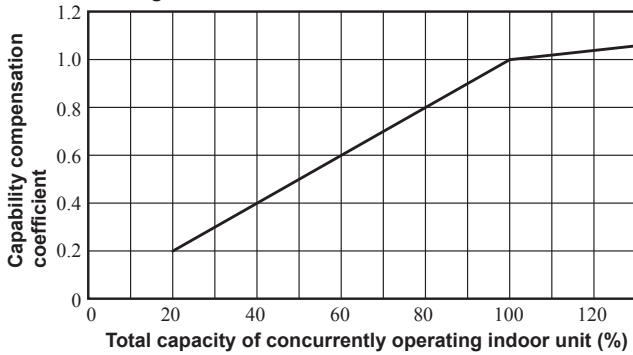
Heating



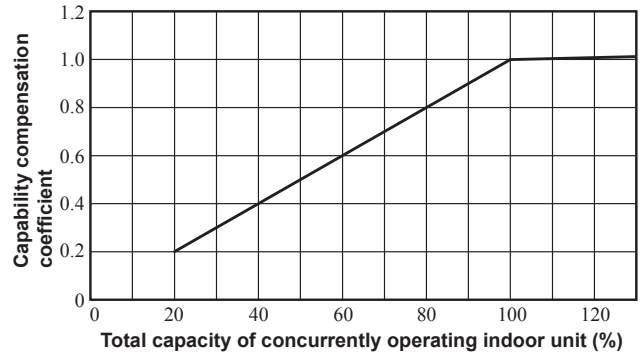
Model FDC800KXZE2M

◆ **Capability compensation coefficient**

Cooling

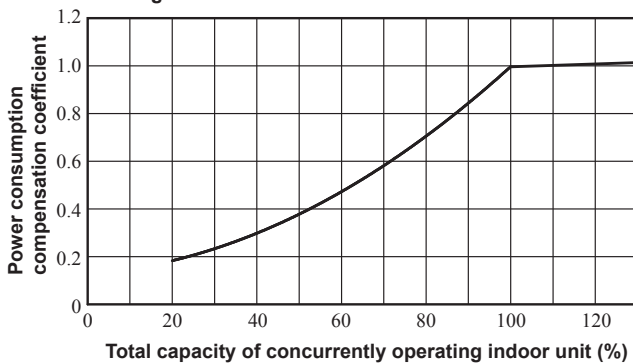


Heating

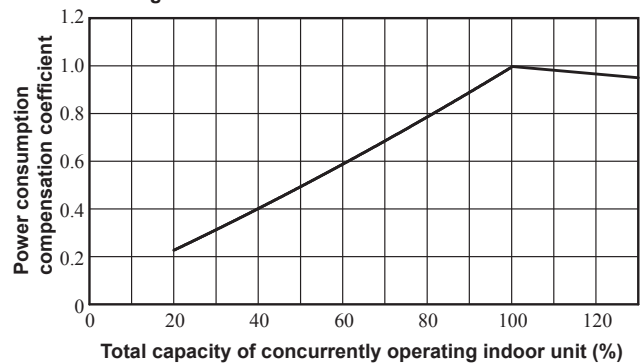


◆ **Power consumption compensation coefficient**

Cooling

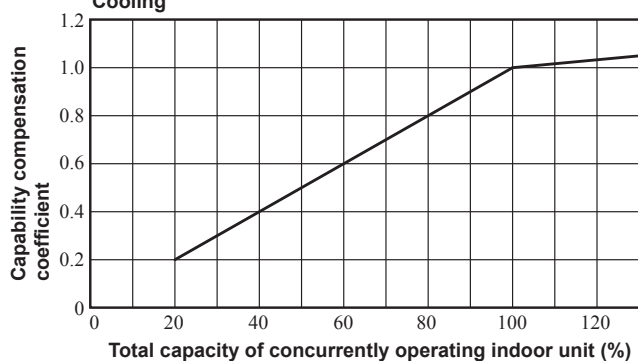


Heating

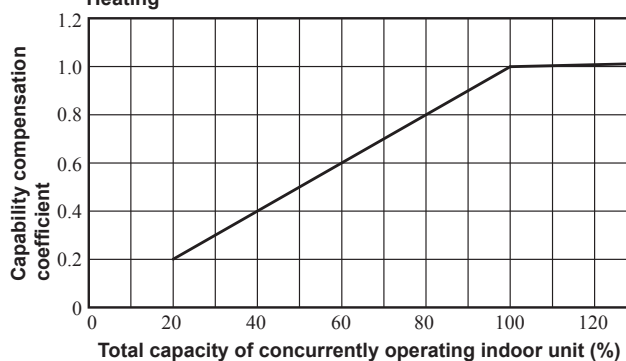


Model FDC850KXZE2M

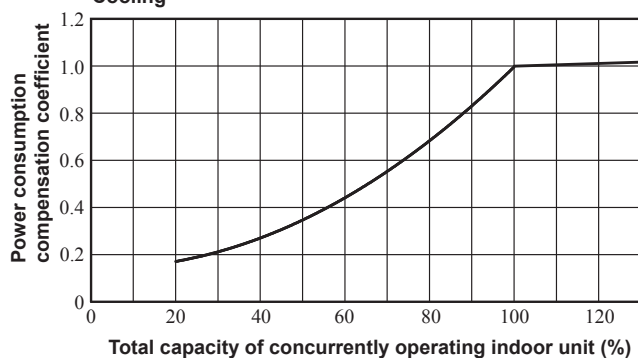
◆ **Capability compensation coefficient**
Cooling



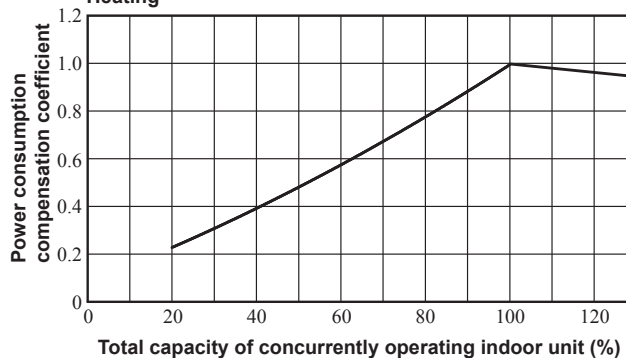
Heating



◆ **Power consumption compensation coefficient**
Cooling

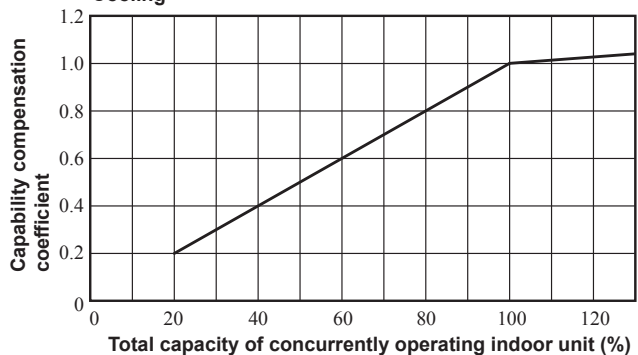


Heating

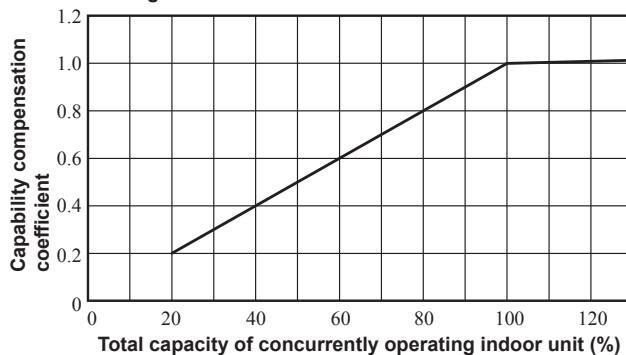


Model FDC900KXZE2M

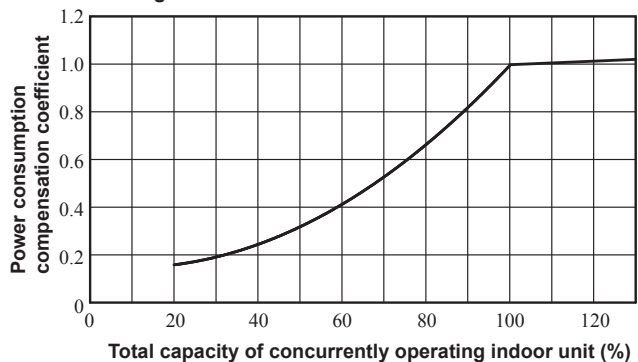
◆ **Capability compensation coefficient**
Cooling



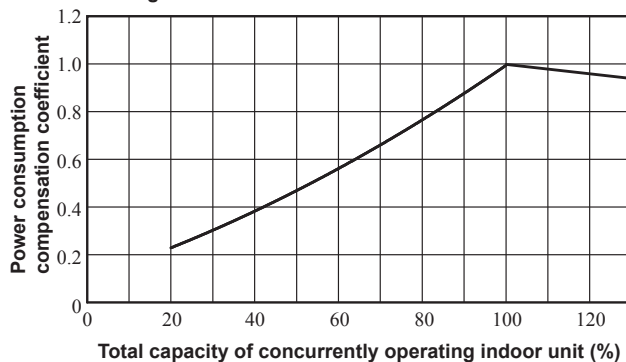
Heating



◆ **Power consumption compensation coefficient**
Cooling

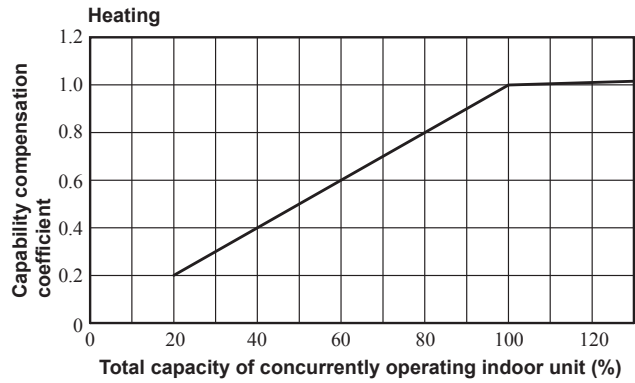
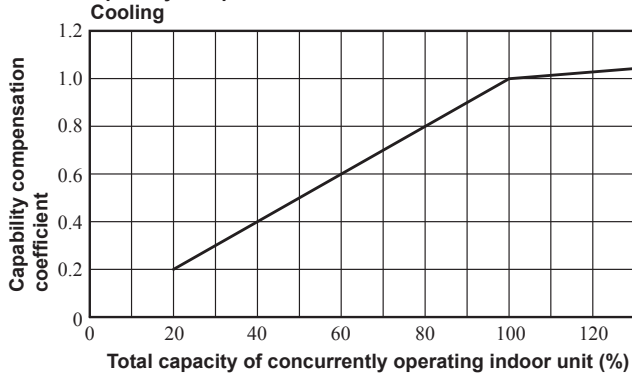


Heating

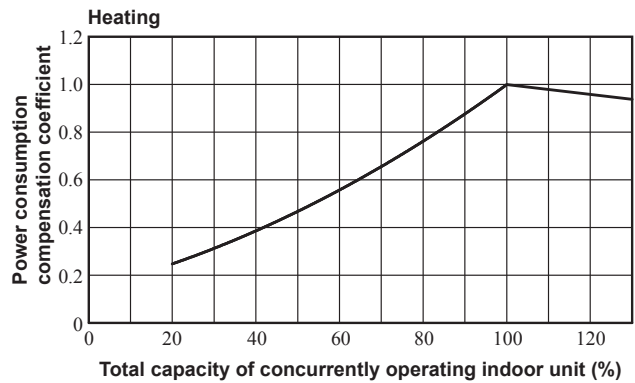
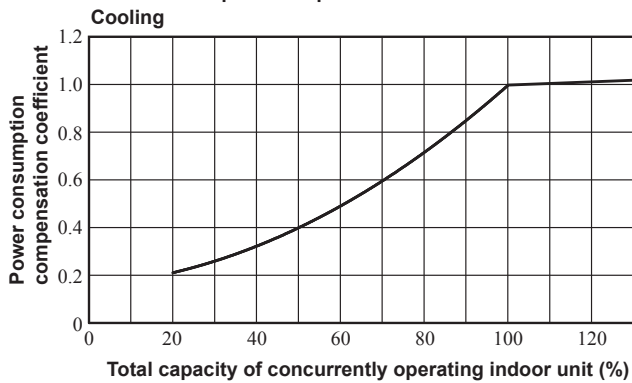


Model FDC950KXZE2M

◆ Capability compensation coefficient

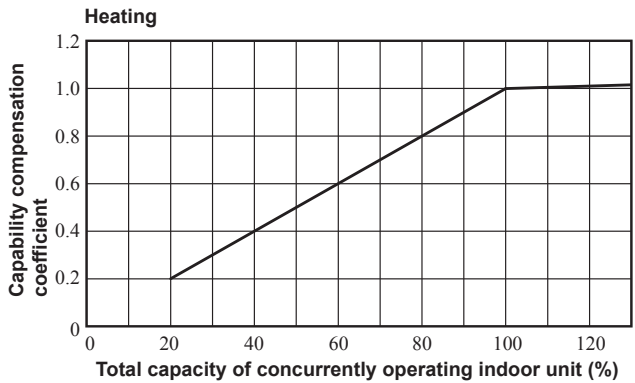
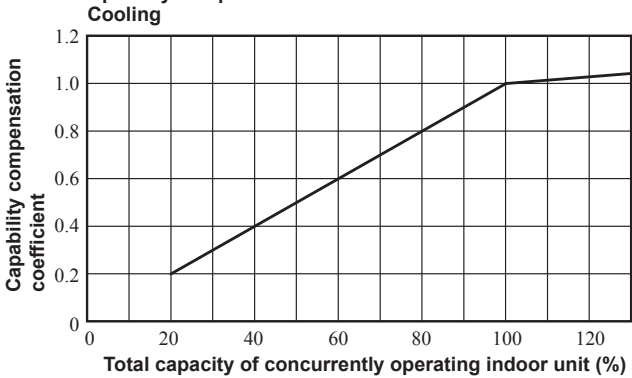


◆ Power consumption compensation coefficient

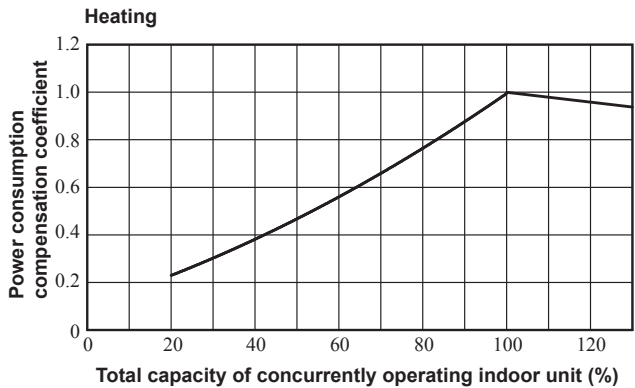
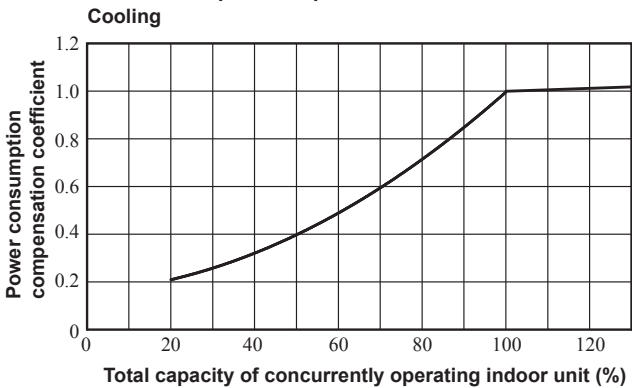


Model FDC1000KXZE2M

◆ Capability compensation coefficient

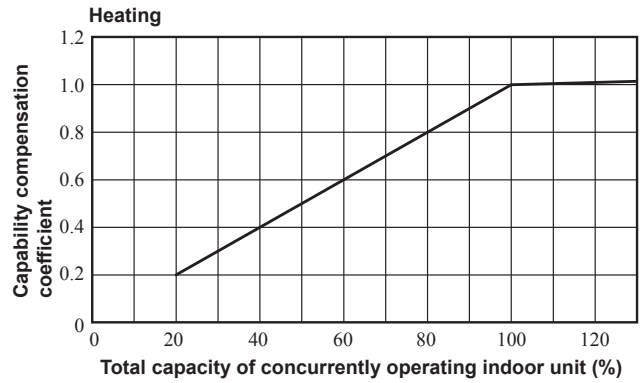
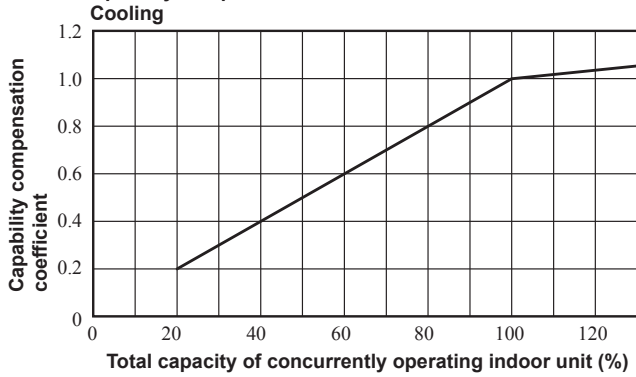


◆ Power consumption compensation coefficient

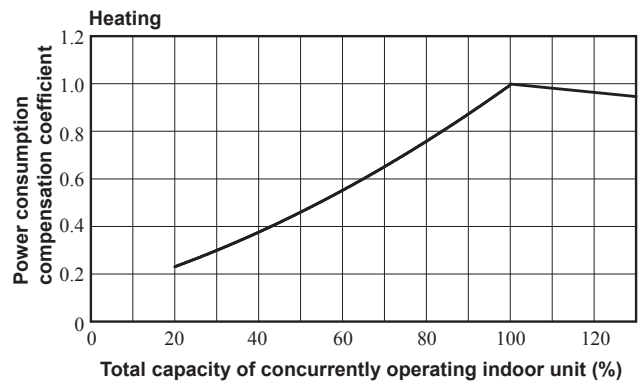
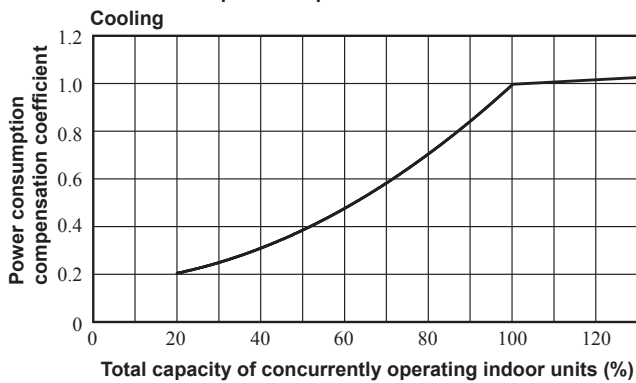


Model FDC1060KXZE2M

◆ **Capability compensation coefficient**

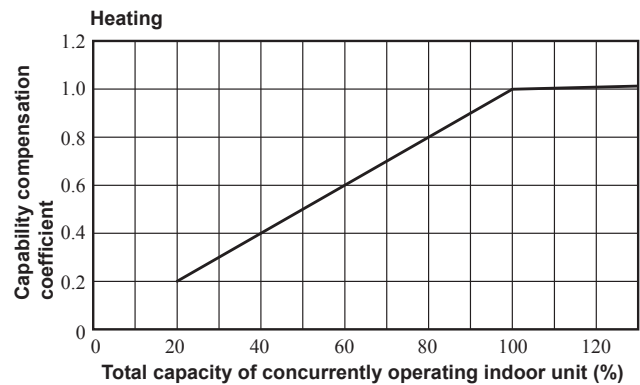
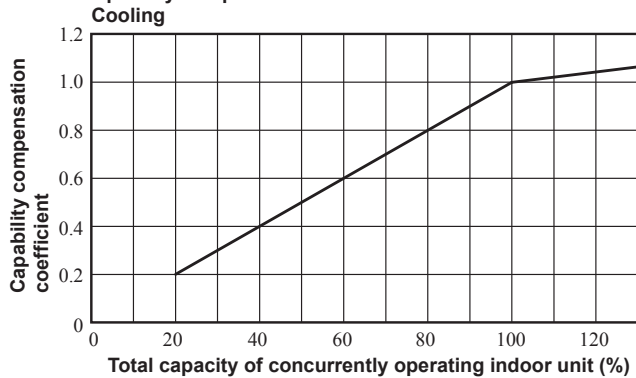


◆ **Power consumption compensation coefficient**

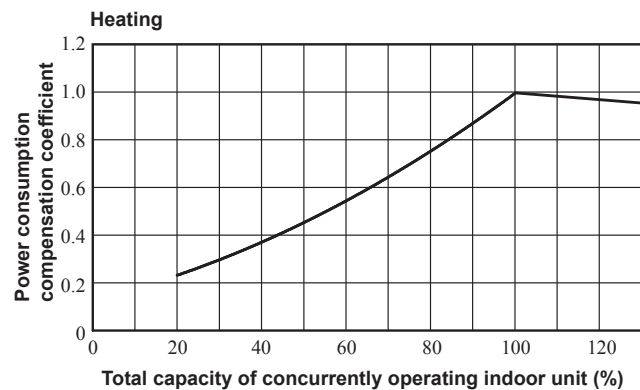
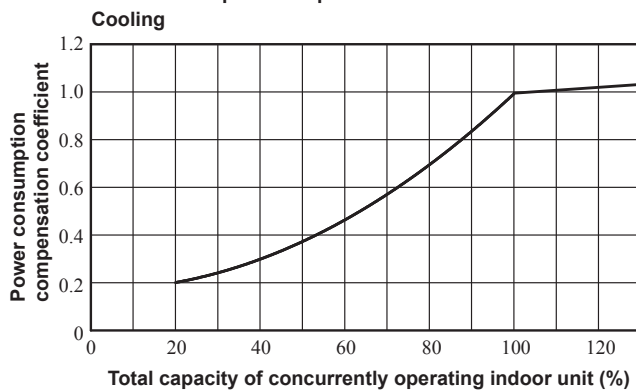


Model FDC1120KXZE2M

◆ **Capability compensation coefficient**

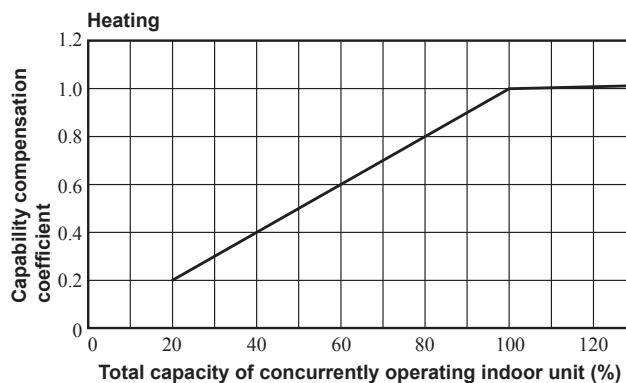
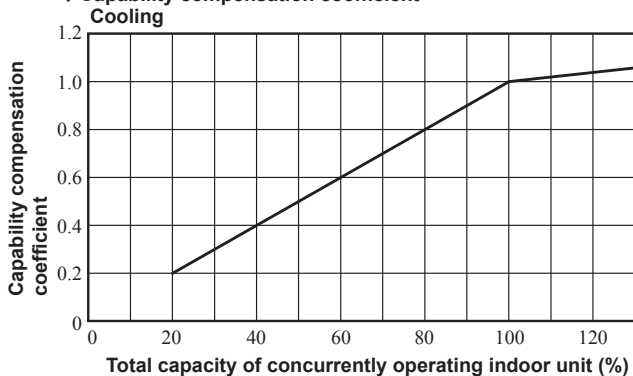


◆ **Power consumption compensation coefficient**

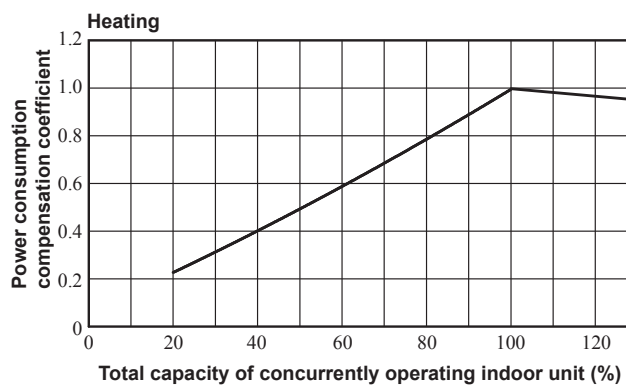
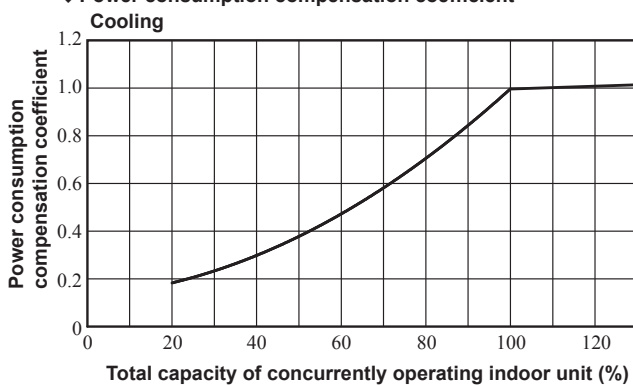


Model FDC1200KXZE2M

◆ **Capability compensation coefficient**

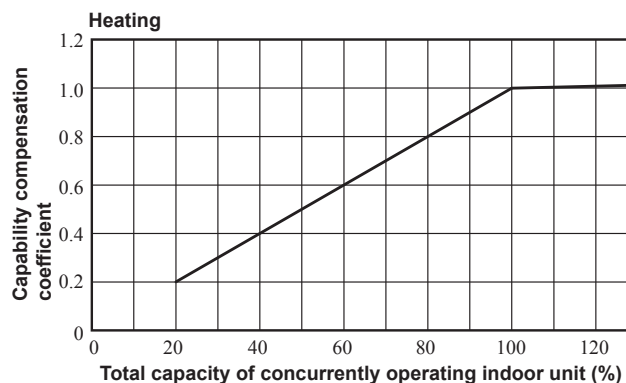
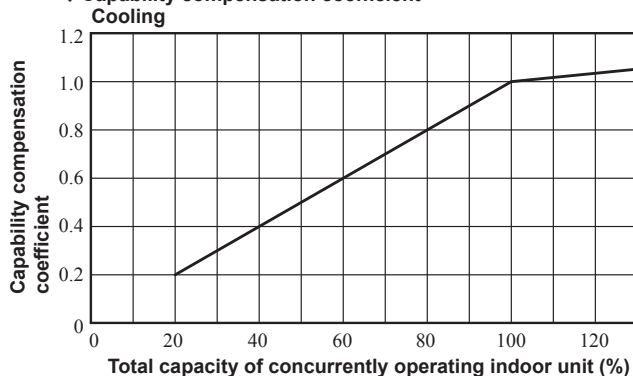


◆ **Power consumption compensation coefficient**

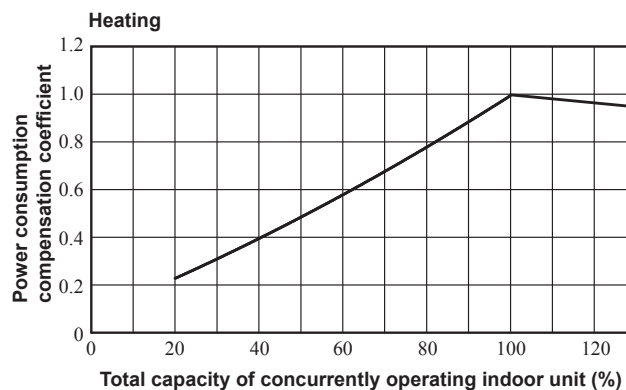
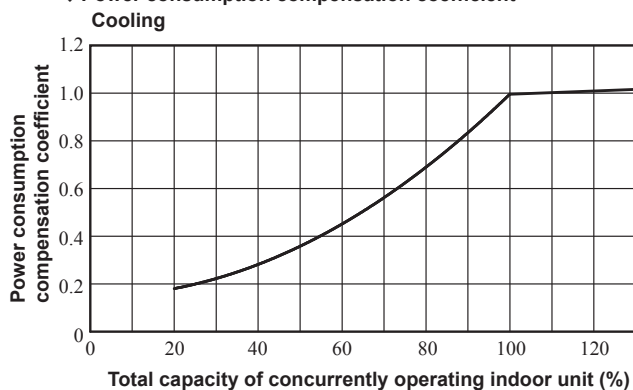


Model FDC1250KXZE2M

◆ **Capability compensation coefficient**

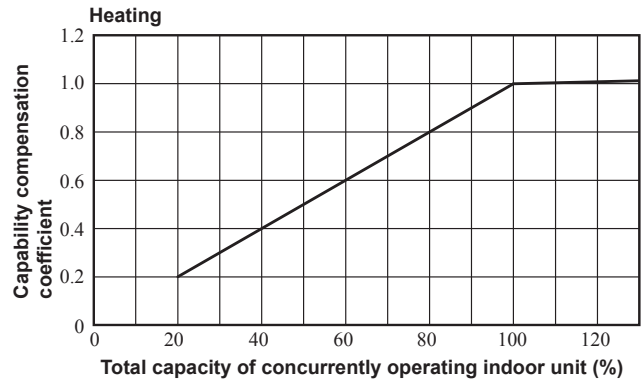
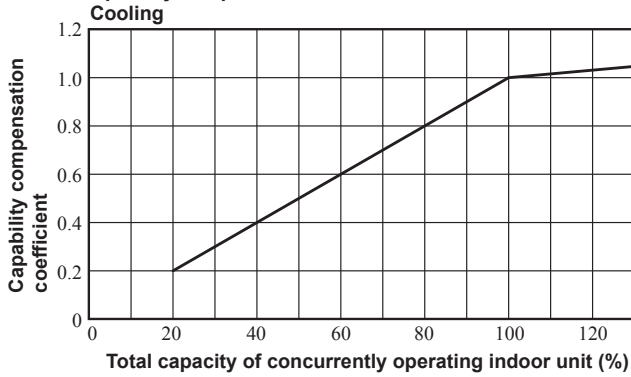


◆ **Power consumption compensation coefficient**

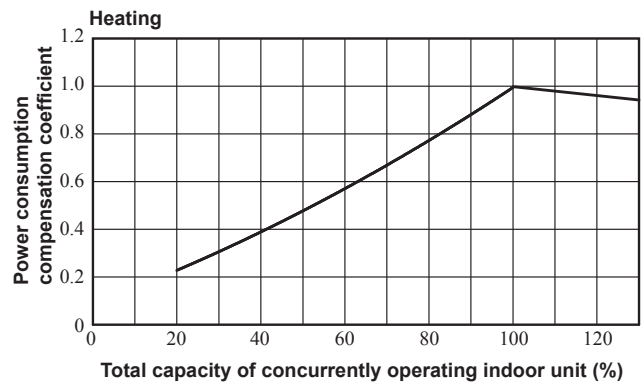
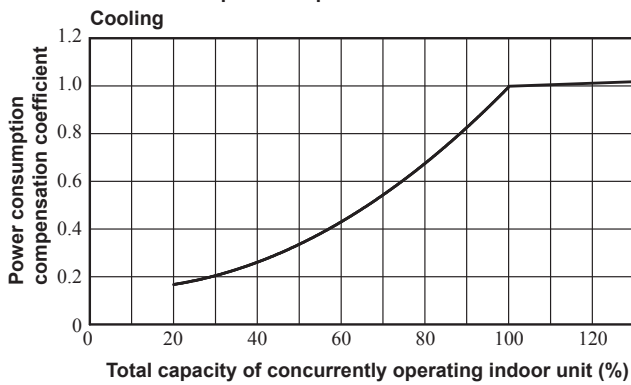


Model FDC1300KXZE2M

◆ **Capability compensation coefficient**

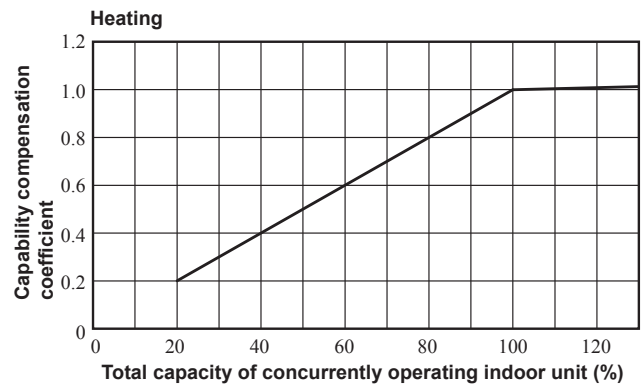
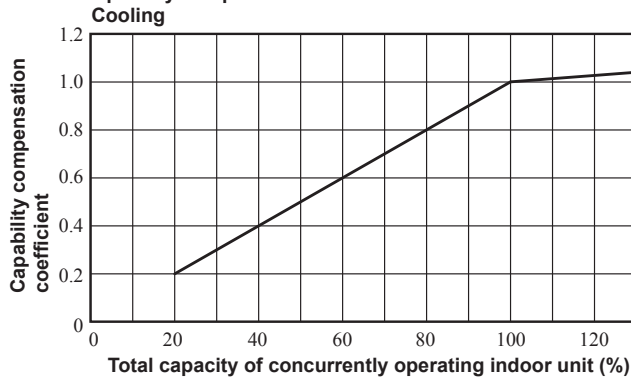


◆ **Power consumption compensation coefficient**

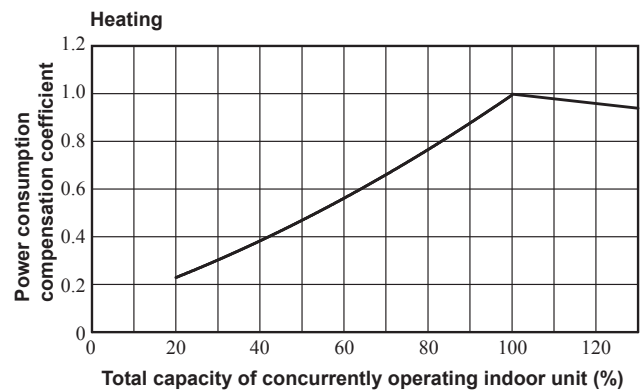
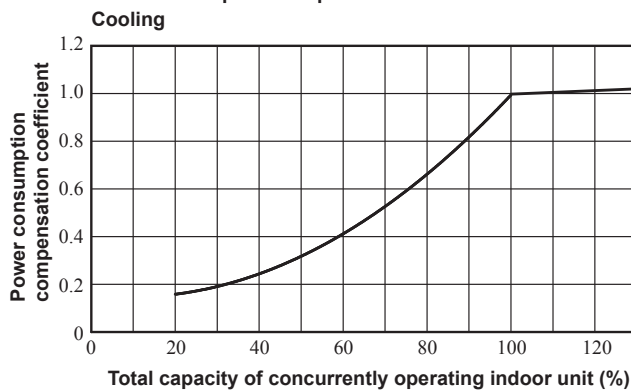


Model FDC1350KXZE2M

◆ **Capability compensation coefficient**

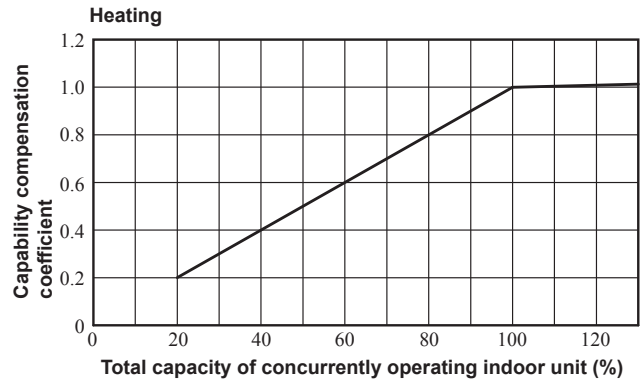
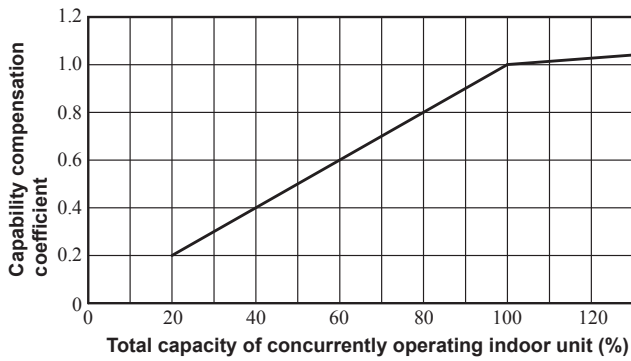


◆ **Power consumption compensation coefficient**

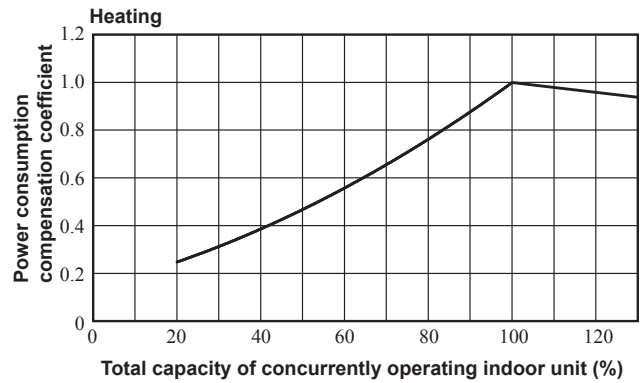
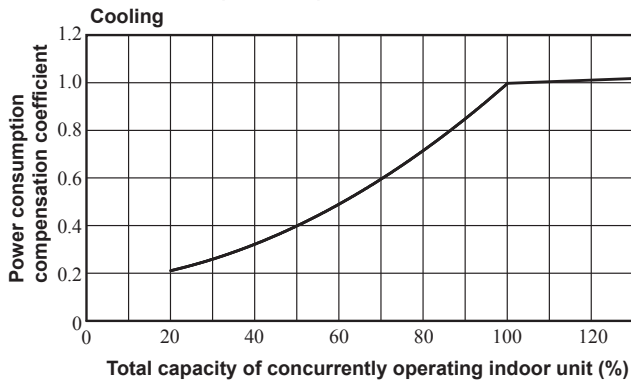


Model FDC1425KXZE2M

◆ **Capability compensation coefficient**

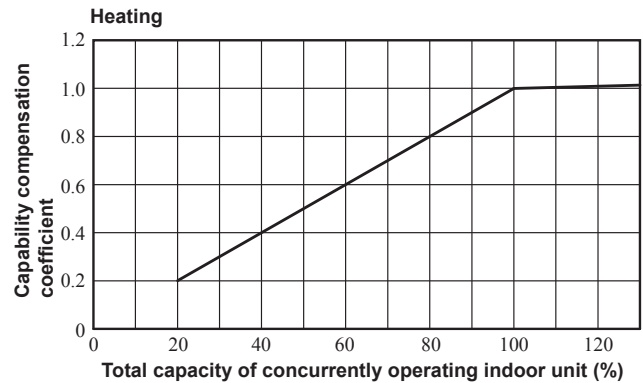
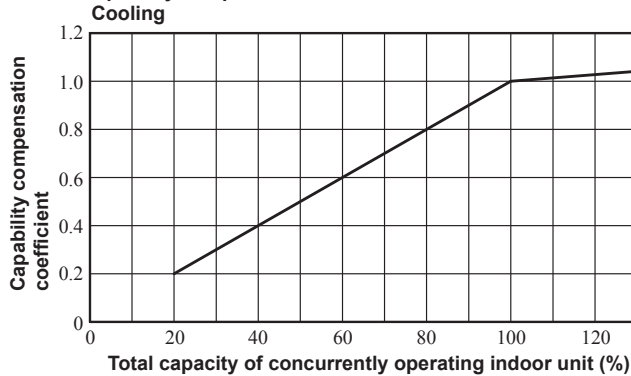


◆ **Power consumption compensation coefficient**

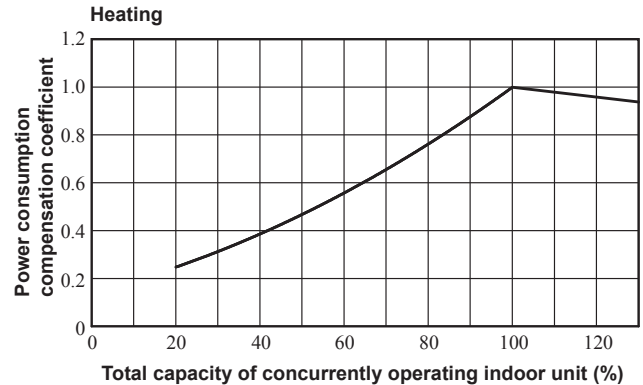
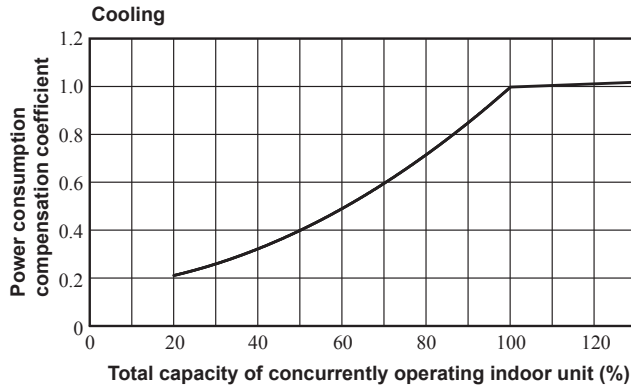


Model FDC1450KXZE2M

◆ **Capability compensation coefficient**

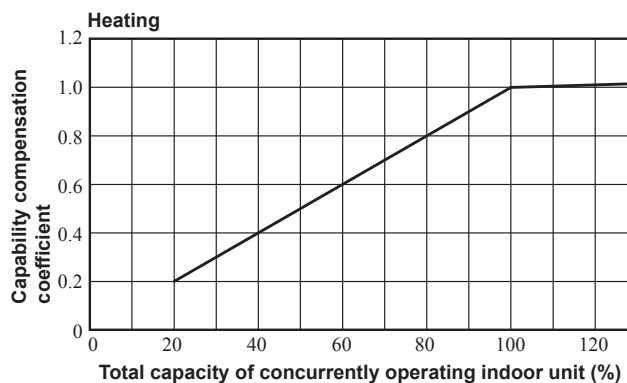
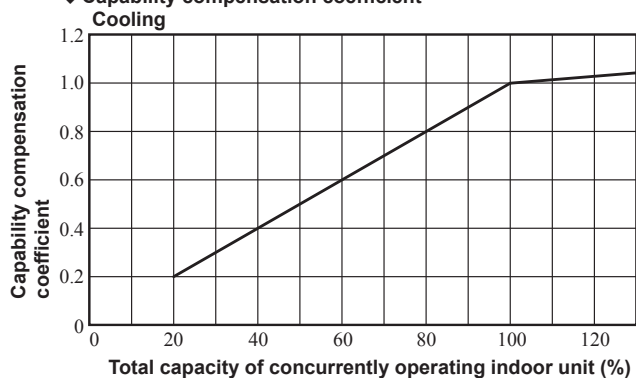


◆ **Power consumption compensation coefficient**

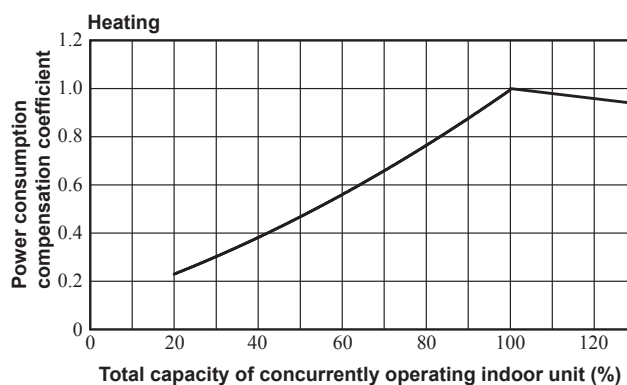
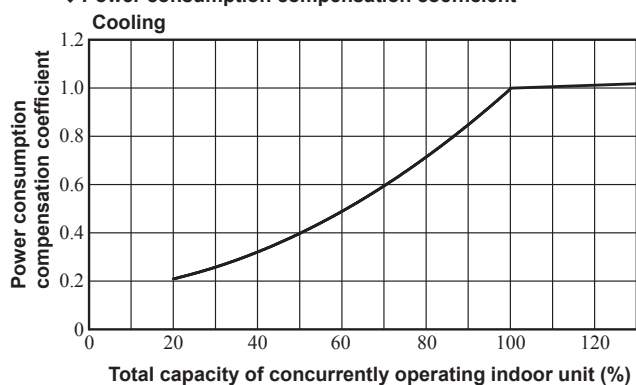


Model FDC1500KXZE2M

◆ **Capability compensation coefficient**

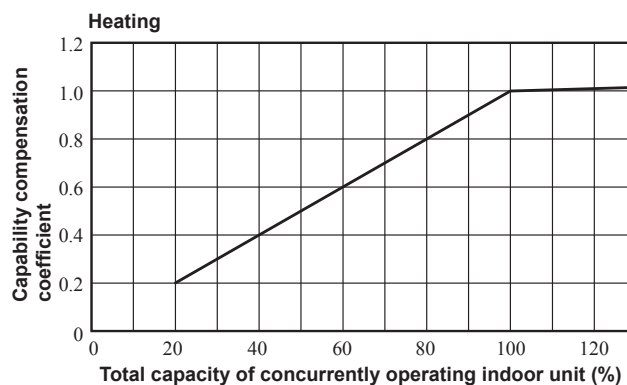
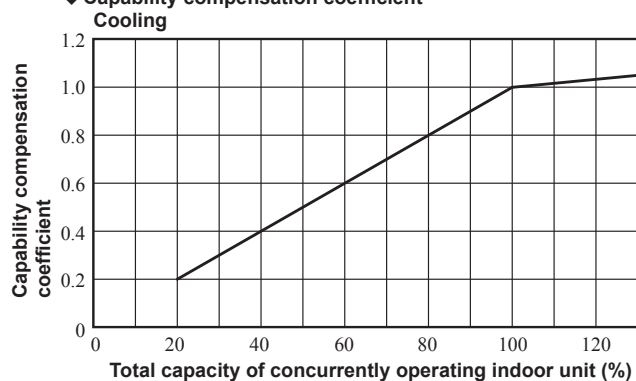


◆ **Power consumption compensation coefficient**

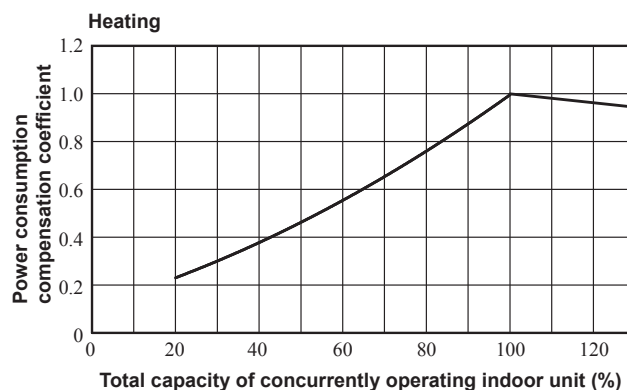
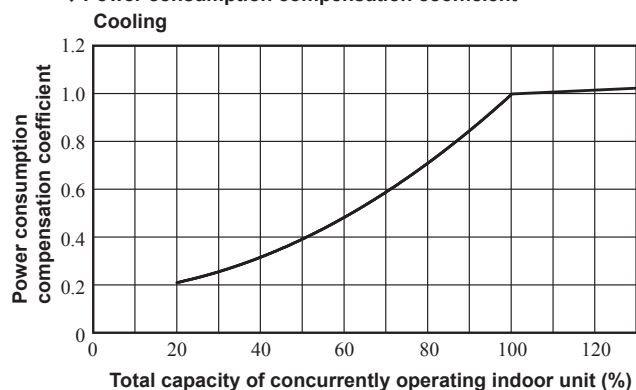


Model FDC1560KXZE2M

◆ **Capability compensation coefficient**



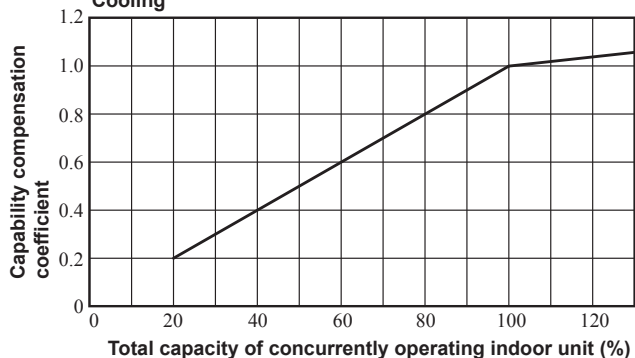
◆ **Power consumption compensation coefficient**



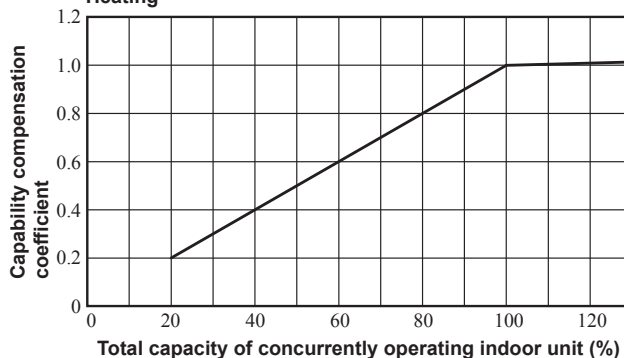
Model FDC1620KXZE2M

◆ Capability compensation coefficient

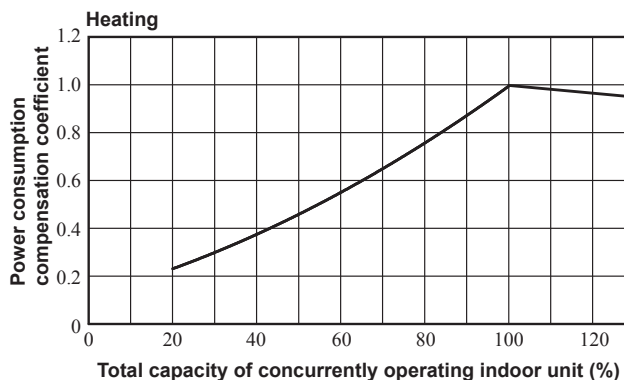
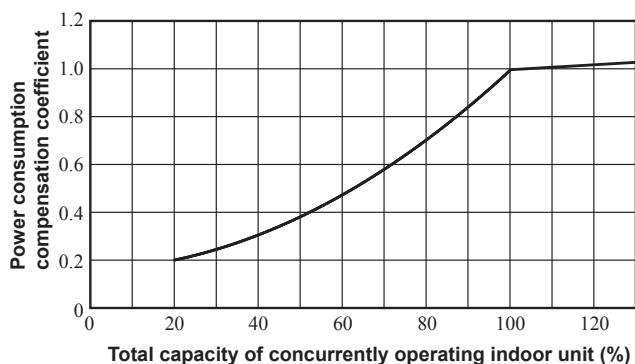
Cooling



Heating



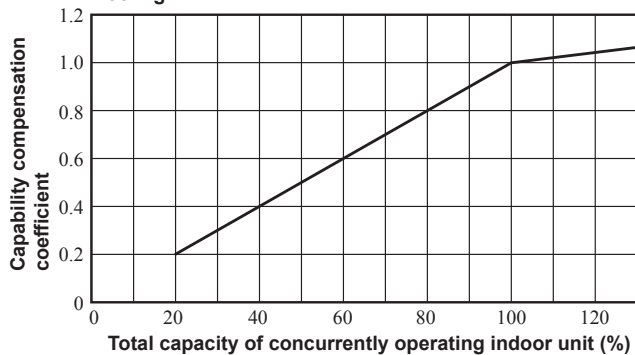
◆ Power consumption compensation coefficient



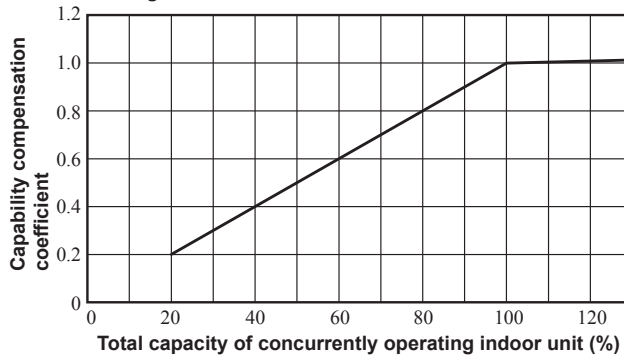
Model FDC1680KXZE2M

◆ Capability compensation coefficient

Cooling

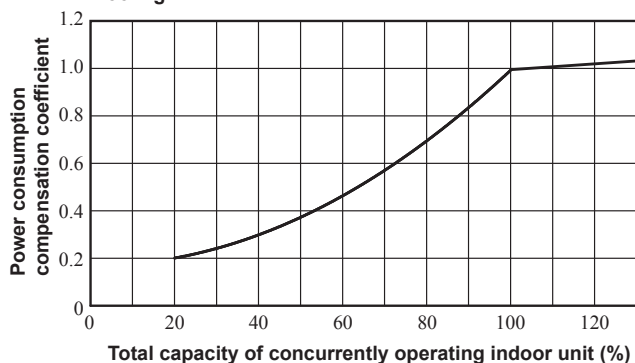


Heating

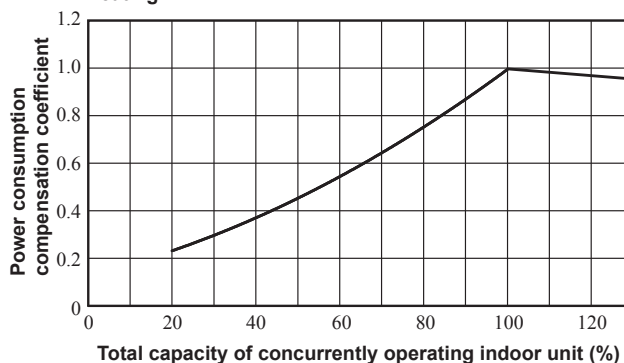


◆ Power consumption compensation coefficient

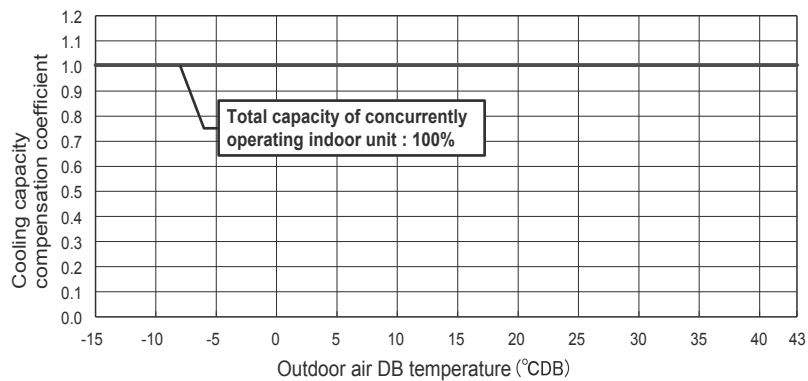
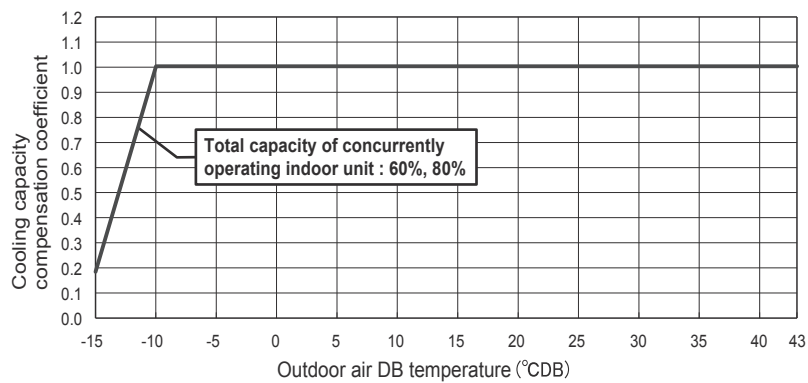
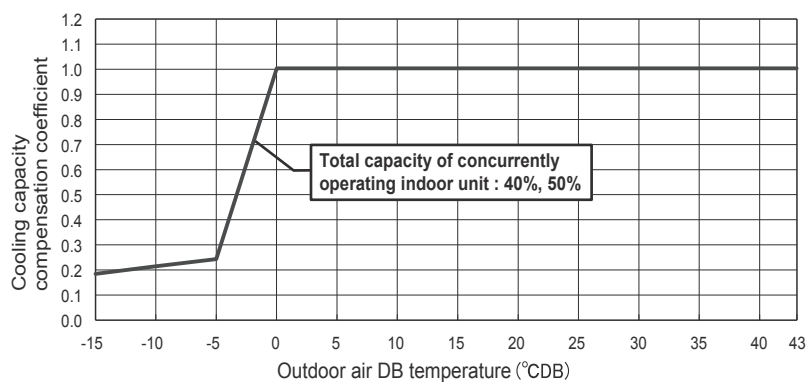
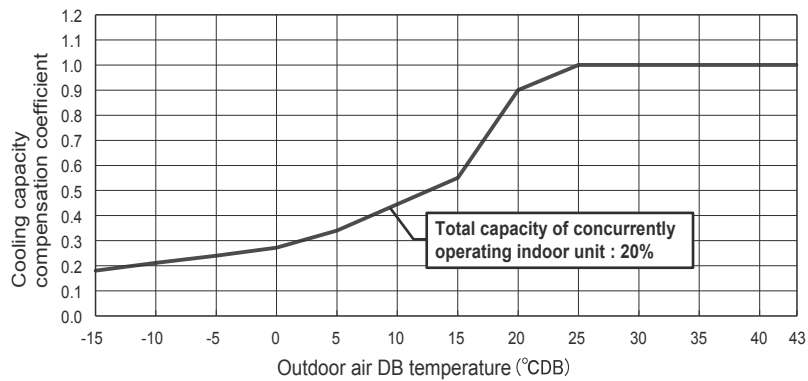
Cooling



Heating

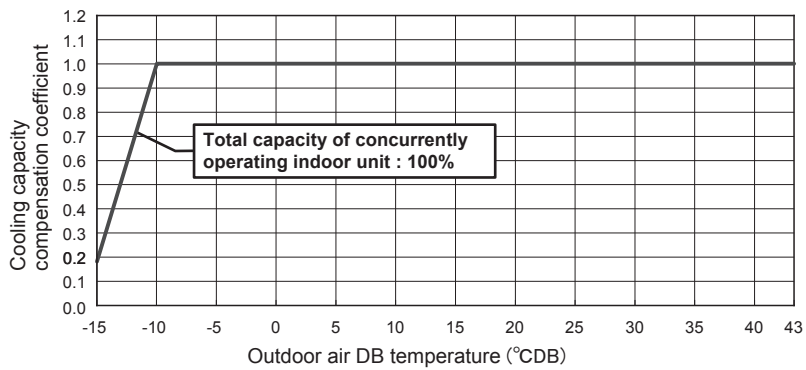
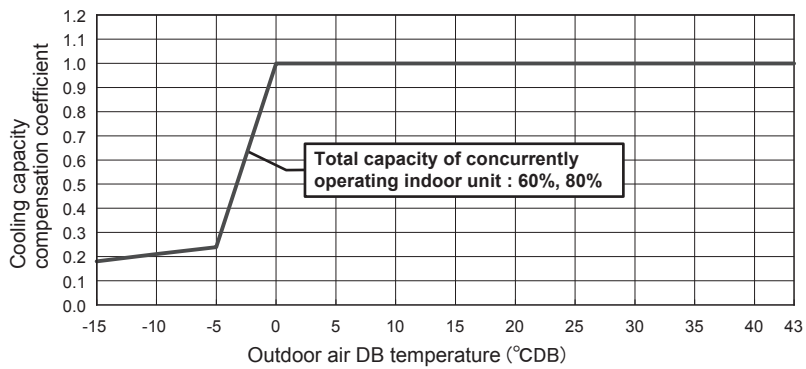
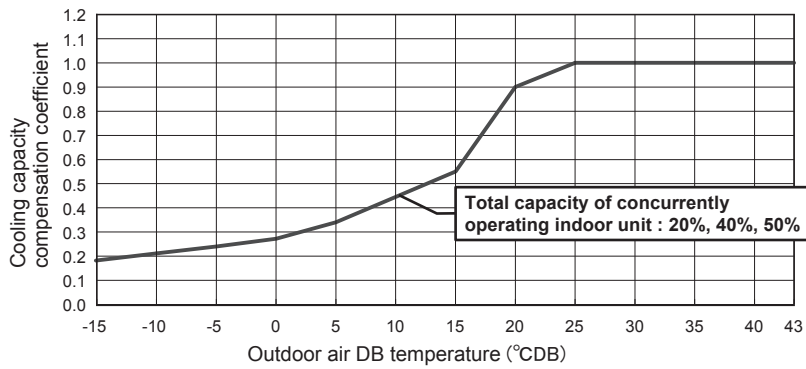


- (f) The capacity compensation coefficient:
 Cooling capacity in low temperature under operation of anti-frost control
 (i) Indoor fan tap: P-Hi



Capacity compensation coefficient is that of cooling capacity at each fan-tap.
 (Condition) Room temperature: 27°CDB/19°CWB
 (*) If room temperature is lower than 27 °CDB/19°CWB, cooling capacity ratio tends to be smaller than values shown in graph.
 The lowest fan tap in the operating indoor units should be selected on above graph.

(ii) Indoor fan tap: Lo



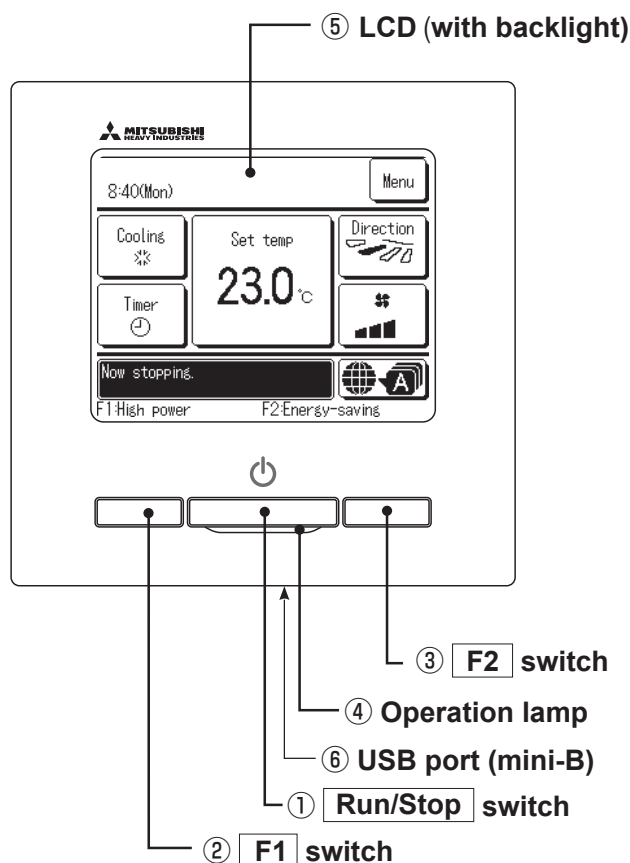
Capacity compensation coefficient is that of cooling capacity at each fan-tap.
 (Condition) Room temperature: 27°CDB/19°CWB
 (*) If room temperature is lower than 27°CDB/19°CWB, cooling capacity ratio tends to be smaller than values shown in graph.
 The lowest fan tap in the operating indoor units should be selected on above graph.

6. OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

6.1 Remote control (Option parts)

(1) Wired remote control

(a) Model RC-EX3A



Touch panel system, which is operated by tapping the LCD screen with a finger, is employed for any operations other than the ①Run/Stop, ②F1 and ③F2 switches.

① Run/Stop switch

One push on the button starts operation and another push stops operation.

If the backlight is ON setting, when the screen is tapped while the backlight is turned off, the backlight only is turned on. (Operations with switches ①, ② and ③ are excluded.)

② F1 switch ③ F2 switch

This switch starts operation that is set in F1/F2 function setting.

⑥ USB port

USB connector (mini-B) allows connecting to a personal computer.

④ Operation lamp

This lamp lights in green (yellow-green) during operation. It changes to red (orange) if any error occurs.

For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

Operation lamp luminance can be changed.

Note(1) When connecting to a personal computer, do not connect simultaneously with other USB devices. Please be sure to connect to the computer directly, without going through a hub, etc.

⑤ LCD (with backlight)

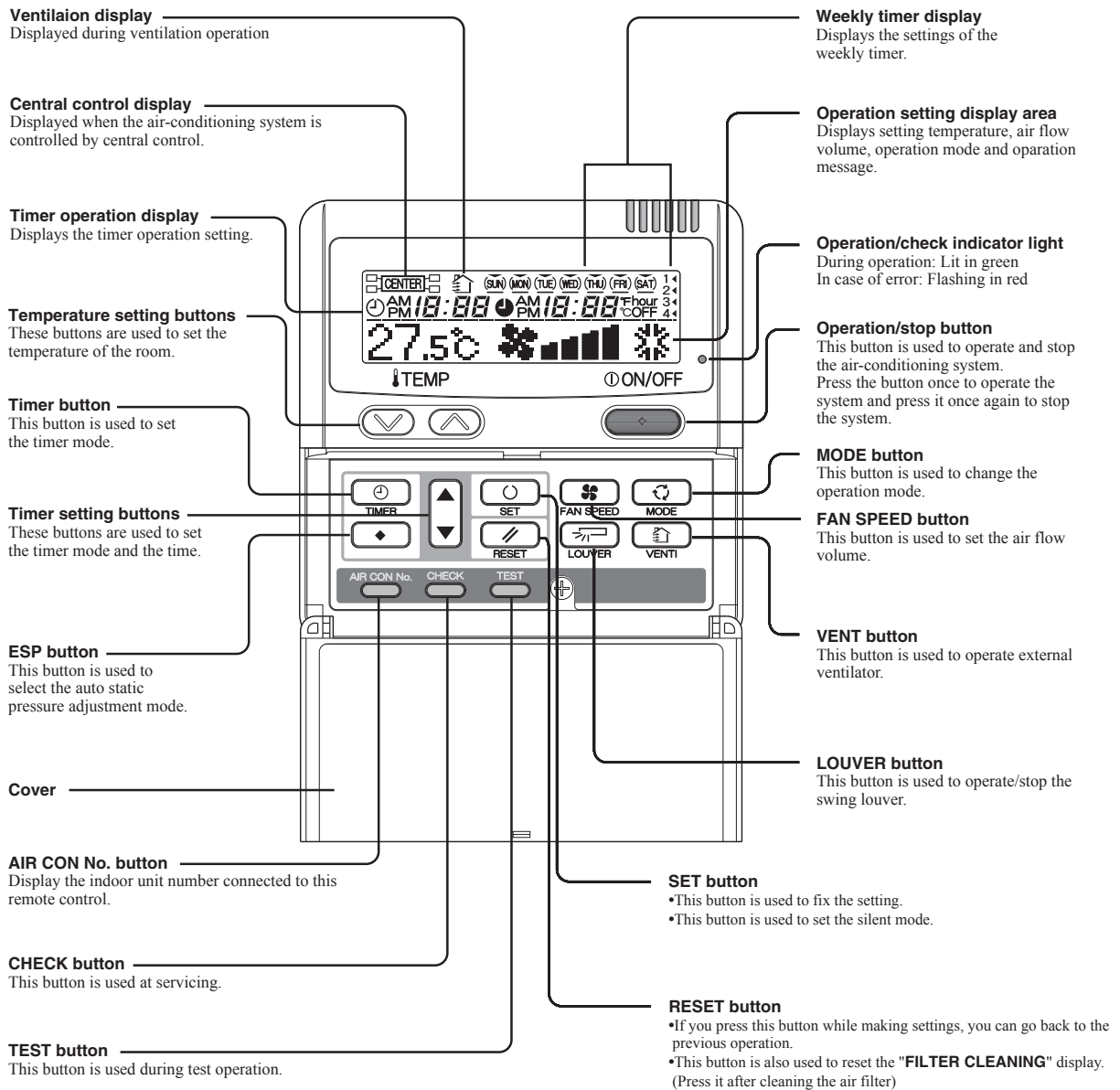
A tap on the LCD lights the backlight.

The backlight turns off automatically if there is no operation for certain period of time. Lighting period of the backlight lighting can be changed.

(b) Model RC-E5

The figure below shows the remote control with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation. Characters displayed with dots in the liquid crystal display area are abbreviated.

The figure below shows the remote control with the cover opened.

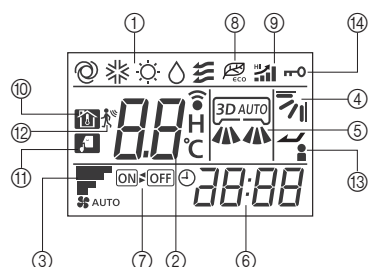


* All displays are described in the liquid crystal display for explanation.

(2) Wireless remote control

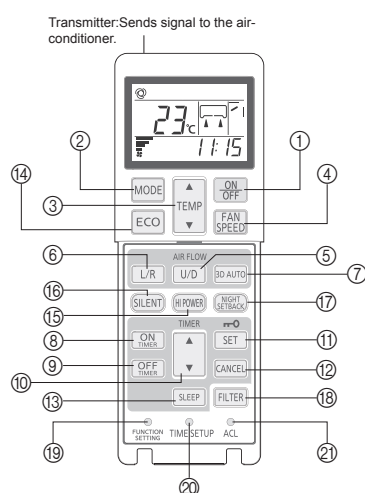
Model RCN-E2

Indication section



| | | |
|---|--|--|
| ① | OPERATION MODE display SET TEMP display | Indicates selected operation mode. Indicates set temperature. |
| ② | SLEEP TIMER time display Indoor function setting number display | Indicates the amount of time remaining on the sleep timer. Indicates the setting number of the indoor function setting. |
| ③ | FAN SPEED display | Indicates the selected air flow volume. |
| ④ | UP/DOWN AIR FLOW display | Indicates the up/down louver position. |
| ⑤ | LEFT/RIGHT AIR FLOW display | Indicates the left/right louver position. |
| ⑥ | Clock display | Indicates the current time. If the timer is set, the ON TIMER and OFF TIMER setting times are indicated. |
| ⑦ | ON/OFF TIMER display | Displayed when the timer is set. |
| ⑧ | ECO mode display | Displayed when the energy-saving operation is active. |
| ⑨ | HI POWER display | Displayed when the high power operation is active. |
| ⑩ | NIGHT SETBACK display | Displayed when the home leave mode is active. |
| ⑪ | SILENT display | Displayed when the silent mode control is active. |
| ⑫ | Motion sensor display | Displayed when the infrared sensor control(motion sensor control) is enabled. |
| ⑬ | Anti draft setting display | Displayed when anti draft setting is enabled. |
| ⑭ | Child lock display | Displayed when child lock is enabled. |

Operation section



| | | |
|---|-------------------------|---|
| ① | ON/OFF button | When this is pressed once, the air-conditioner starts to operate and when this is pressed once again, it stops operating. |
| ② | MODE button | Every time this button is pressed, displays switch as below |
| ③ | TEMP button | Change the set temperature by pressing ▲ or ▼ button. |
| ④ | FAN SPEED button | The fan speed is switched in the following order: 1-speed → 2-speed → 3-speed → 4-speed → AUTO → 1-speed. |
| ⑤ | U/D button | Used to determine the up/down louver position. |
| ⑥ | L/R button | Used to determine the left/right louver position. |
| ⑦ | 3D AUTO button | Used to switch whether or not to enable or disable 3D AUTO mode. |
| ⑧ | ON TIMER button | Used to set the ON TIMER. |
| ⑨ | OFF TIMER button | Used to set the OFF TIMER. |
| ⑩ | SELECT button | Used to switch the time when setting the timer or adjusting the time. Used to switch the settings of the indoor function. |
| ⑪ | SET button | Used to determine the setting when setting the timer or adjusting the time. Used to determine the settings of the indoor function. When press and hold SET button, Child Lock is enabled. |
| ⑫ | CANCEL button | Used to cancel the timer setting. |
| ⑬ | SLEEP button | Used to set the sleep timer. |
| ⑭ | ECO button | Pressing this button starts the energy-saving operation. Pressing this button again cancels it. |
| ⑮ | HI POWER button | Pressing this button starts the high power operation. Pressing this button again cancels it. |
| ⑯ | SILENT button | Pressing this button starts the silent mode control. Pressing this button again cancels it. |
| ⑰ | NIGHT SETBACK button | Pressing this button starts the home leave mode. Pressing this button again cancels it. |
| ⑱ | FILTER button | Pressing this button resets FILTER SIGN. |
| ⑲ | FUNCTION SETTING switch | Used to set the indoor function. |
| ⑳ | TIME SETUP switch | Used to set the current time. |
| ㉑ | ACL switch | Used to reset the microcomputer. |

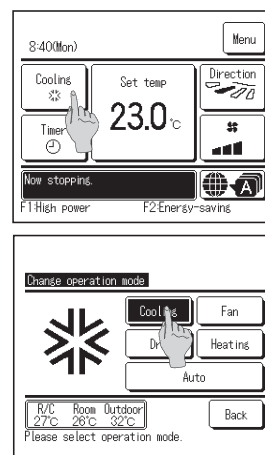
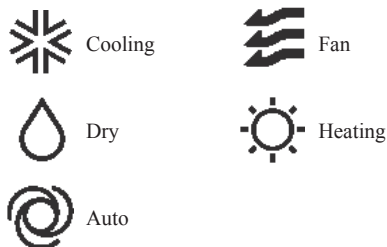
6.2 Operation control function by the wired remote control

(1) Model RC-EX3A

(a) Switching sequence of the operation mode switches of remote control

- (i) Tap the change operation mode button on the TOP screen.
- (ii) When the change operation mode screen is displayed, tap the button of desired mode.
- (iii) When the operation mode is selected, the display returns to the TOP screen.

Icons displayed have the following meanings.



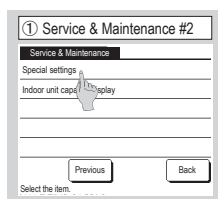
Notes(1) Operation modes which cannot be selected depending on combinations of indoor unit and outdoor unit are not displayed.

- (2) When the Auto is selected, the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

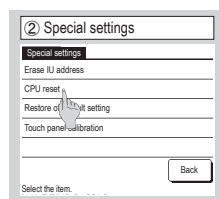
(b) CPU reset

Reset CPU from the remote control as follows.

TOP screen ⇒ ⇒ ⇒



The selected screen is displayed.



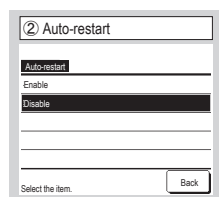
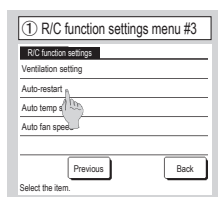
The selected screen is displayed.

Microcomputers of indoor unit and outdoor unit connected are reset (State of restoration after power failure).

(c) Power failure compensation function (Electric power source failure)

Enable the Auto-restart function from the remote control as follows.

TOP screen ⇒ ⇒ ⇒



If the unit stops during operation,

It returns to the state before the power failure as soon as the power source is restored (After the end of the primary control at the power on).

It stops after the restoration of power source.

- Since the status of remote control is retained in memory always, it restarts operations according to the contents of memory as soon as the power source is restored. Although the timer mode is cancelled, the weekly timer, peak cut timer and silent mode timer operate according to the following contents:

- When the clock setting is valid : These timer settings are also valid.
- When the clock setting is invalid : These timer settings become “Invalid” since the clock setting is invalid. These timer settings have to be changed to “Valid” after the timer setting.

●Content memorized with the power failure compensation are as follows.

Note(1) Items f) and g) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

- a) At power failure – Operating/stopped
If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized.
- b) Operation mode
- c) Air flow volume mode
- d) Room temperature setting
- e) Louver auto swing/stop
However, the stop position (4-position) is cancelled so that it returns to Position (1).
- f) “Remote control function items” which have been set with the administrator or installation function settings (“Indoor function items” are saved in the memory of indoor unit.)
- g) Weekly timer, peak-cut timer or silent mode timer settings
- h) Remote control function setting

(d) Alert displays

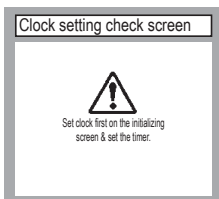
If the following a) to c) appear, check and repair as follows.

- a) Communication check between indoor unit and remote control



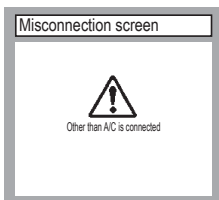
- This appears if communications cannot be established between the remote control and the indoor unit.
Check whether the system is correctly connected (indoor unit, outdoor unit, remote control) and whether the power source for the outdoor unit is connected.

- b) Clock setting check



- This appears when the timer settings are done without clock setting.
Set the clock setting before the timer settings.

- c) Misconnection



- This appears when something other than the air-conditioner has been connected to the remote control.
Check the location to which the remote control is connected.

(2) Model RC-E5**(a) Switching sequence of the operation mode switches of remote control****(b) CPU reset**

This functions when “CHECK” and “ESP” buttons on the remote control are pressed simultaneously. Operation is same as that of the power source reset.

(c) Power failure compensation function (Electric power source failure)

- This becomes effective if “Power failure compensation effective” is selected with the setting of remote control function.
- Since it memorizes always the condition of remote control, it starts operation according to the contents of memory no sooner than normal state is recovered after the power failure. Although the auto swing stop position and the timer mode are cancelled, the weekly timer setting is restored with the holiday setting for all weekdays.

After recovering from the power failure, it readjusts the clock and resets the holiday setting for each weekday so that the setting of weekly timer becomes effective.

- Content memorized with the power failure compensation are as follows.

Note (1) Items f, g) and h) are memorized regardless whether the power failure compensation is effective or not while the setting of silent mode is cancelled regardless whether the power failure compensation is effective or not.

a) At power failure – Operating/stopped

If it had been operating under the off timer mode, sleep timer mode, the state of stop is memorized.

(Although the timer mode is cancelled at the recovery from power failure, the setting of weekly timer is changed to the holiday setting for all weekdays.)

b) Operation mode

c) Air flow volume mode

d) Room temperature setting

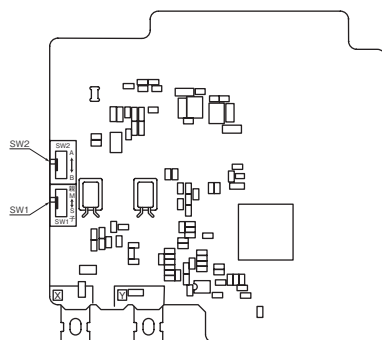
e) Louver auto swing/stop

However, the stop position (4-position) is cancelled so that it returns to Position (1).

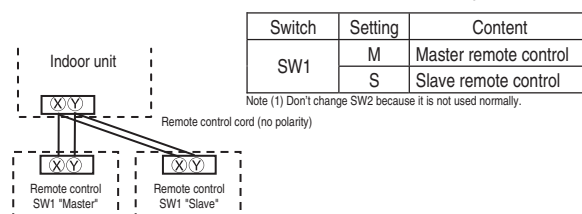
f) “Remote control function items” which have been set with the remote control function setting (“Indoor function items” are saved in the memory of indoor unit.)

g) Upper limit value and lower limit value which have been set with the temperature setting control

h) Sleep timer and weekly timer settings (Other timer settings are not memorized.)

[Parts layout on remote control PCB]**Master/ slave setting when more than one remote controls are used**

A maximum of two remote controls can be connected to one indoor unit (or one group of indoor units.)

**Caution**

When using multiple remote controls, the following displays or settings cannot be done with the slave remote control. It is available only with the master remote control.

- ① Louver position setting (set upper or lower limit of swinging range)
- ② Setting indoor unit functions
- ③ Setting temperature range
- ④ Operation data display
- ⑤ Error data display
- ⑥ Silent mode setting
- ⑦ Test operation of drain pump
- ⑧ Remote control sensor setting

(3) Operation and setting from wired remote control

A : Refer to the instruction manual for RC-EX series
 B : Refer to the installation manual for RC-EX series
 C : Loading a utility software via Internet

○ : Nearly same function setting and operations are possible.
 △ : Similar function setting and operations are possible.

| Setting & display item | Description | RC-EK3A | RC-E5 | |
|--|---|--|-------|---|
| 1.Remote control network | | | | |
| 1 Control plural indoor units by a single remote control | A remote control can control plural indoor units up to 16 (in one group of remote control network). An address is set to each indoor unit. | | ○ | |
| 2 Main/sub setting of remote controls | A pair of remote controls (including optional wireless remote control) can be connected within the remote control network. Set one to "Main" and the other to "Sub". | B | ○ | |
| 2.TOP screen, Switch manipulation | | | | |
| 1 Menu | "Control", "State", or "Details" can be selected. (3-8) | A | | |
| 2 Operation mode | "Cooling", "Heating", "Fan", "Dry" or "Auto" can be set. | A | ○ | |
| 3 Set temp. | "Set temperature" can be set by 0.5°C interval. | A | ○ | |
| 4 Air flow direction | "Air flow direction" [Individual flap control] can be set. Select Enable or Disable for the "3D AUTO" (in case of FDK). *1 | A | △ | |
| 5 Fan speed | "Fan speed" can be set. | A | ○ | |
| 6 Timer setting | "Timer operation" can be set. | A | ○ | |
| 7 ON/OFF | "On/Off operation of the system" can be done. | A | ○ | |
| 8 F1 SW | The system operates and is controlled according to the function specified to the F1 switch. | A | | |
| 9 F2 SW | The system operates and is controlled according to the function specified to the F2 switch. | A | | |
| 3.Useful functions | | | | |
| 1 Individual flap control | The moving range (the positions of upper limit and lower limit) of the flap for individual flap can be set. Set also the left and right limit positions for FDK. | A | △ | |
| 2 Anti draft setting When the panel with the anti-draft function is assembled. | When the panel with the anti draft function is assembled, select to Enable or Disable the anti draft setting for each operation mode and for each blow outlet. | A | | |
| 3 Timer settings | Set On timer by hour | The period of time to start operation after stopping can be set. • The period of set time can be set within range of 1hour-12hours (1hr interval). • The operation mode, set temp. and fan speed at starting operation can be set. | A | △ |
| | Set Off timer by hour | The period of time to stop operation after starting can be set. • The period of set time can be set within range of 1hour-12hours (1hr interval). | A | △ |
| | Set On timer by clock | The clock time to start operation can be set. • The set clock time can be set by 5 minutes interval. • [Once (one time only)] or [Everyday] operation can be switched. • The operation mode, set temp. and fan speed at starting operation can be set. | A | △ |
| | Set Off timer by clock | The clock time to stop operation can be set. • The set clock time can be set by 5 minutes interval. • [Once (one time only)] or [Everyday] operation can be switched. | A | △ |
| | Confirmation of timer settings | Status of timer settings can be seen. | A | |
| 4 Favorite setting [Administrator password] | Set the operation mode, setting temperature, air flow capacity and air flow direction for the choice setting operations. Set them for the Favorite set 1 and the Favorite set 2 respectively. | A | | |
| 5 Weekly timer | On timer and Off timer on weekly basis can be set. • 8-operation patterns per day can be set at a maximum. • The setting clock time can be set by 5 minutes interval. • Holiday setting is available. • The operation mode, set temp. and fan speed at starting operation can be set. | A | △ | |
| 6 Home leave mode [Administrator password] | When leaving home for a long period like a vacation leave, the unit can be operated to maintain the room temperature not to be hotter in summer or not to be colder in winter. • The judgment to switch the operation mode (Cooling ⇄ Heating) is done by the both factors of the set temp. and outdoor air temp. • The set temp. and fan speed can be set. | A | | |
| 7 External Ventilation When the ventilator is combined. | On/Off operation of the external ventilator can be done. It is necessary to set from [Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Ventilation setting]. • If the "Independent" is selected for the ventilation setting, the ventilator can be operated or stopped. | A | ○ | |
| 8 Select the language | Select the language to display on the remote control. • Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian, Polish, Japanese and Chinese. | A | | |
| 4.Energy-saving setting | | | | |
| Administrator password | | | | |
| 1 Sleep timer | To prevent the timer from keeping ON, set hours to stop operation automatically with this timer. • The selectable range of setting time is from 30 to 240 minutes. (10 minutes interval) • When setting is "Enable", this timer will activate whenever the ON timer is set. | A | △ | |
| 2 Peak-cut timer | Power consumption can be reduced by restructuring the maximum capacity. Set the [Start time], the [End time] and the capacity limit % (Peak-cut %). • 4-operation patterns per day can be set at maximum. • The setting time can be changed by 5 minutes interval. • The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval) • Holiday setting is available. | A | | |
| 3 Automatic temp. set back | After the elapse of the set time period, the current set temp. will be set back to the [Set back time.] • The setting can be done in cooling and heating mode respectively. • Selectable range of the set time is from 20 min. to 120 min. (10 min. interval). • Set the [Set back temp.] by 1°C interval. | A | △ | |
| 4 Infrared sensor control (Motion sensor control) When the panel with the infrared sensor (motion sensor) is assembled. | When the infrared sensor (motion sensor) is used, it is necessary to set Enable or Disable for the "Power control" and the "Auto-off". | A | | |
| 5.Filter | | | | |
| 1 Filter sign reset | Filter sign reset | A | | |
| | Setting next cleaning date | A | | |
| 6.User setting | | | | |
| 1 Internal settings | Clock setting | The current date and time can be set or revised. • If a power failure continues no longer than 80 hours, the clock continues to tick by the built-in power source. | A | △ |
| | Date and time display | [Display] or [Hide] the date and/or time can be set, and [12H] or [24H] display can be set. | A | |
| | Summer time | When select [Enable], the +1hour adjustment of current time can be set. When select [Disable], the [Summer time] adjustment can be reset. | A | |
| | Contrast | The contrast of LCD can be adjusted higher or lower. | A | |
| | Backlight | Switching on/off a light can be set and period of the lighting time can be set within the range of 5sec-90sec (5sec interval). | A | |
| | Control sound | It can set with or without [Control sound (beep sound)] at touch panel. | A | |
| | Operation lamp luminance | This is used to adjust the luminance of operation lamp. | A | |
| 2 Administrator settings [Administrator password] | Permission/Prohibition setting | • Permission/Prohibition setting of operation can be set. [On/Off] [Change set temp] [Change operation mode] [Change flap direction] [Change fan speed] [High power operation] [Energy-saving operation] [Timer] Request for administrator can be set. [Individual flap control] [Weekly timer] [Select the language] [Anti draft setting] | A | △ |
| | Outdoor unit silent mode timer | The period of time to operate the outdoor unit by prioritizing the quietness can be set. • The [Start time] and the [End time] for operating outdoor unit in silent mode can be set. • The period of the operation time can be set once a day by 5 minutes interval. | A | △ |
| | Setting temp. range | The upper/lower limit of temp. setting range can be set. • The limitation of indoor temp. setting range can be set for each operation mode in cooling and heating. | A | △ |
| | Temp. increment setting | The temp. increment setting can be changed by 0.5°C or 1.0°C. | A | |
| | Set temp. display | Ways of displaying setting temperatures can be selected. | A | |

| Setting & display item | | Description | RC-EX3A | RC-E5 | | |
|--|---|--|--|--|---|---|
| 2 Administrator settings [Administrator password] | R/C display setting | Register [Room name] [Name of I/U] Display [Indoor temp. display] or not. Display [Error code display] or not. Display [Heating stand-by display] [Defrost operation display] [Auto cooling/heating display] [Display temp. of R/C, Room, Outdoor] or not | A | △ | | |
| | Change administrator password | The administrator password can be changed. (Default setting is "0000") The administrator password can be reset. | A B | | | |
| | F1/F2 function setting | Functions can be set for F1 and F2. Selectable functions: [High power operation], [Energy-saving operation], [Silent mode cont.], [Home leave mode], [Favorite set 1], [Favorite set 2] and [Filter sign reset]. | A | | | |
| 7. Service setting | | | | | | |
| 1 Installer settings [Service password] | Installation date | The [Installation date] can be registered. • When registering the [Installation date], the [Next service date] is displayed automatically. (For changing the [Next service date], please refer the item of [Service & Maintenance]) | B | | | |
| | Company information | The [Company information] can be registered and can be displayed on the R/C. • The [Company] can be registered within 26 characters. • The [Phone No.] can be registered within 13 digits. | B | | | |
| | Test run | On/Off operation of the test run can be done. | | | | |
| | Cooling test run | The [Cooling test run] can be done at 5°C of set temp. for 30 minutes. | B | ○ | | |
| | Drain pump test run | Only drain pump can be operated. | | | | |
| | Static pressure adjustment | In case of combination with only the ducted indoor unit which has a function of static pressure adjustment, the static pressure is adjustable. • It can be set for each indoor unit individually. | B | | | |
| | Change auto-address | The set address of each indoor unit decided by auto-address setting method can be changed to any other address. (For multiple KX units only) | B | △ | | |
| | Address setting of main IU | Main indoor unit address can be set. • Only the Main indoor unit can change operation mode and the Sub indoor units dominated by the Main indoor shall follow. • The Main indoor unit can domain 10 indoor units at a maximum. | B | △ | | |
| | IU back-up function | When a pair of indoor units (2 groups) is connected to one unit of remote control, it can be set Enable or Disable for the [IU rotation], [IU capacity back-up] and [IU fault back-up] | B | | | |
| | Infrared sensor setting (Motion sensor setting) When the panel with the infrared sensor (motion sensor) is assembled. | Set Enable or Disable for the infrared sensor detectors of indoor units connected to the remote control. If Disable is selected, it cannot be control the infrared sensor control for the energy-saving setting. | B | | | |
| 2 R/C function setting [Service password] | Main/Sub R/C | The R/C setting of [Main/Sub] can be changed. | B | ○ | | |
| | Return air temp. | When two or more indoor units are connected to one unit of remote control, suction sensors, which are used for the judgement by thermostat, can be selected. • It can be selected from [Individual], [Master IU] and [Average temp.]. | B | | | |
| | R/C sensor | It can be set the mode to switch to the remote control sensor. It can be selected from cooling and heating. | B | △ | | |
| | R/C sensor adjustment | The offset value of [R/C sensor] sensing temp. can be set respectively in heating and cooling. | B | △ | | |
| | Operation mode °C / °F | Enable or Disable can be set for each operation mode. Set the unit for setting temperatures. • °C or °F can be selected. | B | △ | | |
| | Fan speed | Fan speeds can be selected. | B | ○ | | |
| | External input | When two or more indoor units are connected to one unit of remote control, the range to apply CnT inputs can be set. | B | ○ | | |
| | Upper/lower flap control | [Stop at fixed position] or [Stop at any position] can be selected for the upper and lower louvers. | B | ○ | | |
| | Left/right flap control | [Fixed position stop] or [Stop at any position] can be selected for the right and left louvers. | B | ○ | | |
| | Ventilation setting | Combination control for ventilator can be set. | B | ○ | | |
| | Auto-restart | The operation control method after recovery of power failure happened during operation can be set. | B | ○ | | |
| | Auto temp. setting | [Enable] or [Disable] of [Auto temp. setting] can be selected. | B | | | |
| | Auto fan speed | [Enable] or [Disable] of [Auto fan speed] can be selected. | B | | | |
| | 3 IU settings [Service password] | Fan speed setting | The fan speed for indoor units can be set. | B | ○ | |
| | | Filter sign | The setting of filter sign display timer can be done from following patterns. | B | ○ | |
| External input 1 | | The connect of control by external input 1 can be changed. | B | ○ | | |
| External input 1 signal | | The type of external input 1 signal can be changed. | B | ○ | | |
| External input 2 | | The connect of control by external input 2 can be changed. | B | | | |
| External input 2 signal | | The type of external input 2 signal can be changed. | B | | | |
| Heating thermo-OFF temp. adjustment | | The judgement temp. of heating thermo-off can be adjusted within the range from 0 to +3°C (1°C interval) | B | △ | | |
| Return temperature adjustment | | The sensing temp. of return air temp. sensor built in the indoor unit can be adjusted within the range of ±2°C. | B | △ | | |
| Fan control in cooling thermo-OFF | | Fan control, when the cooling thermostat is turned OFF, can be changed. | B | ○ | | |
| Fan control in heating thermo-OFF | | Fan control, when the heating thermostat is turned OFF, can be changed. | B | ○ | | |
| Anti-frost temp. | | Judgment temperature for the anti-frost control during cooling can be changed. | B | ○ | | |
| Anti-frost control | | When the anti-frost control of indoor unit in cooling is activated, the fan speed can be changed. | B | ○ | | |
| Drain pump operation | | In any operation mode in addition to cooling and dry mode, the setting of drain pump operation can be done. | B | ○ | | |
| Keep fan operating after cooling is stopped | | The time period residual fan operation after stopping or thermo-off in cooling mode can be set. | B | ○ | | |
| Keep fan operating after heating is stopped | | The time period residual fan operation after stopping or thermo-off in heating mode can be set. | B | ○ | | |
| Intermittent fan operation in heating | | The fan operation rule following the residual fan operation after stopping or thermo-off in heating mode can be set. | B | ○ | | |
| Fan circulator operation | | In case that the fan is operated as the circulator, the fan control rule can be set. | B | | | |
| Control pressure adjust | | When only the OA processing units are operated, control pressure value can be changed. | B | | | |
| Auto operation mode | | The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns. | B | | | |
| Thermo. rule setting | | When selecting [Outdoor air temp. control], the judgment temp. can be offset by outdoor temp.. | B | | | |
| Auto fan speed control | Auto switching range for the auto fan speed control can be set. | B | | | | |
| IU overload alarm | If the difference between the setting temperature and the suction temperature becomes larger than the temperature difference set for the overload alarm, at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CnT-5). | B | | | | |
| 8. Contact company | External output setting | Functions assigned to the external outputs 1 to 4 can be changed. | B | | | |
| | 4 Service & Maintenance [Service password] | IU address | Max 16 indoor units can be connected to one remote control, and all address No. of the connected indoor units can be displayed. • The indoor unit conforming to the address No. can be identified by selecting the address No. and tapping [Check] to operate the indoor fan. | B | ○ | |
| | | Next service date | The [Next service date] can be registered. • The [Next service date] and [Company information] is displayed on the message screen. | A B | ○ | |
| | | Operation data | The [Operation data] for indoor unit and outdoor unit can be displayed. | B | ○ | |
| | | Error display | Error history | The error history can be displayed. | B | △ |
| | | | Display anomaly data | The operation data just before the latest error stop can be displayed. | | |
| | | | Erase anomaly data | Anomaly operation data can be erased. | | |
| | | | Reset periodical check | The timer for the periodical check can be reset. | | |
| | | Saving IU settings | The IU settings memorized in the indoor PCB connected to the remote control can be saved in the memory of the remote control. | B | | |
| | | Special settings | [Erase IU address] [CPU reset] [Restore of default setting] [Touch panel calibration] | B | △ | |
| Indoor unit capacity display | | Address No. and capacities of indoor units connected to the remote control are displayed. | B | | | |
| 9. Contact company | | | | | | |
| 9. Inspection | | | | | | |
| Confirmation of Inspection | | This is displayed when any error occurs. | A | △ | | |
| 10. PC connection | | | | | | |
| USB connection | | Weekly timer setting and etc., can be set from PC. | C | | | |

◆ Listed items may not function depending on the specifications of indoor and outdoor units which are combined.

6.3 Operation control function by the indoor control

(1) Operations of functional items during cooling/heating

| Operation Functional item | Cooling | | Fan | Heating | | | Dehumidifying |
|------------------------------|------------------|-------------------|------------------|--------------------|-------------------|------------------------|--|
| | Thermostat ON | Thermostat OFF | | Thermostat ON | Thermostat OFF | Hot start (Defrost) | |
| Compressor | ○ | × | × | ○ | × | ○ | ○/× |
| 4-way valve | × | × | × | ○ | ○ | ○(×) | × |
| Outdoor fan | ○ | × | × | ○ | × | ○(×) | ○/× |
| Indoor fan | ○ | ○ | ○ | ○/× | ○/× | ○/× | ○/× |
| Drain pump ⁽³⁾ | ○ | × ⁽²⁾ | × ⁽²⁾ | ○/× ⁽²⁾ | | | Thermostat ON:○ Thermostat OFF:× ⁽³⁾ |

Notes (1) ○: Operation ×: Stop ○/×: Turned ON/OFF by the control other than the room temperature control.

(2) ON during the drain motor delay control.

(3) Drain pump ON setting may be selected with the indoor unit function setting of the wired remote control.

(2) Dehumidifying (DRY) operation

(a) In case of with humidity sensor

Indoor ambient temperatures and humidity are controlled simultaneously with the relative humidity sensor (HS) and the suction temperature sensor [Thi-A (or the remote control temperature sensor when it is activated)], which are installed at the suction inlet.

- (i) When the operation has been started with cooling, if there is a difference of 2 °C or less between the suction and setting temperatures, the tap of indoor fan is lowered by one tap. This tap is retained for 3 minutes after changing the tap.
- (ii) After the above condition, when a difference between suction and setting temperature is lower than 3°C, and the relative humidity is high, the tap of indoor fan is lowered by one tap.
When the difference between suction and setting temperature is larger than 3°C, the tap of indoor fan is raised by one tap. This tap is retained for 3 minutes after changing the tap.
- (iii) When relative humidity becomes lower, the indoor fan tap is retained.
- (iv) In case of the thermostat OFF, the indoor fan tap at the thermostat ON is retained.

(b) In case of without humidity sensor

Return air temperature sensor [Thi-A (by the remote control when the remote control temperature sensor is enabled)] controls the indoor temperature environment simultaneously.

- (i) Operation is started in the cooling mode. When the difference between the return air temperature and the setting temperature is 2°C or less, the indoor fan tap is brought down by one tap. That tap is retained for 3 minutes after changing the indoor fan tap.
- (ii) If the return air temperature exceeds the setting temperature by 3°C during dehumidifying operation, the indoor fan tap is raised by one tap. That tap is retained for 3 minutes after changing the indoor fan tap.
- (iii) If the thermostat OFF is established during the above control, the indoor fan tap at the thermostat ON is retained so far as the thermostat is turned OFF.

(3) Timer operation

(a) RC-EX3A

(i) Sleep timer

Set the time from the start to stop of operation. The time can be selected in the range from 30 to 240 minutes (in the unit of 10-minute).

Note (1) Enable the "Sleep timer" setting from the remote control. If the setting is enabled, the timer operates at every time.

(ii) Set OFF timer by hour

Set the time to stop the unit after operation, in the range from 1 to 12 hours (in the unit of hour).

(iii) Set ON timer by hour

Set the time to start the unit after the stop of operation, in the range from 1 to 12 hours (in the unit of hour). It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

(iv) Set ON timer by clock

Set the time to start operation. The time can be set in the unit of 5-minute. This setting can be switched only once or daily. It is allowed also to set simultaneously the indoor temperature, operation mode, air flow rate and warm-up enabled/disabled.

Note (1) It is necessary to set the clock to use this timer.

(v) Set OFF timer by clock

Set the time to stop operation. The time can be set in the unit of 5-minute. This setting can be switched only once or daily.

Note (1) It is necessary to set the clock to use this timer.

(vi) Weekly timer

Set the ON or OFF timer for a week. Up to 8 patterns can be set for a day. The day-off setting is provided for holidays and non-business days.

Note (1) It is necessary to set the clock to use the weekly timer.

(vii) **Combination of patterns which can be set for the timer operations**

| | Sleep timer | Set OFF timer by hour | Set ON timer by hour | Set OFF timer by clock | Set ON timer by clock | Weekly timer |
|------------------------|-------------|-----------------------|----------------------|------------------------|-----------------------|--------------|
| Sleep timer | | × | × | ○ | ○ | ○ |
| Set OFF timer by hour | × | | × | × | × | × |
| Set ON timer by hour | × | × | | × | × | × |
| Set OFF timer by clock | ○ | × | × | | ○ | × |
| Set ON timer by clock | ○ | × | × | ○ | | × |
| Weekly timer | ○ | × | × | × | × | |

Note (1) ○: Allowed ×: Not

(b) RC-E5

(i) Sleep timer

Set the duration of time from the present to the time to turn off the air-conditioner.

It can be selected from 10 steps in the range from “OFF 1 hour later” to “OFF 10 hours later”. After the sleep timer setting, the remaining time is displayed with progress of time in the unit of hour.

(ii) OFF timer

Time to turn OFF the air-conditioner can be set in the unit of 10 minutes.

(iii) ON timer

Time to turn ON the air-conditioner can be set in the unit of 10 minutes. Indoor temperature can be set simultaneously.

(iv) Weekly timer

Timer operation (ON timer, OFF timer) can be set up to 4 times a day for each weekday.

(v) **Combination of patterns which can be set for the timer operations**

| Item | Sleep timer | OFF timer | ON timer | Weekly timer |
|--------------|-------------|-----------|----------|--------------|
| Sleep timer | | × | ○ | × |
| OFF timer | × | | ○ | × |
| ON timer | ○ | ○ | | × |
| Weekly timer | × | × | × | |

Notes (1) ○: Allowed ×: Not

(2) Since the ON timer, sleep timer and OFF timer are set in parallel, when the times to turn ON and OFF the air-conditioner are duplicated, the setting of the OFF timer has priority.

(4) Hot start (Cold draft prevention at heating)**(a) Operating conditions**

When either one of following conditions is satisfied, the hot start control is performed.

(i) From stop to heating operation

(ii) From cooling to heating operation

(iii) From heating thermostat OFF to ON

(iv) After completing the defrost operation (only on units with thermostat ON)

(b) Contents of operation

(i) Indoor fan motor control at hot start

1) Within 7 minutes after starting heating operation, the fan mode is determined depending on the condition of thermostat (fan control with heating thermostat OFF).

- a) Thermostat OFF
 - i) Operates according to the fan control setting at heating thermostat OFF.
 - ii) Even if it changes from thermostat OFF to ON, the fan continues to operate with the fan control at thermostat OFF till the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher.
 - iii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.
- b) Thermostat ON
 - i) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 25°C or lower, the fan is turned OFF and does not operate.
 - ii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 25°C or higher, the fan operates with the fan control at heating thermostat OFF.
 - iii) When the heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher, the fan operates with the set air flow volume.
- c) If the fan control at heating thermostat OFF is set at the “Set air flow volume” (from the remote control), the fan operates with the set air flow volume regardless of the thermostat ON/OFF.
- 2) Once the fan motor is changed from OFF to ON during the thermostat ON, the indoor fan motor is not turned OFF even if the heat exchanger temperature sensor detects lower than 25°C.

Note (1) When the defrost operation signal is received, it complies with the fan control during defrost operation.

- 3) Once the hot start is completed, it will not restart even if the temperature on the heat exchanger temperature sensor drops.
 - (ii) During the hot start, the louver is kept at the horizontal position.
 - (iii) When the fan motor is turned OFF for 7 minutes continuously after defrost operation, the fan motor is turned ON regardless of the temperatures detected with the indoor heat exchanger temperature sensor (Thi-R1, R2).

(c) Ending condition

- (i) If one of following conditions is satisfied during the hot start control, this control is terminated, and the fan is operated with the set air flow volume.
 - 1) Heat exchanger temperature sensor (Thi-R1 or R2, whichever higher) detects 35°C or higher.
 - 2) It has elapsed 7 minutes after starting the hot start control.

(5) Hot keep

Hot keep control is performed at the start of the defrost operation.

(a) Contents of operation

- (i) When the indoor heat exchanger temperature (detected with Thi-R1 or R2) drops to 35°C or lower, set the indoor fan to the low speed tap of each setting.
- (ii) During the hot keep, the louver is kept at the horizontal position.

(b) Ending condition

When the indoor fan is at the lower tap at each setting, it returns to the set air flow volume as the indoor heat exchanger temperature rises to 45°C or higher.

(6) Auto swing control

Note Even if [Auto Swing] is selected, the louver position with anti draft function is fixed to position 1.

(a) RC-EX3A

- (i) Louver control
 - 1) To operate the swing louver when the air-conditioner is operating, press the “Direction” button on the TOP screen of remote control. The wind direction select screen will be displayed.
 - 2) To swing the louver, touch the “Auto swing” button. The louver will move up and down. To fix the swing louver at a position, touch one of [1] - [4] buttons. The swing louver will stop at the selected position.
 - 3) Louver operation at the power on with a unit having the louver 4-position control function
 - The louver swings one time automatically (without operating the remote control) at the power on.
 - This allows the microcomputer recognizing and inputting the louver motor (LM) position.
- (ii) Automatic louver level setting during heating
 - At the hot start and the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (in order to prevent blowing of cool wind). The louver position display LCD continues to show the display which has been shown before entering this control.

(iii) Louver free stop control

If you touch the “Menu” → “Service setting” → “R/C function settings” → “Service password” buttons one after another on the TOP screen of remote control, the “Upper / lower flap control” screen is displayed. If the free stop is selected on this screen, the louver motor stops upon receipt of the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position before the stop.

(b) RC-E5

(i) Louver control

- 1) Press the “LOUVER” button to operate the swing louver when the air-conditioner is operating.
“SWING 扇” is displayed for 3 seconds and then the swing louver moves up and down continuously.
- 2) To fix the swing louver at a position, press one time the “LOUVER” button while the swing louver is moving so that four stop positions are displayed one after another per second.
When a desired stop position is displayed, press the “LOUVER” button again. The display stops, changes to show the “STOP 1 一” for 5 seconds and then the swing louver stops.
- 3) Louver operation at the power on with a unit having the louver 4-position control function
The louver swings one time automatically (without operating the remote control) at the power on.
This allows inputting the louver motor (LM) position, which is necessary for the microcomputer to recognize the louver position.

Note (1) If you press the “LOUVER” button, the swing motion is displayed on the louver position LCD for 10 second. The display changes to the “SWING 扇” display 3 seconds later.

(ii) Automatic louver level setting during heating

At the hot start with the heating thermostat OFF, regardless whether the auto swing switch is operated or not (auto swing or louver stop), the louver takes the level position (In order to prevent the cold start). The louver position display LCD continues to show the display which has been shown before entering this control.

(iii) Louver-free stop control

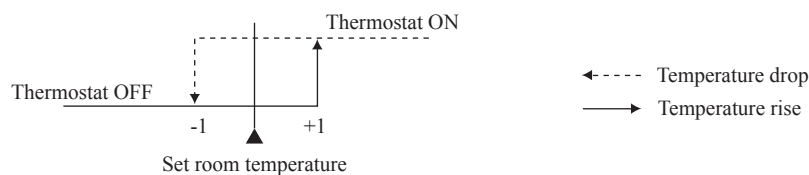
When the louver-free stop has been selected with the indoor function of wired remote control “扇 POSITION”, the louver motor stops when it receives the stop signal from the remote control. If the auto swing signal is received from the remote control, the auto swing will start from the position where it was before the stop.

Note (1) When the indoor function of wired remote control “扇 POSITION” has been switched, switch also the remote control function “扇 POSITION” in the same way.

(7) Thermostat operation

(a) Cooling

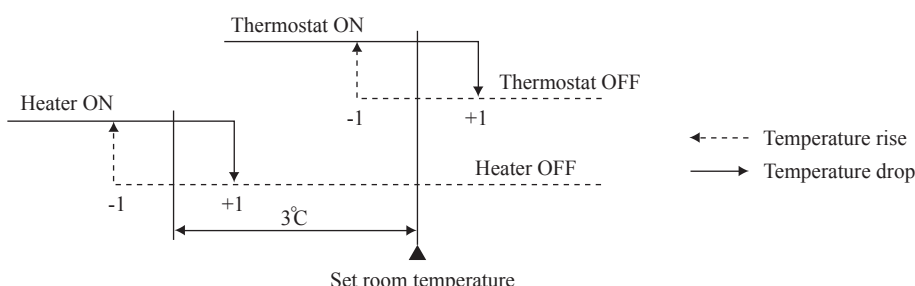
- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



- (iii) Thermostat is turned ON when the room temperature is in the range of $-1 < \text{Set temperature} < +1$ at the start of cooling operation (including from heating to cooling).

(b) Heating

- (i) Thermostat is operated with the room temperature control.
- (ii) Thermostat is turned ON or OFF relative to the set room temperature as shown below.



- (iii) Thermostat is turned ON when the room temperature is in the range of $-1 < \text{Set room temperature} < +1$ at the start of heating operation (including from cooling to heating).

(c) Fan control during heating thermostat OFF

- (i) Following fan controls during the heating thermostat OFF can be selected with the indoor function setting of the wired remote control.
- ① Low fan speed (Factory default) ② Set fan speed ③ Intermittence ④ Fan OFF
- (ii) When the “Low fan speed (Factory default)” is selected, the following taps are used for the indoor fans.
- For DC motor : ULo tap
 - For AC motor : Lo tap
- (iii) When the “Set fan speed” is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the “Intermittence” is selected, following controls are performed:
- 1) If the thermostat is turned OFF during the heating operation, the indoor fan stops.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo or Lo for 2 minutes. In the meantime the louver is controlled at level.
 - 3) After operating at ULo or Lo for 2 minutes, the indoor fan moves to the state of 1) above.
 - 4) If the thermostat is turned ON, it moves to the hot start control.
 - 5) When the heating thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo or Lo to stop.
The remote control uses the operation data display function to display temperatures and updates values of temperature even when the indoor fan is turned OFF.
 - 6) When the defrost operation starts while the heating thermostat is turned OFF or the thermostat is turned OFF during defrost operation, the indoor fan is turned OFF. (Hot keep or hot start control takes priority.) However, the suction temperature is updated at every 7-minute.
 - 7) When the heating thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the “Fan OFF” is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(d) Fan control during cooling thermostat OFF (Except FDTQ, FDUT15-56, FDUH, FDFW, FDFL, FDFU)

- (i) Following fan controls during the cooling thermostat OFF can be selected with the indoor function setting of the wired remote control.
- ① Low fan speed ② Set fan speed (Factory default) ③ Intermittence ④ Fan OFF
- (ii) When the “Low fan speed” is selected, the following taps are used for the indoor fans.
- For DC motor : ULo tap
- (iii) When the “Set fan speed” is selected, it is operated with the set fan speed also in the thermostat OFF condition.
- (iv) If the “Intermittence” is selected, following controls are performed:
- 1) If the thermostat is turned OFF during the cooling operation, the indoor fan stops.
 - 2) Indoor fan OFF is fixed for 5 minutes. After the 5 minutes, the indoor fan is operated at ULo for 2 minutes.
 - 3) After operating at ULo for 2 minutes, the indoor fan moves to the state of 1) above.
 - 4) If the thermostat is turned ON, the fan starts operation at set fan speed.
 - 5) When the cooling thermostat is turned OFF, the remote control displays the temperature detected at the fan stop and revises the temperature later when the indoor fan changes from ULo to stop.
By using operation data display function at wireless remote control, the temperature as displayad and the value is updated including the fan stops.
 - 6) When the cooling thermostat is turned ON or the operation is changed to another mode (including stop), this control is stopped immediately, and the operating condition is restored.
- (v) When the “Fan OFF” is selected, the fan on the indoor unit of which the thermostat has been turned OFF, is turned OFF. The same occurs also when the remote control sensor is effective.

(8) Filter sign

As the operation time (Total ON time of ON/OFF switch) accumulates to 180 hours (1), “FILTER CLEANING” is displayed on the remote control. (This is displayed when the unit is in trouble and under the central control, regardless of ON/OFF)

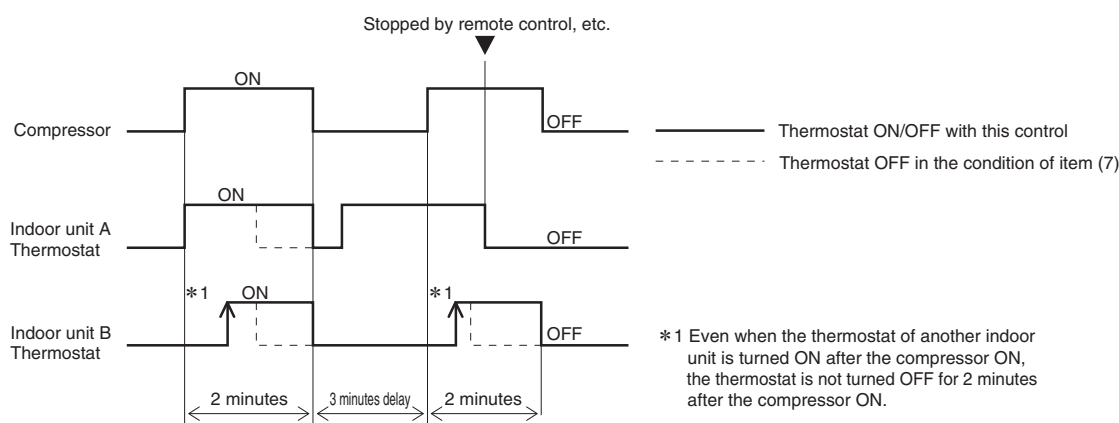
Notes (1) Time setting for the filter sign can be made as shown below using the indoor function of wired remote control “Filter sign”. (It is set at Setting 1 at the shipping from factory.)

| Filter sign setting | Function |
|---------------------|--|
| Setting 1 | Setting time: 180 hrs (Factory default) |
| Setting 2 | Setting time: 600 hrs |
| Setting 3 | Setting time: 1,000 hrs |
| Setting 4 | Setting time: 1,000 hrs (Unit stop) ⁽²⁾ |

(2) After the setting time has elapsed, the “FILTER CLEANING” is displayed and, after operating for 24 hours further (counted also during the stop), the unit stops.

(9) Compressor inching prevention control

- (a) Once the indoor thermostat has been turned ON, the thermostat is not turned OFF for 2 minutes (*1) after the compressor ON even if the thermostat is turned OFF at the state of item (7).



- (b) When the oil return control has started while the thermostat is turned ON, the thermostat is not turned OFF even if the thermostat OFF condition is satisfied during the oil return control.

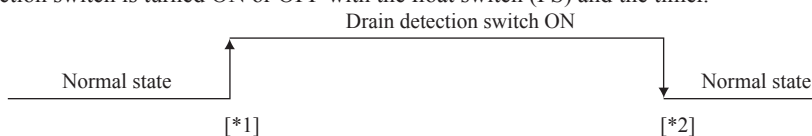
(10) Drain pump control

- (a) This control is operated when the inverter frequency is other than 0 rps during the cooling operation and automatic cooling and dehumidifying operations.
- (b) Drain pump ON condition continues for 5 (Models FDU224, 280 ; FDU 1800, 2400 : 20) minutes even when it enters the OFF range according to (i) above after turning the drain pump ON, and then stops. The 5 (Models FDU224, 280 ; FDU 1800, 2400 : 20) minutes delay continues also in the event of anomalous stop.
- (c) The drain pump is operated with the 5 (Models FDU224, 280 ; FDU 1800, 2400 : 20) minutes delay operation when the compressor is changed from ON to OFF.
- (d) Even in conditions other than the above (such as heating, fan, stop, cooling thermostat OFF), the drain pump control is performed by the drain detection.
- (e) Following settings can be made using the indoor function setting of the wired remote control.
- ☁ [Standard (in cooling)] : Drain pump is run during cooling.
 - ☁☀ [Operate in standard & heating] : Drain pump is run during cooling and heating.
 - ☁☀☀☀ [Operate in heating & fan] : Drain pump is run during cooling, heating and fan.
 - ☁☀☀ [Operate in standard & fan] : Drain pump is run during cooling and fan.

Note (1) Values in [] are for the RC-EX3A model.

(11) Drain pump abnormalities detection

- (a) Drain detection switch is turned ON or OFF with the float switch (FS) and the timer.



[* 1] Drain detection switch is turned “ON” when the float switch “Open” is detected for 3 seconds continuously in the drain detectable space.

[* 2] Drain detection switch is turned “OFF” when the float switch “Close” is detected for 10 seconds continuously.

- (i) It detects always from 30 seconds after turning the power ON.
 - 1) There is no detection of anomalous draining for 10 seconds after turning the drain pump OFF.
 - 2) Turning the drain detection switch “ON” causes to turn ON the drain pump forcibly.
 - 3) Turning the drain detection switch “OFF” releases the forced drain pump ON condition.

- (b) Indoor unit performs the control A or B depending on each operating condition.

| | Indoor unit operation mode | | | | |
|----------------|----------------------------|---------|-----|--------------------|---------|
| | Stop ⁽¹⁾ | Cooling | Dry | Fan ⁽²⁾ | Heating |
| Compressor ON | Control A | | | | |
| Compressor OFF | Control B | | | | |

Notes (1) Including the stop from the cooling, dehumidifying, fan and heating, and the anomalous stop
 (2) Including the “Fan” operation according to the mismatch of operation modes

- (i) Control A
 - 1) If the float switch detects any anomalous draining condition, the unit stops with the anomalous stop (displays E9) and the drain pump starts. After detecting the anomalous condition, the drain motor continues to be ON.
 - 2) It keeps operating while the float switch is detecting the anomalous condition.
- (ii) Control B

If the float switch detects any anomalous drain condition, the drain motor is turned ON for 5 (Models FDU224, 280 ; FDU 1800, 2400 : 20) minutes, and at 10 seconds after the drain motor OFF it checks the float switch. If it is normal, the unit is stopped under the normal mode or, if there is any anomalous condition, E9 is displayed and the drain motor is turned ON. (The ON condition is maintained during the drain detection.)

(12) Operation check/drain pump test run operation mode

- (a) If the power is turned on by the DIP switch (SW7-1) on the indoor unit control PCB when electric power source is supplied, it enters the mode of operation check/drain pump test run. It is ineffective (prohibited) to change the switch after turning power on.
- (b) When the communication with the remote control has been established within 60 seconds after turning power on by the DIP switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the drain pump test run mode.

Note (1) To select the drain pump test run mode, disconnect the remote control connector (CnB) on the indoor unit PCB to shut down the remote control communication.

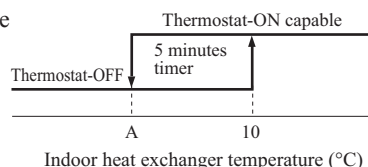
- (c) Operation check mode
 There is no communication with the outdoor unit but it allows performing operation in respective modes by operating the remote control.
- (d) Drain pump test run mode (Except FDK)
 As the drain pump test run is established, the drain pump only operates and during the operation protective functions by the microcomputer of indoor unit become ineffective.

(13) Cooling, dehumidifying frost protection

- (a) To prevent frosting during cooling mode or dehumidifying mode operation, the of thermostat-OFF if the indoor heat exchanger temperature (detected with Thi-R) drops to 1.0 °C or lower at 4 minutes after the thermostat-ON. If the indoor unit heat exchanger temperature is 1.0 °C or lower after 5 minutes, the indoor unit is controlled thermostat-OFF. If it becomes 10°C or higher, the control terminates. When the indoor heat exchanger temperature has become as show, the indoor unit send heat source unit the “Anti-frost” signal.

• Frost prevention temperature setting can be selected with the indoor unit function setting of the wired remote control.

| Item | Symbol | A |
|-------------------------------------|--------|-----|
| Temperature - Low (Factory default) | | 1.0 |
| Temperature - High | | 2.5 |



- Compressor forced off temperature (In case of with humidity sensor)

Hs > 50%

| Item | Low | High |
|--------|-----|------|
| Symbol | | |
| A | 1.0 | 2.5 |

Hs ≤ 50%

| Item | Low | High |
|--------|------|------|
| Symbol | | |
| A | -0.5 | 1.0 |

(b) Selection of indoor fan speed

If it enters the frost prevention control during cooling operation (including dehumidifying), the indoor fan speed is switched.

- When the indoor return air temperature (Thi-A) is 18°C or higher and the indoor heat exchanger temperature (detected with Thi-R) detects the compressor frequency drop start temperature A°C+1°C, of indoor fan speed is increased by 20min⁻¹.
- If the phenomenon of (i) above is detected again after the acceleration of indoor fan, indoor fan speed is increased further by 20min⁻¹.

Note (1) Indoor fan speed can be increased by up to P-Hi.

(14) Anomalous fan motor

- After starting the fan motor, if the fan motor speed is 200min⁻¹ or less is detected for 30 seconds continuously and 4 times within 60 minutes, then fan motor stops with the anomalous stop (E16).
- If the fan motor fails to reach at -50 (FDU : -500) min⁻¹ less than the required speed, it stops with the anomalous stop (E20).

(15) Plural unit control – Control of 16 units group by one remote control

(a) Function

One remote control can control a group of multiple number of unit (Max. 16 indoor units). “Operation mode” which is set by the remote control can operate or stop all units in the group one after another in the order of unit. No.⁽¹⁾. Thermostat and protective function of each unit function independently.

Note (1) Unit No. is set by SW1, SW2, and SW5-2 on the indoor control PCB.

(b) Display to the remote control

- Central or each remote control basis, heating preparation: the smallest unit No. among the operating units in the remote mode (or the center mode unless the remote mode is available) is displayed.
- Inspection display, filter sign: Any of unit that starts initially is displayed.

(c) Confirmation of connected units

(i) In case of RC-EX3A remote control

If you touch the buttons in the order of “Menu” → “Service setting” → “Service & Maintenance” → “Service password” → “IU address” on the TOP screen of remote control, the indoor units which are connected are displayed.

(ii) In case of RC-E5 remote control

Pressing “AIR CON No.” button on the remote control displays the indoor unit address. If “▲” “▼” button is pressed at the next, it is displayed orderly starting from the unit of smallest No.

(d) In case of anomaly

If any anomaly occurs on a unit in a group (a protective function operates), that unit stops with the anomalous stop but any other normal units continue to run as they are.

(e) Signal wiring procedure

Signal wiring between indoor and outdoor units should be made on each unit same as the normal wiring. For the group control, connect the remote control wiring to each indoor unit via terminal block for the remote control.

Connect the remote control wiring separately from the power source cable or wires of other electric devices (AC220V or higher).

(16) Fan speed setting control

When sufficient air flow rate cannot be obtained from the indoor unit which is installed at a room with high ceiling, the air flow rate can be increased by changing the fan tap. To change the fan tap, use the indoor unit function “Fan speed setting” on the wired remote control.

| Fan tap | | Indoor unit air flow rate setting | | | | Series (Wired remote control) |
|-------------------|---------------|-----------------------------------|-----------------|------------|------------|--|
| | | Hi - Me - Lo | Hi - Me - ULo | Hi - Lo | Hi - Me | |
| Fan speed setting | Standard | P-Hi1 - Hi - Me - Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | Except FDT, FDE (RC-EX3A) |
| | | P-Hi2 - Hi - Me - ULo | Hi - Me - ULo | Hi - ULo | Hi - Me | Only FDT (RC-EX3A) |
| | | P-Hi2 - Hi - Me - Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | Only FDE (RC-EX3A) |
| | | UH - Hi - Me - Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | All series (RC-E5) |
| | Setting 1 | P-Hi1 - P-Hi1 - Hi - Me | P-Hi1 - Hi - Me | P-Hi1 - Me | P-Hi1 - Hi | Except FDT, FDE (RC-EX3A) |
| | | P-Hi2 - P-Hi1 - Hi - Me | P-Hi1 - Hi - Me | P-Hi1 - Me | P-Hi1 - Hi | Only FDT, FDTC, FDTW, FDTS, FDK (RC-EX3A) |
| | | P-Hi1 - Hi - Me - Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | Only FDE (RC-EX3A) |
| | Setting 2 | P-Hi2 - Hi - Me - Lo | Hi - Me - Lo | Hi - Lo | Hi - Me | Only FDT, FDTC, FDTW, FDTS, FDK, FDE (RC-EX3A) |
| | HIGH SPEED1,2 | UH - UH - Hi - Me | UH - Hi - Me | UH - Me | UH - Hi | All series (RC-E5) |

Notes (1) Factory default is Standard.

(2) At the hot-start and heating thermostat OFF, or other, the indoor fan is operated at the low speed tap of each setting.

(3) This function is not able to be set with wireless remote control or simple remote control (RCH-E3).

(17) Abnormal temperature sensor (return air/indoor heat exchanger) broken wire/short-circuit detection

(a) Broken wire detection

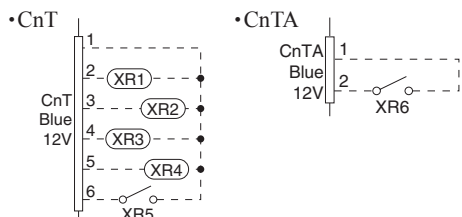
If the return air temperature sensor detects broken wire for 5 seconds continuously, the compressor stops (E7). If the heat exchanger temperature sensor detects broken wire for 5 seconds continuously, the compressor stops (E6).

(b) Short-circuit detection

If the return air temperature sensor detects short-circuit for 5 seconds continuously, the compressor stops (E6).
If the heat exchanger temperature sensor detects short-circuit for 5 seconds continuously, the compressor stops (E6).

(18) External input/output control (CnT or CnTA)

External input/output connectors are provided on the indoor unit control PCB, and each input/output is possible to be changed by RC-EX3A. Be sure to connect the wired remote control to the indoor unit. Remote operation with CnT/CnTA only is not possible.



| Input/Output | Connector | Factory default setting | RC-EX3A function name |
|------------------------------|-------------|---------------------------|-----------------------|
| Output | CnT-2 (XR1) | Operation output | External output 1 |
| | CnT-3 (XR2) | Heating output | External output 2 |
| | CnT-4 (XR3) | Thermostat ON output | External output 3 |
| | CnT-5 (XR4) | Inspection (Error) output | External output 4 |
| Input (Volt-free contact) | CnT-6 (XR5) | Remote operation input | External input 1 |
| | CnTA (XR6) | Remote operation input | External input 2 |

Priority order for combinations of CnT and CnTA input.

| | | CnTA | | | | | | |
|-----|--|------------------------|------------------------|------------------------------------|--|-----------------------------------|-----------------------------------|------------------|
| | | ① Operation stop level | ② Operation stop pulse | ③ Operation permission/prohibition | ④ Operation permission/prohibition pulse | ⑤ Cooling/heating selection level | ⑥ Cooling/heating selection pulse | ⑦ Emergency stop |
| CnT | ① Operation stop level | CnT ① | CnT ① | CnT ① + CnTA ② | CnT ① | CnT ① / CnTA ⑤ | CnT ① / CnTA ⑥ | CnT ① < CnTA ⑦ |
| | ② Operation stop pulse | CnT ② | CnT ② | CnT ② + CnTA ③ | CnT ② | CnT ② / CnTA ⑤ | CnT ② / CnTA ⑥ | CnT ② < CnTA ⑦ |
| | ③ Operation permission/prohibition level | CnT ③ > CnTA ① | CnT ③ > CnTA ② | CnT ③ + CnTA ③ | CnT ③ | CnT ③ / CnTA ⑤ | CnT ③ / CnTA ⑥ | CnT ③ < CnTA ⑦ |
| | ④ Operation permission/prohibition pulse | CnT ④ | CnT ④ | CnT ④ + CnTA ③※ | CnT ④ | CnT ④ / CnTA ⑤ | CnT ④ / CnTA ⑥ | CnT ④ < CnTA ⑦ |
| | ⑤ Cooling/heating selection level | CnT ⑤ / CnTA ① | CnT ⑤ / CnTA ② | CnT ⑤ / CnTA ③ | CnT ⑤ / CnTA ④ | CnT ⑤ | CnT ⑤ | CnT ⑤ / CnTA ⑦ |
| | ⑥ Cooling/heating selection pulse | CnT ⑥ / CnTA ① | CnT ⑥ / CnTA ② | CnT ⑥ / CnTA ③ | CnT ⑥ / CnTA ④ | CnT ⑥ | CnT ⑥ | CnT ⑥ / CnTA ⑦ |
| | ⑦ Emergency stop | CnT ⑦ > CnTA ① | CnT ⑦ > CnTA ② | CnT ⑦ > CnTA ③ | CnT ⑦ > CnTA ④ | CnT ⑦ / CnTA ⑤ | CnT ⑦ / CnTA ⑥ | CnT ⑦ + CnTA ⑦ |

Note (1) Following operation commands are accepted when the operation prohibition is set with CnTA as indicated with *.

Individual operation command from remote control, test run command from outdoor unit and operation command from option device, CnT input.

Reference: Explanation on the codes and the combinations of codes in the table above

- In case of CnT "Number", the CnT "Number" is adopted and CnTA is invalidated.
- In case of CnTA "Number", the CnTA "Number" is adopted and CnT is invalidated.
- In case of CnT "Number"/CnTA "Number", the CnT "Number" and the CnTA "Number" become independent functions each other.
- In case of CnT "Number" + CnTA "Number", the CnT "Number" and the CnTA "Number" become competing functions each other.
- In case of CnT "Number" > CnTA "Number", the function of CnT "Number" supersedes that of CnTA "Number".
- In case of CnT "Number" < CnTA "Number", the function of CnTA "Number" supersedes that of CnT "Number".
(The "Number" above means ① - ⑦ in the table.)

(a) Output for external control (remote display)

Indoor unit outputs the following signal for operation status monitoring.

| | Output name | Condition |
|----|-----------------------------------|---|
| 1 | Operation output | During operation |
| 2 | Heating output | During heating operation |
| 3 | Thermostat ON output | During compressor operation |
| 4 | Inspection (Error) output | When anomalous condition occurs. |
| 5 | Cooling output | During cooling operation |
| 6 | Fan operation output 1 | When indoor unit's fan is operating |
| 7 | Fan operation output 2 | When indoor unit's fan is operating, and fan speed is higher than Hi speed. |
| 8 | Fan operation output 3 | When indoor unit's fan is operating, and fan speed is Lower than Me speed. |
| 9 | Defrost/oil return output | When indoor unit receive defrost/oil return signal from the outdoor unit. |
| 10 | Ventilation output | When "Venti.ON" is selected from remote control |
| 11 | Heater output | Refer to " (7) Thermostat operation (b) Heating" |
| 12 | Free cooling output | When the ambient temp. is between 10-18 °C in cooling and fan operation |
| 13 | Indoor unit overload alarm output | Refer to "IU overload alarm" |

(b) Input for external control

The external input for the indoor unit can be selected from the following input by the wired remote control.

The input connectors (CnT-6 and CnTA) are equipped on the indoor unit control PCB.

“LEVEL INPUT(Factory default)” or ”PULSE INPUT” is selectable from the wired remote control.

| | Input name | Content |
|---|----------------------------|--|
| 1 | Run/Stop (Factory default) | Refer to [(18) (c) Remote operation input] |
| 2 | Permission/Prohibition | Refer to [(19) Operation permission/prohibition] |
| 3 | Cooling/Heating | Refer to [(21) Selection of cooling/heating external input function] |
| 4 | Emergency stop | Refer to [(22) Emergency stop input] |
| 5 | Setting temperature shift | Set temperature is shifted by +2/-2°C in cooling/heating. |
| 6 | Forced thermo-OFF | Unit goes thermo off. |
| 7 | Temporary stop | Refer to [(20) Temporary stop input] |
| 8 | Silent mode | Outdoor unit silent mode is activated. |

(c) Remote operation input

The indoor unit operation can be controlled by external input.

However it is not effective when “Center mode” is selected by central control.

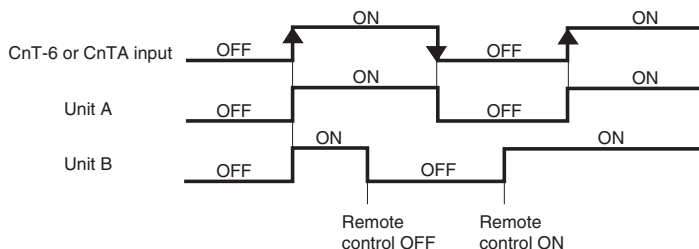
Only the “LEVEL INPUT” is recommended for this input, and operation status is changed as follows.

(i) In case of “Level input” setting (Factory default)

Input signal to CnT-6 or CnTA is OFF→ON unit ON

Input signal to CnT-6 or CnTA is ON→OFF unit OFF

Operation is not inverted.

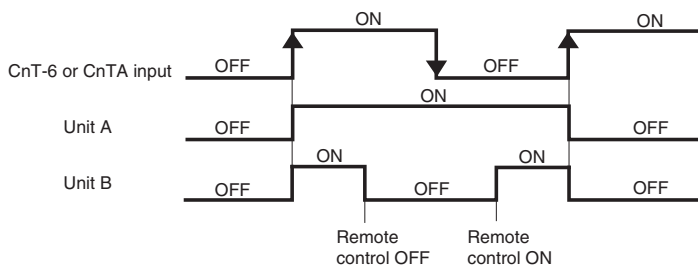


Note: The latest operation has priority.

It is available to operate/stop by remote control or central control.

(ii) In case of “Pulse input” setting (Local setting)

It is effective only when the input signal to CnT-6 or CnTA is changed OFF→ON, and at that time unit operation [ON/OFF] is inverted.



(iii) In case of multiple units (Max. 16 indoor units group) are connected to one wired remote control

When the R/C function setting of wired remote control for “External control set” is changed from “Individual (Factory default)” to “ For all units”, all units connected in one wired remote control system can be controlled by external operation input.

(19) Operation permission/prohibition

(In case of adopting card key switches or commercially available timers)

When the external input is selected to “Permission/Prohibition”, this control becomes effective.

However it is not effective when “Center mode” is selected by central control.

| Connector | Indoor function | |
|-----------|---|--|
| | RC-EX3A | RC-E5 |
| CnT | External input 1 : Permission/Prohibition | Operation permission/Prohibition : Valid |
| CnTA | External input 2 : Permission/Prohibition | No function |

Only the “LEVEL INPUT” is recommended for this input, and operation status is changed as follows.

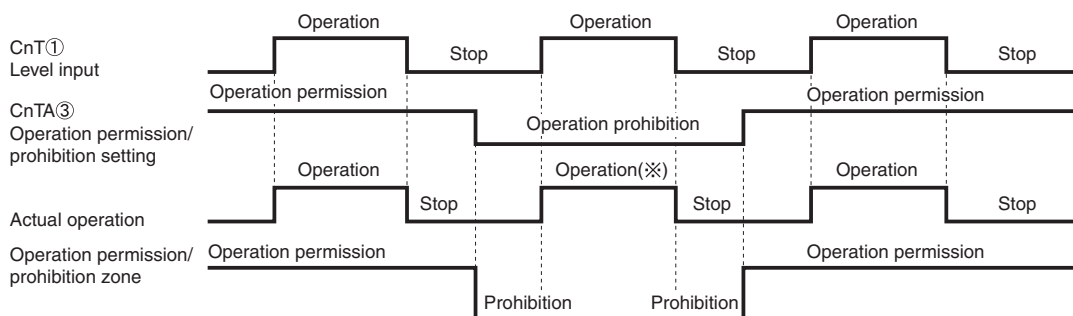
(a) In case of “Level input” setting (Factory default)

- (i) When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
- (ii) When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.

(b) In case of “Pulse input” setting (Local setting)

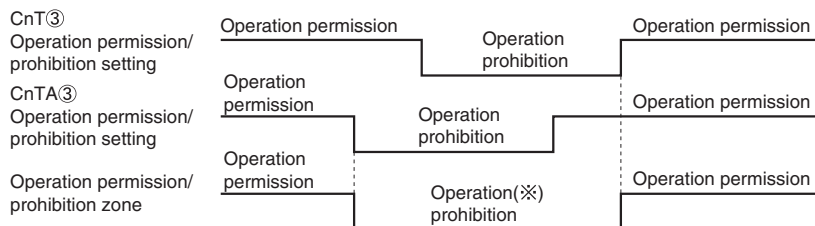
- (i) When card key switch is ON (Operation permission), the unit starts operation in conjunction with ON signal, and also start/stop operation of the unit from the wired remote control becomes available.
- (ii) When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.

(c) In case of CnT ① Operation stop level > CnTA ③ Operation permission/prohibition level



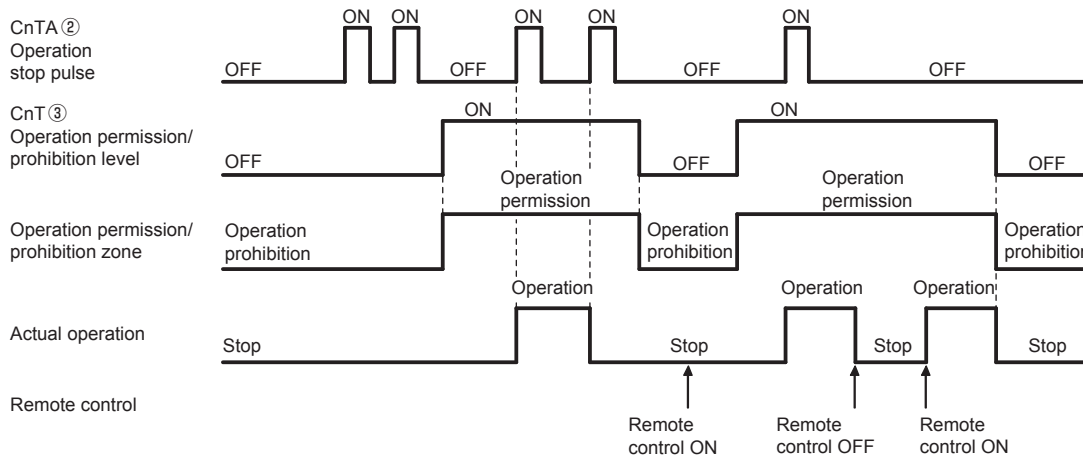
(※) CnT level input supersedes CnTA operation prohibition.

(d) In case of CnT ③ Operation permission/prohibition level + CnTA ③ Operation permission/prohibition level



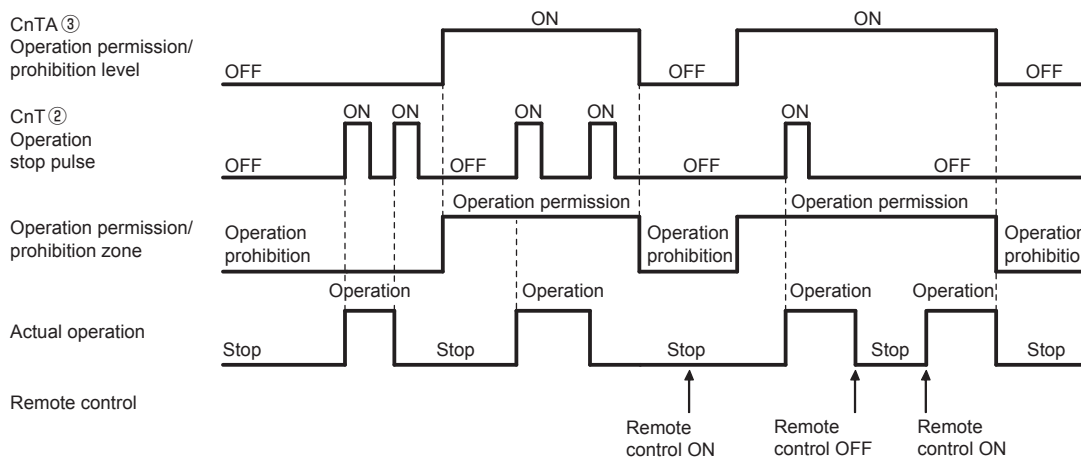
(※) Operation prohibition zone is determined by the OR judgment between CnT operation prohibition zone and CnTA operation prohibition zone.

(e) In case of CnT ③ Operation permission/prohibition level > CnTA ② Operation stop pulse



Note (1) If it is prohibited by CnT, all “Operation” and “Stop” commands are not accepted.

(f) In case of CnT② Operation stop pulse + CnTA ③ Operation permission/prohibition level

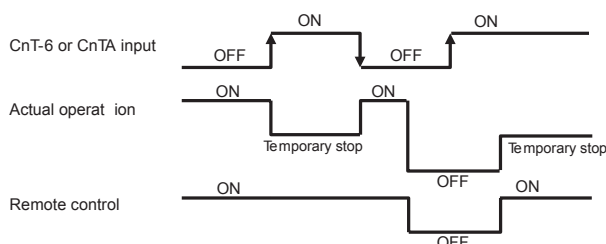


(20) Temporary stop input

In case of temporary stop, operation lamp of remote control lights, but indoor unit stop the operation.

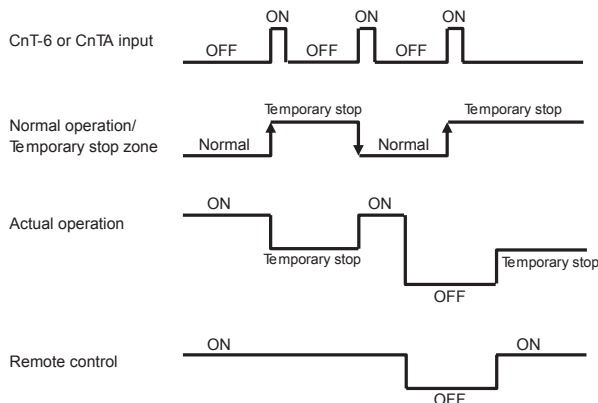
(a) In case of “Level input” setting (Factory default)

Input signal to CnT-6 or CnTA is OFF → ON : Temporary stop
 Input signal to CnT-6 or CnTA is OFF → ON : Normal operation



(b) In case of “Pulse input” setting (Local setting)

It is effective only when the input signal is changed OFF→ON, and “temporary stop/normal operation” is inverted.



(21) Selection of cooling/heating external input function

When “External input 1 or 2 setting: Cooling/heating” is set by the indoor unit function from remote control, the cooling or heating is selected with CnT-6 or CnTA.

(a) In case of “Level input” setting (Factory default)

- CnT-6 or CnTA: OPEN → Cooling operation mode
- CnT-6 or CnTA: CLOSE → Heating operation mode

(b) In case of “Pulse input” setting (Local setting)

If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).

(c) If the cooling/heating selection signal is given by the external input, the operation mode is transmitted to the remote control.

■ Selection of cooling/heating external input function

| External input selection | External input method | Operation | |
|---------------------------|-----------------------|-------------------------------|--|
| Cooling/heating selection | Level | External input (CnT or CnTA) | |
| | | Cooling/heating | |
| | | Cooling/heating (Competitive) | |
| | Pulse | External input (CnT or CnTA) | |
| | | Cooling/heating | |
| | | Cooling/heating (Competitive) | |

Note(1) Regarding the priority order for combinations of CnT and CnTA, refer to page 68.

(22) Emergency stop input

When the external input is selected to “Emergency stop”, it is possible to stop the outdoor unit operation by the external input to the indoor unit.

(a) Function setting

Emergency stop input can be selected by the indoor function of wired remote control.

| Connector | Indoor function | |
|-----------|-----------------------------------|------------------------|
| | RC-EX3A | RC-E5 |
| CnT | External input 1 : Emergency stop | Emergency stop : Valid |
| CnTA | External input 2 : Emergency stop | No function |

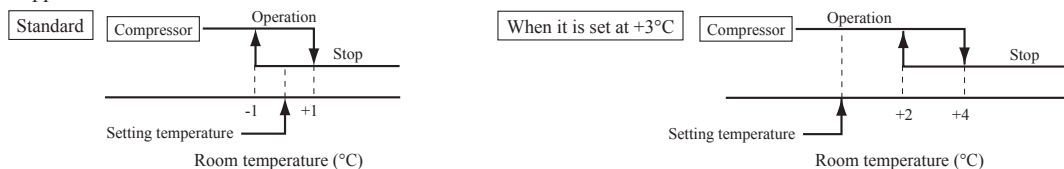
(b) Emergency stop control

When the external input is OFF, the indoor and outdoor units stop.

The indoor unit receive the external input stops the operation, and the outdoor unit which the stopped indoor unit are connected stops with [E-63].

(23) Room temperature detection temperature compensation during heating

With the standard specification, the compressor is turned ON/OFF with the thermostat setting temperature. When the thermostat is likely to turn OFF earlier because the unit is installed at the ceiling where warm air tends to accumulate, the setting can be changed with the wired remote control indoor unit function “*SP OFFSET”. The compressor and the heater are turned ON/OFF at one of the setting temperature +3, +2 or +1°C in order to improve the feeling of heating. The setting temperature, however, has the upper limit of 30°C.



(24) Return air temperature compensation

This is the function to compensate the deviation between the detection temperature by the return air temperature sensor and the measured temperature after installing the unit.

- (a) It is adjustable in the unit of 0.5°C with the wired remote control indoor unit function “RETURN AIR TEMP”.
 - +1.0°C, +1.5°C, +2.0°C
 - -1.0°C, -1.5°C, -2.0°C

- (b) Compensated temperature is transmitted to the remote control and the outdoor unit.

Note (1) The detection temperature compensation is effective on the indoor unit temperature sensor only.

(25) High power operation (RC-EX3A only)

It operates at with the setting temperature fixed at 16°C for cooling, 30°C for heating and maximum indoor fan speed for 15 minutes maximum.

(26) Energy-saving operation (RC-EX3A only)

It operates with the setting temperature fixed at 28°C for cooling, 22°C for heating or 25°C for auto. When fan control in cooling/heating thermo-OFF setting is “Set fan speed”, fan speed during thermo-OFF is changed to “Low”. (Maximum capacity is restricted at 80%.)

(27) Warm-up control (RC-EX3A only)

Operation will be started 5 to 60 minutes before use according to the forecast made by the microcomputer which calculates when the operation should be started in order to warm up the indoor temperature near the setting temperature at the setting time of operation start.

(28) Home leave mode (RC-EX3A only)

When the unit is not used for a long period of time, the room temperature is maintained at a moderate level, avoiding extremely hot or cool temperature.

- (a) Cooling or heating is operated according to the outdoor temperature (factory setting 35°C for cooling, 0°C for heating) and the setting temperature. (factory setting 33°C for cooling, 10°C for heating)
- (b) Setting temperature and indoor fan speed can be set by RC-EX3A.

(29) Auto temperature setting (RC-EX3A only)

Setting temperature is adjusted automatically at the adequate temperature the center setting temperature is 24°C by correcting the outdoor air temperature.

(30) Fan circulator operation (RC-EX3A only)

When the fan is used for circulation, the unit is operated as follows depending on the setting with the remote control.

- (a) If the invalid is selected with the remote control, the fan is operated continuously during the fan operation. (normal fan mode)
- (b) If the valid is selected with the remote control, the fan is operated or stopped when on the difference of the remote control temperature sensor and the return air temperature sensor becomes bigger than 3°C.

(31) The operation judgment is executed every 5 minutes (RC-EX3A only)

Setting temperature T_s is changed according to outdoor temperature.

This control is valid with cooling and heating mode. (Not auto mode)

- (a) Operate 5 minutes forcedly.
- (b) Setting temperature is adjusted every 10 minutes.
 - (i) Cooling mode
 $T_s = \text{outdoor temperature} - \text{offset value}$
 - (ii) Heating mode
 $T_s = \text{outdoor temperature} + \text{offset value}$
- (c) If the return air temperature lower than 18°C in cooling or return air temperature becomes higher than 25°C in heating, unit goes thermostat OFF.

(32) Auto fan speed control (RC-EX3A only)

In order to reach the room temperature to the set temperature as quickly as possible, the air flow rate is increased when the set temperature of thermostat differs largely from the return air temperature. According to temperature difference between set temperature and return air temperature, indoor fan tap are controlled automatically.

- Auto 1: Changes the indoor fan tap within the range of Hi ↔ Me ↔ Lo.
- Auto 2: Changes the indoor fan tap within the range of P-Hi ↔ Hi ↔ Me ↔ Lo.

(33) Indoor unit overload alarm (RC-EX3A only)

If the following condition is satisfied at 30 minutes after starting operation, RC-EX3A shows maintenance code "M07" and the signal is transmitted to the external output (CnT-2-5).

It is necessary to select "Indoor unit overload alarm output" by the external output setting.

- Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature by remote control + Alarm temperature difference
- Heating, Auto(Heating) : Indoor air temperature = Set room temperature by remote control - Alarm temperature difference

Alarm temperature difference is selectable between 5 to 10°C.

If the following condition is satisfied or unit is stopped, the signal is disappeared.

- Cooling, Dry, Auto(Cooling) : Indoor air temperature = Set room temperature + Alarm temperature difference -2°C
- Heating, Auto(Heating) : Indoor air temperature = Set room temperature - Alarm temperature difference +2°C

(34) Peak-cut timer (RC-EX3A only)

Power consumption can be reduced by restricting the maximum capacity.

Set the [Start time], the [End time] and the capacity limit % (Peak-cut %).

- 4-operation patterns per day can be set at maximum.
- The setting time can be changed by 5-minute interval.
- The selectable range of capacity limit % (Peak-cut %) is from 0% to 40-80% (20% interval).
- Holiday setting is available.

(35) Motion sensor control (RC-EX3A and RCN-E2 only)

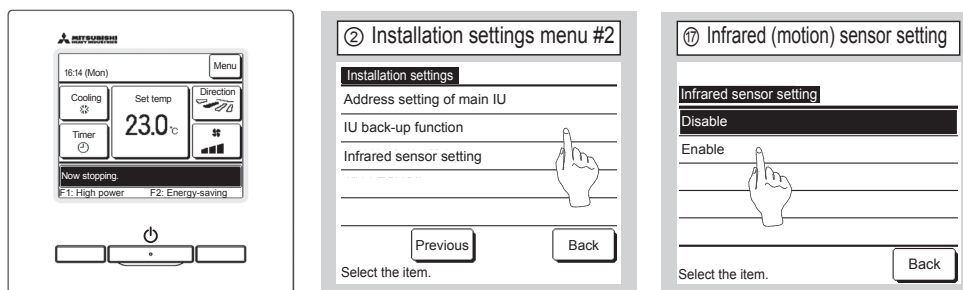
The sensor determines the presence of people and the amount of activity, and the following controls are done by the motion sensor.

Following settings are necessary to activate motion sensor control.

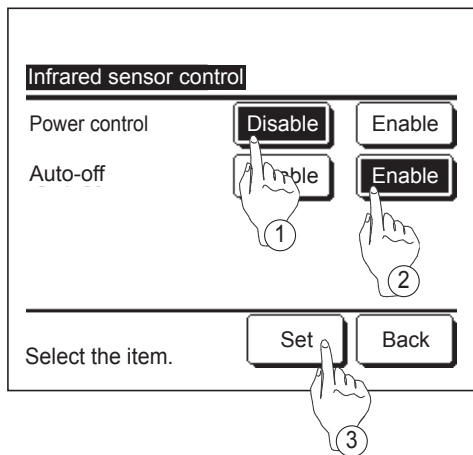
- Infrared (motion) sensor setting: Installation setting of remote control
The indoor unit which is set to "Enable" become valid.
- Infrared (motion) sensor control: Energy-saving setting of remote control
The function which is set to "Enable" become valid.

RC-EX3A

TOP screen **Menu** ⇒ **Service setting** ⇒ **Installation settings** ⇒ **Service password**



TOP screen **Menu** ⇒ **Energy-saving setting** ⇒ **Infrared sensor control** or **Motion sensor control**



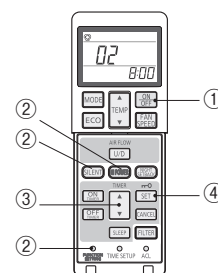
The Infrared sensor control screen and contents of the current settings are displayed.

- ① Enable/disable power control.
- ② Enable/disable auto-off.
- ③ After you set each item, tap the **Set** button.
The display returns to the Energy-saving setting menu screen.

RCN-E2

1. Set indoor functions

- ① Press the ON/OFF button to stop the unit.
 - ② Press the desired one of the buttons shown item 2. while holding down the FUNCTION SETTING switch.
 - ③ Use the selection buttons, ▲ and ▼, to change the setting.
 - ④ Press the SET button.
- The buzzer on the remote control signal receiver beeps twice, and the LED lamp flashes four times at two-second intervals.



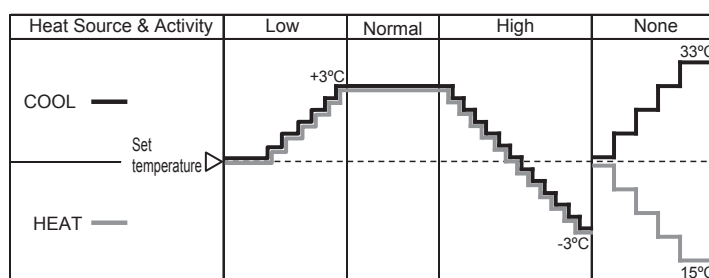
2. Setting details

| Button | Number indicator | Function setting |
|----------|------------------|--|
| SILENT | 00 | Infrared sensor setting (Motion sensor setting) : Disable |
| | 01 | Infrared sensor setting (Motion sensor setting) : Enable |
| HI POWER | 00 | Infrared sensor control (Motion sensor control) : Disable |
| | 01 | Infrared sensor control (Motion sensor control) : Power control only |
| | 02 | Infrared sensor control (Motion sensor control) : Auto OFF only |
| | 03 | Infrared sensor control (Motion sensor control) : Power control and Auto OFF |

(i) Power saving / comfort control

The set temperature is adjusted according to the presence of people and their amount of activity detected by the infrared (motion) sensor.

MODE:AUTO/COOL/HEAT mode operation



| | |
|-------------|--|
| Low | When the extent of human activity is low |
| High | When the extent of human activity is high |
| None | When there is no one in the room |

- When the “None” continues for 1 hour, the FAN SPEED is set Lo.

Notes (1) When the following operations are set, power saving control will be canceled.

- ① Energy-saving, Home leave mode, Warm-up control, Cooling operation check.
- ② When the operation mode is changed DRY or FAN.

(2) Not operable while the air-conditioner is OFF.

(ii) Auto-off control

When no activity is detected for 1 hour, unit will go stand-by mode.※ Unit will re-start operation automatically with the original set temperature by activity detection during the stand-by mode. When stand-by mode continues for 12 hours, unit stops.

※ Compressor keeps stopped regardless of the set temperature.

6.4 Operation control function by the outdoor control

(A) Normal control

(1) Operation of major functional components under each operation mode

| Functional Components \ Operation mode | Cooling | | Fan | Heating | | | Dehumidify |
|---|-------------------------------|------------------------|------------------------|-------------------------------------|------------------------|---------------------------------------|-------------------------------|
| | Thermostat ON | Thermostat OFF | | Thermostat ON | Thermostat OFF | Defrost | |
| Indoor fan | Remote control command | Remote control command | Remote control command | Remote control command | Intermittent operation | ○ → × | ○ / × |
| Indoor electronic expansion valve | Superheating control response | Fully closed | Fully closed | Outlet temperature control response | Slight opening control | Model-specific aperture opening angle | Superheating control response |
| Compressor [CM1] | ○ | × | × | ○ | × | ○ | ○ / × |
| Magnetic contactor CM1 [52X1] | ○ | ○ | × / ○ | ○ | ○ | ○ | ○ |
| Compressor [CM2] | ○ / × | × | × | ○ / × | × | ○ | ○ / × |
| Magnetic contactor CM2 [52X2] | ○ | ○ | × | ○ | ○ | ○ | ○ |
| Outdoor fan [FMo-1] | ○ / × | × | × / ○ | ○ / × | × | ○ → × | ○ / × |
| Outdoor fan [FMo-2] | ○ | × | × / ○ | ○ | × | ○ → × | ○ |
| 4-way valve [20S] | × | × | × | ○ | ○ | ○ → × | × |
| Electronic expansion valve for heating [EEVH1, 2] | Fully open ※3 | ※1 | ※2 | Superheating ※4 control response | ※2 | Fully closed / Fully open | Fully open ※3 |
| Electronic expansion valve for subcooling [EEVSC] | Opening pulse control | Fully closed | Fully closed | Fully closed | Fully closed | Fully closed | Opening pulse control |
| Solenoid valve [SV1] | ○ / × | × | × | ○ / × | × | ○ / × | ○ / × |
| Solenoid valve [SV2] | ○ / × | × | × | ○ / × | × | ○ / × | ○ / × |
| Solenoid valve [SV6] [SV7] | ○ / × | × | × | ○ / × | × | ○ / × | ○ / × |
| Solenoid valve [SV11] | × | × | × | ○ / × | × | × | × |
| Solenoid valve [20UF] | ○ / × | × | × | ○ / × | ○ / × | ○ / × | ○ / × |
| Crankcase heater [CH1,2] | ○ / × | ○ / × | ○ / × | ○ / × | ○ / × | ○ / × | ○ / × |

Notes(1) ○ : ON, × : OFF, ○/×, ×/○: ON or OFF

(2) ※1: The EEVH1, 2 of master unit are fully opened and those of slave unit are fully closed.

(3) ※2: When the unit is stopped from cooling operation, the EEVH1, 2 of master unit are fully opened and those of slave unit are fully closed.

When the unit is stopped from heating operation, the EEVH1, 2 of both master and slave units are fully closed unless the opening degree is specified by the low pressure protective control.

(4) ※3: When the operation mode is changed from heating to cooling/dehumidifying, EEVH1, 2 are maintained at fully closed position and EEV of only one indoor unit keeps 60 pulse until 20S is turned OFF.

(5) ※4: When the operation mode is changed from cooling/dehumidifying to heating, EEVH1, 2 are maintained at fully opened position and EEVs of all indoor units keep 0 pulse until 20S is turned ON.

(6) This shows the state of output when all indoor units are in the same operation mode.

(2) Compressor control (Master unit/slave unit)**(a) Starting compressor****(i) Compressor starting order**

After turning the power on, firstly CM1 compressor starts. (In case of the combination use, it is CM01 of master unit) And corresponding to the condition of under-dome temperature and to the required capacity of indoor units thermostat ON, the next compressor will start sequentially, and finally maximum 6 compressors (in case of 3 outdoor units combination use) will start simultaneously.

1) Single use (Model 280, 335)

Range of the compressor operation speed relative to load is as follows.

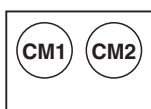
| | | |
|--|------|-----------|
| System load range (Number of operating outdoor units) | 0 | 1 |
| Local load range (Number of compressors operating in outdoor units) | 0 | 1 |
| CM1 | 0rps | - 140rps* |

Note(1) * only model 335 is Max. 140rps, model 280 is Max. 120rps.

2) Single use (Model 400, 450)

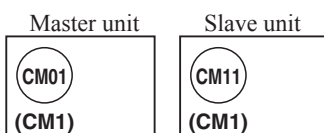
Range of the compressor operation frequency relative to load is as follows.

| | | |
|-------------------|------|----------|
| System load range | 0 | 1 |
| Local load range | 0 | 1 |
| CM1 | 0rps | - 120rps |

3) Single use (Model 475, 500, 560 : 2 compressors specification)

Range of the compressor operation frequency relative to load is as follows.

| | | | |
|-------------------|------|----------|----------|
| System load range | 0 | 1 | |
| Local load range | 0 | 1 | 2 |
| CM1 | 0rps | - 112rps | - 140rps |
| CM2 | 0rps | 0rps | - 140rps |

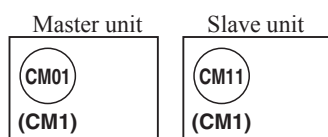
4) 2 outdoor units combination use (Model 560, 615, 670)

Range of the compressor operation frequency relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | 0 | 1 | 1 | |
| Local load range | 0 | 1 | 1 | |
| Master unit | CM01 | 0rps | - 112rps | - 140rps |
| Slave unit | CM11 | 0rps | 0rps | - 140rps |

5) 2 outdoor units combination use (Model 735)

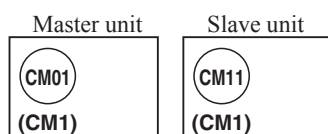
Model 400 (Master) + 335 (Slave)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

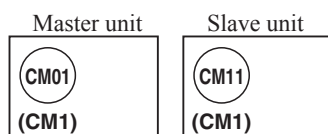
| | | | | |
|-------------------|------|------|---------|----------|
| System load range | | 0 | 1 | 2 |
| Local load range | | 0 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 82rps |
| Slave unit | CM11 | 0rps | 0rps | - 140rps |

Model 335 (Master) + 400 (Slave)



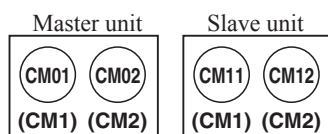
Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | | 0 | 1 | 2 |
| Local load range | | 0 | 1 | 1 |
| Master unit | CM01 | 0rps | - 112rps | - 140rps |
| Slave unit | CM11 | 0rps | 0rps | - 82rps |

6) 2 outdoor units combination use (Model 800, 850, 900)

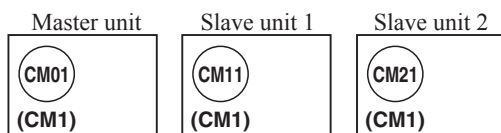
Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|---------|----------|
| System load range | | 0 | 1 | 2 |
| Local load range | | 0 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 120rps |
| Slave unit | CM11 | 0rps | 0rps | - 120rps |

7) 2 outdoor units combination use (Model 950, 1000, 1060, 1120)

Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | | |
|-------------------|------|------|----------|----------|----------|
| System load range | | 0 | 1 | 2 | |
| Local load range | | 0 | 1 | 1 | 2 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps | - 140rps |
| | CM02 | 0rps | 0rps | 0rps | - 140rps |
| Slave unit | CM11 | 0rps | 0rps | - 112rps | - 140rps |
| | CM12 | 0rps | 0rps | 0rps | - 140rps |

8) 3 outdoor units combination use (Model 850, 900, 950, 1000)

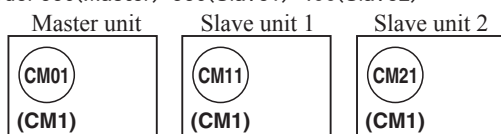
(Model 850, 900, 950, 1000)

Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | 0 | 1 | 2 | 3 |
| Local load range | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 112rps |
| Slave unit 2 | CM21 | 0rps | 0rps | - 140rps |

9) 3 outdoor units combination use (Model 1060)

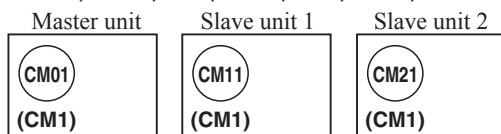
Model 335(Master)+335(Slave1)+400(Slave2)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | 0 | 1 | 2 | 3 |
| Local load range | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 112rps |
| Slave unit 2 | CM21 | 0rps | 0rps | - 82rps |

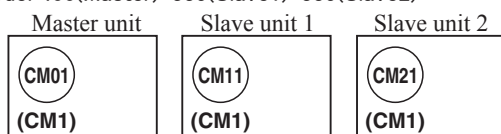
Model 335(Master)+400(Slave1)+335(Slave2)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | 0 | 1 | 2 | 3 |
| Local load range | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 65rps |
| Slave unit 2 | CM21 | 0rps | 0rps | - 140rps |

Model 400(Master)+335(Slave1)+335(Slave2)

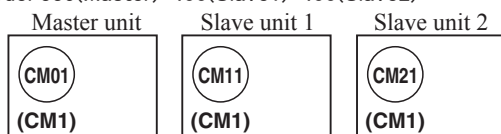


Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|---------|----------|
| System load range | 0 | 1 | 2 | 3 |
| Local load range | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 65rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 112rps |
| Slave unit 2 | CM21 | 0rps | 0rps | - 140rps |

10) 3 outdoor units combination use (Model 1120)

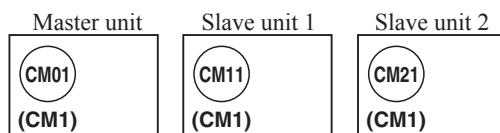
Model 335(Master)+400(Slave1)+400(Slave2)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | |
|-------------------|------|------|----------|----------|
| System load range | 0 | 1 | 2 | 3 |
| Local load range | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 65rps |
| Slave unit 2 | CM21 | 0rps | 0rps | - 82rps |

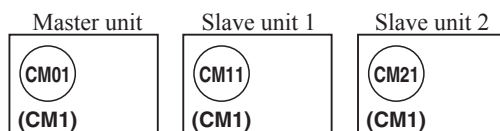
Model 400(Master)+335(Slave1)+400(Slave2)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | | |
|-------------------|------|------|---------|----------|----------|
| System load range | | 0 | 1 | 2 | 3 |
| Local load range | | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 65rps | - 82rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 112rps | - 140rps |
| Slave unit 2 | CM21 | 0rps | 0rps | 0rps | - 82rps |

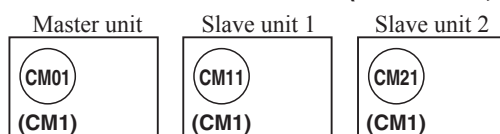
Model 400(Master)+400(Slave1)+335(Slave2)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | | |
|-------------------|------|------|---------|---------|----------|
| System load range | | 0 | 1 | 2 | 3 |
| Local load range | | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 65rps | - 82rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 65rps | - 82rps |
| Slave unit 2 | CM21 | 0rps | 0rps | 0rps | - 140rps |

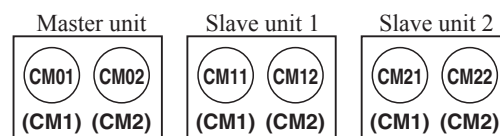
11) 3 outdoor units combination use (Model 1200, 1250, 1300, 1350)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | | |
|-------------------|------|------|---------|---------|----------|
| System load range | | 0 | 1 | 2 | 3 |
| Local load range | | 0 | 1 | 1 | 1 |
| Master unit | CM01 | 0rps | - 65rps | - 65rps | - 120rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 65rps | - 120rps |
| Slave unit 2 | CM21 | 0rps | 0rps | 0rps | - 120rps |

12) 3 outdoor units combination use (Model 1425, 1450, 1500, 1560, 1620, 1680)



Range of the compressor operation speed relative to load is as follows. Following table is applicable when CM01 starts initially.

| | | | | | | |
|-------------------|------|------|----------|----------|----------|----------|
| System load range | | 0 | 1 | 2 | 3 | |
| Local load range | | 0 | 0 | 1 | 1 | 2 |
| Master unit | CM01 | 0rps | - 112rps | - 112rps | - 112rps | - 140rps |
| | CM02 | 0rps | 0rps | 0rps | 0rps | - 140rps |
| Slave unit 1 | CM11 | 0rps | 0rps | - 112rps | - 112rps | - 140rps |
| | CM12 | 0rps | 0rps | 0rps | 0rps | - 140rps |
| Slave unit 2 | CM21 | 0rps | 0rps | 0rps | - 112rps | - 140rps |
| | CM22 | 0rps | 0rps | 0rps | 0rps | - 140rps |

(ii) Rotation of compressor start/stop order

- 1) The compressors will be changed over by determining the start/stop order in each heat load zone.
- 2) In case of single use, the starting order of CM1 and CM2 will be changed over on each occasion when the outdoor unit stops.
- 3) In case of combination use, the starting order of CM01(CM11) [CM21] and CM02(CM12) [CM22] will be changed over on each occasion when the master unit or slave unit stops all independently.
- 4) In case of combination use, the starting order of master and slave units will be changed over on each occasion when the master unit or slave unit stops all independently.

Starting order of outdoor units Master→Slave→Master

(3) Outdoor fan control (Master unit/slave unit)**(a) Outdoor fan speed and fan motor rotation speed**Unit : min⁻¹

| Fan tap | Cooling | | Heating | | Remark |
|------------|---------|------|---------|------|--|
| | FMo1 | FMo2 | FMo1 | FMo2 | |
| 0th speed | 0 | 0 | 0 | 0 | stop |
| 1st speed | 0 | 160 | 0 | 160 | Min. speed at 1 FM operation |
| 2nd speed | 200 | 200 | 0 | 400 | Max. speed at 1 FM operation (During heating) |
| 3rd speed | 300 | 300 | 160 | 160 | Min. speed at 2 FM operation (During heating) |
| 4th speed | 400 | 400 | 1140 | 1140 | Max. speed at 2 FM operation (During heating) Rated speed of heating |
| 5th speed | 500 | 500 | – | – | |
| 6th speed | 600 | 600 | – | – | |
| 7th speed | 700 | 700 | – | – | |
| 8th speed | 800 | 800 | – | – | |
| 9th speed | 900 | 900 | – | – | |
| 10th speed | 1000 | 1000 | – | – | |
| 11th speed | 1100 | 1100 | – | – | |
| 12th speed | 1140 | 1140 | – | – | Rated speed of cooling |

(b) Outdoor fan control in cooling mode

Fan speed is controlled based on the high pressure during cooling/dehumidifying (detected with PSH) and the outdoor air temperature (detected with Tho-A).

- (i) Initial fan speed is as follows.

Initial cooling speed of outdoor fan

| | | |
|---|--|---|
| Outdoor air temperature $\leq 10^{\circ}\text{C}$ | $10^{\circ}\text{C} \leq$ Outdoor air temperature $< 15^{\circ}\text{C}$ | $15^{\circ}\text{C} \leq$ Outdoor air temperature |
| 2nd speed | 4th speed | 6th speed |

- (ii) Speed changes depending on high pressure values.

(c) Outdoor fan control in heating mode

Fan speed is controlled based on the low pressure (detected with PSL) during heating operation.

- (i) Speed changes depending on low pressure values.
- (ii) Under normal condition, the stepless fan control between 1st speed and 4th speed is performed.

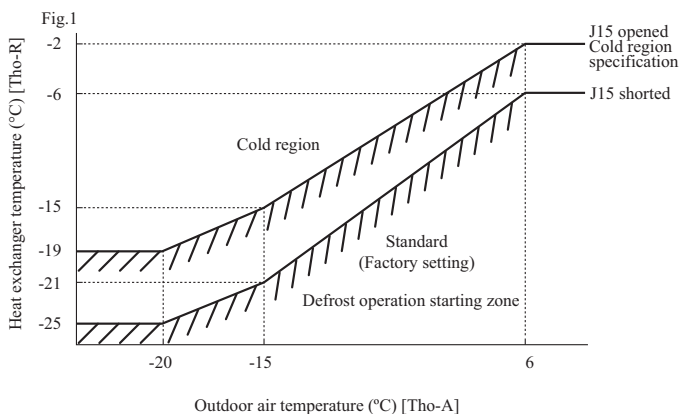
(4) Defrost operation (Master unit/Slave unit)

If the defrost operation starting conditions at the outdoor heat exchanger are satisfied, defrost operation starts.

(a) Temperature conditions for defrost operation**(i) Conditions for starting defrost operation**

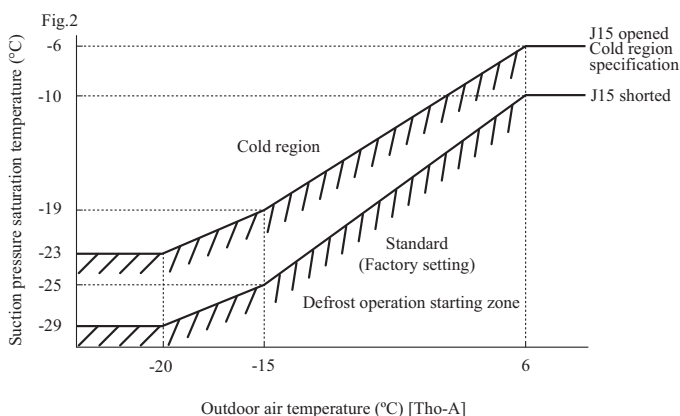
When all of following conditions are satisfied, defrost operation will be started.

- 1) When the cumulative operation time of the compressor becomes 33 minutes after completion of previous defrost operation, or it becomes 33 minutes after heating operation starts.
- 2) When 8 minutes have elapsed after one compressor is turned ON from the state of all compressors OFF.
- 3) When 8 minutes have elapsed after one outdoor fan is turned ON from the state of all outdoor fan OFF.



- 4) When either of following conditions is satisfied after all of the above conditions are satisfied.

- When the temperatures detected with the outdoor heat exchanger temperature sensors (Tho-R1,-R2) and outdoor air temperature sensor (Tho-A) are below the defrost operation starting temperature mentioned in the above graph continuously for 3 minutes.
- When the suction pressure saturation temperature has continued for 3 minutes in the defrost zone which is determined by the outdoor air temperature sensor (Fig. 2)

**(ii) Conditions for finishing defrost operation**

- Standard (J14 is shorted)
 - 1) When the temperature detected with both outdoor heat exchanger temperature sensors (Tho-R1 and Tho-R2) is higher than 9°C
 - 2) Or when 12 minutes have elapsed since defrost operation started
- Cold region setting (J14 is open)
 - 1) When $(\text{Tho-R1 and Tho-R2}) \geq 9^\circ\text{C}$ is satisfied, after 2 minutes and 30 seconds have elapsed since defrost operation started, and when either of following conditions is satisfied, the defrost operation end.
 - a) 2 minutes and 30 seconds have elapsed since the temperature of either Tho-R1 or Tho-R2 was 14°C or higher
 - b) The temperature of either Tho-R1 or Tho-R2 is 30°C or higher.
 - c) 14 minutes have elapsed since defrost operation started.
 - 2) When $(\text{Tho-R1 and Tho-R2}) < 9^\circ\text{C}$ is satisfied, after 2 minutes and 30 seconds have elapsed since defrost operation started, and when either of following conditions is satisfied, the defrost operation end.
 - a) 5 minutes have elapsed since the temperature of either Tho-R1 or Tho-R2 was 14°C or higher.
 - b) The temperature of either Tho-R1 or Tho-R2 is 30°C or higher.
 - c) 14 minutes have elapsed since defrost operation started.

(5) Protective control**(a) High pressure protective control/error**

If the high pressure exceeds 3.7MPa, the compressor speed is reduced gradually.

It reduces to 20rps at the lowest.

If the high pressure still rises to 4.15MPa, the compressor stops.

(b) Low pressure protective control/error

If the low pressure drops below 0.18MPa, the compressor speed is reduced gradually.

It reduces to 20rps at the lowest.

If the low pressure still drops below 0.134MPa, the compressor stops.

(c) Discharge pipe temperature control/error

If discharge pipe temperatures (detected with Tho-D1, -D2) exceed 120°C, the compressor speed is reduced gradually. (To 20 rps at the lowest) If the temperatures still continue to rise beyond 130°C, the compressor stops.

(d) Compressor compression ratio protective control

If the compressor compression ratio exceeds the setting value, the compressor speed is reduced gradually.

It reduces to 20rps at the lowest.

(e) Current safe control

(i) The current safe control monitors current values at T-phase of inverter. If the value exceeds the setting value, the compressor speed is reduced.

If the value is higher than the setting value even if the speed is reduced, the speed is reduced further.

(ii) This control is reset if the current value at T-phase of inverter becomes lower than the setting value – 1 A for 3 minutes continuously or lower than the setting value for 6 minutes continuously.

(f) Current cut control

(i) Current sensor built in the power transistor monitors current values output from the inverter. If the value exceeds 88 A, the current cut control stops the compressor. The compressor starts automatically 3 minutes after the stop.

(ii) If the above control activates 4 times within 15 minutes, 52C1 or 52C2 is turned off, and the operation is stopped with the error stop.

State of the error continues for 3 minutes after the error stop. The error can be reset by operating the inspection reset from the remote control.

(g) Power transistor temperature (PT) protective control

If temperatures on the power transistor exceed the setting value, the compressor speed is reduced gradually.

It reduces to 20rps at the lowest.

(h) Under-dome temperature protective control

If the under-dome temperature exceeds the setting value, the compressor speed is reduced gradually.

It reduces to 20rps at the lowest.

(i) Protection for combination of outdoor units (Master unit)

The capacity of connectable outdoor units is checked when the communication check is performed after turning the power ON.

If the checked result is other than the allowable combinations mentioned in the following table ① it is prohibited to start operation due to outdoor unit combination error.

When this error occurs, the error code mentioned in the following table ② is displayed on the 7-segment display.

Table① Combination list

| Capacity | Combination patterns | Capacity | Combination patterns |
|----------|--------------------------------------|----------|---------------------------|
| 560 | Combination (280+280) | 1200 | Combination (400+400+400) |
| 615 | Combination (280+335) | 1250 | Combination (400+400+450) |
| 670 | Combination (335+335) | 1300 | Combination (400+450+450) |
| 735 | Combination (335+400) | 1350 | Combination (450+450+450) |
| 800 | Combination (400+400) | 1425 | Combination (475+475+475) |
| 850 | Combination (400+450), (280+280+280) | 1450 | Combination (475+475+500) |
| 900 | Combination (450+450), (280+280+335) | 1500 | Combination (500+500+500) |
| 950 | Combination (475+475), (280+335+335) | 1560 | Combination (500+500+560) |
| 1000 | Combination (500+500), (335+335+335) | 1620 | Combination (500+560+560) |
| 1060 | Combination (500+560), (335+335+400) | 1680 | Combination (560+560+560) |
| 1120 | Combination (560+560), (335+400+400) | | |

Table② Contents displayed on 7-segment display at the combination error

| Code display area | Data display area | Contents of invalid operation |
|-------------------|-------------------|--------------------------------------|
| oPE | 3 | Invalid combination of outdoor units |

(6) Auto backup operation**(a) Classification of auto backup operations**

When the auto backup operation is enabled, anomaly stops are classified as follows and countermeasures are provided for respective categories.

System stop: All stop including master/slave units

Unit stop: Stop in the unit of outdoor unit

Compressor stop: Stop in the unit of compressor

(b) Control contents of auto backup operation

- (i) Condition of auto backup operation is satisfied when the DIP switch SW3-2 on the PCB of master unit is turned ON (selected).
- (ii) However, the switching of SW3-2 is effective only at the power on. (It does not become effective unless the power source is reset.)
- (iii) Anomaly contents in the following table are invalid and are not detected when the auto backup is effective.

| Anomaly detection invalid code | SW3-2ON | Anomaly detection invalid code | SW3-2ON |
|--|---------|--|---------|
| E32: Open L3 phase on power source at primary side | ○ | E45: Communication error between inverter PCB and outdoor unit control PCB | ○ |
| E36: Discharge pipe temperature error | ○ | E48: Outdoor DC fan motor anomaly | ○ |
| E37: Outdoor heat exchanger and subcooling coil temperature sensor anomaly | ○ | E51: Power transistor overheat (Continuousness) | ○ |
| E38: Outdoor air temperature sensor anomaly | ○ | E53: Suction pipe temperature sensor anomaly | ○ |
| E39: Discharge pipe temperature sensor anomaly | ○ | E55: Under-dome temperature sensor anomaly | ○ |
| E40: High pressure anomaly | ○ | E56: Power transistor temperature sensor anomaly | ○ |
| E41: Power transistor overheat | ○ | E58: Anomalous compressor by loss synchronism | ○ |
| E42: Current cut | ○ | E59: Compressor startup failure | ○ |
| E44: Liquid flooding anomaly | ○ | E60: Rotor position detection failure | ○ |

- (iv) If any anomaly occurs when the auto backup is effective, the operation output (CnH), Anomaly output (CnY), 7-segment display and LED show as follows.
 - 1) At the system stop

Operation output on the master unit is turned OFF, the Anomaly output is turned ON, 7-segment display and LED show the anomaly, and the remote control displays E??. (To reset the anomaly, it is necessary to reset the inspection from the remote control.)
 - 2) At the unit stop

On the anomaly occurred unit only, the operation output is turned OFF, the anomaly output is turned ON, 7-segment display and LED show the anomaly and normal units continue their operation ON(or stop).
To reset the state of anomaly on the unit the anomaly occurred, it depends on the condition to reset the state of each anomaly.
 - 3) At the compressor stop

Only the compressor concerned stops, previous states are maintained on the operation output, anomaly output, 7-segment display and LED. To reset the state of anomaly on the compressor, it depends on the condition to reset the state of each anomaly.

| Remote control error display | Anomaly contents | Anomalous stop of master outdoor unit | | | Anomalous stop of slave outdoor unit | | |
|------------------------------|---|---------------------------------------|-----------|-----------------|--------------------------------------|-----------|-----------------|
| | | System stop | Unit stop | Compressor stop | System stop | Unit stop | Compressor stop |
| E31 | Duplicated outdoor unit address No. | ○ | | | | | |
| E32 | Open L3 Phase on power source at primary side | | ○ | | | ○ | |
| E36 | Discharge pipe temperature error | | | ○ | | | ○ |
| E37 | Outdoor heat exchanger and subcooling coil temperature sensor anomaly | | ○ | | | ○ | |
| E38 | Outdoor air temperature sensor anomaly | | ○ | | | ○ | |
| E39 | Discharge pipe temperature sensor anomaly | | | ○ | | | ○ |
| E40 | High pressure anomaly | | ○ | | | ○ | |
| E41 | Power transistor overheat | | | ○ | | | ○ |
| E42 | Current cut | | | ○ | | | ○ |
| E43 | Excessive number of indoor unit connected, excessive total capacity of connection | ○ | | | — | — | — |
| E44 | Liquid flooding anomaly | | | ○ | | | ○ |
| E45 | Communication error between inverter PCB and outdoor unit control PCB | | ○ | | | ○ | |
| E48 | Outdoor DC fan motor anomaly | | ○ | | | ○ | |
| E49 | Low pressure error | ○ | | | ○ | | |
| E51 | Power transistor overheat (continuousness) | | | ○ | | | ○ |
| E53 | Suction pipe temperature sensor anomaly | | ○ | | | ○ | |
| E54 | High pressure sensor/Low pressure sensor anomaly | ○ | | | ○ | | |
| E55 | Under-dome temperature sensor anomaly | | | ○ | | | ○ |
| E56 | Power transistor temperature sensor anomaly | | | ○ | | | ○ |
| E59 | Compressor startup failure | | | ○ | | | ○ |
| E60 | Rotor position detection failure | | | ○ | | | ○ |
| E61 | Communications error between the master unit and slave units | ○ | | | — | — | — |
| E63 | Emergency stop | ○ | | | ○ | | |

(c) Prohibiting conditions of auto backup operation

- (i) When the conditions of oil return control are not satisfied
- (ii) When the backup operation time has exceeded the limit value

(d) Control after the conditions to prohibit the auto backup operation have been satisfied

All compressor stop, and the error display [EXX] is shown on the 7-segment display and the remote control.

In this state, the inspection reset of remote control is effective. → [EXX] is displayed continuously on the remote control.

Backup operation function is only for emergency purpose when one of compressors or one of units is damaged. If backup operation is performed continuously for long period, it may cause the damage of good compressors. Accordingly be sure to repair the damaged unit or to replace the damaged compressor and to cancel the backup operation within 48 hours after starting backup operation.

(7) Test run**(a) This control can be performed from the master unit, not from the slave unit.**

If this control is done from the slave unit, the following display is shown on the 7-segment display.

The display returns to normal display if the test run control switch is reset.

| Code indicator | Data indicator | Contents of invalid operation |
|----------------|----------------|-------------------------------|
| oPE | 10 | Slave setting is invalid. |

(b) Test run from master outdoor units with DIP switches SW5-1 and SW5-2.

| SW5-1 | ON | SW5-2 | OFF | Test run for heating |
|-------|---|-------|-----|----------------------|
| | | | ON | Test run for cooling |
| OFF | Normally operation and after test operation | | | |

Take note that this operation has priority over other option devices such as central control and etc.

This operation status is transmitted to the option devices.

(Note) Test run operation by external input is also available with following method. (Refer next page for detail.)

- Select the external input terminal (CnS1) and set 7-segment [P07]-[6] for the function of SW5-1, and select the external input terminal (CnS2) and set 7-segment [P08]-[7] for the function of SW5-2.

| CnS1 | Shorted | CnS2 | Open | Test run for heating |
|------|---|------|---------|----------------------|
| | | | Shorted | Test run for cooling |
| Open | Normal operation and after test operation | | | |

- Other combination of external input terminals (CnS1, CnS2, CnG1, CnG2) and of setting function with 7-segment ([P07], [P08], [P09], [P10] and -[6], -[7]) are available to use.

(c) Starting conditions of test run operation

- DIP switch SW5-1 is turned ON. However the input before the power ON is invalid.
- The DIP switches SW3 and SW5, other than SW5-1 and SW5-2, should be turned OFF.
However, regarding the DIP switch SW3-2 for automatic backup operation, it is invalid during test run operation regardless whether SW3-2 is turned ON (valid) or OFF (invalid).→In order to check trouble during test run operation.

(d) Control during test run (If indoor units are normal)

- Heating operation is performed with SW5-2 OFF, while cooling operation is performed with SW5-2 ON.
- Indoor EEV control at the end of test run is depended on the specifications of the indoor unit.
- Cooling operation: Compressor frequency control is depended on the cooling low pressure control.
- Heating operation: Compressor frequency control is depended on the heating high pressure control.

(e) Ending conditions of test run operation

Test run operation is terminated if one of following conditions is satisfied.

- Test run operation ends when the DIP switch SW5-1 is turned OFF.
- When the operation is stopped by the error control during test run, the error is displayed same as the normal operation and the state of error stop is retained even if SW5-1 is turned OFF.

(B) Option controls

• External input terminal

- ① 4 external input terminals (CnS1, CnS2, CnG1 and CnG2) are provided. (See Fig 1.)
- ② Each external input terminal can be changed its function by allotting the external input function No. of P07-P10 selected with 7-segment respectively. (External input functions of the code P07-P10 are shown in Fig 2.)

| External input terminal | | | External input function allotment of 7-segment | | |
|-------------------------|----------------------------|-----------------|--|--------------|-----------------|
| Terminal | Specification | Factory setting | Code | Function No. | Factory setting |
| CnS1 | No voltage contact (DC12V) | Shorted | P07 | "0"- "9" | "0" |
| CnS2 | No voltage contact (DC12V) | Shorted | P08 | "0"- "9" | "1" |
| CnG1 | No voltage contact (DC12V) | Open | P09 | "0"- "9" | "2" |
| CnG2 | No voltage contact (DC12V) | Open | P10 | "0"- "9" | "3" |

Fig 1

- ③ The following function is effective, when the external input function of PXX-"X" is allotted and the signal is input to the external terminal of CnXX.

(Example) If CnS1 terminal is used for demand control (pulse input), allot the "1" of P07 and open J13, and if CnS2 terminal is used for demand control (level input), allot the "1" of P08 and short J13.

By changing the allocation of external input function (P07-10) on the 7-segment, functions of external input terminal may be selected. Inputting signals to external input terminals enable the following functions.

| Setting value for external input function assignment | External input terminal shorted | External input terminal open |
|--|---------------------------------|------------------------------|
| "0" : External operation input | Permitted | Prohibited |
| "1" : Demand input | *3 | *3 |
| "2" : Cooling / heating force input | Heating | Cooling |
| "3" : Silent mode 1 *1 | Valid | Invalid |
| "4" : Spare | | |
| "5" : Outdoor fan snow control input | Valid | Invalid |
| "6" : Test run external input 1 (SW5-1 equivalent) | Test run start | Normal |
| "7" : Test run external input (SW5-2 equivalent) | Cooling | Heating |
| "8" : Silent mode 2 *1 | Valid | Invalid |
| "9" : Demand input | *3 | *3 |
| "10" : AF periodic inspection display | Valid | Invalid |
| "11" : AF error display | Valid | Invalid |
| "12" : Building multi energy save control | Valid | Invalid |

*3 Demand setting table

| Demand control | Function assignment 1 | Function assignment 9 |
|----------------|-----------------------|-----------------------|
| None (Normal) | Shorted | Shorted |
| 1-step | Open | Shorted |
| 2-step | Open | Open |
| 3-step | Shorted | Open |

*1 Valid/invalid is changed depending on outdoor air temperatures.
 *2 It is always valid, regardless of outdoor air temperature.
 *3 According to the demand setting table.

Fig 2

- ④ J13: Switching of CnS1,S2 input method (CnS1, S2 only)

J13 shorted: Level input by CnS1, S2
 J13 open : Pulse input by CnS1, S2

*1 "Setting" means;

Master : Set only the master unit. (No necessary to set the slave unit)

Master/Slave: Set both master/slave unit same.

(1) External input and demand input (Master unit/Slave unit)

(a) Operation permission or prohibition mode

(Note) Following explanation is based on using CnS1 terminal and setting function [P07]-[0] with 7-segment display.

However other terminals can be used with following function setting of 7-segment display.

CnS2: [P08]-[0] CnG1: [P09]-[0] CnG2: [P10]-[0]

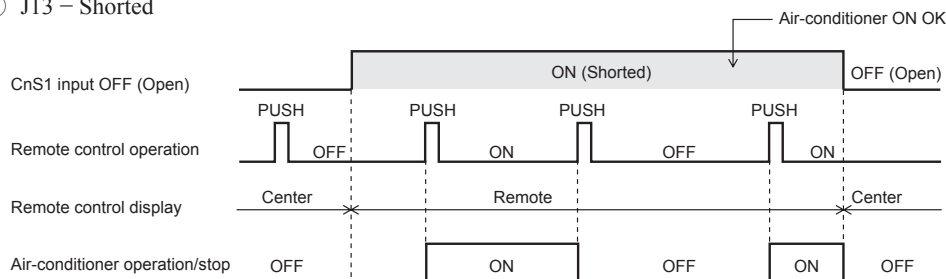
- 1) Operation permission or prohibition mode is switched with the connector (CnS1) and the jumper wire (J13) on the outdoor unit control PCB after setting function [P07]-[0] (Factory setting) with 7-segment display
- 2) Operation permission/prohibition control by the external input CnS1 to outdoor unit.

| Input: CnS1 | Switching CnS1 input method:J13 | CnS1: Switching operation permission/prohibition mode |
|-------------|---------------------------------|--|
| | Shorted (Level input) | Operation prohibition mode → Operation permission mode |
| | Open (Pulse input) | Switching operation permission/ Operation prohibition mode (Reversal) |
| | Shorted (Level input) | Operation permission mode → Operation prohibition mode |
| | Open (Pulse input) | (NOP) — |

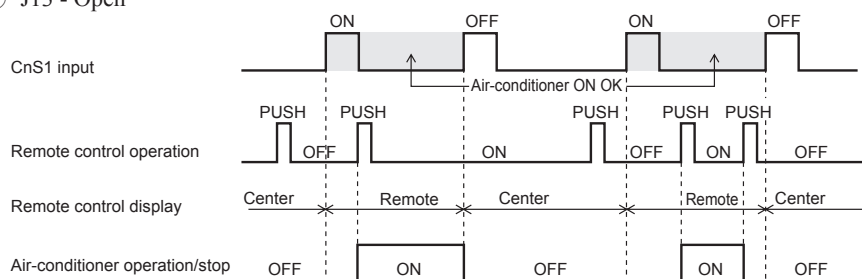
Note (1) Factory setting J13: Shorted, CnS1: Shorted (Short pin is connected.)

- 3) The operation condition is displayed on the LCD of remote control and it is transferred to option central control.
- 4) When the operation command from remote control is not accepted by this control, "Center" is displayed on the LCD of remote control. (See item 5 mentioned next page.)
- 5) CnS1 performs the following operation according to switching the jumper wire (J13) shorted or open. In case of pulse input, the pulse width is 500ms or larger.

① J13 – Shorted



② J13 - Open



- 6) After changing mode from operation prohibition mode to permission mode, the indoor units operation status can be select by 7-segment [P17] setting.
 7-segment [P17] =0 → Keeping STOP
 7-segment [P17] =1 → Automatically RUN

(b) Demand control

(Note) Following explanation is based on using CnS2 terminal and setting function [P08]-[1] with 7-segment display.

However other terminals can be used with following function setting of 7-segment display

CnS1: [P07]-[1] CnG1: [P09]-[1] CnG2: [P10]-[1]

- 1) Demand control or normal control is switched with the connector (CnS2) and the jumper wire (J13) on the outdoor control PCB after setting function [P08]-[1] (Factory setting) with 7-segment display.

J13: Switching of CnS2 input method

J13 shorted: Level input by CnS2

J13 open : Pulse input by CnS2

- 2) Demand control/Normal operation by the external input CnS2 to outdoor unit.

| Input: CnS2 | Switching CnS2 input method:J13 | CnS2: Switching operation permission/prohibition mode |
|-------------|---------------------------------|--|
| | Shorted (Level input) | Demand control → Normal operation |
| | Open (Pulse input) | Switching Demand control/ Normal operation (Reversal) |
| | Shorted (Level input) | Normal control → Demand operation |
| | Open (Pulse input) | (NOP) — |

Note (1) Factory setting J13: Shorted, CnS2: Shorted (Short pin is connected.)

- 3) The operation condition is displayed on the LCD of remote control and it is transferred to option central control.

4) Demand control

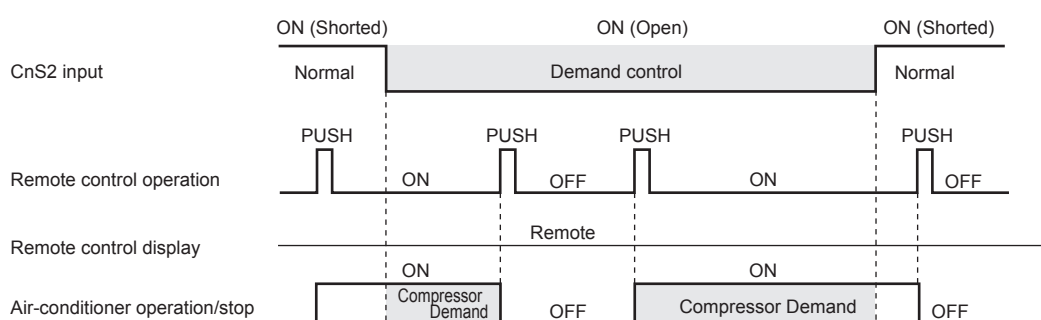
Demand ratio can be changed with the 7-segment "P04" on the outdoor control PCB.

| P04 setting | Compressor output (%) |
|----------------------|-----------------------|
| 080(Factory default) | 80 |
| 060 | 60 |
| 040 | 40 |
| 000 | 0 |

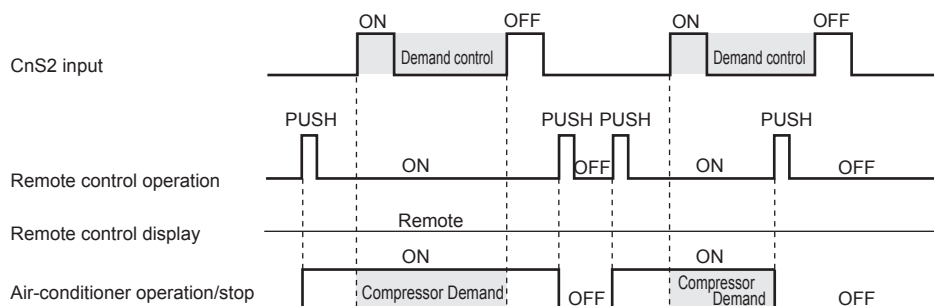
5) This control has priority over the controls of 4-way valve safeguard, compressor protective start operation, defrost operation, oil equalized operation, oil return operation, pump-down operation for replacement, Start/Stop pump-down operation and check operation.

6) CnS2 performs the following operation according to switching the jumper wire (J13) shorted or open.
In case of pulse input, the pulse width is 500ms or larger.

① J13 – Shorted



② J13 - Open



(c) 3 steps demand control

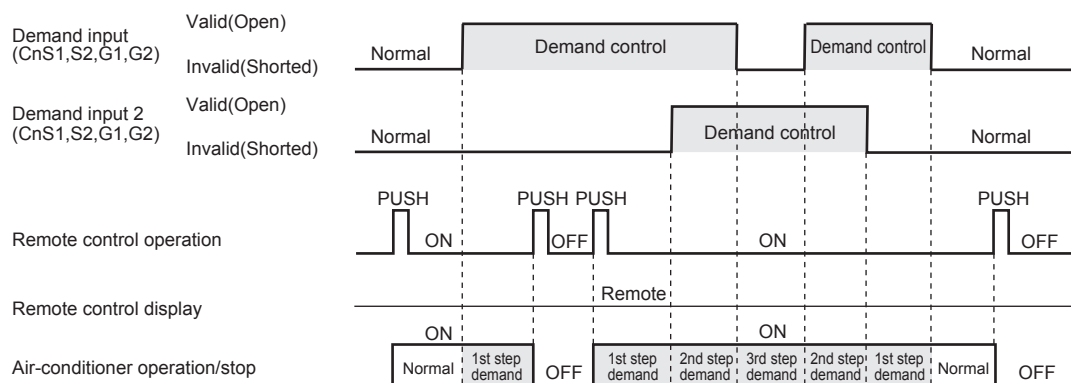
1) Starting condition

When the "Demand input 2" via the external input terminal of outdoor unit (master unit) has become valid.

2) Contents of control

The demand control is performed at the demand rate which has been set with [P14] and [P15] according to the demand input or the demand input 2.

| Demand control | Following is assigned to one of P07 - P10. | | Demand rate setting |
|-----------------|--|---|---------------------|
| | Demand input (Function assignment: 1) | Demand input 2 (Function assignment: 9) | |
| None (Normal) | Shorted | Shorted | — |
| 1st step demand | Open | Shorted | P04 |
| 2nd step demand | Open | Open | P14 |
| 3rd step demand | Shorted | Open | P15 |



3) Ending condition

When the starting conditions have been lost

(d) Demand control from indoor unit

1) Starting condition

- ① When a demand ratio ("80%", "60%", "40%" or "0%") has been transmitted from an indoor unit of "Peak-cut timer" function.
- ② Normal demand of Item (b) is not activated.
- ③ This control is performed on the RC-EX3A remote control.

2) Contents of control

- ① Compressor's upper limit speed is restricted according to the demand restriction rate.
- ② The demand ratio controlled by the restriction rate which is transmitted from an indoor unit.
- ③ If the demand control rate signals are received from two or more indoor units, the control takes the lowest rate.
- ④ When the demand rate is other than 0%, this control is superseded by the controls of 4-way valve safeguard, defrost operation, oil return operation, oil equalized operation, pump-down operation for replacement, Start/Stop pump-down operation and check operation.

3) Ending condition

When the starting conditions have been lost

(2) Silent mode control

(Note) With CnG2 terminal and 7-segment display [P10]-[3] for silent mode 1(Factory default) or with CnG2 terminal and 7-segment display [P10]-[8] for silent mode 2 (Setting on site) It is also available to use other terminals as follows.

CnS2: [P08]-[3] or -[8] CnS1: [P07]-[3] or -[8] CnG1: [P09]-[3] or -[8]

- (a) Silent mode is commanded either from the indoor unit (remote control setting) or from the master outdoor unit (CnG2).
- (b) When the "Silent mode start" signals is received from one of indoor units, it enters the silent mode operation.
- (c) When CnG2 of master unit is shorted after setting function [P10]-[3] (Silent mode 1) or [P10]-[8] (Silent mode 2) with 7-segment display, it enters the silent mode operation. (If the signal is input to the slave unit, it is invalid)
- (Note) Silent mode 1 and 2 can not be set at same time.
- (d) When the "Silent mode start" signal from indoor unit and the "Silent mode" signal from outdoor unit are received, it enters the silent mode operation under "or" condition.
- (e) When silent mode signals from all indoor units become "Silent mode end" and when silent mode signal input to CnG2 on outdoor unit becomes open, the silent mode operation is reset.
- (f) The operation of silent mode 1 is effective within the following temperature range.

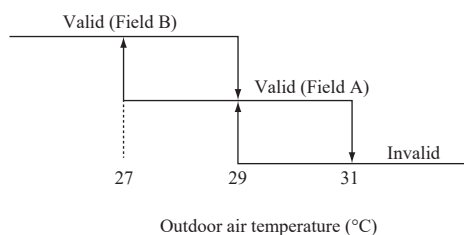
(Note) In case of external input of silent mode 2, following temperature conditions are disregarded.

- (i) Silent mode 0,1 : Effect on field A,B
- (ii) Silent mode 2,3 : Effect on field B

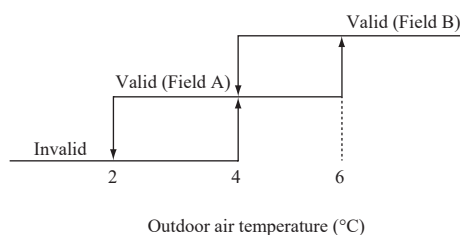
- (g) Silent mode setting
Silent mode setting can be changed with 7-segment "P05" on the outdoor control PCB.

| P05 setting | Silent mode setting |
|-----------------------|-----------------------|
| 000 (Factory default) | Silent mode setting 0 |
| 001 | Silent mode setting 1 |
| 002 | Silent mode setting 2 |
| 003 | Silent mode setting 3 |

• Cooling



• Heating



- (h) Sound level (Reference data)

| Model | SPL Sound pressure level for cooling | SPL Sound pressure level for heating | SPL Silent mode setting 0 | SPL Silent mode setting 1 | SPL Silent mode setting 2 | SPL Silent mode setting 3 | PWL Cooling | PWL Heating |
|--------------|--------------------------------------|--------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------|-------------|
| | (dB(A)) | (dB(A)) | (dB(A)) | (dB(A)) | (dB(A)) | (dB(A)) | (dB(A)) | (dB(A)) |
| FDC280KXZE2M | 56 | 57 | 55 | 51 | 47 | 43 | 75 | 76 |
| FDC335KXZE2M | 63 | 62 | 61 | 57 | 53 | 49 | 82 | 81 |
| FDC400KXZE2M | 60 | 62 | 60 | 56 | 52 | 48 | 80 | 82 |
| FDC450KXZE2M | 61 | 62 | 61 | 57 | 53 | 49 | 81 | 82 |
| FDC475KXZE2M | 61 | 61 | 61 | 57 | 53 | 49 | 81 | 81 |
| FDC500KXZE2M | 61 | 62 | 61 | 57 | 53 | 49 | 81 | 82 |
| FDC560KXZE2M | 63 | 64 | 63 | 60 | 56 | 52 | 82 | 83 |

(3) Outdoor fan snow protection control (Master unit/Slave unit)

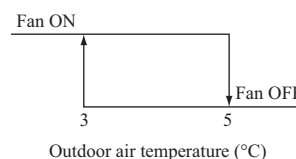
(Note) Following explanation is based on setting function with 7-segment display [P02].

However the following terminals and 7-segment function settings are available to use.

CnS1: [P07]-[5] CnS2: [P08]-[5] CnG1: [P09]-[5] CnG2: [P10]-[5]

- (a) The setting of this control should be done not only on the master unit but also on the slave unit, because the fans of master unit and the slave unit are controlled independently.
- (b) The control is enabled /disabled by selecting [0] or [1] displayed at 7-segment LED of master/slave units.
- (c) Operation method of outdoor fan snow protection control
 - (i) Set the code [P02] on 7-segment display
 - (ii) “0” or “1” is displayed at the data display area of 7-segment LED.
 - “0”: Outdoor fan snow protection control is disabled (Factory setting)
 - “1”: Outdoor fan snow protection control is enabled
 - (iii) Press SW7 (Data write/delete) for 3 seconds continuously
 - (iv) “0” or “1” blinks every 0.5 second at the data display area of 7-segment LED.
 - (v) Press SW8 (one digit) to toggle the display between “0” and “1”.
 - (vi) If SW7 is pressed for 3 seconds continuously while “0” and “1” are blinking, “0” or “1” at the data display area of 7-segment LED stops blinking.

With this operation, the enabled/disabled setting of outdoor fan snow protection control is saved in the memory of EEPROM, and henceforth the outdoor fan is controlled according to the contents of memory.
 - (vii) Contents of outdoor fan snow protection control are retained even if the power is turned off and backed on again.
- (d) Contents of outdoor fan snow protection control
 - (i) At the status of all stop or emergency stop, if the outdoor air temperature drops 3°C or lower, all of outdoor fans are operated at the maximum speed (4th speed) once every 10 minutes.
 - (ii) The outdoor fan runs for 30 minutes
 - (iii) During this snow protection control, the magnetic contactor 52C1 of the compressor is ON

**(4) Outdoor operation mode**

On the standard models of 2-pipe system, the outdoor operation mode of Stop/Cooling/Heating is selected based on the information of indoor units, and then respective controls are performed.

<Contents of control>

- (a) Determination of outdoor operation mode

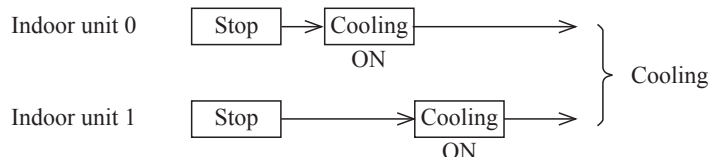
Operation mode of outdoor unit is determined based on respective signals of Operation/Stop and Cooling/Heating.
- (b) Type of outdoor operation mode
 - 1) Outdoor operation mode - Stop
 - 2) Outdoor operation mode - Cooling
 - 3) Outdoor operation mode - Heating
- (c) Priority in operation mode selection
 - 1) First priority is given to the forced cooling/heating operation.
 - 2) Second priority is given as follows

Priority in the operation mode selection can be changed using the 7-segment setting [P01].

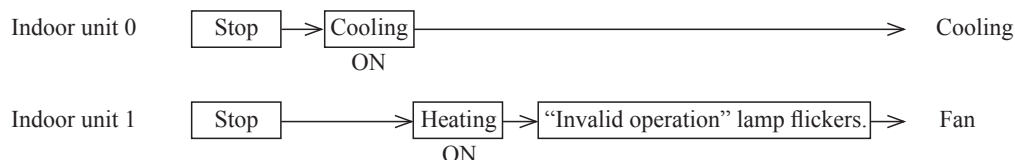
| P01 setting | Mode |
|---------------------|--|
| 0 (Factory default) | First unit's operation mode |
| 1 | Last unit's operation mode |
| 2 | Priority of master unit's setting operation mode |
| 3 | Priority of required major operation mode |

- First unit's operation mode: Operation mode of the indoor unit which is operated first time after stop of the outdoor unit operation mode
 - Last unit's operation mode: Operation mode of the indoor unit which is operated at the last time
 - Priority of master unit's setting operation mode: Operation mode of indoor unit of which the address No. is smallest (Master indoor unit). When the master indoor unit is turned off, it become valid the first push priority on other indoor units' remote controls.
 - Priority of required major operation mode: Operation mode of which the total capacity of operating indoor units is larger. There is no renewed judgment for 10 minutes after a change on the operation mode.
The judgment, however, is renewed in following cases.
 - At the stop
 - When the P01 setting is changed
- 3) In the event that agreement of operation mode is lost between indoor units and outdoor units by selecting the first or second priority after determining the operation mode, it is changed forcibly to the "Fan" mode. The operation mode LCD flickers to warn the "Mode unmatched"
- 4) Example of operation mode selection
<First unit's operation mode>

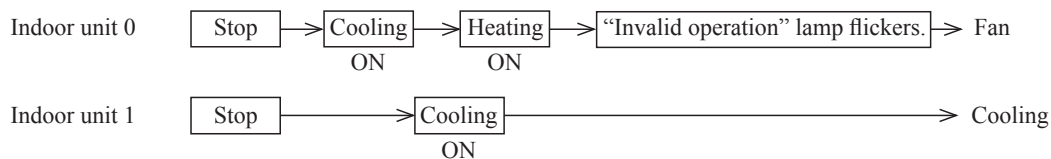
- ① If both of indoor units 0 and 1 have the same operation mode, it operates with the mode.



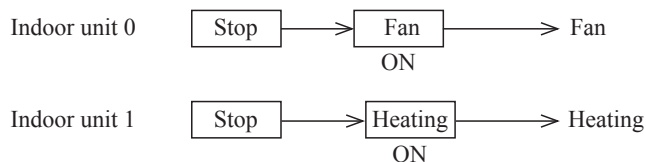
- ② Cooling does not match on indoor units 0 and 1 (Priority is given to previous operation.)



③ When it is changed from same mode to unmatched

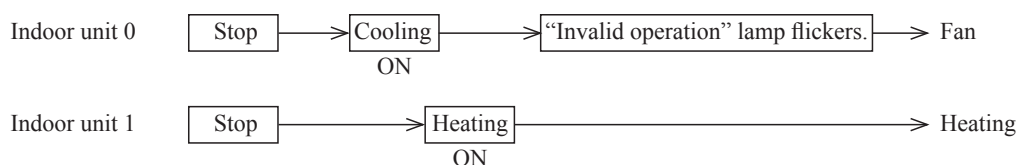


④ Operation mode is prepared for change in the fan mode.

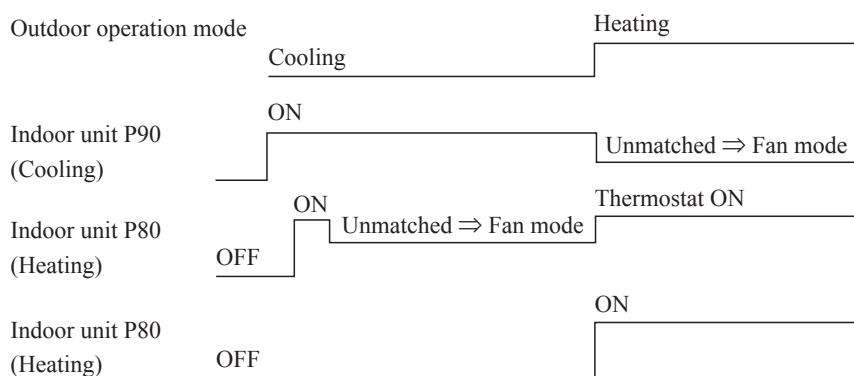


<Last unit's operation mode>

① If the indoor unit 1 of which operation mode is different has joined in when the indoor units 0 is operating.



<Priority of required major operation mode>



5) Reset of unmatched condition (Cooling/heating unmatched)

When unmatched occurs among indoor units, it can be reset by either one of followings.

- ① If the operation mode of outdoor unit is matched with that of indoor unit.
- ② If the operation mode is changed to "Fan" or "Stop" on the indoor units on which Cooling/heating is unmatched.

(d) Forced cooling /heating operation (Master unit)

(Note) Following explanation is based on using CnG1 terminal and setting function [P09]-[2] with 7-segment display.

However other terminals can be used with following function setting of 7-segment display.

CnS1: [P07]-[2]

CnS2: [P08]-[2]

CnG2: [P10]-[2]

- 1) When SW3-7 on the outdoor control PCB is turned ON after setting function [P09]-[2] with 7-segment display, if CnG1 is shorted, forced heating operation is performed, but if CnG1 is open, forced cooling operation is performed.
- 2) If the different mode from the forced operation mode is commanded from indoor unit, the "mode unmatched" message is displayed on the LCD of remote control and the operation is entered in FAN mode.

| | | | | |
|-------|-----|------------------|---------|---------------------------|
| SW3-7 | ON | CnG1 | Open | Operation in cooling only |
| | | | Shorted | Operation in heating only |
| | OFF | Normal operation | | |

- 3) With the forced mode from indoor unit, if a different operation mode is commanded, following operations take place based on the forced cooling/heating operation set with the 7-segment [P18].

P18 = 0: The operation mode unmatched is displayed on the remote control, etc., and it is changed to the fan operation.

P18 = 1: It is operated with the forced cooling/heating operation mode.

Setting temperature for cooling ... 28°C

Setting temperature for heating ... 20°C

(5) Emergency stop control

When one of indoor units receives the emergency stop signal through CnT terminal on the indoor control PCB from the device like as refrigerant leakage detector and that information is transmitted to the outdoor unit, the outdoor unit stops operation and emergency stop error message transmitted to all indoor units running.

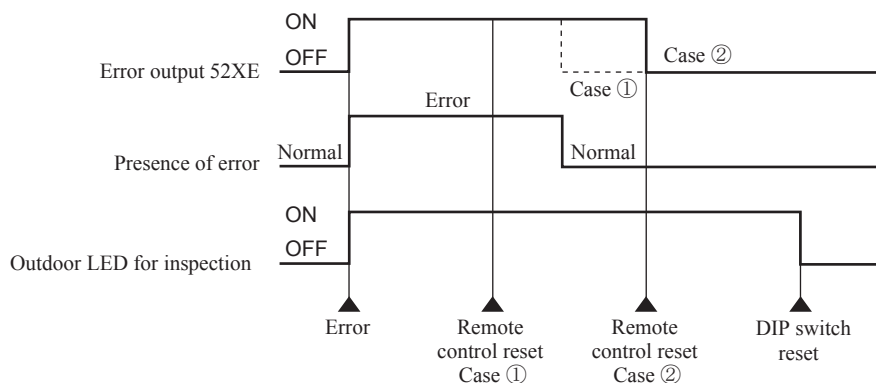
It is able to make the emergency stop function effective by remote control indoor function setting.

- (a) When the outdoor unit receives the "Emergency stop" command from the indoor unit, it makes all stop by error.
- (b) And the "Emergency stop" command is transmitted to all indoor units and error code "E63" is displayed.
- (c) When the outdoor unit receives the "Emergency stop reset" command from the indoor unit, the "Emergency stop reset" command is transmitted to all indoor units.

(6) Operation and error signal output (Master unit/Slave unit)

This is the function to retrieve and display the operation and error information on the outdoor unit as a batch.. Although indoor units also have the function to retrieve the operation and error information, this function is designed to retrieve the whole information of each refrigeration system connected to the outdoor unit.

- (a) The terminals for the operation and error outputs at the outdoor unit side are provided on the outdoor control PCB.
- (b) Diagram of output relay operations



- (c) The error output relay (52XE) is turned ON when the error stop occurs, and is turned OFF when the error reset is done from remote control by pressing "Check" and "Reset" button simultaneously after recovery from the error (Remote control reset case ②).
Before recovery from the error, if the error reset is done from remote control, 52XE is not turned OFF, but it will be turned OFF automatically after the error is recovered subsequently (Remote control reset case ①).
- (d) If at least one of connected indoor units is operating, the operation output relay (52XR) is turned ON. (Operation means the state that remote control is turned ON, in which the fan operation and the thermostat OFF is included, but the error stop is excluded.)
- (e) Output relay (52XR, 52XE) of DC12V should be prepared in the field. The maximum load of relay is LY2F (Omron).
- (f) The output connectors (CnH, CnY) to be connected to the relays for operation output (52XR) and for error output (52XE) is mounted on the outdoor unit control PCB.
- (g) If CPU goes out of control, this function becomes disable.
- (h) When the automatic backup operation is effective, there is no error display for any error on the compressor stopping by detecting its anomaly.

(7) External output

This function is used in order to operate the external option devices in conjunction with relay output of the respective operational information from outdoor unit.

However, since these models do not have dedicated output, it makes switchable by using the existing 52R relay in order to comply with various usages.

This control is done for master unit and slave unit independently.

[External output function]

External output function of CnZ1 can be switched by changing of [P06] of 7-segment display from "0" to "5" as mentioned below. However in case of setting [P19]=1 of 7-segment display, Pump-down operation by external input was assigned to CnZ1 function regardless [P06] setting.

0: Operation output [Factory default]

1: Error output

It is turned on at anomalous stop, and turned OFF when "CHECK" and "RESET" buttons on remote control are pressed simultaneously after recovering from the anomaly. Even if "CHECK" and "RESET" buttons are pressed before recovering from the anomaly, it is not turned OFF. But when recovering from the anomaly later, it is automatically turned OFF.

2: Compressor ON output

·It is turned ON, when the compressor is ON

3: Fan ON output

·It is turned ON, when the outdoor fan No.1 speed command > 0, or the outdoor fan No.2 speed command > 0.

4: Oil return operation output

·It is turned ON at oil return operation in cooling or at oil return operation in heating, or at defrost operation in heating.

5: When HP is relatively high

·Signal is output in order to operate a sprinkler system for cooling down the outdoor heat exchanger.

It is turned ON, when high pressure > 3.3MPa in cooling mode

If once starting operation of sprinkler system, it shall be kept operation for 30sec at least.

(8) Pump down control for replacement (Master unit/slave unit)

This control is for recovering refrigerant to outdoor unit quickly in case of replacement or relocation of the outdoor unit.

- (a) This control is performed from the master unit side. It cannot be controlled from the slave unit side. If this control is attempted from the slave unit side, the following codes are displayed on the 7-segment LED of the slave unit.

| Code display area | Data display area | Contents of invalid operation |
|-------------------|-------------------|--|
| oPE | 10 | Setting from the slave unit is invalid |

Note (1) The display returns to normal if the pump-down control switch is reset.

- (b) Pump down operation can be performed with the operation of 3 DIP switches SW5-1(Test run switch), SW5-2 (Test run operation mode) and SW5-3 (Pump down switch)

(c) Pump down procedure

- 1) Shut the liquid side service valve on the outdoor units
- 2) Turn SW5-2 (test run operation mode) ON (cooling)
- 3) Turn SW5-3 (pump down switch) ON
- 4) Turn SW5-1 (test run switch) ON

(d) Ending condition

If any of the following conditions is satisfied, this control ends.

- (i) When the low pressure sensor (PSL) is preset value or less, this control ends normally, and indicates followings
 - ① Red LED: Keeps lighting
 - ② Green LED: Keeps flashing
 - ③ 7-segment display: PdE
 - ④ Remote control: Stop
- (ii) Anomalous all stop by the error detection control
- (iii) If the cumulative compressor operation time under pump down control is 15 minutes (End control because time is up), this control ends and indicates followings
 - ① Red LED: Stays OFF
 - ② Green LED: Keeps flashing
 - ③ 7-segment display: No display
 - ④ Remote control: Stop
- (iv) When any of setting switch (SW5-1, SW5-2, SW5-3) is turned OFF during pump down control.

(Note) Even if only SW5-3 is turned OFF, it is not recognized as the cooling test run mode and it stops.

(9) Pump-down operation by external input

If an error stop is raised by an external input by refrigerant leaking alarm unit, the pump-down operation is performed at the outdoor unit side in order to prevent the refrigerant from leaking.

They are local arrangements.

- ① Refrigerant leaking alarm unit
- ② Valve to shut liquid pipe
- ③ Valve to shut gas pipe

Valves of ② and ③ should be selected what the pressure loss of refrigerant piping doesn't increase.

(a) Status 1: Pump-down operation**(i) Starting condition**

- ① When the external input function is assigned to "0: External operation input" and the external input terminal is open (by refrigerant leaking alarm unit).
- ② If the pump-down control is valid when the error stop is raised by the setting on 7-segment. ([P19] = "1")

(ii) Contents of control

- ① ON is output on CnY, and the liquid service valve is shut down if it is connected on CnY.
- ② The pump-down operation for replacement is performed.

(iii) Ending condition

- ① When starting conditions are lost
- ② When the pump-down operation has ended

(b) Status 2: Emergency stop operation**(i) Starting condition**

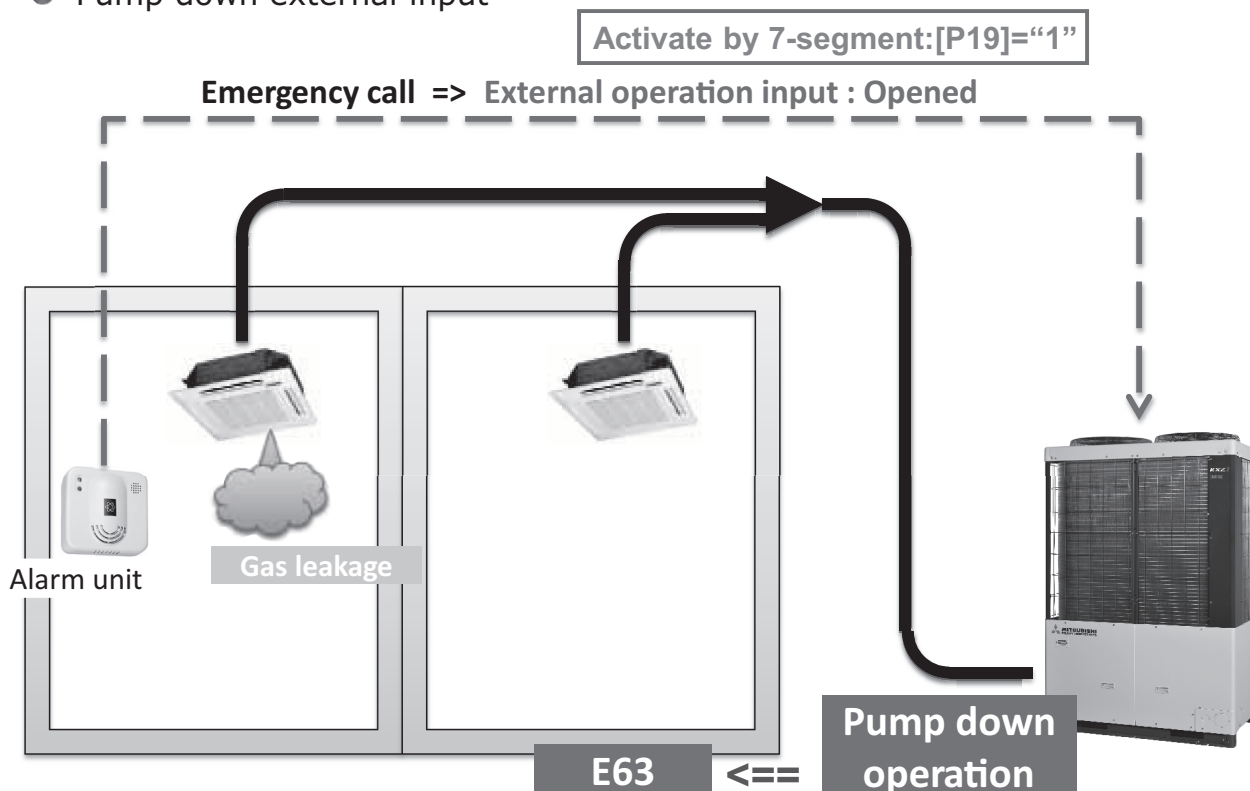
- ① When the pump-down operation has ended in the status 1.

(ii) Contents of control

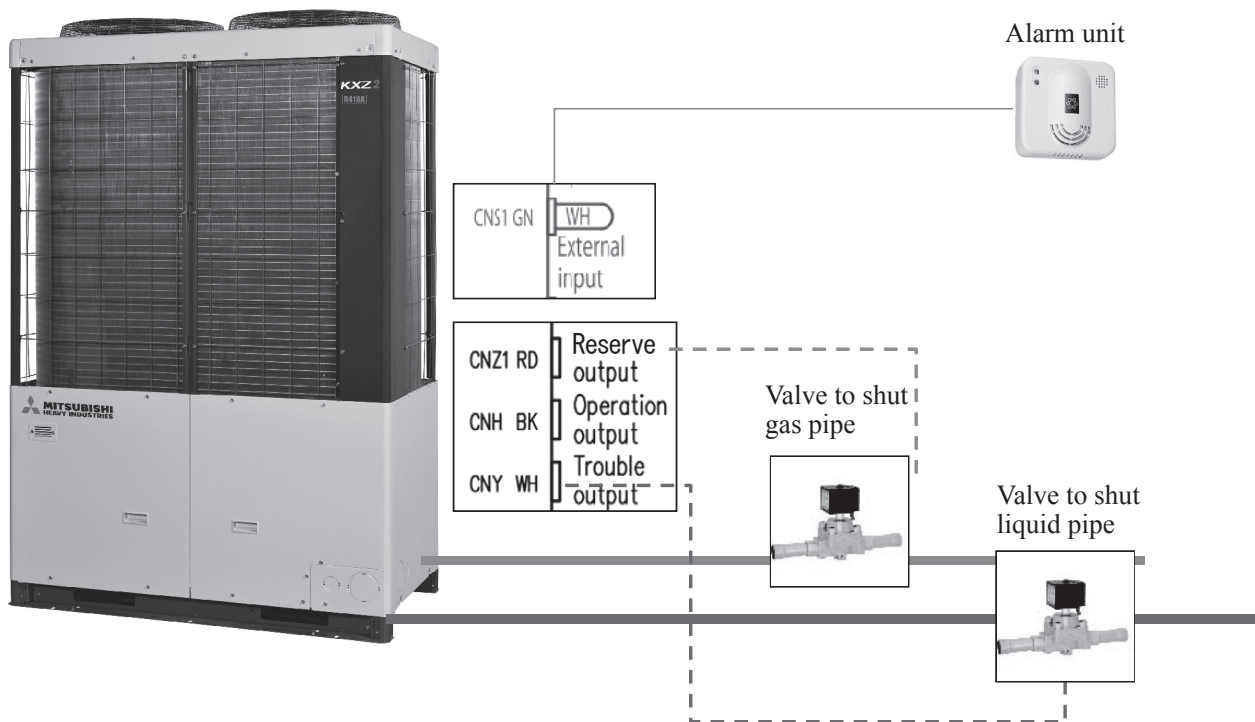
- ① ON is output to CnZ1, and the gas service valve is shut down if it is connected on CnZ1.
- ② Operation stops with the error full stop. ([E63] is displayed.)

(iii) Ending condition

- ① When starting conditions for the status 1 are lost
- ② State of error continues for 3 minutes after the error full stop. It cannot be reset in this condition from the remote control. If the starting conditions for status 1 are not yet satisfied later, this can be reset by the remote control inspection reset.

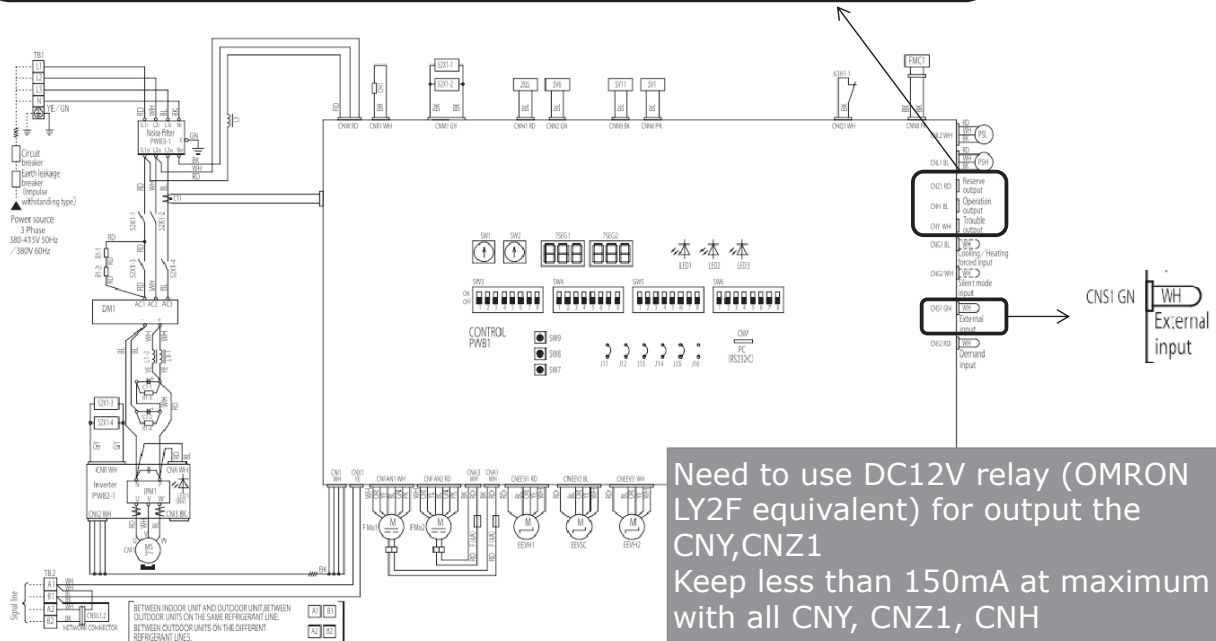
● Pump down external input

● Sample of system configuration



Output for valve to shut liquid pipe : CNY
Wiring part No. PCZ006A051A
Output for valve to shut gas pipe : CNZ1
Wiring part No. PCZ006A051B

| | |
|---------|------------------|
| CNZ1 RD | Reserve output |
| CNH BL | Operation output |
| CNY WH | Trouble output |



(10) Continuous Heating Capacity Control (CHCC)**(a) Starting condition**

- 1) Defrost operation interval extension control (See page 82.)
 - ① When 7-segment [P00] is set at 1.
 - ② When the defrost operation start conditions 1) – 3) are satisfied.
 - ③ When more lower one of two outdoor heat exchanger temperature sensors (Tho-R1, -R2) falls in the defrost operation starting zone (Fig.1) which is determined by the outdoor air temperature sensor (Tho-A) of the defrost control <Starting condition> 4).
- 2) Continuous heating control
 - ① When 7-segment [P00] is set at 2.
 - ② When the defrost operation <Starting conditions> 1) – 3) are satisfied.
 - ③ When more lower one of two outdoor heat exchanger temperature sensors (Tho-R1, -R2) falls in the defrost operation starting zone (temperature of Fig.1 + 1°C) which is determined by the outdoor air temperature sensor (Tho-A) of the defrost operation <Starting condition> 4).

(b) Contents of control

- 1) Lowering of the compressor capacity on each outdoor unit
 - ① Defrost operation interval extension control

It is confirmed at every 30-second that it is in the defrost operation starting zone.

 - If it is in the defrost operation starting zone, the compressor capacity is lowered further.
 - If it is not in the defrost operation starting zone, the PI control is reset.
 - ② Continuous heating control

It is confirmed at every 30-second that it is in the defrost operation starting zone (J15 shorted).

 - If it is in the defrost operation starting zone (J15 shorted), the compressor capacity is lowered further.
 - If it is not in the defrost operation starting zone, the PI control is reset.
- 2) The compressor capacity is lowered by the following value from actual operating condition at that time, on each compressor.

The PI control by the compressor high-low pressure control is implemented still.

| All models | Extent of lowered compressor capacity |
|------------|---------------------------------------|
| Normally | 5% |

- 3) If this control terminates after establishing the <Ending conditions> 4) and 8), it is not activated till the defrost operation terminates normally.
- 4) If this control terminates after establishing the <Ending condition> 5), it is not activated till all compressors on each outdoor unit detect the compressor OFF or the under-dome SH > 18 deg.

(c) Ending condition

- 1) Outdoor unit operation mode stop
- 2) When the outdoor unit operation mode changes to the cooling
- 3) When it continues for 3 minutes the state that it runs out the defrost operation starting zone
- 4) When the following condition is satisfied on all indoor units on which the heating thermostat is turned ON

Remote control setting temperature – Main unit suction temperature ≥ 3 deg
- 5) When either compressor on all outdoor unit has detected for 3 minutes continuously the compressor ON and also the state that the under-dome SH ≤ 15 deg
- 6) When the defrost operation conditions are not satisfied
- 7) Compressor OFF
- 8) When 7-segment [P00] is set at other than 1 or 2

(11) VTCC : Variable temperature and capacity control (VRF inverter multi-system energy save control)

On the multi-system, target pressures are set uniformly so that indoor units operate with a constant capacity and repeat the ON/OFF control with which thermostats are turned OFF when temperatures become near the setting temperature.

Owing to the tuning of target high/low pressure near the setting temperature, it becomes possible to perform the high efficiency operation near the setting temperature.

For this reason, duration of time for highly efficient operation is increased by providing the compressor upper limit speed according to the thermostat ON capacity.

• Thermostat ON capacity ... Total capacity of indoor units which are operating with the thermostat ON

(a) Correction of target high/low pressure**(i) Starting condition (either of ① or ②)**

- ① When the external input function assignment [P07] - [P10]: Multi-system energy save control = Valid
- ② When 7-segment [P69] (Multi-system energy save control I) = ON, if the external input function assignment [P07] - [P10] is not assigned this control.

(ii) Contents of control

- ① During the outdoor unit operation mode at cooling
 - Indoor load more than 50% → Corrected to the target cooling low pressure lower.
 - Indoor load less than 50% → Corrected to the target cooling low pressure higher.
- ② During the outdoor unit operation mode at heating
 - Indoor load more than 50% → Corrected to the target heating high pressure higher.
 - Indoor load less than 50% → Corrected to the target heating high pressure lower.

$$\text{(Note) Indoor load condition (\%)} = \frac{\text{(Total capacity of indoor units of which load is high)}}{\text{Total capacity of indoor units with the thermostat ON}}$$

(iii) Ending condition

- ① When the starting conditions are lost

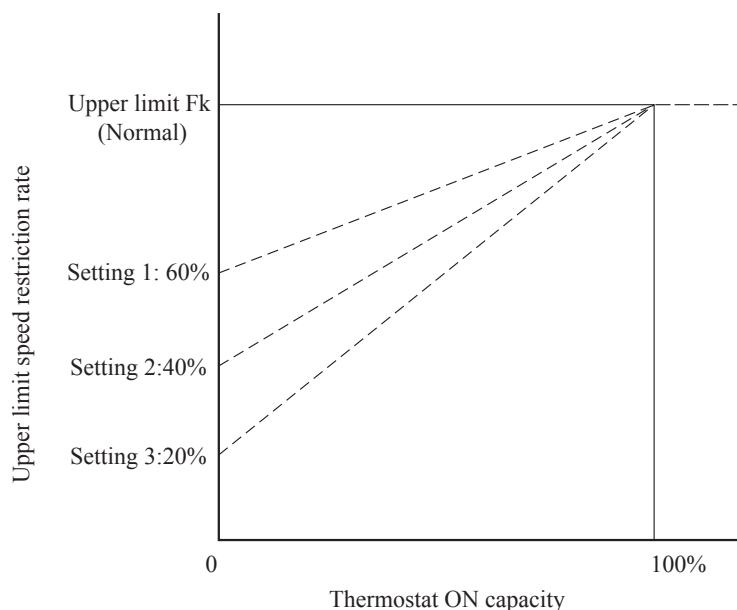
(b) Compressor upper limit speed restriction for each operation capacity

(i) Starting condition (either of ① or ②)

- ① When the external input assignment [P07] – [P10]: Multi-system energy save operation = Valid and 7-segment [P16] (Multi-system energy save control II) = 1 or 2 or 3
 Factory default: 0 (OFF)/1 (Setting 1), 2 (Setting 2), 3 (Setting 3)
- ② 7-segment [P16] = 1 or 2 or 3, if the external input function assignment [P07] – [P10] is not assigned this control.

(ii) Contents of control

- ① Compressor upper limit speed is the value obtained by multiplying with the upper limit speed restriction rate according to the thermostat ON capacity.
- ② The upper limit restriction rate is divided to the following 3 steps according to each setting of [P16] as follows.



③ Following controls supersede this control.

- 4-way valve safeguard
- Oil return operation
- Pump-down operation for replacement
- Defrost operation
- Oil equalized operation
- Start/Stop pump-down operation

(iii) Ending condition

- ① When the starting conditions are lost

(C) Data output**(1) 7-segment display and operation data retention****(a) 7-segment display**

Operation information is displayed for checking various operation data during test run and for helping malfunction diagnosis at servicing. Input data to microcomputer, contents of outdoor unit control, registration information of indoor units and etc. are mainly displayed on the 7-segment LED.

(i) Operation information display

- 1) Each item is displayed at the 7-segment LED with 6-digit on outdoor unit control PCB.
- 2) Left 3 digits are for code display and right 3 digits are for data display.
- 3) The code No. of each item is selected by pressing SW9 for the order of 10 and SW8 for the order of 1.
- 4) If the code No. is set at "C99", the data of the code No. from "C00" to "C29" is displayed cyclically. Code No. at factory setting is "C99".
- 5) If the code No. is set at other than "C99", the data of selected code No. are kept on displaying.
- 6) The code No. "C96" is for resetting.

The contents of retained operation data (the data for a period of 30 minutes prior to error stop) can be erased by setting the code No. at "C96".

< The way to reset >

The resetting method is to select the code "C96" first. (If any error data are retained, "dEL" is displayed on the data display area.)

And then when press SW7 for 3 seconds, the retained error data can be erased. However the data of EEPROM are not erased.

When the data are erased, "---" is displayed on the data display area of 7-segment LED. And this is displayed as well when no error data are retained.

- 7) If SW8 (order of 1) is pressed, it displays in the order of 0 ⇒ 1 ⇒ 2 9 ⇒ 0.
- 8) If SW9 (order of 10) is pressed, it jumps to the leading code of each order of 10.
(Example) If SW9 is pressed at the code No. "C07" displayed, it jumps to the code No. "C10". If SW9 is pressed at the code No. "C90" displayed, it jumps to the code No. "P00".
- 9) The data of code No. "C44" and "C45" can be erased independently.

< The way to reset >

The compressor cumulative operation time corresponding to the code No. selected can be erased (reset). (For resetting of the compressor cumulative operation time after replacement of compressor.)

The resetting method is to select the code "C44" or "C45" first. (the compressor cumulative operation time corresponding to the code No. is displayed on the data display area of 7-segment LED.)

And then when press SW7 for 3 seconds, the retained data can be erased. However the data of the retained operation data (the data for 30 minutes before error stop) are not erased.

- 10) It will skip items of spare in display unit.

- (ii) Error code displayed at error occurrence can be reset with the DIP switch SW3-1 ON.
- (iii) Discharge pressure saturated temperature and suction pressure saturated temperature are displayed after rounding to unit, if it is -10.0°C or lower. (Because the 7-segment display range is 3-digit.)
- (iv) Priority of display

- 1) [EXX] > [CHJ] > [CHU] > [PdS] > [PdE] > [oPE-X] > [CXX], [PXX]

[EXX]: Error code

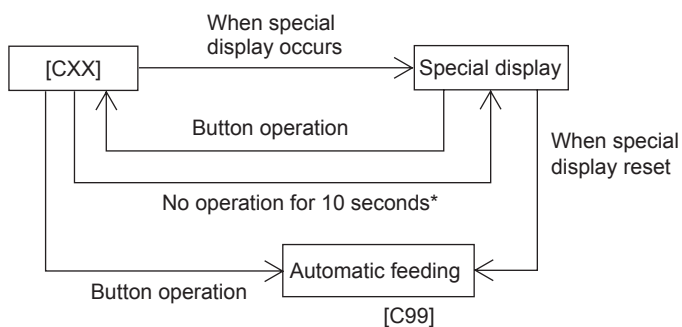
[CHJ], [CHU]: Check mode

[PdE], [PdS]: Pump down operation

[oPE]: Outdoor unit setting

- 2) If the state of 1) is reset, it is automatically switched to [CXX] (Automatic data display mode).
- 3) When pressing SW8 or SW9 under the state of 1), it switched to [CXX].

However the button input is not done for 10 seconds after switching to [CXX], the display is changed to the special display according to the priority of the state 1).



* If the special display is reset in the meanwhile, it remains [CXX].

< Individual definition of display contents >

[C49] Subcooling degree at cooling mode

- = High pressure saturated temperature (°C) detected with high pressure sensor (PSH)
- Subcooling coil temperature (°C) detected with subcooling temperature sensor (Tho-SC)

During heating mode this data might be unreliable as subcooling degree, but the result is displayed as it is.

[C50] Suction superheat degree

- = Suction pipe temperature (°C) detected with suction pipe temperature sensor (Tho-S)
- Low pressure saturated temperature (°C) detected with low pressure sensor (PSL)

[C51] Superheat degree of subcooling coil

- = Subcooling coil temperature (°C) detected with subcooling coil temperature sensor (Tho-H)
- Low pressure saturated temperature (°C) detected with low pressure sensor (PSL)

[C52] Superheat degree of under-dome

- = Under-dome temperature (°C) detected with under-dome temperature sensor (Tho-C)
- Low pressure saturated temperature (°C) detected with low pressure sensor (PSL)

< Operation information >

| Code No. | Contents of display | Data display range | Minimum unit | Remark |
|--|--|--------------------|---------------------|------------------------|
| Unusual code | [EXX] | | | |
| Warning code | [oPx][oPE-X] | | | |
| Special code | [PdS][PdE] [CH][CHF][CO][HE][PCL][dLP] | | | |
| < Information for sensor or actuator value > | | | | |
| C00 | CM1 operating frequency | 0 - 130 | 1rps | |
| C01 | CM2 operating frequency | 0 - 130 | 1rps | |
| C02 | Tho-A Outdoor air temperature | L,-20 - 70 | 1°C | |
| C03 | Tho-R1 Heat exchanger temperature 1 | L,-40 - 75 | 1°C | |
| C04 | Tho-R2 Heat exchanger temperature 2 | L,-40 - 75 | 1°C | |
| C05 | Tho-R3 Heat exchanger temperature 3 | L,-40 - 75 | 1°C | |
| C06 | Tho-R4 Heat exchanger temperature 4 | L,-40 - 75 | 1°C | |
| C07 | Tho-D1 Discharge pipe temperature (CM1) | L,-20 - 140 | 1°C | |
| C08 | Tho-D2 Discharge pipe temperature (CM2) | L,-20 - 140 | 1°C | |
| C10 | Tho-C1 Under-dome temperature (CM1) | L,-30 - 90 | 1°C | |
| C11 | Tho-C2 Under-dome temperature (CM2) | L,-30 - 90 | 1°C | |
| C12 | Tho-P1 Power transistor temperature (CM1) | L,-20 - 140 | 1°C | |
| C13 | Tho-P2 Power transistor temperature (CM2) | L,-20 - 140 | 1°C | |
| C14 | Tho-SC Subcooling coil temperature 1 | L,-40 - 75 | 1°C | |
| C15 | Tho-H Subcooling coil temperature 2 | L,-40 - 75 | 1°C | |
| C16 | Tho-S Suction pipe temperature | L,-40 - 75 | 1°C | |
| C18 | CT1 Current (CM1) | 0 - 70 | 1A | FDC400,450KXZE2M only |
| | | 0 - 61 | | Except the above units |
| C19 | CT2 Current (CM2) | 0 | 1A | FDC400,450KXZE2M only |
| | | 0 - 60 | | Except the above units |
| C20 | Opening angle of EEVH1 expansion valve for heating | 0 - 500 | 1pulse | |
| C21 | Opening angle of EEVH2 expansion valve for heating | 0 - 500 | 1pulse | |
| C22 | Opening angle of EEVSC expansion valve for subcooling coil | 0 - 500 | 1pulse | |
| C23 | FMo1 Number of rotations | 0 - 999 | 10min ⁻¹ | |
| C24 | FMo2 Number of rotations | 0 - 999 | 10min ⁻¹ | |
| C25 | PSH High pressure sensor | 0 - 4.15 | 0.01MPa | |
| C26 | PSL Low pressure sensor | 0 - 1.70 | 0.01MPa | |

| Code No. | Contents of display | Data display range | Minimum unit | Remark |
|--------------------------------------|--|--------------------|--------------|---|
| C27 | Inverter secondary current 1 | 0 - 127 | 1A | FDC400,450KXZE2M only |
| | | 0 - 63 | | Except the above units |
| C28 | Inverter secondary current 2 | 0 - 63 | 1A | |
| C30 | 63H1-1 63H1-2 (63H1-R) | 0,1 | – | Order of 100 : 63H1-1, 2 Order of 10 : 63H1-R Order of 1 : Spare (0: Open, 1: Close) |
| C31 | CNS1 CNS2 CNG1 | 0,1 | – | Order of 100 : CNS1 Order of 10 : CNS2 Order of 1 : CNG1 (0: Open, 1: Close) |
| C32 | CNG2 SV8 SV10 | 0,1 | – | Order of 100 : CNG2 Order of 10 : SV8 Order of 1 : SV10 (0: Open, 1: Close) |
| C33 | 52C1 52C2 CH1 | 0,1 | – | Order of 100 : 52C1 Order of 10 : 52C2 Order of 1 : CH1 (0: Open, 1: Close) |
| C34 | CH2 20S (20SL) | 0,1 | – | Order of 100 : CH2 Order of 10 : 20S Order of 1 : (20SL) (0: Open, 1: Close) |
| C35 | FMC1, 2 | 0,1 | – | Order of 100 : FMC1, 2 Order of 10 : Spare Order of 1 : Spare (0: Open, 1: Close) |
| C36 | SV1 SV2 (SV3) | 0,1 | – | Order of 100 : SV1 Order of 10 : SV2 Order of 1 : (SV3) (0: Open, 1: Close) |
| C37 | SV4 SV6 SV7 | 0,1 | – | Order of 100 : SV4 Order of 10 : SV6 Order of 1 : SV7 (0: Open, 1: Close) |
| C38 | SV11 X19 | 0,1 | – | Order of 100 : SV11 Order of 10 : Spare Order of 1 : X19 (0: Open, 1: Close) |
| C39 | CNZ1 CNH CNY | 0,1 | – | Order of 100 : CNZ1 Order of 10 : CNH Order of 1 : CNY (0: Open, 1: Close) |
| < Information for heat source unit > | | | | |
| C40 | Number of connected indoor unit | 0 - 80 | 1 | |
| C41 | Capacity ratio of connected indoor unit | 0 - 999 | 1% | |
| C42 | Number of operation indoor unit | 0 - 50 | 1 | |
| C43 | Required Fk total | 0 - 999 | 1rps | |
| C44 | Compressor cumulative operating time (CM1) | 0 - 655 | 100h | |
| C45 | Compressor cumulative operating time (CM2) | 0 - 655 | 100h | |
| C46 | Discharge pressure saturation temperature | -50 - 70 | 0.1°C | Minimum unit 1°C at -10°C or lower |
| C47 | Suction pressure saturation temperature | -50 - 30 | 0.1°C | Minimum unit 1°C at -10°C or lower |
| C48 | Tho-SC1 saturated pressure | -0.68 - 4.15 | 0.01MPa | |
| C49 | Cooling operation subcooling | 0 - 50 | 0.1deg | See page 102. |
| C50 | Suction superheat | 0 - 50 | 0.1deg | See page 102. |
| C51 | Superheat of subcooling coil | 0 - 50 | 0.1deg | See page 102. |
| C52 | Tho-C1 Superheat | 0 - 50 | 0.1deg | See page 102. |
| C53 | Tho-C2 Superheat | 0 - 50 | 0.1deg | |
| C54 | Target cooling low pressure | 0.00 - 2.00 | 0.01MPa | |
| C55 | Target heating high pressure | 1.60 - 4.15 | 0.01MPa | |

| Code No. | Contents of display | Data display range | Minimum unit | Remark |
|-------------------------------------|---|--------------------|---------------------|--|
| C56 | Target Fk | 0 - 999 | 1rps | |
| C57 | Inverter 1 operating frequency command | 0 - 130 | 1rps | |
| C58 | Inverter 2 operating frequency command | 0 - 130 | 1rps | |
| C59 | FMo1 operating revolution command | 0 - 999 | 10min ⁻¹ | |
| C60 | FMo2 operating revolution command | 0 - 999 | 10min ⁻¹ | |
| C61 | Demand ratio | 0 - 100 | 1% | |
| < Control status > | | | | |
| C65 | Outdoor unit operating mode pattern | 0 - 127 | 1 | |
| C66 | Control status | 0 - 127 | 1 | See table on page 109. |
| C67 | Protection control status | 0 - 127 | 1 | See table on page 109. |
| C68 | Compressor stop causes | 0 - 127 | 1 | See table on page 110. |
| C69 | Time elapsed after compressor stop cause | 0 - 255 | 1h | |
| C70 | Protection control causes 1 | 0 - 127 | 1 | Displays No. of the protection control of which effect is the strongest among those occurred from the start of operation after the power on. |
| C71 | Protection control causes 2 | 0 - 127 | 1 | Displays No. of the protection control of which effect is stronger secondly among those occurred from the start of operation after the power on. |
| C72 | Protection control causes 3 | 0 - 127 | 1 | Displays No. of the protection control of which effect is stronger thirdly among those occurred from the start of operation after the power on. |
| C73 | Compressor error causes 1 | 0 - 127 | 1 | Displays No. of the error detection of which effect is the strongest among those occurred from the start of operation after the power on. |
| C74 | Compressor error causes 2 | 0 - 127 | 1 | Displays No. of the error detection of which effect is stronger secondly among those occurred from the start of operation after the power on. |
| C75 | Compressor error causes 3 | 0 - 127 | 1 | Displays No. of the error detection of which effect is stronger thirdly among those occurred from the start of operation after the power on. |
| < Information for unusual counter > | | | | |
| C80 | Counter · Current cut (CM1) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C81 | Counter · Current cut (CM2) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C82 | Counter · Power transistor overheat (CM1) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C83 | Counter · Power transistor overheat (CM2) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C84 | Counter · Compressor startup failure (CM1) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C85 | Counter · Compressor startup failure (CM2) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C86 | Counter · Anomalous compressor by loss of synchronism (CM1) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C87 | Counter · Anomalous compressor by loss of synchronism (CM2) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C88 | Counter · Communication error between inverter PCB and outdoor unit control (CM1) | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C89 | Counter · Communication error between inverter PCB and outdoor unit control (CM2) | 0 - 255 | 1 | EEPROM memory. Resettable. |

| Code No. | Contents of display | Data display range | Minimum unit | Remark |
|---------------|--|--------------------|--------------|----------------------------|
| C90 | Counter · Anomalous FMo1 | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C91 | Counter · Anomalous FMo2 | 0 - 255 | 1 | EEPROM memory. Resettable. |
| C92 | Counter · Indoor-outdoor unit communications error | 0 - 255 | — | EEPROM memory. Resettable. |
| C93 | Counter · Outdoor unit CPU reset | 0 - 255 | — | EEPROM memory. Resettable. |
| C94 | Auto back up capable time | 0 - 80 | 1h | |
| < The other > | | | | |
| C96 | Data reset | — | — | |
| C97 | Program sub-version | 0 - 991 | — | |
| C98 | Program POL version | 0.00 - 9.99 | 0.01 | |
| C99 | Auto send display | — | — | |

< 7-segment software input >

| < User setting > | | | | |
|------------------|--|--|----|--|
| P00 | Continuous Heating Capacity Control (CHCC) | <u>0: (Factory default)</u> 0, 1, 2 | — | |
| P01 | Switching to operation priority | <u>0: (Factory default)</u> 0 - 3 | 1 | |
| P02 | Outdoor fan snow protection control | <u>0: (Factory default)</u> 0 - 2 | 1 | 0 : Invalid 1 or over : Valid |
| P03 | Outdoor fan snow protection control ON time setting | <u>30: (Factory default)</u> 10,30 - 600(sec) | 30 | Changes to 10, 30, 60, 90 ... 600. |
| P04 | Many steps demand setting (1st step demand) | <u>80: (Factory default)</u> 0,40,60,80 | — | |
| P05 | Silent mode setting | <u>0: (Factory default)</u> 0 - 9 | 1 | |
| P06 | CNZ1 function assignment | <u>0: (Factory default)</u> 0 - 9 | 1 | |
| P07 | CNS1 function assignment | <u>0: (Factory default)</u> 0 - 20 | 1 | 0: External operation input 1: Demand input 2: Cooling/heating forced operation input 4: Oil return control forced operation input 5: Outdoor fan snow protection control input 6: Test run external input 1 (SW5-1 equivalent) 7: Test run external input 2 (SW5-2 equivalent) 8: Silent mode input 2 9: 2-step demand input 10: AF periodic inspection display 11: AF error display 12: Building multi energy save control 13 - 20:Spare |
| P08 | CNS2 function assignment | <u>1: (Factory default)</u> 0 - 20 | 1 | |
| P09 | CNG1 function assignment | <u>2: (Factory default)</u> 0 - 20 | 1 | |
| P10 | CNG2 function assignment | <u>3: (Factory default)</u> 0 - 20 | 1 | |
| P11 | Switching to ensure priority for heating blowing temperature | <u>0: (Factory default)</u> 0, 1 | — | 0 : Invalid 1 : Valid |
| P12 | Capacity ratio of thermostat ON to ensure for heating blowing temperature | <u>110: (Factory default)</u> 110,100,090,080 | — | |
| P13 | Security number of thermostat ON to ensure for heating blowing temperature | <u>0: (Factory default)</u> 0 - 9 | 1 | |
| P14 | Many steps demand setting (2nd step demand) | <u>60: (Normal time)</u> 0,40,60,80 | — | |
| P15 | Many steps demand setting (3rd step demand) | <u>40: (Normal time)</u> 0,40,60,80 | — | |
| P16 | Multi-system energy save control II | <u>0: (Factory default)</u> 0, 1, 2, 3 | 1 | |
| P17 | After changing mode from operation prohibition mode | <u>0: (Factory default)</u> 0, 1 | 1 | 0 : Keeping STOP 1 : Automatically RUN |

| Code No. | Contents of display | Data display range | Minimum unit | Remark |
|---------------------------|---|------------------------------------|--------------|---|
| P18 | Mode unmatched indoor unit setting in forced mode | 0: (Factory default) 0, 1 | 1 | |
| P19 | Pump-down control at the emergency stop | 0: (Factory default) 0, 1 | 1 | 0: Invalid 1: Valid |
| < New Superlink setting > | | | | |
| P30 | Superlink communication status | 0, 1 | — | 0: Previous Superlink 1: New Superlink |
| P31 | Start automatic address setting | 0: (Factory default) 0, 1 | — | 0: Automatic address setting standby 1: Automatic address setting start |
| P32 | Input starting indoor address | 0: (Factory default) 0 - 127 | 1 | Specify the starting indoor address connected in one refrigerant system for automatic address setting. |
| P33 | Input the number of connected indoor units | 24: (Factory default) 1 - 24(*) | 1 | Specify the number of indoor units connected in one refrigerant system for automatic address setting. (*) Maximum connectable number of indoor units for each outdoor unit |
| P34 | Polarity definition | 0: (Factory default) 0, 1 | — | 0: Network polarity not defined 1: Network polarity defined |

[C66] Control status**<Definition of signal>**

Shows the status of control in operation currently.

If two or more controls among the following protection controls are satisfied simultaneously, No. of the control of which number is larger is displayed.

| | Protection control status | Number |
|--|---|--------|
| Ordinary control | Remote control all stop | 0 |
| | Ordinary cooling control | 1 |
| | Ordinary heating control | 2 |
| Operating control | Pump down control at start/stop | 10 |
| | Indoor heat exchanger refrigerant purge control | 11 |
| | Outdoor unit heat exchanger refrigerant purge control | 12 |
| | Oil return control | 13 |
| | Defrost control | 14 |
| | Oil equalization rotation control | 15 |
| | Oil equalization control | 16 |
| Special control | Test run control | 20 |
| | Pump down control for replacement | 21 |
| | Demand control | 22 |
| | Silent mode control | 23 |
| | Ability measurement mode control | 24 |
| | Outdoor air intake unit control | 25 |
| | Low outdoor temperature control | 26 |
| | Cooling unusual low pressure return control | 27 |
| Compressor dilution protection control | 28 | |

[C67] Protection control status**<Definition of signal>**

Shows the status of protection control in operation currently.

If two or more controls among the following protection controls are satisfied simultaneously, No. of the control of which number is larger is displayed.

| | Protection control status | Number |
|--------------------|--|--------|
| Ordinary control | No operation of protective control | 0 |
| Protection control | During high pressure (HP) | 1 |
| | During low pressure (LP) | 3 |
| | During discharge pipe temperature (Td) | 4 |
| | During specific pressure (SCR) | 5 |
| | During under-dome temperature (Tc) | 6 |
| | During current safe (CS) | 7 |
| | During power transistor temperature (PT) | 8 |

[C68] Compressor stop causes**<Definition of signal>**

Shows the latest compressor stop cause counted from right now.

(Excluding the ordinary stop, etc.)

Output of the No. is retained till next compressor stop cause occurs.

| | Compressor stop causes | Number |
|---|--|--------|
| | No history | 0 |
| Sensor wire breakage | Tho-A | 1 |
| | Tho-R1 | 2 |
| | Tho-R2 | 3 |
| | Tho-R3 | 4 |
| | Tho-R4 | 5 |
| | Tho-D1 | 6 |
| | Tho-D2 | 7 |
| | Tho-SC | 8 |
| | Tho-H | 9 |
| | Tho-S | 10 |
| | Tho-C1 | 11 |
| | Tho-C2 | 12 |
| | Tho-P1 | 13 |
| | Tho-P2 | 14 |
| | High pressure sensor | 15 |
| | Low pressure sensor | 16 |
| System error | High pressure anomaly | 20 |
| | Low pressure anomaly | 21 |
| | Discharge temperature sensor error (Tho-D1) | 22 |
| | Discharge temperature sensor error (Tho-D2) | 23 |
| | Liquid flooding anomaly (CM1) | 24 |
| | Liquid flooding anomaly (CM2) | 25 |
| | Spare | 26 |
| Fan • Compressor Communication error | Outdoor DC fan motor anomaly (FMo1) | 30 |
| | Outdoor DC fan motor anomaly (FMo2) | 31 |
| | Current cut (CM1) | 32 |
| | Current cut (CM2) | 33 |
| | Fo short-circuit (CM1) | 34 |
| | Fo short-circuit (CM2) | 35 |
| | Compressor startup failure (CM1) | 36 |
| | Compressor startup failure (CM2) | 37 |
| | Communication error between inverter PCB and outdoor control (CM1) | 38 |
| | Communication error between inverter PCB and outdoor control (CM2) | 39 |
| | Anomalous compressor by loss of synchronism (CM1) | 40 |
| | Anomalous compressor by loss of synchronism (CM2) | 41 |
| | Communication error between the master unit and slave units | 42 |
| Compressor stop by control | Operation mode change | 50 |
| | Differential pressure startup prevention control | 51 |
| | Protect for heating overload | 52 |
| | Spare | 53 |

| Code | Display unit | Contents of invalid operation |
|--------|--------------|---|
| oPE 03 | Master | Incorrect combination |
| oPE 07 | Master/Slave | Fault of model selection by SW4 & jumper setting |
| oPE 08 | Master | Prohibition compressor operation due to low ambient temperature |
| oPE 10 | Slave | Unavailable setting from slave |

(b) Saving of operation data

For the purpose to investigate the cause of trouble in the field, the operation data are always saved in the memory, and if the trouble occurs, the data writing is stopped and the operation data prior to the trouble occurrence are recorded. These data can be retrieved to personal computer through RS-232C connector on the outdoor unit control PCB and utilized for probing the cause.

- (i) Operation data for a period of 15 times prior to the present operation are saved and updated sequentially.
- (ii) If an anomalous stop occurs, the data are not updated any more.
- (iii) Data are written in at 2-minute interval and following data will be transmitted to PC upon demand.

| Data | Data Range | Example |
|----------------------------|-------------------------|----------------------------|
| Software version | Ascii 15 byte | KD3C218##### (#: NULL) |
| PID (program ID) | Ascii 2 byte | 5D |
| Outdoor unit capacity | Ascii 3 byte | As shown in table at right |
| Power source frequency | Ascii 2 byte | 60 |
| Outdoor unit address | Ascii 2 byte | 00 - 3F |
| Indoor address × 16 units | Ascii 2 byte × 16 units | 40 - 7F |
| Indoor capacity × 16 units | Ascii 3 byte × 16 units | 022 - 280 |

| Outdoor unit capacity data | Outdoor unit capacity data | Remark |
|---------------------------------|----------------------------|--|
| Single type | Example: 24HP - [S24] | S: Display with Horse Power of single type or single use of combination type |
| Master unit of combination type | Example: 46HP - [S46] | S: Display with Horse Power of master unit of combination type |
| Slave unit of combination type | Example: 20HP - [C22] | C: Display with Horse Power of slave unit of combination type |

(iv) Error retention and monitoring data

< Indoor unit indicate data >

| Code No. | Write-in content | Record data | | | | |
|----------|---|---------------------|---------------|-----------------|------------------------------|---------------------------------|
| | | Data write-in range | Write-in unit | Number of bytes | Content | |
| 00 | Indoor unit 1 Thi-A | -10 - 52 | 1°C | 1 | Air inlet temperature | |
| 01 | Indoor unit 1 Thi-R1 | -19 - 71 | 1°C | 1 | Heat exchanger temperature 1 | |
| 02 | Indoor unit 1 Thi-R2 | -19 - 71 | 1°C | 1 | Heat exchanger temperature 2 | |
| 03 | Indoor unit 1 Thi-R3 | -19 - 71 | 1°C | 1 | Heat exchanger temperature 3 | |
| 04 | Indoor unit 1 EEV | 0 - 470 | 1pulse | 2 | | |
| 05 | Indoor unit 1 setting temperature | 0 - 127 | 0.5°C | 1 | | |
| 06 | Indoor unit 1 Operation mode/Air capacity | 0 - 500 | - | 2 | 0 | Not used (Data not received) |
| | | | | | 100 | Dehumidifying stop 0-speed |
| | | | | | 110 | Dehumidifying operation 0-speed |
| | | | | | 111 | Dehumidifying operation 1-speed |
| | | | | | 112 | Dehumidifying operation 2-speed |
| | | | | | 113 | Dehumidifying operation 3-speed |
| | | | | | 114 | Dehumidifying operation 4-speed |
| | | | | | 115 | Dehumidifying operation 5-speed |
| | | | | | 116 | Dehumidifying operation 6-speed |
| | | | | | 200 | Cooling stop 0-speed |
| | | | | | 210 | Cooling operation 0-speed |
| | | | | | 211 | Cooling operation 1-speed |
| | | | | | 212 | Cooling operation 2-speed |
| | | | | | 213 | Cooling operation 3-speed |
| | | | | | 214 | Cooling operation 4-speed |
| | | | | | 215 | Cooling operation 5-speed |
| | | | | | 216 | Cooling operation 6-speed |
| | | | | | 300 | Fan stop 0-speed |
| | | | | | 310 | Fan operation 0-speed |
| | | | | | 311 | Fan operation 1-speed |
| 312 | Fan operation 2-speed | | | | | |
| 313 | Fan operation 3-speed | | | | | |
| 314 | Fan operation 4-speed | | | | | |
| 315 | Fan operation 5-speed | | | | | |
| 316 | Fan operation 6-speed | | | | | |
| 400 | Heating stop 0-speed | | | | | |
| 410 | Heating operation 0-speed | | | | | |

| Code No. | Write-in content | Record data | | | |
|---|--------------------------------|---------------------|---------------|-----------------|--|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| | | | | | 411 Heating operation 1-speed |
| | | | | | 412 Heating operation 2-speed |
| | | | | | 413 Heating operation 3-speed |
| | | | | | 414 Heating operation 4-speed |
| | | | | | 415 Heating operation 5-speed |
| | | | | | 416 Heating operation 6-speed |
| 07 | Indoor unit 1 Demand frequency | 0 - 255 | 1rps | 1 | |
| 08 | Indoor unit 1 Answer frequency | 0 - 255 | 1rps | 1 | |
| 09 | Indoor unit 1 Indoor local | — | — | 1 | Bit0 Anti-frost Bit1 Aperture command ON Bit2※ If indoor unit is HMU, Bit3※ Cooling : Target SH Bit4※ Heating : Target heat exchanger outlet temperature Bit5※ Range : 0 - 62 (Units of 1°C, round up. Converse from binary number of Bit2 - 7.) Bit6※ ※If indoor unit is not HMU : 0 Bit7※ |
| 10 | Indoor unit 1 Thi spare | -10 - 52 | 1°C | 1 | Air outlet temperature |
| 11 | Indoor unit 1 Model | 0 - 85 | — | 1 | 0 FDT 1 FDK 2 other 3 FDE 4 FDTC 5 Outdoor air intake unit 6 Spacious area 7 Outdoor air treatment |
| 12 | Indoor unit 1 PID | — | — | 1 | |
| Data contents for indoor 2 to 16 are same as above. | | | | | |

< Outdoor unit indicate data >

| Code No. | Write-in content | Record data | | | |
|-----------------------------|--|---------------------|---------------|-----------------|---|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| 00 | Anomalous code | 00 - 99 | — | 1 | 00: No anomalous, outdoor unit all anomalous |
| 01 | Address of unit where trouble occurred | 00 - FF | — | 1 | 00-3F: Outdoor unit side, 40-6F: Indoor unit side |
| < Sensor mesurement value > | | | | | |
| 02 | Tho-A Outdoor air temperature | -25 - 70 | 0.01°C | 2 | |
| 03 | Tho-R1 Heat exchanger temperature 1 | -40 - 75 | 0.01°C | 2 | Cooling liquid side |
| 04 | Tho-R2 Heat exchanger temperature 2 | -40 - 75 | 0.01°C | 2 | Cooling gas side |
| 05 | Tho-R3 Heat exchanger temperature 3 | -40 - 75 | 0.01°C | 2 | |
| 06 | Tho-R4 Heat exchanger temperature 4 | -40 - 75 | 0.01°C | 2 | |
| 07 | Tho-D1 Discharge pipe temperature (CM1) | -20 - 140 | 0.01°C | 2 | |
| 08 | Tho-D2 Discharge pipe temperature (CM2) | -20 - 140 | 0.01°C | 2 | |
| 09 | Tho-C1 Under-dome temperature (CM1) | -30 - 90 | 0.01°C | 2 | |
| 10 | Tho-C2 Under-dome temperature (CM2) | -30 - 90 | 0.01°C | 2 | |
| 11 | Tho-P1 Power transistor temperature (Heat dissipation fin) | -20 - 140 | 0.01°C | 2 | |
| 12 | Tho-P2 Power transistor temperature (Heat dissipation fin) | -20 - 140 | 0.01°C | 2 | |
| 13 | Tho-S Suction pipe temperature | -40 - 75 | 0.01°C | 2 | |
| 14 | Tho-SC Sub-cooling coil temperature1 | -40 - 75 | 0.01°C | 2 | |

| Code No. | Write-in content | Record data | | | |
|----------------------------------|---|---------------------|---------------------|-----------------|------------------------|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| 15 | Tho-H Subcooling coil temperature 2 | -40 - 75 | 0.01°C | 2 | |
| 16 | Injection suction pipe temperature 1 (spare) | -40 - 75 | 0.01°C | 2 | |
| 17 | Tho-J Receiver liquid surface detection temperature 1 | -40 - 75 | 0.01°C | 2 | |
| 18 | CT1 Current | 0 - 70 | 0.01A | 2 | FDC400, 450KXZE2M only |
| | | 0 - 60.7 | | | Except the above unist |
| 19 | CT2 Current | 0 | 0.01A | 2 | FDC400, 450KXZE2M only |
| | | 0 - 60.7 | | | Except the above unist |
| 20 | Inverter secondary current 1 | 0 - 127.75 | 0.01A | 2 | FDC400, 450KXZE2M only |
| | | 0 - 63.75 | | | Except the above unist |
| 21 | Inverter secondary current 2 | 0 - 63.75 | 0.01A | 2 | |
| 22 | High pressure sensor | 0.00 - 4.15 | 0.001MPa | 2 | |
| 23 | Low pressure sensor | 0.00 - 1.70 | 0.001MPa | 2 | |
| 24 | Liquid pipe pressure sensor | 0.00 - 4.15 | 0.001MPa | 2 | |
| < Information for outdoor unit > | | | | | |
| 25 | Indoor unit connection number | 0 - 127 | 1unit | 1 | |
| 26 | Indoor unit connection capacity | 0 - 65535 | — | 2 | |
| 27 | Indoor unit thermostat ON number | 0 - 255 | 1unit | 1 | |
| 28 | Indoor unit cooling thermostat ON capacity | 0 - 65535 | — | 2 | |
| 29 | Indoor unit heating thermostat ON capacity | 0 - 65535 | — | 2 | |
| 30 | Operation mode | 0 - 2 | — | 1 | 0 Stop |
| | | | | | 1 Cooling |
| | | | | | 2 Heating |
| 31 | Outdoor unit operation pattern | 0 - 255 | 1 | 1 | Real range is 1-17 |
| 32 | CM1 frequency | 0 - 255 | 1rps | 1 | |
| 33 | CM2 frequency | 0 - 255 | 1rps | 1 | |
| 34 | FMo1 number of rotations | 0 - 2550 | 10min ⁻¹ | 1 | |
| 35 | FMo2 number of rotations | 0 - 2550 | 10min ⁻¹ | 1 | |
| 36 | Required rps total | 0 - 65535 | 1rps | 2 | |
| 37 | Discharge pressure saturation temperature | -50 - 70 | 0.01°C | 2 | |
| 38 | Intake pressure saturation temperature | -50 - 30 | 0.01°C | 2 | |
| 39 | Pressure ratio | 1.0 - 10.0 | 0.1 | 1 | |
| 40 | Cooling operation subcooling | 0 - 25.5 | 0.1deg | 1 | |
| 41 | Superheat of suction pipe | 0 - 25.5 | 0.1deg | 1 | |
| 42 | Superheat of subcooling coil | 0 - 25.5 | 0.1deg | 1 | |

| Code No. | Write-in content | Record data | | | | | |
|----------------------------|---|---------------------|---------------------|-----------------|---|-------------|---------------|
| | | Data write-in range | Write-in unit | Number of bytes | Content | | |
| 43 | Under-dome superheat CM1 | 0 - 25.5 | 0.1deg | 1 | | | |
| 44 | Under-dome superheat CM2 | 0 - 25.5 | 0.1deg | 1 | | | |
| 45 | Target FK | 0 - 65535 | 1rps | 2 | | | |
| 46 | Inverter CM1 operation frequency | 0 - 255 | 1rps | 1 | | | |
| 47 | Inverter CM2 operation frequency | 0 - 255 | 1rps | 1 | | | |
| 48 | FMo1 rotation command | 0 - 2550 | 10min ⁻¹ | 1 | | | |
| 49 | FMo2 rotation command | 0 - 2550 | 10min ⁻¹ | 1 | | | |
| 50 | EEVH1 opening angle | -32768 ~32767 | 1pulse | 2 | | | |
| 51 | EEVH2 opening angle | -32768 ~32767 | 1pulse | 2 | | | |
| 52 | EEVSC opening angle | -32768 ~32767 | 1pulse | 2 | | | |
| 53 | EEVD opening angle | -32768 ~32767 | 1pulse | 2 | High head unit setting | | |
| | Target temperature of compressor | 0~1270 | 5°C | 2 | Other 0 : Outlet water temperature of compressor is not controlled. Other 0 : Target outlet water temperature of compressor | | |
| 54 | Target cooling low pressure of compressor | 0.00 - 2.00 | 0.01MPa | 1 | | | |
| 55 | Target heating high pressure of compressor | 0.00 - 4.15 | 0.01MPa | 2 | | | |
| 56 | Target differential temperature of heating CSST | 0 - 127 | 1deg | 1 | Real range is 5-30deg | | |
| 57 | Spare | — | — | 1 | | | |
| 58 | Target superheat of outdoor unit EEVSC | 0 - 25.5 | 0.1deg | 1 | | | |
| 59 | Count of refrigerant oil reduction (CM1) | 0 - 2550 | 10cc | 1 | Real range is 0-1100 cc | | |
| 60 | Count of refrigerant oil reduction (CM2) | 0 - 2550 | 10cc | 1 | Real range is 0-1100 cc | | |
| 61 | Countdown of refrigerant oil return | 0 - 255 | 3minutes | 1 | Real range is 0-600 minutes | | |
| < Output of PCB hardware > | | | | | | | |
| 62 | Output of relay | — | — | 1 | Bit0 | 52C1 | 0: OFF, 1: ON |
| | | | | | Bit1 | 52C2 | 0: OFF, 1: ON |
| | | | | | Bit2 | CH1 | 0: OFF, 1: ON |
| | | | | | Bit3 | CH2 | 0: OFF, 1: ON |
| | | | | | Bit4 | 20S | 0: OFF, 1: ON |
| | | | | | Bit5 | 20SL | 0: OFF, 1: ON |
| | | | | | Bit6 | FMC1,2 | 0: OFF, 1: ON |
| | | | | | Bit7 | Spare(FMC3) | 0: OFF, 1: ON |
| 63 | Output of relay | — | — | 1 | Bit0 | SV1 | 0: OFF, 1: ON |
| | | | | | Bit1 | SV2 | 0: OFF, 1: ON |
| | | | | | Bit2 | SV4 | 0: OFF, 1: ON |
| | | | | | Bit3 | SV6 | 0: OFF, 1: ON |
| | | | | | Bit4 | SV7 | 0: OFF, 1: ON |
| | | | | | Bit5 | SV8 | 0: OFF, 1: ON |
| | | | | | Bit6 | Spare(SV10) | 0: OFF, 1: ON |
| | | | | | Bit7 | SV11 | 0: OFF, 1: ON |
| 64 | Output of relay | — | — | 1 | Bit0 | SV12 | 0: OFF, 1: ON |
| | | | | | Bit1 | 52X3 | 0: OFF, 1: ON |
| | | | | | Bit2 | SV3 | 0: OFF, 1: ON |
| | | | | | Bit3 | Spare | 0: OFF, 1: ON |
| | | | | | Bit4 | Spare | 0: OFF, 1: ON |
| | | | | | Bit5 | CNZ1 | 0: OFF, 1: ON |
| | | | | | Bit6 | CnH | 0: OFF, 1: ON |
| | | | | | Bit7 | CnY | 0: OFF, 1: ON |

| Code No. | Write-in content | Record data | | | |
|--|---|---------------------|---------------|-----------------|---|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| < Compressor > | | | | | |
| 65 | Compressor 1 cumulative operating time (estimate) | 0 - 65535 | 1h | 2 | |
| 66 | Compressor 2 cumulative operating time (estimate) | 0 - 65535 | 1h | 2 | |
| 67 | Compressor 1 start times | 0 - 65535 | 20times | 2 | |
| 68 | Compressor 2 start times | 0 - 65535 | 20times | 2 | |
| 69 | CM1 3-minute delay timer | 0 - 180 | 1second | 1 | |
| 70 | CM2 3-minute delay timer | 0 - 180 | 1second | 1 | |
| 71 | CH compressor protection timer | 0 - 360 | 2minutes | 1 | |
| 72 | Control status CH compressor protective start | 0 - 15 | — | 1 | 15 Protective start end |
| | | | | | 0-14 During protective start |
| < Control status > | | | | | |
| 73 | Control status Oil equalization | 0 - 127 | — | 1 | 0 None |
| | | | | | 1 Oil equalized rotation |
| | | | | | 10 Oil equalized operation 1 |
| | | | | | 20 Oil equalized operation 2 |
| | | | | | 30 Oil equalized operation 3 |
| | | | | | 41 Oil equalized operation 4-1 |
| | | | | | 42 Oil equalized operation 4-2 |
| | | | | | 51 Oil equalized operation 5-1 |
| | | | | | 52 Oil equalized operation 5-2 |
| | | | | | 61 Oil equalized operation 6-1 |
| | | | | | 62 Oil equalized operation 6-2 |
| | | | | | 71 Oil equalized operation 7-1 |
| | | | | | 72 Oil equalized operation 7-2 |
| | | | | | 81 Oil equalized operation 8-1 |
| 82 Oil equalized operation 8-2 | | | | | |
| 91 Oil equalized operation 9-1 | | | | | |
| 74 | Control status Oil return | 0 - 2 | — | 1 | 0 None |
| | | | | | 1 Oil return (cooling) |
| | | | | | 2 Oil return (gas cycle) |
| 75 | Control status Defrost kinds + defrost status | 0 - 127 | — | 1 | 0 None |
| | | | | | 11 Thermal condition defrost status 1 |
| | | | | | 12 Thermal condition defrost status 2 |
| | | | | | 13 Thermal condition defrost status 3 |
| | | | | | 14 Thermal condition defrost status 4 |
| | | | | | 21 Strength type thermal condition defrost status 1 |
| | | | | | 22 Strength type thermal condition defrost status 2 |
| | | | | | 23 Strength type thermal condition defrost status 3 |
| | | | | | 24 Strength type thermal condition defrost status 4 |
| | | | | | 31 Time condition defrost status 1 |
| | | | | | 32 Time condition defrost status 2 |
| | | | | | 33 Time condition defrost status 3 |
| | | | | | 34 Time condition defrost status 4 |
| | | | | | 76 |
| 1 Compressor OFF | | | | | |
| 2 For 70 seconds after compressor ON | | | | | |
| 3 After 70 to 180 seconds after compressor ON | | | | | |
| 4 After 180 to 195 seconds after compressor ON | | | | | |
| 77 | Control status 1 | — | — | 1 | Bit0 Superlink communication state 0: SL I (old SL) 1: SL II (new SL) |
| | | | | | Bit1 In trial operation control 0: Normal 1: Practice |
| | | | | | Bit2 In demand control 0: Normal 1: Practice |
| | | | | | Bit3 In silent mode 0: Normal 1: Practice |
| | | | | | Bit4 In ability measurement mode 0: Normal 1: Practice |
| | | | | | Bit5 In outdoor air intake unit control 0: Normal 1: Practice |
| | | | | | Bit6 History of none oil return control 0: Normal 1: Practice |
| | | | | | Bit7 In pump-down control at Start/Stop 0: Normal 1: Practice |
| 78 | Control status 2 | — | — | 1 | Bit0 In low outdoor air temperature control 0: Normal 1: Practice |
| | | | | | Bit1 In pump-down control for replacement 0: Normal 1: Practice |

| Code No. | Write-in content | Record data | | | |
|-------------------------------|--|---------------------|---------------|-----------------|--|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| | | | | | Bit2 Compressor dilution protection 0: Normal 1: Practice Bit3 Outdoor heat exchanger refrigerant purge 0: Normal 1: Practice Bit4 Indoor heat exchanger refrigerant purge 0: Normal 1: Practice Bit5 Evaporative air handling setting valid 0: Normal 1: Practice Bit6 In pressure equalization control at outdoor unit 0: Normal 1: Practice Bit7 Compressor control with branching controller 0: Normal 1: Practice |
| 79 | Control status 3 | — | — | 1 | Bit0 Auto backup operation 0: Normal 1: Practice Bit1 Mster unit compressor 1 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit2 Mster unit compressor 2 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit3 Slave unit 1 compressor 1 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit4 Slave unit 1 compressor 2 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit5 Slave unit 2 compressor 1 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit6 Slave unit 2 compressor 2 Oil equalization cumulative Fk UP 0: Count 1: Count up Bit7 Oil equalization rotation cumulative Fk UP 0: Count 1: Count up |
| 80 | Control status of refrigerant filling | — | — | 1 | Bit0 Spare Bit1 Expulsion control of accumulator Bit2 Target operating point control Bit3 Rough charge Bit4 Liquid level detection control Bit5 Detailed charge Bit6 Successful completion Bit7 Abnormal termination |
| 81 | Backup cumulative time | 0 - 127 | 1h | 1 | |
| 82 | Check operation status | 0 - 7 | — | 1 | 0 Normal 1 Insufficient check operation start condition 2 Check operation warm-up 3 Check operation ON 4 Check operation stop 5 Operation valve is closed 6 Indoor unit abnormal 7 Normal ending of check operation |
| 83 | Status of pipe cleaning operation | 0~40 | — | 1 | 0 Normal 10 Insufficient check operation starting condition 21 Check operation warm-up 22 Pump-down operation 1 23 Preparatory operation 24 Liquid back cleaning operation 25 Refrigerant eviction operation 26 Pump-down operation 30 Piping cleaning operation interruption 40 Piping cleaning operation completion |
| 84 | Control status Refrigerant quantity check | 0~127 | — | 1 | |
| < Protection control status > | | | | | |
| 85 | Protection control status 1 | — | — | 1 | Bit0 HP protection 1 Compressor capacity control 0: Normal 1: Practice Bit1 HP protection 2 Gas bypass control 0: Normal 1: Practice Bit2 HP protection 3 Heating stop indoor unit slight opening control 0: Normal 1: Practice Bit3 LP protection 1 Compressor capacity control 0: Normal 1: Practice Bit4 LP protection 2 Compressor rising rate control 0: Normal 1: Practice Bit5 LP protection 3 Outdoor unit EEV control 0: Normal 1: Practice Bit6 LP protection 4 Oil separator SV control 0: Normal 1: Practice Bit7 Td protection 1 Compressor capacity control 0: Normal 1: Practice |
| 86 | Protection control status 2 | — | — | 1 | Bit0 Td protection 2-1 EEVSC-Td cooling control 0: Normal 1: Practice Bit1 Td protection 2-2 EEVH-Td cooling control 0: Normal 1: Practice Bit2 Td protection 4 Heating stop indoor unit slight opening control 0: Normal 1: Practice |

| Code No. | Write-in content | Record data | | | |
|---------------------|--|---------------------|---------------|-----------------|--|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| | | | | | Bit3 Td protection 5 Outdoor unit EEV control 0: Normal 1: Practice Bit4 CS protection 1 Compressor capacity control 0: Normal 1: Practice Bit5 Tc protection 1 Compressor capacity control 0: Normal 1: Practice Bit6 Tc protection 2 Gas bypass control 0: Normal 1: Practice Bit7 Tc protection 3 CM dilution protection control 0: Normal 1: Practice |
| 87 | Protection control status 3 | — | — | 1 | Bit0 Compression ratio protection 1 Compressor capacity control 0: Normal 1: Practice Bit1 Compression ratio protection 2 Outdoor unit EEV control 0: Normal 1: Practice Bit2 PT protection 1 Compressor capacity control 0: Normal 1: Practice Bit3 PT protection 2 Inverter cooling fan control 0: Normal 1: Practice Bit4 Dilution rate protection 0: Normal 1: Practice Bit5 Continuous Heating Capacity Control 0: Normal 1: Practice Bit6 Spare 0: Normal 1: Practice Bit7 Spare 0: Normal 1: Practice |
| 88 | Protection control causes 1 | 0 - 127 | — | 1 | |
| 89 | Protection control causes 2 | 0 - 127 | — | 1 | |
| 90 | Protection control causes 3 | 0 - 127 | — | 1 | |
| 91 | Compressor stop causes | 0 - 127 | — | 1 | |
| 92 | Compressor stop causes lapse of time | 0 - 255 | 1h | 1 | |
| < Anomaly counter > | | | | | |
| 93 | Control status High pressure anomaly (63H1) counter | 0 - 5 | — | 1 | |
| 94 | Control status Low pressure anomaly (running) counter | 0 - 5 | — | 1 | |
| 95 | Control status Low pressure anomaly (starting) counter | 0 - 5 | — | 1 | |
| 96 | Control status Low pressure anomaly (stopped) counter | 0 - 5 | — | 1 | |
| 97 | Control status Discharge temperature error (Tho-D1) counter | 0 - 5 | — | 1 | |
| 98 | Control status Discharge temperature error (Tho-D2) counter | 0 - 5 | — | 1 | |
| 99 | Control status Cut off sensor counter | 0 - 3 | — | 1 | |
| 100 | Control status Liquid flooding anomaly counter | 0 - 3 | — | 1 | |
| 101 | Counter • Current cut (CM1) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |
| 102 | Counter • Current cut (CM2) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |
| 103 | Counter • Power transistor overheat (CM1) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |
| 104 | Counter • Power transistor overheat (CM2) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |
| 105 | Counter • Compressor startup failure (CM1) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |
| 106 | Counter • Compressor startup failure (CM2) | 0 - 255 | — | 1 | EEPROM memory. Resettable. |

| Code No. | Write-in content | Record data | | | | | |
|---------------------------------|---|---------------------|---------------|-----------------|--------------------------------|---|--------------------------|
| | | Data write-in range | Write-in unit | Number of bytes | Content | | |
| 107 | Counter • Anomalous compressor by loss of synchronism (CM1) | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 108 | Counter • Anomalous compressor by loss of synchronism (CM2) | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 109 | Counter • Communication error between inverter PCB and outdoor unit control (CM1) | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 110 | Counter • Communication error between inverter PCB and outdoor unit control (CM2) | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 111 | Counter • Anomalous FMo1 | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 112 | Counter • Anomalous FMo2 | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 113 | Counter • Indoor-outdoor unit communications error | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 114 | Counter • CPU reset | 0 - 255 | — | 1 | EEPROM memory. Resettable. | | |
| 115 | Compressor error causes 1 | 0 - 127 | — | 1 | | | |
| 116 | Compressor error causes 2 | 0 - 127 | — | 1 | | | |
| 117 | Compressor error causes 3 | 0 - 127 | — | 1 | | | |
| 118 | INV 1 information | — | — | 1 | Version (Initial value FFh) | | |
| 119 | | — | — | 1 | DIP switch (Initial value FFh) | | |
| 120 | INV 2 information | — | — | 1 | Version (Initial value FFh) | | |
| 121 | | — | — | 1 | DIP switch (Initial value FFh) | | |
| < Information for indoor unit > | | | | | | | |
| 122 | Indoor unit control status 1 | — | — | 1 | Bit0 | Indoor unit EEV full open detection control | 0: Normal 1: Practice |
| | | | | | Bit1 | Indoor unit avoidance of un-heating control | 0: Normal 1: Practice |
| | | | | | Bit2 | Indoor unit heating stop slight opening control | 0: Normal 1: Practice |
| | | | | | Bit3 | Indoor unit cooling startup control 1 (normal) | 0: Normal 1: Practice |
| | | | | | Bit4 | Indoor unit cooling startup control 2 (prevent liquid back) | 0: Normal 1: Practice |
| | | | | | Bit5 | Indoor unit heating startup control | 0: Normal 1: Practice |
| | | | | | Bit6 | Indoor unit outlet temp. of heating control assist | 0: Normal 1: Practice |
| | | | | | Bit7 | Indoor unit refrigerant withdrawing control | 0: Normal 1: Practice |
| 123 | Indoor unit control status 2 | — | — | 1 | Bit0 | Outdoor air intake unit HP protection | 0: Normal 1: Practice |
| | | | | | Bit1 | Spare | 0: Normal 1: Practice |
| | | | | | Bit2 | Indoor unit refrigerant purge control | 0: Normal 1: Practice |
| | | | | | Bit3 | Spare | 0: Normal 1: Practice |
| | | | | | Bit4 | Spare | 0: Normal 1: Practice |
| | | | | | Bit5 | Spare | 0: Normal 1: Practice |
| | | | | | Bit6 | Spare | 0: Normal 1: Practice |
| | | | | | Bit7 | Spare | 0: Normal 1: Practice |

| Code No. | Write-in content | Record data | | | | | |
|---------------------------|---|---------------------|---------------|-----------------|---------|---|--------------|
| | | Data write-in range | Write-in unit | Number of bytes | Content | | |
| < Input of PCB hardware > | | | | | | | |
| 124 | External input | — | — | 1 | Bit0 | 63H1 | 0: OFF 1: ON |
| | | | | | Bit1 | 63H1-R | 0: OFF 1: ON |
| | | | | | Bit2 | CNS1 | 0: OFF 1: ON |
| | | | | | Bit3 | CNS2 | 0: OFF 1: ON |
| | | | | | Bit4 | CNG1 | 0: OFF 1: ON |
| | | | | | Bit5 | CNG2 | 0: OFF 1: ON |
| | | | | | Bit6 | Spare | 0: OFF 1: ON |
| | | | | | Bit7 | Spare | 0: OFF 1: ON |
| 125 | DIP switch [SW3] | — | — | 1 | Bit0 | SW3-1 | 0: OFF 1: ON |
| | | | | | Bit1 | SW3-2 | 0: OFF 1: ON |
| | | | | | Bit2 | SW3-3 | 0: OFF 1: ON |
| | | | | | Bit3 | SW3-4 | 0: OFF 1: ON |
| | | | | | Bit4 | SW3-5 | 0: OFF 1: ON |
| | | | | | Bit5 | SW3-6 | 0: OFF 1: ON |
| | | | | | Bit6 | SW3-7 | 0: OFF 1: ON |
| | | | | | Bit7 | SW3-8 | 0: OFF 1: ON |
| 126 | DIP switch [SW4] | — | — | 1 | Bit0 | SW4-1 | 0: OFF 1: ON |
| | | | | | Bit1 | SW4-2 | 0: OFF 1: ON |
| | | | | | Bit2 | SW4-3 | 0: OFF 1: ON |
| | | | | | Bit3 | SW4-4 | 0: OFF 1: ON |
| | | | | | Bit4 | SW4-5 | 0: OFF 1: ON |
| | | | | | Bit5 | SW4-6 | 0: OFF 1: ON |
| | | | | | Bit6 | SW4-7 | 0: OFF 1: ON |
| | | | | | Bit7 | SW4-8 | 0: OFF 1: ON |
| 127 | DIP switch [SW5] | — | — | 1 | Bit0 | SW5-1 | 0: OFF 1: ON |
| | | | | | Bit1 | SW5-2 | 0: OFF 1: ON |
| | | | | | Bit2 | SW5-3 | 0: OFF 1: ON |
| | | | | | Bit3 | SW5-4 | 0: OFF 1: ON |
| | | | | | Bit4 | SW5-5 | 0: OFF 1: ON |
| | | | | | Bit5 | SW5-6 | 0: OFF 1: ON |
| | | | | | Bit6 | SW5-7 | 0: OFF 1: ON |
| | | | | | Bit7 | SW5-8 | 0: OFF 1: ON |
| 128 | DIP switch [SW6] | — | — | 1 | Bit0 | SW6-1 | 0: OFF 1: ON |
| | | | | | Bit1 | SW6-2 | 0: OFF 1: ON |
| | | | | | Bit2 | SW6-3 | 0: OFF 1: ON |
| | | | | | Bit3 | SW6-4 | 0: OFF 1: ON |
| | | | | | Bit4 | SW6-5 | 0: OFF 1: ON |
| | | | | | Bit5 | SW6-6 | 0: OFF 1: ON |
| | | | | | Bit6 | SW6-7 | 0: OFF 1: ON |
| | | | | | Bit7 | SW6-8 | 0: OFF 1: ON |
| 129 | Jumper switch | — | — | 1 | Bit0 | J11 | 0: OFF 1: ON |
| | | | | | Bit1 | J12 | 0: OFF 1: ON |
| | | | | | Bit2 | J13 | 0: OFF 1: ON |
| | | | | | Bit3 | J14 | 0: OFF 1: ON |
| | | | | | Bit4 | J15 | 0: OFF 1: ON |
| | | | | | Bit5 | J16 | 0: OFF 1: ON |
| | | | | | Bit6 | Spare | 0: OFF 1: ON |
| | | | | | Bit7 | Spare | 0: OFF 1: ON |
| < List of setting value > | | | | | | | |
| 130 | Software switch | — | — | 1 | Bit0 | Switching to measure of siren | |
| | | | | | Bit1 | Switching to measure of discharge pulsation | |
| | | | | | Bit2 | Cancel abnormal liquid back | |
| | | | | | Bit3 | Outdoor fan snow protection control | |
| | | | | | Bit4 | Condition of cooling cycle oil return operation | |
| | | | | | Bit5 | Switching to heating wind temperature security priority | |
| | | | | | Bit6 | Spare | |
| | | | | | Bit7 | Spare | |
| 131 | Priority operation switch | 0 - 3 | — | 1 | 0 | First push priority | |
| | | | | | 1 | Last push priority | |
| | | | | | 2 | Director mode | |
| | | | | | 3 | Operating capacity priority | |
| 132 | Heating setting 1 (Target exit temperature) | 20 - 50 | 1°C | 1 | | | |
| 133 | Heating setting 2 (Target of high pressure) | 3.65 - 2.75 | 0.05MPa | 1 | | | |
| 134 | Heating setting 3 (Judgment temperature) | 20 - 38 | 1°C | 1 | | | |

| Code No. | Write-in content | Record data | | | |
|----------------|---|---------------------|---------------|-----------------|---------|
| | | Data write-in range | Write-in unit | Number of bytes | Content |
| 135 | CNS1 function assignment | 0 - 20 | — | 1 | |
| 136 | CNS2 function assignment | 0 - 20 | — | 1 | |
| 137 | CNG1 function assignment | 0 - 20 | — | 1 | |
| 138 | CNG2 function assignment | 0 - 20 | — | 1 | |
| 139 | External output function assignment | 0 - 20 | — | 1 | |
| 140 | State in check operation (User's operation, limited to 255 - 1→0 only) | 0 - 255 | — | 1 | |
| < The others > | | | | | |
| 141 | Override | 0 - | — | 1 | |

(2) Outdoor PCB setting

| Code | Input | Remark |
|--------------|--|--------------------------------------|
| SW1 | Outdoor address No. (Order of 10) | Factory setting is 4.(Rotary switch) |
| SW2 | Outdoor address No. (Order of 1) | Factory setting is 9.(Rotary switch) |
| SW3-1 | Inspection LED reset Normal★/Reset | Factory setting is OFF. |
| SW3-2 | Auto backup operation Invalid★/Valid | Factory setting is OFF. |
| SW3-4 | Refrigerant quantity check Normal★/Check | Factory setting is OFF. |
| SW3-5 | Check operation start Normal★/Check | Factory setting is OFF. |
| SW3-7 | Forced cooling/heating Normal★/Forced cooling-heating | Factory setting is OFF. |
| SW5-1 | Test run switch Normal★/Test run | Factory setting is OFF. |
| SW5-2 | Test run mode Heating★/Cooling | Factory setting is OFF. |
| SW5-3 | Pump down switch Normal★/Pump down | Factory setting is OFF. |
| SW5-5 | SL selector New SL (Auto)★/Old SL | Factory setting is OFF. |
| SW5-6 | Spare | Factory setting is OFF.Keep OFF. |
| SW5-7 | | |
| SW5-8 | | |
| SW6-3 | High COP setting Normal★/High COP | Factory setting is OFF. |
| SW6-4 | High head setting Normal★/High head | Factory setting is OFF. |
| SW7 | Data erase/write | (Button switch) |
| SW8 | 7-segment display code No. increasing (order of 1) | (Button switch) |
| SW9 | 7-segment display code No. increasing (order of 10) | (Button switch) |
| SW4-1 | Model selection | See following table. |
| SW4-2 | | |
| SW4-3 | | |
| SW4-4 | | |
| SW4-5 | Spare | Factory setting is OFF.Keep OFF. |
| SW4-6 | | |
| SW4-7 | Master/slave unit setting address | See following table. |
| SW4-8 | Master/slave unit setting address | |
| J11 | Power source voltage selection | See following table. |
| J12 | | |
| J13 | External input Pulse/Level★ | Factory setting is ON. |
| J14 | Defrost reset temperature Intensive/Normal★ | Factory setting is ON. |
| J15 | Defrost start temperature Cold region/Normal★ | Factory setting is ON. |
| J16 | Spare | Factory setting is OFF.Keep OFF. |

Notes (1) Jumper wires indicates OFF (open) /ON (short-circuit).

(2) DIP switches SW's indicate OFF/ON.

(3) ★ indicates the factory setting.

■Model selection with SW4-1–SW4-4

0: OFF 1: ON

| Model (HP) | 280 (10) | 335 (12) | 400 (14) | 450 (16) | 475 (17) | 500 (18) | 560 (20) |
|------------|----------|----------|----------|----------|----------|----------|----------|
| SW4-1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| SW4-2 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| SW4-3 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| SW4-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

■Master/slave setting with SW4-7, SW4-8

0: OFF 1: ON

| Outdoor unit | SW4-7 | SW4-8 |
|--------------|-------|-------|
| Master unit | 0 ★ | 0 ★ |
| Slave unit 1 | 1 | 0 |
| Slave unit 2 | 0 | 1 |

■Power source selection with J11, J12

| Power source | J11 | J12 | Remarks |
|--------------|---------|--------|---------------|
| 220V 60HZ | Shorted | Opened | KXZE2M series |

(3) Indoor PCB setting

| Code | Input | Default setting | | Remark |
|-------|---------------------------------------|-------------------------|------|-----------------|
| SW1 | Indoor unit address No.(Order of 10) | 0 | | 0-9 |
| SW2 | Indoor unit address No.(Order of 1) | 0 | | 0-9 |
| SW3 | Outdoor unit address No.(Order of 10) | 4 | | 0-9 |
| SW4 | Outdoor unit address No.(Order of 1) | 9 | | 0-9 |
| SW5-1 | Superlink selection | Automatic*/Previous SL | OFF | Automatic |
| SW5-2 | Indoor unit address No.(Order of 100) | OFF | 0 | OFF : 0, ON : 1 |
| SW6-1 | Model selection | As per model | | See table 1. |
| SW6-2 | | | | |
| SW6-3 | | | | |
| SW6-4 | | | | |
| SW8-1 | | | | |
| SW7-1 | Test run, Drain motor | Normal*/Test run | OFF | Normal |
| SW7-2 | Reserved | | OFF | keep OFF |
| SW7-3 | Spare | | OFF | keep OFF |
| SW7-4 | Reserved | | OFF | keep OFF |
| JSL1 | Superlink terminal spare | Normal*/switch to spare | With | Normal |

* Default setting

Table 1

■Model selection with SW6-1 – SW6-4 and SW8-1

0: OFF 1: ON

| | P15 | P22 | P28 | P36 | P45 | P56 | P71 | P90 | P112 | P140 | P160 | P224 | P280 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| SW6-1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| SW6-2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| SW6-3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| SW6-4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SW8-1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

7. SYSTEM TROUBLESHOOTING PROCEDURE

7.1 Basics of troubleshooting

Basic troubleshooting is to check/analyze/save data by connecting the Mente PC.

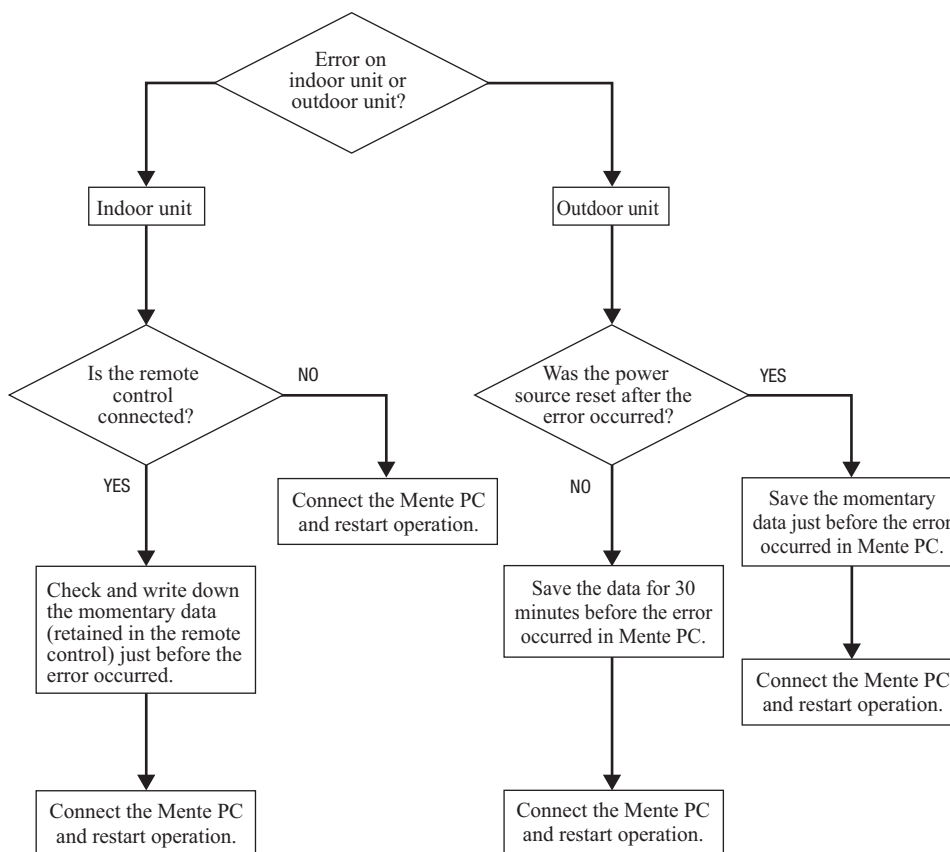
Whenever arriving at the site, always connect the Mente PC before starting work.

Method of error data analysis (Basic procedure)

- Identify whether particular error occurred during operation or stopping.
- Is it caused by the installation conditions of outdoor/indoor unit? (Refrigerant quantity, pipe length, short-circuit, clogged filter, etc.)
- Isn't there any beginner's mistake at the installation? (Wrong address, mistake in piping or wiring, etc.)
- Is the failure related to any hardware (parts)? (Service valve main body, coil, capillary, check valve, thermistor, etc.)
- Is it a major component?

Compressor, inverter PCB and outdoor DC fan motor

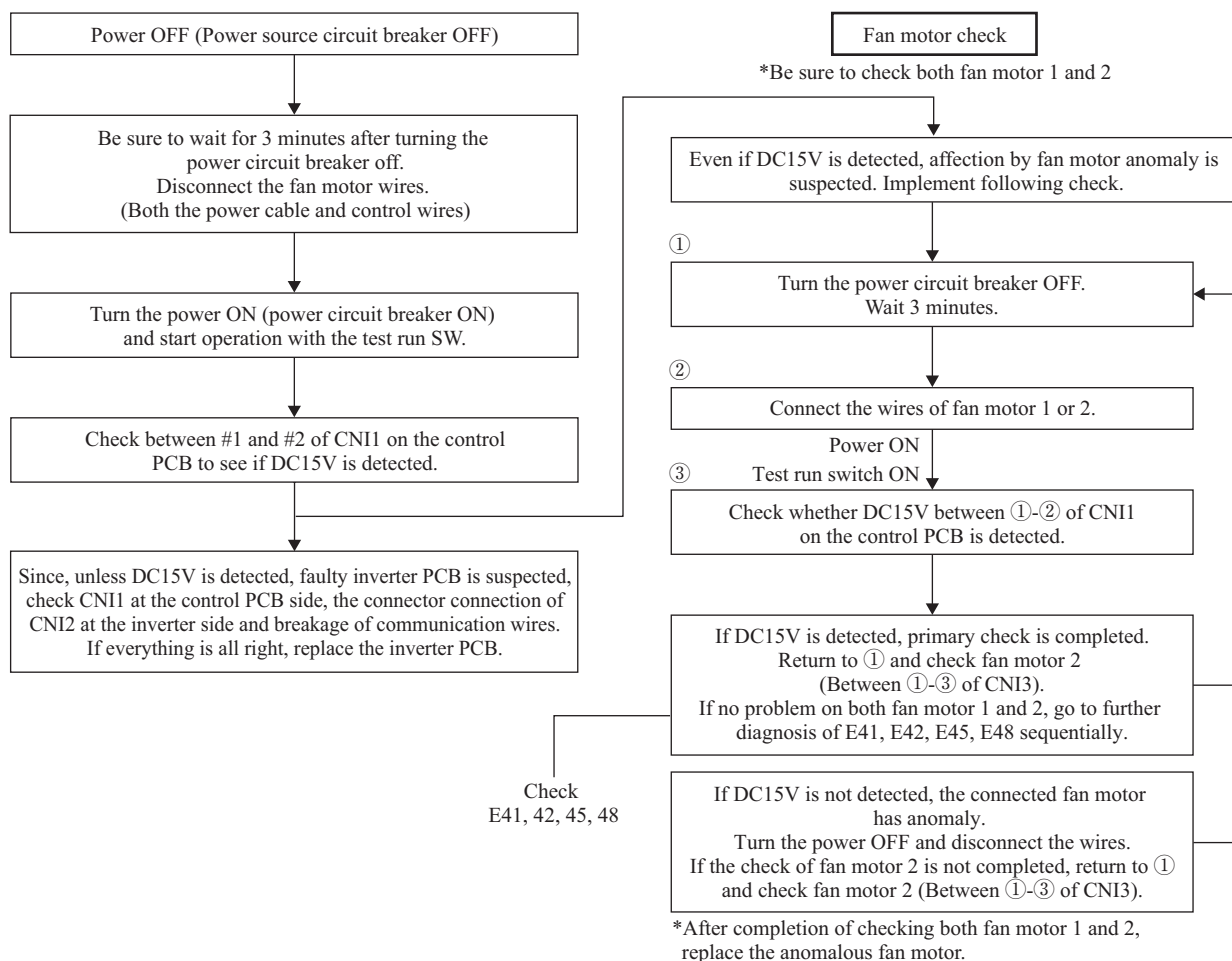
- Is it a failure of electrical component part?



7.2 Explanation of troubleshooting

(1) Checking DC15V on the control PCB (Step to check if the inverter PCB fails or not)

Use this to diagnose E41, E42, E45 and E48.



(2) Inspection of short-circuit on the power transistor module terminals

Disconnect the wiring of compressor and check for short-circuit with a tester.

Inspect between terminals of: P-U, P-V, P-W, N-U, N-V, N-W and P-N

It will be easier to contact the tester at the following place at each terminal.

P: P terminal of power transistor

N: N terminal of power transistor

U: End of red harness to compressor

V: End of white harness to compressor

W: End of blue harness to compressor

| Terminal (+) | Terminal (-) | Normal value (Ω) | |
|--------------|--------------|------------------|--------------|
| P | N | About 1M | Several 10 M |
| N | P | About 300-400 | Several M |
| P | U | 0 | Several 10 M |
| P | V | | |
| P | W | About 1.2M | Several 100k |
| N | U | | |
| N | V | | |
| N | W | About 1.3M | Several 100k |
| U | P | | |
| V | P | | |
| W | P | 0 | Several 10 M |
| U | N | | |
| V | N | | |
| W | N | | |

Note (1) When a measured value is 0 – a few kΩ, the element may be broken. Replace the power transistor part.

(3) Inverter checker for diagnosis of inverter output

●Checking method

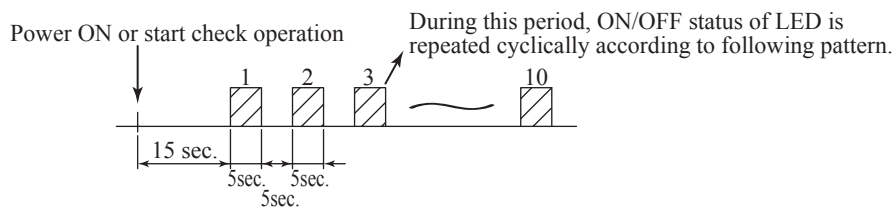
(i) Setup procedure of checker

- 1) Power OFF (Turn off the breaker).
- 2) Remove the terminal cover of compressor and disconnect the wires (U, V, W) from compressor.
- 3) Connect the wires U (Red) , V (White) and W (Black) of the checker to the terminal of disconnected wires (U, V, W) from compressor respectively.

(ii) Operation for judgment

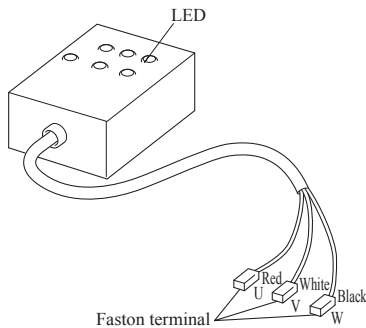
- 1) Power ON after JSW10-4 on outdoor inverter PCB was turned ON.
- 2) After 15 seconds since power has turned ON, LED start ON/OFF for 5 seconds cyclically and it repeats 10 times.
- 3) Check ON/OFF status of 6 LED's on the checker.
- 4) Judge the PCB by ON/OFF status of 6 LED's on the checker.

| ON/OFF status of LED | If all of LED are ON/OFF according to following pattern | If all of LED stay OFF or some of LED are ON/OFF |
|----------------------|---|--|
| Inverter PCB | Normal | Anomalous |

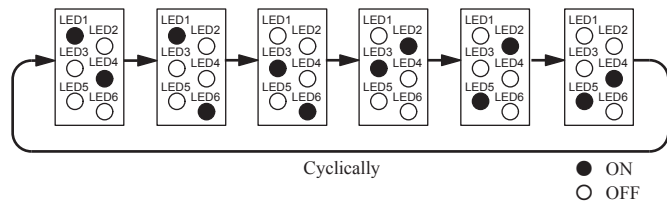


- 5) Be sure to turn off JSW10-4 on outdoor inverter PCB, after finishing the check operation.

<Inverter checker>



LED ON/OFF pattern



Connect to the terminal of the wires which are disconnected from compressor.

7.3 Contents of troubleshooting

(1) List of inspection displays (indoor units)

| Remote control error code | Name of inspection | Classification | Page |
|---------------------------|---|-------------------------------|---------|
| None | Operates but does not cool | System error | 126 |
| None | Operates but does not heat | System error | 127 |
| None | Earth leakage breaker activated | System error | 128 |
| None | Excessive noise/vibration | System error | 129-131 |
| None | Louver motor anomaly | System error | 132 |
| None | Power source system anomaly (Power source to indoor unit PCB) | System error | 133-135 |
| None | Power source system error (Power source to remote control) | System error | 136-138 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (1) | System error | 139 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (2) | System error | 140 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (3) | System error | 141 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (4) | System error | 142 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (5) | System error | 143 |
| 🔊 WAIT 🔊 | 🔊 WAIT 🔊 (6) | System error | 144 |
| [No display] | [No display] | System error | 145 |
| E1 | Remote control communication error | Communication error | 146 |
| E2 | Duplicated indoor unit address | Address setting error | 147 |
| E3 | Outdoor unit signal line error | Address pairing setting error | 148 |
| E5 | Communication error during operation | Communication error | 149 |
| E6 | Indoor unit heat exchanger temperature sensor anomaly (Thi-R) | Sensor wire breakage | 150 |
| E7 | Indoor return air temperature sensor anomaly (Thi-A) | Sensor wire breakage | 151 |
| E9 | Drain trouble | System error | 152 |
| E10 | Excessive number of indoor units (more than 17 units) by controlling one remote control | Communication error | 153 |
| E11 | Address setting error of indoor units | Address setting error | 154 |
| E12 | Address setting error by mixed setting method | Address setting error | 155 |
| E16 | Indoor DC fan motor anomaly (FDT, FDTC, FDK series) | DC fan motor error | 156 |
| | Indoor DC fan motor anomaly | | 157 |
| | Indoor DC fan motor anomaly | | 158 |
| E18 | Address setting error of master and slave indoor units | Address setting error | 159 |
| E19 | Indoor unit operation check, drain pump motor check mode anomaly | Setting error | 160 |
| E20 | Indoor DC fan motor rotation speed anomaly (FDT, FDTC, FDK series) | DC fan motor error | 161 |
| | Indoor DC fan motor rotation speed anomaly | | 162 |
| | Indoor DC fan motor rotation speed anomaly | | 163 |
| E28 | Remote control temperature sensor anomaly (Thc) | Sensor wire breakage | 164 |

(2) Troubleshooting

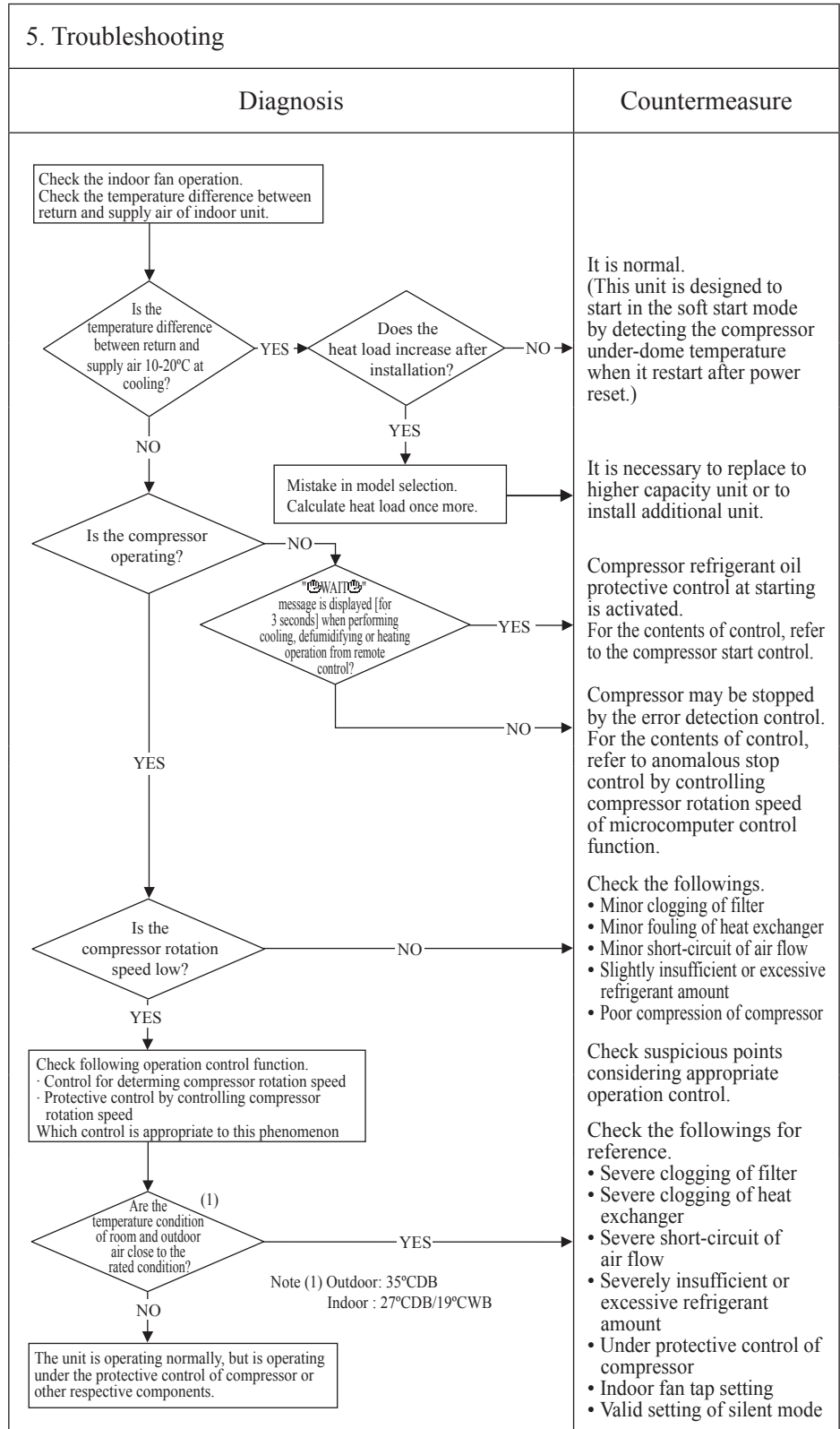
| | | | | |
|--|---------|----------------|-----------|--|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Operates but does not cool |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | Stays Off | |

| |
|---------------------|
| 1. Applicable model |
| All models |

| |
|---------------------------|
| 2. Error detection method |
| |

| |
|---------------------------------|
| 3. Condition of error displayed |
| |

| |
|---|
| 4. Presumable cause |
| <ul style="list-style-type: none"> Poor compression of compressor Expansion valve anomaly |



Note:

| | | | | |
|--|---------|----------------|-----------|--|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Operates but does not heat |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | Stays Off | |

| |
|--|
| 1. Applicable model |
| All models |
| 2. Error detection method |
| |
| 3. Condition of error displayed |
| |
| 4. Presumable cause |
| <ul style="list-style-type: none"> • 4-way valve anomaly • Poor compression of compressor • Expansion valve anomaly |

| | |
|--|----------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <p>Check the indoor fan operation Check the temperature difference between return and supply air of indoor unit</p> <pre> graph TD Start[] --> Q1{Is the temperature difference between return and supply air 10-30°C at heating?} Q1 -- YES --> Q2{Does the heat load increase after installation?} Q1 -- NO --> Q3{Is the compressor operating?} Q2 -- YES --> Box1[Mistake in model selection. Calculate heat load once more.] Q2 -- NO --> Q3 Box1 --> Q3 Q3 -- NO --> Q4{Is the compressor rotation speed low?} Q3 -- YES --> Q5{Are the temperature condition of room and outdoor air close to the rated condition?} Q4 --> Q5 Q5 -- YES --> End[] Q5 -- NO --> Box2[The unit is operating normally, but is operating under the protective control of compressor or other respective components] </pre> <p>WAIT message is displayed [for 3 seconds] when performing cooling, defumidifying or heating operation from remote control?</p> <p>Note (1) Outdoor: 7°CDB Indoor: 20°CDB</p> | |
| <p>It is normal. (This unit is designed to start in the soft start mode by detecting the compressor under-dome temperature when it restart after power reset.)</p> <p>It is necessary to replace to higher capacity unit or to install additional unit.</p> <p>Compressor refrigerant oil protective control at starting is activated. For the contents of control, refer to the compressor start control.</p> <p>Compressor may be stopped by the error detection control. For the contents of control, refer to anomalous stop control by controlling compressor rotation speed of microcomputer control function.</p> <p>Check the followings.</p> <ul style="list-style-type: none"> • Minor clogging of filter • Minor fouling of heat exchanger • Minor short-circuit of air flow • Slightly insufficient or excessive refrigerant amount • Poor compression of compressor <p>Check suspicious points considering appropriate operation control.</p> <p>Check the followings for reference.</p> <ul style="list-style-type: none"> • Severe clogging of filter • Severe clogging of heat exchanger • Severe short-circuit of air flow • Severely insufficient or excessive refrigerant amount • Under protective control of compressor • Indoor fan tap setting • Valid setting of silent mode | |

Note:

| | | | | |
|---|---------|-----------|-----------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Earth leakage breaker activated |
| | Indoor | Stays Off | Stays Off | |
| | Outdoor | Stays Off | Stays Off | |

| | | | |
|---|---------------------------|--|---|
| 1. Applicable model All models | 5. Troubleshooting | | |
| 2. Error detection method | Diagnosis | | Countermeasure |
| 3. Condition of error displayed | | | Replace compressor. * Secure insulation resistance. Secure insulation resistance. |
| 4. Presumable cause <ul style="list-style-type: none"> • Compressor anomaly • Noise | | | |

Note:

| | | | | |
|--|---------|-------|-----|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Excessive noise/vibration (1/3)</h2> |
| | Indoor | - | - | |
| | Outdoor | - | - | |

| | | | |
|--|---|--|---|
| <h3>1. Applicable model</h3> <p>All models</p> | <h3>5. Troubleshooting</h3> | | |
| <h3>2. Error detection method</h3> | <h4>Diagnosis</h4> | | <h4>Countermeasure</h4> |
| <h3>3. Condition of error displayed</h3> | <pre> graph TD Q1{Does noise/vibration occur during or soon after stopping operation of air-conditioner?} Q2{[Installation work] Does the noise/vibration occur not only from the air-conditioner but also from entire building?} Q3{Does the installation of indoor/outdoor unit have looseness?} Q4{Are pipes touching the wall and etc.?} Q5{[Units] Does noise/vibration occur when only the fan is operating?} Q6{Is fan or louver touching other components?} End[To 2/3] Q1 -- NO --> CM1 Q1 -- YES --> Q2 Q2 -- YES --> Q3 Q2 -- NO --> Q4 Q3 -- YES --> CM2 Q3 -- NO --> Q4 Q4 -- YES --> CM3 Q4 -- NO --> CM4 Q5 -- YES --> Q6 Q5 -- NO --> CM5 Q6 -- YES --> CM6 Q6 -- NO --> CM7 End --> CM8 </pre> | | <p>If excessive noise/vibration persists when sufficient time has elapsed after stopping the unit, it is considered that the air-conditioner is not the source.</p> <p>Check the installed condition carefully, and correct the installed position or insert rubber cushions into the gap or take other measure in order to eliminate looseness.</p> <p>Prevent the vibration from transmitting to wall and etc by fixing pipes on the wall tightly or wrapping rubber cushion around the pipe which goes through the hole in the wall or applying other appropriate means.</p> <p>Strength of ceiling wall, floor, etc. may be insufficient. Review the installation place or apply reinforcement to increase the strength.</p> <p>Check for leaning of installed unit or incorrect mounting of fan, louver or motor, and then specify the contacting point and correct it.</p> <p>When the heat exchanger or filter is clogged, clean them.</p> <p>In case that the unit is installed at the site where background noise is very low, even the low level noise from indoor unit like as refrigerant flow noise can be heard, but it is normal. Before installation, check for background noise. If background noise is very low, convince client prior to installation.</p> |
| <h3>4. Presumable cause</h3> <ol style="list-style-type: none"> ① Improper installation work <ul style="list-style-type: none"> • Improper vibration-proof work at installation • Insufficient strength of mounting surface ② Anomaly of product <ul style="list-style-type: none"> • Before/after shipment from factory ③ Improper adjustment during commissioning <ul style="list-style-type: none"> • Excessive/insufficient refrigerant. | | | |

Note:

| | | | | |
|--|---------|-------|-----|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content <h3>Excessive noise/vibration (2/3)</h3> |
| | Indoor | - | - | |
| | Outdoor | - | - | |

| | | |
|--|-----------------------------|-------------------------|
| <h3>1. Applicable model</h3> <p>All models</p> | <h3>5. Troubleshooting</h3> | |
| <h3>2. Error detection method</h3> | <h4>Diagnosis</h4> | <h4>Countermeasure</h4> |
| <h3>3. Condition of error displayed</h3> | | |
| <h3>4. Presumable cause</h3> | | |

Note:

| | | | | |
|--|---------|-------|-----|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Excessive noise/vibration (3/3) |
| | Indoor | - | - | |
| | Outdoor | - | - | |

| | | | |
|--|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| All models | Diagnosis | Countermeasure | |
| 2. Error detection method | <div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 80px; text-align: center;">From 2/3</div> <div style="border: 1px solid black; padding: 10px; margin: 0 auto; width: 300px; text-align: center;"> <p>[Adjustment during commissioning] Does noise/vibration occur when the cooling/heating operation is performed under anomalous condition?</p> </div> <div style="margin-left: 100px;"> <p>→ YES →</p> </div> | | |
| 3. Condition of error displayed | <p>If insufficient cooling/heating problem happens due to anomalous operating conditions at cooling/heating, followings are suspicious.</p> <ul style="list-style-type: none"> • Excessive charge amount of refrigerant • Insufficient charge amount of refrigerant • Intrusion of air, nitrogen, etc. <p>In such case, it is necessary to recover refrigerant, vacuum-dry and recharge refrigerant.</p> <p>* Since there could be many causes of noise/vibration, the above may not cover all. In such case, check the conditions when, where, how the noise/vibration occurs according to following check points and ask our consultation.</p> <ul style="list-style-type: none"> • Indoor/outdoor unit • Cooling/heating/fan mode • Startup/stop/during operation • Operating condition (Indoor/outdoor air temperatures and pressures) • Time it occurred • Operation data retained by remote control or Mente PC such as compressor rotation speed, heat exchanger temperature, EEV opening degree and etc. • Tone (If available, record the noise) • Any other anomalies | | |
| 4. Presumable cause | | | |

Note:

| | | | | |
|---|------------|----------------|------------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Louver motor anomaly</h2> |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | Stays Off | |

| |
|---|
| 1. Applicable model |
| FDT, FDTC, FDTW, FDTS, FDTQ, FDK, FDE series |
| 2. Error detection method |
| |
| 3. Condition of error displayed |
| |
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Louver motor anomaly • Disconnection/breakage of LM harness • Limit switch anomaly • Indoor unit control PCB anomaly |

| 5. Troubleshooting | Diagnosis | Countermeasure |
|--|-----------|---|
| ~Check at the indoor unit side. | | |
| Operate after waiting for more than 1 minute. | | |
| Does the louver operate when power on? | | |
| YES | | |
| NO | | Is there any disconnection or breakage of LM connector? |
| | | YES → Correct it. |
| | | NO |
| | | Is LM harness broken? |
| | | YES → Repair harness. |
| | | NO → Check connector (CnJ). Replace indoor unit control PCB. |
| Is LM locked? | | |
| YES | | |
| NO | | |
| Does LM turn smoothly? | | |
| YES | | |
| NO → Correct it. | | |
| Is there any problem on the connection link? | | |
| YES → Correct it. | | |
| NO → Replace louver motor. | | |
| Is the setting of air flow direction change prohibited? | | |
| YES → Correct it. | | |
| NO | | |
| Check the remote control whether it is fixed free flow setting. | | |
| In cases of FDTW, FDTS and FDTQ | | |
| It is normal if LM can be stopped by pressing LS two times. | | |
| Check how LS reacts when the power is turned OFF and ON again | | |
| NO | | |
| Does the louver link press LS till crick sound can be heard? | | |
| YES → | | • LS anomaly → Replace. • Indoor unit control PCB anomaly → Replace. |
| NO → Adjust LM lever and then check again. | | |
| Notes (1) LM: Louver motor (2) LS: Limit switch | | |
| In cases of FDT, FDTC, FDK and FDE | | |
| Check the remote control whether it is fixed free flow setting or not. | | |

Note:

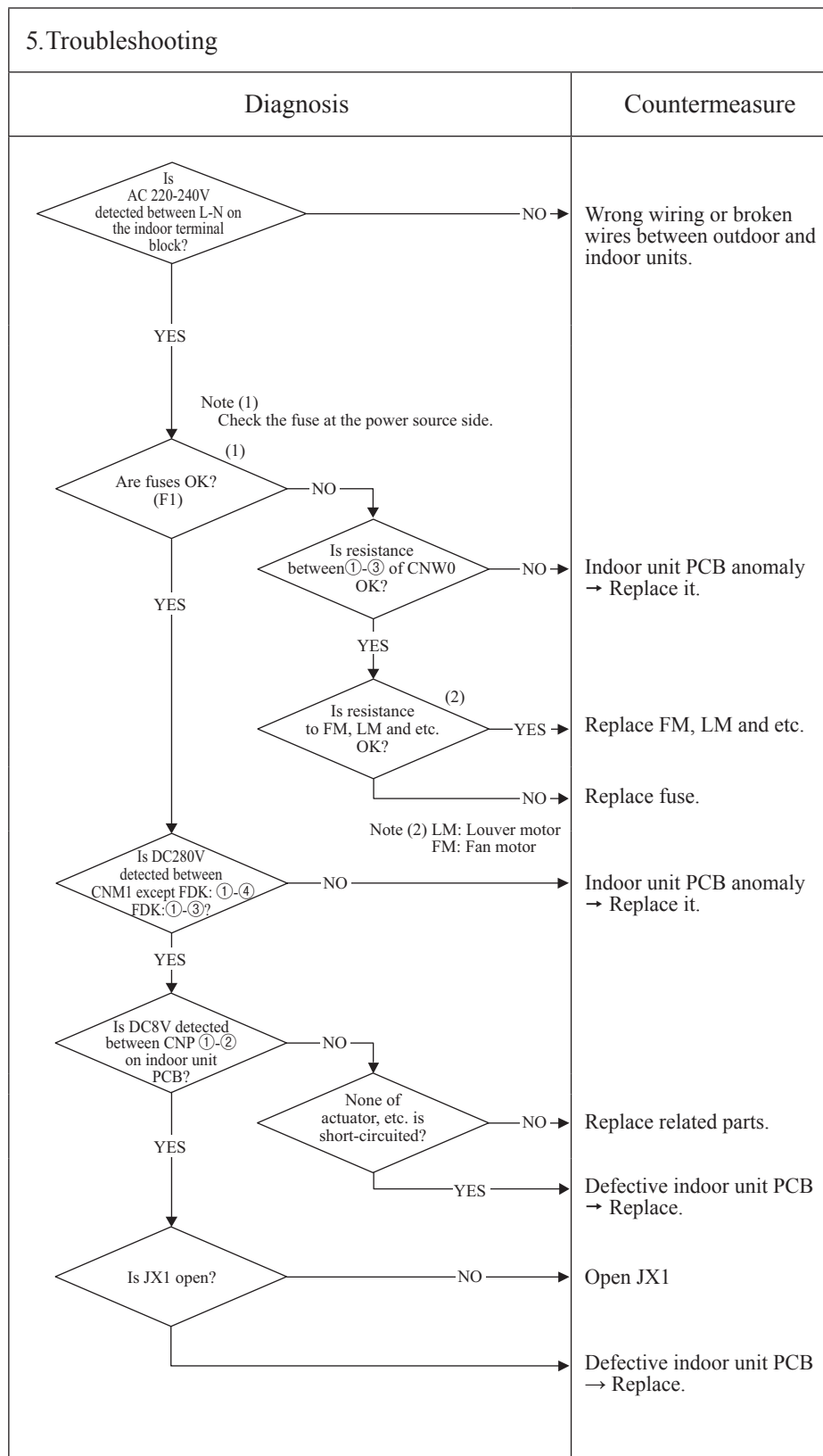
| | | | | |
|--|------------|----------------|--------------|---|
| Error code Remote control:None 7-segment display: - | LED | Green | Red | Content Power source system anomaly (Power source to indoor unit PCB) |
| | Indoor | Stays OFF | Stays OFF | |
| | Outdoor | Keeps flashing | 2-time flash | |

| |
|----------------------------|
| 1.Applicable model |
| FDT, FDTC, FDK series only |

| |
|---------------------------------|
| 2.Error detection method |
| |

| |
|--|
| 3. Condition of error displayed |
| |

| |
|--|
| 4.Presumable cause |
| <ul style="list-style-type: none"> • Wrong connection or breakage of connecting wires • Blown fuse • Fan motor anomaly • Indoor unit PCB anomaly • Broken harness • Louver motor anomaly |



Note:

| | | | | |
|---|---------|-----------|---------------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Power source system anomaly (Power source to indoor unit PCB) |
| | Indoor | Stays Off | Stays Off | |
| | Outdoor | Stays Off | 2 times flash | |

| |
|--|
| 1. Applicable model See note. |
| 2. Error detection method |
| 3. Condition of error displayed |
| 4. Presumable cause <ul style="list-style-type: none"> • Wrong connection or breakage of connecting wires • Blown fuse • Transformer anomaly • Indoor unit power PCB anomaly • Broken harness • Indoor unit control PCB anomaly • Fan motor anomaly • Louver motor anomaly |

| 5. Troubleshooting | Diagnosis | Countermeasure |
|--------------------|-----------|----------------|
| | | |

Note: A group: FDTW, FDTS, FDU45-160, FDUM, FDU71, FDE series
 B group: FDTQ, FDUT15-56, FDUH, FDFL, FDFU series

| | | | | |
|---|---------|----------------|--------------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Power source system anomaly (Power source to indoor unit PCB) |
| | Indoor | Stays OFF | Stays OFF | |
| | Outdoor | Keeps flashing | 2-time flash | |

| |
|--|
| 1. Applicable model FDU224, 280 FDFW FDU650-2400FKXZE1 |
|--|

| |
|----------------------------------|
| 2. Error detection method |
|----------------------------------|

| |
|--|
| 3. Condition of error displayed |
|--|

| |
|---|
| 4. Presumable cause <ul style="list-style-type: none"> • Wrong connection or breakage of connecting wires • Blown fuse • Fan motor anomaly • Indoor unit power PCB anomaly • Broken harness • Indoor unit control PCB anomaly |
|---|

| 5. Troubleshooting | | | | | | |
|---|----------------|----------------|--|--|--------------------------|--|
| <table border="1"> <thead> <tr> <th>Diagnosis</th> <th>Countermeasure</th> </tr> </thead> <tbody> <tr> <td> • FDU224, 280; FDFW, FDU1800, 2400FKXZE1 </td> <td></td> </tr> <tr> <td> • FDU650, 1100FKXZE1 </td> <td></td> </tr> </tbody> </table> | Diagnosis | Countermeasure | • FDU224, 280; FDFW, FDU1800, 2400FKXZE1 | | • FDU650, 1100FKXZE1 | |
| Diagnosis | Countermeasure | | | | | |
| • FDU224, 280; FDFW, FDU1800, 2400FKXZE1 | | | | | | |
| • FDU650, 1100FKXZE1 | | | | | | |

Note:

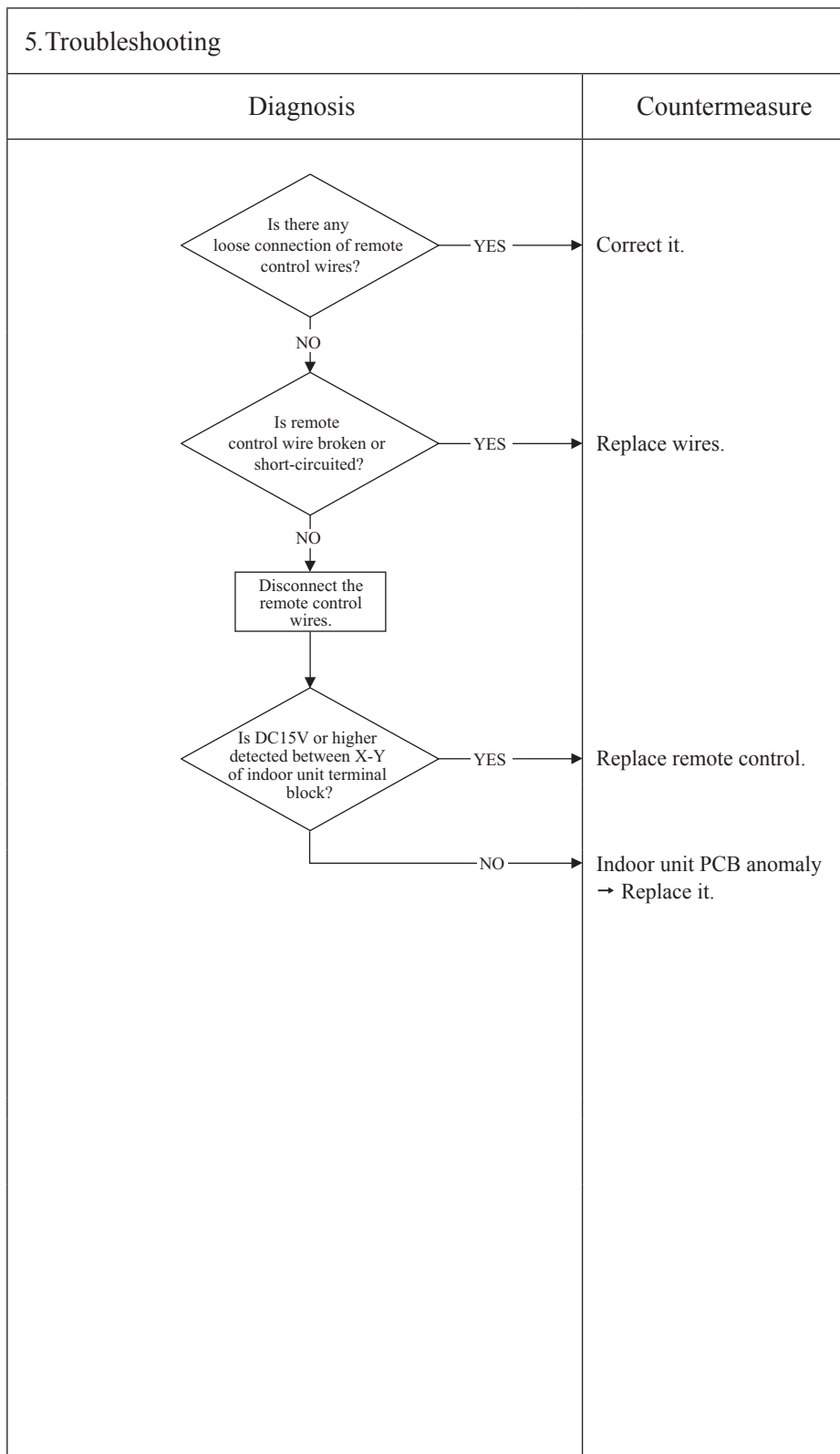
| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Power source system error (Power source to remote control) |
| | Indoor | Keeps lighting | 3-time flash | |
| | Outdoor | Keeps lighting | 2-time flash | |

1. Applicable model
 FDT, FDTC series

2. Error detection method

3. Condition of error displayed

- 4. Presumable cause**
- Remote control wire breakage/short-circuit
 - Remote control anomaly
 - Indoor unit PCB anomaly
 - Broken harness



Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Power source system error (Power source to remote control) |
| | Indoor | Keeps flashing | 3-time flash | |
| | Outdoor | Keeps flashing | 2-time flash | |

| |
|--|
| 1. Applicable model See note. |
| 2. Error detection method |
| 3. Condition of error displayed |
| 4. Presumable cause <ul style="list-style-type: none"> • Remote control wire breakage/short-circuit • Remote control anomaly • Indoor unit power PCB anomaly • Broken harness • Indoor unit control PCB anomaly • Transformer anomaly |

| | |
|--|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <pre> graph TD Q1{Is there any loose connection of remote control wires?} -- YES --> C1[Correct it.] Q1 -- NO --> Q2{Is remote control wire broken or short-circuited?} Q2 -- YES --> C2[Replace wires.] Q2 -- NO --> R1[Disconnect the remote control wires.] R1 --> Q3{Is DC15V or higher detected between X-Y of indoor unit terminal block?} Q3 -- YES --> C3[Replace remote control.] Q3 -- NO --> B{B group} Q3 -- NO --> A{A group} A --> Q4{Is DC18V detected between ①-② of CNW2?} Q4 -- YES --> C4[Indoor unit control PCB anomaly -> Replace it.] Q4 -- NO --> C5[Indoor unit power PCB anomaly -> Replace it.] B --> Q5{Is 23V or higher detected between Brown-Brown at the transformer secondary side?} Q5 -- YES --> C6[Indoor unit control PCB anomaly -> Replace it.] Q5 -- NO --> C7[Replace transformer.] </pre> | |

Note: A group: FDTW, FDTS, FDU45-160, FDUM, FDU71, FDE series
 B group: FDTQ, FDUT15-56, FDUH, FDFL, FDFU series

| | | | | |
|--|---------|----------------|--------------|--|
| Error code Remote control: None 7-segment display: - | LED | Green | Red | Content Power source system error (Power source to remote control) |
| | Indoor | Keeps flashing | 3-time flash | |
| | Outdoor | Keeps flashing | 2-time flash | |

| | | |
|--|--|--|
| <p>1. Applicable model</p> <p>FDK series only</p> | <p>5. Troubleshooting</p> | |
| <p>2. Error detection method</p> | <p style="text-align: center;">Diagnosis</p> <pre> graph TD D1{Is the connection of the remote control's wiring OK? X (white), Y (black)} -- NO --> C1[Correct it.] D1 -- YES --> D2{Does the voltage between X and Y in the indoor terminal block exceed 15 VDC?} D2 -- NO --> R1[Remove wire for the remote control] D2 -- YES --> B1[Power source reset] B1 --> D3{Does resetting the power source return it to normal?} D3 -- YES --> C2[Malfunction by temporary noise.] D3 -- NO --> C3[Remote control wire breakage? Replace remote control.] R1 --> D4{Does the re-measured voltage between X and Y in the indoor terminal block exceed 15 VDC?} D4 -- YES --> C4[Remote control wire breakage? Replace remote control.] D4 -- NO --> C5[Indoor unit PCB anomaly -> Replace.] </pre> | <p style="text-align: center;">Countermeasure</p> |
| <p>3. Condition of error displayed</p> | | |
| <p>4. Presumable cause</p> <ul style="list-style-type: none"> • Remote control wire breakage/short-circuit • Defective remote control • Malfunction by noise • Indoor unit PCB anomaly | | |

Note:

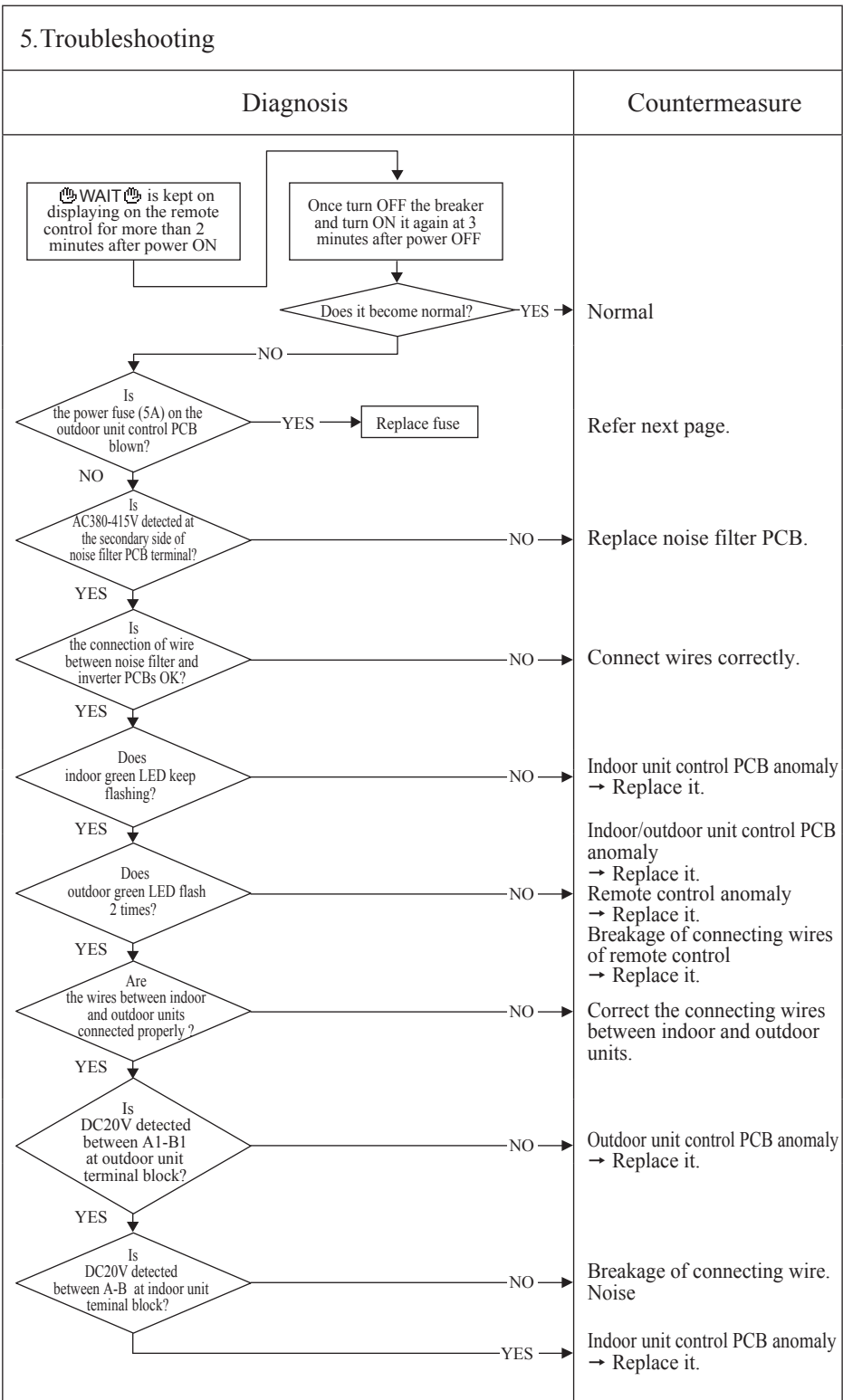
| | | | | |
|---|---------|----------------|--------------|--------------------------|
| Error code Remote control: WAIT 7-segment display: - | LED | Green | Red | Content WAIT (1) |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | 2-time flash | |

1. Applicable model
All models
(In case that WAIT is kept on displaying on the remote control for more than 2 minutes after power ON)

2. Error detection method

3. Condition of error displayed

- 4. Presumable cause**
- Fuse blown
 - Noise filter anomaly
 - Anomalous connection of wire between PCBs
 - Indoor unit control PCB anomaly
 - Remote control anomaly
 - Breakage of connecting wires of remote control
 - Outdoor unit control PCB anomaly



Note: (1) When anomaly occurs during establishing communication between indoor and outdoor unit, error code E5 is displayed (outdoor red LED flash 2-time)
In case of E5, the way of troubleshooting is same as above mentioned (except for checking of connecting wire)
When reset the power after E5 occurs, if this anomaly recurs, WAIT is displayed on remote control. If power ON/OFF is repeated in a short period (within 1 minute), WAIT may be displayed. In such case, please wait for 3 minutes after the power breaker OFF.
(2) If any error is detected 30 minutes after displaying WAIT on the remote control, the display changes to "INSPECT I/U".

| | | | | |
|--|---------|----------------|--------------|---------|
| Error code Remote control: 🏠 WAIT 🏠 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | 2-time flash | |

🏠 WAIT 🏠 (2)

| | | |
|--|---|--|
| <h3>1. Applicable model</h3> <p>All models</p> <p>(In case of fuse blown, how to check the inverter before replacement of fuse)</p> | <h3>5. Troubleshooting</h3> | |
| <h3>2. Error detection method</h3> | <h4>Diagnosis</h4> <pre> graph TD Q1{Is there any short-circuit between phases of noise filter?} Q2{Is there any crack or damage on power transistor module or diode stack?} Q3{Is there any anomaly on reactor?} A1[Replace noise filter.] A2[Replace inverter PCB.] A3[Replace reactor.] A4[Replace fuse.] Q1 -- YES --> A1 Q1 -- NO --> Q2 Q2 -- YES --> A2 Q2 -- NO --> Q3 Q3 -- YES --> A3 Q3 -- NO --> A4 </pre> | <h4>Countermeasure</h4> <p>Replace fuse.</p> |
| <h3>3. Condition of error displayed</h3> | | |
| <h3>4. Presumable cause</h3> <ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Inverter anomaly • Reactor anomaly | | |

Note:

| | | | | |
|--|---------|----------------|--------------|---------|
| Error code Remote control: WAIT 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | 2-time flash | |

WAIT (3)

| |
|---|
| 1. Applicable model All models (No display on the remote control after power ON) |
| 2. Error detection method |
| 3. Condition of error displayed |
| 4. Presumable cause <ul style="list-style-type: none"> • Fuse blown • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly • Transformer anomaly |

| 5. Troubleshooting |
|--------------------|
| Diagnosis |
| |
| Countermeasure |

Note:

| | | | | |
|--|---------|----------------|--------------|---------|
| Error code Remote control: WAIT 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | 2-time flash | |

WAIT (4)

| |
|---|
| 1. Applicable model All models (In case that WAIT is kept on displaying on the remote control for more than 2 minutes after power ON) |
| 2. Error detection method |
| 3. Condition of error displayed |
| 4. Presumable cause <ul style="list-style-type: none"> • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control • Outdoor unit control PCB anomaly |

| | |
|---------------------------|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| | |
| Refer next page. | |

Note:

| | | | | |
|--|---------|-----------|-----------|---------|
| Error code Remote control: 🏠WAIT🏠 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Stays OFF | Stays Off | |
| | Outdoor | Stays OFF | Stays Off | |

🏠WAIT🏠 (5)

| 1.Applicable model | 5.Troubleshooting | |
|---|-------------------|----------------|
| All models (In case that LED on outdoor unit control PCB stays OFF) | Diagnosis | Countermeasure |
| 2.Error detection method | | |
| 3. Condition of error displayed | | |
| 4.Presumable cause | | |
| <ul style="list-style-type: none"> Noise filter anomaly Anomalous connection of wire between PCBs Outdoor unit control PCB anomaly Malfunction by noise Reactor anomaly Outdoor fan anomaly | | |

Note:

| | | | | |
|--|---------|-----------|-----------|---------|
| Error code Remote control: WAIT 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Stays Off | Stays Off | |
| | Outdoor | Stays Off | Stays Off | |

WAIT (6)

| |
|---|
| 1. Applicable model All models (In case of fuse blown, how to check the inverter before replacement of fuse) |
| 2. Error detection method |
| 3. Condition of error displayed |
| 4. Presumable cause <ul style="list-style-type: none"> • Fuse blown • Noise filter anomaly • Inverter anomaly • Reactor anomaly • Electrolytic capacitor anomaly |

| 5. Troubleshooting | |
|---|----------------|
| Diagnosis | Countermeasure |
| <pre> graph TD B[B] --> D1{Is there any short-circuit between phases of noise filter?} D1 -- YES --> A1[Replace noise filter.] D1 -- NO --> D2{Is there any short-circuit between phases at input terminal of inverter PCB?} D2 -- YES --> A2[Replace inverter PCB.] D2 -- NO --> D3{Is there any crack or damage on power transistor module or diode stack?} D3 -- YES --> A2 D3 -- NO --> D4{Is there any anomaly on reactor?} D4 -- YES --> A3[Replace reactor.] D4 -- NO --> D5{Is there any anomaly on electrolytic capacitor?} D5 -- YES --> A4[Replace electrolytic capacitor.] D5 -- NO --> A5[Replace power fuse.] </pre> | |

Note:

| | | | | |
|--|---------|-----------|-----------|------------------------------------|
| Error code Remote control: [No display] 7-segment display: - | LED | Green | Red | Content [No display] |
| | Indoor | Stays OFF | Stays Off | |
| | Outdoor | Stays OFF | Stays Off | |

| | | | |
|---|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| All models (No display on the remote control after power ON) | Diagnosis | Countermeasure | |
| 2. Error detection method | <pre> graph TD Start[No display on the remote control after power ON] --> D1{Is DC10V or higher between X-Y detected at remote control terminal?} D1 -- YES --> C1[Remote control anomaly.] D1 -- NO --> D2{Is DC10V or higher between X-Y wires detected when removing remote control?} D2 -- YES --> C2[Remote control anomaly.] D2 -- NO --> D3{Are connecting wires between indoor and outdoor units connected properly?} D3 -- YES --> C3[Indoor unit control PCB anomaly] D3 -- NO --> C4[Correct connecting wire.] </pre> | | |
| 3. Condition of error displayed | | | |
| 4. Presumable cause | <ul style="list-style-type: none"> • Anomalous connection of wire between PCBs • Indoor unit control PCB anomaly • Remote control anomaly • Breakage of connecting wires of remote control | | |

Note:

| | | | | | |
|--|---------|----------------|-----------|---------|---|
| Error code Remote control: E1 7-segment display: - | LED | Green | Red | Content | <h2>Remote control communication error</h2> |
| | Indoor | Keeps flashing | Stays Off | | |
| | Outdoor | Keeps flashing | Stays Off | | |

| <h3>1. Applicable model</h3> <p>All models</p> | <h3>5. Troubleshooting</h3> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> <pre> graph TD D1{Is it possible to reset normally by the power source reset?} P1[Turn SW7-1 OFF -> ON. Disconnect the wire between indoor and outdoor units] P2[Reset power source.] D2{Does the drain pump start automatically at one minute after power ON?} D1 -- YES --> C1[Malfunction by temporary noise. Check peripheral environment.] D1 -- NO --> P1 P1 --> P2 P2 --> D2 D2 -- YES --> C2[Indoor unit control PCB anomaly -> Replace it.] D2 -- NO --> C3[Remote control anomaly -> Replace it.] </pre> </td> <td></td> </tr> </tbody> </table> | | Diagnosis | Countermeasure | <pre> graph TD D1{Is it possible to reset normally by the power source reset?} P1[Turn SW7-1 OFF -> ON. Disconnect the wire between indoor and outdoor units] P2[Reset power source.] D2{Does the drain pump start automatically at one minute after power ON?} D1 -- YES --> C1[Malfunction by temporary noise. Check peripheral environment.] D1 -- NO --> P1 P1 --> P2 P2 --> D2 D2 -- YES --> C2[Indoor unit control PCB anomaly -> Replace it.] D2 -- NO --> C3[Remote control anomaly -> Replace it.] </pre> | |
|--|---|--|-----------|----------------|--|--|
| Diagnosis | Countermeasure | | | | | |
| <pre> graph TD D1{Is it possible to reset normally by the power source reset?} P1[Turn SW7-1 OFF -> ON. Disconnect the wire between indoor and outdoor units] P2[Reset power source.] D2{Does the drain pump start automatically at one minute after power ON?} D1 -- YES --> C1[Malfunction by temporary noise. Check peripheral environment.] D1 -- NO --> P1 P1 --> P2 P2 --> D2 D2 -- YES --> C2[Indoor unit control PCB anomaly -> Replace it.] D2 -- NO --> C3[Remote control anomaly -> Replace it.] </pre> | | | | | | |
| <h3>2. Error detection method</h3> <p>When normal communication between remote control and indoor unit is interrupted for more than 2 minutes (Detectable only with the remote control)</p> | | | | | | |
| <h3>3. Condition of error displayed</h3> <p>Same as above</p> | | | | | | |
| <h3>4. Presumable cause</h3> <ul style="list-style-type: none"> Anomalous communication circuit between remote control and indoor unit Noise | | | | | | |

Note: If the indoor unit cannot communicate normally with the remote control for 180 seconds, the indoor unit PCB starts to reset automatically.

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E2 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Duplicated indoor unit address</h2> |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

| | | | |
|--|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| All models | Diagnosis | Countermeasure | |
| 2. Error detection method | <pre> graph TD Q1{Is the number of connected indoor units up to 128 units?} Q2{Is the different address No. assigned to each indoor unit?} R1[Reset the power source and restart.] C[Caution: Unless the power source is reset, addresses will not be confirmed.] Q3{Is E2 displayed?} Q1 -- NO --> CM1[Review number of connected units.] Q1 -- YES --> Q2 Q2 -- NO --> CM2[Correct indoor unit address setting.] Q2 -- YES --> R1 R1 --> C C --> Q3 Q3 -- NO --> CM3[Implement test run.] Q3 -- YES --> CM4[Replace indoor unit control PCB. *] </pre> | | |
| More than 129 indoor units are connected in the same Superlink system. Duplicated indoor unit address | | | |
| 3. Condition of error displayed | Same as above | | |
| | | | |
| 4. Presumable cause | <ul style="list-style-type: none"> • Number of connected indoor units exceeds the limitation. • Duplicated indoor unit address • Indoor unit control PCB anomaly | | |
| | | | |

Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E3/5 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Outdoor unit signal line error</h2> |
| | Indoor | Keeps flashing | 2-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

| |
|----------------------------|
| 1. Applicable model |
| All models |

| |
|--|
| 2. Error detection method |
| No outdoor unit exists in the same Superlink system. |

| |
|--|
| 3. Condition of error displayed |
| Same as above |

| |
|---|
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Power is not supplied to the outdoor unit • Unmatch of pairing between indoor and outdoor units • Indoor unit control PCB anomaly • Outdoor unit control PCB anomaly • Missing local wiring |

| | |
|---|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <p>E3 is a communication error that occurs when communication between indoor and outdoor units is not established at all. Once the communication between indoor and outdoor units is established, it changes to E5. In both cases, check signal wires (between indoor-outdoor units) locally.</p> <pre> graph TD Start[Reset the power source and restart.] --> D1{Does E3/E5 occurs?} D1 -- NO --> C1[Temporary malfunction by noise. Identify the source of noise and correct it.] D1 -- YES --> D2{Is protective fuse for the Superlink circuit blown?} D2 -- YES --> C2[Change to spare circuit.] D2 -- NO --> D3{Is the LED on indoor unit control PCB OK?} D3 -- NO --> C3[Indoor unit control PCB anomaly → Replace it.] D3 -- YES --> D4{Is the power source to outdoor unit OK?} D4 -- NO --> C4[Correct it.] D4 -- YES --> D5{Is the outdoor unit address set on the indoor unit OK?} D5 -- NO --> C5[Correct it.] D5 -- YES --> D6{Is the Superlink communication wire connection OK?} D6 -- NO --> C6[Correct it.] D6 -- YES --> C7[Outdoor unit control PCB anomaly → Replace it.] </pre> | |

Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E5 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Communication error during operation</h2> |
| | Indoor | Keeps flashing | *See below | |
| | Outdoor | Keeps flashing | 2-time flash | |

| |
|---|
| 1. Applicable model All models |
| 2. Error detection method When the communication between indoor and outdoor units is interrupted for more than 2 minutes |
| 3. Condition of error displayed When this anomaly is detected during operation. |
| 4. Presumable cause <ul style="list-style-type: none"> • Unit address No. setting error • Remote control wires broken • Poor connection/disconnection of remote control wires • Outdoor unit control PCB anomaly • Malfunction by noise |

| | |
|---|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <p>* In case that indoor unit red LED flashes 2 times</p> <p style="text-align: center;">Note (1) Check the connection (disconnection, looseness) of signal wires at outdoor unit terminal block</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p style="text-align: center;">Is the connection of signal wires at the outdoor unit side OK?</p> <p style="text-align: center;">NO →</p> <p style="text-align: center;">YES ↓</p> <p style="text-align: center;">Note (2) Check the connection (disconnection, looseness, brackage) of signal wires (between indoor and outdoor units)</p> <p style="text-align: center;">Is the connection of signal wires (between indoor and outdoor units) OK?</p> <p style="text-align: center;">NO →</p> <p style="text-align: center;">YES ↓</p> <p style="text-align: center;">Reset the power source and restart.</p> <p style="text-align: center;">Does the remote control LCD becomes normal?</p> <p style="text-align: center;">NO →</p> <p style="text-align: center;">YES →</p> </div> <div style="width: 35%;"> <p style="text-align: center;">Repair signal wires.</p> <p style="text-align: center;">Repair signal wires.</p> <p style="text-align: center;">Go to the diagnosis of WAIT (1).</p> <p style="text-align: center;">Unit is normal. (Malfunction by temporary noise, etc.)</p> </div> </div> <p>* In case that indoor unit red LED stays OFF</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p style="text-align: center;">Reset the power source and restart.</p> <p style="text-align: center;">Does the remote control LCD becomes normal?</p> <p style="text-align: center;">NO →</p> <p style="text-align: center;">YES →</p> </div> <div style="width: 35%;"> <p style="text-align: center;">Outdoor unit control PCB anomaly (Network communication circuit anomaly) → Replace it.</p> <p style="text-align: center;">Unit is normal. (Malfunction by temporary noise, etc.)</p> </div> </div> | |

Note: When the pump down switch is turned on, communication between indoor and outdoor units is cancelled so that "Communication error E5" will be displayed on the remote control and indoor unit control PCB, but this is normal.

| | | | | |
|--|------------|----------------|--------------|---|
| Error code Remote control: E6 7-segment display:- | LED | Green | Red | Content Indoor heat exchanger temperature sensor anomaly (Thi-R) |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature or high temperature (resistance) of Thi-R1, R2, R3

3. Condition of error displayed

- If broken wire is detected for 5 seconds continuously
- Or if in cooling operation short-circuit is detected for 5 seconds continuously

4. Presumable cause

- Anomalous connection of indoor heat exchanger temperature sensor
- Indoor heat exchanger temperature sensor anomaly
- Indoor unit control PCB anomaly

5. Troubleshooting

| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | |
|---|------------------------------------|------------------------------------|---|-----|----|-----|----|----|----|---|----|----|----|----|----|----|--|
| <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK? *1} Q2 -- NO --> C2[Replace temperature sensor. (Thi-R)] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection.</p> | | | | | | | | | | | | | | | | | |
| <p>Temperature-resistance characteristics of indoor heat exchanger temperature sensor (Thi-R1, R2, R3)</p> <table border="1"> <caption>Temperature-resistance characteristics of indoor heat exchanger temperature sensor (Thi-R1, R2, R3)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>~16</td> </tr> <tr> <td>10</td> <td>~10</td> </tr> <tr> <td>20</td> <td>~6</td> </tr> <tr> <td>25</td> <td>5</td> </tr> <tr> <td>30</td> <td>~4</td> </tr> <tr> <td>40</td> <td>~3</td> </tr> <tr> <td>50</td> <td>~2</td> </tr> </tbody> </table> | Temperature (°C) | Temperature sensor resistance (kΩ) | 0 | ~16 | 10 | ~10 | 20 | ~6 | 25 | 5 | 30 | ~4 | 40 | ~3 | 50 | ~2 | |
| Temperature (°C) | Temperature sensor resistance (kΩ) | | | | | | | | | | | | | | | | |
| 0 | ~16 | | | | | | | | | | | | | | | | |
| 10 | ~10 | | | | | | | | | | | | | | | | |
| 20 | ~6 | | | | | | | | | | | | | | | | |
| 25 | 5 | | | | | | | | | | | | | | | | |
| 30 | ~4 | | | | | | | | | | | | | | | | |
| 40 | ~3 | | | | | | | | | | | | | | | | |
| 50 | ~2 | | | | | | | | | | | | | | | | |

Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E7 7-segment display: - | LED | Green | Red | Content Indoor return air temperature sensor anomaly (Thi-A) |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature or high temperature (resistance) of Thi-A

3. Condition of error displayed

- If broken wire is detected for 5 seconds continuously

4. Presumable cause

- Anomalous connection of indoor return air temperature sensor
- Indoor return air temperature sensor anomaly
- Indoor unit control PCB anomaly

5. Troubleshooting

| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | |
|---|------------------------------------|------------------------------------|---|-----|----|-----|----|----|----|---|----|----|----|----|----|----|--|
| <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK? *1} Q2 -- NO --> C2[Replace temperature sensor (Thi-A).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection.</p> | | | | | | | | | | | | | | | | | |
| <p>Temperature-resistance characteristics of indoor return air temperature sensor (Thi-A)</p> <table border="1"> <caption>Temperature-resistance characteristics of indoor return air temperature sensor (Thi-A)</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>~16</td> </tr> <tr> <td>10</td> <td>~11</td> </tr> <tr> <td>20</td> <td>~7</td> </tr> <tr> <td>25</td> <td>5</td> </tr> <tr> <td>30</td> <td>~4</td> </tr> <tr> <td>40</td> <td>~3</td> </tr> <tr> <td>50</td> <td>~2</td> </tr> </tbody> </table> | Temperature (°C) | Temperature sensor resistance (kΩ) | 0 | ~16 | 10 | ~11 | 20 | ~7 | 25 | 5 | 30 | ~4 | 40 | ~3 | 50 | ~2 | |
| Temperature (°C) | Temperature sensor resistance (kΩ) | | | | | | | | | | | | | | | | |
| 0 | ~16 | | | | | | | | | | | | | | | | |
| 10 | ~11 | | | | | | | | | | | | | | | | |
| 20 | ~7 | | | | | | | | | | | | | | | | |
| 25 | 5 | | | | | | | | | | | | | | | | |
| 30 | ~4 | | | | | | | | | | | | | | | | |
| 40 | ~3 | | | | | | | | | | | | | | | | |
| 50 | ~2 | | | | | | | | | | | | | | | | |

Note:

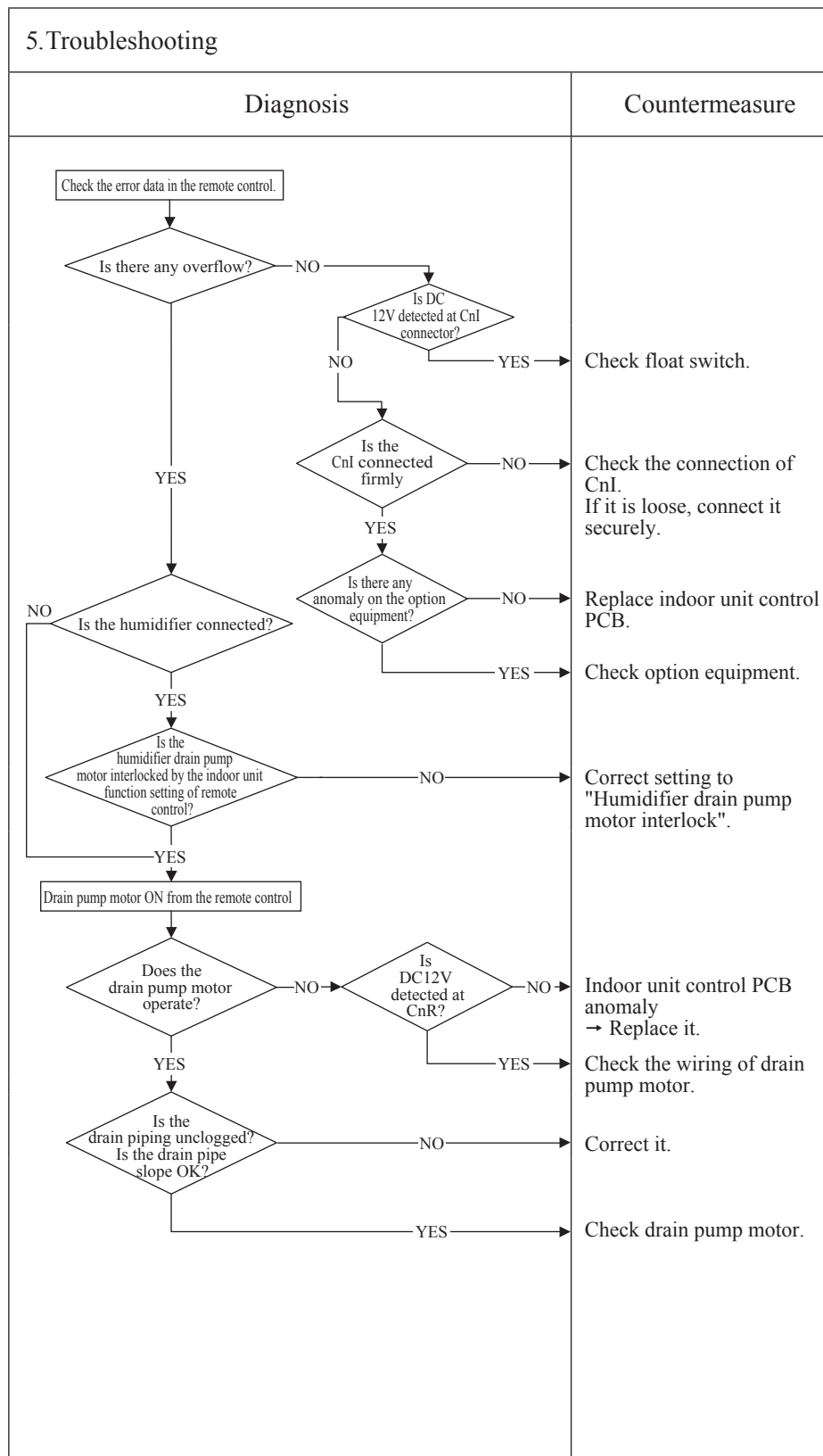
| | | | | |
|--|---------|----------------|--------------|---|
| Error code Remote control: E9 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Drain trouble</h2> |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

1. Applicable model
FDT, FDTC, FDTW, FDTQ, FDTS, FDUT, FDU, FDUM, and FDU650, 1100F series

2. Error detection method
Float switch is activated

3. Condition of error displayed
If the float switch OPEN is detected for 3 seconds continuously or if float switch connector is disconnected or wire broken.

- 4. Presumable cause**
- Indoor unit control PCB anomaly
 - Mistake in setting of float switch
 - Mistake in setting of humidifier drain pump motor interlock
 - Mistake in setting of option equipment
 - Mistake in drain piping
 - Drain pump motor anomaly
 - Disconnection/breakage of drain pump motor wires



Note: When this anomaly occurs at power ON, disconnection of connector or breakage of wire of float switch is suspected. Check and correct it (or replace it, if necessary).

| | | | | |
|--|------------|----------------|------------|--|
| Error code Remote control: E10 7-segment display: - | LED | Green | Red | Content Excessive number of indoor units (more than 17 units) by controlling one remote control |
| | Indoor | Keeps flashing | Stays Off | |
| | Outdoor | Keeps flashing | Stays Off | |

| |
|----------------------------|
| 1. Applicable model |
| All models |

| |
|--|
| 2. Error detection method |
| When it detects more than 17 of indoor units connected to one remote control |

| |
|--|
| 3. Condition of error displayed |
| Same as above |

| |
|--|
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Excessive number of indoor units connected. • Remote control anomaly. |

| | |
|---|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <pre> graph TD A{Are more than 17 indoor units connected to one remote control?} -- NO --> B[Remote control anomaly -> Replace it.] A -- YES --> C[Reduce to 16 or less units.] </pre> | |

Note:

| | | | | |
|---|------------|----------------|------------|--|
| Error code Remote control: E11 7-segment display:- | LED | Green | Red | Content <h2 style="text-align: center;">Address setting error of indoor units</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | Stays OFF | |

| <h3>1. Applicable model</h3> <p>All models</p> | <h3>5. Troubleshooting</h3> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <div style="text-align: center;"> <pre> graph TD A[E11 occurs] --> B{Is "Master IU address set" function of remote control used?} B -- YES --> C[Change of address setting method] </pre> </div> <p>In case the wiring is below and "Master IU address set" is used, E11 is appeared.</p> <div style="text-align: center;"> </div> </td> <td style="vertical-align: top;"> <p>Change of address setting method Set the address by rotary switch SW1, 2 and DIP switch SW5-2 on indoor unit control PCB.</p> </td> </tr> </tbody> </table> | | Diagnosis | Countermeasure | <div style="text-align: center;"> <pre> graph TD A[E11 occurs] --> B{Is "Master IU address set" function of remote control used?} B -- YES --> C[Change of address setting method] </pre> </div> <p>In case the wiring is below and "Master IU address set" is used, E11 is appeared.</p> <div style="text-align: center;"> </div> | <p>Change of address setting method Set the address by rotary switch SW1, 2 and DIP switch SW5-2 on indoor unit control PCB.</p> |
|--|---|--|-----------|----------------|--|--|
| Diagnosis | Countermeasure | | | | | |
| <div style="text-align: center;"> <pre> graph TD A[E11 occurs] --> B{Is "Master IU address set" function of remote control used?} B -- YES --> C[Change of address setting method] </pre> </div> <p>In case the wiring is below and "Master IU address set" is used, E11 is appeared.</p> <div style="text-align: center;"> </div> | <p>Change of address setting method Set the address by rotary switch SW1, 2 and DIP switch SW5-2 on indoor unit control PCB.</p> | | | | | |
| <h3>2. Error detection method</h3> <p>IU address has been set using the "Master IU address set" function of remote control.</p> | | | | | | |
| <h3>3. Condition of error displayed</h3> <p>Same as above</p> | | | | | | |
| <h3>4. Presumable cause</h3> <p>Mistake of address setting method When more than one indoor units are controlled by 1 remote control, address setting from remote control can't be done. Only manual or automatic address setting. (Only when signal wire doesn't straddle the refrigerant system.)</p> | | | | | | |

Note:

| | | | | |
|--|------------|----------------|--------------|--|
| Error code Remote control: E12 7-segment display: - | LED | Green | Red | Content <h2 style="text-align: center;">Address setting error by mixed setting method</h2> |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

1. Applicable model

All models

2. Error detection method

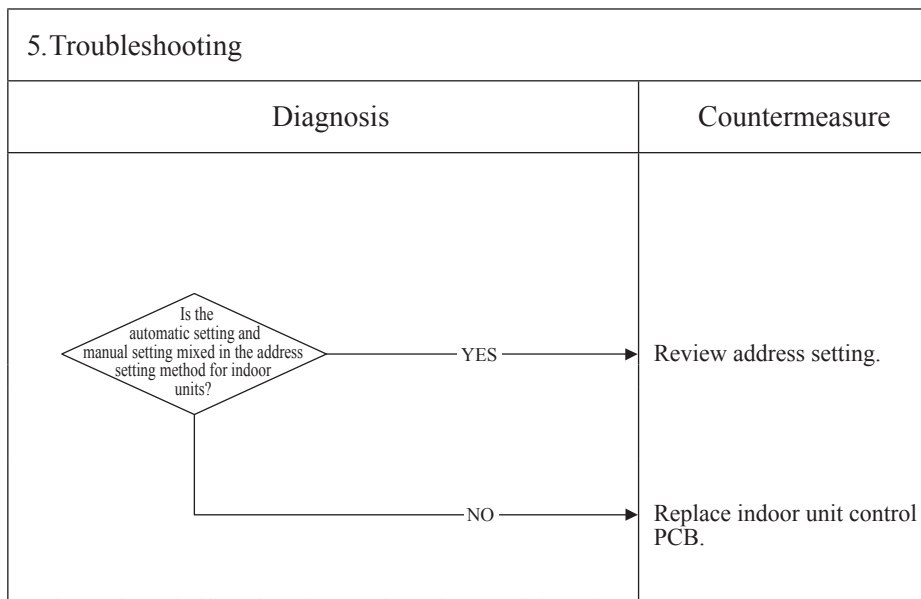
Automatic address setting and manual address setting are mixed when setting address of indoor units

3. Condition of error displayed

Same as above

4. Presumable cause

Mistake in address setting for indoor units



Address setting method list (Figures in [] are for previous Superlink models)

| | | Models for new Superlink protocol | | | Models for previous Superlink protocol | | |
|--|---------------|-----------------------------------|-------------------------|------------------------------|--|-------------------------|------------------------------|
| | | Indoor unit address setting | | Outdoor unit address setting | Indoor unit address setting | | Outdoor unit address setting |
| | | Indoor unit No. switch | Outdoor unit No. switch | Outdoor unit No. switch | Indoor unit No. switch | Outdoor unit No. switch | Outdoor unit No. switch |
| Manual address setting | (New SL) | 000-127 | 00-31 | 00-31 | 00-47 | 00-47 | 00-47 |
| | (Previous SL) | [00-47] | [00-47] | [00-47] | | | |
| Automatic address setting for single refrigerant system | (New SL) | 000 | 49 | 49 | 49 | 49 | 49 |
| | (Previous SL) | | | | | | |
| Automatic address setting for multiple refrigerant systems | (New SL) | 000 | 49 | 00-31 | Not available | | |
| | (Previous SL) | Not available | | | | | |

Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E16 7-segment display:- | LED | Green | Red | Content <h2 style="text-align: center;">Indoor DC fan motor anomaly</h2> <p style="text-align: center;">(FDT, FDTC, FDK series)</p> |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

1.Applicable model

FDT, FDTC, FDK series only

2.Error detection method

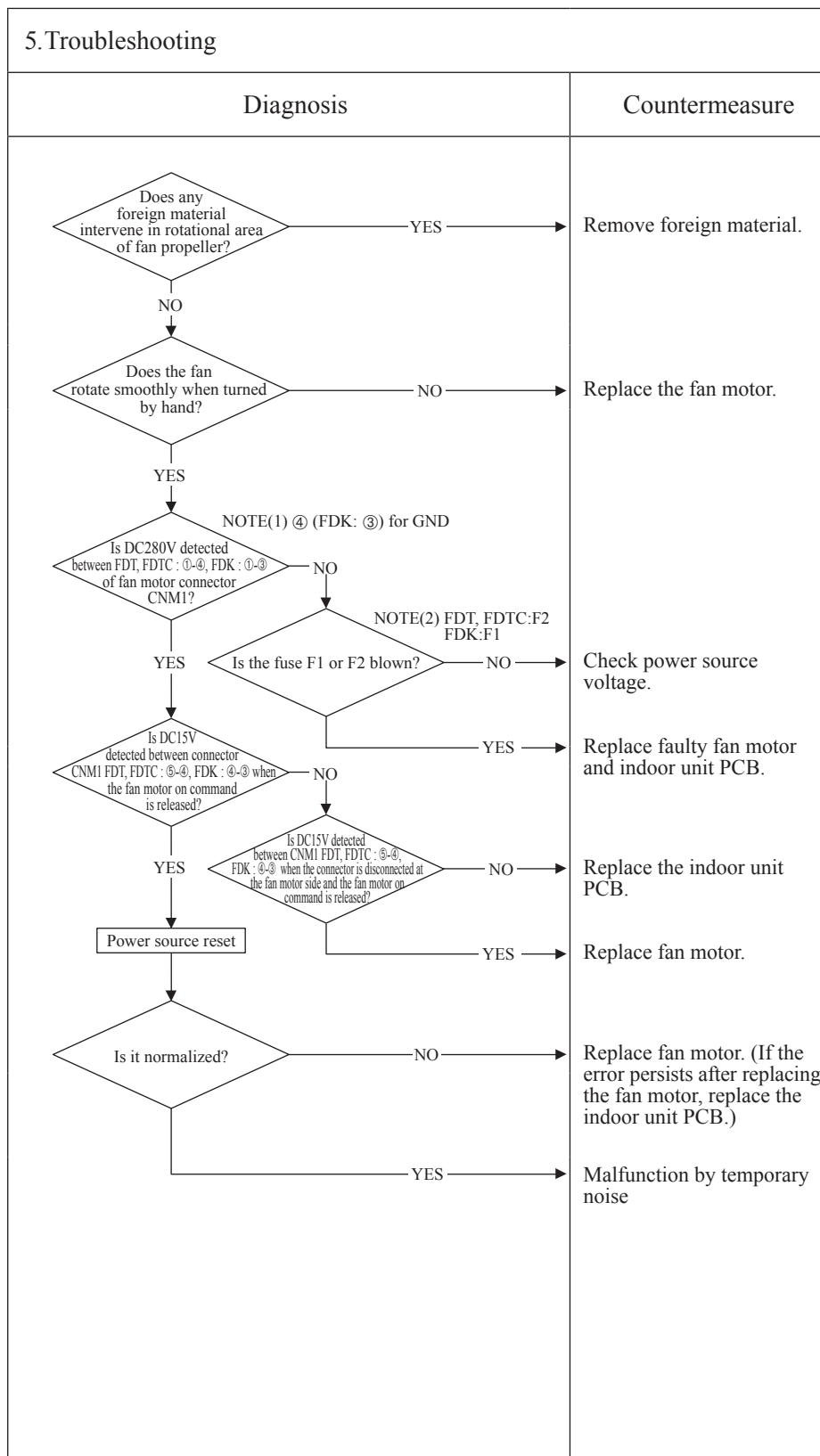
Detected by rotation speed of indoor fan motor

3. Condition of error displayed

- When actual rotation speed of indoor fan motor drops to lower than 200min⁻¹ for 30 seconds continuously, the compressor and the indoor fan motor stop.
- After 2 seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection, the compressor and the indoor fan motor stop abnormally.

4.Presumable cause

- Indoor unit PCB anomaly
- Foreign material at rotational area of fan propeller
- Fan motor anomaly
- Dust on PCB
- Blown fuse
- External noise, surge



Note:

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E16 7-segment display:- | LED | Green | Red | Content Indoor DC fan motor anomaly |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

1.Applicable model

FDTW, FDTS, FDU45-160, FDUM, FDUT71, FDE, FDFW series

2. Error detection method

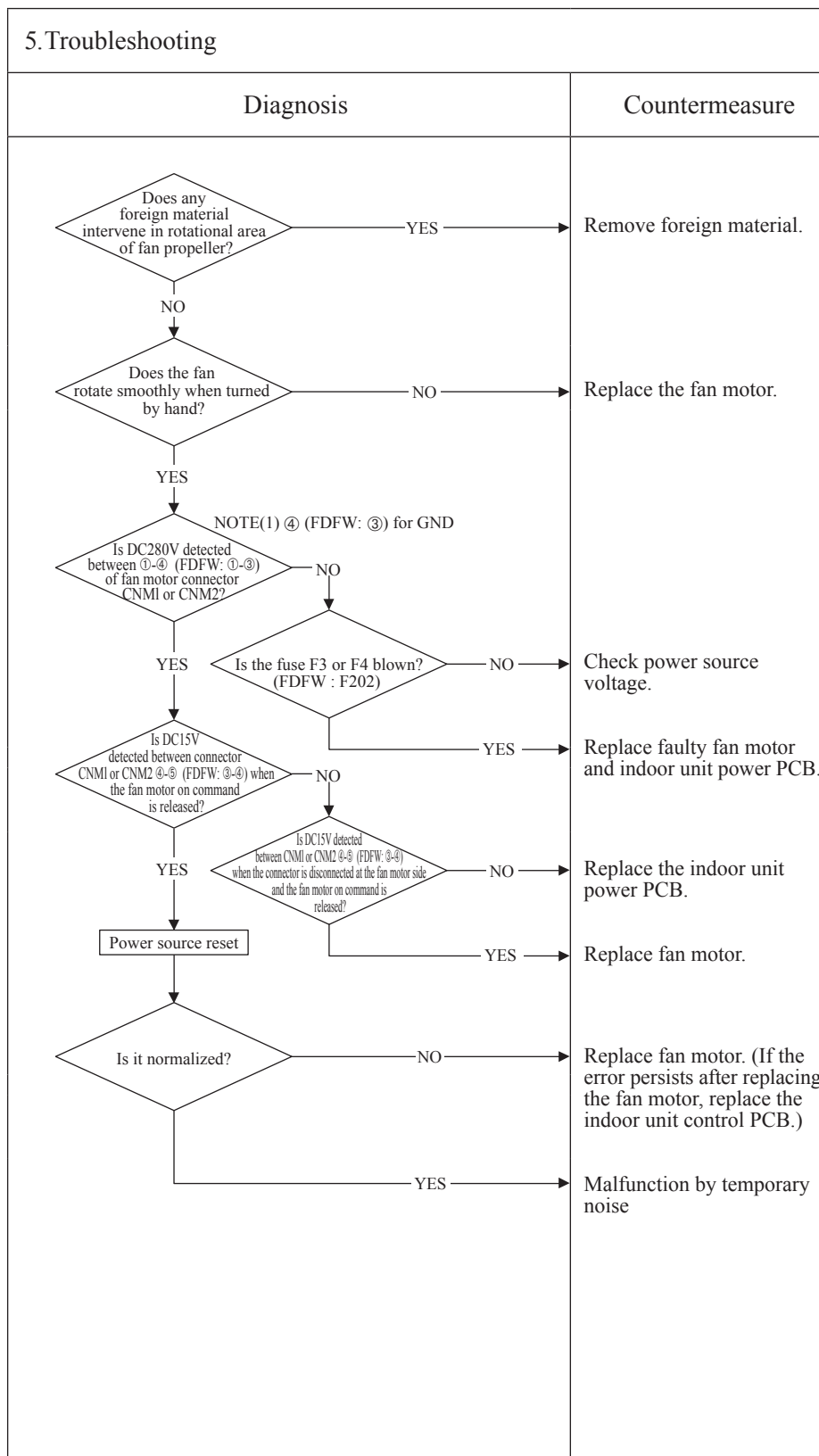
Detected by rotation speed of indoor fan motor

3. Condition of error displayed

- When actual rotation speed of indoor fan motor drops to lower than 200min⁻¹ for 30 seconds continuously, the compressor and the indoor fan motor stop.
- After 2 seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection, the compressor and the indoor fan motor stop abnormally.

4. Presumable cause

- Indoor unit power PCB anomaly
- Foreign material at rotational area of fan propeller
- Fan motor anomaly
- Dust on PCB
- Blown fuse
- External noise, surge
- Indoor unit control PCB anomaly



Note:

| | | | | |
|--|---------|----------------|------------------|---|
| Error code Remote control: E16 7-segment display:- | LED | Green | Red | Content Indoor DC fan motor anomaly |
| | Indoor | Keeps flashing | 1 (2)-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

Note(1) Value in () is for FM2.

| |
|--|
| 1. Applicable model |
| FDU224, 280 FDU650-2400FKXZE1 series |
| 2. Error detection method |
| Detected by rotation speed of indoor fan motor |
| 3. Condition of error displayed |
| <ul style="list-style-type: none"> When actual rotation speed of indoor fan motor drops to lower than 200min⁻¹ for 30 seconds continuously, the compressor and the indoor fan motor stop. After 2 seconds, it starts again automatically, but if this error occurs 4 times within 60 minutes after the initial detection. |
| 4. Presumable cause |
| <ul style="list-style-type: none"> Indoor unit power PCB anomaly Foreign material at rotational area of fan propeller Fan motor anomaly Dust on PCB Blown fuse External noise, surge Indoor unit control PCB Indoor unit motor PCB |

| | |
|---------------------------|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| | |

Note:

| | | | | |
|---|---------|----------------|-------------|---------|
| Error code Remote control: E18 7-segment display: - | LED | Green | Red | Content |
| | Indoor | Keeps flashing | 1-ime flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

Address setting error of master and slave indoor units

| | | |
|--|---|-------------------------|
| <h3>1. Applicable model</h3> <p>Except heat recovery 3-pipe combination system</p> | 5. Troubleshooting | |
| <h3>2. Error detection method</h3> <p>(1) When the address setting for the master indoor unit is not existing in the same Superlink system</p> <p>(2) When the address setting for the slave indoor unit is set for the master indoor unit redundantly</p> | <h3>Diagnosis</h3> <pre> graph TD D1{Is the address setting for the master indoor unit correct?} D2{Is the power source to the master indoor unit turned on?} D3{Are the Superlink signal wires connected between master and slave indoor units?} D1 -- NO --> C1[Correct the address setting of the master indoor unit.] D1 -- YES --> D2 D2 -- NO --> C2[Turn on power source to the master indoor unit] D2 -- YES --> D3 D3 -- NO --> C3[Connect the Superlink signal wires correctly.] D3 -- YES --> C4[Indoor unit control PCB anomaly -> Replace it. (Firstly replace indoor unit control PCB on the slave indoor unit. If it is not recovered, replace indoor unit control PCB on the master indoor unit as well.)] </pre> | <h3>Countermeasure</h3> |
| <h3>3. Condition of error displayed</h3> <p>Same as above</p> | | |
| <h3>4. Presumable cause</h3> <ul style="list-style-type: none"> ▪ Address setting error of the master indoor unit ▪ No power source to the master indoor unit ▪ No connection of Superlink signal wires between master and slave indoor unit ▪ Indoor unit control PCB anomaly (Slave or master or both) | | |

Note:

| | | | | |
|--|------------|----------------|--------------|---|
| Error code Remote control: E19 7-segment display: - | LED | Green | Red | Content Indoor unit operation check, drain pump motor check mode anomaly |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays Off | |

| | | | |
|--|--|-----------------------|--|
| 1. Applicable model All models | 5. Troubleshooting | | |
| 2. Error detection method E19 occurs | Diagnosis | Countermeasure | |
| 3. Condition of error displayed Same as above | <pre> graph TD Start[E19 occurs when the power ON.] --> Decision{Is SW7-1 on the indoor unit control PCB ON?} Decision -- NO --> Countermeasure1[Indoor unit control PCB anomaly (Anomalous SW7) -> Replace.] Decision -- YES --> Countermeasure2[Turn SW7-1 on the indoor unit control PCB OFF and reset the power.] </pre> | | |
| 4. Presumable cause <ul style="list-style-type: none"> • Mistake in SW7-1 setting (Due to forgetting to turn OFF SW7-1 after indoor unit operation check) • Indoor unit control PCB anomaly (Anomalous SW7) | | | |

Note: Indoor unit operation check/drain pump check mode
 If the power is ON after SW7-1ON, indoor unit operation check/drain pump check mode can be established.

- 1) When the communication between remote control and indoor unit PCB is established within 60 seconds after power ON, it goes to indoor unit operation check.
- 2) When the communication between remote control and indoor unit PCB is not established, it goes to drain pump check (CnB connector should be open before power ON)

| | | | | |
|---|------------|----------------|--------------|---|
| Error code Remote control: E20 7-segment display:- | LED | Green | Red | Content Indoor DC fan motor rotation speed anomaly (FDT, FDTC, FDK series) |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

1.Applicable model

FDT, FDTC, FDK series only

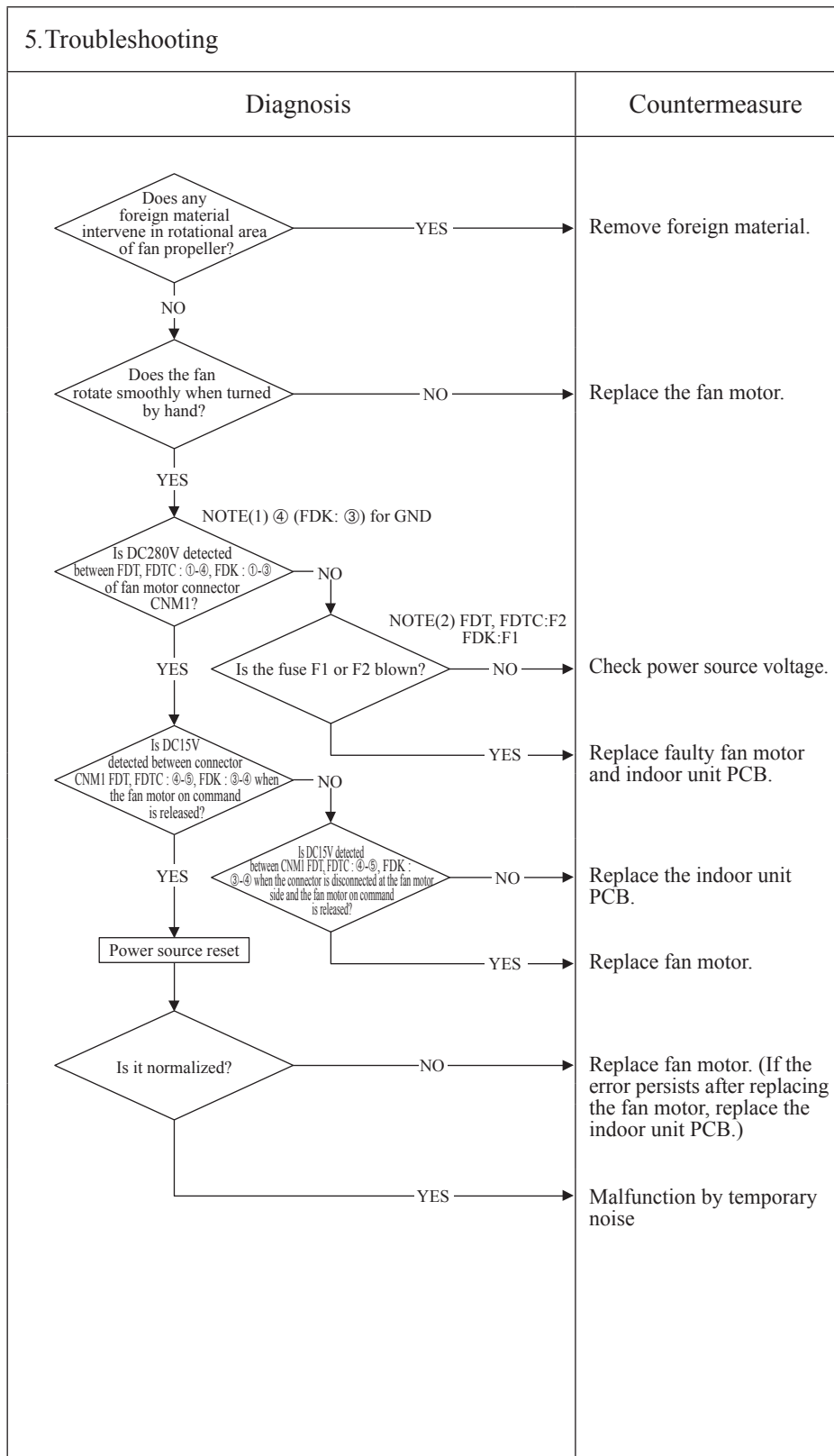
2. Error detection method

Detected by rotation speed of indoor fan motor

3. Condition of error displayed

When the actual fan rotation speed does not reach to the speed of [required speed -50 min⁻¹] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

- 4. Presumable cause**
- Indoor unit PCB anomaly
 - Foreign material at rotational area of fan propeller
 - Fan motor anomaly
 - Dust on PCB
 - Blown fuse
 - External noise, surge



Note:

| | | | | |
|--|---------|----------------|--------------|--|
| Error code Remote control: E20 7-segment display:- | LED | Green | Red | Content Indoor DC fan motor rotation speed anomaly |
| | Indoor | Keeps flashing | 1-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

1. Applicable model
FDTW, FDTS, FDU45-160, FDUM, FDUT71, FDE, FDFW series

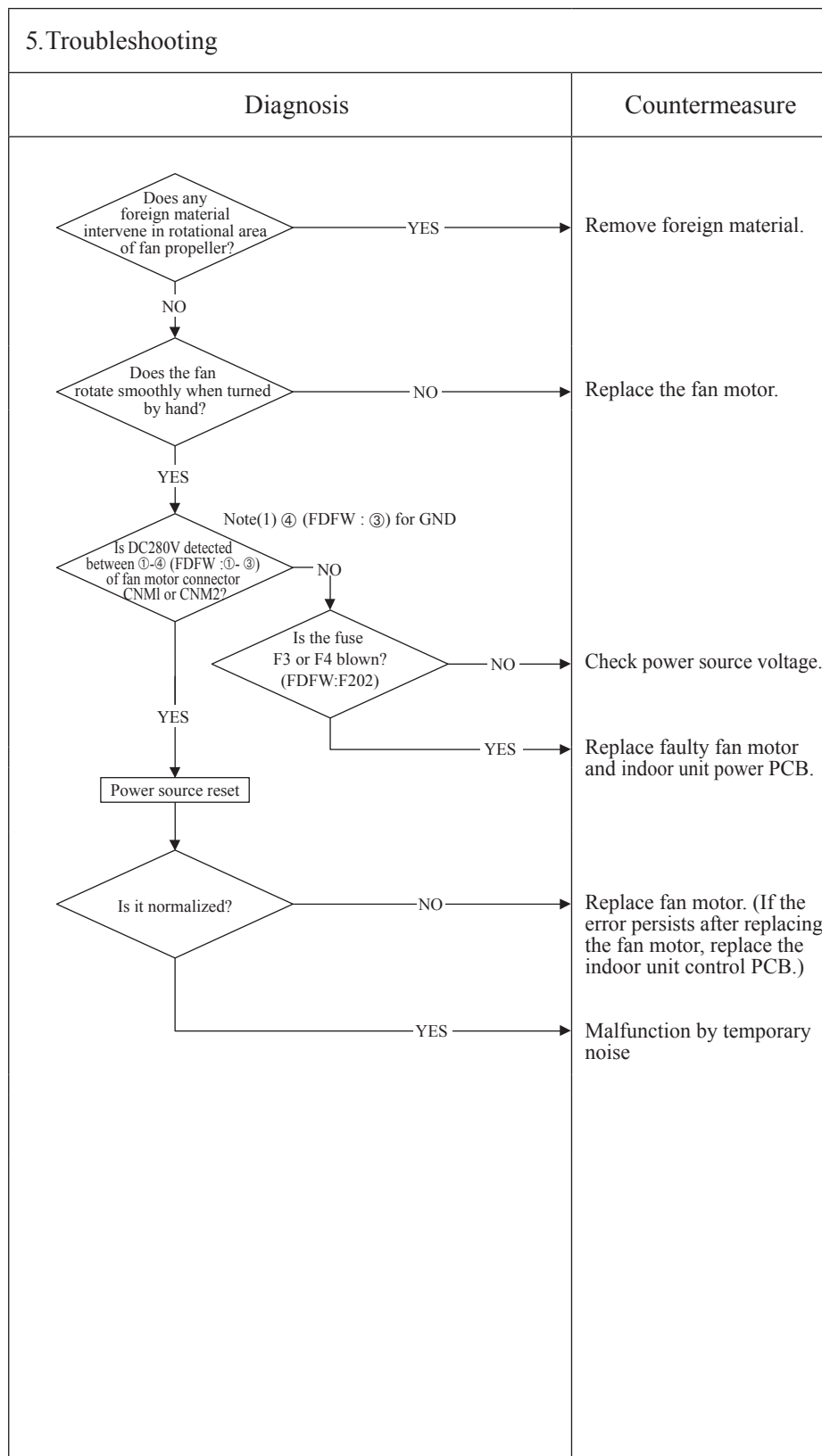
2. Error detection method
Detected by rotation speed of indoor fan motor

3. Condition of error displayed

- When the actual fan rotation speed does not reach to the speed of [required speed -50 (FDU: -500) min⁻¹] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly.

4. Presumable cause

- Indoor unit power PCB anomaly
- Foreign material at rotational area of fan propeller
- Fan motor anomaly
- Dust on PCB
- Blown fuse
- External noise, surge
- Indoor unit control PCB anomaly



Note:

| | | | | |
|---|------------|----------------|------------------|---|
| Error code Remote control: E20 7-segment display:- | LED | Green | Red | Content Indoor DC fan motor rotation speed anomaly |
| | Indoor | Keeps flashing | 1 (2)-time flash | |
| | Outdoor | Keeps flashing | Stays OFF | |

Note(1) Value in () is for FM2.

| |
|---|
| 1.Applicable model FDU224, 280 FDU650-2400FKXZE1 series |
| 2. Error detection method Detected by rotation speed of indoor fan motor |
| 3. Condition of error displayed <ul style="list-style-type: none"> When the actual fan rotation speed does not reach to the speed of [required speed -500 (FDU-F : -50) min⁻¹] after 2 minutes have been elapsed since the fan motor rotation speed command was output, the unit stops by detecting indoor fan motor anomaly. |
| 4. Presumable cause <ul style="list-style-type: none"> Indoor unit power PCB anomaly Foreign material at rotational area of fan propeller Fan motor anomaly Dust on PCB Blown fuse External noise, surge Indoor unit control PCB Indoor unit motor PCB |

| 5. Troubleshooting | | | | | | | | | | | | | | | | | | | | |
|---|--|----------------|---|--------------------------|--|------------------------|--|-----------------------------|--|---|--|--|---|--|---|-----------------------------|--|---|--|--|
| <table border="1"> <thead> <tr> <th>Diagnosis</th> <th>Countermeasure</th> </tr> </thead> <tbody> <tr> <td> Does any foreign material intervene in rotational area of fan propeller? YES → NO → </td> <td> Remove foreign material. </td> </tr> <tr> <td> Does the fan rotate smoothly when turned by hand? YES → NO → </td> <td> Replace the fan motor. </td> </tr> <tr> <td> · FDU224, 280, FDU-F (1800,2400) : In case of FM1 YES NOTE(1) ④ for GND Is DC280V detected between ⑥-④ of fan motor connector CNMI on indoor unit power PCB? YES → NO → </td> <td> Check power source voltage. </td> </tr> <tr> <td> Is the fuse F1 blown? YES → NO → </td> <td> Replace faulty fan motor and indoor unit power PCB. </td> </tr> <tr> <td> Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → </td> <td> Replace harness between indoor unit power PCB and motor PCB. </td> </tr> <tr> <td> Power source reset Is it normalized? Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → </td> <td> Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB and motor PCB.) Malfunction by temporary noise </td> </tr> <tr> <td> · FDU224,280;FDU-F(1800,2400):In case of FM2 · FDU-F(650,1100): In case of FM1,2 YES NOTE(1) ④ for GND Is DC280V detected between ①-④ of fan motor connector CNMI or CNM2? YES → NO → </td> <td> Check power source voltage. </td> </tr> <tr> <td> NOTE (2) FDU224,280; FDU-F (1800, 2400) :F2 FDU-F(650, 1100): F3, F4 Is the fuse F2, F3 or F4 blown? YES → NO → </td> <td> Replace faulty fan motor and indoor unit power PCB. </td> </tr> <tr> <td> Power source reset Is it normalized? YES → NO → </td> <td> Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB.) Malfunction by temporary noise </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | Does any foreign material intervene in rotational area of fan propeller? YES → NO → | Remove foreign material. | Does the fan rotate smoothly when turned by hand? YES → NO → | Replace the fan motor. | · FDU224, 280, FDU-F (1800,2400) : In case of FM1 YES NOTE(1) ④ for GND Is DC280V detected between ⑥-④ of fan motor connector CNMI on indoor unit power PCB? YES → NO → | Check power source voltage. | Is the fuse F1 blown? YES → NO → | Replace faulty fan motor and indoor unit power PCB. | Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → | Replace harness between indoor unit power PCB and motor PCB. | Power source reset Is it normalized? Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → | Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB and motor PCB.) Malfunction by temporary noise | · FDU224,280;FDU-F(1800,2400):In case of FM2 · FDU-F(650,1100): In case of FM1,2 YES NOTE(1) ④ for GND Is DC280V detected between ①-④ of fan motor connector CNMI or CNM2? YES → NO → | Check power source voltage. | NOTE (2) FDU224,280; FDU-F (1800, 2400) :F2 FDU-F(650, 1100): F3, F4 Is the fuse F2, F3 or F4 blown? YES → NO → | Replace faulty fan motor and indoor unit power PCB. | Power source reset Is it normalized? YES → NO → | Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB.) Malfunction by temporary noise |
| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | | | | |
| Does any foreign material intervene in rotational area of fan propeller? YES → NO → | Remove foreign material. | | | | | | | | | | | | | | | | | | | |
| Does the fan rotate smoothly when turned by hand? YES → NO → | Replace the fan motor. | | | | | | | | | | | | | | | | | | | |
| · FDU224, 280, FDU-F (1800,2400) : In case of FM1 YES NOTE(1) ④ for GND Is DC280V detected between ⑥-④ of fan motor connector CNMI on indoor unit power PCB? YES → NO → | Check power source voltage. | | | | | | | | | | | | | | | | | | | |
| Is the fuse F1 blown? YES → NO → | Replace faulty fan motor and indoor unit power PCB. | | | | | | | | | | | | | | | | | | | |
| Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → | Replace harness between indoor unit power PCB and motor PCB. | | | | | | | | | | | | | | | | | | | |
| Power source reset Is it normalized? Is DC280V detected between ⑥-④ of connector CNM on indoor unit motor PCB? YES → NO → | Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB and motor PCB.) Malfunction by temporary noise | | | | | | | | | | | | | | | | | | | |
| · FDU224,280;FDU-F(1800,2400):In case of FM2 · FDU-F(650,1100): In case of FM1,2 YES NOTE(1) ④ for GND Is DC280V detected between ①-④ of fan motor connector CNMI or CNM2? YES → NO → | Check power source voltage. | | | | | | | | | | | | | | | | | | | |
| NOTE (2) FDU224,280; FDU-F (1800, 2400) :F2 FDU-F(650, 1100): F3, F4 Is the fuse F2, F3 or F4 blown? YES → NO → | Replace faulty fan motor and indoor unit power PCB. | | | | | | | | | | | | | | | | | | | |
| Power source reset Is it normalized? YES → NO → | Replace fan motor. (If the error persists after replacing the fan motor, replace the indoor unit control PCB.) Malfunction by temporary noise | | | | | | | | | | | | | | | | | | | |

Note:

| | | | | |
|---|------------|----------------|------------|--|
| Error code Remote control: E28 7-segment display:- | LED | Green | Red | Content <h2 style="text-align: center;">Remote control temperature sensor anomaly (Thc)</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | Stays OFF | |

1. Applicable model

All models

2. Error detection method

Detection of anomalously low temperature (resistance) of Thc.

3. Condition of error displayed

- If -50°C or lower is detected for 5 seconds continuously, compressor stops. After 3-minute delay, the compressor is restarted automatically, but if this anomaly occurs again within 60 minutes after the initial detection.

4. Presumable cause

- Anomalous connection of remote control temperature sensor
- Remote control temperature sensor anomaly
- Remote control PCB anomaly

5. Troubleshooting

| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|---|----|----|----|----|----|----|-----|---|----|----|----|----|----|----|-----|---|----|----|----|----|----|----|-----|---|----|----|----|----|----|----|-----|---|----|----|----|----|----|----|-----|---|----|----|----|----|----|----|-----|----|----|----|----|----|-----|----|-----|----|----|----|----|----|-----|----|-----|
| <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> T1[Regarding the characteristics of the temperature sensor, see the following table.] T1 --> Q2{Are the characteristics of temperature sensor OK? Is the temperature sensor wire OK? *1} Q2 -- NO --> C2[Replace remote control temperature sensor (Thc).] Q2 -- YES --> C3[Replace remote control PCB. (Defective remote control temperature sensor input circuit)] </pre> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>*1 Check several times to prove any poor connection.</p> <p>Temperature-resistance characteristics of remote control temperature sensor (Thc).</p> <table border="1" style="margin: auto;"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>65</td><td>14</td><td>33</td><td>30</td><td>16</td><td>46</td><td>8.5</td></tr> <tr><td>1</td><td>62</td><td>16</td><td>30</td><td>32</td><td>15</td><td>48</td><td>7.8</td></tr> <tr><td>2</td><td>59</td><td>18</td><td>27</td><td>34</td><td>14</td><td>50</td><td>7.3</td></tr> <tr><td>4</td><td>53</td><td>20</td><td>25</td><td>36</td><td>13</td><td>52</td><td>6.7</td></tr> <tr><td>6</td><td>48</td><td>22</td><td>23</td><td>38</td><td>12</td><td>54</td><td>6.3</td></tr> <tr><td>8</td><td>44</td><td>24</td><td>21</td><td>40</td><td>11</td><td>56</td><td>5.8</td></tr> <tr><td>10</td><td>40</td><td>26</td><td>19</td><td>42</td><td>9.9</td><td>58</td><td>5.4</td></tr> <tr><td>12</td><td>36</td><td>28</td><td>18</td><td>44</td><td>9.2</td><td>60</td><td>5.0</td></tr> </tbody> </table> | | Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | 0 | 65 | 14 | 33 | 30 | 16 | 46 | 8.5 | 1 | 62 | 16 | 30 | 32 | 15 | 48 | 7.8 | 2 | 59 | 18 | 27 | 34 | 14 | 50 | 7.3 | 4 | 53 | 20 | 25 | 36 | 13 | 52 | 6.7 | 6 | 48 | 22 | 23 | 38 | 12 | 54 | 6.3 | 8 | 44 | 24 | 21 | 40 | 11 | 56 | 5.8 | 10 | 40 | 26 | 19 | 42 | 9.9 | 58 | 5.4 | 12 | 36 | 28 | 18 | 44 | 9.2 | 60 | 5.0 |
| Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | Temperature (°C) | Resistance (kΩ) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 65 | 14 | 33 | 30 | 16 | 46 | 8.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 62 | 16 | 30 | 32 | 15 | 48 | 7.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 59 | 18 | 27 | 34 | 14 | 50 | 7.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 53 | 20 | 25 | 36 | 13 | 52 | 6.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 48 | 22 | 23 | 38 | 12 | 54 | 6.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 44 | 24 | 21 | 40 | 11 | 56 | 5.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 40 | 26 | 19 | 42 | 9.9 | 58 | 5.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 36 | 28 | 18 | 44 | 9.2 | 60 | 5.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note: After 10 seconds has elapsed since remote control temperature sensor was switched from invalid to valid, E28 will not be displayed even if the temperature sensor harness is disconnected or broken. However, in such case, the indoor return air temperature sensor (Thi-A) will be valid instantly instead of the remote control temperature sensor (Thc). Please note that even though the remote control temperature sensor (Thc) is valid, the displayed return air temperature on the remote control LCD shows the value detected by the indoor return air temperature sensor (Thi-A), not by the remote control temperature sensor (Thc).

(3) List of inspection displays (outdoor units)

| Remote control error code | 7-segment display | Name of inspection | Classification | Page |
|---------------------------|----------------------------------|---|-----------------------|---------|
| E31 | E31 | Duplicated outdoor unit address No. | Address setting error | 166 |
| E32 | E32 | Open L3 Phase on power source at primary side | Site setting error | 167 |
| E36 | E36-1, 2 | Discharge pipe temperature error (Tho-D1, D2) | System error | 168 |
| E37 | E37-1, 2 E37-4, 5 E37-5, 6 | Outdoor heat exchanger temperature sensor (Tho-R) and subcooling coil temperature sensor (Tho-SC, -H) anomaly | Sensor wire breakage | 169 |
| E38 | E38 | Outdoor air temperature sensor anomaly (Tho-A) | Sensor wire breakage | 170 |
| E39 | E39-1, 2 | Discharge pipe temperature sensor anomaly (Tho-D1, D2) | Sensor wire breakage | 171 |
| E40 | E40 | High pressure anomaly (63H1-1, 2 activated) | System error | 172 |
| E41 (E51) | E41 (E51)-1, 2 | Power transistor overheat | System error | 173 |
| E42 | E42-1, 2 | Current cut (CM1, 2) | System error | 174 |
| E43 | E43-1 E43-2 | Excessive number of indoor units connected, excessive total capacity of connection | Site setting error | 175 |
| E44 | E44-1, 2 | Liquid flooding anomaly (CM1,2) | System error | 176 |
| E45 | E45-1, 2 | Communication error between inverter PCB and outdoor unit control PCB | Communication error | 177 |
| E46 | E46 | Mixed address setting methods coexistent in same network | Address setting error | 178 |
| E48 | E48-1 E48-2 | Outdoor DC fan motor anomaly | DC fan motor error | 179,180 |
| E49 | E49 | Low pressure anomaly | System error | 181 |
| E53/E55 | E53/E55-1, 2 | Suction pipe temperature sensor anomaly (Tho-S), Under-dome temperature sensor anomaly (Tho-C1, C2) | Sensor wire breakage | 182 |
| E54 | E54-1 E54-2 | High pressure sensor anomaly (PSH) Low pressure sensor anomaly (PSL) | Sensor wire breakage | 183 |
| E56 | E56-1, 2 | Power transistor temperature sensor anomaly (Tho-P1, Tho-P2) | Sensor wire breakage | 184 |
| E58 | E58-1, 2 | Anomalous compressor by loss of synchronism | System error | 185 |
| E59 | E59-1, 2 | Compressor startup failure (CM1, 2) | System error | 186 |
| E61 | E61-1, 2 | Communication error between the master unit and slave units | System error | 187 |
| E63 | E63 | Emergency stop | Site setting error | 188 |

| | | | | |
|---|---------|----------------|--------------|---|
| Error code Remote control: E31 7-segment display: E31 | LED | Green | Red | Content Duplicated outdoor unit address No. |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

| |
|---|
| 1. Applicable model Outdoor unit |
| 2. Error detection method When the microcomputer of outdoor unit control PCB recognizes the duplicated address No. by scanning all addresses of outdoor units in the same Superlink system |
| 3. Condition of error displayed When duplicated outdoor unit address No. exists in the same Superlink system |
| 4. Presumable cause <ul style="list-style-type: none"> • Mistake in the address setting of outdoor units • More than 129 indoor units connected [Maximum number can be set by address switch is 128 units] • No setting of Master/Slave setting switch for combination use • Outdoor unit control PCB anomaly |

| | |
|---|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <pre> graph TD A[Save data for 30 minutes before stopping in Mente PC.] --> B[Reset the power source and restart operation.] B --> C{Does E31 recur?} C -- NO --> D[Test run *No action is taken because it is judged that the power source reset is not done after changing address.] C -- YES --> E[Check outdoor address Nos. in the same Superlink system.] E --> F{Does the same address No. exist?} F -- YES --> G[Correct address.] F -- NO --> H[Replace outdoor unit control PCB. * * Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.)] </pre> | |

Note: After taken above measure, reset the power source and confirm no error is displayed occurs.
 Unless the power source is reset after changing address, the set address will not be confirmed.
 In case of combination use, set the same address to both master and slave units. Distinction of master or slave unit is done by setting SW4-7 and 4-8. (Refer the instruction manual and technical manual for details.)

| | | | | |
|--|------------|----------------|--------------|--|
| Error code Remote control: E32 7-segment display: E32 | LED | Green | Red | Content <h2 style="text-align: center;">Open L3 Phase on power source at primary side</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

| | | | |
|--|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| Outdoor unit | Diagnosis | Countermeasure | |
| 2. Error detection method | <pre> graph TD Start[Save data for 30 minutes before stopping in Mente PC.] --> D1{Is the power source voltage (between phases) at the primary side OK?} D1 -- NO --> C1[Propose an improvement to the customer.] D1 -- YES --> R1[Reset the power source and restart operation.] R1 --> D2{Does E32 recur?} D2 -- YES --> C2[Replace outdoor unit control PCB.] D2 -- NO --> R2[Restart operation] R2 --> D3{Does E32 recur?} D3 -- YES --> C3[Check the connection of wire.] D3 -- NO --> C4[Wait and see without taking any action.] </pre> | | |
| By checking the power source voltage at primary side of the outdoor unit control PCB (Check only L3 phase) | | | |
| 3. Condition of error displayed | | | |
| When the power source voltage between L1-N or L2-N becomes 0V and/or the current of L3 decrease to 0A | | | |
| 4. Presumable cause | <ul style="list-style-type: none"> • Anomalous power source at primary side • Outdoor unit control PCB anomaly. | | |

Note:

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E36 7-segment display: E36-1, 2 *1 | LED | Green | Red | Content Discharge pipe temperature error (Tho-D1, D2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E36-1: Tho-D1, E36-2: Tho-D2 *2 E36-1: 1-time flash, E36-2: 2-time flash

| |
|----------------------------|
| 1. Applicable model |
| Outdoor unit |

| |
|---|
| 2. Error detection method |
| When anomalously high temperature is detected by the discharge pipe temperature sensor (Tho-D1, D2) |

| |
|--|
| 3. Condition of error displayed |
| When 130°C or higher is detected by the discharge temperature sensor, the compressor stops. After 3-minute delay, the compressor starts again automatically, but if this anomaly occurs 5 times within 60 minutes after the initial detection. |

| |
|--|
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Discharge pipe temperature sensor anomaly • SV1, 2 (liquid refrigerant by-pass valve) anomaly <ul style="list-style-type: none"> • Breakage of coil • Faulty main body • Outdoor unit control PCB anomaly • Insufficient amount of refrigerant • Insufficient airflow volume • Short-circuit of airflow |

| | |
|--|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> | |

Note:

| | | | | |
|---|------------|----------------|------------|---|
| Error code Remote control: E37 7-segment display: E37-1, 2, 3, 4, 5, 6*1 | LED | Green | Red | Content Outdoor heat exchanger temperature sensor (Tho-R) and subcooling coil temperature sensor (Tho-SC, -H) anomaly |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | * 1 | |

*1 E37-1: 1-time flash (Tho-R1), E37-2: 2-time flash (Tho-R2), E37-3: 3-time flash (Tho-R3), E37-4: 4-time flash (Tho-R4), E37-5: 5-time flash (Tho-SC), E37-6: 6-time flash (Tho-H)

| 1. Applicable model Outdoor unit | 5. Troubleshooting | | | | | | | | | | | | | | | | | | |
|---|--|--|---|------------------|------------------------------------|---|----|----|----|----|---|----|---|----|---|----|---|----|---|
| 2. Error detection method Detection of anomalously low temperature (resistance) of Tho-R or Tho-SC or Tho-H | Diagnosis | | Countermeasure | | | | | | | | | | | | | | | | |
| 3. Condition of error displayed <ul style="list-style-type: none"> If -50°C or lower is detected for 5 seconds continuously within 2-minutes to 2-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection If -50°C or lower is detected for 5 seconds continuously within 20 seconds after power ON. | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK?*2} Q2 -- NO --> C2[Replace temperature sensor. (Tho-SC, Tho-H, Tho-R)] Q2 -- YES --> C3[Replace outdoor unit control PCB.] </pre> | | Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value. | | | | | | | | | | | | | | | | |
| 4. Presumable cause <ul style="list-style-type: none"> Broken temperature sensor harness or the internal wire of sensing section (Check the molded section as well.) Disconnection of temperature sensor harness connection (connector). Outdoor unit control PCB anomaly. | *2 Check several times to prove any poor connection | | | | | | | | | | | | | | | | | | |
| | Temperature-resistance characteristics of outdoor heat exchanger temperature sensor (Tho-R1-R4) and subcooling coil temperature sensor (Tho-SC, Tho-H) | | | | | | | | | | | | | | | | | | |
| | <table border="1" style="margin: 10px auto;"> <caption>Temperature-resistance characteristics data</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>15</td></tr> <tr><td>10</td><td>10</td></tr> <tr><td>20</td><td>6</td></tr> <tr><td>25</td><td>5</td></tr> <tr><td>30</td><td>4</td></tr> <tr><td>40</td><td>3</td></tr> <tr><td>50</td><td>2</td></tr> </tbody> </table> | | | Temperature (°C) | Temperature sensor resistance (kΩ) | 0 | 15 | 10 | 10 | 20 | 6 | 25 | 5 | 30 | 4 | 40 | 3 | 50 | 2 |
| Temperature (°C) | Temperature sensor resistance (kΩ) | | | | | | | | | | | | | | | | | | |
| 0 | 15 | | | | | | | | | | | | | | | | | | |
| 10 | 10 | | | | | | | | | | | | | | | | | | |
| 20 | 6 | | | | | | | | | | | | | | | | | | |
| 25 | 5 | | | | | | | | | | | | | | | | | | |
| 30 | 4 | | | | | | | | | | | | | | | | | | |
| 40 | 3 | | | | | | | | | | | | | | | | | | |
| 50 | 2 | | | | | | | | | | | | | | | | | | |

Note:

| | | | | |
|--|------------|----------------|--------------|--|
| Error code Remote control: E38 7-segment display: E38 | LED | Green | Red | Content Outdoor air temperature sensor anomaly (Tho-A) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

1. Applicable model

Outdoor unit

2. Error detection method

Detection of anomalously low temperature (resistance) of Tho-A

3. Condition of error displayed

- If -30°C or lower is detected for 5 seconds continuously within 2-minutes to 2-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection
- If -30°C or lower is detected for 5 seconds continuously within 20 seconds after power ON

4. Presumable cause

- Broken temperature sensor harness or the internal wire of sensing section (Check the molded section as well.)
- Disconnection of temperature sensor harness connection (connector).
- Outdoor unit control PCB anomaly.

5. Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK?*1} Q2 -- NO --> C2[Replace temperature sensor (Tho-A).] Q2 -- YES --> C3[Replace outdoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection.</p> | <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> |

Temperature-resistance characteristics of outdoor air temperature sensor (Tho-A)

| Temperature (°C) | Temperature sensor resistance (kΩ) |
|------------------|------------------------------------|
| -20 | 100 |
| -10 | 70 |
| 0 | 45 |
| 10 | 30 |
| 20 | 20 |
| 30 | 15 |
| 40 | 10 |
| 50 | 5 |

Note:

| | | | | |
|---|------------|----------------|------------|--|
| Error code Remote control: E39 7-segment display: E39-1, 2*1 | LED | Green | Red | Content Discharge pipe temperature sensor anomaly (Tho-D1, D2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E39-1: Tho-D1, E39-2: Tho-D2, *2 E39-1: 1-time flash, E39-2: 2-time flash

| <p>1. Applicable model</p> <p>Outdoor unit</p> | <p>5. Troubleshooting</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK? *3} Q2 -- NO --> C2[Replace temperature sensor (Tho-D1 or D2).] Q2 -- YES --> C3[Replace outdoor unit control PCB.] </pre> </td> <td style="vertical-align: top;"> <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> </td> </tr> </tbody> </table> <p>*3 Check several times to prove any poor connection.</p> | Diagnosis | Countermeasure | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK? *3} Q2 -- NO --> C2[Replace temperature sensor (Tho-D1 or D2).] Q2 -- YES --> C3[Replace outdoor unit control PCB.] </pre> | <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> |
|---|---|-----------|----------------|---|---|
| Diagnosis | Countermeasure | | | | |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the connector of temperature sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of temperature sensor OK? *3} Q2 -- NO --> C2[Replace temperature sensor (Tho-D1 or D2).] Q2 -- YES --> C3[Replace outdoor unit control PCB.] </pre> | <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> | | | | |

| **2. Error detection method** Detection of anomalously low temperature (resistance) of Tho-D1, D2 | |
| **3. Condition of error displayed** - If -30°C or lower is detected for 5 seconds continuously within 10-minutes to 10-minutes 20-seconds after the compressor ON, the compressor stops. And after 3-minute delay, the compressor starts again automatically, but if this anomalous temperature is detected 3 times within 40 minutes after the initial detection. | |
| **4. Presumable cause** - Broken temperature sensor harness or the internal wire of sensing section. (Check the molded section as well.) - Disconnection of temperature sensor harness connection (connector) - Outdoor unit control PCB anomaly. | |
| | Temperature-resistance characteristics of discharge pipe temperature sensor (Tho-D1, D2) | Temperature (°C) | Temperature sensor resistance (kΩ) | |------------------|------------------------------------| | 0 | 180 | | 20 | 100 | | 40 | 60 | | 60 | 40 | | 80 | 30 | | 100 | 25 | | 120 | 22 | | 140 | 21 | | 160 | 20 | |

Note:

| | | | | |
|--|------------|----------------|--------------|--|
| Error code Remote control: E40 7-segment display: E40 | LED | Green | Red | Content High pressure anomaly (63H1-1, 2 activated) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

1. Applicable model

Outdoor unit

2. Error detection method

When high pressure switch 63H1-1 or 63H1-2 is activated

3. Condition of error displayed

- If high pressure sensor exceeds 4.14MPa for 10 seconds continuously
- If 63H1-1, 2 is activated 5 times within 60 minutes
- If 63H1-1, 2 is activated for 60 minutes continuously

4. Presumable cause

- Short-circuit of airflow at condenser side of heat exchanger/ Disturbance of airflow/Clogging filter/Fan motor anomaly
- Disconnection of high pressure switch connector
- Breakage of high pressure switch harness
- Closed service valves
- High pressure sensor anomaly
- High pressure switch anomaly
- Outdoor unit control PCB anomaly

5. Troubleshooting

| Diagnosis | Countermeasure |
|---|---|
| <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Save data for 30 minutes before stopping in Mente PC.</div> | |
| <pre> graph TD Q1{Was 63H1 or 63H1-2 activated at 4.15MPa or higher?} Q2{Does the sensed value of the high pressure sensor show 4.15MPa? (Normal?) } Q3{Are the 63H1-1, 2 OK? Are the connector and/or harness OK?} Q4{Are the service valves fully open?} Q5{Is it stop at 4.15MPa of gauge pressure?} Q6{Is there any clogging in the refrigerant circuit?} Q1 -- YES --> Q3 Q1 -- NO --> Q2 Q2 -- YES --> Q3 Q2 -- NO --> CM1[Check and save the data of operating condition. Check the sensed value of high pressure sensor when the 63H1-1, 2 is activated. Check whether the high pressure switch is activated at the sensed value of high pressure sensor.] Q3 -- YES --> Q4 Q3 -- NO --> CM2[High pressure sensor anomaly is suspicious. Check high pressure sensor itself according to the troubleshooting procedure of E54, after restarting operation. (If the high pressure sensor [PSH] fails, replace it) If the connector is disconnected or the harness is broken, correct it. Also check whether the high pressure switch is properly mounted or not.] Q4 -- YES --> Q5 Q4 -- NO --> CM3[Open service valve. Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.] Q5 -- YES --> Q6 Q5 -- NO --> CM4[Replace outdoor unit control PCB.] Q6 -- YES --> CM5[Remove clogs.] Q6 -- NO --> CM6[Check items (condenser side): Filter clogging, Airflow volume (Fan motor), Short-circuit of air flow] </pre> | <p>Check and save the data of operating condition. Check the sensed value of high pressure sensor when the 63H1-1, 2 is activated. Check whether the high pressure switch is activated at the sensed value of high pressure sensor.</p> <p>High pressure sensor anomaly is suspicious. Check high pressure sensor itself according to the troubleshooting procedure of E54, after restarting operation. (If the high pressure sensor [PSH] fails, replace it)</p> <p>If the connector is disconnected or the harness is broken, correct it. Also check whether the high pressure switch is properly mounted or not.</p> <p>Open service valve.</p> <p>Check it, as much as possible, under the operating conditions for 30 minutes before error occurred.</p> <p>Replace outdoor unit control PCB.</p> <p>Remove clogs.</p> <p>Check items (condenser side):</p> <ul style="list-style-type: none"> • Filter clogging • Airflow volume (Fan motor) • Short-circuit of air flow |

Note: If the error does not recur, connect the Maintenance PC and continue to collect data.

| | | | | |
|---|------------|----------------|------------|--|
| Error code Remote control: E41(E51) 7-segment display: E41(E51)-1, 2*1 | LED | Green | Red | Content <h2 style="text-align: center;">Power transistor overheat</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E41-1 (E51-1) : CM1, E41-2 (E51-2) : CM2 *2 E41-1 (E51-1) : 1-time flash, E41-2 (E51-2) : 2-time flash

| <h3>1. Applicable model</h3> <p>Outdoor unit</p> | <h3>5. Troubleshooting</h3> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Save data for 30 minutes before stopping in Mente PC.</div> </td> <td style="vertical-align: top;"> <p>Check, record operating condition. Check power transistor temperature. Check operations of outdoor fan, inverter cooling fan.</p> <p>Repair according to the troubleshooting E48.</p> <p>Wait and see. (Continue, if possible, and record data.)</p> <p>If it fails to run even in ON range, check voltage at connector (*1) on control PCB. If AC 230V is detected, replace inverter cooling fan. If it shows 0V, replace control PCB. Inverter cooling fan runs under following condition.</p> <div style="text-align: center;"> </div> <p>Power transistor sensor temperatures 1, 2</p> <p>Connect sensors securely.</p> <p>Replace power transistor temperature sensor.</p> <p>* See page 184 for temperature sensor characteristic.</p> <p>Measure after confirming that 52C or 52X is turned ON. Replace inverter PCB.</p> <p>Coat power transistor with silicon sufficiently, and fix on radiator fin securely.</p> <p>Replace power transistor.</p> </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Save data for 30 minutes before stopping in Mente PC.</div> | <p>Check, record operating condition. Check power transistor temperature. Check operations of outdoor fan, inverter cooling fan.</p> <p>Repair according to the troubleshooting E48.</p> <p>Wait and see. (Continue, if possible, and record data.)</p> <p>If it fails to run even in ON range, check voltage at connector (*1) on control PCB. If AC 230V is detected, replace inverter cooling fan. If it shows 0V, replace control PCB. Inverter cooling fan runs under following condition.</p> <div style="text-align: center;"> </div> <p>Power transistor sensor temperatures 1, 2</p> <p>Connect sensors securely.</p> <p>Replace power transistor temperature sensor.</p> <p>* See page 184 for temperature sensor characteristic.</p> <p>Measure after confirming that 52C or 52X is turned ON. Replace inverter PCB.</p> <p>Coat power transistor with silicon sufficiently, and fix on radiator fin securely.</p> <p>Replace power transistor.</p> |
|---|---|-----------|----------------|---|--|
| Diagnosis | Countermeasure | | | | |
| <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">Save data for 30 minutes before stopping in Mente PC.</div> | <p>Check, record operating condition. Check power transistor temperature. Check operations of outdoor fan, inverter cooling fan.</p> <p>Repair according to the troubleshooting E48.</p> <p>Wait and see. (Continue, if possible, and record data.)</p> <p>If it fails to run even in ON range, check voltage at connector (*1) on control PCB. If AC 230V is detected, replace inverter cooling fan. If it shows 0V, replace control PCB. Inverter cooling fan runs under following condition.</p> <div style="text-align: center;"> </div> <p>Power transistor sensor temperatures 1, 2</p> <p>Connect sensors securely.</p> <p>Replace power transistor temperature sensor.</p> <p>* See page 184 for temperature sensor characteristic.</p> <p>Measure after confirming that 52C or 52X is turned ON. Replace inverter PCB.</p> <p>Coat power transistor with silicon sufficiently, and fix on radiator fin securely.</p> <p>Replace power transistor.</p> | | | | |
| <h3>2. Error detection method</h3> <p>E41 is displayed on 7-segment LED.</p> | | | | | |
| <h3>3. Condition of error displayed</h3> <p>Anomalously high temperature of power transistor is detected 5 times within 60 minutes (E41). Or it is detected for 15 minutes continuously (E51).</p> | | | | | |
| <h3>4. Presumable cause</h3> <ul style="list-style-type: none"> • Power transistor anomaly • Power transistor temperature sensor anomaly • Inverter PCB anomaly • Outdoor fan motor anomaly • Anomalous cooling fan motor for inverter • Outdoor unit control PCB anomaly | | | | | |

Note: *1 Measurement position: Between ① – ③ pins of CNN8
 *2 Measuring position: Between + and – of C19
 If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E42 7-segment display: E42-1, 2* | LED | Green | Red | Content <h2 style="text-align: center;">Current cut (CM1, CM2)</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E42-1: CM1, E42-2: CM2 *2 E42-1: 1-time flash, E42-2: 2-time flash

| | | | |
|---|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| Outdoor unit | Diagnosis | Countermeasure | |
| 2. Error detection method | | | |
| When anomalously high output current of inverter is detected by the current sensor mounted in the power transistor | | | |
| 3. Condition of error displayed | | | |
| When 88A or higher output current of inverter is detected 4 times within 15 minutes | Check, record operating condition. Check, record operating condition. Check pressure for anomaly. | | |
| 4. Presumable cause | Replace compressor. Check oil separator cavity strainer. (Replace if necessary.) | | |
| <ul style="list-style-type: none"> Compressor anomaly Leakage of refrigerant Power transistor module anomaly Anomalous power source for inverter PCB Outdoor fan motor anomaly Inverter PCB anomaly | Repair according to the troubleshooting E48. | | |
| | Wait and see. | | |
| | Replace compressor. | | |
| | Measure after confirming that 52C or 52X is turned ON. Replace inverter PCB. | | |
| | Replace power transistor. | | |
| | Replace power transistor. | | |
| | Replace inverter PCB. | | |
| | Wait and see. | | |
| | Replace compressor on which error occurred initially. | | |

Note: *3 Measurement position: Between + and - of C19

*4 Measurement position: Check resistance between P-U, P-V, P-W, N-U, N-V, N-W, P-N. (Disconnect compressor wires before measurement). If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E43 7-segment display: E43-1, 2 *1 | LED | Green | Red | Content Excessive number of indoor units connected, excessive total capacity of connection |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E43-1/1-time flash: Excessive number of indoor units connected, E43-2/2-time flash: Excessive capacity of indoor units connection

| 1. Applicable model Outdoor unit | 5. Troubleshooting | | | | | | | | | | | | | | | | | | |
|--|---|-----------|----------------|---|---|------------------|--|-------------------|--|--|---|---|--|--|--|---|--|--|---|
| 2. Error detection method When the number of connected indoor units exceeds the limitation When the total capacity of connected indoor units exceeds the limitation | <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> Save data for 30 minutes before stopping in Mente PC. </td> <td style="text-align: center;"> Check and save the data of operating condition. </td> </tr> <tr> <td style="text-align: center;"> Reset the power. </td> <td style="text-align: center;"> Caution: Address will not be confirmed, unless the power source is reset after changing address. </td> </tr> <tr> <td style="text-align: center;"> Is E43 displayed? </td> <td style="text-align: center;"> NO → Test run No action is taken because it is judged that the power source reset was not done after changing address </td> </tr> <tr> <td style="text-align: center;"> YES → Does the number of indoor units connected and/or total capacity exceed limitation? </td> <td style="text-align: center;"> YES → Check indoor unit addresses and correct. In case that total capacity of connected indoor units exceeds the limitation, if tentative operation is required turn ON the DIP switch SW5-4 on the outdoor unit control PCB. (However since this tentative solution could cause trouble, be sure to correct it as soon as possible) </td> </tr> <tr> <td style="text-align: center;"> NO → Check the connected number of indoor units with 7-segment display code C40 or Mente PC with reference to the utilities drawing. (Check not only one system, but also other systems.) </td> <td></td> </tr> <tr> <td style="text-align: center;"> Are there any indoor units which is not expected to exist in that signal line? </td> <td style="text-align: center;"> YES → Signal wire may be connected to other outdoor unit system. Correct the signal wire. </td> </tr> <tr> <td style="text-align: center;"> NO → Check the resistance between A and B of signal line as well. </td> <td style="text-align: center;"> Correct addresses. (Either one of addresses is wrong.) If the address corrected with rotary switch is still wrong, replace control PCB. (Defective rotary switch) </td> </tr> <tr> <td style="text-align: center;"> General checking of indoor/outdoor unit addresses by means of: ◇ Outdoor unit: Mente PC, 7-Segment display and rotary switch (SW1, 2) ◇ Indoor unit: Remote control, rotary switch (SW1, 2, 3, 4) * It is recommended to use means other than the rotary switch which could be defective. </td> <td style="text-align: center;"> * Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.) </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | Save data for 30 minutes before stopping in Mente PC. | Check and save the data of operating condition. | Reset the power. | Caution: Address will not be confirmed, unless the power source is reset after changing address. | Is E43 displayed? | NO → Test run No action is taken because it is judged that the power source reset was not done after changing address | YES → Does the number of indoor units connected and/or total capacity exceed limitation? | YES → Check indoor unit addresses and correct. In case that total capacity of connected indoor units exceeds the limitation, if tentative operation is required turn ON the DIP switch SW5-4 on the outdoor unit control PCB. (However since this tentative solution could cause trouble, be sure to correct it as soon as possible) | NO → Check the connected number of indoor units with 7-segment display code C40 or Mente PC with reference to the utilities drawing. (Check not only one system, but also other systems.) | | Are there any indoor units which is not expected to exist in that signal line? | YES → Signal wire may be connected to other outdoor unit system. Correct the signal wire. | NO → Check the resistance between A and B of signal line as well. | Correct addresses. (Either one of addresses is wrong.) If the address corrected with rotary switch is still wrong, replace control PCB. (Defective rotary switch) | General checking of indoor/outdoor unit addresses by means of: ◇ Outdoor unit: Mente PC, 7-Segment display and rotary switch (SW1, 2) ◇ Indoor unit: Remote control, rotary switch (SW1, 2, 3, 4) * It is recommended to use means other than the rotary switch which could be defective. | * Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.) |
| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | | | |
| Save data for 30 minutes before stopping in Mente PC. | Check and save the data of operating condition. | | | | | | | | | | | | | | | | | | |
| Reset the power. | Caution: Address will not be confirmed, unless the power source is reset after changing address. | | | | | | | | | | | | | | | | | | |
| Is E43 displayed? | NO → Test run No action is taken because it is judged that the power source reset was not done after changing address | | | | | | | | | | | | | | | | | | |
| YES → Does the number of indoor units connected and/or total capacity exceed limitation? | YES → Check indoor unit addresses and correct. In case that total capacity of connected indoor units exceeds the limitation, if tentative operation is required turn ON the DIP switch SW5-4 on the outdoor unit control PCB. (However since this tentative solution could cause trouble, be sure to correct it as soon as possible) | | | | | | | | | | | | | | | | | | |
| NO → Check the connected number of indoor units with 7-segment display code C40 or Mente PC with reference to the utilities drawing. (Check not only one system, but also other systems.) | | | | | | | | | | | | | | | | | | | |
| Are there any indoor units which is not expected to exist in that signal line? | YES → Signal wire may be connected to other outdoor unit system. Correct the signal wire. | | | | | | | | | | | | | | | | | | |
| NO → Check the resistance between A and B of signal line as well. | Correct addresses. (Either one of addresses is wrong.) If the address corrected with rotary switch is still wrong, replace control PCB. (Defective rotary switch) | | | | | | | | | | | | | | | | | | |
| General checking of indoor/outdoor unit addresses by means of: ◇ Outdoor unit: Mente PC, 7-Segment display and rotary switch (SW1, 2) ◇ Indoor unit: Remote control, rotary switch (SW1, 2, 3, 4) * It is recommended to use means other than the rotary switch which could be defective. | * Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No. 5 on rotary switch was not recognized.) | | | | | | | | | | | | | | | | | | |
| 3. Condition of error displayed <ul style="list-style-type: none"> Excessive number of connected indoor units Excessive total capacity of connected indoor units The total capacity of connected indoor units exceeds the limitation | | | | | | | | | | | | | | | | | | | |
| 4. Presumable cause <ul style="list-style-type: none"> Mistake in setting of indoor/outdoor unit addresses Mistake in signal wire connection | | | | | | | | | | | | | | | | | | | |

Note: After completing the above procedure, reset the power source and confirm that the error display does not recur. Unless the power source is reset for both indoor unit and outdoor unit, the set addresses will not be confirmed.

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E44 7-segment display: E44-1, 2 *1 | LED | Green | Red | Content Liquid flooding anomaly (CM1, CM2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E44-1: CM1, E44-2 : CM2 *2 E44-1: 1-time flash, E45-2: 2-time flash

| |
|--|
| 1. Applicable model |
| Outdoor units |
| 2. Error detection method |
| When 5°C or lower of the under-dome temperature superheat is detected for 15 minutes continuously or for 30 minutes continuously |
| 3. Condition of error displayed |
| When above anomaly is detected 3 times within 90 minutes |
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Unmatching of refrigerant piping and/or signal wiring • Overcharging of refrigerant • Anomalous control of superheat • Anomalous circuit of liquid refrigerant by-pass • Anomalous refrigerant circuit of subcooling coil • Under-dome temperature sensor (Tho-C1, 2) anomaly |

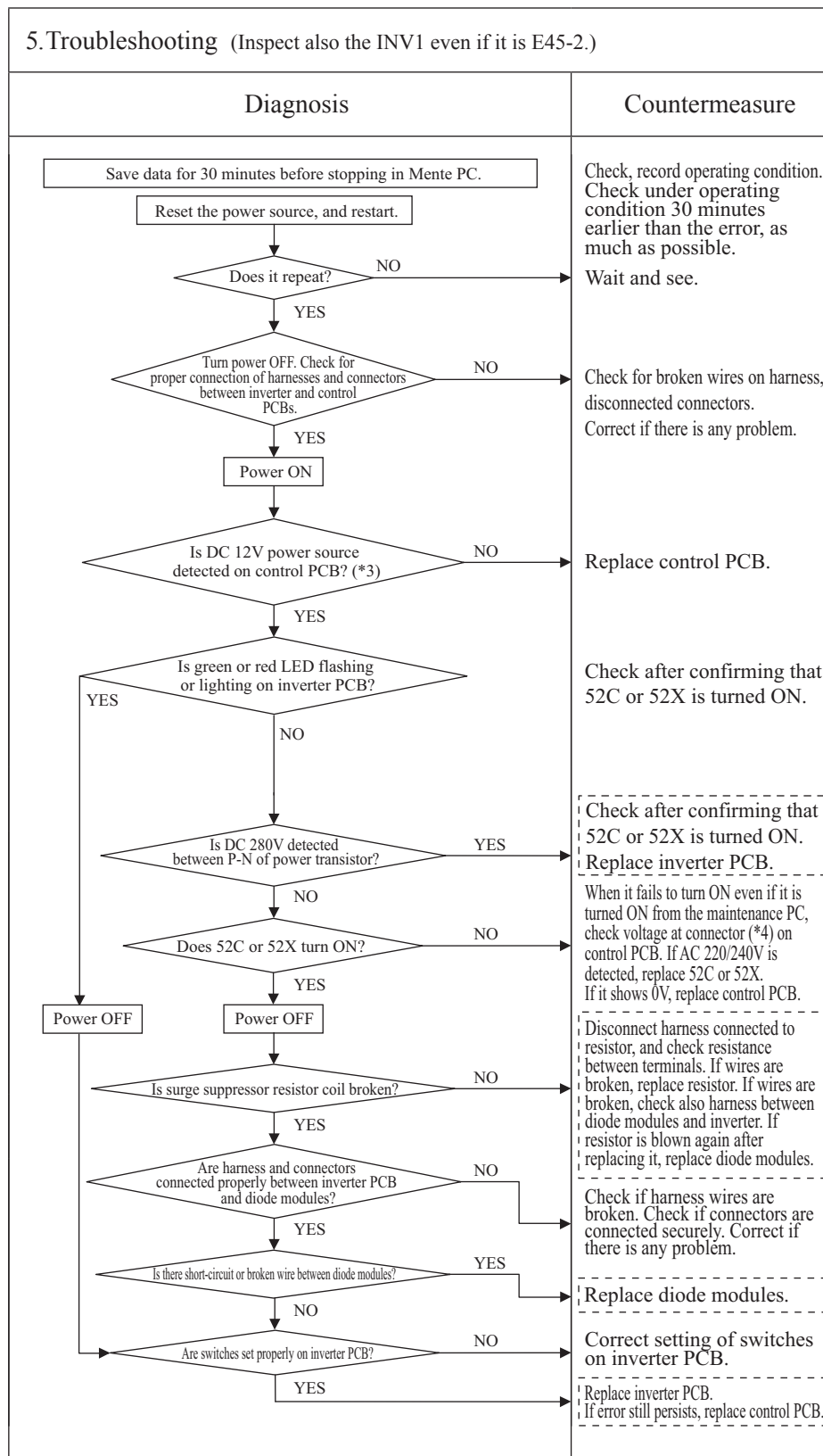
| 5. Troubleshooting | |
|---|---|
| Diagnosis | Countermeasure |
| <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">Save data for 30 minutes before stopping in Mente PC.</div> | <p>Check and save the data of operating condition. Check the ROM version. Confirmation of SV1, 2 operation.</p> <p>Correct the connection of refrigerant piping and/or signal wiring properly.</p> <p>Adjust refrigerant amount properly.</p> <p>Replace SV1, 2. Replace the coil of SV1, 2.</p> <ul style="list-style-type: none"> • Replace EEVSC. • Check the coil of EEVSC → Replace the coil of EEVSC • Replace Tho-H. • Replace PSL. <ul style="list-style-type: none"> • Replace indoor EEV. • Check the coil of EEV → Replace the coil of EEV. • Check the installed position of Thi-R1, R2, R3 → Replace Thi-R, if necessary. • Check the air filter. • Check the connection of indoor fan motor connector. Replace indoor fan motor * By checking Thi-R1, R2, R3 from indoor unit operation data of Mente PC, specify the indoor unit which tends to be liquid flooding (Thi-R3=Thi-R2 shows the probability of liquid flooding) <ul style="list-style-type: none"> • Replace EEVH1, 2. • Check the coil of EEVH1, 2 → Replace the coil of EEVH1, 2. • Check the installed position of Tho-R1, R2, R3, R4 → Replace Tho-R, if necessary. • Clean the fin of outdoor heat exchanger. • Check the connection of outdoor fan motor connector. Replace outdoor fan motor. <p>Replace Tho-C1, 2.</p> <p>Collect the data with Mente PC and ask our consultation.</p> |

Note: If the error does not recur, connect the Mente PC and continue to collect data.

| | | | | |
|--|---------|----------------|-----------|---|
| Error code Remote control: E45 7-segment display: E45-1, 2 *1 | LED | Green | Red | Content Communication error between inverter PCB and outdoor unit control PCB |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E45-1: INV1, E45-2: INV2 *2 E45-1: 1-time flash, E45-2: 2-time flash

| |
|--|
| 1. Applicable model Outdoor unit |
| 2. Error detection method E45 is displayed on 7-segment LED. |
| 3. Condition of error displayed When the communication between inverter PCB and outdoor unit control PCB is not established |
| 4. Presumable cause <ul style="list-style-type: none"> • Signal wire anomaly • Outdoor unit control PCB anomaly • Inverter PCB anomaly • Rush current prevention resistor anomaly • Defective 52C or 52X • Defective diode module |



Note: *3 Measurement position: Between + and - of C21

*4 Measurement position: Between pins ① - ③ of CNM1, CNM2 (CNM2 for systems having 2 units of compressor only)
 If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E46 7-segment display: E46 | LED | Green | Red | Content Mixed address setting methods coexistent in same network |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | Stays OFF | |

1. Applicable model

Outdoor unit

2. Error detection method

If the signal line of a outdoor unit system applied automatic address setting is connected to other outdoor unit system (Detected at indoor unit side)

3. Condition of error displayed

Same as above

4. Presumable cause

- Mistake in the address setting
- Mistake in the connection of signal wire

5. Troubleshooting

| Diagnosis | Countermeasure | | | | | | | | | |
|--|----------------|--------|--------|----------------------|-----|-----|------------------------|-----|--------|---|
| <p>Save data for 30 minutes before stopping in Mente PC.</p> <p>Reset power source and restart.</p> <p>Does E46 recur?</p> <p>NO →</p> <p>YES →</p> <p>Is the signal line of a outdoor unit system applying automatic address setting connected to other outdoor unit system?</p> <p>YES →</p> <p>NO →</p> <p>If signal line is connected to more than 2 outdoor unit systems, address setting should be done by manually.</p> <p>Is E46 still displayed?</p> <p>NO →</p> <p>YES →</p> <p>Turn ON the power source of each outdoor unit one by one and search the outdoor unit that can start up with automatic address setting.</p> <p><Reference> Error display at mixed address setting</p> <table border="1"> <tr> <td></td> <td>Auto</td> <td>Manual</td> </tr> <tr> <td>Auto address setting</td> <td>E31</td> <td>E46</td> </tr> <tr> <td>Manual address setting</td> <td>E46</td> <td>Normal</td> </tr> </table> | | Auto | Manual | Auto address setting | E31 | E46 | Manual address setting | E46 | Normal | <p>Check and save the data of operating conditions. Check the address setting method of faulty network whether it is automatic setting or manual setting.</p> <p>Caution: Unless the power source is reset after changing address, the set address will not be confirmed.</p> <p>Test run * No action is taken because it is judged that the power source reset is not done after changing address.</p> <p>Correct signal line. *In case of automatic address setting, signal line cannot be connected to other outdoor unit system.</p> <p>Test run</p> <p>Replace outdoor unit control PCB*. (Rotary switch anomaly)</p> <p>* Before replacement, please confirm whether the rotary switch for address setting is not damaged. (It was experienced that No.5 on rotary switch was not recognized.)</p> |
| | Auto | Manual | | | | | | | | |
| Auto address setting | E31 | E46 | | | | | | | | |
| Manual address setting | E46 | Normal | | | | | | | | |

Note: After completing the above procedure, reset the power source and confirm that the error display does not recur. Unless the power source is reset for both indoor unit and outdoor unit, the set addresses will not be confirmed.

| | | | | |
|--|------------|----------------|------------|--|
| Error code Remote control: E48 7-segment display: E48-1, 2 *1 | LED | Green | Red | Content <h2 style="text-align: center;">Outdoor DC fan motor anomaly(1/2)</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E48-1: 1-time flash (FMo1), E48-2 : 2-time flash (FMo2)

| <h3>1. Applicable model</h3> <p>Outdoor unit</p> | <h3>5. Troubleshooting</h3> <p>(Inspect also the fan motor 2 even if it is E48-1.) (Inspect also the fan motor 1 even if it is E48-2.)</p> | | | | |
|--|---|-----------|----------------|--|--|
| <h3>2. Error detection method</h3> <ul style="list-style-type: none"> If 400 min⁻¹ or lower of the fan rotation command and the state of overcurrent are detected for 10 seconds continuously (CNFAN terminal: Between 5-2 pins ... Hi output ⇒ Overcurrent Lo output ⇒ Normal) If 100 min⁻¹ or lower of the actual fan rotation speed is detected for 30 seconds continuously | <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 60%;">Diagnosis</th> <th style="width: 40%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> </td> <td style="vertical-align: top;"> <p>Replace fan motor.</p> <p>Replace inverter PCB on 1 line. ⇒ When inverter PCB is replaced, check also items further than ※2 (see next page) (Checking of blown surge suppressor resistor coil and short-circuit on power transistor and diode).</p> <p>Replace fan motor.</p> <p>Replace fan motor.</p> <p>Replace faulty fan motor. If it changes E48-1 to E48-2 ⇒ Replace. If it changes E48-2 to E48-1 ⇒ Replace.</p> <p>Replace inverter PCB.</p> </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | | <p>Replace fan motor.</p> <p>Replace inverter PCB on 1 line. ⇒ When inverter PCB is replaced, check also items further than ※2 (see next page) (Checking of blown surge suppressor resistor coil and short-circuit on power transistor and diode).</p> <p>Replace fan motor.</p> <p>Replace fan motor.</p> <p>Replace faulty fan motor. If it changes E48-1 to E48-2 ⇒ Replace. If it changes E48-2 to E48-1 ⇒ Replace.</p> <p>Replace inverter PCB.</p> |
| Diagnosis | Countermeasure | | | | |
| | <p>Replace fan motor.</p> <p>Replace inverter PCB on 1 line. ⇒ When inverter PCB is replaced, check also items further than ※2 (see next page) (Checking of blown surge suppressor resistor coil and short-circuit on power transistor and diode).</p> <p>Replace fan motor.</p> <p>Replace fan motor.</p> <p>Replace faulty fan motor. If it changes E48-1 to E48-2 ⇒ Replace. If it changes E48-2 to E48-1 ⇒ Replace.</p> <p>Replace inverter PCB.</p> | | | | |
| <h3>3. Condition of error displayed</h3> <p>Speed of 400 min⁻¹ or less is commanded, and state of overcurrent is communicated.</p> | <p>2 fan motor only</p> | | | | |
| <h3>4. Presumable cause</h3> <ul style="list-style-type: none"> Broken or disconnected wire Faulty fan motor Defective inverter PCB Defective control PCB Defective power transistor Defective diode module Defective surge suppressor resistor | <h3>5. Troubleshooting</h3> | | | | |

Note: ※1 Measurement position: Between pins 2-3 of IC3 on control PCB
If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|---|---------|----------------|-----------|---|
| Error code Remote control: E48 7-segment display: E48-1, 2 *1 | LED | Green | Red | Content Outdoor DC fan motor anomaly(2/2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E48-1: 1-time flash (FMo1), E48-2 : 2-time flash (FMo2)

| | | | |
|---|---|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting (Inspect also the fan motor 2 even if it is E48-1.) (Inspect also the fan motor 1 even if it is E48-2.) | | |
| Outdoor unit | Diagnosis | Countermeasure | |
| 2. Error detection method | <pre> graph TD Start[From previous page] --> PowerOFF[Power OFF] PowerOFF --> D1{Does speed command voltage of control PCB rise gradually and stabilize after a rise of several V?} D1 -- NO --> C1[Replace control PCB.] D1 -- YES --> D2{Is surge suppressor resistor coil blown on any line?} D2 -- NO --> C2[Replace surge suppressor resistor on the line. (Disconnect harness from resistor, and measure resistance between terminals.)] D2 -- YES --> D3{Is power transistor or diode module short-circuited?} D3 -- NO --> C3[Replace power transistor or diode module on poorly insulated line. (For check method of short-circuit, see page 123.)] D3 -- YES --> C4[Replace No. 1 or 2 fan motor.] </pre> | | |
| <ul style="list-style-type: none"> If 400 min⁻¹ or lower of the fan rotation command and the state of overcurrent are detected for 10 seconds continuously (CNFAN terminal: Between 5-2 pins ... Hi output ⇒ Overcurrent Lo output ⇒ Normal) If 100 min⁻¹ or lower of the actual fan rotation speed is detected for 30 seconds continuously | | | |
| 3. Condition of error displayed | | | |
| Speed of 400 min ⁻¹ or less is commanded, and state of overcurrent is communicated. | | | |
| 4. Presumable cause | | | |
| <ul style="list-style-type: none"> Broken or disconnected wire Faulty fan motor Defective inverter PCB Defective control PCB Defective power transistor Defective diode module Defective surge suppressor resistor | | | |

Note: ※1 Measurement position: Between pins 2-3 of IC3 on control PCB
If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|------------|----------------|--------------|---|
| Error code Remote control: E49 7-segment display: E49 | LED | Green | Red | Content <h2 style="text-align: center;">Low pressure anomaly</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

| |
|--|
| 1. Applicable model Outdoor unit |
| 2. Error detection method Detection of anomalously low pressure. |
| 3. Condition of error displayed During operation <ul style="list-style-type: none"> When the low pressure sensor detects lower than 0.003MPa for 5 seconds continuously When the low pressure sensor detects 0.134MPa or lower for 30 seconds continuously And if this anomaly occurs 5 times within 60 minutes. |
| 4. Presumable cause <ul style="list-style-type: none"> Low pressure sensor (PSL) anomaly Service valves closed EEV anomaly (EEV closed) Insufficient refrigerant amount Clogging at EEV or strainer |

| 5. Troubleshooting | |
|--|---|
| Diagnosis | Countermeasure |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Reset power source and restart.</div> <div style="text-align: center;"> Does the error occur immediately after the startup? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <div style="text-align: center;"> Does the low pressure fluctuate after the startup? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Is the opening degree of EEV for evaporator side fluctuating? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Is the checked result of harness and insulation of EEV coil OK? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Does the EEV operate normally by judging from Mente PC data, etc? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> </div> <div style="width: 45%;"> <div style="margin-top: 20px;"> Is the connection of sensor connector OK? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Are the sensor characteristics OK? * <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Is the connection of temperature sensor connector for heat exchanger OK? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Are the temperature sensor characteristics OK? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> <div style="margin-top: 20px;"> Is EEV or strainer clogged? <div style="display: flex; justify-content: space-around; margin-top: 5px;"> NO YES </div> </div> </div> </div> <div style="margin-left: 100px; margin-top: 10px;"> <p>* The sensor characteristics is shown in page 183.</p> </div> | <p>Check and save the data of operating conditions Check error status. Is the refrigerant amount OK? Check additional refrigerant amount charged at site according to the piping length instructed on the label pasted on the panel of the unit.</p> <p>Check whether the service valves are open.</p> <p>Correct the connection of low pressure sensor connector.</p> <p>Replace low pressure sensor.</p> <p>Replace outdoor unit control PCB.</p> <p>Correct the connection of temperature sensor connector of heat exchanger.</p> <p>Replace temperature sensor of heat exchanger at evaporator side.</p> <p>Replace control PCB at evaporator side.</p> <p>Replace EEV coil.</p> <p>Replace EEV main body or strainer.</p> <p>Check for short-circuit of air flow of heat exchanger at evaporator side and for fan motor anomaly.</p> |

Note: Check whether the indoor unit is connected to other outdoor Superlink network.
If the error does not recur, connect the Mente PC and continue to collect data.

| | | | | |
|--|---------|----------------|-----------|---|
| Error code Remote control: E53/E55*1 7-segment display: E53/E55-1, 2 | LED | Green | Red | Content Suction pipe temperature sensor anomaly (Tho-S), Under-dome temperature sensor anomaly (Tho-C1, C2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E53 : Tho-S, E55-1 : Tho-C1, E55-2: Tho-C2 *2 E53, E55-1 : 1-time flash, E55-2 : 2-time flash

| <p>1. Applicable model</p> <p>Outdoor unit</p> | <p>5. Troubleshooting</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">※1 Check several times to prove any poor connection.</p> </td> <td style="vertical-align: top;"> <p>Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace temperature sensor. (Tho-S or Tho-C1, C2)</p> <p>Replace outdoor unit control PCB.</p> </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">※1 Check several times to prove any poor connection.</p> | <p>Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace temperature sensor. (Tho-S or Tho-C1, C2)</p> <p>Replace outdoor unit control PCB.</p> |
|--|---|-----------|----------------|--|--|
| Diagnosis | Countermeasure | | | | |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">※1 Check several times to prove any poor connection.</p> | <p>Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature on Mente PC with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace temperature sensor. (Tho-S or Tho-C1, C2)</p> <p>Replace outdoor unit control PCB.</p> | | | | |
| <p>2. Error detection method</p> <p>Detection of anomalously low temperature (resistance) of Tho-S or Tho-C1, C2.</p> | | | | | |
| <p>3. Condition of error displayed</p> <p>Tho-S :</p> <ul style="list-style-type: none"> If -50°C or lower is detected for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly occurs 3 times within 40 minutes <p>Tho-C1 :</p> <ul style="list-style-type: none"> If -40°C or lower is detected for 5 seconds continuously within 10 minutes to 10 minutes 20 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly occurs 3 times within 40 minutes | | | | | |
| <p>4. Presumable cause</p> <ul style="list-style-type: none"> Broken temperature sensor harness or the internal wire of sensing section (Check the molded section as well) Disconnection of temperature sensor harness connection (connector) Outdoor unit control PCB anomaly | | | | | |
| | <p>Temperature-resistance characteristics of suction pipe temperature sensor (Tho-S)</p> <p>Temperature-resistance characteristics of under-dome temperature sensor (Tho-C1, C2)</p> | | | | |

Note:

| | | | | |
|--|------------|----------------|------------|---|
| Error code Remote control: E54 7-segment display: E54-1, 2 *1 | LED | Green | Red | Content High pressure sensor anomaly (PSH) Low pressure sensor anomaly (PSL) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E54-1: 1-time flash (PSL), E54-2 : 2-time flash (PSH)

| |
|--|
| 1. Applicable model |
| Outdoor unit |
| 2. Error detection method |
| Detection of anomalous pressure (voltage) of PSH or PSL. [Operation range High pressure : 0-4.15MPa Low pressure : 0-1.7MPa] |
| 3. Condition of error displayed |
| If anomalous pressure sensor output voltage (0V or lower or 3.49V or higher) is detected for 5 seconds continuously within 2 minutes to 2 minutes 20 seconds after the compressor ON |
| 4. Presumable cause |
| <ul style="list-style-type: none"> • Broken pressure sensor harness • Disconnection of pressure sensor harness connection (connector) • Pressure sensor (PSH, PSL) anomaly • Outdoor unit control PCB anomaly • Anomalous installation conditions • Insufficient air flow volume • Excessive or insufficient refrigerant amount |

| | |
|--|-----------------------|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <p style="text-align: center;">Save data for 30 minutes before stopping in Mente PC.</p> <p style="text-align: center;">Check the data for 30 minutes before stopping.</p> <p style="text-align: center;">Is anomalous pressure detected?</p> <p style="text-align: center;">NO → Reset the power source and restart operation.</p> <p style="text-align: center;">YES → Is the connector of the pressure sensor inserted properly to the connector on the outdoor unit control PCB?</p> <p style="text-align: center;">NO → Insert the connector securely and restart operation.</p> <p style="text-align: center;">YES → Does E54 recur?</p> <p style="text-align: center;">NO → Temporary malfunction by noise Correct if the source of noise is specified.</p> <p style="text-align: center;">YES → Does the pressure sensor output voltage match the actual pressure measure by pressure gauge?</p> <p style="text-align: center;">NO → Replace pressure sensor (PSH, PSL)</p> <p style="text-align: center;">YES → Replace outdoor unit control PCB.</p> | |
| <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>High pressure sensor output characteristics</p> <p>Output voltage (V)</p> <p>Pressure (MPa)</p> </div> <div style="text-align: center;"> <p>Low pressure sensor output characteristics</p> <p>Output voltage (V)</p> <p>Pressure (MPa)</p> </div> </div> <p style="text-align: center;">Pressure sensor output Black (GND) – White; Output voltage (Black – Red; DC5V)</p> | |

Note:

| | | | | |
|--|------------|----------------|------------|--|
| Error code Remote control: E56 7-segment display: E56-1, 2 *1 | LED | Green | Red | Content Power transistor temperature sensor anomaly (Tho-P1, P2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E56-1/1-time flash: Tho-P1 anomaly, E56-2/2-time flash: Tho-P2-anomaly

| <p>1. Applicable model</p> <p>Outdoor unit</p> | <p>5. Troubleshooting</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Diagnosis</th> <th style="width: 50%;">Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">*1 Check several times to prove any poor connection.</p> <div style="text-align: center;"> <p>Temperature-resistance characteristics of power transistor temperature sensor (Tho-P1, P2)</p> <table border="1" style="display: none;"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>180</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>50</td></tr> <tr><td>60</td><td>30</td></tr> <tr><td>80</td><td>20</td></tr> <tr><td>100</td><td>15</td></tr> <tr><td>120</td><td>12</td></tr> <tr><td>140</td><td>10</td></tr> </tbody> </table> </div> </td> <td style="vertical-align: top;"> <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature of Mente PC data with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace power transistor temperature sensor (Tho-P1, P2).</p> <p>Replace outdoor unit control PCB.</p> </td> </tr> </tbody> </table> | Diagnosis | Countermeasure | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">*1 Check several times to prove any poor connection.</p> <div style="text-align: center;"> <p>Temperature-resistance characteristics of power transistor temperature sensor (Tho-P1, P2)</p> <table border="1" style="display: none;"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>180</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>50</td></tr> <tr><td>60</td><td>30</td></tr> <tr><td>80</td><td>20</td></tr> <tr><td>100</td><td>15</td></tr> <tr><td>120</td><td>12</td></tr> <tr><td>140</td><td>10</td></tr> </tbody> </table> </div> | Temperature (°C) | Temperature sensor resistance (kΩ) | 0 | 180 | 20 | 100 | 40 | 50 | 60 | 30 | 80 | 20 | 100 | 15 | 120 | 12 | 140 | 10 | <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature of Mente PC data with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace power transistor temperature sensor (Tho-P1, P2).</p> <p>Replace outdoor unit control PCB.</p> |
|---|---|------------------------------------|----------------|---|------------------|------------------------------------|----|-----|----|-----|----|----|-----|----|-----|----|-----|----|--|----|-----|----|--|
| Diagnosis | Countermeasure | | | | | | | | | | | | | | | | | | | | | | |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <p style="text-align: center;">*1 Check several times to prove any poor connection.</p> <div style="text-align: center;"> <p>Temperature-resistance characteristics of power transistor temperature sensor (Tho-P1, P2)</p> <table border="1" style="display: none;"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Temperature (°C)</th> <th>Temperature sensor resistance (kΩ)</th> </tr> </thead> <tbody> <tr><td>0</td><td>180</td></tr> <tr><td>20</td><td>100</td></tr> <tr><td>40</td><td>50</td></tr> <tr><td>60</td><td>30</td></tr> <tr><td>80</td><td>20</td></tr> <tr><td>100</td><td>15</td></tr> <tr><td>120</td><td>12</td></tr> <tr><td>140</td><td>10</td></tr> </tbody> </table> </div> | Temperature (°C) | Temperature sensor resistance (kΩ) | 0 | 180 | 20 | 100 | 40 | 50 | 60 | 30 | 80 | 20 | 100 | 15 | 120 | 12 | 140 | 10 | <p>Check and save the data of operating condition. Check the conditions whether it occurs immediately after the power on or during operation or stopping. Check the sensed value. Compare the temperature of Mente PC data with actual measured value.</p> <p>Insert the connector securely.</p> <p>Replace power transistor temperature sensor (Tho-P1, P2).</p> <p>Replace outdoor unit control PCB.</p> | | | | |
| Temperature (°C) | Temperature sensor resistance (kΩ) | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 180 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 100 | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 50 | | | | | | | | | | | | | | | | | | | | | | |
| 60 | 30 | | | | | | | | | | | | | | | | | | | | | | |
| 80 | 20 | | | | | | | | | | | | | | | | | | | | | | |
| 100 | 15 | | | | | | | | | | | | | | | | | | | | | | |
| 120 | 12 | | | | | | | | | | | | | | | | | | | | | | |
| 140 | 10 | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Error detection method</p> <p>Detection of anomalously low temperature (resistance) of Tho-P1, P2.</p> | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. Condition of error displayed</p> <p>When the outdoor air temperature is above 0°C, if -10°C or lower is detected for 20 seconds continuously within 10 minutes to 10 minutes 30 seconds after compressor ON, compressor stops. When the compressor is restarted automatically after 3-minute delay, if this anomaly occurs 3 times within 40 minutes</p> | | | | | | | | | | | | | | | | | | | | | | | |
| <p>4. Presumable cause</p> <ul style="list-style-type: none"> • Broken temperature sensor harness or the internal wire of sensing section (Check the molded section as well) • Disconnection of temperature sensor harness connection (connector) • Outdoor control PCB anomaly | | | | | | | | | | | | | | | | | | | | | | | |

Note:

| | | | | |
|--|------------|----------------|------------|--|
| Error code Remote control: E58 7-segment display: E58-1, 2 *1 | LED | Green | Red | Content <h2 style="text-align: center;">Anomalous compressor by loss of synchronism</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E58-1: CM1, E58-2: CM2 *2 E58-1: 1-time flash, E58-2: 2-time flash

| | | | |
|---|--|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| Outdoor unit | Diagnosis | Countermeasure | |
| 2. Error detection method | <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Save data for 30 minutes before stopping in Mente PC.</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Evaluate data 30 minutes earlier.</div> <div style="margin-bottom: 5px;"> Is it initial startup within 1 hour after power ON? <div style="float: right;">YES →</div> </div> <div style="margin-bottom: 5px;"> Is there record of replacement of inverter PCB? <div style="float: right;">YES →</div> </div> <div style="margin-bottom: 5px;"> Is there poor connection on wires to compressor terminals? <div style="float: right;">NO →</div> </div> <div style="margin-bottom: 5px;"> <div style="border: 1px solid black; padding: 2px;">Turn power ON (after 1 hour if possible), and operate again.</div> Does the system have one compressor only? <div style="float: right;">YES →</div> </div> <div style="margin-bottom: 5px;"> Does it repeat? <div style="float: right;">NO →</div> </div> <div style="margin-bottom: 5px;"> Is there inverter output? <div style="float: right;">YES →</div> </div> <div style="margin-bottom: 5px;"> Is 15 V detected on inverter PCB? (*3) <div style="float: right;">NO →</div> </div> <div style="margin-bottom: 5px;"> Check inverter PCB for defect with the checker. <div style="float: right;">Power transistor error →</div> </div> <div style="margin-bottom: 5px;"> Check resistance between power transistor modules. (Is it short-circuited?) (*4) <div style="float: right;">Short-circuited. →</div> </div> <div style="margin-bottom: 5px;"> Good → </div> | | |
| E58 is displayed on 7-segment LED. | Check, record operating condition. Refrigerant may be stagnated. Wait for approx. 1 hour after power ON before restarting operation. (Supply power to crankcase heater to evaporate liquid refrigerant in compressor.) Model setting may be wrong. Check setting of DIP switches. Replace wires. (If terminal block at compressor side is faulty, replace compressor.) Wait and see. Replace compressor. Measure after confirming that 52C or 52X is turned ON. Replace power transistor. Replace power transistor. Replace inverter PCB. Wait and see. Replace compressor. | | |
| 3. Condition of error displayed | Does it repeat? (Repeats on one unit only.) YES → Does it repeat? (Repeats on two units.) YES → Does it repeat? (Not repeat on both units.) NO → | | |
| When this anomaly is established 4 times within 15 minutes | Change wire connections on inverter and compressor, and operate again. | | |
| 4. Presumable cause | Does it repeat on other compressor? YES → NO → | | |
| <ul style="list-style-type: none"> Insufficient time elapsed after the power supplied, before compressor startup. (Startup the compressor without crankcase heater ON) Compressor anomaly Inverter PCB anomaly Power transistor anomaly | | | |

Note: *3 Measurement position: Between + and - of C19

*4 Measurement position: Check resistance between P-U, P-V, P-W, N-U, N-V, N-W, P-N. (Disconnect wires from compressor beforehand.) If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|---------|----------------|-----------|--|
| Error code Remote control: E59 7-segment display: E59-1, 2 *1 | LED | Green | Red | Content Compressor startup failure (CM1,CM2) |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *2 | |

*1 E59-1: CM1, E59-2: CM2 *2 E59-1: 1-time flash, E59-2: 2-time flash

| |
|---|
| 1. Applicable model Outdoor unit |
| 2. Error detection method When it fails to change over to the operation for rotor position detection of compressor motor (If the compressor speed cannot increase 11Hz or higher) |
| 3. Condition of error displayed If the compressor fails to startup for 20 times (10 patterns x 2 times) continuously |
| 4. Presumable cause <ul style="list-style-type: none"> Anomalous voltage of power source Anomalous components for refrigerant circuit Inverter PCB anomaly Loose connection of connector or cable Compressor anomaly (Motor or bearing) |

| 5. Troubleshooting | Diagnosis | Countermeasure |
|--------------------|-----------|--|
| | | Check and save the data of operating conditions. Check the power source voltage and correct it. Check the version No. of software. (Is it latest?) Check whether the solenoid valve SV6,7 at the exit of oil separator is open during compressor stopping. (Is the pressure equalized?) Replace the cable. (If there is a problem on the terminal of compressor, replace the compressor.) Wait and see Replace compressor. Measure after confirming that 52C or 52X is turned ON. Replace inverter PCB. Replace power transistor. Replace power transistor. Replace inverter PCB. Wait and see. Replace compressor. |

Note: *3 Measurement position: Between + and - of C19
 *4 Measurement position: Check resistance between P-U, P-V, P-W, N-U, N-V, N-W, P-N. (Disconnect wires from compressor beforehand.)
 If it fails to repeat, connect the Mente PC, and continue to collect data.

| | | | | |
|--|------------|----------------|------------|--|
| Error code Remote control: E61 7-segment display: E61-1, 2 *1 | LED | Green | Red | Content Communications error between the master unit and slave units |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | *1 | |

*1 E61-1/1-time flash: Slave unit 1, E61-2/2-time flash: Slave unit 2

| | | | |
|---|--|-----------------------|--|
| 1. Applicable model | 5. Troubleshooting | | |
| Outdoor unit | Diagnosis | Countermeasure | |
| 2. Error detection method | <pre> graph TD Q1{Is the address setting of master and slave outdoor units OK?} Q1 -- NO --> C1[Correct it.] Q1 -- YES --> R1[Reset the power source and restart operation.] R1 --> Q2{Is E61 occur?} Q2 -- YES --> C2[Replace the outdoor unit PCB.] Q2 -- NO --> C3[Anomalous noise, etc.] </pre> | | |
| E61 is displayed on 7-segment LED. | | | |
| 3. Condition of error displayed | | | |
| When the communication between master unit and slave units is not established | | | |
| 4. Presumable cause | <ul style="list-style-type: none"> • Signal wire anomaly • Outdoor unit control PCB anomaly • Inverter PCB anomaly • Rush current prevention resistor anomaly | | |

Note:

| | | | | |
|--|----------------|----------------|--------------|---|
| Error code Remote control: E63 7-segment display: E63 | LED | Green | Red | Content <h2 style="text-align: center;">Emergency stop</h2> |
| | Indoor | Keeps flashing | Stays OFF | |
| | Outdoor | Keeps flashing | 1-time flash | |

| |
|----------------------------|
| 1. Applicable model |
| Indoor unit |

| |
|---|
| 2. Error detection method |
| When ON signal is inputted to the CnT terminal of indoor unit control PCB |

| |
|--|
| 3. Condition of error displayed |
| Same as above |

| |
|----------------------------|
| 4. Presumable cause |
| Factors for emergency stop |

| | |
|---|--|
| 5. Troubleshooting | |
| Diagnosis | Countermeasure |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Save data for 30 minutes before stopping in Mente PC.</div> <pre> graph TD Q1{Is the remote controller setting of Emergency Stop "Valid"?} Q2{Is ON signal inputted to the CnT terminal of indoor unit control PCB?} C1[Replace remote control PCB.] C2[Replace indoor unit control PCB.] C3[Check the cause of emergency stop. (It is better to have the data for 30 minutes before stopping, when instructing the installer.)] Q1 -- NO --> C1 Q1 -- YES --> Q2 Q2 -- NO --> C2 Q2 -- YES --> C3 </pre> | |
| | Check and save the data of operating conditions. Check the conditions whether it occurs immediately after the power on or during operation. Replace remote control PCB. Replace indoor unit control PCB. Check the cause of emergency stop. (It is better to have the data for 30 minutes before stopping, when instructing the installer.) |

Note: Indoor unit detected emergency stop signal gives command "all stop".



7.4 Outdoor unit control PCB replacement procedure

PCB012D046C 

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them.

WARNING and CAUTION are described as follows:

-  **WARNING** Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.
-  **CAUTION** Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

WARNING

- Securely exchange the PCB according to this procedure.
If the PCB is incorrectly exchanged, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before exchanging the substrate.
The PCB exchange under current-carrying will cause an electric shock or fire.
- After finishing the PCB exchange, check that wiring is correctly connected with the PCB before power distribution.
If the PCB is incorrectly exchanged, it will cause an electric shock or fire.

CAUTION

- Band the wiring so as not to tense because it will cause an electric shock.

Exchange the control PCB according to the following procedure.

1. Exchange the PCB **after elapsing 3 minutes from power OFF.**
(Be sure to measure voltage (DC) and check that the voltage is discharged sufficiently. (Refer to Fig.2.))
2. Disconnect the connectors from the PCB.
3. Match the setting switches (SW1-6) and jumper wires (J11-J16) with the former PCB.
4. Connect the connectors to the PCB. (Confirm the **connectors are not half inserted.**)

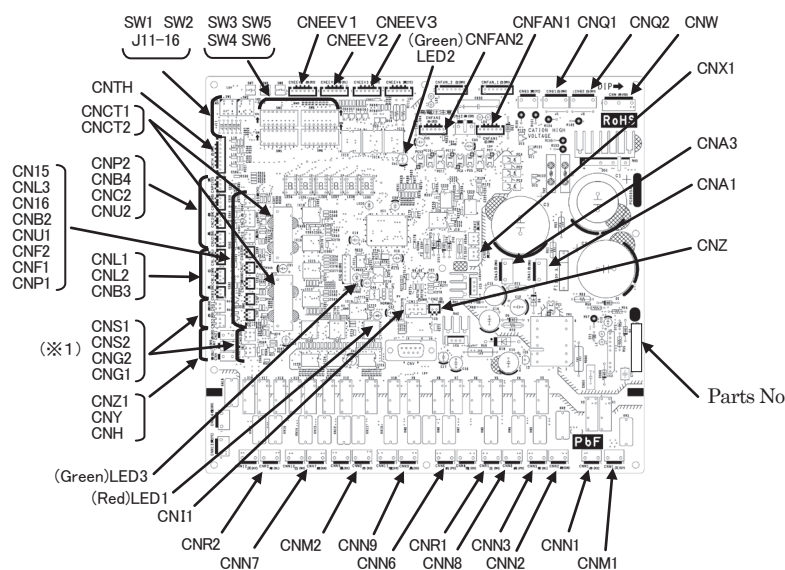


Fig.1 Parts arrangement

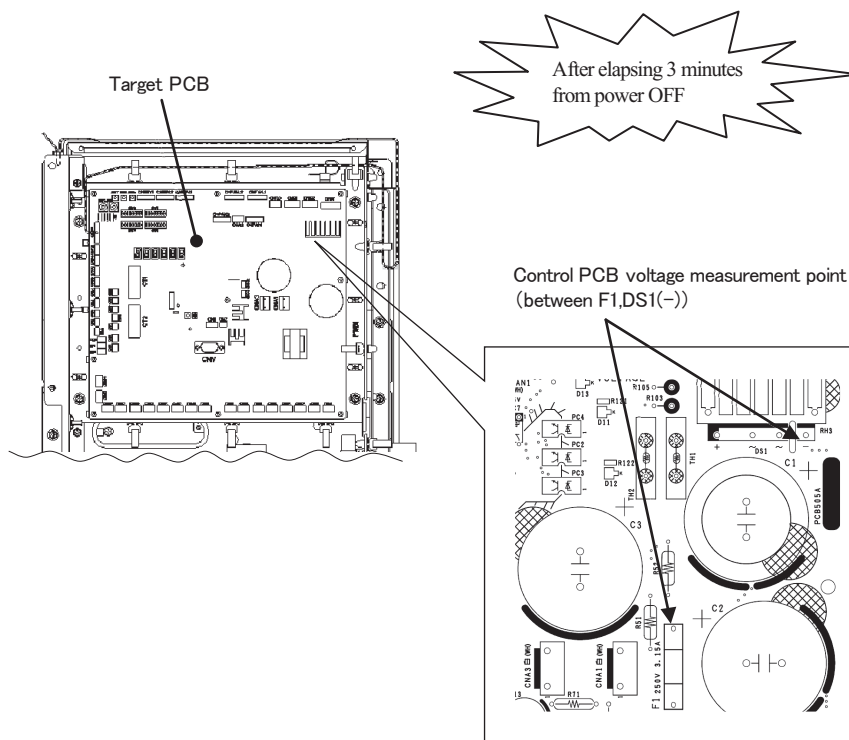


Fig.2 Voltage measurement points

※1 : Reuse the parts used before the PCB exchange.

※2 : Because spare PCB is commonized, by the model , extra connectors is implemented, compared with the former PCB.



When connecting the connectors after exchanging the PCB, Check the color and name of the connectors, please note the faulty connections.

7.5 Outdoor unit inverter PCB replacement procedure

PCB012D057B 

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them. WARNING and CAUTION are described as follows:

| | |
|--|---|
|  WARNING | Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to. |
|  CAUTION | Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to. |

WARNING

- Securely replace PCB according to this procedure. If the PCB is incorrectly replace, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before replacing the substrate. The PCB replace under current-carrying will cause an electric shock or fire.
- After finishing the PCB replacement, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly replaced, it will cause an electric shock or fire.

CAUTION

- Bundle the wiring so as not to tense because it will cause an electric shock.

Exchange the inverter PCB according to the following procedure.

1. Exchange the PCB after elapsing 3 minutes from power OFF.
(Be sure to measure voltage (DC) of two place ((A),(B)) and check that the voltage is discharged sufficiently.)
(Refer to Fig 3.)
2. Disconnect the connectors from the PCB.
3. Exchange the PCB.
4. Match the setting switches (JSW10,11) with the former PCB.
5. Connect the connectors , wiring , and snubber capacitor. (Confirm the connectors are not half inserted.)

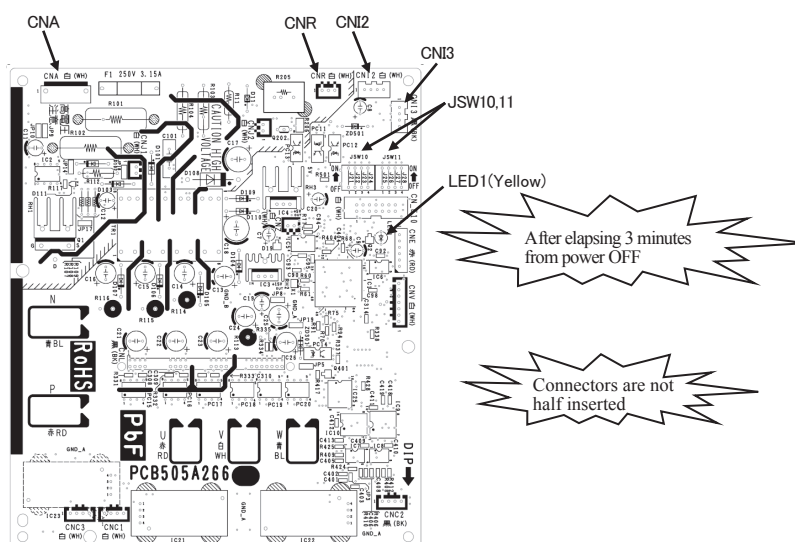


Fig.1 Parts arrangement

(A) Control PCB voltage measurement points

(B) Inverter PCB (INV1,2) voltage measurement points

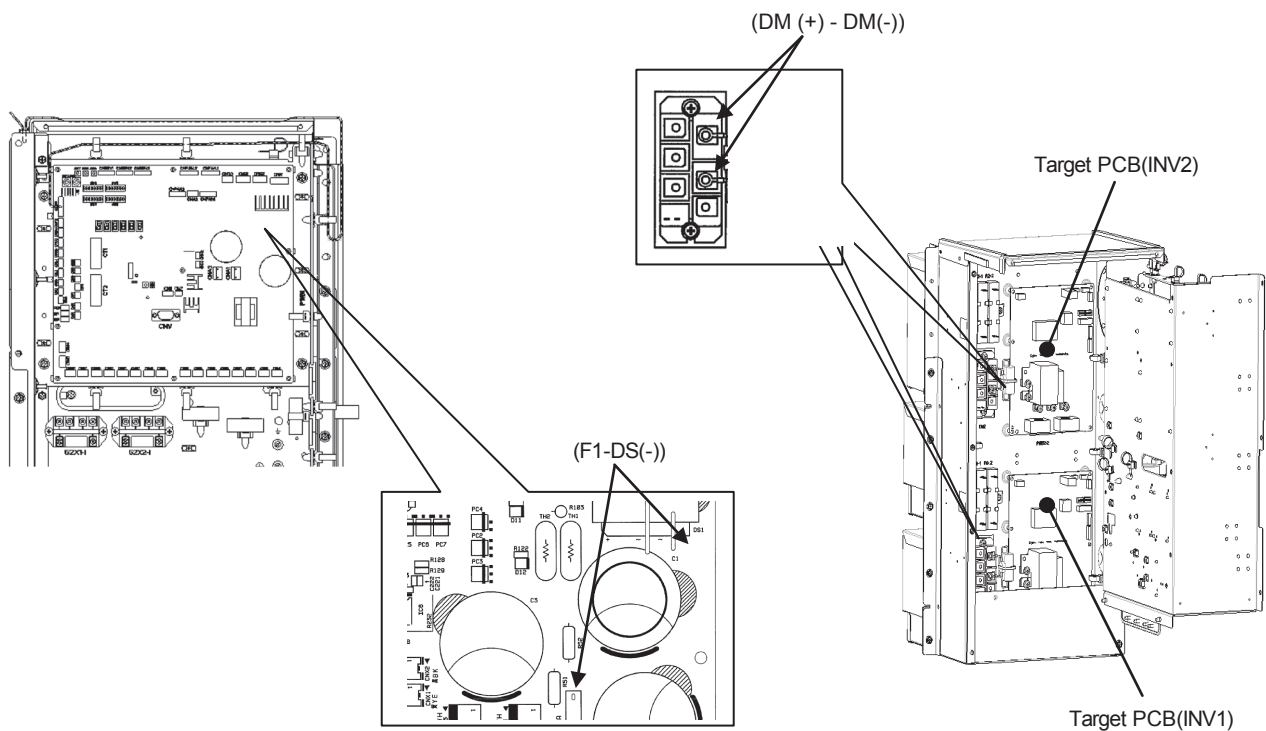
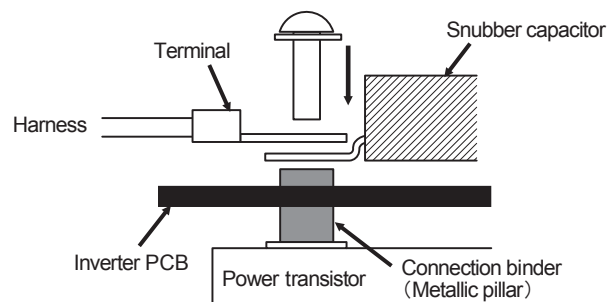


Fig.2 Voltage measurement points



Procedure on tightening harness (snubber capacitor) and power transistor with screw. A metallic connection binder is set in each hole of the inverter PCB of "P", "N", "U", "V", and "W" beforehand. Then tighten the harness (snubber capacitor) and the power transistor with the screw together.
 (Set the harness wires to be fixed to "U" and "W" with screws in respective holes after passing them through IC21 and 22.)
 (Connect snubber capacitor with "P" and "N".)

Fig.3 Installation method to power transistor

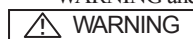
7.6 Outdoor unit transistor module replacement procedure

PCB012D043A 

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them.

WARNING and CAUTION are described as follows:



Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.



Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

WARNING

- Securely exchange the transistor module according to this procedure. If the transistor module is incorrectly exchanged, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before exchanging the transistor module. The transistor module exchange under current-carrying will cause an electric shock.
- After finishing the transistor module exchange, check that wiring is correctly connected with the transistor module before power distribution. If the transistor module is incorrectly exchanged, it will cause an electric shock or fire.

CAUTION

- Band the wiring so as not to tense because it will cause an electric shock.

Exchange the transistor module according to the following procedure.

- Exchange the transistor module **after elapsing 3 minutes from power OFF.**
(Be sure to measure voltage (DC) on both capacitor terminals (P, N of transistor module or connector terminals of fan motor power etc.) , **and check that the voltage is discharged sufficiently.**)
- Disassemble the control box.
- Disconnect with the wire (U, V, W, P, N) to the transistor module. (Refer to Fig.1 Parts arrangement view.)
- Pull up the inverter PCB from transistor module. Remove transistor module after removing the screw for transistor module.
- Attach the transistor module. Coat the transistor module where its reverse-side all over with accessories silicone grease uniformly.
- Set the inverter PCB with make sure of connect connector.
- Connect with the wire (U, V, W, P, N) to the transistor module.
- Assemble the control box as before.

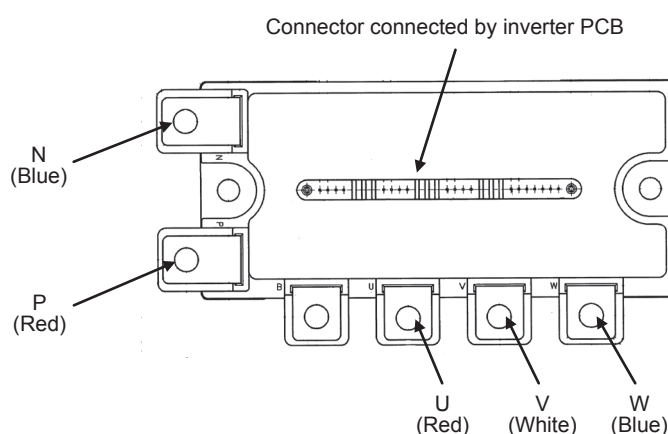






Fig.1 Parts arrangement view

7.7 Outdoor unit diode module replacement procedure

PCB012D009C 

| Precautions for Safety | |
|---|---|
| <ul style="list-style-type: none"> Since the following precaution is the important contents for safety, be sure to observe them. WARNING and CAUTION are described as follows: | |
|  WARNING | Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to. |
|  CAUTION | Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to. |
|  WARNING | |
| <ul style="list-style-type: none"> Securely exchange the diode module according to this procedure. If the diode module is incorrectly exchanged, it will cause an electric shock or fire. Be sure to check that the power source for the outdoor unit is turned OFF before exchanging the diode module. The diode module exchange under current-carrying will cause an electric shock. After finishing the diode module exchange, check that wiring is correctly connected with the diode module before power distribution. If the diode module is incorrectly exchanged, it will cause an electric shock or fire. | |
|  CAUTION | |
| <ul style="list-style-type: none"> Band the wiring so as not to tense because it will cause an electric shock. | |

It is recommended to exchange the diode module according to the following procedure.

- Start the replacing work **ten minutes after turning off the power source.** (Be sure to measure the voltage (DC) between **the electrolytic capacitor terminals (connector terminals of fan motor power etc.) to check that the electrolytic capacitor have been discharged completely.**)
- Disassemble the control box.
- Disconnect with the wire (AC1, AC2, AC3, +, -) to the diode module. (See Fig. 1.)
- Remove the diode module after removing the screw for diode module.
- Attach the diode module after applying uniformly silicone grease to the back surface of the diode module.
(Recommended diode module tightening torque: $2.4 - 2.8\text{N}\cdot\text{m}$)
- Connect the wire to the diode module (AC1, AC2, AC3, +, -). (See Fig.1.)
(Recommended diode module tightening torque: $2.4 - 2.8\text{N}\cdot\text{m}$)
- Assemble the control box as before.

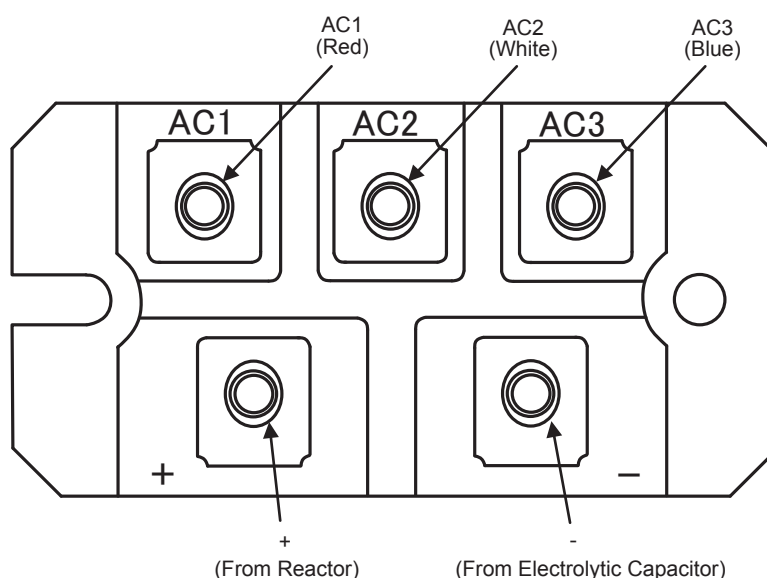


Fig.1 Parts arrangement view

7.8 Outdoor unit noise filter PCB replacement procedure

PCB012D077

Precautions for Safety

- Since the following precaution is the important contents for safety, be sure to observe them.

WARNING and CAUTION are described as follows:



Indicates an imminently hazardous situation which will result in death or serious injury if proper safety procedures and instructions are not adhered to.



Indicates a potentially hazardous situation which may result in minor or moderate injury if proper safety procedures and instructions are not adhered to.

WARNING

- Securely exchange the PCB according to this procedure. If the PCB is incorrectly exchanged, it will cause an electric shock or fire.
- Be sure to check that the power source for the outdoor unit is turned OFF before exchanging the substrate. The PCB exchange under current-carrying will cause an electric shock or fire.
- After finishing the PCB exchange, check that wiring is correctly connected with the PCB before power distribution. If the PCB is incorrectly exchanged, it will cause an electric shock or fire.

CAUTION

- Band the wiring so as not to tense because it will cause an electric shock.

Exchange the noise filter PCB according to the following procedure.

- Exchange the PCB **after elapsing 3 minutes from power OFF.**
- Disconnect the wiring from the PCB. (Remove the current sensor.)
- Exchange the PCB.
- Connect the wiring from the PCB. The wiring to TB3 attaches the current sensor which you removed with 2 to a PCB, and maintain wiring. (Confirm the **not lack of clamping.**)

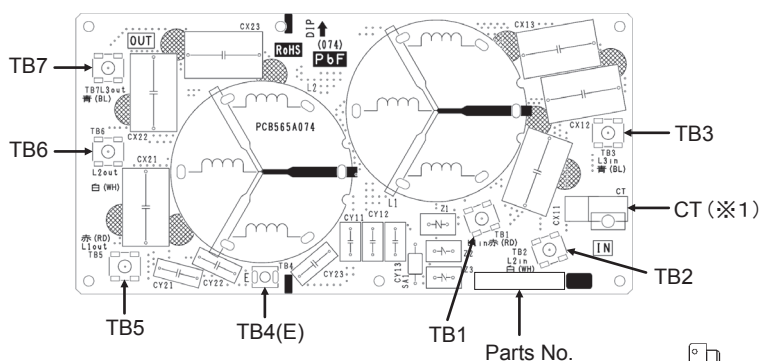


Fig.1 Parts arrangement

※ 1 : Reuse the parts used before the PCB exchange.

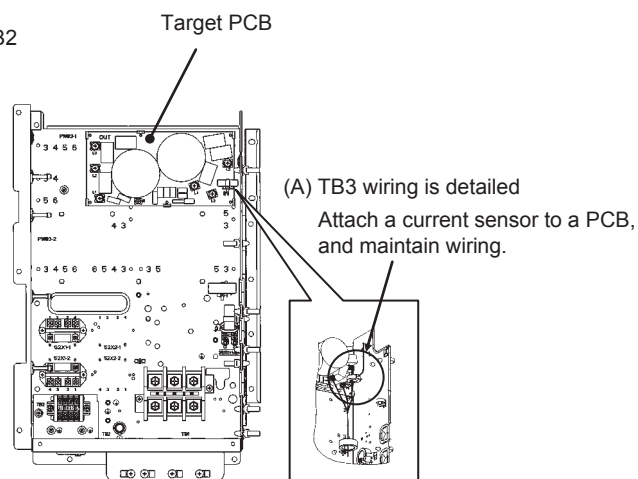


Fig.2 Wiring to TB3

■ Function of Connection

(1) Control PCB input

| Mark | Connector | Function |
|--------------|-----------|--|
| Tho-A | CNTH | Outdoor air temperature sensor |
| Tho-R1 | CNTH | Heat exchanger temperature sensor 1 (Exit, Front) |
| Tho-R2 | CNB2 | Heat exchanger temperature sensor 2 (Exit, Rear) |
| Tho-R3 | CNB3 | Heat exchanger temperature sensor 3 (Inlet, Front) |
| Tho-R4 | CNB4 | Heat exchanger temperature sensor 4 (Inlet, Rear) |
| Tho-D1 | CNTH | Discharge pipe temperature sensor 1 (CM1) |
| Tho-D2 | CNC2 | Discharge pipe temperature sensor 2 (CM2) |
| Tho-C1 | CNU1 | Under-dome temperature sensor 1 (CM1) |
| Tho-C2 | CNU2 | Under-dome temperature sensor 2 (CM2) |
| Tho-P1 | CNP1 | Power transistor temperature sensor 1 (CM1) |
| Tho-P2 | CNP2 | Power transistor temperature sensor 2 (CM2) |
| Tho-S | CNTH | Suction pipe temperature sensor |
| Tho-SC | CNF1 | Subcooling coil temperature sensor 1 |
| Tho-H | CNF2 | Subcooling coil temperature sensor 2 |
| CT1 | | Current sensor (CM1) |
| CT2 | | Current sensor (CM2) |
| PSH | CNL1 | High pressure sensor |
| PSL | CNL2 | Low pressure sensor |
| 63H1-1 | CHQ1 | High pressure switch (CM1) |
| 63H1-2 | CHQ2 | High pressure switch (CM2) |
| | CNS1 | External operation input |
| | CNS2 | Demand input |
| | CNG1 | Forced operation input cooling/heating |
| | CNG2 | Silent mode input |
| Power source | CNW | Open phase detection 220V |

(3) Control PCB input/output

| Mark | Connector | Function |
|------|-----------|-------------------------------------|
| FM01 | CNFAN1-1 | DC 15 V output (Vcc) |
| | -2 | Reverse turn detection output (REV) |
| | -3 | Speed command output (Vsp) |
| | -4 | RPM monitor input (FG) |
| | -5 | Over-current error input (OverC) |
| | -6 | GND |
| FM02 | CNFAN2-1 | DC 15 V output (Vcc) |
| | -2 | Reverse turn detection output (REV) |
| | -3 | Speed command output (Vsp) |
| | -4 | RPM monitor input (FG) |
| | -5 | Over-current error input (OverC) |
| | -6 | GND |
| | CnI1 | Inverter protocol |
| | CnX1 | Superlink protocol |
| | CnX2 | Spare for Superlink protocol |

(2) Control PCB output

| Mark | Connector | Function |
|---------|-----------|---|
| 52X1 | CNM1 | Solenoid for CM1 |
| 52X2 | CNM2 | Solenoid for CM2 |
| 20S | CNN1 | 4-way valve |
| SV6 | CNN2 | Solenoid valve (oil return CM1) |
| SV7 | CNN3 | Solenoid valve (oil return CM2) |
| SV1 | CNN6 | Solenoid valve (CM1:liquid bypass) |
| SV2 | CNN7 | Solenoid valve (CM2:liquid bypass) |
| FMC1,2 | CNN8 | Fan for IPM |
| SV11 | CNN9 | Solenoid valve (gas bypass) |
| CH1 | CNR1 | Crankcase heater (CM1) |
| CH2 | CNR2 | Crankcase heater (CM2) |
| 52XR | CnH | Operation output |
| 52XE | CnY | Error output |
| | CnZ1 | Spare |
| | CnE | RAM Checker output |
| | CnV | For servicing (for rewriting soft ware) |
| LED1 | | Inspection (Red) |
| LED2 | | Normal (Green) |
| LED3 | | For service (Green) |
| 7 SEG 1 | | 7-segment LED1 (function indication) |
| 7 SEG 2 | | 7-segment LED2 (data indication) |
| EEVH1 | CNEEV1 | EEVH1 for heating (Front) |
| EEVH2 | CNEEV3 | EEVH2 for heating (Rear) |
| EEVSC | CNEEV2 | EEV-SC for Subcooling coil |

8. APPLICATION DATA

8.1 Installation of outdoor unit

Designed for R410A refrigerant

PSC012D162

Outdoor unit capacity
FDC280-1680

KXZ SERIES INSTALLATION MANUAL

- This installation manual deals with outdoor units and general installation specifications only. For indoor units, please refer to the respective installation manuals supplied with your units.
- Please read this manual carefully before you set to installation work and carry it out according to the instructions contained in this manual.

Precautions for safety

- Read these "Precautions for safety" carefully before starting installation work and do it in the proper way.
- Safety instructions listed here are grouped into [⚠ Warnings] and [⚡ Cautions]. If a non-compliant installation method is likely to result in a serious consequence such as death or major injury, the instruction is grouped into [⚠ Warnings] to emphasize its importance. However, a failure to observe a safety instruction listed under [⚡ Cautions] can also result in a serious consequence depending on the circumstances. Please observe all these instructions, because they include important points concerning safety.
- The meanings of "Marks" used here are as shown on the right: [⚠] Never do it under any circumstances. [⚡] Always do it according to the instruction.
- When you have completed installation work, perform a test run and make sure that the installation is working properly. Then, explain the customer how to operate and how to take care of the air-conditioner according to the user's manual. Please ask the customer to keep this installation manual together with the user's manual.
- FDC280, 335KXZ comply with EN61000-3-3. The other units comply with EN61000-3-11.
- For outdoor unit, EN61000-3-2 and EN61000-3-12 are not applicable as consent by the utility company or notification to the utility company is given before usage.

⚠ WARNING

- Installation must be carried out by the qualified installer.
 - If you install the system by yourself, it may cause serious trouble such as water leaks, electric shocks, fire and personal injury, as a result of a system malfunction.
- Install the system in full accordance with the instruction manual.
 - Incorrect installation may cause bursts, personal injury, water leaks, electric shocks and fire.
- Use the original accessories and the specified components for installation.
 - If parts other than those prescribed by us are used, it may cause fall of the unit, water leaks, electric shocks, fire, refrigerant leak, substandard performance, control failure and personal injury.
- When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage accordance with ISO5149.
 - Consult the expert about prevention measures. If the density of refrigerant exceeds the limit in the event of leakage, lack of oxygen can occur, which can cause serious accidents.
- Ventilate the working area well in the event of refrigerant leakage during installation.
 - If the refrigerant comes into contact with naked flames, poisonous gas is produced.
- After completed installation, check that no refrigerant leaks from the system.
 - If refrigerant leaks into the room and comes into contact with an oven or other hot surface, poisonous gas is produced.
- Hang up the unit at the specified points with ropes which can support the weight in lifting for portage. And to avoid jolting of alignment, be sure to hang up the unit at 4-point support.
 - An improper manner of portage such as 3-point support can cause death or serious personal injury due to falling of the unit.
- Install the unit in a location with good support.
 - Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- Ensure the unit is stable when installed, so that it can withstand earthquakes and strong winds.
 - Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.
- The electrical installation must be carried out by the qualified electrician in accordance with "the norm for electrical work" and "national wiring regulation", and the system must be connected to the dedicated circuit.
 - Power source with insufficient capacity and incorrect function done by improper work can cause electric shocks and fire.
- Be sure to shut off the power before starting electrical work.
 - Failure to shut off the power can cause electric shocks, unit failure or incorrect function of equipment.
- Be sure to use the cables conformed to safety standard and cable ampacity for power distribution work.
 - Unconformable cables can cause electric leak, anomalous heat production or fire.
- Use the prescribed cables for electrical connection, tighten the cables securely in terminal block and relieve the cables correctly to prevent overloading the terminal blocks.
 - Loose connections or cable mountings can cause anomalous heat production or fire.
- Arrange the wiring in the control box so that it cannot be pushed up further into the box. Install the service panel correctly.
 - Incorrect installation may result in overheating and fire.
- In connecting the power cable, make sure that no anomalies such as dust deposits, socket clogging or wobble are found and insert the plug securely.
 - Accumulation of dust, clogging on the socket, or looseness of plugging can cause electric shocks and fire.
- Be sure not to reuse existing refrigerant pipes.
 - Conventional refrigerant oil or chlorine contained in the conventional refrigerant which is remaining in the existing refrigerant pipes can cause deterioration of refrigerant oil of new unit. And 1.6 times higher pressure of R410A refrigerant than conventional one can cause burst of existing pipe, personal injury or serious accident.
- Do not perform brazing work in the airtight room.
 - It can cause lack of oxygen.
- Use the prescribed pipes, flare nuts and tools for R410A.
 - Using existing parts (for R22 or R407C) can cause the unit failure and serious accidents due to burst of the refrigerant circuit.
- Tighten the flare nut by using double spanners and torque wrench according to prescribed method. Be sure not to tighten the flare nut too much.
 - Loose flare connection or damage on the flare part by tightening with excess torque can cause burst or refrigerant leaks which may result in lack of oxygen.
- Do not open the service valves for liquid line and gas line until completed refrigerant piping work, air tightness test and evacuation.
 - If the compressor is operated in state of opening service valves before completed connection of refrigerant piping work, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked into refrigerant circuit, which can cause burst or personal injury due to anomalously high pressure in the refrigerant.
- Do not put the drainage pipe directly into drainage channels where poisonous gases such as sulphide gas can occur.
 - Poisonous gases will flow into the room through drainage pipe and seriously affect the user's health and safety. It can also cause the corrosion of the indoor unit and resultant unit failure or refrigerant leak.
- Only use prescribed optional parts. The installation must be carried out by the qualified installer.
 - If you install the system by yourself, it can cause serious trouble such as water leaks, electric shocks, fire.
- Do not perform any change of protective device itself or its setup condition.
 - The forced operation by short-circuiting protective device of pressure switch and temperature controller or the use of non specified component can cause fire or burst.
- Be sure to switch off the power source in the event of installation, inspection or servicing.
 - If the power source is not shut off, there is a risk of electric shocks, unit failure or personal injury due to the unexpected start of fan.
- Consult the dealer or an expert regarding removal of the unit.
 - Incorrect installation can cause water leaks, electric shocks or fire.
- Stop the compressor before closing valve and disconnecting refrigerant pipes in case of pump down operation.
 - If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, you may incur frost bite or injury from an abrupt refrigerant outflow and air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.
- This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.
 - Ensure that no air enters in the refrigerant circuit when the unit is installed and removed.
 - If air enters in the refrigerant circuit, the pressure in the refrigerant circuit becomes too high, which can cause burst and personal injury.
 - Do not run the unit with removed panels or protections.
 - Touching rotating equipments, hot surfaces or high voltage parts can cause personal injury due to entrapment, burn or electric shocks.
 - Be sure to fix up the service panels.
 - Incorrect fixing can cause electric shocks or fire due to intrusion of dust or water.
 - Do not perform any repairs or modifications by yourself. Consult the dealer if the unit requires repair.
 - If you repair or modify the unit, it can cause water leaks, electric shocks or fire.

⚡ CAUTION

- Use the circuit breaker for all pole with correct capacity.
 - Using the incorrect circuit breaker, it can cause the unit malfunction and fire.
- Take care when carrying the unit by hand.
 - If the unit weights more than 20kg, it must be carried by two or more persons. Do not carry by the plastic straps, always use the carry handle when carrying the unit by hand. Use gloves to minimize the risk of cuts by the aluminum fins.
- Dispose of any packing materials correctly.
 - Any remaining packing materials can cause personal injury as it contains nails and wood. And to avoid danger of suffocation, be sure to keep the plastic wrapper away from children and to dispose after tear it up.
- Pay attention not to damage the drain pan by weld spatter when welding work is done near the indoor unit.
 - If weld spatter entered into the indoor unit during welding work, it can cause pin-hole in drain pan and result in water leakage. To prevent such damage, keep the indoor unit in its packing or cover it.
- Be sure to insulate the refrigerant pipes so as not to condense the ambient air moisture on them.
 - Insufficient insulation can cause condensation, which can lead to moisture damage on the ceiling, floor, furniture and any other valuables.
- Be sure to perform air tightness test by pressurizing with nitrogen gas after completed refrigerant piping work.
 - If the density of refrigerant exceeds the limit in the event of refrigerant leakage in the small room, lack of oxygen can occur, which can cause serious accidents.
- Perform installation work properly according to this installation manual.
 - Improper installation can cause abnormal vibrations or increased noise generation.
- Carry out the electrical work for ground lead with care.
 - Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks and fire due to short-circuiting. Never connect the grounding wire to a gas pipe because if gas leaks, it could cause explosion or ignition.
- Earth leakage breaker must be installed.
 - If the earth leakage breaker is not installed, it can cause fire or electric shocks.
- Do not use any materials other than a fuse with the correct rating in the location where fuses are to be used.
 - Connecting the circuit with copper wire or other metal thread can cause unit failure and fire.
- Do not install the unit near the location where leakage of combustible gases can occur.
 - Leaked gases accumulate around the unit, it can cause fire.
- Do not install the unit where corrosive gas such as sulfuric acid gas etc.) or combustible gas (such as thinner and petroleum gases) can accumulate or collect, or where volatile combustible substances are handled.
 - Corrosive gas can cause corrosion of heat exchanger, breakage of plastic parts and etc. And combustible gas can cause fire.
- Secure a space for installation, inspection and maintenance specified in the manual.
 - Insufficient space can result in accident such as personal injury due to falling from the installation place.
- When the outdoor unit is installed on a roof or a high place, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.
 - If safety facilities are not provided, it can cause personal injury due to falling from the installation place.
- Do not install nor use the system close to the equipment that generates electromagnetic fields or high frequency harmonics equipment such as inverters, standby generators, medical high frequency equipments and telecommunication equipments can affect the system, and cause malfunctions and breakdowns. The system can also affect medical equipment and telecommunication equipment, and obstruct its function or cause jamming.
- Do not install the outdoor unit in a location where insects and small animals can inhabit.
 - Insects and small animals can enter the electric parts and cause damage or fire. Instruct the user to keep the surroundings clean.
- Do not use the base flame for outdoor unit which is corroded or damaged due to long periods of operation.
 - Using an old and damaged base flame can cause the unit falling down and cause personal injury.
- Do not install the unit in the locations listed below.
 - Locations where carbon fiber, metal powder or any powder is floating.
 - Locations where any substances that can affect the unit such as sulphide gas, chloride gas, acid and alkaline can occur.
 - Vehicles and ships
 - Locations where cosmetic or special sprays are often used.
 - Locations with direct exposure of oil mist and steam such as kitchen and machine plant.
 - Locations where any machines which generate high frequency harmonics are used.
 - Locations with salty atmospheres such as coastlines
 - Locations with heavy snow (if installed, be sure to provide base flame and snow hood mentioned in the manual)
 - Locations where the unit is exposed to chimney smoke
 - Locations at high altitude (more than 1000m high)
 - Locations with ammoniac atmospheres (e.g. organic fertilizer).
 - Locations with calcium chloride (e.g. snow melting agent).
 - Locations where heat radiation from other heat source can affect the unit
 - Locations without good air circulation.
 - Locations with any obstacles which can prevent inlet and outlet air of the unit
 - Locations where short-circuit of air can occur (in case of multiple units installation)
 - Locations where strong air blows against the air outlet of outdoor unit
- It can cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire.
 - Do not install the outdoor unit in the locations listed below.
 - Locations where discharged hot air or operating sound of the outdoor unit can bother neighborhood.
 - Locations where outlet air of the outdoor unit blows directly to an animal or plants. The outlet air can affect adversely to the plant etc.
 - Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
 - Locations where vibration and operation sound generated by the outdoor unit can affect seriously.
 - Locations where an equipment affected by high harmonics is placed. (TV set or radio receiver is placed within 5m)
 - Locations where drainage cannot run off safely.
 - It can affect surrounding environment and cause a claim
- Do not use the unit for special purposes such as storing foods, cooling precision instruments and preservation of animals, plants or art. It can cause the damage of the items.
- Do not touch any buttons with wet hands.
 - It can cause electric shocks
- Do not shut off the power source immediately after stopping the operation.
 - Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.
- Do not control the system with main power switch.
 - It can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.
- Do not touch any refrigerant pipes with your hands when the system is in operation.
 - During operation the refrigerant pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- Do not operate the outdoor unit with any article placed on it.
 - You may incur property damage or personal injury from a fall of the article.
- Do not step onto the outdoor unit.
 - You may incur injury from a drop or fall.

Notabilia as a unit designed for R410A

- Do not use any refrigerant other than R410A. R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant.
A cylinder containing R410A has a pink indication mark on the top.
- A unit designed for R410A has adopted a different size indoor unit service valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table on the right before installing or servicing this unit.
- Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to change, which results in performance degradation.
- In charging refrigerant, always take it out from a cylinder in the liquid phase.
- All indoor units must be models designed exclusively for R410A. Please check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)


| Dedicated R410A tools | |
|-----------------------|---|
| a) | Gauge manifold |
| b) | Charge hose |
| c) | Electronic scale for refrigerant charging |
| d) | Torque wrench |
| e) | Flare tool |
| f) | Protrusion control copper pipe gauge |
| g) | Vacuum pump adapter |
| h) | Gas leak detector |

1. BEFORE BEGINNING INSTALLATION (Check that the models, power source specifications, piping, wiring are correct.)

CAUTION

- Please read this manual without fail before you set to installation work and carry it out according to this manual.
- For the installation of an indoor unit, please refer to the installation manual of an indoor unit.
- For piping work, option distribution parts (branching pipe set, header set) are necessary. Please refer to our catalog, etc.
- Never fail to install an earth leakage breaker. (Please use one tolerable to harmonic components)
- Operating the unit with the outlet pipe temperature sensor, the inlet pipe temperature sensor, the pressure sensor, etc. removed can result in a compressor burnout. Avoid operation under such conditions in any circumstances.
- With this air-conditioning system, room temperature may rise, depending on installation conditions, while indoor units are stopped, because small quantity of refrigerant flows into the stopped indoor units if heating operation is conducted on the system.

ACCESSORY

| Name | Quantity | Usage location | |
|--|----------|---|---|
| Wiring  | 2 | In operating the unit in the silent mode or the forced cooling/heating mode, insert it to the outdoor unit board's CNG. | It is supplied with the unit. You can find it taped inside the control box. |
| Instruction manual | 1 | When the installation work is completed, give instructions to the customer and ask him/her to keep it. | Attached on the side panel below the service valve. |

COMBINATION PATTERNS

- The possible outdoor unit combinations and the number and the total capacity of indoor units that can be connected in a system are shown in the table below.
- Please always use indoor units designed exclusively for R410A. For connectable indoor unit model names, please check with our catalog, etc.
- It can be used in combination with the following indoor unit.

| Indoor unit | Remote control | Connection OK/NO |
|----------------------------|------------------------------------|------------------|
| FD○△△KXE6, KXE1 | RC-E5 (2 cores), RC-EX3A (2 cores) | OK |
| FD○A△△KXE4R, KXE4BR, KXE5R | RC-E1R(3 cores) | NO |
| FD○A△△KXE4, KXE4(A), KXE4A | RC-E1(3 cores) | NO |

Notabilia

The same outdoor unit is used whether it is used alone or in combination with another unit.

- Please note that an installation involving a combination other than those listed below is not operable. (For example, you cannot operate 280 and 400 in combination)

| Outdoor unit | | Indoor unit | |
|--------------|------------------------------------|-------------------------------------|--|
| Capacity | Combination patterns | Number of connectable units (units) | Range of the total capacity of indoor units connected in a system *1 |
| 280 | Single | 1-24 | 140-364 |
| 335 | Single | 1-29 | 168-435 |
| 400 | Single | 1-34 | 200-520 |
| 450 | Single | 1-39 | 225-585 |
| 475 | Single | 1-41 | 238-617 |
| 500 | Single | 1-43 | 250-650 |
| 560 | Single | 1-48 | 280-728 |
| 615 | Combination (280+335) | 2-53 | 308-799 |
| 670 | Combination (335+335) | 2-58 | 335-871 |
| 735 | Combination (335+400) | 2-63 | 368-955 |
| 800 | Combination (400+400) | 2-69 | 400-1040 |
| 850 | Combination (400+450) | 2-73 | 425-1105 |
| 900 | Combination (450+450) | 2-78 | 450-1170 |
| 950 | Combination (475+475) | 2-80 | 475-1235 |
| 1000 | Combination (500+500) | 2-80 | 500-1300 |
| 1060 | Combination (500+560) | 2-80 | 530-1378 |
| 1120 | Combination (560+560) | 2-80 | 560-1456 |
| 1200 | Combination (400+400+400) | 3-80 | 600-1560 |
| 1250 | Combination (400+400+450) | 3-80 | 625-1625 |
| 1300 | Combination (400+450+450) | 3-80 | 650-1690 |
| 1350 | Combination (450+450+450) | 3-80 | 675-1755 |
| 1425 | Combination (475+475+475) | 3-80 | 713-1852 |
| 1450 | Combination (475+475+500) | 3-80 | 725-1885 |
| 1500 | Combination (500+500+500) | 3-80 | 750-1950 |
| 1560 | Combination (500+500+560) | 3-80 | 780-2028 |
| 1620 | Combination (500+560+560) | 3-80 | 810-2106 |
| 1680 | Combination (560+560+560) | 3-80 | 840-2184 |
| 560 | High-COP combination (280+280) | 2-48 | 448-728 |
| 850 | High-COP combination (280+280+280) | 3-73 | 680-1105 |
| 900 | High-COP combination (280+280+335) | 3-78 | 720-1170 |
| 950 | High-COP combination (280+335+335) | 3-80 | 760-1235 |
| 1000 | High-COP combination (335+335+335) | 3-80 | 800-1300 |
| 1060 | High-COP combination (335+335+400) | 3-80 | 848-1378 |
| 1120 | High-COP combination (335+400+400) | 3-80 | 896-1456 |

[Option parts]

Refrigerant distribution piping components supplied as option parts will become necessary in installing the unit.
 As refrigerant distribution piping components, branching pipe sets (model type: DOS) for the outdoor unit side piping, branching pipe sets (model type: DIS) and header sets (model type: HEAD) for the outdoor unit side piping are available.
 Select according to the application. Please refer to "4. REFRIGERANT PIPING WORK" in selecting.
 If you are uncertain, please do not hesitate to consult with your distributor or the manufacturer.
 Please use refrigerant branching sets and header sets designed exclusively for R410A without fail.

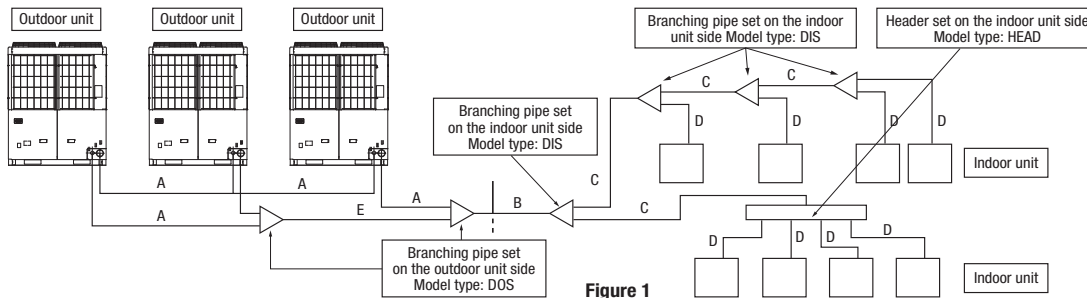


Figure 1

2. INSTALLATION LOCATION (Obtain approval from the customer when selecting the installation area.)

2-1. Selecting the installation location

- Where air is not trapped.
- Where the installation fittings can be firmly installed.
- Where wind does not hinder the intake and outlet pipes.
- Out of the heat range of other heat sources.
- Where strong winds will not blow against the outlet pipe.
- A place where stringent regulation of electric noises is not applicable.
- Where it is safe for the drain water to be discharged.
- Where noise and hot air will not bother neighboring residents.
- Where snow will not accumulate.
- A place where no TV set or radio receiver is placed within 5m.
(If electrical interference is caused, seek a place less likely to cause the problem)
- Do not install the unit in places which exposed to sea breeze (e.g. coastal area) or calcium chloride (e.g. snow melting agent), exposed to ammonia substance (e.g. organic fertilizer).

Please note

- a) A four-sided enclosure cannot be used. Leave a space of at least 1m above the unit.
 - b) If there is a danger of a short-circuit, then install a wind direction variable adapter.
 - c) When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
 - d) In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent snow from accumulating on it.
(Inhibition of collective drain discharge in a snowy country)
 - e) Do not install the equipment in areas where there is a danger for potential explosive atmosphere.
- * Please ask your distributor about option parts such as wind vane adapters, snow guard hoods, etc.

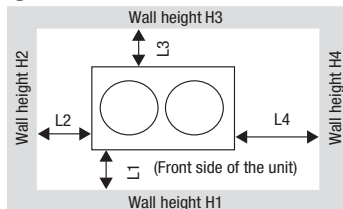
CAUTION

Please leave sufficient clearance around the unit without fail. Otherwise, a risk of compressor and/or electric component failure may arise.

2-2. Installation space (service space) example

Please secure sufficient clearance (room for maintenance work, passage, draft and piping). (If your installation site does not fulfill the installation condition requirements set out on this drawing, please consult with your distributor or the manufacturer)

① When one unit is installed



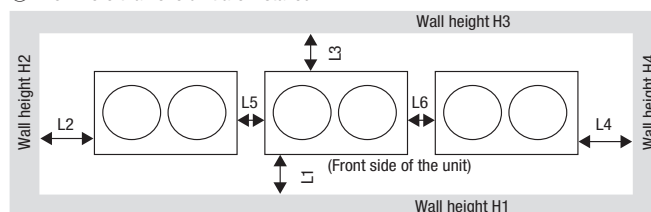
| Example installation | I | II | III |
|----------------------|----------|----------|----------|
| Dimensions | | | |
| L1 | 500 | 500 | Open |
| L2 | 10 (30) | 50 | 10 (30) |
| L3 | 100 | 50 | 100 |
| L4 | 10 (30) | 50 | Open |
| H1 | 1500 | 1500 | Open |
| H2 | No limit | No limit | No limit |
| H3 | 1000 | 1000 | No limit |
| H4 | No limit | No limit | Open |

() : In case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43°C or more.

For a normal installation, leave a 10 mm or wider space on both sides of the unit (L5 and L6) as workspace. It is also possible to install at a 0mm interval (continuous installation) with future renewal, etc. in mind.

For your information:
 the footprint of an outdoor unit is 1350x720 for all models throughout the series (280-560).

② When more than one unit are installed



| Example installation | I | II |
|----------------------|----------|----------|
| Dimensions | | |
| L1 | 500 | Open |
| L2 | 10 (30) | 200 |
| L3 | 100 | 300 |
| L4 | 10 (30) | Open |
| L5 | 10 (30) | 400 |
| L6 | 10 (30) | 400 |
| H1 | 1500 | Open |
| H2 | No limit | No limit |
| H3 | 1000 | No limit |
| H4 | No limit | Open |

() : In case it is the promised installation location that the outdoor unit is used on conditions with the ambient temperature of 43°C or more.

3. UNIT DELIVERY AND INSTALLATION

CAUTION When a unit is hoisted with slings for haulage, please take into consideration the offset of its gravity center position. If not properly balanced, the unit can be thrown off-balance and fall.

3-1. Delivery

- By defining a cartage path, carry in the entire package containing a unit to its installation point.
- In slinging a unit, use two canvas belts with plates, cloth pads or other protections applied to the unit to prevent damage.

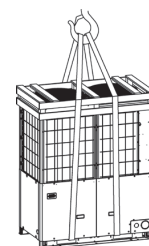
Please note

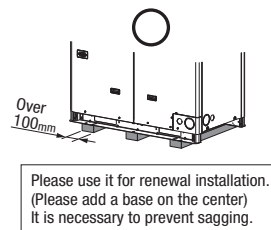
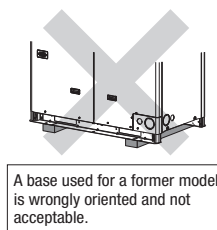
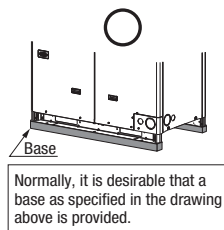
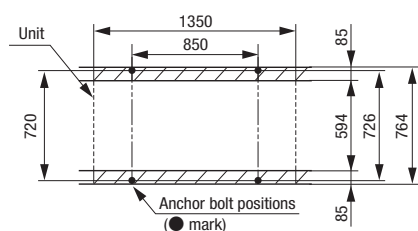
- a) Please do not fail to put belts through the rectangular holes of a unit's anchoring legs.
- b) Apply cloth pads between a canvas belt and a unit to prevent damage.

3-2. Notabilia for installation

(1) Anchor bolt positions

- Use four anchor bolts (M10) to fix an outdoor unit's anchoring legs at all times. Ideally, an anchor bolt should protrude 20mm.





(2) Base

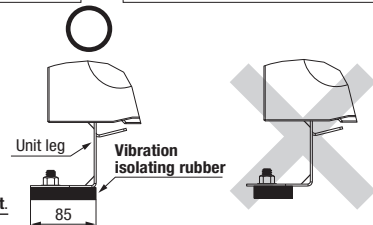
- Please install a unit after ascertaining that the bases have been made to sufficient strength and level to ensure the unit against vibration or noise generation.
- Please construct a base to the size of a shadowed area (the entire bottom area of an outdoor unit's anchoring leg) shown on the above drawing or larger.
- Please orient a base in the traversal direction (direction of W1350mm) of an outdoor unit as illustrated in the drawing above.

(3) Vibration isolating rubber

- A vibration isolating rubber must support an outdoor unit's anchoring leg by its entire bottom area.

Please note

- 1) Install a vibration isolating rubber **in such a manner that the entire bottom area of an outdoor unit's anchoring leg will rest on it.**
- 2) Do not install an outdoor unit in such a manner that a part of the bottom area of its anchoring leg is off a vibration isolating rubber.



4. REFRIGERANT PIPING WORK

4-1. Restrictions on the use of pipes

(1) Limitation on use of pipes

- **In installing pipes, always observe the restrictions on the use of pipes specified in this Section (1) including Maximum length, Total pipe length, Allowable pipe length from the first branching, and Allowable elevation difference (head difference).**

- Please avoid forming any trap () or bump () in piping as they can cause fluid stagnation.
- Maximum length (from an outdoor unit to the farthest indoor unit) 160 m or less as actual pipe length (185 m or less as equivalent pipe length)
(When an actual pipe length exceeds 90m, however, it is necessary to change the pipe size. Please determine the main pipe size by consulting with the Main Selection Reference Table set out in Section (3) (b).

- Total pipe length 1000 m or less
- Main pipe length 130 m or less
- Allowable pipe length from the first branching 90 m or less
(However, difference between the longest and shortest piping 40 m or less (Max 85 m or less*1))
- Allowable elevation difference (head difference)

(a) When the outdoor unit is installed above ...

- ① Outdoor dry bulb temp. (at cooling): Lower than 43°C ... 50 m or less (Max. 90 m or less)

→ (When installing at 50 to 90 m, restrictions on use, etc., differ from the description in this installation manual. For details, refer to technical documents.*2)

- ② Outdoor dry bulb temp. (at cooling): Higher than 43°C ... Max. length ≤ 90 m ... 40 m or less
Max. length > 90 m ... 30 m or less

*2 The microcomputer control needs to be adapted to the higher outdoor unit installation and to the installation with the elevation difference at 50 to 90 m. Make sure to set on both the master and slave units. Change the setting of SW6-4 before turning on the power source.

(b) When an outdoor unit is installed below 40 m or less*3

*3 It must be less than 30 m when conducting the cooling operation with the outdoor air temperature lower than 10°C.

(c) Elevation difference between indoor units in the system ... 18 m or less (Max. 30 m or less)

→ (When installing at 18 to 30 m, restrictions on use, etc., differ from the description in this installation manual.

For details, refer to technical documents.*4)

*4 The microcomputer control needs to be adapted to the installation with the elevation difference between indoor units at 18 to 30 m. Make sure to set on both the master and slave units.

| Setting conditions (Elevation difference) | Control changing method |
|---|--------------------------------|
| More than 18 m but 30 m or less | 7 segment F33 setting 1: Valid |

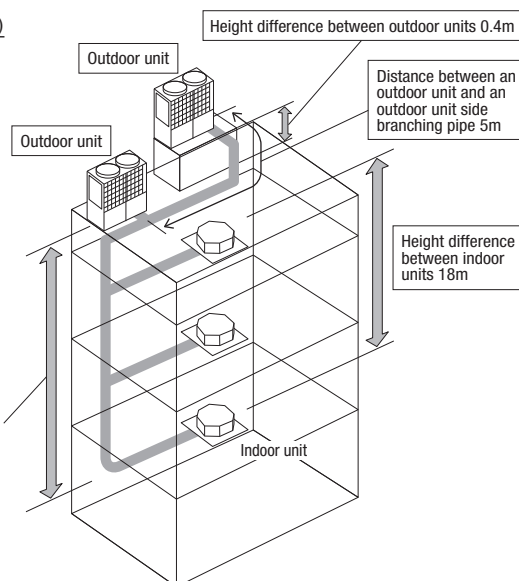
(d) Elevation difference between the first branching point and the indoor unit 18 m or less

- Restrictions on piping applicable to the section between an outdoor unit and an outdoor unit side branching pipe (combination unit)
 - (a) Difference in the elevation 0.4 m or less
 - (b) Distance between an outdoor unit and an outdoor unit side branching pipe 5 m or less
 - (c) Length of oil equalization piping 10 m or less

CAUTION

An installation not conforming to these restrictions can induce a compressor failure, which shall be excluded from the scope of warranty. Always observe the restrictions on the use of pipes in developing a system.

| Setting conditions (Elevation difference) | Control changing method | |
|---|-------------------------|------------------------------|
| | SW6-4 | 7-segment F32 |
| More than 50 m but 70 m or less | ON | 0: Invalid (Factory setting) |
| More than 70 m but 90 m or less | ON | 1: Valid |



Important

When the Additional refrigerant quantity (S+P+I) is over the following table, please separate the refrigerant line.

| Outdoor unit | S+P+I (kg) |
|--------------|------------|
| 280-670 | 40 |
| 735-1350 | 80 |
| 1425-1680 | 100 |

(2) Piping material selection

- Please use pipes clean on both the inside and outside and free from contaminants harmful to operation such as sulfur, oxides, dust, chips, oil, fat and water.
- Use the following material for refrigerant piping.
Material: phosphorus deoxidized seamless copper pipe (C1120T-0, 1/2H, JIS H 3300) Use C1220T-1/2H for φ 19.05 or larger, or C1220T-0 for φ 15.88 or smaller
- Do not use φ 28.58 x t1.0, φ 31.8 x t1.1, φ 34.92 x t1.2 and φ 38.1 x t1.35 as a bent pipe.

- Thickness and size: Please select proper pipes according to the pipe size selection guideline.
(Since this unit uses R410A, always use 1/2H pipes of a specified minimum thickness or thicker for all pipes of $\phi 19.05$ or larger, because the pressure resistance requirement is not satisfied with O-type pipes).
- For branching pipes, use a genuine branching pipe set or header set at all times. (option parts)
- For the handling of service valves, please refer to P.9 4-3(4) Method of operating service valves.
- In installing pipes, observe the restrictions on the use of pipes set out in Section 1 (Maximum length, total pipe length, allowable pipe length from the first branching, allowable elevation difference (head difference)) without fail.
- Install a branching pipe set, paying attention to the direction of attachment, after you have perused through the installation manual supplied with it.

(3) Pipe size selection

(a) Outdoor unit – Outdoor unit side branching pipe: Section A in Figure 1

Please use a pipe conforming to the pipe size specified for outdoor unit connection.

Indoor unit connecting pipe size table

| Outdoor unit | Outdoor unit outlet pipe specifications | | | | | |
|--------------|---|-------------------|--------------------------|-------------------|--------------------------------|-------------------|
| | Gas pipe | Connection method | Liquid pipe | Connection method | Oil equalizing pipe | Connection method |
| 280 | $\phi 22.22 \times t 1.0$ | Blazed | $\phi 9.52 \times t 0.8$ | Flare | $\phi 9.52 \times t 0.8$ ※1 | Flare |
| 335 | $\phi 25.4 (\phi 22.22) \times t 1.0$ | | | | | |
| 400 | $\phi 25.4 (\phi 28.58) \times t 1.0$ | | | | | |
| 450 | $\phi 28.58 \times t 1.0$ | | | | | |
| 475 | | | | | | |
| 500 | | | | | | |
| 560 | | | | | | |

Pipe sizes applicable to European installations are shown in parentheses.

Please use C1220T-1/2H for $\phi 19.05$ or larger pipes.

※1: Please connect the master and slave units with an oil equalization pipe, when they are used in a combined installation.
(It is not required, when a unit is used as a standalone installation)

When three outdoor units combination, please connect using a tee joint. (If contains in a branching pipe set for three units.)

(b) Main (Outdoor unit side branching pipe – Indoor unit side first branching pipe): Section B in Figure 1

If the longest distance (measured between the outdoor unit and the farthest indoor unit) is 90m or longer (actual length), please change the main pipe size according to the table below.

| Outdoor unit | Main pipe size (normal) | | Pipe size for an actual length of 90m or longer | | |
|--------------|--|---------------------------|--|---|---------------------------|
| | Gas pipe | Liquid pipe | Gas pipe | Liquid pipe | |
| 280 | $\phi 22.22 \times t 1.0$ | $\phi 12.7 \times t 0.8$ | $\phi 9.52 \times t 0.8$ | $\phi 25.4 (\phi 22.22) \times t 1.0$ | |
| 335 | $\phi 25.4 (\phi 22.22) \times t 1.0$ | | | | |
| 400 | $\phi 25.4 (\phi 28.58) \times t 1.0$ | | | | |
| 450 | $\phi 28.58 \times t 1.0$ | | $\phi 12.7 \times t 0.8$ | $\phi 31.8 \times t 1.1$ ($\phi 28.58 \times t 1.0$) | $\phi 15.88 \times t 1.0$ |
| 475 | | | | | |
| 500 | | | | | |
| 560 | | | | | |
| 615 | $\phi 31.8 \times t 1.1$ ($\phi 34.92 \times t 1.2$) | $\phi 15.88 \times t 1.0$ | $\phi 19.05 \times t 1.0$ | $\phi 19.05 \times t 1.0$ | |
| 670 | | | | | |
| 735 | | | | | |
| 800 | | | | | |
| 850 | | | | | |
| 900 | | | | | |
| 950 | | | | | |
| 1000 | $\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$) | $\phi 19.05 \times t 1.0$ | $\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$) | $\phi 22.22 \times t 1.0$ | |
| 1060 | | | | | |
| 1120 | | | | | |
| 1200 | | | | | |
| 1250 | | | | | |
| 1300 | | | | | |
| 1350 | | | | | |
| 1425 | | | | | |
| 1450 | | | | | |
| 1500 | | | | | |
| 1560 | | | | | |
| 1620 | | | | | |
| 1680 | | | | | |

Please use C1220T-1/2H for $\phi 19.05$ or larger pipes.

Pipe sizes applicable to European installations are shown in parentheses.

(c) Indoor unit side first branching pipe – Indoor unit side branching pipe: Section C in Figure 1

Please choose from the table below an appropriate pipe size as determined by the total capacity of indoor units connected downstream, provided, however, that the pipe size for this section should not exceed the main size (Section B in Figure 1).

| Total capacity of indoor units | Gas pipe | Liquid pipe |
|--------------------------------|---|---------------------------|
| Less than 70 | $\phi 12.7 \times t 0.8$ | $\phi 9.52 \times t 0.8$ |
| 70 or more but less than 180 | $\phi 15.88 \times t 1.0$ | |
| 180 or more but less than 371 | $\phi 19.05 \times t 1.0$ *1 | |
| 371 or more but less than 540 | $\phi 25.4 \times t 1.0$ ($\phi 28.58$) | $\phi 15.88 \times t 1.0$ |
| 540 or more but less than 700 | $\phi 28.58 \times t 1.0$ | |
| 700 or more but less than 1100 | $\phi 31.8 \times t 1.1$ ($\phi 34.92 \times t 1.2$) | $\phi 19.05 \times t 1.0$ |
| 1100 or more | $\phi 38.1 \times t 1.35$ ($\phi 34.92 \times t 1.2$) | |

Please use C1220T-1/2H for $\phi 19.05$ or larger pipes.

Pipe sizes applicable to European installations are shown in parentheses.

*1: When connecting indoor units of 280 at the downstream and the main gas pipe is of $\phi 22.22$ or larger, use the pipe of $\phi 22.22 \times t 1.0$.

(d) Indoor unit side branching pipe – Indoor unit: Section D in Figure 1

Indoor unit connection pipe size table

| Indoor unit | Capacity | Gas pipe | Liquid pipe |
|-----------------------|----------|---------------------------|--------------------------|
| | | 15, 22, 28 | $\phi 9.52 \times t 0.8$ |
| 36, 45, 56 | | $\phi 12.7 \times t 0.8$ | |
| 71, 90, 112, 140, 160 | | $\phi 15.88 \times t 1.0$ | $\phi 9.52 \times t 0.8$ |
| 224 | | $\phi 19.05 \times t 1.0$ | |
| 280 | | $\phi 22.22 \times t 1.0$ | |

Please use C1220T-1/2H for $\phi 19.05$ or larger pipes.

(e) Selection of pipe between outdoor branch pipes for 3-unit combination: Section E in Figure 1

Size of pipe between outdoor branch pipes varies depending on the capacity of outdoor unit which is connected to second branch pipe in the outdoors.

Select it from the following table.

| Total capacity of outdoor units connected to second branch pipe in the outdoors | Size of pipe between branch pipes | |
|---|--|---------------------------|
| | Gas pipe | Liquid pipe |
| 800 | $\phi 31.8 \times t 1.1$ ($\phi 34.92 \times t 1.2$) | $\phi 15.88 \times t 1.0$ |
| 850 | | |
| 900 | | |
| 950 | | |
| 975 | $\phi 38.1 \times t 1.34$ ($\phi 34.92 \times t 1.2$) | $\phi 15.88 \times t 1.0$ |
| 1000 | | |
| 1060 | | $\phi 19.05 \times t 1.0$ |
| 1120 | | |

Use C1220T-1/2H material for $\phi 19.05$ or larger.

(4) Selection of an outdoor unit side branching pipe set

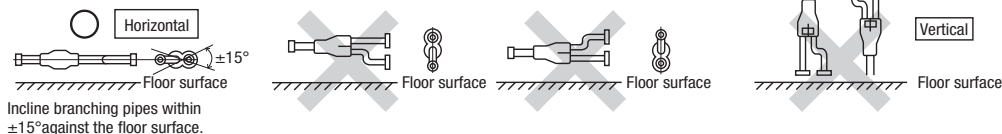
This branching pipe set will always become necessary when units are used in combination.

(When a unit is used as a standalone installation, it is not required)

Please note

- a) In connecting an outdoor unit, please use a pipe conforming to the pipe size specified for outdoor unit connection.
- b) Choose a different-diameter pipe joint matching a main pipe size specified in the above section in installing pipes (= main pipes) on the outdoor unit side.
- c) Always install branching pipe (for both gas and liquid) in such a manner that they form correct horizontal branch.

| Outdoor unit | Branching pipe set |
|-----------------------------------|--------------------|
| For two units (for 615 – 1120) | DOS-2A-3 |
| For three units (for 1200 – 1680) | DOS-3A-3 |



(5) Selection of an indoor unit side branching pipe set

(a) Method of selecting a branching pipe set

- As an appropriate branching pipe size varies with the connected capacity (total capacity connected downstream), determine a size from the following table.

Please note

- In connecting an indoor unit with the indoor unit side branching pipe set, please use a pipe conforming to the pipe size specified for indoor unit connection.
- Always install branching pipes (both gas and liquid pipe) **either horizontally or vertically.**

| Total capacity downstream | Branching pipe set |
|-------------------------------|--------------------|
| Less than 180 | DIS-22-1G |
| 180 or more but less than 371 | DIS-180-1G |
| 371 or more but less than 540 | DIS-371-1G |
| 540 or more | DIS-540-3 |



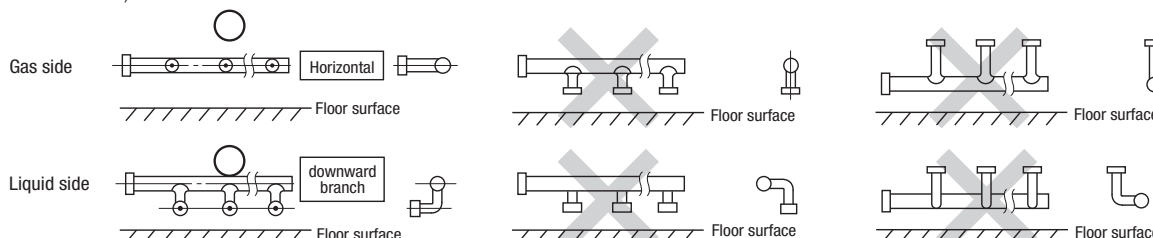
(b) Method of selecting a header set

- Depending on the number of units connected, connect plugged pipes (to be procured on the installer's part) at a branching point (on the indoor unit connection side).
- For the size of a plugged pipe, please refer to the documentation for a header set (option part).

| Total capacity downstream | Header set model type | Number of branches |
|-------------------------------|-----------------------|------------------------|
| Less than 180 | HEAD4-22-1G | 4 branches at the most |
| 180 or more but less than 371 | HEAD6-180-1G | 6 branches at the most |
| 371 or more but less than 540 | HEAD8-371-2 | 8 branches at the most |
| 540 or more | HEAD8-540-3 | 8 branches at the most |

Please note

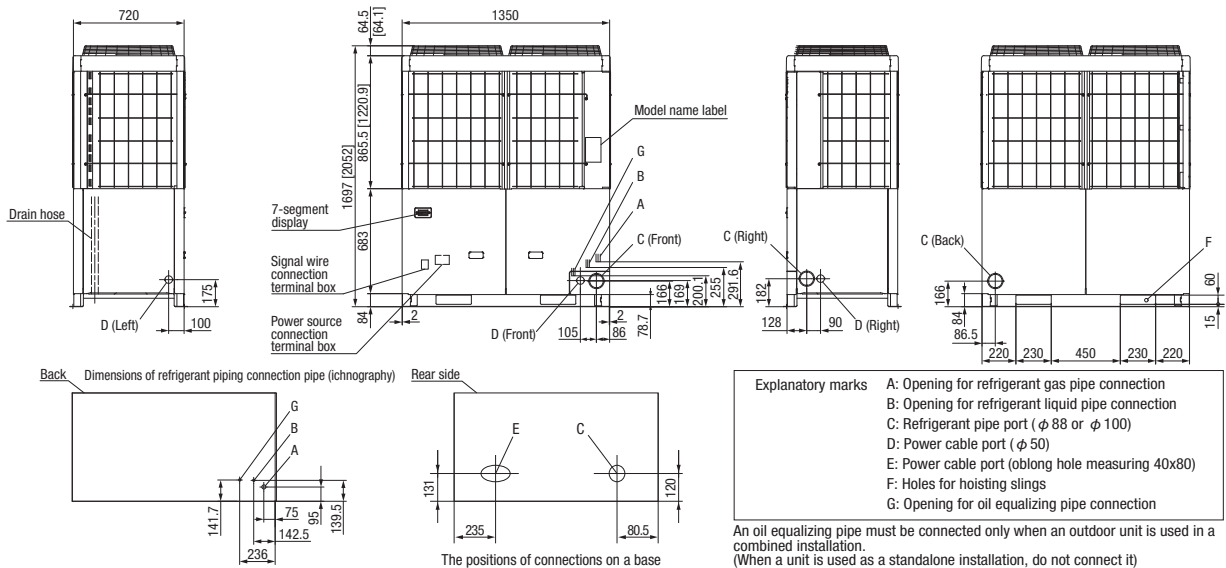
- a) In connecting a header with an indoor unit, please use a pipe conforming to the pipe size specified for indoor unit connection.
- b) **In installing a header, always arrange a gas-side header to branch horizontally and a liquid-side header to branch downward.**
- c) Indoor units 224 and 280 can not be connected to the header.



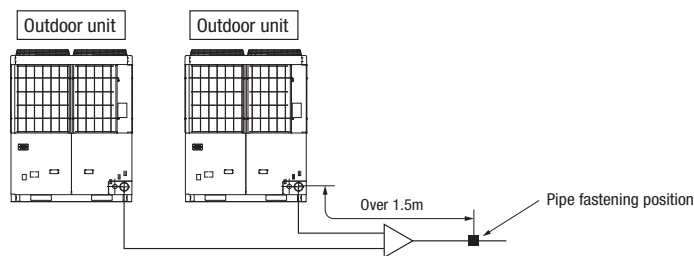
4-2. Pipe connection position and pipe direction

(1) Pipe connecting position and pipe outgoing direction

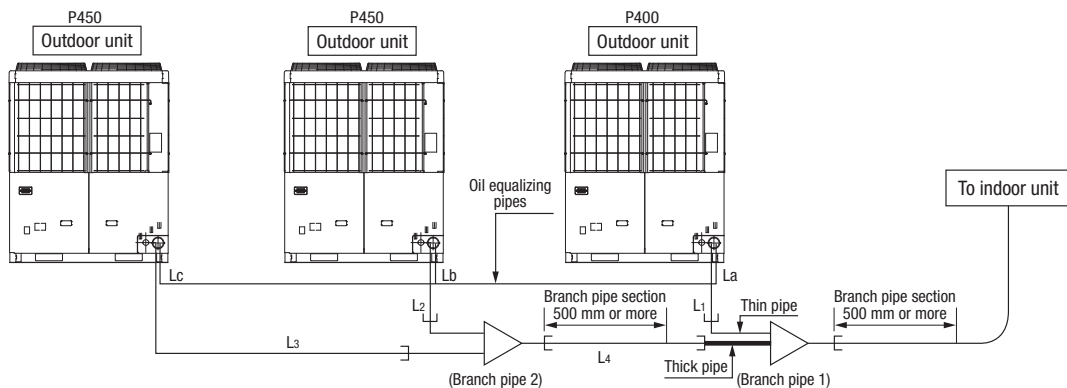
Although this drawing illustrates an installation involving a 335 or smaller capacity unit, an installation involving a 400 or a larger capacity unit should be arranged in the same manner as long as pipe connection points and directions are concerned, except that the height of a unit is different. Measurements in [] indicate those of a 400 or larger capacity unit.



- A pipe can be laid through the front, right, bottom or rear of a unit as illustrated on the above drawings.
- In laying pipes on the installation site, cut off the casing's half blank (φ 88 or φ 100) that covers a hole for pipe penetration with nippers.
- When there is a danger that a small animal enters from the pipe port, cover the port with appropriate blocking materials (to be arranged on the user's part).
- Use an elbow (to be arranged on the user's part) to connect control valves to the piping.
- In anchoring piping on the installation site, give 1.5m or a longer distance between an outdoor unit and an anchoring point where the piping is secured as illustrated below. (A failure to observe this instruction may result in a pipe fracture depending on a method of isolating vibrations employed.)
- The pipe should be anchored every 1.5m or less to isolate the vibration.



- Connect pipes between combined units, with care for the followings.
 - (a) On combination units, it must be secured a straight pipe section of 500 mm or more before a branch pipe (Type DOS) for both gas pipe and liquid pipe as shown below.
 - (b) On the pipe connection system of combination units, place the outdoor unit of which the capacity is the smallest among combined outdoor units, closer to the indoor unit, and place the outdoor unit of which the capacity is the largest among combined outdoor units, far from the indoor unit. (Connecting positions are not specified when the capacities are same.)
(Example) As shown below, in case of P1300 (P400 + P450 + P450), place the outdoor unit P400 closer to the indoor unit and place the outdoor unit P450 far from the indoor unit in the pipe connection system.
 - (c) On the pipe connection system for combination of 3 units, use a branch pipe of which the pipe diameter is different after the pipe branching, for the branch pipe (branch pipe 1) located the closest to the indoor unit. It is necessary also to connect a thin pipe to the outdoor unit and to connect a thick pipe to next branch pipe.
 - (d) It must be no longer than 5m the length of pipe from the branching pipe 1 to the outdoor unit. ($L_1 \leq 5$ m, $L_2 + L_4 \leq 5$ m, $L_3 + L_4 \leq 5$ m) It must be no longer than 10 m the length of oil equalizing pipes between outdoor units. ($L_a + L_b \leq 10$ m, $L_b + L_c \leq 10$ m, $L_a + L_c \leq 10$ m)
 In case of P1300 three combination unit:



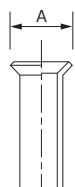
(2) Piping work

Important

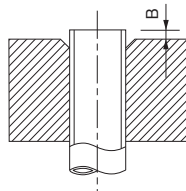
- Please take care so that installed pipes may not touch components within a unit.
- **In laying pipes on the installation site, keep the service valves shut all the time.**
- Give **sufficient protections** (compressed and brazed or by an adhesive tape) **to pipe ends so that any water or foreign matters may not enter the pipes.**
- In bending a pipe, bend it **to the largest possible radius (at least four times the pipe diameter)**. Do not bend a pipe repeatedly to correct its form.
- An outdoor unit's liquid pipe and liquid refrigerant piping are to be flare connected. Flare a pipe after engaging a flare nut onto it. A flare size for R410A is different from that for conventional R407C. Although we recommend the use of flaring tools developed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.
- Tighten a flare joint securely **with two spanners**. Observe flare nut tightening torque specified in the table below.

CAUTION

If you tighten it without using double spanners, you may deform the service valve, which can cause an inflow of nitrogen gas into the outdoor unit.



| Copper pipe outer diameter | A |
|----------------------------|------|
| φ 6.35 | 9.1 |
| φ 9.52 | 13.2 |
| φ 12.7 | 16.6 |
| φ 15.88 | 19.7 |



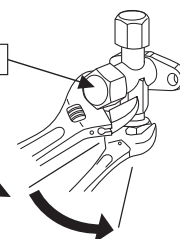
| Copper pipe outer diameter | In the case of a rigid (clutch) type | |
|----------------------------|--------------------------------------|--------------------------|
| | With an R410A tool | With a conventional tool |
| φ 6.35 | 0—0.5 | 0.7—1.3 |
| φ 9.52 | | |
| φ 12.7 | | |
| φ 15.88 | | |

Tightening torque (N·m)

| Service valve size (mm) | Tightening torque (N·m) | Tightening angle (°) | Recommended length of tool handle (mm) |
|-------------------------|-------------------------|----------------------|--|
| φ 6.35 (1/4") | 14—18 | 45—60 | 150 |
| φ 9.52 (3/8") | 34—42 | 30—45 | 200 |
| φ 12.7 (1/2") | 49—61 | 30—45 | 250 |
| φ 15.88 (5/8") | 68—82 | 15—20 | 300 |
| φ 19.05 (3/4") | 100—120 | 15—20 | 450 |

Do not hold the valve cap area with a spanner.

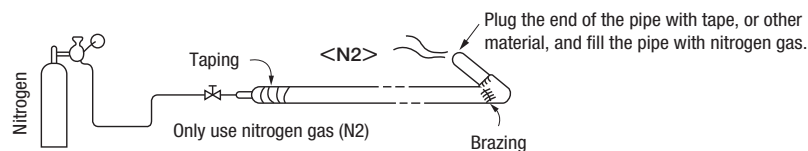
Use a torque wrench. If a torque wrench is not available, fasten the flare nut manually first and then tighten it further, using the left table as a guide.



- Do not apply any oil on a flare joint.
- Pipes are to be blazed to connect an outdoor unit's gas pipe with refrigerant piping or refrigerant piping with a branching pipe set.
- **Blazing must be performed under a nitrogen gas flow.** Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.
- Brazing of the service valve and the pipes should be performed while cooling the valve body with a wet towel.
- Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).

Operation procedure

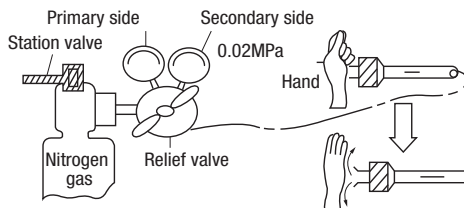
- 1 **In laying pipes on the installation site, keep the service valves shut all the time.**
- 2 **Blazing must be performed under a nitrogen gas flow.** Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



- 3 Give **sufficient protections** (compressed and brazed or with an adhesive tape) **so that water or foreign matters may not enter the piping.**



- 4 Perform flushing. To flush the piping, charge nitrogen gas at about 0.02MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).



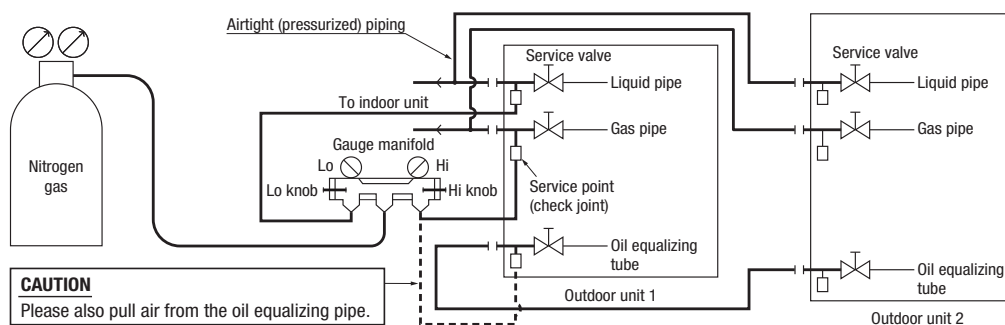
- 5 In brazing an service valve and a pipe, **braze them with the valve main body cooled with a wet towel or the like.**

4-3. Air tightness test and air purge

(1) Air tightness test

- ① Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, **keep the service valve shut all the time.**
- ② Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according to the drawing below. Under no circumstances should chlorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system. **Keep the service valve shut all the time.** Do not open it under any circumstances.
Be sure to pressurize all of the liquid, gas and oil equalizing pipes.
- ③ In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.
 - a) **Raise the pressure to 0.5 MPa, and then stop. Leave it for five minutes or more** to see if the pressure drops.
 - b) **Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes** to see if the pressure drops.
 - c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
 - d) **If no pressure drop is observed with an installation pressurized to the specified level and left for about one day, it is acceptable.** When the ambient temperature changes 1°C, the pressure also changes approximately 0.01 MPa. The pressure, if changed, should be compensated for.
 - e) If a pressure drop is observed in checking a) – d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
- ④ Always pull air from the pipes after the airtightness test.

CAUTION
Applying excessive pressure can cause an inflow of nitrogen gas into an outdoor unit.

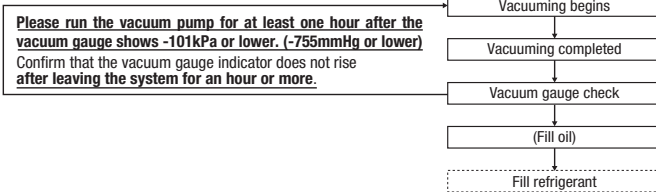


(2) Vacuuming

Please pull air **from the check joints of the service valves on both liquid and gas sides.**
Please also **pull air from the oil equalizing pipe.** (Please pull air separately from the rest of the piping by using the oil equalizing valve check joint)

< Work flow >

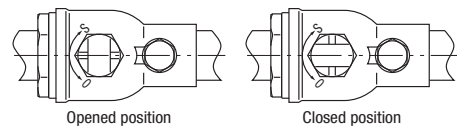
When the system has remaining moisture inside or a leaky point, the vacuum gauge indicator will rise. Check the system for a leaky point and then draw air to create a vacuum again.



CAUTION
Insufficient vacuuming may result in poor performance falling short of the design capacity, pipe clogging due to residue moisture and/or a compressor failure.

Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.



(3) Additional oil charge

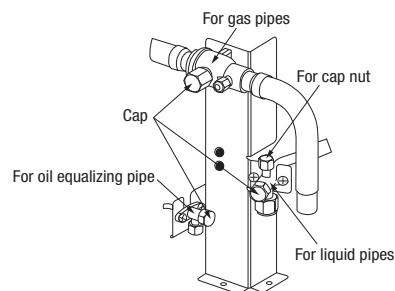
When the total pipe length is longer than 510 m, charge 1,000 cc of M-MA32R refrigeration machine oil from the check joint of gas pipe service valve after the vacuuming.

(4) Method of operating service valves

Method of opening/closing a valve

- Remove the cap, turn the gas pipe side until it comes to the "Open" position as indicated in the drawing on the right.
- For the liquid side pipe and oil equalizing pipe side, turn with a hexagonal wrench until the shaft stops. If excessive force is applied, the valve main body can be damaged. Always use a dedicated special tool.
- Tighten the cap securely.

For tightening torque, refer to the table below.



| | | Tightening torque N · m | | |
|-------------------------|--------|-------------------------|------------|-------------------------------|
| | | Shaft (valve main body) | Cap (lid) | Cap nut (check joint section) |
| For gas pipes | | 7 or less | 30 or less | 13 |
| For liquid pipes | φ 9.52 | 6—8 | 20—30 | 10—12 |
| | φ 12.7 | 14—16 | 25—35 | |
| For oil equalizing pipe | | 6—8 | 20—30 | 10—12 |

For fastening torque of a flare nut, please refer to Section 4-2 (2) Piping work on site.

4-4. Additional refrigerant charge

Charge additional refrigerant **in the liquid state**.

Be sure to measure the quantity **with a scale in adding refrigerant**.

If you cannot charge all refrigerant with the outdoor unit lying idle, charge it with the unit running in the test run mode. (For the test run method, please refer to Section 8) If operated for a long time with insufficient refrigerant the compressor will be damaged. (In particular, when adding refrigerant during operation, complete the job within 30min.)

This unit contains **<280,335 : 11.0 kg, 400-560 : 11.5kg, 615,670 : 22.0 kg, 735 : 22.5 kg, 800-1120 : 23.0 kg, 1200-1680 : 34.5 kg> of refrigerant**.

Determine the amount of refrigerant to be charged additionally using the following formula and put down the amount of refrigerant added on the refrigerant charge volume recording plate provided on the back the front panel.

● Adding additional refrigerant

Charge additional refrigerant according to the size and length of the liquid piping and unit capacity.

Determine additional charge volume by rounding to the nearest 0.1 kg.

Additional fill quantity (kg) = S + P + I

S: standard additional refrigerant quantity (kg)

| Outdoor unit | S (kg) |
|--------------|--------|
| 280 | 0 |
| 335 | 0 |
| 400 | 2.1 |
| 450 | 2.1 |
| 475 | 6.2 |
| 500 | 6.2 |
| 560 | 6.2 |
| 615 | 0 |
| 670 | 0 |
| 735 | 2.1 |

| Outdoor unit | S (kg) |
|--------------|--------|
| 800 | 4.2 |
| 850 | 4.2 |
| 900 | 4.2 |
| 950 | 12.4 |
| 1000 | 12.4 |
| 1060 | 12.4 |
| 1120 | 12.4 |
| 1200 | 6.3 |
| 1250 | 6.3 |

| Outdoor unit | S (kg) |
|--------------|--------|
| 1300 | 6.3 |
| 1350 | 6.3 |
| 1425 | 18.6 |
| 1450 | 18.6 |
| 1500 | 18.6 |
| 1560 | 18.6 |
| 1620 | 18.6 |
| 1680 | 18.6 |

P: Additional refrigerant quantity for piping (kg)

$P = (L1 \times 0.37) + (L2 \times 0.26) + (L3 \times 0.18) + (L4 \times 0.12) + (L5 \times 0.059) + (L6 \times 0.022)$

L1 : φ 22.22 total length (m) L2 : φ 19.05 total length (m) L3 : φ 15.88 total length (m)

L4 : φ 12.7 total length (m) L5 : φ 9.52 total length (m) L6 : φ 6.35 total length (m)

| Refrigerant liquid pipe size | φ 22.22 | φ 19.05 | φ 15.88 | φ 12.7 | φ 9.52 | φ 6.35 |
|---------------------------------|---------|---------|---------|--------|--------|--------|
| Additional fill quantity (kg/m) | 0.37 | 0.26 | 0.18 | 0.12 | 0.059 | 0.022 |

I: Additional refrigerant quantity for indoor units (kg)

If the total indoor units capacity is larger than outdoor unit capacity, then calculate the additional refrigerant quantity for indoor units.

$D = \{(Total\ indoor\ units\ capacity) - (outdoor\ unit\ capacity)\}$

$I = D \times 0.01$

When $D > 0$, calculate I using the above equation;

When $D \leq 0$, take it as $I = 0$.

<Example>

When you connect FDC400 to FDT140 x 3 units:

$D = 140 \times 3 - 400 = 20 (> 0)$

$I = 20 \times 0.01 = 0.2 (kg)$

Important

When the Additional refrigerant quantity (S + P + I) is over the following table, please separate the refrigerant line.

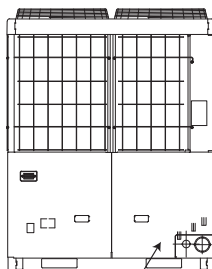
| Outdoor unit | S + P + I (kg) |
|--------------|----------------|
| 280-670 | 40 |
| 735-1350 | 80 |
| 1425-1680 | 100 |

Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R407C, etc.).
- Refrigerant types are indicated by color at the top of the cylinder 5. (Pink for R410A). Always confirm this.
- Do not use a charge cylinder under any circumstances. There is a danger that the composition of the refrigerant will change when R410A is transferred to a cylinder.
- When charging refrigerant, use liquid refrigerant from a cylinder. If refrigerant is charged in a gas form, the composition may change considerably.

Please note

Put down on the refrigerant charge volume recording plate provided on the back of the front panel the amount of refrigerant calculated from the pipe length.



It is located in back of this front panel.

CAUTION

Be sure to record the refrigerant volume, because the information is necessary to perform the installation's maintenance service.

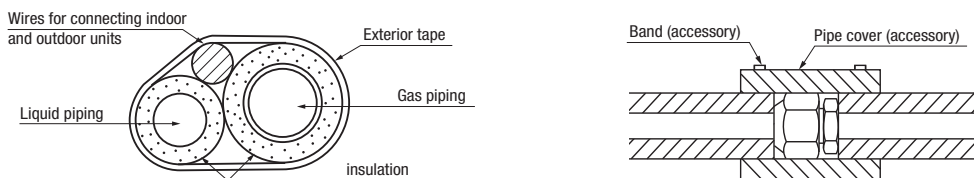
4-5. Heating and condensation prevention

① Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation.

Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.

② Use a heat insulating material that can withstand 120°C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.

- The gas pipe can cause during a cooling operation dew condensation, which will become drain water causing a possible water-leak accident, or reach during a heating operation as high a temperature as 60°C to 110°C, posing a risk of burns, when touched accidentally. So, do not fail to dress it with a heat insulation material.
- Wrap indoor units' flare joints with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).
- Give heat insulation to both gas and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and wrap them together with a connecting cable by a dressing tape.
- Although this air-conditioning unit has been tested under the JIS condensation test conditions, the dripping of water may occur when it is operated in a high-humidity atmosphere (23°C or a higher dew point temperature). In such a case, apply an additional heat insulation material of 10 to 20 mm thick to dress an indoor unit body, piping and drain pipes. When the ambient dew point temperature becomes 28°C or higher, or the relative humidity becomes 80% or higher, add further 10 to 20 mm thick heat insulation material.



5. DRAINAGE

- Where water drained from the outdoor unit may freeze, connect the drain pipe using option drain elbow and drain grommet.

6. ELECTRICAL WIRING WORK

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.

Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

⚠ Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents. (Since this unit employs inverter control, please **use an impulse withstanding type** to prevent an earth leakage breaker's false actuation.)

Please note

a) Use only copper wires.

Do not use any supply cord lighter than one specified in parentheses for each type below.

- braided cord (code designation 60245 IEC 51), if allowed in the relevant part 2;
- ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
- flat twin tinsel cord (code designation 60227 IEC 41)
- ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53).

Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC57) for supply cords of parts of appliances for outdoor use.

b) **Use separate power sources for the indoor and outdoor units.**

c) A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.

d) **The power sources for indoor units in the same system should turn on and off simultaneously.**

e) Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.

If improperly grounded, an electric shock or malfunction may result.

Never connect the grounding wire to a gas pipe because if gas leaks, it could cause explosion or ignition.

f) **The installation of an impulse withstanding type earth leakage breaker is necessary.** A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.

g) Please do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)

h) For power source cables, use conduits.

i) Please **do not lay electronic control cables (remote control and signaling wires) and other high current cables together outside the unit.** Laying them together can result in malfunctioning or a failure of the unit due to electric noises.

j) Power cables and signaling wires must always be connected to the power cable terminal block and secured by cable fastening clamps provided in the unit.

k) Fasten cables so that they may not touch the piping, etc.

l) **When cables are connected, please make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection** and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)

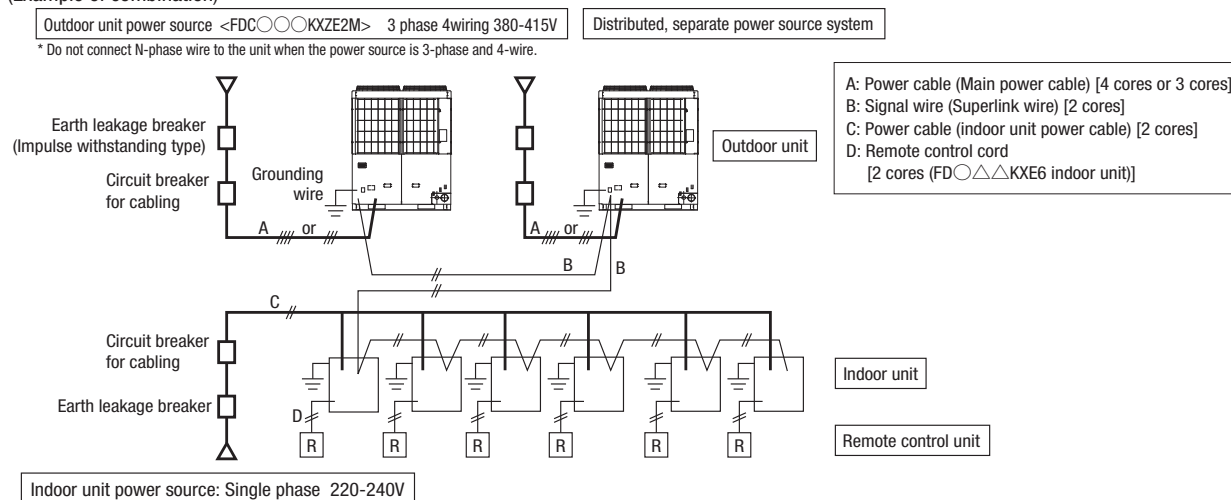
m) Make sure to use circuit breakers (earth leakage breaker and circuit breaker) of proper capacity. Use of breakers of larger capacity could result in trouble on components or fire accident. The circuit breaker should isolate all poles under over current.

n) Install isolator or disconnect switch on the power source wiring in accordance with the local codes and regulations. The isolator should be locked in OFF state in accordance with EN60204-1.

o) After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.

6-1. Wiring system diagrams

(Example of combination)



CAUTION

If the earth leakage breaker is exclusively for ground fault protection, then you will need to install a circuit breaker for wiring work.

6-2. Method of connecting power cables

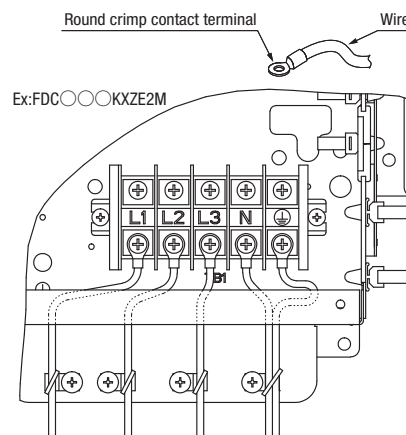
(1) Method of leading out cables

- As shown on the drawing in Section 4-2 (1), cables can be laid through the front, right, left or bottom casing.
- In wiring on the installation site, cut off a half-blank (φ 50 or oblong hole measuring 40x80) covering a penetration of the casing with nippers.

(2) Notabilia in connecting power cables

Power cables must always be connected to the power cable terminal block and clamped outside the electrical component box. In connecting to the power cable terminal block, use round solderless terminals.

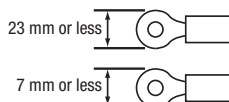
- Connect the ground wire before you connect the power cable. When you connect a grounding wire to a terminal block, use a grounding wire longer than the power cable so that it may not be subject to tension.
- Do not turn on power until installation work is completed. Turn off power to the unit before you service the unit.
- Ensure that the unit is properly grounded.
- Always connect power cables to the power terminal block.
- To connect a cable to the power terminal block, use a round crimp contact terminal.
- Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
- In fastening a screw of a terminal block, use a correct-size driver.
- Fastening a screw of a terminal block with excessive force can break the screw.
- For the tightening torque of terminals, refer to the list shown at right.
- When electrical installation work is completed, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.



| FDC○○○KXZE2M : Tightening torque (N · m) | | |
|--|------------------------------------|------------|
| M3.5 | Outdoor signal line terminal block | 0.9—1.2 |
| M8 | Earth wire | 5.97—7.25 |
| M8 | Power cable terminal block | 6.28—10.29 |

Request (FDC○○○KXZE2M)

- When connecting to the power source terminal block, use the crimp terminals for M8 as shown at right.
- When connecting to the signal terminal block, use the crimp terminals for M3.5 as shown at right.



(3) Outdoor unit power source specifications

FDC○○○KXZE2M : 3phase 220V

| Model | Power source | Cable size for power source (mm ²) | Wire length (m) | Moulded-case circuit breaker (A) | | Earth leakage breaker | Earth wire | |
|-------|---------------------|--|-----------------|----------------------------------|-----------------|-----------------------------|-------------------------|------------|
| | | | | Rated current | Switch capacity | | Size (mm ²) | Screw type |
| 280 | 3 phase 220V60Hz | 14 | 48 | 50 | 50 | 50A100mA less than 0.1 sec | 5.5 | M8 |
| 335 | | 14 | 48 | 50 | 50 | 50A100mA less than 0.1 sec | 5.5 | M8 |
| 400 | | 38 | 94 | 60 | 60 | 60A100mA less than 0.1 sec | 5.5 | M8 |
| 450 | | 38 | 86 | 100 | 100 | 100A100mA less than 0.1 sec | 8 | M8 |
| 475 | | 38 | 79 | 100 | 100 | 100A100mA less than 0.1 sec | 8 | M8 |
| 500 | | 38 | 79 | 100 | 100 | 100A100mA less than 0.1 sec | 8 | M8 |
| 560 | | 38 | 74 | 100 | 100 | 100A100mA less than 0.1 sec | 8 | M8 |

Please note

- The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEC8001). (Please adapt it to the regulations in effect in each country)
- In the case of distributed, separate power source system, the listed data represent those of an outdoor unit.
- For details, please refer to the installation manual supplied with the indoor unit.
- Use an all-pole disconnection type breaker with at 3mm or more gap between the contact point, that provide full disconnection under over-voltage category III," will be added.

6-3. Method of connecting signaling wires

The communication protocol can be chosen from following two types. One of them is the conventional Superlink (hereinafter previous SL) and the other is the new Superlink II (hereinafter new SL). These two communication protocols have the following advantages and restrictions, so please choose a desirable one meeting your installation conditions such as connected indoor units and centralized control. When signal cables are connected into a network involving outdoor units, indoor units or centralized control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

| Communication protocol | Conventional communication protocol (previous SL) | New communication protocol (new SL) |
|---|---|--|
| Outdoor unit setting (SW5-5) | ON | OFF (Factory default) |
| No. of connectable indoor units | Max. 48 | Max. 128 |
| No. of connectable outdoor units in a network | Max. 48 | Max. 32 |
| Signal cable (total length) | Up to 1000m | Up to 1,500 m for 0.75 mm ² shielding wire (MWS) Up to 1,000 m for 1.25 mm ² shielding wire (MWS) |
| Signal cable (furthest length) | Up to 1000m | Up to 1000m |
| Connectable units to a network | Units not supporting new SL (FD○A△△KXE4-5 series) Units supporting new SL (FD○△△KXE6 series, FD○△△KXZ series) Can be used together. | Units supporting new SL (FD○△△KXE6 series, FD○△△KXZ series) |

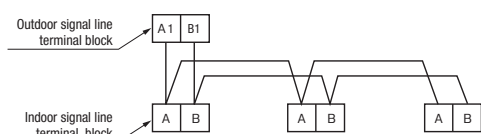
Note: For FDT224 and 280 models, calculate the number of units taking 1 indoor unit as 2 units for the sake of communication.

- **Signal cables are for DC 5 V. Never connect wires for 220/240 V or 380/415 V.** Protective fuse on the PCB will trip.
 - ① Confirm that signal cables are prevented from applying 220/240 V or 380/415 V.
 - ② Before turning the power on, check the resistance on the signal cable terminal block. If it is less than 100Ω, power source cables may be connected to the signal cable terminal block.
- When units of FD○△△KXE6 Series, FD○△△KXE1 series are connected:
Standard resistance value=5,100/Number of connected units.
- When units of FD○A△△KXE4 and 5 Series only are connected:
Standard resistance value=9,200/Number of connected units.
- When units of FD○△△KXE6 Series, FD○△△KXE1 series and units of FD○A△△KXE4 and 5 Series are connected in a mixture:
Standard resistance value=46,000/[(Number of connected FD○A△△KXE4 and 5 Series units x 5) + (Number of connected FD○△△KXE6 and KXZ Series units x 9)]
- The number of connected units includes those of indoor units, outdoor units and SL devices.
- If the resistance value is less than 100Ω, disconnect the signal cables temporarily to divide to more than one network, to reduce the number of indoor units on the same network, and check each network.

Indoor and outdoor units signal cables

- Connect the signal cable between indoor and outdoor units and the signal cable between outdoor units belonging to the same refrigerant line to A1 and B1.
- Connect the signal line between outdoor units on different refrigerant lines to A2 and B2.
- Please use a shielded cable for a signal line and connect a shielding earth at all the indoor units and outdoor units.

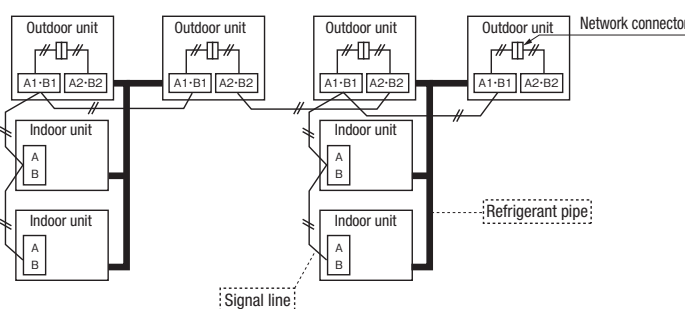
(1) When one outdoor unit is used.



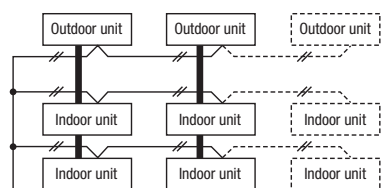
○ Indoor and outdoor signal lines do not have a polarity. Any of the connections in the following illustration can be made.



(2) When plural outdoor units are used

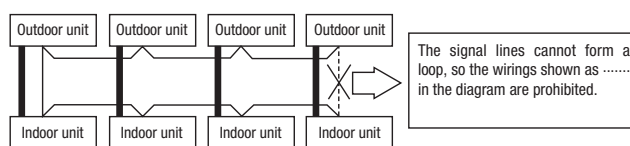


(3) The signal lines can also be connected using the method shown below.



Important

○ Loop wiring prohibited.



Remote control wiring specifications

(1) A standard remote control wire is 0.3mm² x 2 cores (FDC○△△KXE6, KXE1 indoor unit), 0.3mm² x 3 cores (FD○A△△KXE4-5 indoor unit). It can be extended up to 600m. For a remote control wire exceeding 100m, please upgrade wire size as specified in the table below.

| Length (m) | Wire size |
|------------|-------------------------------|
| | FD○△△KXE6 indoor unit |
| 100 to 200 | 0.5mm ² × 2 cores |
| To 300 | 0.75mm ² × 2 cores |
| To 400 | 1.25mm ² × 2 cores |
| To 600 | 2 mm ² × 2 cores |

- (2) When the remote control wire runs parallel to another power source wire or when it is subject to outside noise, such as from a high-frequency device, use shielded wire. (Be sure to ground only one end of the shielded wire.)

CAUTION In addition to a possible wiring error between indoor and outdoor units, there are other possibilities of erroneous wiring as illustrated below.

① Wrong wiring between signaling wires and remote control wires.

② Connecting power cables to the signaling wire terminal block.

7. CONTROL SETTINGS

7-1. Unit address setting

This control system controls the controls of more than one air-conditioner's outdoor unit, indoor unit and remote control unit through communication control, using the microcomputers built in the respective controls. Address setting needs to be done for both outdoor and indoor units. Turn on power in the order of the outdoor units and then the indoor units.

Use 1 minute as the rule of thumb for an interval between them.

The communication protocol can be chosen from following two types. One of them is the conventional communication protocol (previous SL) and the other is the new communication protocol (new SL). These two communication protocols have their own features and restrictions as shown by Table 6-3. Select them according the indoor units and the centralized control to be connected. When signal cables are connected into a network involving outdoor units, indoor units or central control equipment that do not support new SL, please select communications in the previous SL mode, even if the refrigerant system is separated from theirs.

When communication is established after setting addresses, check the communication protocol with the 7-segment display panel of the outdoor unit.

●Address setting methods

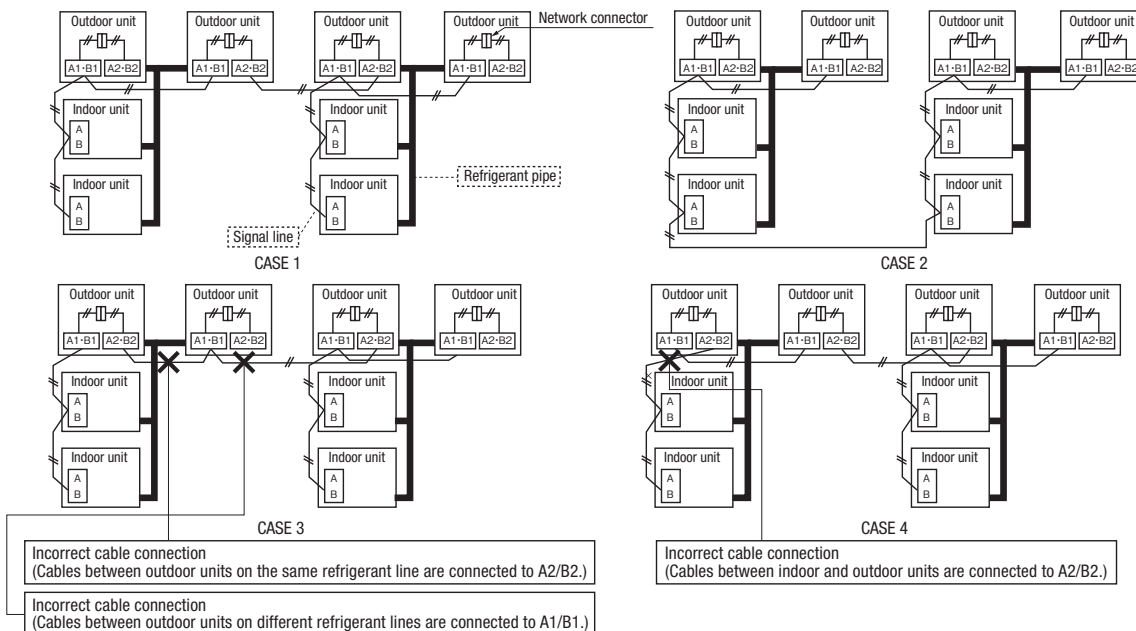
The following address setting methods can be used. The procedure for automatic address setting is different from the conventional one. Please use the automatic address setting function after reading this manual carefully.

| Communication protocol Address setting method | | new SL | | previous SL | |
|--|--|-----------|--------|-------------|--------|
| | | Automatic | Manual | Automatic | Manual |
| When plural refrigerant systems are linked with signal lines (e.g., to implement central control) | Case 1 When signal lines linking plural refrigerant systems are provided between outdoor units. (When the network connector is disconnected, refrigerant systems are separated each other) | OK*1 | OK | × | OK |
| | Case 2 When signal lines linking plural refrigerant systems are provided between indoor units. | × | OK | × | OK |
| When only one refrigerant system is involved (signal lines do not link plural refrigerant systems) | | OK | OK | OK | OK |

*1 Do not connect the signal line between outdoor units on the different refrigerant lines to A1 and B1. Do not connect the signal line between outdoor units on the same refrigerant line to A2 and B2. This may interrupt proper address setting. (Case 3)

Do not connect the signal line between indoor unit and outdoor unit to A2 and B2. This may interrupt proper address setting. (Case 4)

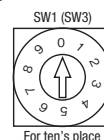
*2 In Case 2, automatic address setting is not available. Set addresses manually.



●Address No. setting

Set SW1 through 4 and SW5-2 provided on the PCB and SW1 & 2 provided on the outdoor unit PCB as shown in the drawings below.

| | | |
|-------------|----------------|---|
| Indoor PCB | SW1, 2 (blue) | For setting indoor No. (The ten's and one's) |
| | SW3, 4 (green) | For setting outdoor No. (The ten's and one's) |
| | SW5-2 | Indoor No. switch (The hundred's Place) [OFF : 0, ON : 1] |
| Outdoor PCB | SW1, 2 (green) | For setting outdoor No. (The ten's and one's) |



By inserting a flat driver (precision screw driver) into this groove and turn the arrow to point a desired number.

●Summary of address setting methods (figures in [] should be used with previous SL)

| | Units supporting new SL | | | Units NOT supporting new SL | | |
|--|-----------------------------|--------------------|------------------------------|-----------------------------|--------------------|------------------------------|
| | Indoor unit address setting | | Outdoor unit address setting | Indoor unit address setting | | Outdoor unit address setting |
| | Indoor No. switch | Outdoor No. switch | Outdoor No. switch | Indoor No. switch | Outdoor No. switch | Outdoor No. switch |
| Manual address setting (previous SL/new SL) | 000-127[47] | 00-31[47] | 00-31[47] | 00-47 | 00-47 | 00-47 |
| Automatic address setting for single refrigerant system installation (previous SL/new SL) | 000 | 49 | 49 | 49 | 49 | 49 |
| Automatic address setting for multiple refrigerant systems installation (with new SL only) | 000 | 49 | 00-31 | × | × | × |

Do not set numbers other than those shown in the table, or an error may be generated.

Note: When units supporting new SL are added to a network using previous SL such as one involving FD○A△△KXE4-5 series units, choose previous SL for the communication protocol and set addresses manually.

Since the models FDT224 and 280 have 2 PCBs per unit, set different indoor unit No. and SW on each PCB.

- An outdoor unit No., which is used to identify which outdoor unit and indoor units are connected in a refrigerant system, is set on outdoor unit PCB and indoor unit PCB. Give the same outdoor unit No. to all outdoor unit and indoor units connected in same refrigerant system.
- An indoor unit No. is used to identify individual indoor units. Assign a unique number that is not assigned to any other indoor units on the network.

Unless stated otherwise, the following procedures apply, when new SL is chosen for the communication protocol.

When previous SL is chosen, use figures shown in [] in carrying out these procedures.

Manual address setting Generally applicable to new SL/previous SL, use figures in [] with previous SL.

① Address setting of outdoor unit

Before turning on the power, set as follows. The outdoor address is registered when the power is turned on.

Set the **outdoor No. switches** in a range of **00 - 31 [or 00 - 47 for old SL]**.

Take care not to duplicate with other outdoor unit No. on the network.

In the same way also on the master unit of combination, set the rotary switch for outdoor No. **in a range of 00 - 31 [or 00 - 47 for old SL]**

For slave units of combination, set the rotary switches for outdoor No. **at the same outdoor No. as the master unit of combination.**

When 2 units are combined, set the DIP switch SW4-7 of slave unit to ON. When 3 units are combined, set the DIP switch SW4-7 of slave unit 1 to ON and the DIP switch SW4-8 of slave unit 2 to ON. (Use same setting for outdoor No. of master unit and slave unit.)

② Address setting of indoor unit

Before turning on the power, set as follows. Indoor address is registered when the power is turned on.

Set the **indoor No. switch** in a range of **000 - 127 [or 00 - 47 for old SL]**.

For the **outdoor No switches**, set corresponding outdoor No. in a range of **00 - 31 [or 00 - 47 for old SL]**.

Set with care not to duplicate with other indoor No. on the network.

| Refrigerant system | Outdoor unit | SW1 | SW2 | SW4-7 | Address on network |
|--------------------|--------------|-----|-----|-------|--------------------|
| A | Master | 2 | 2 | OFF | 22 |
| | Slave | 2 | 2 | ON | 23 |
| B | Master | 2 | 4 | OFF | 24 |
| | Slave | 2 | 4 | ON | 25 |
| C | Master | 3 | 1 | OFF | 31 |
| | Slave | 3 | 1 | ON | 00 |

Above list is an example. **The address on the network is master unit +1 for the slave unit.**

If the slave unit address is larger than 31 [or 47 for old SL], the address is assigned sequentially starting from 00.

When setting sequential addresses, take care not to duplicate the master unit address in the refrigerant system B with addresses of slave units in the refrigerant system A.

| Refrigerant system | Outdoor unit | SW1 | SW2 | SW4-7 | SW4-8 | Address on network |
|--------------------|--------------|-----|-----|-------|-------|--------------------|
| A | Master | 2 | 2 | OFF | OFF | 22 |
| | Slave 1 | 2 | 2 | ON | OFF | 23 |
| | Slave 2 | 2 | 2 | OFF | ON | 24 |
| B | Master | 2 | 5 | OFF | OFF | 25 |
| | Slave 1 | 2 | 5 | ON | OFF | 26 |
| | Slave 2 | 2 | 5 | OFF | ON | 27 |
| C | Master | 3 | 1 | OFF | OFF | 31 |
| | Slave 1 | 3 | 1 | ON | OFF | 00 |
| | Slave 2 | 3 | 1 | OFF | ON | 01 |

Note:

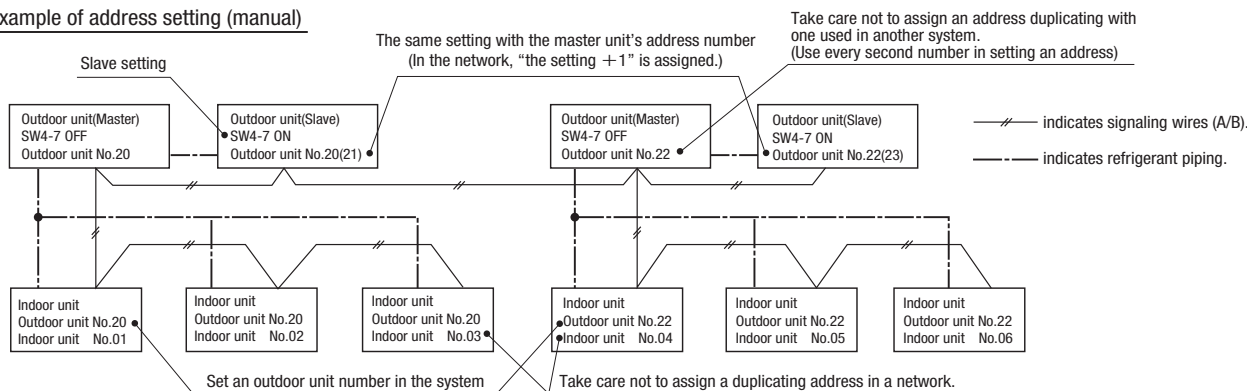
Slave unit address is master unit +1. Address of second slave unit is master unit +2. When setting the address for master unit, take care to avoid duplication with other systems. Otherwise, it cannot operate. (Error: E-31)

③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.

* When there are some units not supporting new SL connected in the network, set SW5-5 to ON to choose the previous SL communication mode.

In the case of previous SL, the maximum number of indoor units connectable in a network is 48.

Example of address setting (manual)



Automatic address setting Generally applicable to new SL/previous SL, use figures in [] with previous SL.

With new SL, you can set indoor unit addresses automatically even for an installation involving multiple refrigerant systems connected with same network, in addition to the conventional automatic address setting of a single refrigerant system installation.

However, an installation must satisfy some additional requirements such as for wiring methods, so please read this manual carefully before you carry out automatic address setting.

(1) In the case of a single refrigerant system installation (Generally applicable to new SL/previous SL, use figures in [] with previous SL.)

- ① Address setting of outdoor unit Before turning on the power, set as follows.
 Confirm that **the outdoor No. switch** is set at **49 by the default**.
 • **In the same way also on the master unit of combination**, confirm that the rotary switch for outdoor No. is set at **49 by the default**.
 • **In the same way also on the slave unit of combination**, confirm that the rotary switch for outdoor No. is set at **49 by the default**.
When 2 units are combined, set the DIP switch SW4-7 of slave unit to ON. When 3 units are combined, set the DIP switch 4-7 of slave unit 1 to ON and the DIP switch SW4-8 of slave unit 2 to ON.

| Outdoor unit | SW1 | SW2 | SW4-7 | Address on network |
|--------------|-----|-----|-------|--------------------|
| Master | 4 | 9 | OFF | 49 |
| Slave | 4 | 9 | ON | 00 |

| Outdoor unit | SW1 | SW2 | SW4-7 | SW4-8 | Address on network |
|--------------|-----|-----|-------|-------|--------------------|
| Master | 4 | 9 | OFF | OFF | 49 |
| Slave 1 | 4 | 9 | ON | OFF | 00 |
| Slave 2 | 4 | 9 | OFF | ON | 01 |

CAUTION
 If the slave unit is not specified, a compressor failure may result.

- ② Indoor unit address setting
 Set as follows before you turn on power.
 Make sure that the **Indoor Unit No. switch** is set to **000 [in the case of previous SL: 49] (factory setting)**.
 Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**.
 ③ Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them. Unlike the procedure set out in (2) below, you need not change settings from the 7-segment display panel.
 ④ Make sure that the number of indoor units indicated on the 7-segment display panel agrees with the number of the indoor units that are actually connected to the refrigerant system.

(2) In the case of a multiple refrigerant systems installation (Applicable to new SL only. In the case of previous SL, set addresses with some other method.)

(This option is available when the interconnection wiring among refrigerant systems is on the outdoor side and new SL is chosen as the communication protocol.)

Address setting procedure (perform these steps for each outdoor unit)

[STEP1] (Items set before turning on power)

- ① Address setting of outdoor unit Before turning on the power, set as follows.
 Set **the outdoor No. switches** in a range of **00 – 31**.
 Take care not to duplicate with other outdoor unit No. on the network.
In the same way also on the master unit of combination, set the rotary switch for outdoor No. **in a range of 00 - 31**
For slave units of combination, set the rotary switches for outdoor No. at **the same outdoor No. as the master unit of combination**.
When 2 units are combined, set the DIP switch SW4-7 of slave unit to ON. When 3 units are combined, set the DIP switch SW4-7 of slave unit 1 to ON and the DIP switch SW4-8 of slave unit 2 to ON. (Use same setting for outdoor No. of master unit and slave unit.)
 ② Address setting of indoor unit Before turning on the power, set as follows.
 Make sure that the **Indoor Unit No. switch** is set to **000 (factory setting)**.
 Make sure that the **Outdoor Unit No. switch** is set to **49 (factory setting)**.
 ③ Isolate the present refrigerant system from the network.
 Disengage the **network connectors (white 2P)** of the outdoor units. (Turning on power without isolating each refrigerant system will result in erroneous address setting.)

[STEP2] (Power on and automatic address setting)

- ④ Turn on power to the outdoor unit
 Turn on power in order from the outdoor unit to indoor units. Give a one-minute or longer interval for them.
 ⑤ Select and enter "1" in P31 on the 7-segment display panel of each outdoor unit (master unit in case of combination) to input "Automatic address start."
 ⑥ Input a starting address and the number of connected indoor units.
 Input a starting address in P32 on the 7-segment display panel of each outdoor unit (master unit in case of combination).
 ⑦ When a starting address is entered, the display indication will switch back to the "Number of Connected Indoor Units Input" screen.
 Input the number of connected indoor units from the 7-segment display panel of each outdoor unit (master unit in case of combination). Please input the number of connected indoor units (on the same refrigerant line in case of combination) for each outdoor unit. (You can input it from P33 on the 7-segment display panel.) When the number of connected indoor units is entered, the 7-segment display panel indication will switch to "AUX" and start flickering.

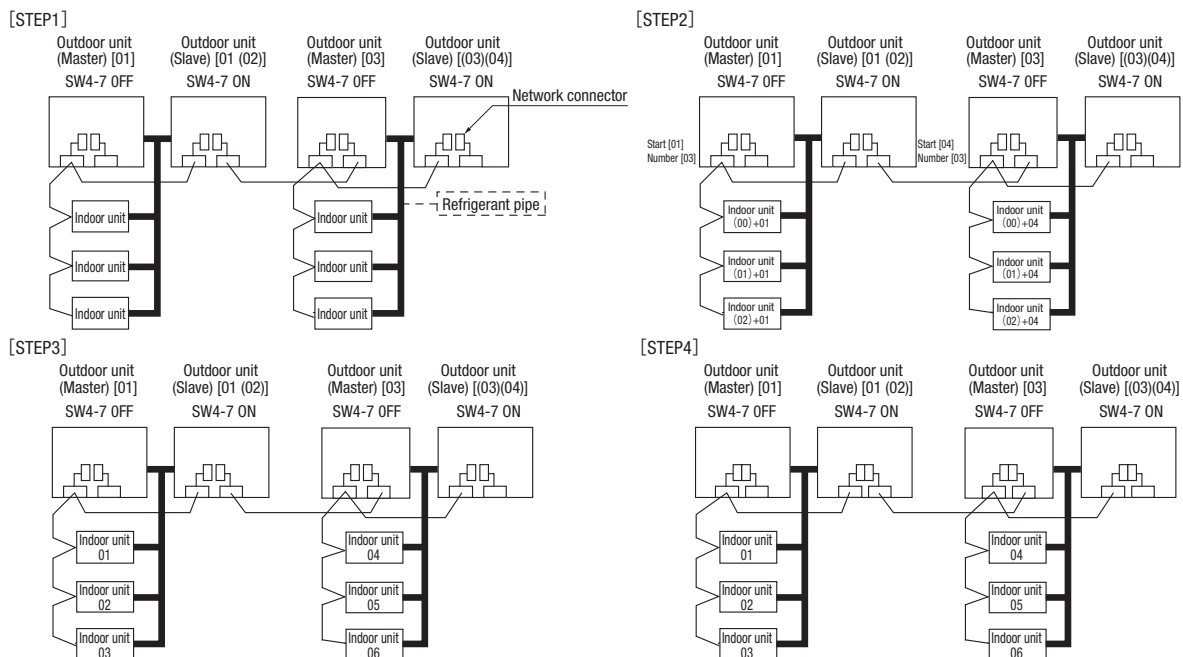
[STEP3] (Automatic address setting completion check)

- ⑧ Indoor unit address determination
 When the indoor unit addresses are all set, the 7-segment display panel indication will switch to "AUE" and start flickering.
 If an error is detected in this process, the display will show "A○○."
 Check the 7-segment display panel of each outdoor unit (master unit in case of combination).
 Depending on the number of connected indoor units, it may take **about 10 minutes** before the indoor unit addresses are all set.

[STEP4] (Network definition setting)

- ⑨ Network connection
 When you have confirmed an "AUE" indication on the display of each outdoor unit, **engage the network connectors** again.
 ⑩ Network polarity setting
After you have made sure that the network connectors are engaged, select and enter "1" in P34 on the 7-segment display panel of **any outdoor unit (on only 1 unit : master unit in case of combination)** to specify network polarity.
 ⑪ Network setting completion check
 When the network is defined, "End" will appear on the 7-segment display panel. An "End" indication will go off, when some operation is made from the 7-segment display panel or 3 minutes after.

| | STEP1 | STEP2 | STEP3 | STEP4 |
|------------------------------------|--|--|---|--|
| Indoor unit power source | ② OFF | ④ ON | — | — |
| Outdoor unit power source | ① OFF | ④ ON | — | — |
| Indoor unit (indoor/outdoor No.SW) | ② Indoor000/outdoor 49 (factory setting) | — | — | — |
| Outdoor unit (outdoor No.SW) | ① 01,03(Ex) | — | — | — |
| Network connectors | ③ Disconnect(each outdoor unit) | — | — | ⑨ Connect(each outdoor unit) |
| Start automatic address setting | — | ⑤ Select "Automatic Address Start" on each outdoor unit. | — | — |
| Set starting address | — | ⑥ Outdoor 01:[01](Ex) Outdoor 03:[04](Ex) | — | — |
| Set the number of indoor unit | — | ⑦ Outdoor 01:[03](Ex) Outdoor 03:[03](Ex) | — | — |
| Polarity setting | — | — | — | ⑩ Set in P34 on the 7-segment display panel of any outdoor unit. |
| 7-segment display | — | ⑦ [AUX] (Blink) | ⑧ "AUE"(blink), or "A○○" in error events. | ⑪ [End] |



- Within a refrigerant system, indoor units are assigned addresses in the order they are recognized by the outdoor unit. Therefore, they are not necessarily assigned addresses in order from the nearest to the outdoor unit first as depicted in drawings above.
- Make sure that power has been turned on to all indoor units.
- When addresses are set, you can have the registered indoor unit address No. and the outdoor unit address No. displayed on the remote control unit by pressing its CHECK button.
- Automatic address setting can be used for an installation in which prul indoor units are controlled from one remote control unit.
- Once they are registered, addresses are stored in microcomputers, even if power is turned off.
- If you want to change an address after automatic address setting, you can change it from the remote control unit with its "Address Change" function or by means of manual setting. Set a unique address by avoiding the address assigned to other indoor unit on the network when the address is changed.
- Do not turn on power to central control equipment until automatic address setting is completed.
- When addresses are set, be sure to perform a test run and ensure that you can operate all indoor and outdoor units normally. Also check the addresses assigned to the indoor units.

Address change (available only with new SL)

"Address Change" is used, **when you want to change an indoor unit address assigned with the "Automatic Address Setting" function from a remote control unit.** Accordingly, the conditions that permit an address change from a remote control unit are as follows.

| | Indoor unit address setting | | Outdoor unit address setting |
|---|-----------------------------|---------------|------------------------------|
| | Indoor No.SW | Outdoor No.SW | Outdoor No.SW |
| Automatic address setting forsingle refrigerant system installation | 000 | 49 | 49 |
| Automatic address setting for multiple refrigerant systems installation | 000 | 49 | 00-31 |

If "CHANGE ADD. ▼" is selected with some addresses falling outside these conditions, the following indication will appear for 3 seconds on the remote control "INVALID OPER".

Operating procedure

When the eco touch remote control is connected, refer to the installation setting in the installation manual which is packed along with the remote control.

(1) When single indoor unit is connected to the remote control.

| Item | Operation | Display |
|---------------------------------|--|--|
| 1 Address change mode | ① Press the AIR CON No. switch for 3 seconds or longer. | [CHANGE ADD. ▼] |
| | ② Each time when you press the ◀ switch, the display indication will be switched. | [CHANGE ADD. ▼] ⇔ [MASTER I/U ▲] |
| | ③ Press the SET switch when the display shows "CHANGE ADD. ▼" and then start the address change mode, changing the display indication to the "Indoor Unit No. Setting" screen from the currently assigned address. | [I/U 001 O/U 01] (1sec) → [◀ SET I/U ADD.] (1sec) → [I/U 001 ▶] (Blink) |
| 2 To set a new indoor unit No. | ④ Set a new indoor unit No. with the ▶ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively. | [I/U 000 ▲] ⇔ [I/U 001 ▶] ⇔ [I/U 002 ▶] ⇔ . . . ⇔ [I/U 127 ▼] |
| | ⑤ After selecting an address, press the SET switch, and then the indoor unit address No. is defined. | [I/U 002] (2sec) |
| 3 To set a new outdoor unit No. | ⑥ After showing the defined indoor address No. for 2 seconds, the display will change to the "Outdoor Address No. Setting" screen. The currently assigned address is shown as a default value. | [I/U 002] (2sec Lighting) → [▶ SET O/U ADD.] (1sec) → [O/U 01 ▶] (Blink) |
| | ⑦ Set a new outdoor unit No. with the ▶ switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively. | [O/U 00 ▲] ⇔ [O/U 01 ▶] ⇔ [O/U 02 ▶] ⇔ . . . ⇔ [O/U 31 ▼] |
| | ⑧ After selecting an address, press the SET switch, and then the outdoor unit No. and the indoor unit No. are defined. | [I/U 002 O/U 02] (2sec Lighting) → [SET COMPLETE] (2sec Lighting) → Returns to normal condition. |

(2) When plural indoor units are connected to the remote control.
When plural indoor units are connected, you can change their addresses without altering their cable connection.

| Item | Operation | Display |
|--|---|--|
| 1 Address change mode | ① Press the AIR CON Unit No. switch for 3 seconds or longer. | [CHANGE ADD▼] |
| | ② Each time when you press the switch, the display indication will be switched. | [CHANGE ADD▼] ⇔[MASTER I/U▲] |
| | ③ Press the SET switch when the display shows "CHANGE ADD. ▼" The lowest indoor unit No. among the indoor units connected to the remote control unit will be shown. | [SELECT I/U] (1sec) →[I/U 001 O/U 01▲] (Blink) |
| 2 Selecting an indoor unit to be changed address | ④ Pressing the switch will change the display indication cyclically to show the unit No.'s of the indoor units connected to the remote control and the unit No.'s of the outdoor units connected with them. | [I/U 001 O/U 01▲] ⇔[I/U 002 O/U 01] ⇔[I/U 003 O/U 01] ⇔ . . . ⇔[I/U 016 O/U 01▼] |
| | ⑤ Then the address No. of the indoor unit to be changed is determined and the screen switches to the display "SET I/U ADD." | [SET I/U ADD.] (1sec) →[I/U 001] (Blink) |
| 3 Setting a new indoor unit No. | ⑥ Set a new indoor unit No. with the switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively. | [I/U 000▲] ⇔[I/U 001] ⇔[I/U 002] ⇔ . . . ⇔[I/U 127▼] |
| | ⑦ After selecting an address, press the SET switch. Then the address No. of the indoor unit is determined. | [I/U 002] (2sec) |
| 4 Setting a new outdoor unit No. | ⑧ The display will indicate the determined indoor address No. for 2 seconds and then switch to the "SET O/U ADD." screen. A default value shown on the display is the current address. | [I/U 002] (2sec lighting) ⇔[SET O/U ADD.](1sec) ⇔[O/U 01] (Blink) |
| | ⑨ Set a new outdoor unit No. with the switch. A number indicated on the display will increase or decrease by 1 upon pressing the ▲ or ▼ switch respectively. | [O/U 00▲] ⇔[O/U 01] ⇔[O/U 02] ⇔ . . . ⇔[O/U 31▼] |
| | ⑩ After selecting an address, press the SET switch. Then the address of the indoor unit and outdoor unit are determined. | [I/U 002 O/U 02](2sec lighting) →[SELECT](1sec lighting) →[I/U SELECTION▼](lighting) |
| | ⑪ If you want to continue to change addresses, return to step ④. | [Press the switch](1sec) →[SET COMPLETE] (2—10sec lighting) |
| 5 Ending the session | ⑫ If you want to end the session (and reflect new address settings) In Step ⑩, press the ▼ switch to select "END ▲". If you have finished changing addresses, press the SET switch while "END ▲" is shown. While new settings are being transmitted, "SET COMPLETE" will be indicated. Then the remote control display will change to the normal state. | [END▲] →[SET COMPLETE] (2—10sec lighting) →Normal state |
| | ⑬ If you want to end the session (without reflecting new address settings) Before you complete the present address setting session, press the "ON/OFF" switch. Then the display is change to exit from this mode and switch the display to the normal state. All address settings changed in the session will be aborted and not reflected. | [ON/OFF] →Forced termination |

The switch will continuously change the display indication to the next one in every 0.25 seconds when it is pressed for 0.75 seconds or longer.
If the Reset switch is pressed during an operation, the display indication returns to the one that was shown before the last Set switch operation.
Even if an indoor unit No. is changed in this mode, the registered indoor unit No. before address change mode is displayed when [I/U SELECTION▼] is shown.
When "SET COMPLETE" is shown, indoor unit No. is registered.

NOTICE Turn on power to central control equipment after the addresses are determined.
Turning on power in wrong order may result in a failure to recognize addresses.

● 7-segment display indication in automatic address setting

Items that are to be set by the customer

| Code | Content of display |
|------|---|
| P30 | Communication protocol 0: Previous SL mode 1: New SL mode (The communication protocol is displayed ; display only) |
| P31 | Automatic address start |
| P32 | Input starting address Specify a starting indoor unit address in automatic address setting. |
| P33 | Input number of connected indoor units Specify the number of indoor units connected in the refrigerant system in automatic address setting. |
| P34 | Polarity definition 0: Network polarity not defined. 1: Network polarity defined. |

7-segment display indication in automatic address setting.

| Code | Content of display |
|------|--|
| AUX | During automatic address setting. X: The number of indoor units recognized by the outdoor unit. |
| AUE | Indoor unit address setting is completed normally. |
| End | Polarity is defined. (Automatic address) Completed normally. |

Address setting failure indication

| Code | Content of display | Please check |
|------|--|---|
| A01 | The number of the indoor units that can be actually communicated with is less than the number specified in P33 on the 7-segment display panel. | Are signal lines connected properly without any loose connections? Input the number of connected indoor units again. |
| A02 | The number of the indoor units that can be actually communicated with is more than the number specified in P33 on the 7-segment display panel. | Are signal lines connected properly without any loose connections? Are the network connectors coupled properly? Input the number of connected indoor units again. |
| A03 | Starting address (P32) + Number of connected indoor units (P33) > 128 | Input the starting address again. Input the number of connected indoor units again. |
| A04 | While some units are operating in the previous SL mode on the network, the automatic address setting on multiple refrigerant systems is attempted. | Perform manual address setting. Separate previous SL setting unit from the network Arrange all units to operate in the new SL. |

Error indication

| Code | Content of display | Cause |
|------|----------------------------------|---|
| E31 | Duplicating outdoor unit address | • Plural outdoor units are exist as same address in same network. |
| E46 | Incorrect setting | • Automatic address setting and manual address setting are mixed. |

7-2. Change of control

Contents of control for outdoor unit can be changed with dipswitches on PCB and P○○ on 7-segment indicator.

When changing P○○ on 7-segment indicator, it can be set by holding down SW8 (7-segment indicator UP: Ones digit), SW9 (7-segment indicator UP: Tens digit) and SW7 (Data write/Enter)

| Method to change control | | Contents of control change |
|---|---|---|
| SW setting on PCB | P○○ setting on 7-segment | |
| SW3-7 to ON*1 | Set external input function allocation to "2". *1 | Forced cooling/heating mode (It can be fixed at cooling with external input terminals open, or at heating with them closed.) |
| SW5-1 to ON + SW5-2 to ON | — | Cooling test run |
| SW5-1 to ON + SW5-2 to OFF | — | Heating test run |
| Close the fluid service valve on outdoor unit and set as follows: (1) SW5-2 of PCB to ON (2) SW5-3 of PCB to ON (3) SW5-1 of PCB to ON | — | Pump-down operation |
| SW5-5 | — | Communication method select ON: Previous SL communication, OFF: New SL communication (SLII) |
| J13: Shorted (Factory default), J13: Open | — | External input switing (CnS1, CnS2 only) shorted: Level input, open: Pulse input |
| J15: Shorted (Factory default), J15: Open | — | Defrost start temperature shorted : normal, open: Cold weather district. |
| — | P01 | Operation priority select 0: First push preferred (Factory default) 1: Last push preferred |
| — | P02 | Outdoor fan snow protection control 0: Control invalid (Factory default) 1: Control valid |
| — | P03 | Outdoor fan snow protection ON time setting 30 sec (Factory default) 10, 30 to 600 sec |
| — | P04 | Demand ratio change value OFF: Invalid (Factory default) 000, 040, 060, 080 [%] |
| — | P05 | Silent mode setting 0: at shipping-3: Larger values for larger effect |
| — | P06 | Allocation of external output (CnZ1) |
| — | P07 | Allocation of external input (CnS1) |
| — | P08 | Allocation of external input (CnS2) |
| — | P09 | Allocation of external input (CnG1) |
| — | P10 | Allocation of external input (CnG2) |
| — | P11 | Spare |
| — | P14 | 2-step demand OFF: Invalid (Factory default) 000, 040, 060, 080 [%] |
| — | P15 | 3-step demand OFF: Invalid (Factory default) 000, 040, 060, 080 [%] |

*1 When both of external input function assignment (P07 – 10) and SW are changed, the control is changed.

(Ex: When CnS1 is used for the input of forced cooling/cooling mode, set P07 at 2 and SW3-7 to ON. When CnS2 is used for the input of forced cooling/cooling mode, set P08 at 2 and SW3-7 to ON)

*2 Under the energy save control, the capacity control becomes valid even if no signal is input to the external input terminal.

By changing the allocation of external input function (P07-10) on the 7-segment, functions of external input terminal may be selected. Inputting signals to external input terminals enable the following functions.

| Setting value for external input function assignment | External input terminal shorted | External input terminal open |
|--|---------------------------------|------------------------------|
| "0" : External operation input | Permitted | Prohibited |
| "1" : Demand input | *3 | *3 |
| "2" : Cooling / heating forced input | Heating | Cooling |
| "3" : Silent mode 1 *1 | Valid | Invalid |
| "4" : Spare | | |
| "5" : Outdoor fan snow control input | Valid | Invalid |
| "6" : Test run external input 1 (SW5-1 equivalent) | Test run start | Normal |
| "7" : Test run external input (SW5-2 equivalent) | Cooling | Heating |
| "8" : Silent mode 2 *2 | Valid | Invalid |
| "9" : Demand input | *3 | *3 |
| "10" : AF periodic inspection display | Valid | Invalid |
| "11" : AF error display | Valid | Invalid |
| "12" : Building multi energy save control | Valid | Invalid |

*1 Valid/invalid is changed depending on outdoor air temperatures.

*2 It is always Valid, regardless of outdoor air temperature.

*3 According to the demand setting table.

External output function of CnZ1 can be changed by changing P06 on 7-segment indicator.

| |
|----------------------------|
| "0" : Operation output |
| "1" : Error output |
| "2" : Compressor ON output |
| "3" : Fan ON output |
| "4 - 9" : Spare |

*3 Demand setting table

| Demand control | Function assignment 1 | Function assignment 9 |
|----------------|-----------------------|-----------------------|
| None (Normal) | Shorted | Shorted |
| 1-step | Open | Shorted |
| 2-step | Open | Open |
| 3-step | Shorted | Open |

7-3. External input and output terminals specifications

| Name | Purpose (Factory default) | Specification | Operating side connector |
|---------------------|---|-------------------------------|---|
| External input CnS1 | External operation input (Closed at shipping) | Non-voltage contactor (DC12V) | J. S. T (NACHIATSU) B02B-XAMK-1 (LF) (SN) |
| External input CnS2 | Demand input (Short-circuited at shipping) | Non-voltage contactor (DC12V) | J. S. T (NACHIATSU) B02B-XARK-1 (LF) (SN) |
| External input CnG1 | Cooling / Heating forced input (Open at shipping) | Non-voltage contactor (DC12V) | J. S. T (NACHIATSU) B02B-XAEK-1 (LF) (SN) |
| External input CnG2 | Silencing mode input (Open at shipping) | Non-voltage contactor (DC12V) | J. S. T (NACHIATSU) B02B-XASK-1 (LF) (SN) |
| External output CnH | Operation output | DC12V output | MOLEX 5286-02A-BU |
| External output CnY | Error output | DC12V output | MOLEX 5266-02A |

8. TEST OPERATION AND TRANSFER

8-1. Before starting operation

- (1) Make sure that a measurement between the power source terminal block and ground, when measured with a 500V megger, is greater than 1 MΩ.
When the unit is left for a long time with power OFF or just after the installation, there is possibility that the refrigerant is accumulated in the compressor and the insulation resistance between the contact terminals for power source and grounding decreases to 1MΩ or around.
When the insulation resistance is 1MΩ or more, the insulation resistance will rise with crank case heater power ON for 6 hours or more because the refrigerant in the compressor is evaporated.
- (2) Please check the resistance of the signaling wire terminal block before power is turned on. If a resistance measurement is 100Ω or less, it suggests a possibility that power cables are connected to the signaling wire terminal block. (Please refer to 6-3. Standard resistance value.)
- (3) Be sure to turn on the crank case heater 6 hours before operation.
After turning on the crank case heater, there is possibility that the compressor doesn't start operation unless the compressor temperature rises or the time mentioned above is passed. (for protection of compressor)
If the 7-segment display shows the "dLO" and "○○○" (the rest of time 360-001) alternately every 4 seconds, perform the test operation after the compressor temperature rises by the turning on the crank case heater.
- (4) Make sure that the bottom of the compressor casing is warm. (higher than outdoor temperature +5°C)
- (5) Be sure to fully open the service valves (liquid, gas and Equalizer oil piping (for a combined installation only)) for the outdoor unit.
Operating the outdoor unit with the valves closed may damage the compressor.
- (6) Check that the power to all indoor units has been turned on. If not, water leakage may occur.

CAUTION

Please make sure that the service valves (gas, liquid, oil equalizing pipe (for a combined installation only)) are full open before a test run. Conducting a test run with any of them in a closed position can result in a compressor failure.

8-2. Check operation

It is recommended to practice the check operation in precedent to the test run.

[Even if the check operation is not practiced, the test run and normal operations can be performed.]

For further details regarding the check operation refer to the technical data.

Important

- Practice the check operation after completing the address setting for the indoor and outdoor units and also after charging the refrigerant.
 - To assure accurate checking, proper amount of refrigerant must be retained.
 - Check operation cannot be done when the system is stopped by an error.
 - Check operation cannot be done when the total capacity of connected indoor units is less than 80% of the outdoor unit capacity.
 - Check operation cannot be done when the system communication method is previous SL.
 - Don't perform the check operation simultaneously on more than one refrigerant line. Accurate checking cannot be obtained.
 - Practice the check operation within the operation temperature ranges (Outdoor temperature: 0 - 43° C, room temperature: 10 - 32°C). Check operation will not start out of these ranges.
 - Outdoor air processing unit cannot be checked. (It is possible to check indoor units other than the outdoor air processing unit of the same refrigerant line.)
- (1) Check items
Check operation allows proving the following points.
 - Whether or not the service valve is left open (Service valve open/close check). (In case of combination, however, accurate judgement can be made only all service valves of master and slave units are closed.)
 - Whether or not the refrigerant pipes and signal cables are connected properly between indoor and outdoor units. (Mismatch check)
 - Whether or not the indoor expansion valve operates properly. (Expansion valve failure check)
 - (2) Method of check operation
 - (a) Starting the check operation
 - Confirm that all of the following switches are turned OFF: SW3-2 (Auto backup operation), SW3-6 (Pipe wash mode), SW3-7 (Forced cooling/heating mode), SW5-1 (Test run), SW5-2 (Test run cooling setting), SW5-3 (Pump-down operation) and SW5-6, -7, -8 (Capacity measurement mode). (In case of combination, on both main and slave units)
 - At the next, turn the SW3-5 (Check operation) OFF → ON (only on master unit in case of combination) so that the check operation will start.
 - It takes 15 - 30 minutes normally (max. 80 min) from the start to the end of check operation.
 - (b) End the check operation and the result display
 - When the check operation is over, the system stops automatically. The 7-segment indicator shows the result (only on master unit in case of combination).
- <Normal ending>
- 7-segment indicator shows "CHO End".
 - Return the SW3-5 to OFF. The 7-segment indicator returns to normal display.
- <Abnormal ending>
- 7-segment indicator shows an error alarm.
 - Referring to the section [Inspect here], repair the faulty section and return the SW3-5 to OFF.
 - At the next, repeat the check operation from the Step (2) above.

Display on 7-segment indicator during check operation

| Code indicator | Data indicator | Display contents |
|----------------|---------------------|---|
| H1 | Max. remaining time | Check operation preparation on. Indicates max. remaining time (min). (In case of combination, indicated on master unit only.) |
| H2 | Max. remaining time | Check operation on. Indicates max. remaining time (min). (In case of combination, indicated on master unit only.) |
| CHO | End | Normal ending of check operation. (In case of combination, indicated on master unit only.) |

Error display on 7-segment indicator after ending the check operation

| Code indicato | Data indicator | Display contents | Check following points |
|---------------|--------------------------|---|--|
| CHL | --- | Operation valve is closed. (Refrigerant circuit is shut off partially.) | <ul style="list-style-type: none"> • Isn't the service valve of outdoor unit left open? • Is the low pressure sensor normal? (Detected pressure can be seen on the 7-segment indicator.) • Is the connector of indoor unit expansion valve coil connected? • Isn't the indoor unit expansion valve coil disconnected from the expansion valve body? • Is the indoor unit heat exchanger sensor normal? (Check if the sensor is disconnected.) |
| CHU | Abnormal indoor unit No. | Mismatch between refrigerant pipes and signal cables. Refrigerant is not circulated to the indoor unit of which No. is displayed. | <ul style="list-style-type: none"> • Are the refrigerant pipes and signal cables connected properly between the indoor and outdoor units? • Is the connector of indoor unit expansion valve coil connected? • Isn't the indoor unit expansion valve coil disconnected from the expansion valve body? • Is the indoor unit heat exchanger sensor normal? (Check if the sensor is disconnected.) |
| CHJ | Abnormal indoor unit No. | Expansion valve on the indoor unit of which No. is displayed is not operating properly. | <ul style="list-style-type: none"> • Is the connector of indoor unit expansion valve coil connected? • Isn't the indoor unit expansion valve coil disconnected from the expansion valve body? • Is the indoor unit heat exchanger sensor normal? (Check if the sensor is disconnected.) |
| CHE | --- | Abnormal ending of check operation. | <ul style="list-style-type: none"> • Isn't any error displayed (E??) on the indoor unit or outdoor unit? • Are signal cables connected without play? • Hasn't the switch setting been changed during the check operation? |

※ When any error is detected, errors other than those listed above may be displayed. In such occasion, refer to the separate technical data.

8-3. Refrigerant quantity check

Refrigerant quantity check tells you whether the refrigerant quantity is excessive (over) or insufficient (low).

(Even if the check operation is not practiced, the test run and normal operation can be performed.)

For further details regarding the check operation refer to the technical data.

It must be noted that, during the check operation, the outdoor units and the indoor units are operated automatically.

Important

- Practice the refrigerant quantity check service only after charging the measured quantity of additional refrigerant.
- It is necessary to add or reduce the refrigerant depending on the result of refrigerant quantity check. Even when it has been judged that proper quantity of refrigerant is retained, the result could become inadequate if the operating conditions are changed.
- It should be noted, therefore, that a result under particular conditions cannot cover all operating conditions.

(1) Guideline of accuracy

Guidelines of judgment on the refrigerant quantity are as shown below.

It should be noted that the result of judgment could vary depending on the conditions of judgment.

| | |
|---------------------------|---|
| Refrigerant quantity over | +10 kg (Single machine) +20 kg (Combination machine) |
| Low refrigerant quantity | 20% of the additional refrigerant quantity for piping (P) |

(2) Confirmation before implementing the refrigerant quantity check

Confirm on all of the followings before starting the refrigerant quantity check.

- Confirm that it has been completed all works up to "8-1 Before starting operation".
- Check operation cannot be done when the total capacity of connected indoor units is less than 80% of the outdoor unit capacity.
- Check operation cannot be done when the system communication method is that of previous SL.
- Check operation cannot be done when the system is stopped by an error.
- Practice the check operation within applicable operation temperature range (Outdoor temperature: 10 - 43°C, room temperature: 15 - 32°C). Check operation will not start out of these ranges.
- Start the check operation only at 5 minutes after stopping all indoor units.

(3) Method of refrigerant quantity check operation**(a) Starting the refrigerant quantity check operation**

- Confirm that all of the following switches are turned OFF; SW3-2 (Auto backup operation), SW3-6 (Pipe wash mode), SW3-7 (Forced cooling/heating mode), SW5-1 (Test run), SW5-2 (Test run cooling setting), SW5-3 (Pump-down operation) and SW5-6, 7, 8 (Capacity measurement mode). (In case of combination, on both master/slave units)
- At the next, turn the SW3-4 (Refrigerant quantity check operation) OFF → ON (only on master unit in case of combination) so that the check operation will start.
- It takes 60 — 75 minutes normally from the start to the end of check operation.

(b) End of refrigerant quantity check operation and result display

- When the check operation is over, the system stops automatically, and the result is displayed on the 7-segment indicator. (Only on master unit in case of combination)

< Normal ending >

- 7-segment indicator shows “Co End”.
- Return the SW3-4 to OFF. 7-segment indicator returns to normal display.

< Abnormal ending >

- 7-segment indicator shows an error alarm.
- Repair the faulty section referring to the guidance, and return the SW3-4 to OFF.
- At the next, repeat the check operation from the Step (2) above.

(4) After the refrigerant quantity check operation

Following codes may be displayed at the end of check operation, other than “Co End”.

Check and take action according to the contents of remedy. And then, repeat the check operation.

Display on 7-segment indicator after the check operation (Displayed on master unit only in case of combination.)

| Code indicator | Data indicator | Meaning | Remedy |
|----------------|----------------|----------------------------------|---|
| Co | Hi | Refrigerant quantity over | ① Too much refrigerant is charged. Reduce the quantity. < Guidelines of reduction > • Single machine:10 kg • Combination machine:20 kg Make sure to recover the refrigerant from the check joint of liquid pipe service valve using the refrigerant recovery device. |
| Co | Lo | Low refrigerant quantity | ① Refrigerant quantity is insufficient. Recharge the refrigerant. < Guideline of recharge > • 20% of the additional refrigerant quantity for piping* (Upper limit: 5 kg) Recharge the refrigerant in the liquid state from the check joint of low pressure line. Make sure to measure the quantity before recharging. |
| Co | H_L | Couldn't judge. | It cannot judge (a state that it cannot judge properly). State of refrigerant might have been unstable during the check operation due to influence of wind, temperature change, etc. ① Check the expansion valve of indoor unit (disconnected coil, disconnected connector or faulty expansion valve). ② Implement at a later date by changing the conditions. |
| Co | --- | Judgment was interrupted. | Check the following points. ① Haven't you changed the setting of DIP switches after the start? Return them to original setting. ② Is any error code (E??) displayed? If Yes, refer to the troubleshooting section in the technical data. |
| Co | HE | Starting conditions are not met. | Starting conditions are not met so that it cannot start the check operation. Refer to “(2) Confirmation before implementing the refrigerant quantity check”. |

※ “Additional refrigerant quantity for piping” means the value of “Additional refrigerant quantity for piping (P)+(l)” in the Section 4-4 Additional refrigerant charge.

Other errors than above may also be displayed if errors are detected. In such occasion, inspect by referring to the separate technical data.

8-4. Test operation

(1) Test run from an outdoor unit.

Whether external inputs are set to ON or OFF, you can start a test run by using the SW5-1 and SW5-2 switches provided on the outdoor unit board.

Select the test run mode first.

Please set SW5-2 to ON for a cooling test run or OFF for a heating test run. (It is set to OFF at the factory for shipment)

Turning SW5-1 from OFF to ON next will cause all connected indoor units to start.

When a test run is completed, please set SW5-1 to OFF.

Note: During a test run, an indoor unit cannot be operated from the remote control unit (to change settings). ("Under centralized control" is indicated)

(2) Method of starting a test run for a cooling operation from an outdoor unit: please operate a remote control unit according to the following steps.

(a) Start of a cooling test run

○ Operate the unit by pressing the **[START/STOP]** button.

○ Select the "COOLING" mode with the **[MODE]** button.

○ Press the **[TEST RUN]** button for 3 seconds or longer.

The screen display will be switched from "Select with ITEM◆" → "Determine with **[SET]**" → "Cooling test run▼."

○ When the **[SET]** button is pressed while "Cooling test run▼" is displayed, a cooling test run will start. The screen display will be switched to "COOLING TEST RUN."

(b) Termination of a cooling test run

○ When the **[START/STOP]** button or the "TEMP SET button is pressed, a cooling test run will be terminated.

Notes : for engineers undertaking piping or electrical installation work

When a test run is completed, please make sure again that the electrical component box cover and the main body panel have been attached before you turn the unit over to the customer.

8-5. TRANSFER

○ Use the instruction manual that came with the outdoor unit to explain the operation method to the customer.

Please ask the customer to keep this installation manual together with the operation manual of his indoor units.

○ Instruct the customer that the power should not be turned off even if the unit is not to be used for a long time. This will enable operation of the air-conditioner any time. (Since the compressor bottom is warmed by the crank case heater, seasonal compressor trouble can be prevented.)

9. CAUTIONS FOR SERVICING (for R410A and compatible machines)

(1) To avoid mixing of different types of oil, use separate tools for each type of refrigerant.

(2) To avoid moisture from being absorbed by the refrigerant oil, the time for when the refrigerant circuit is open should be kept as short as possible. (Within 10 min. is ideal.)

(3) For other piping work, airtightness testing, vacuuming, and refrigerant charging, refer to section 4, REFRIGERANT PIPING WORK.

(4) Diagnostic Inspection Procedures

For the meanings of failure diagnosis messages, please refer to the nameplate provided on the unit (on the back of the control lid)

(5) 7-segment LED indication

Data are indicated when so chosen with the indication selector switch. For the details of indication, please refer to the cable name plate attached on the unit. (On the face of the control lid)

(6) Internal wiring

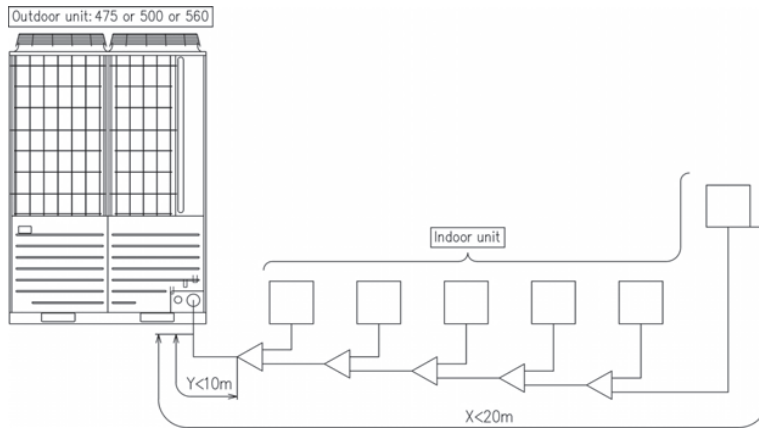
After maintenance, all wiring, wiring ties and the like, should be returned to their original state and wiring route, and the necessary clearance from all metal parts should be secured.

■ Refrigerant charge quantity calculation notes in case outdoor unit capacity is 475,500 and 560*

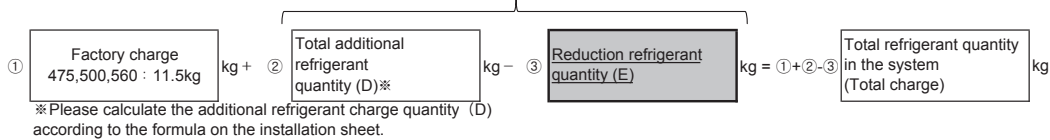
※The combination unit is not applicable

● In case when the outdoor unit capacity is 475—560 and the pipe length (X,Y) is in the following conditions, please calculate the reduction refrigerant quantity (E).

- $X < 20m$ and $Y < 10m$. (X : The length from the outdoor unit to the furthest indoor unit. Y : Main pipe length.)



(②-③) : Additional charge in this case



● The calculation of reduction refrigerant quantity (E)

• If total indoor units capacity is less than outdoor unit capacity, reduction refrigerant quantity (E) is 2kg.

Outdoor unit capacity > Total indoor units capacity (E)=2kg

• If total indoor units capacity is same or larger than outdoor unit capacity, reduction refrigerant quantity (E) is the connecting number of indoor units of refrigerant reduction × 0.5 (kg).

Outdoor unit capacity ≤ Total indoor units capacity (E)=Connecting number of indoor units of refrigerant reduction × 0.5 (kg)

• Indoor units list of the refrigerant reduction

- FDT140 , FDTW140 , FDU140 , FDUM140 , FDT160 , FDU160 , FDUM160 , FDU90 , FDUM90

< Example >

X = 19m (< 20m)
Y = 9m (< 10m)

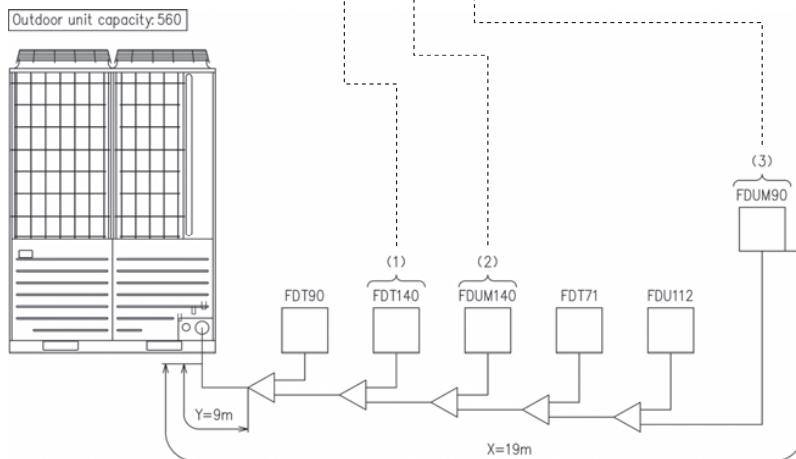
Outdoor unit capacity = 560

Total indoor units capacity = 643 (= FDT90 + FDT140 + FDUM140 + FDT71 + FDU112 + FDUM90)

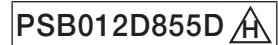
The number of indoor units of the refrigerant reduction = 3 units (FDT140, FDUM140, FDUM90 : 3 units)

(E) = 3 × 0.5 = 1.5(kg)

Outdoor unit capacity: 560 ≤ Total indoor units capacity: 643



8.2 Instructions for installing the branch pipe set



- ⊙ This manual describes the specifications of branching pipe set and header set installation. For outdoor unit installation and indoor unit installation, please refer to the respective installation manuals supplied with your outdoor unit and indoor unit.
- ⊙ Before you set about installation work, please read this manual carefully so that you can carry out installation work according to the instructions contained herein.
- Please read the safety instructions contained in the installation manual supplied with your outdoor unit carefully and carry out installation work unerringly.
- When installation work is completed, conduct a test run to check the installation for any anomaly. Please also give the customer necessary instructions as to the operation and maintenance of the unit pursuant to the instruction manual (supplied with the indoor unit).
- Please ask the customer to keep the installation manual on the customer's part together with the instruction manual.

PARTS LIST

| Branching pipe set type | | Gas side | Liquid side | Different diameter pipe joint |
|-----------------------------------|------------|---|---|-------------------------------|
| Branching pipe set | DIS-22-1G | | | None |
| | DIS-180-1G | | | |
| | DIS-371-1G | | | |
| | DIS-540-3 | | | |
| Outdoor unit's branching pipe set | DOS-2A-3 | | | |
| | DOS-3A-3 | <p>Branch pipe 1</p> <p>Branch pipe 2</p> | <p>Branch pipe 1</p> <p>Branch pipe 2</p> | |

| Branching pipe set type | Gas side | Liquid side | Different diameter pipe joint |
|-------------------------|----------|-------------|-------------------------------|
| HEAD4-22-1G | | | None |
| HEAD6-180-1G | | | |
| HEAD8-371-2 | | | |
| HEAD8-540-3 | | | |

INSTALLATION PROCEDURE

1. Please select an appropriate branching pipe set model and a pipe size by consulting with the installation manual of the indoor unit or other relevant technical documents.

Attention

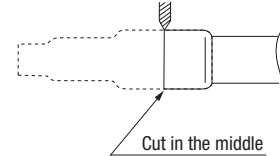
- ① Use a pipe conforming to a pipe size specified for indoor unit connection for the section between an indoor unit and a branching pipe.
- ② Use a pipe conforming to a pipe size specified for outdoor unit connection for the section between an outdoor branching pipe and an outdoor unit.

2. Cut a branching pipe set or a different diameter joint with a pipe cutter to make it fit for a selected pipe size before application.

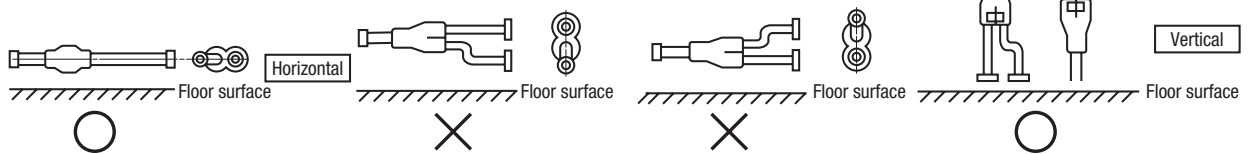
Attention

- ① In cutting pipes, always use a pipe cutter. Remove burrs from a cut end when you cut a pipe. In doing so, keep a cut end downward so that no chips or burrs may enter the pipe.
- ② Take utmost care so that no foreign matter such as dust or water may enter piping during installation work.
 - Please cover all the open ends of piping until installation work is completed. Particularly, any openings in the section of piping laid outdoors should be sealed stringently.
 - As long as possible, avoid open ends left facing upward. Make them face either horizontally or downward.
- ③ A branching joint (for both gas and liquid) must always be positioned in such a way that it branches either horizontally or vertically.

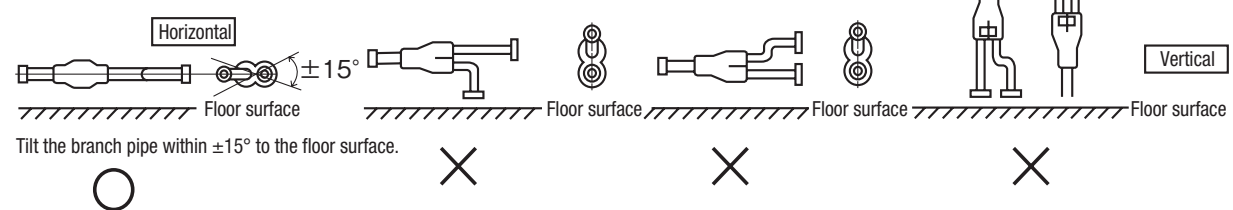
Use pipe cutter to cut pipes.



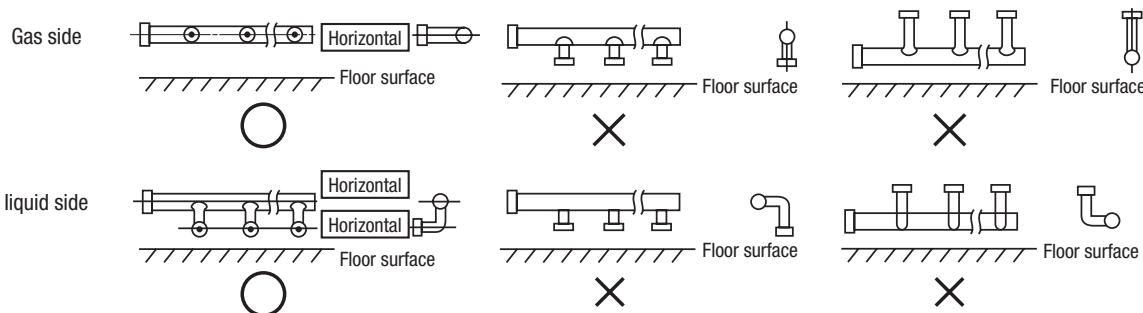
• In the case of a branching pipe set (model type DIS)



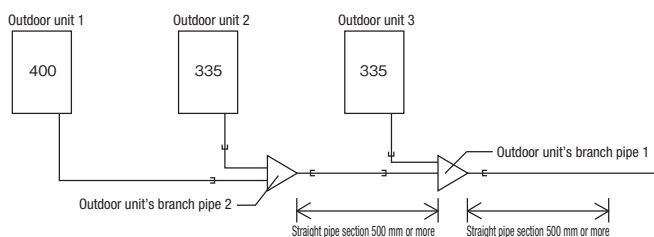
• In the case of a outdoor unit's branching pipe set (model type DOS)



• In the case of a header set (model type HEAD)



④ When using the outdoor unit's branch pipe set, make sure to secure a straight section of 500mm or more for both the gas and liquid pipes before branching them.



⑤ Always apply nitrogen gas when soldering joints. If nitrogen gas is not applied, a large amount of film oxide will be formed which could lead to a critical failure in the unit. Use caution to prevent moisture or any foreign matters from entering the pipe when connecting pipe ends.

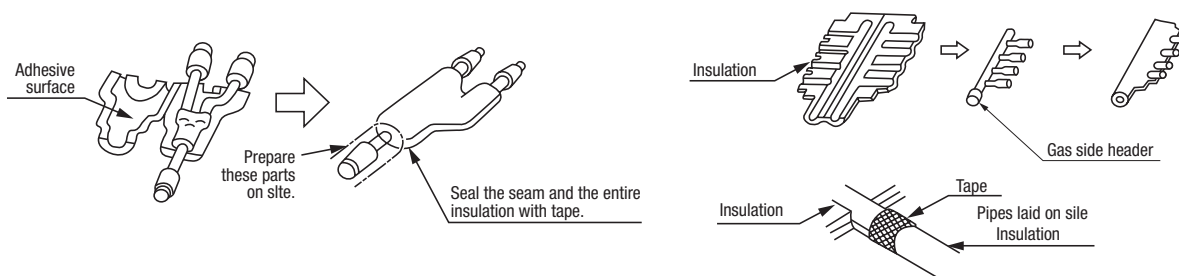
For the method of air tightness testing and pulling air, please refer to the installation manual of the outdoor unit.

⑥ Do not leave piping with any open ends uncovered to prevent water or foreign matters from entering inside.

3. Please dress it with an attached insulation sheet for heat insulation. (Please dress both liquid and gas sides)

Attention

- ① Apply an attached insulation sheet along a pipe, tape the joining line with a joint tape (to be procured on the installer's part) for complete sealing, and wrap the pipe and insulation sheet entirely with a tape.
- ② Dress both liquid and gas pipes with attached insulation sheets for heat insulation.
- ③ Ensure that the liquid pipe is given the heat insulation as good as that of the gas pipe. The absence of heat insulation can cause dripping water from dew condensing on the pipe or performance degradation.



4. How to select a branching pipe

(1) Method to select a branch pipe set (Type DIS)

- An appropriate branching pipe size varies depending on the capacity of connected indoor units (combined total capacity connected downstream), so please choose from the table below.
- In the case of a 140/160 (5/6HP) outdoor unit, however, select DIS-22-1G. (Even if the capacity of connected indoor units reaches 180 or higher, select DIS-22-1G.)

| Total capacity downstream | Branching pipe set model type |
|-------------------------------|-------------------------------|
| less than 180 | DIS-22-1G |
| 180 or higher – less than 371 | DIS-180-1G |
| 371 or higher – less than 540 | DIS-371-1G |
| 540 or more | DIS-540-3 |

Attention

- ① Use a pipe conforming to a pipe size specified for indoor unit connection for the section between an indoor unit and an indoor unit side branching pipe.
- ② A branching joint (for both gas and liquid) must always be positioned in such a way that it branches either horizontally or vertically.

(2) How to select a header set

- Depending on the number of units connected, connect plugged pipes (to be procured on the installer's part) at a branching point (on the indoor unit connection side).
- For the size of a plugged pipe, please refer to the documentation for a header set (optional part).
- In the case of a 140/160 (5/6HP) outdoor unit, however, select HEAD4-22-1G. (Even if the capacity of connected indoor units reaches 180 or higher, select HEAD4-22-1G.)

| Total capacity downstream | Header set model type | Number of branches |
|-------------------------------|-----------------------|--------------------|
| less than 180 | HEAD4-22-1G | Up to 4 branches |
| 180 or higher – less than 371 | HEAD6-180-1G | Up to 6 branches |
| 371 or higher – less than 540 | HEAD8-371-2 | Up to 8 branches |
| 540 or more | HEAD8-540-3 | Up to 8 branches |

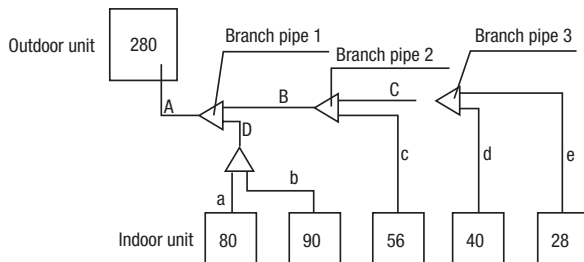
Attention

- ① Use a pipe conforming to a pipe size specified for indoor unit connection for the section between a header and an indoor unit.
- ② Always position a header (both gas and liquid headers) in such a way that it branches horizontally.
- ③ No 224 or 280 indoor unit is connectable to a header.

5. Example of piping

Example 1: Branching type configuration

Connected capacity: 294

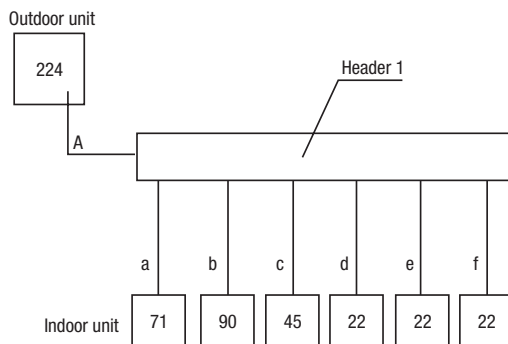


Selection of a branching pipe set

| Mark | Selection procedure | Branching pipe set |
|---------------|--|--------------------|
| Branch pipe 1 | Combined total capacity of indoor units connected downstream (80+90+56+40+28)=294 | DIS-180-1G |
| Branch pipe 2 | Combined total capacity of indoor units connected downstream (56+40+28)=124 | DIS-22-1G |
| Branch pipe 3 | Combined total capacity of indoor units connected downstream (40+28)=68 | DIS-22-1G |

Example 2: Header type configuration

Connected capacity: 272

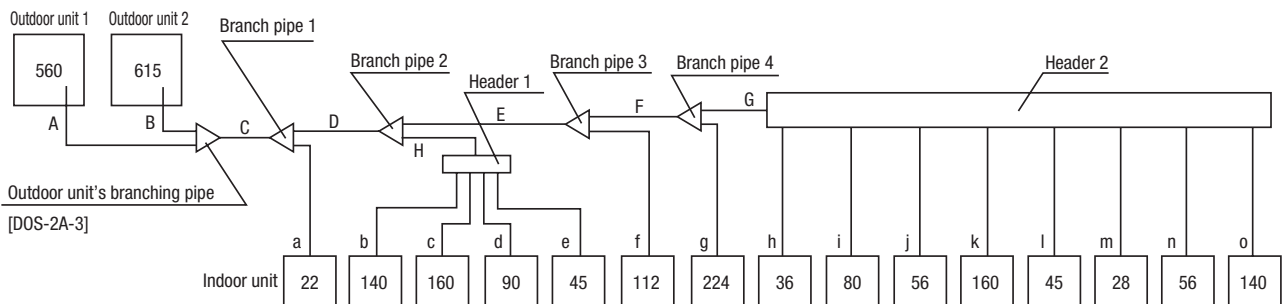


Selection of a header set

| Mark | Selection procedure | Header set |
|----------|---|--------------|
| Header 1 | Combined total capacity of indoor units connected downstream (71+90+45+22+22+22)=272 | HEAD6-180-1G |

Example 3: Branching + Header mixed type configuration

Connected capacity: 1394



Selection of a branching pipe set

| Mark | Selection procedure | Branching pipe set |
|---------------|---|--------------------|
| Branch pipe 1 | Combined total capacity of indoor units connected downstream (22+140+160+90+45+112+224+36+80+56+160+45+28+56+140)=1394 | DIS-540-3 |
| Branch pipe 2 | Combined total capacity of indoor units connected downstream (140+160+90+45+112+224+36+80+56+160+45+28+56+140)=1372 | DIS-540-3 |
| Branch pipe 3 | Combined total capacity of indoor units connected downstream (112+224+36+80+56+160+45+28+56+140)=937 | DIS-540-3 |
| Branch pipe 4 | Combined total capacity of indoor units connected downstream (224+36+80+56+160+45+28+56+140)=825 | DIS-540-3 |

Selection of a header set

| Mark | Selection procedure | Header set |
|----------|---|-------------|
| Header 1 | Combined total capacity of indoor units connected downstream (140+160+90+45)=435 | HEAD8-371-2 |
| Header 2 | Combined total capacity of indoor units connected downstream (36+80+56+160+45+28+56+140)=601 | HEAD8-540-3 |

8.3 Procedure to attach or remove the service panel

(1) Purpose

- To be easier to remove / attach panels
- To improve serviceability

(2) Point of change

- Handles are added on panel to help easier removal / attachment.
- Gap was widened between lower and upper panel so that there is no need to move upper panel when removal / attachment.
- Panel shape is changed with corner radius. It became clear to see claw inserting when removal / attachment.
- Panel structure is changed so that side panel is able to be removed / attached.

(3) Removal and attachment of front panel

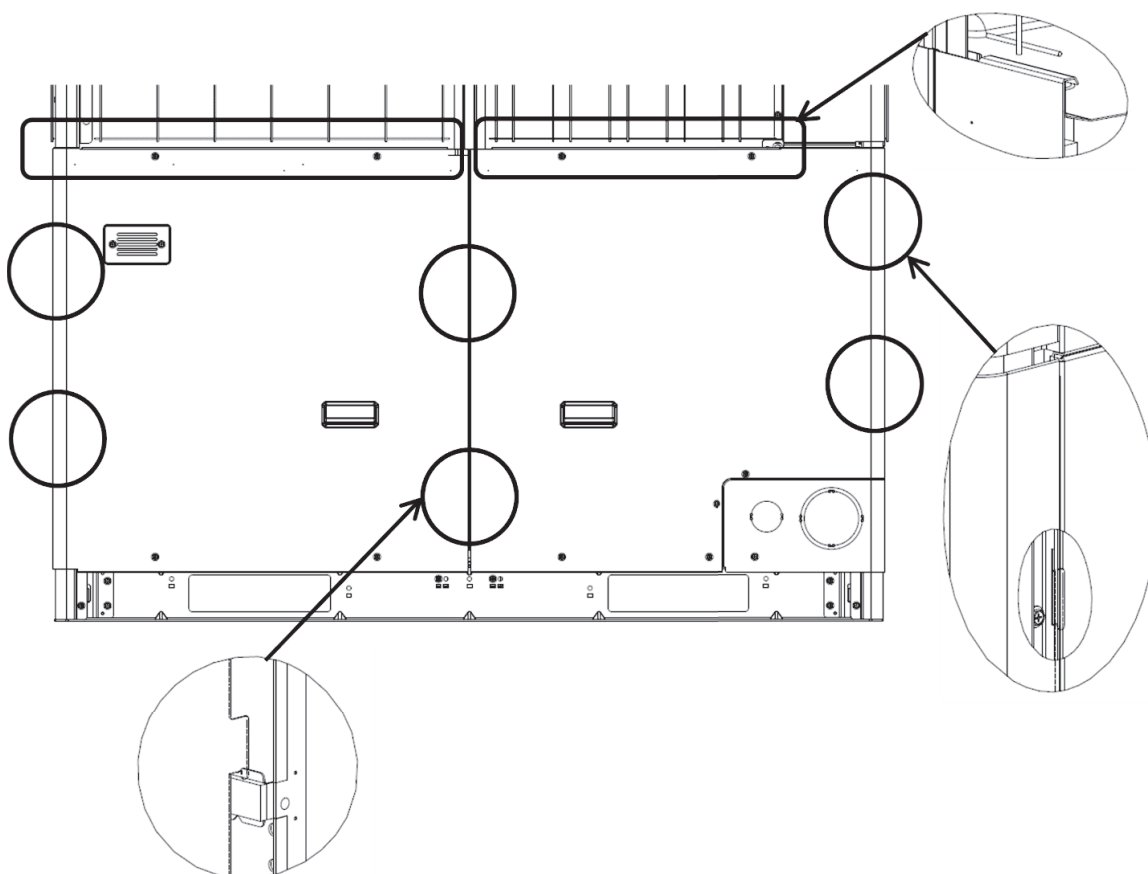
- Removal

- ① Slide-up the front panel about 10mm to release claws. Hold a handle as necessary.
- ② After the claws are released, pull the front panel to this side to remove.

- Attachment

Hook all claws as the reverse order of removal.

(4) Location of claws on front panel



(5) Removal and attachment of rear panel

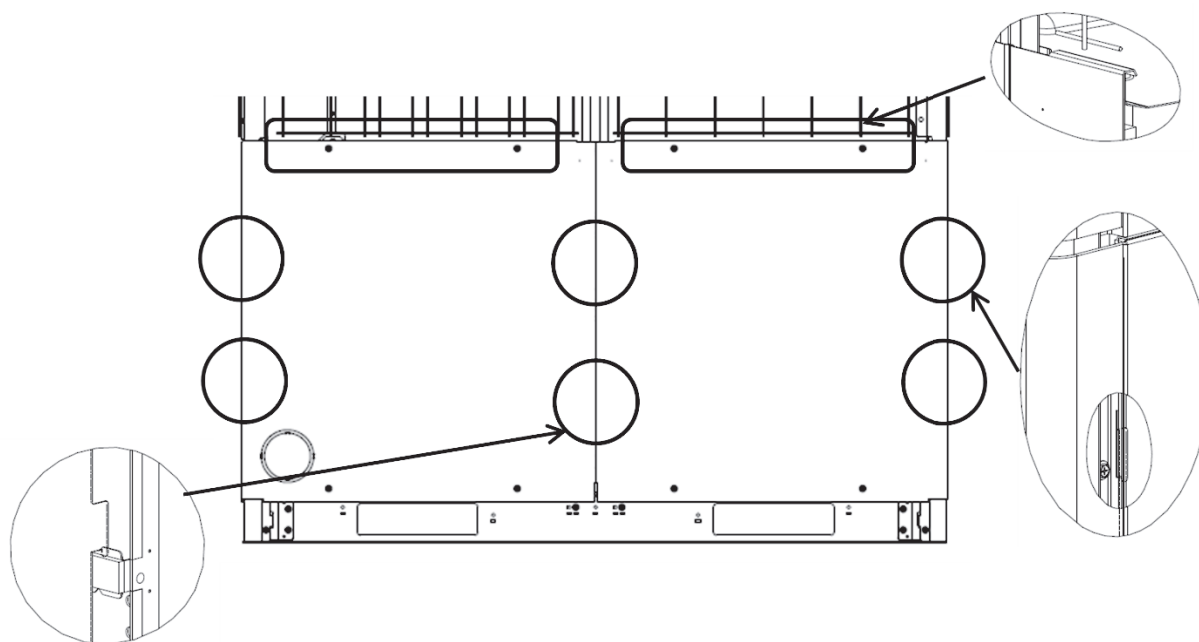
• Removal

- ① Slide-up the front panel about 10mm to release claws.
- ② After the claws are released, pull the front panel to this side to remove.

• Attachment

Hook all claws as the reverse order of removal.

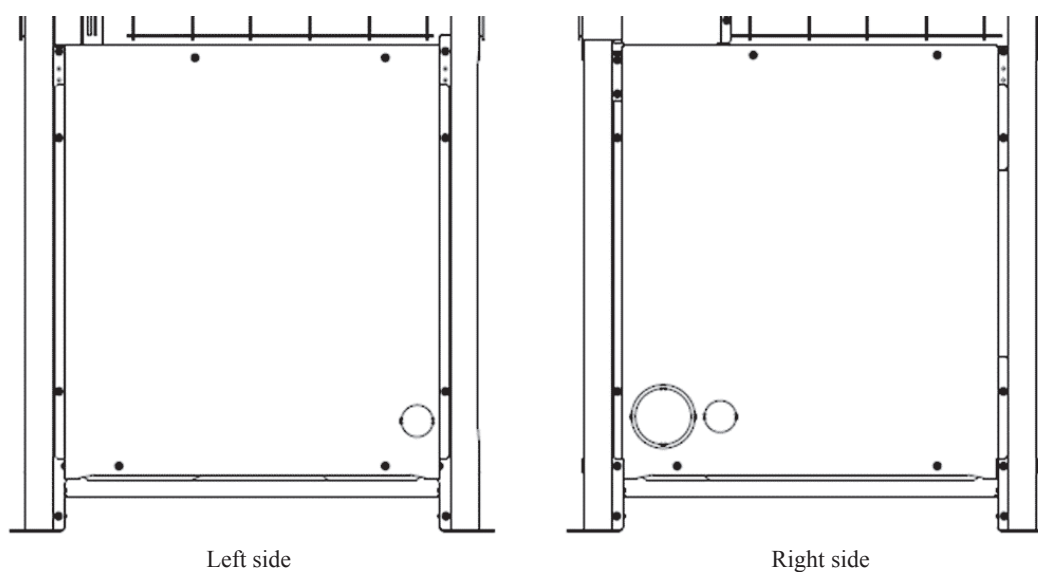
(6) Location of claws on rear panel



(7) Removal and attachment of side panel

- Before remove / attach side panel, both front and rear panel should be removed.

After removal of front and rear panel, take off all screws below and remove side panel.



9. WARNINGS ON REFRIGERANT LEAKAGE

Check of concentration limit

The room in which the air-conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air-conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively.

Suffocation from leakage of R410A is almost nonexistent. With the recent increase in the number of high concentration buildings, however, the installation of multi air-conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air-conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air-conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

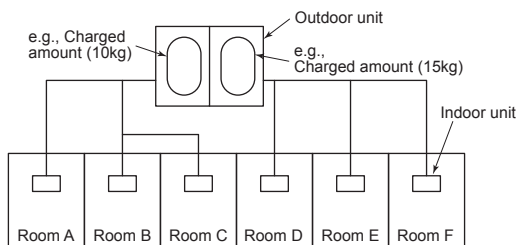
In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The concentration is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

The concentration limit of R410A which is used in multi air-conditioners is 0.42kg/m³. (ISO5149)

Note(1) If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.

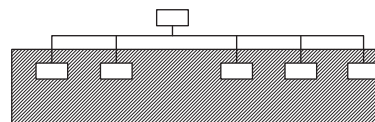


For the amount of charge in this example:
 The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
 The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

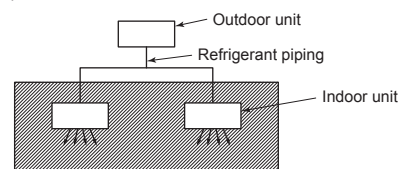
Important

Note(2) The standards for minimum room volume are as follows.

- ① No partition (shaded portion)

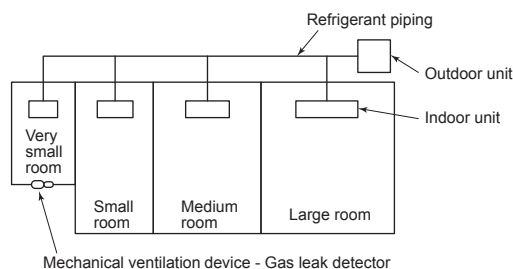


- ② When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

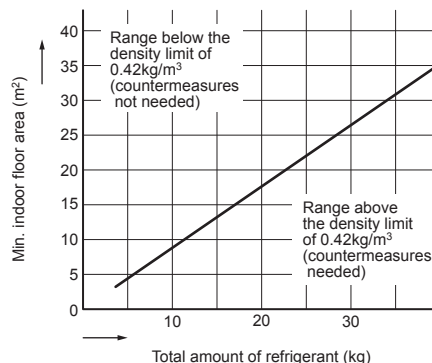


- ③ If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest of course becomes the object.

But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



Note(3) The minimum indoor floor area compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7m high)



10. OUTDOOR UNIT DISASSEMBLY PROCEDURE

PCB012D109

DISASSEMBLY PROCEDURE

WARNING Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

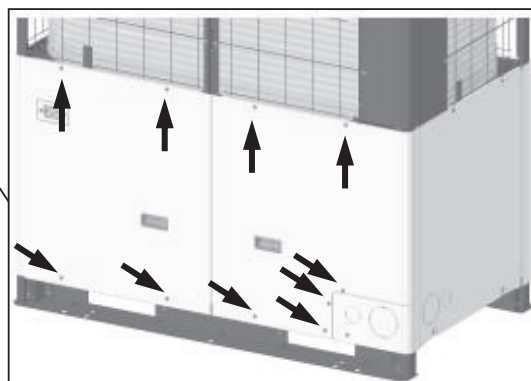
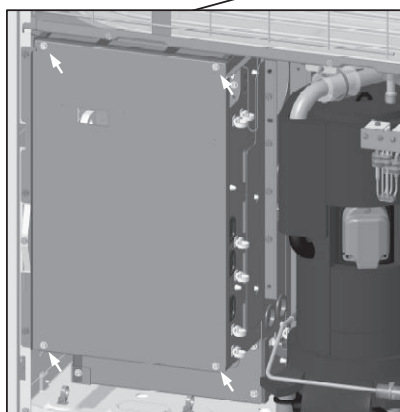
PROCEDURE & PICTURES

1. To remove the service panel

- (1) Remove 10 service panel fixing screws and remove it.

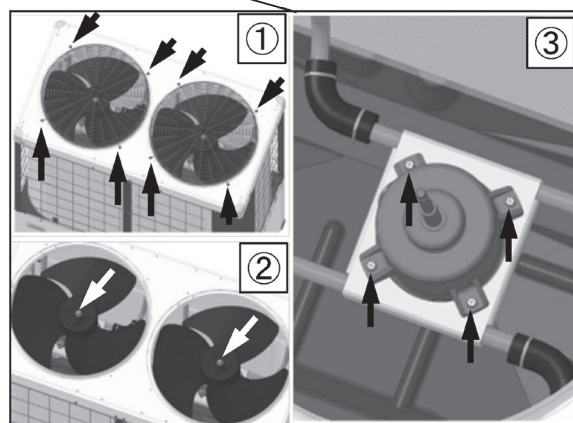
2. To remove the lid of control box

- (1) Remove the service panel.(See No.1.)
- (2) Remove 4 lid fixing screws and remove it.



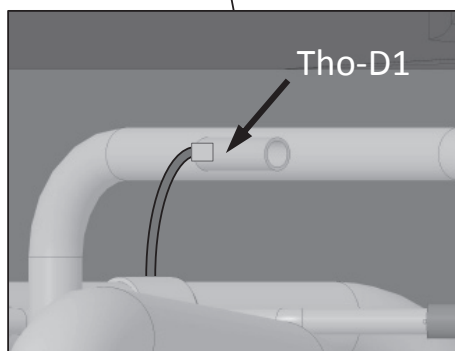
3. To remove the fan motor(FM1, FM2)

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the motor connectors(CNFANx, CNAx) on PCB in control box.
- (3) Remove 8 fan guard fixing screws and remove it.(Pic.①)
- (4) Remove 2 propeller fan fixing nuts and remove it.(Pic.②)
- (5) Remove 4 fan motor fixing nuts and remove it.(Pic.③)



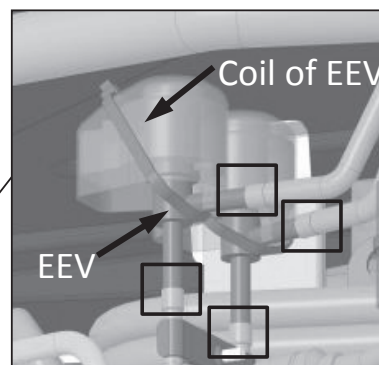
4. To remove the temperature sensor (example "Tho-D1")

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the Tho-D1 connector(CNTH or CNxx) on PCB in control box.
- (3) Pull out the temperature sensor "Tho-D1" from the sensor holder.



5. To remove the electronic expansion valve (EEV)

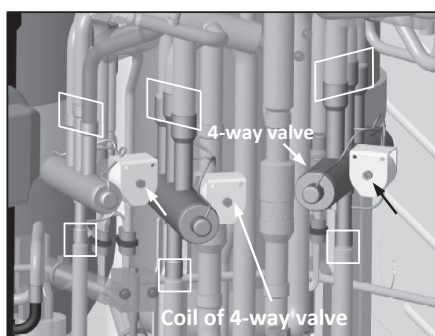
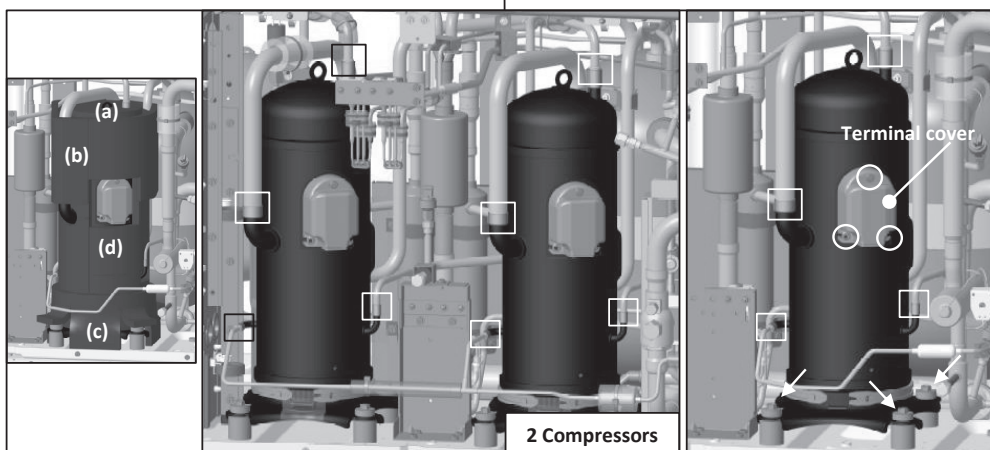
- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the EEV connector(CNEEVx) on PCB in control box.
- (3) Remove the coil cover and pull out the EEV coil on the top.
- (4) Remove welded part of EEV by welding.(□ mark)



PROCEDURE & PICTURES

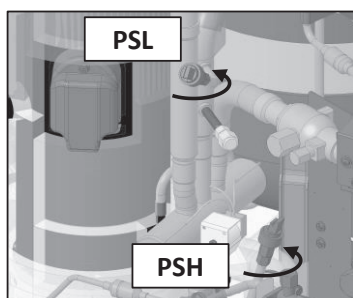
6. To remove the compressor (CM)

- (1) Remove the service panel.(See No.1.)
- (2) Remove the insulation which covers compressors. (Strings (a)~(d) should be loosen.)
- (3) Remove 3 terminal cover fixing bolts(○ mark) and remove it, and disconnect the power wiring.
- (4) Remove welded part of compressor by welding. (□ mark)
- (5) Remove 4 compressor fixing nuts(← mark) using spaner or adjustable wrench.



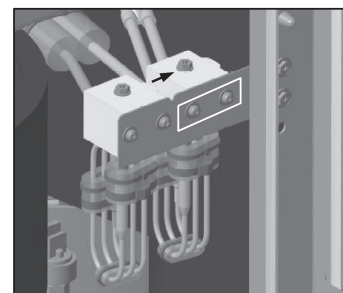
7. To remove the 4-way valve(20S)

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the coil of 4-way valve connector (CNNxx) on PCB in control box.
- (3) Remove coil of 4-way valve fixing screw and remove it.(← mark)
- (4) Remove welded part of 4-way valve by welding. (□ mark)



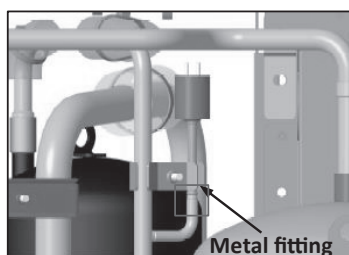
8. To remove the low/high pressure sensor (PSL/PSH)

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the PSL/PSH connector (CNLx) on PCB in control box.
- (3) Turn PSL/PSH to the left and remove it. (Double spanners are needed.)



9. To remove the high pressure switch (63H)

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the 63H connector(CNQx) on PCB in control box.
- (3) Remove the metal fitting fixing screw and remove it.
- (4) Remove welded part of high pressure switch by welding.

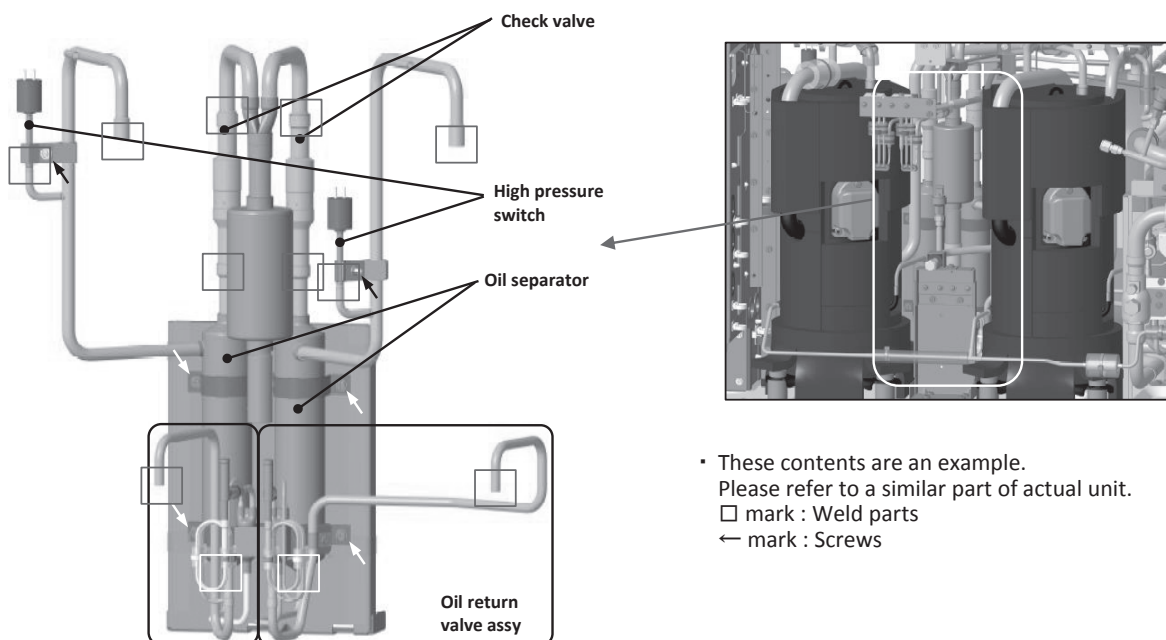


10. To remove bypass valve (SV)

- (1) Remove the lid of control box.(See No.2.)
- (2) Disconnect the SV connector(CNNxx) on PCB in control box.
- (3) Remove 2 coil of SV fixing screws and remove it.(□ mark)
- (4) Remove SV fixing screws(← mark) and remove it.
- (5) Remove welded part of SV by welding.

PROCEDURE & PICTURES

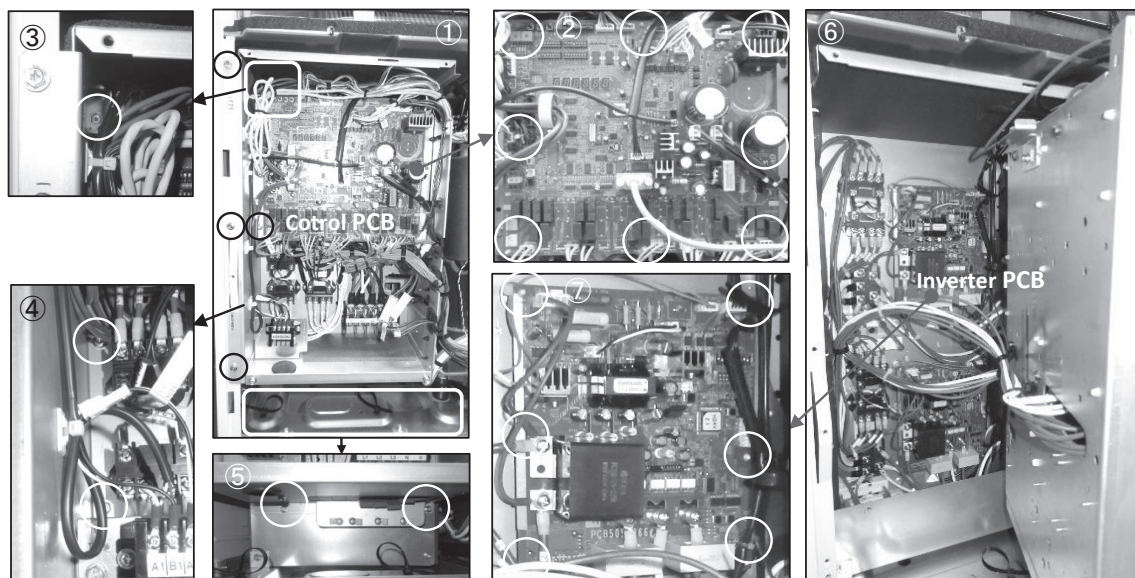
11. To remove other components



12. To remove the printed circuit board (PCB)

- (1) Remove the lid of control box.(See No.2.)
- **Control PCB**
 - (2) Pull off all the inserted connectors.
 - (3) Take off 8 control PCB fixing locking supports and remove it.(○ mark, Pic.②)

- **Inverter PCB**
 - (4) Remove 8 plate fixing screws(○mark, Pic.①③④⑤) and open it.(Pic.⑥)
 - (5) Pull off all the inserted connectors.
 - (6) Take off 6 inverter PCB fixing locking supports and remove it.(○mark, Pic.⑦)



11. INDOOR UNIT DISASSEMBLY PROCEDURE

PJF012D045

(1) FDT series

DISASSEMBLY PROCEDURE

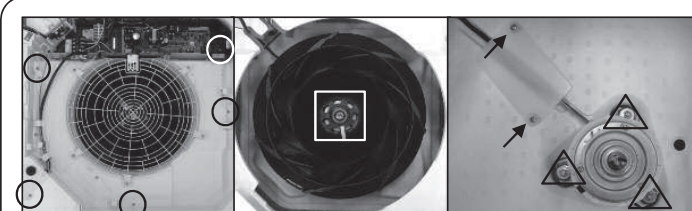
⚠ WARNING Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDT series)

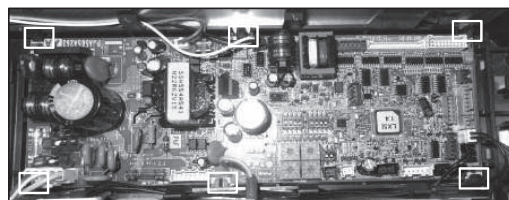


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

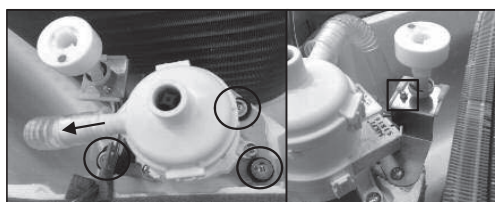


- 3. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the motor connector(CNMx.) on PCB in control box.
(3) Remove 5 bellmouth fixing screws and remove it.(O mark)
(4) Remove the impeller fixing nut and remove it.(□ mark)
(5) Remove 2 plate fixing screws and remove it.(← mark)
(6) Remove 3 motor fixing nuts and remove it.(△ mark)

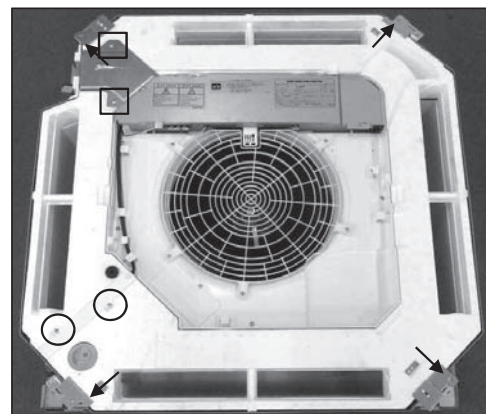
- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Take off 6 fixing hooks and remove it.



- 4. To remove the drain pan**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Remove 2 plate fixing screws and remove it.
(O mark)
(4) Remove 2 lid fixing screws and remove it.
(□ mark)
(5) Remove 4 drain pan fixing screws and remove it.
(← mark)

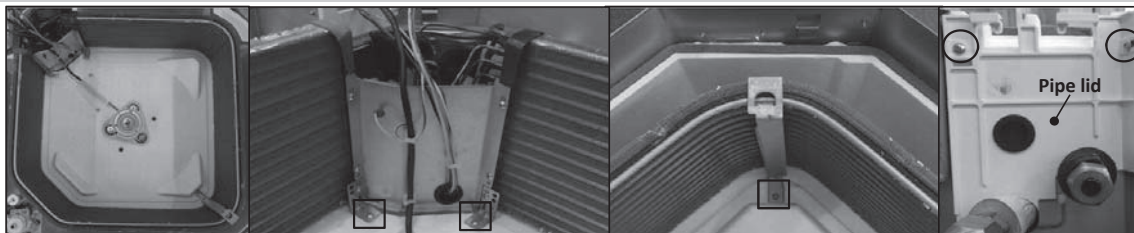


- 5. To remove drain pump (DM) and float switch (FS)**
(1) Remove the drain pan.(See No.4.)
(2) Pull the hose to the arrow direction and remove it.
(3) Remove 3 drain pump fixing screws and remove it.(O mark)
(4) Remove the float switch fixing screw and remove it.(□ mark)



- 6. To remove the temperature sensors (example "Thi-R1")**
(1) Remove the drain pan.(See No.4.)
(2) Pull out the temperature sensor "Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

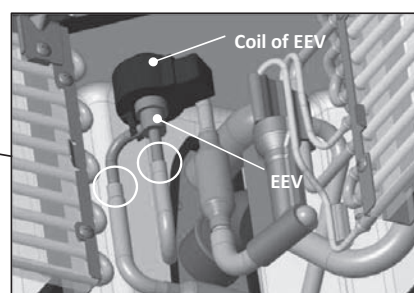


7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4.)
- (2) Remove 2 pipe lid fixing screws and remove it.(○ mark)
- (3) Remove 3 heat exchanger assembly fixing screws and remove it.(□ mark)

8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



General view

(2) FDTC series

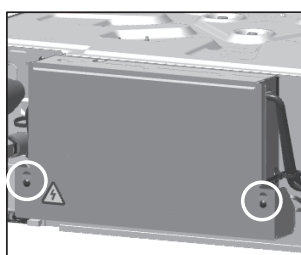
PJA012D792A 

DISASSEMBLY PROCEDURE

 **WARNING** Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

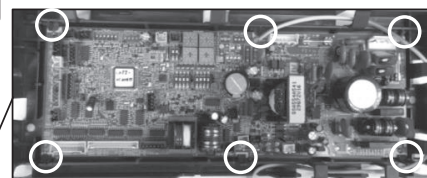
PROCEDURE & PICTURES (FDTC series)

**1. To remove the lid of control box**

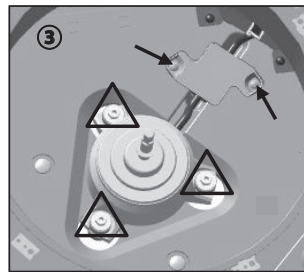
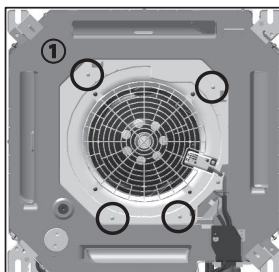
- (1) Remove 2 lid fixing screws then remove the lid.

2. To remove the printed circuit board (PCB)

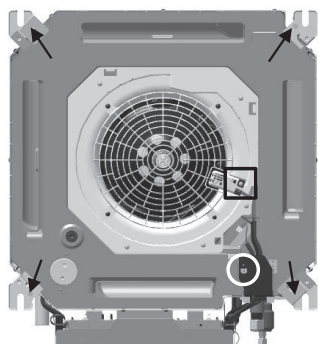
- (1) Remove the lid of control box. (See No.1.)
- (2) Pull off all the inserted connectors.
- (3) Take off 6 fixing hooks then remove the PCB.

**3. To remove the impeller and motor (FM)**

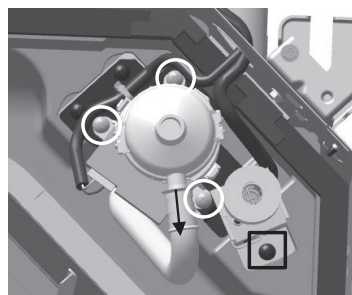
- (1) Remove 4 bellmouth fixing screws then remove the bellmouth. (○ mark)
- (2) Remove the turbo fan fixing nut then remove the turbo fan. (□ mark)
- (3) Remove 2 plate fixing screws then remove the plate. (← mark)
- (4) Disconnect the motor connector (CNMx) in the middle of wiring.
- (5) Remove 3 motor fixing nuts then remove the motor. (△ mark)

**4. To remove the drain pan**

- (1) Remove the lid of control box. (See No.1.)
- (2) Remove the plate fixing screw then remove the plate. (○ mark)
- (3) Remove the sensor holder screw then remove the sensor holder. (□ mark)
- (4) Remove 4 drain pan fixing screws then remove the drain pan. (← mark)

**5. To remove drain pump (DM) and float switch (FS)**

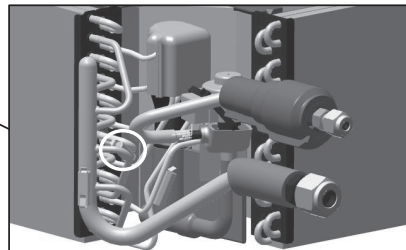
- (1) Remove the lid of control box. (See No.1.)
- (2) Disconnect the drain pump connector (CNRx) and float switch connector (CNix).
- (3) Remove the drain pan. (See No.4.)
- (4) Pull the hose to the arrow direction then remove the hose.
- (5) Remove 3 drain pump fixing screws then remove the drain pump. (○ mark)
- (6) Remove the float switch fixing screw then remove the float switch. (□ mark)



PROCEDURE & PICTURES

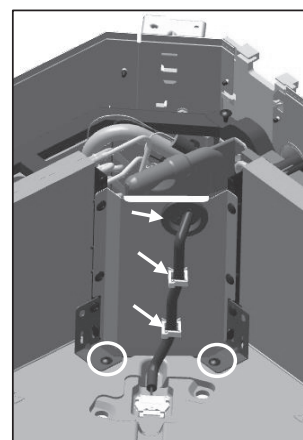
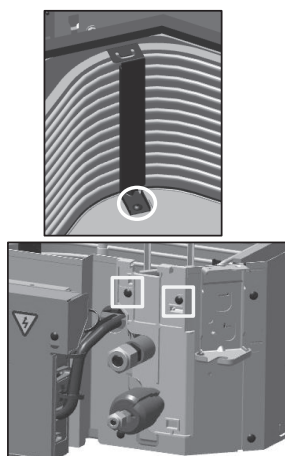
6. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the temperature sensors connector(CNNx).
- (3) Remove the drain pan.(See No.3.)
- (4) Pull out the temperature sensors "Thi-R1" from the sensor holder.



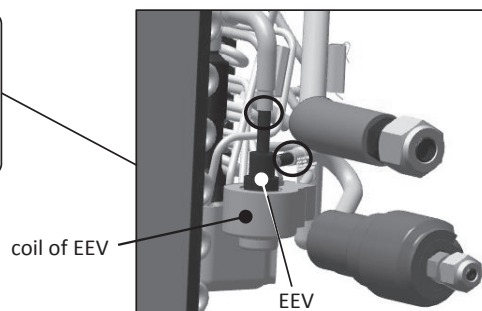
7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4.)
- (2) Remove 2 pipe lid fixing screws then remove the pipe lid.(□ mark)
- (3) Remove the fan motor wiring from clip and grommet.(← mark)
- (4) Remove 3 heat exchanger assembly fixing screws then remove the heat exchanger assembly.(○ mark)



8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7.)
- (2) Remove the damper sealant from EEV.
- (3) Remove the coil of EEV by pull out on the top.
- (4) Remove welded part of EEV by welding.(○ mark)



General view

(3) FDTW series

PJB012D309

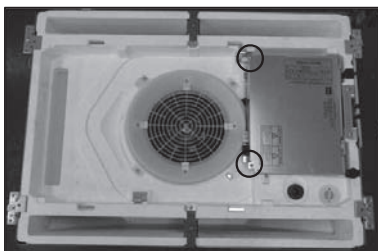
DISASSEMBLY PROCEDURE

⚠ WARNING

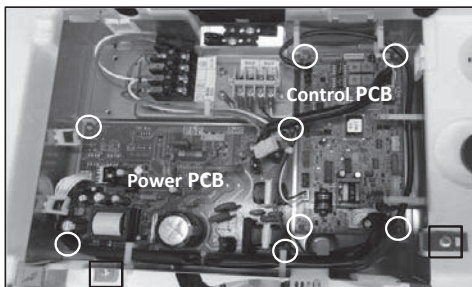
Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTW series)

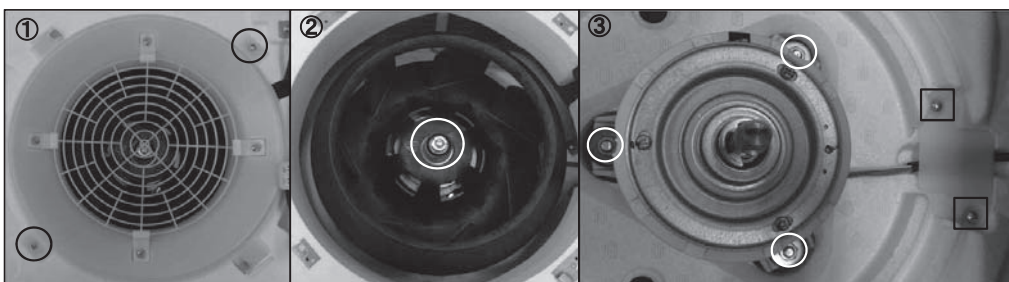


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

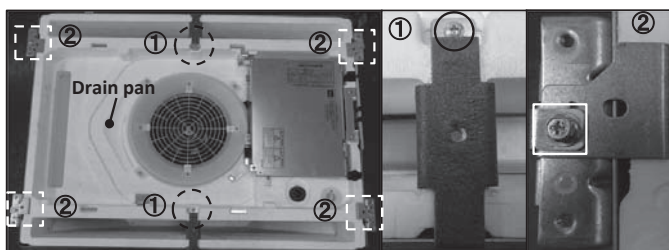


- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
- **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it.(○ mark)
 - **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it.(○ mark)

- 3. To remove the control box**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Remove 2 control box fixing screws(□ mark) and remove it.

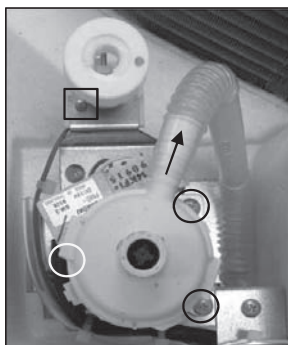


- 4. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the motor connector(CNMx) on PCB in control box.
(3) Remove 2 fan guard fixing screws and remove it.(Pic.①)
(4) Remove the impeller fixing nut and remove it.(Pic.②)
(5) Remove 2 plate fixing screws and remove it.(Pic.③, □ mark)
(6) Remove 3 motor fixing nuts and remove it.(Pic.③, ○ mark)

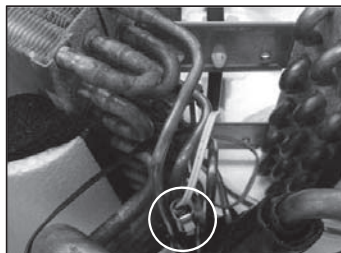


- 5. To remove the drain pan**
(1) Remove the control box.(See No.3.)
(2) Remove the plate fixing screw and remove it.
(Pic.①, ○ mark)
(3) Remove the bracket fixing screw.(Pic.②, □ mark)
(4) Pull drain pan off.

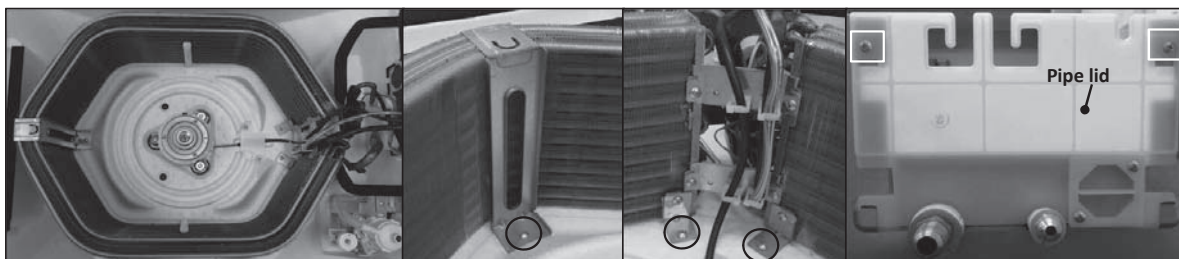
PROCEDURE & PICTURES



- 6. To remove the drain pump(DM) and float switch(FS)**
- (1) Remove the drain pan.(See No.5.)
 - (2) Pull a hose to the arrow direction and remove it.
 - (3) Remove 3 drain pump fixing screws and remove it.(○ mark)
 - (4) Remove the float switch fixing screw and remove it.(□ mark)

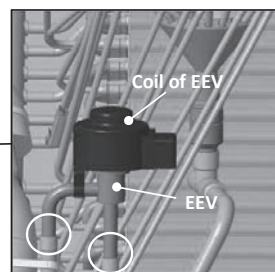


- 7. To remove the temperature sensors(example"Thi-R1")**
- (1) Remove the drain pan.(See No.5.)
 - (2) Pull out the temperature sensor"Thi-R1" from the sensor holder.



- 8. To remove the heat exchanger assembly**
- (1) Remove the drain pan.(See No.5.)
 - (2) Remove 2 pipe lid fixing screws and remove it.(□ mark)
 - (3) Remove 3 heat exchanger assembly fixing screws and remove it.(○ mark)

- 9. To remove the Electronic Expansion Valve (EEV)**
- (1) Remove the heat exchanger assembly.(See No.8.)
 - (2) Remove the coil of EEV by pull out on the top.
 - (3) Remove welded part of EEV by welding.(○ mark)



General view

(4) FDTQ series

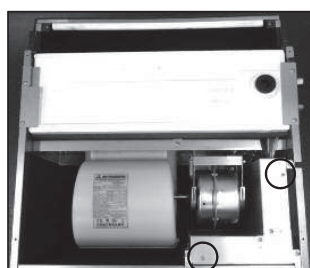
PJC012D211

DISASSEMBLY PROCEDURE

⚠ WARNING**Precautions for safety**

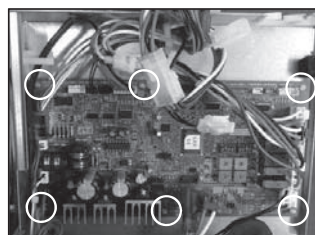
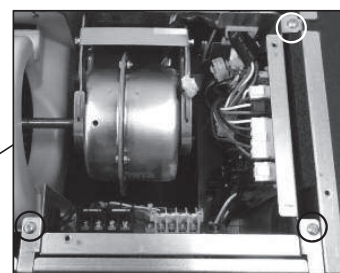
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTQ series)



- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

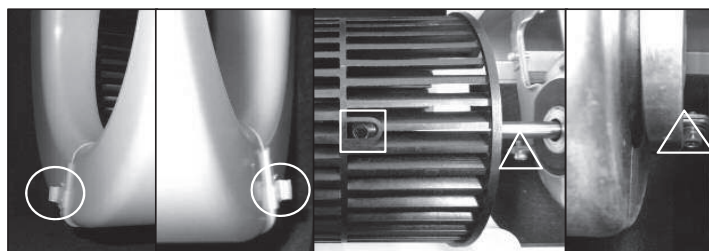
- 2. To remove the control box**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Remove 3 control box fixing screws and remove it.
(4) Pull out the control box.



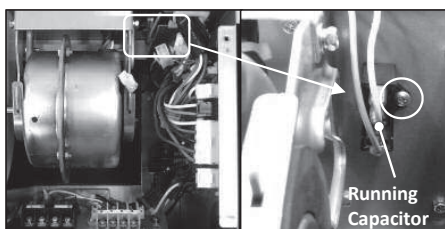
- 3. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Remove control box.(See No.2.)
(3) Take off 6 PCB fixing locking supports and remove it.



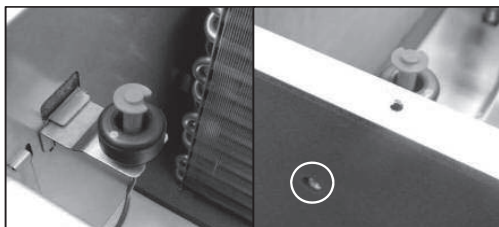
- 4. To remove the drain pan.**
(1) Remove 2 plate fixing screws and remove it.(right and left)
(2) Pull out the control box.



- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the float switch connector(CNFx) in the middle of wiring.
(3) Take off 2 impeller casing hooks and remove it.(O mark)
(4) Remove the impeller fixing bolt and remove it.(□ mark)
(5) Remove 2 motor fixing screws and remove it.(△ mark)

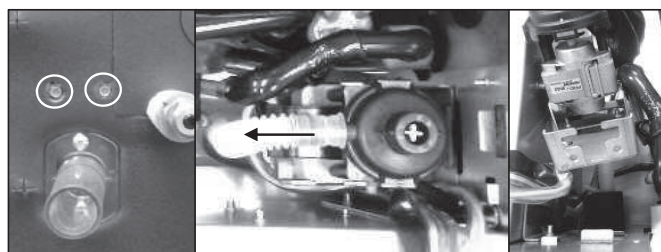


- 6. To remove the running capacitor of fan motor**
(1) Remove the running capacitor fixing screw and remove it.



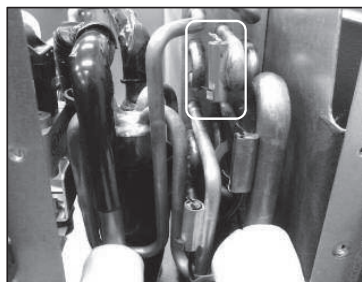
- 7. To remove the float switch (FS)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the float switch connector(CN1x) in the middle of wiring.
(3) Remove the drain pan.(See No.4.)
(4) Remove the float switch fixing screw and remove it.

PROCEDURE & PICTURES



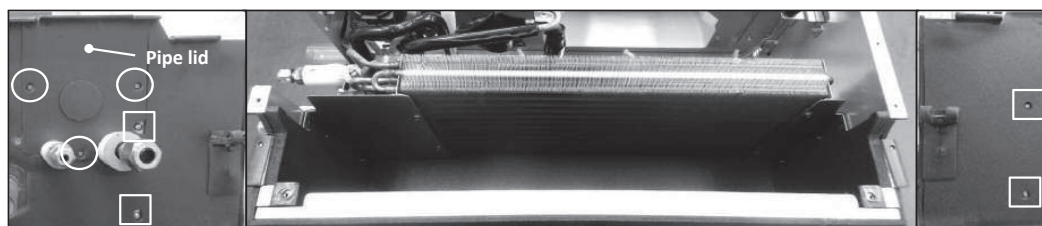
8. To remove drain pump (DM)

- (1) Remove the lid of control box.(See No.1.)
- (2) Remove the drain pan.(See No.4.)
- (3) Disconnect the drain pump connector(CNRx) in the middle of wiring.
- (4) Pull a hose to the arrow direction and remove it.
- (5) Remove 2 drain pump assembly fixing screws and remove it.



9. To remove the temperature sensors(example"Thi-R1")

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.4.)
- (4) Pull out the temperature sensor"Thi-R1" from the sensor holder.

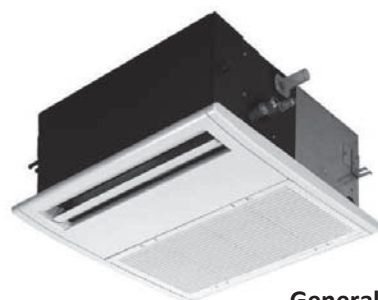
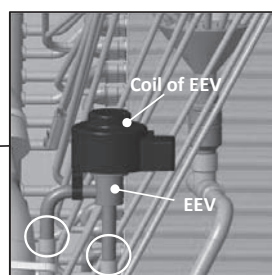


10. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.3.)
- (2) Remove 3 pipe lid fixing screws and remove it.(O mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

11. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.10.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(O mark)



General view

(5) FDTS series

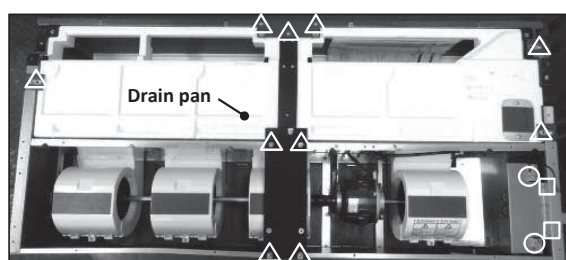
PJC012D311

DISASSEMBLY PROCEDURE

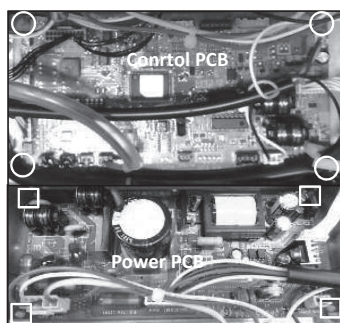
⚠ WARNING Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDTS series)

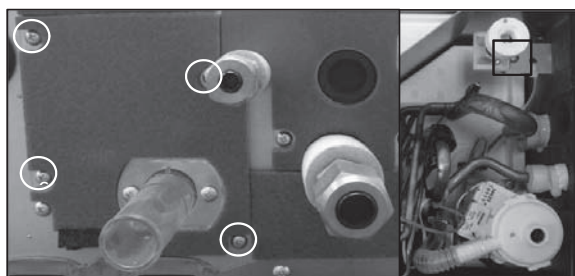
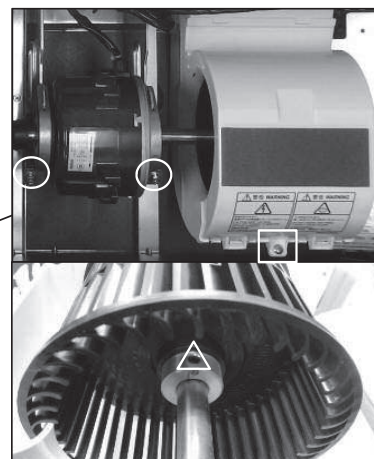


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.(○ mark)
- 2. To remove the control box**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Remove 2 control box fixing screws and remove it.(□ mark)
- 3. To remove the drain pan**
(1) Remove 10 drain pan fixing screws and remove it.
(△ mark)



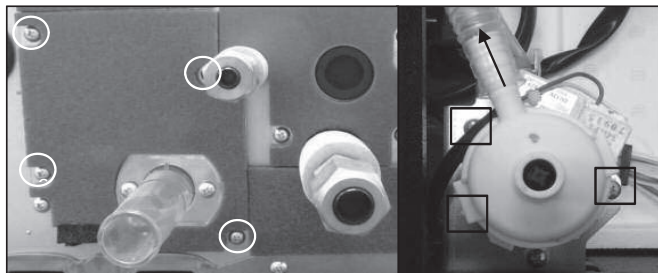
- 4. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
 - **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it.(○ mark)
 - **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it.(□ mark)

- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the motor connector(CNMx) on PCB in control box.
(3) Remove 2 motor fixings screw and remove it.(○ mark)
(4) Remove the fan casing fixing screw and remove it.(□ mark)
(5) Remove the impeller fixing bolt and remove it.(△ mark)



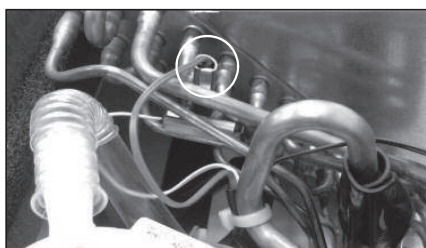
- 6. To remove the float switch (FS)**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the float switch connector(CNI) on PCB in control box.
(3) Remove 4 drain pump assembly fixing screws and remove it.(○ mark)
(4) Remove the float switch fixing screw and remove it.(□ mark)

PROCEDURE & PICTURES



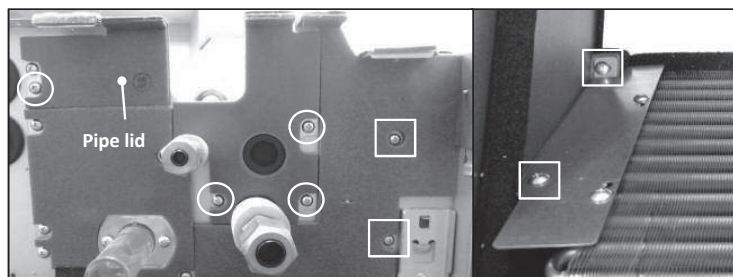
7. To remove drain pump (DM)

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the drain pump connector(CNR) on PCB in control box.
- (3) Remove 4 drain pump assembly fixing screws and remove it.(O mark)
- (4) Pull a hose to the arrow direction and remove it.
- (5) Remove 3 drain pump fixing screws and remove it.(□ mark)



8. To remove the temperature sensors(example"Thi-R1")

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.3.)
- (4) Pull out the temperature sensor"Thi-R1" from the sensor holder.

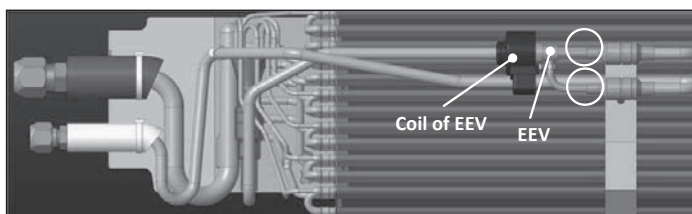


9. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.3.)
- (2) Remove 4 pipe lid fixing screws and remove it.(O mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

10. To remove the electronic expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.7.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (O mark)



General view

(6) FDU • FDUM series

PJG012D019

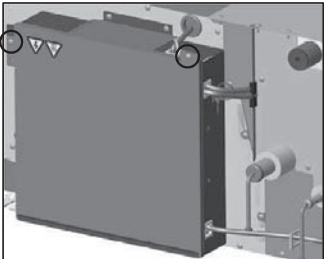
DISASSEMBLY PROCEDURE

⚠ WARNING**Precautions for safety**

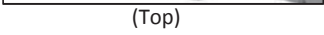
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDU • FDUM series)

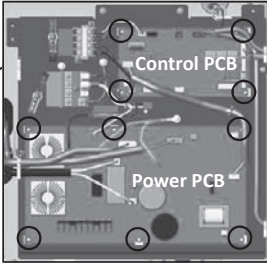
(Bottom)



(Top)



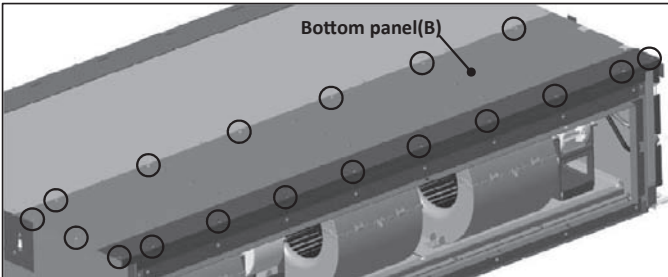
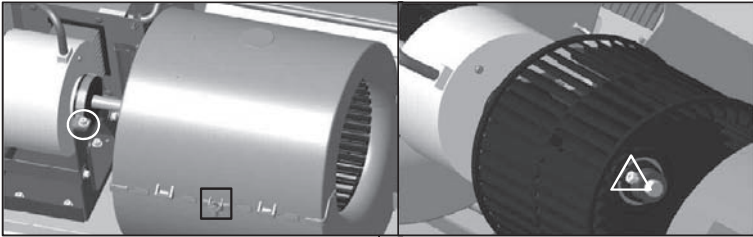
1. To remove the lid of control box
(1) Remove 2 lid fixing screws and remove it.



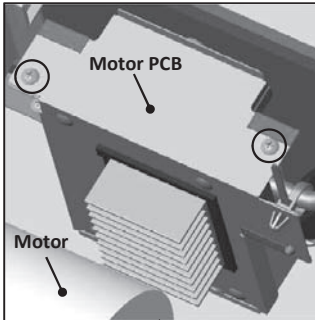
2. To remove the printed circuit board (PCB)
(1) Remove the lid of control box. (See No.1.)
(2) Pull off all the inserted connectors.

- **Control PCB**
(3) Take off 4 control PCB fixing locking supports (○ mark) and remove it.
- **Power PCB**
(4) Take off 6 power PCB fixing locking supports (○ mark) and remove it.

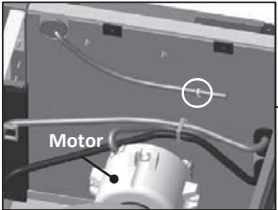
3. To remove the bottom panel(B)
(1) Remove 18 panel fixing screws and remove it.

4. To remove the impellers and motors(FM)
(1) Remove the lid of control box. (See No.1.)
(2) Remove the bottom panel(B). (See No.3.)
(3) Disconnect the motor connector (CNFMx or CNMx) on PCB in control box.
(4) Remove the motor fixing screw and remove it. (○ mark/right and left side)
(5) Remove the fan casing fixing screw and remove it. (□ mark)
(6) Remove the sirocco fan fixing bolt and remove it. (△ mark)

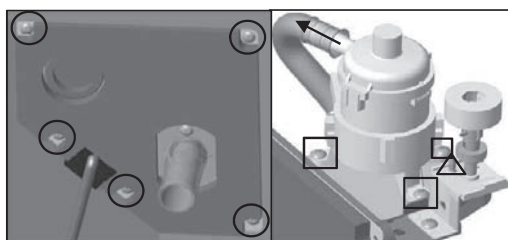


5. To remove the motor PCB
(1) Remove the lid of control box. (See No.1.)
(2) Remove the bottom panel(B). (See No.3.)
(3) Disconnect the motor PCB connector (CNFMx or CNMx) on PCB in control box.
(4) Remove 2 motor PCB fixing screws and remove it.

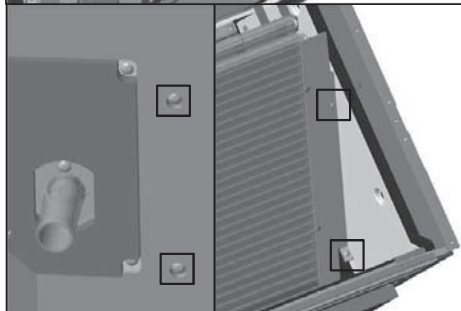
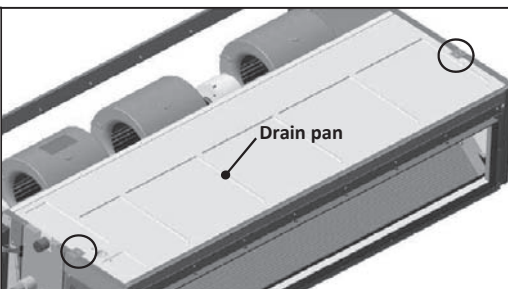
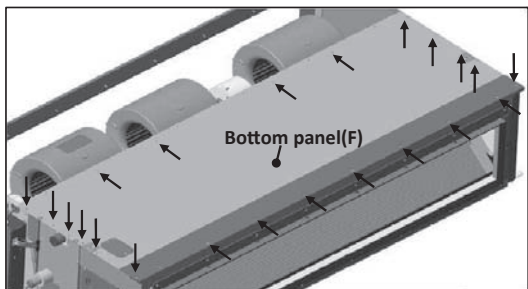


6. To remove the temperature sensors (example "Thi-A")
(1) Remove the lid of control box. (See No.1.)
(2) Remove the bottom panel(B). (See No.3.)
(3) Disconnect the Thi-A connector (CNH) on PCB in control box.
(4) Pull the temperature sensor fixing clip and remove it. (○ mark)

PROCEDURE & PICTURES

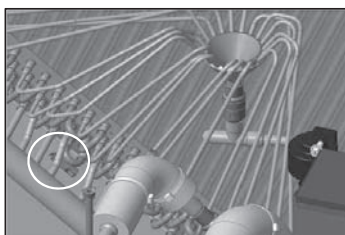
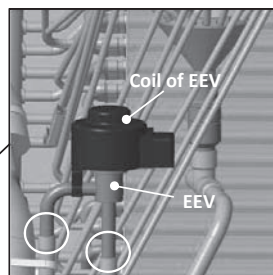


- 7. To remove the drain pump(DM) and flot switch(FS)**
- (1) Remove the lid of control box.(See No.1.)
 - (2) Remove 5 drain pump assembly fixing screws and remove it. (○ mark)
 - (3) Disconnect the drain pump connector(CNR) on PCB in control box.
 - (4) Pull a hose to the arrow direction and remove it.
 - (5) Remove 3 drain pump fixing screws and remove it.(□ mark)
 - (6) Disconnect the flot switch connector(CNI) on PCB in control box.
 - (7) Remove the flot switch fixing screw and remove it.(△ mark)



- 8. To remove the heat exchanger assembly**
- (1) Remove the bottom panel(B).(See No.3.)
 - (2) Remove 22 bottom panel(F) fixing screws and remove it.(← mark)
 - (3) Remove 2 drain pan fixing screws and remove it.(○ mark)
 - (4) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

- 9. To remove the Electronic Expansion Valve (EEV)**
- (1) Remove the heat exchanger assembly.(See No.8.)
 - (2) Remove the coil of EEV by pull out on the top.
 - (3) Remove welded part of EEV by welding.(○ mark)



- 10. To remove the temperature sensors (example "Thi-R3")**
- (1) Remove the lid of control box.(See No.1.)
 - (2) Disconnect the Thi-R3 connector(CNN) on PWB in control box.
 - (3) Remove the drain pan.(See No.8.)
 - (4) Pull out the temperature sensor"Thi-R3" from the sensor holder.



General view

(7) FDUT series

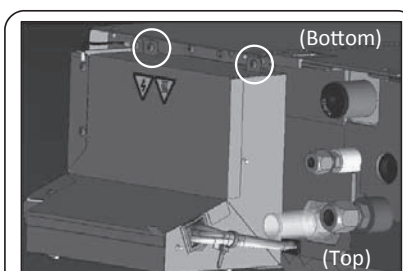
PJH012D004

DISASSEMBLY PROCEDURE

⚠ WARNING Precautions for safety

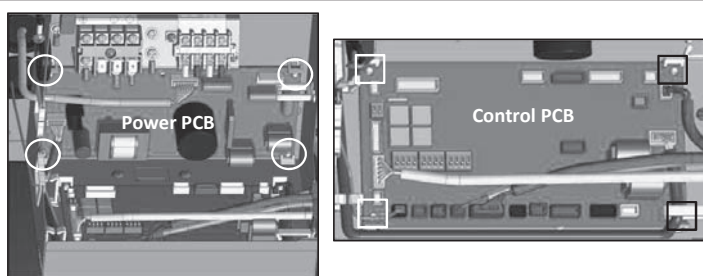
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDUT series)

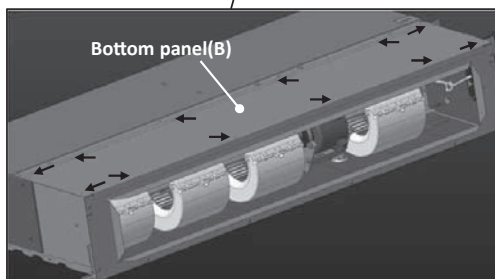


- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

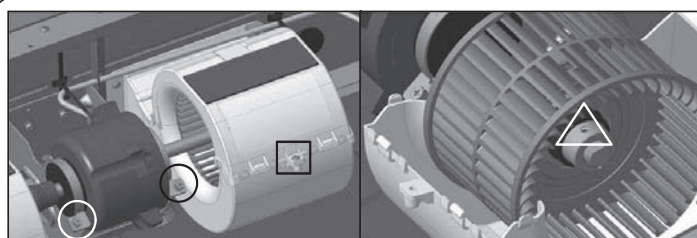
- 3. To remove the bottom panel(B)**
(1) Remove 12 panel fixing screws and remove it.



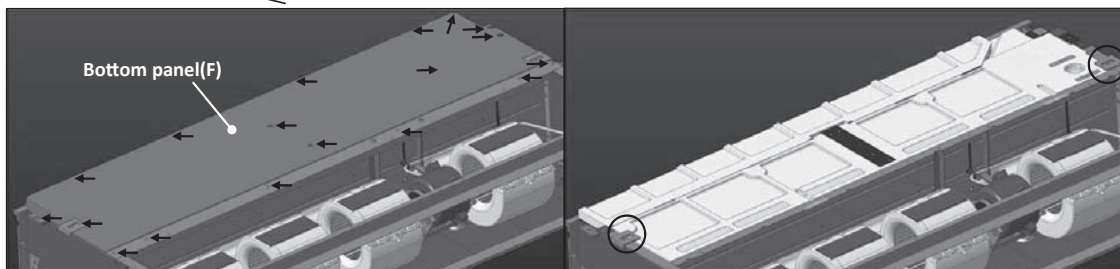
- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
- **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it. (□ mark)
 - **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it. (○ mark)



- 5. To remove the drain pan**
(1) Remove the bottom panel(B).(See No.3.)
(2) Remove 18 bottom panel(F) fixing screws and remove it.(← mark)
(3) Remove 2 drain pan fixing screws and remove it.(○ mark)



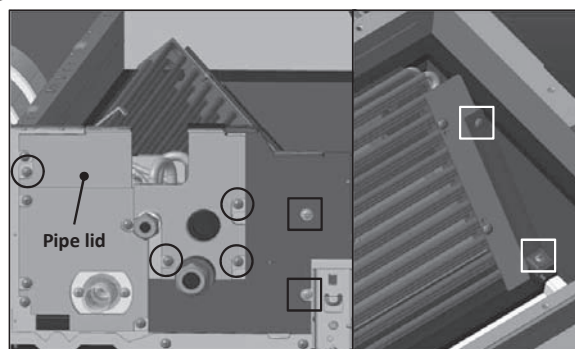
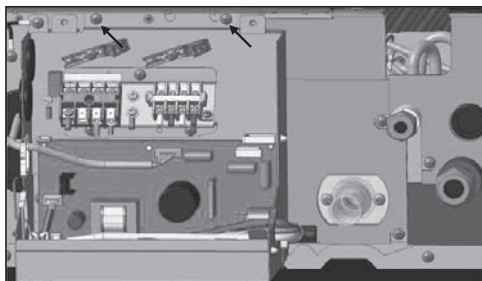
- 4. To remove the impellers and motors(FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Remove the bottom panel(B).(See No.3.)
(3) Disconnect the motor connector(CNM1) on PCB in control box.
(4) Remove 2 motor fixing screws and remove it.(○ mark)
(5) Remove the fan casing fixing screw and remove it.(□ mark)
(6) Remove the sirocco fan fixing bolt and remove it.(△ mark)



PROCEDURE & PICTURES

6. To remove the control box

- (1) Remove the lid of control box.(See No.1.)
- (2) Pull off all the inserted connectors.
- (3) Remove 2 cotrol box fixing screws and remove it.

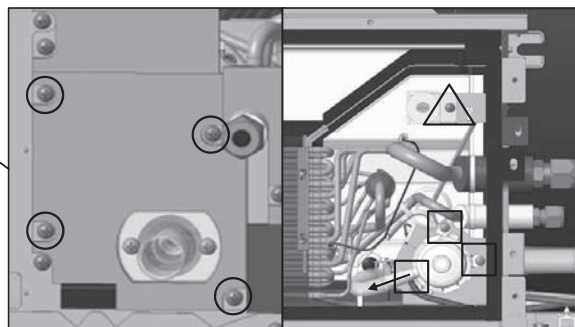


7. To remove the heat exchanger assembly

- (1) Remove the bottom panel(B).(See No.3.)
- (2) Remove the drain pan.(See No.5.)
- (3) Remove the control box.(See No.6.)
- (4) Remove 4 pipe lid fixing screws and remove it.(○ mark)
- (5) Remove 4 heat exchanger assy fixing screws and remove it.(□ mark)

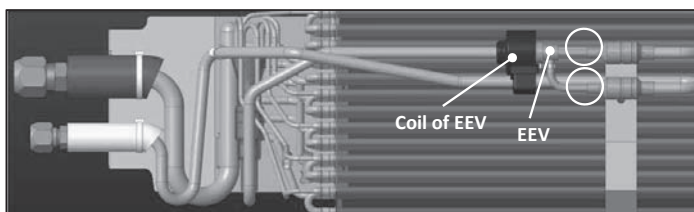
8. To remove the drain pump(DM) and float switch(FS)

- (1) Remove the control box.(See No.6.)
- (2) Disconnect the drain pump connector(CNR) on PCB in control box.
- (3) Disconnect the float switch connector(CNI) on PCB in control box.
- (4) Remove 4 drain pump assembly fixing screws and remove it.(○ mark)
- (5) Pull a hose to the arrow direction and remove it.
- (6) Remove 3 drain pump fixing screws and remove it.(□ mark)
- (7) Remove the float switch fixing screw and remove it.(△ mark)



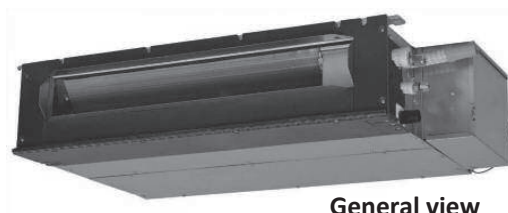
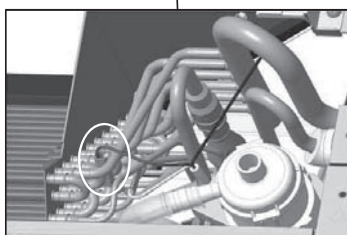
9. To remove the electronic expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.7.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



10. To remove the temperature sensors (example "Thi-R1")

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the Thi-R1 connector(CNN) on PWB in control box.
- (3) Remove the drain pan.(See No.5.)
- (4) Pull out the temperature sensor "Thi-R3" from the sensor holder.



General view

(8) FDUH series

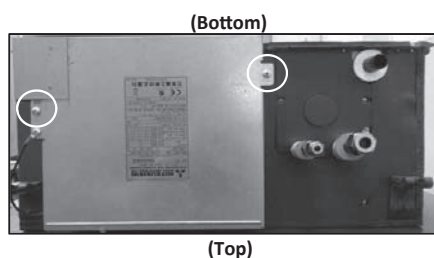
PJC012D123

DISASSEMBLY PROCEDURE

⚠ WARNING Precautions for safety

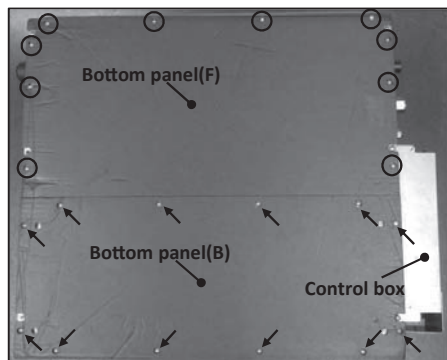
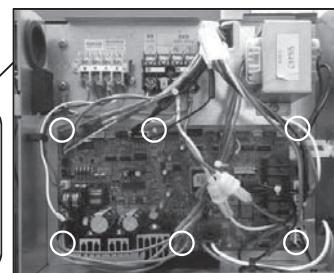
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDUH series)



- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

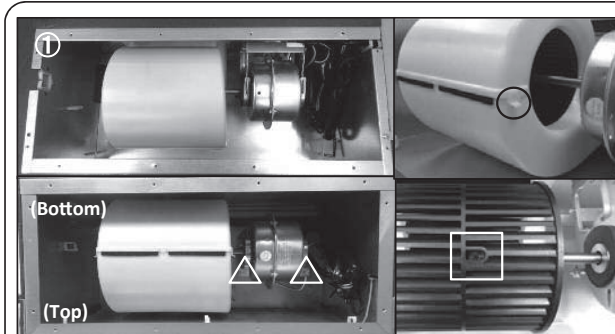
- 2. To remove the printed circuit board**
(1) Remove the lid of control box. (See No.1.)
(2) Pull off all the inserted connectors.
(3) Take off 6 control PCB fixing locking supports and remove it.



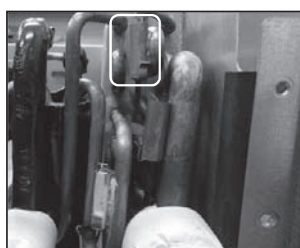
- 3. To remove the bottom panel(B) and bottom panel(F)**
(1) Remove 12 bottom panel panel(B) fixing screws and remove it.(→ mark)
(2) Remove 10 bottom panel panel(F) fixing screws and remove it.(○ mark)



- 4. To remove the drain pan.**
(1) Remove the bottom panel(B) and bottom panel(F).(See.No.3.)
(2) Pull out the control box.

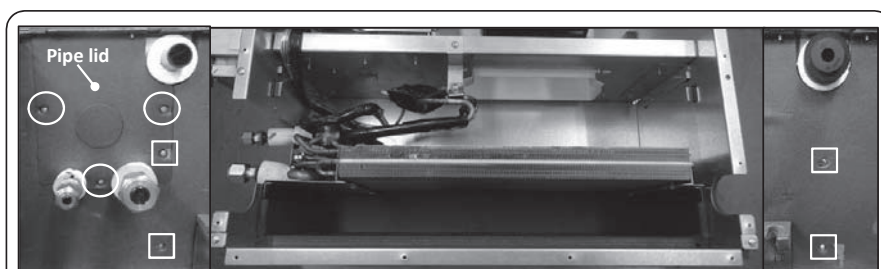


- 5. To remove the impeller and motor (FM)**
(1) Remove the lid of control box.(See No.1.)
(2) Remove the bottom panel(B).(See No.2.)<Pic①>
(3) Disconnect the motor connector(CNFx) in the middle of wiring.
(4) Take off the right and left hooks of the fan casing and remove it.(○ mark)
(5) Remove the impeller fixing bolt and remove it.(□ mark)
(6) Remove 2 motor fixing screws and remove it.(△ mark)



- 6. To remove the temperature sensors (example"Thi-R1")**
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the Tho-R1 connector(CNNx) on PCB in control box.
(3) Remove the drain pan.(See No.4.)
(4) Pull out the temperature sensor"Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

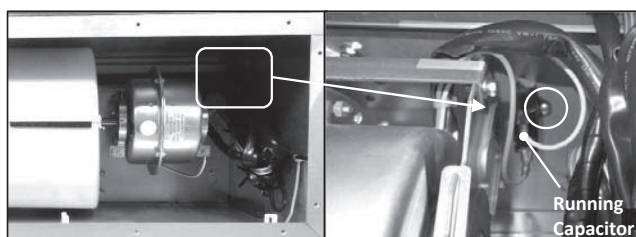
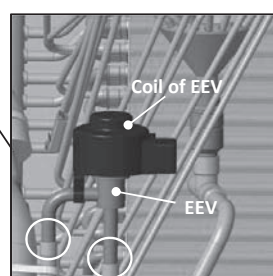


7. To remove the heat exchanger assembly

- (1) Remove the drain pan. (See No.3.)
- (2) Remove 3 pipe lid fixing screws and remove it. (○ mark)
- (3) Remove 4 heat exchanger assy fixing screws and remove it. (□ mark)

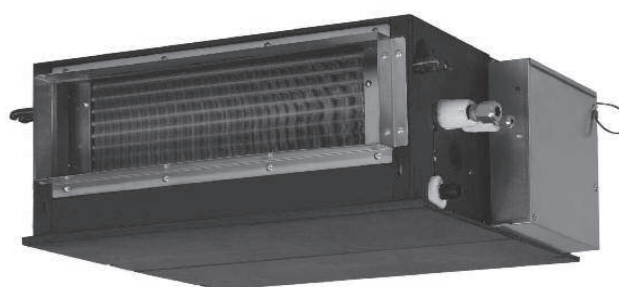
8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.9.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



8. To remove the running capacitor of fan motor

- (1) Remove the running capacitor fixing screw and remove it.




General view

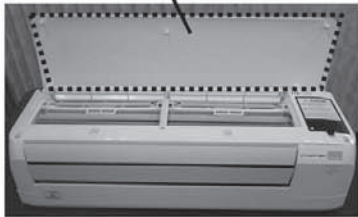


(9) FDK series

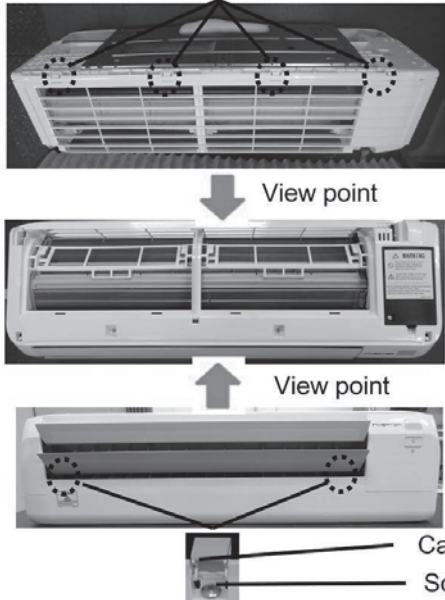
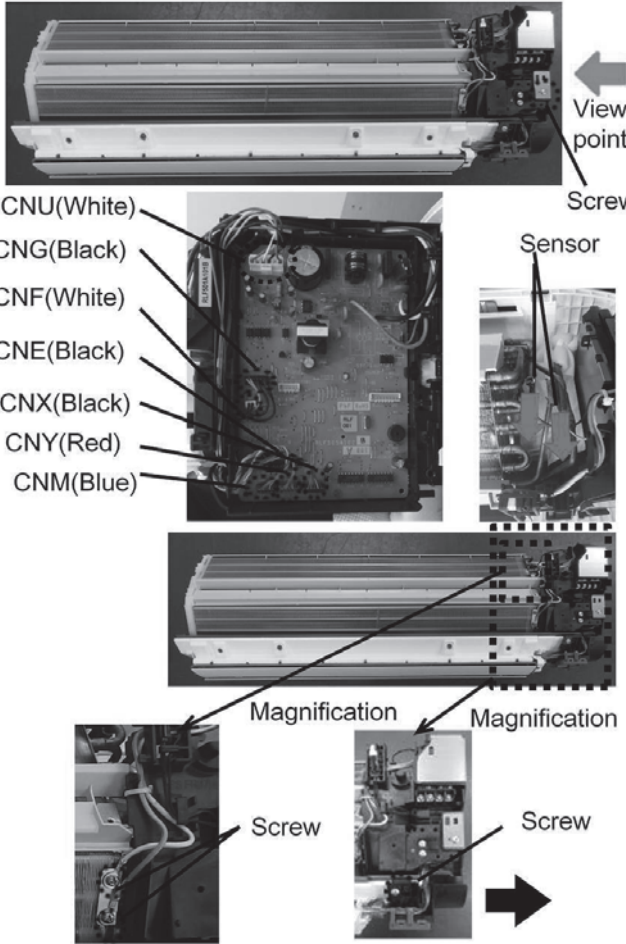
PHA012D402

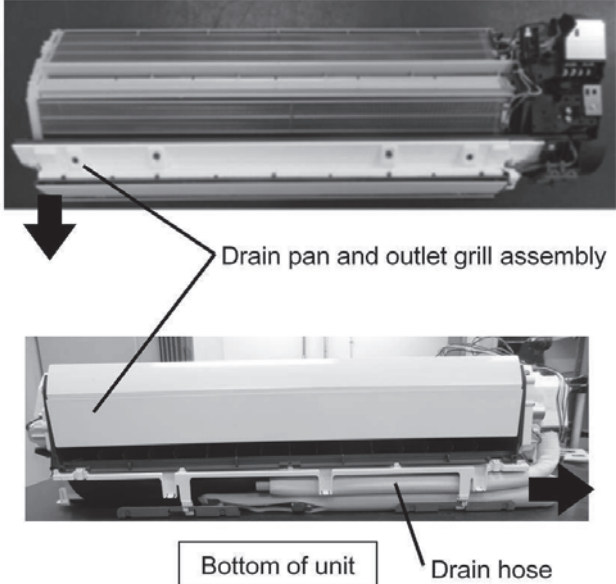
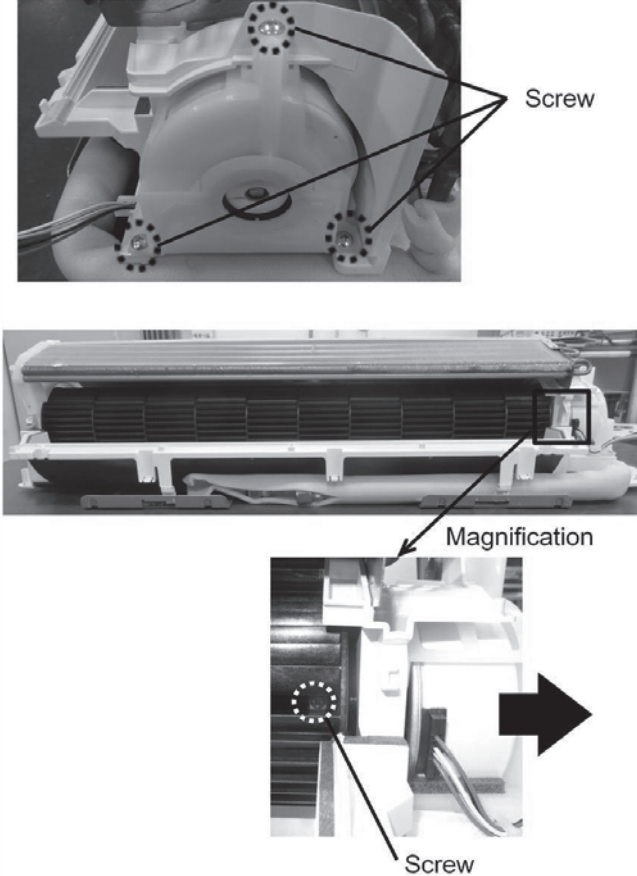
DISASSEMBLY PROCEDURE

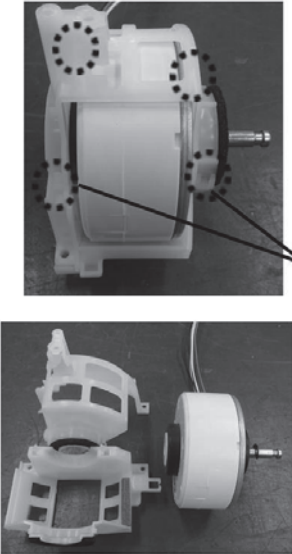
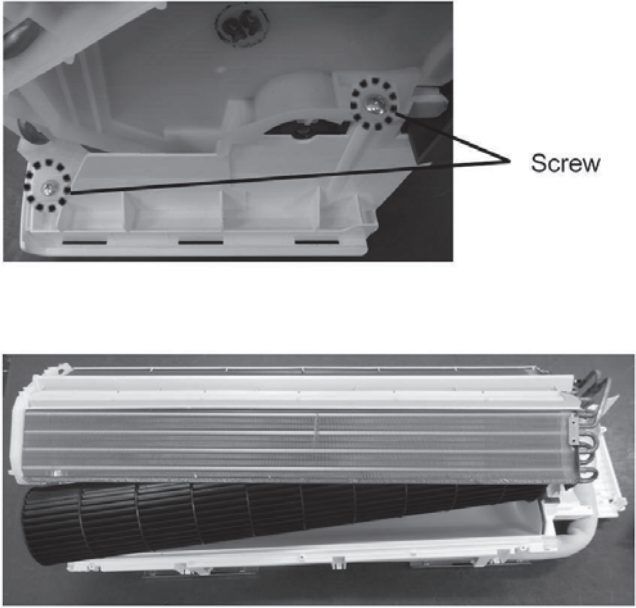
| | |
|---|-------------------------------|
|  WARNING | Precautions for safety |
| <ul style="list-style-type: none"> ● Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way. ● When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram. ● The electrical components are under high voltage by the operation of the booster capacitor. Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock. ● When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode. ● Be sure to collect refrigerant without spreading it in the air. ● These contents are an example. Please refer to a similar part of actual unit. | |

PROCEDURE & PICTURES (SRK-ZS,FDK series)

| Item | Illustration | Operating procedure |
|------|--|---|
| ① | <p>Air inlet panel</p>  | <p>[Removing the air inlet panel]</p> <p>1. Hold lower edge of the air inlet panel, and then open it to about 80°.</p> |
| ② | <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Removing the front panel</p> <p style="text-align: center;">Air filter</p>  <p style="text-align: center;">Air cleaning filter</p>  | <p>[Removing the filter]</p> <p>1. Remove the air filter ×2.</p> <p>2. Remove the air-cleaning filter ×2</p> <p>3. Holding both sides of the air inlet panel, pull the left and right sides forward at the same time to remove the panel.</p> |

| Item | Illustration | Operating procedure |
|---|---|--|
| <p style="text-align: center;">③</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Removing the front panel</p> | <p style="text-align: center;">Hook</p>  <p style="text-align: center;">View point</p> <p style="text-align: center;">View point</p> <p style="text-align: right;">Cap Screw</p> | <p>1. Open the caps, and then remove the screw ×2 (circled in the illustration below)</p> <p>2. Draw the front panel above after removing 4 hooks</p> <p>Caution</p> <ul style="list-style-type: none"> • Be sure to use a fine-tipped tool (such as a precision screwdriver) to open the cap. • Be careful not to damage the panel surface when opening the caps. |
| <p style="text-align: center;">④</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Removing the electrical controller and peripheral parts</p> |  <p style="text-align: right;">View point Screw</p> <p>CNU(White) CNG(Black) CNF(White) CNE(Black) CNX(Black) CNY(Red) CNM(Blue)</p> <p style="text-align: center;">Sensor</p> <p style="text-align: center;">Magnification Magnification</p> <p style="text-align: center;">Screw Screw</p> | <p>[Removing the Controller]</p> <p>1. Remove screw x1 so as to remove a metal lid.</p> <p>2. Remove a metal lid then unplug the following connector x7 CNU(White) CNG(Black) CNF(White) CNE(Black) CNX(Black) CNY(Red) CNW(Blue)</p> <p>3. Pull the each sensor out from the case into the indicated directions in red arrows.</p> <p>4. Remove screw x3 then draw the controller toward right direction.</p> |

| Item | Illustration | Operating procedure |
|--|--|---|
| <p style="text-align: center;">⑤</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Removing drain pan & outlet grill assembly</p> |  <p style="text-align: center;">Bottom of unit Drain hose</p> | <p>[Removing the drain pan]</p> <ol style="list-style-type: none"> 1. Draw the left of the drain pan and outlet grill assembly toward lower side so as to come off it from heat exchanger assembly. 2. Draw the drain pan and outlet grill assembly toward the right with drawing the drain hose. |
| <p style="text-align: center;">⑥</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Removing fan & motor</p> |  <p style="text-align: center;">Magnification</p> <p style="text-align: center;">Screw</p> | <p>[Removing fan & motor]</p> <ol style="list-style-type: none"> 1. Remove screw x3 2. Look into the area surrounded the black rectangle, adjust the screw position with rotating the cross flow fan, then remove a screw. 3. Draw the motor and its bracket toward the right. |

| Item | Illustration | Operating procedure |
|---|--|--|
| <p style="text-align: center;">⑦</p> <p style="text-align: center;">Disassemble the motor</p> |  <p style="text-align: right;">Hook</p> | <p>[Removing the motor case] 1. Release the hook ×4 (circled in the illustration), and then remove the motor case (U).</p> |
| <p style="text-align: center;">⑧</p> <p style="text-align: center;">Removing the fan and heat exchanger</p> |  <p style="text-align: right;">Screw</p> | <p>1. Remove the screw ×2 (circled in the illustration) on the left side of the heat exchanger.</p> <p>2. While lifting up and supporting the left side of the heat exchanger, pull out the fan to the left, keeping it angled down.</p> |

(10) FDE series

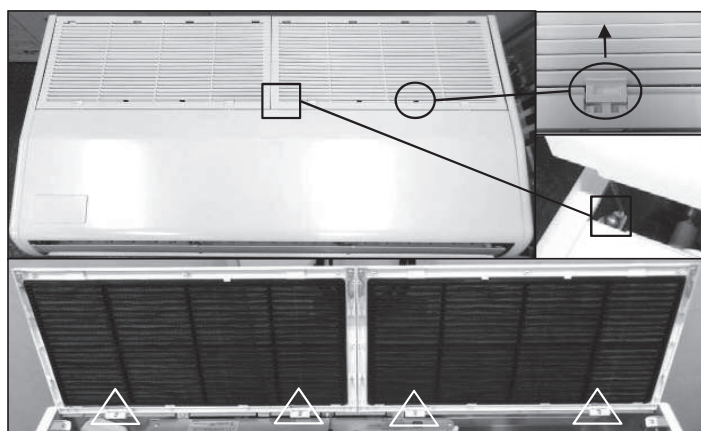
PFA012D631

DISASSEMBLY PROCEDURE

⚠ WARNING Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDE series)

**1. To remove air inlet grille.**

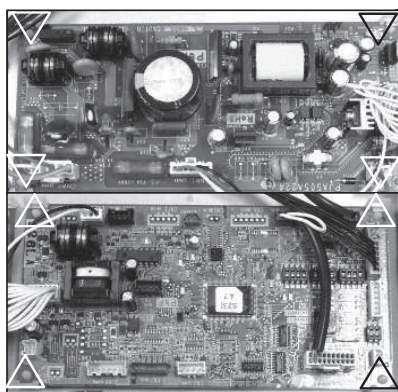
- (1) Slide the hook in the direction of the arrow.(○ mark)
- (2) Remove 4 wire fixing screws.(□ mark)
- (3) Remove 4 air inlet grille fixing screws.(△ mark)

2. To remove the lid of control box

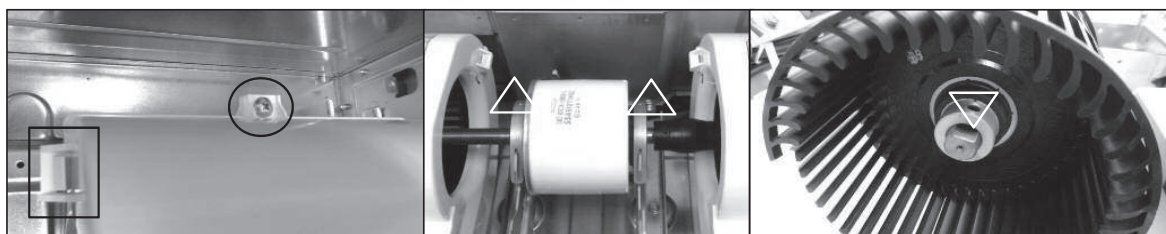
- (1) To remove air inlet grille.(See No.1.)
- (2) Remove 2 wire fixing screws and remove it.(← mark)
- (3) Remove 2 lid fixing screws and remove it.(○ mark)

3. To remove the control box

- (1) Remove the lid of control box.(See No.2)
- (2) Pull off all the inserted connectors.
- (3) Remove 2 control box fixing screws and remove it.(□ mark)
- (4) Pull out the control box.

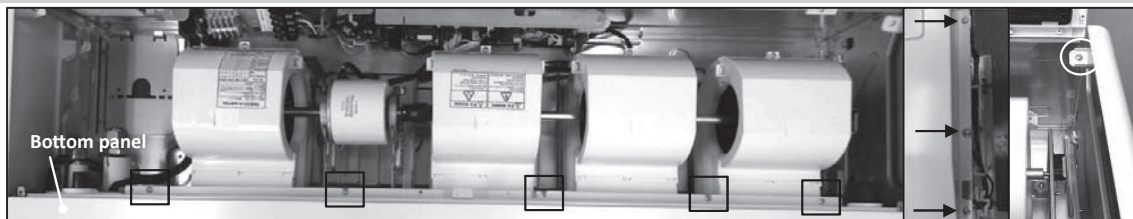
**4. To remove the printed circuit board (PCB)**

- (1) Remove the lid of control box.(See No.2.)
- (2) Pull off all the inserted connectors.
- **Control PCB**
(3) Take off 4 control PCB fixing locking supports and remove it.(△ mark)
- **Power PCB**
(4) Take off 4 power PCB fixing locking supports and remove it.(▽ mark)

**5. To remove the impeller and motor (FM)**

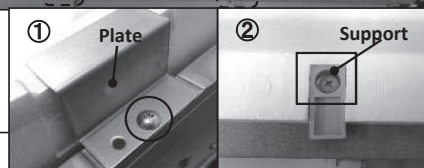
- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the motor connector(CNFx) in the middle way of wiring.
- (3) Remove the fan casing fixing screw.(○ mark) Take off the fan casing fixing hook and remove it.(□ mark)
- (4) Remove the impeller fixing screw and remove it.(▽ mark)
- (5) Remove 2 motor fixing screws and remove it.(△ mark)

PROCEDURE & PICTURES



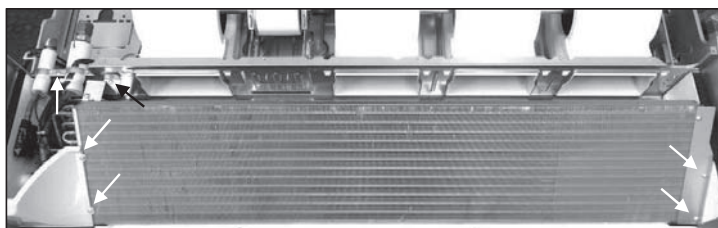
6. To remove side panel and bottom panel

- (1) Remove air inlet grille.(See No.1.)
- (2) Remove the right and left side panel fixing screws and remove it.(○ mark)
- (3) Remove 5 bottom panel fixing screws.(□ mark)
Remove 6 bottom panel fixing screws and remove it. (← mark, left and right side)



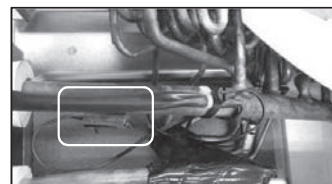
7. To remove drain pan

- (1) Remove side panel and bottom panel.(See No.5.)
- (2) Remove 2 plate fixing screws and remove it.(○ mark, Pic.①)
- (3) Remove 2 support fixing screws and remove it.(□ mark, Pic.②)
- (4) Pull out the drain pan.



8. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.6.)
- (2) Remove 6 heat exchanger asy fixing screws and remove it.(← mark)



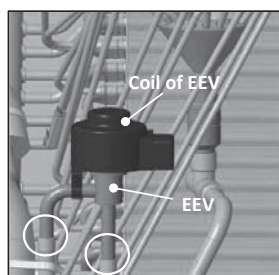
9. To remove the louver motor (LM)

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the louver motor connector (CNJ) on PCB in control box.
- (3) Remove side panel.(See No.5.)
- (4) Remove 2 louver motor fixing screws and remove it.



10. To remove the temperature sensors (example "Thi-R3")

- (1) Remove the lid of control box.(See No.1.)
- (2) Disconnect the Tho-R3 connector(CNNx) on PCB in control box.
- (3) Remove the drain pan.(See No.3.)
- (4) Pull out the temperature sensor "Thi-R1" from the sensor holder.



11. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.9.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(○ mark)



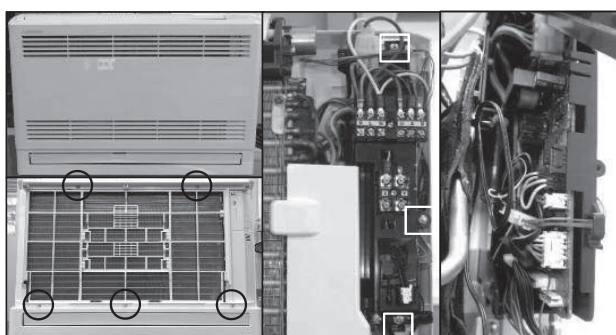
General view

DISASSEMBLY PROCEDURE

⚠ WARNING Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

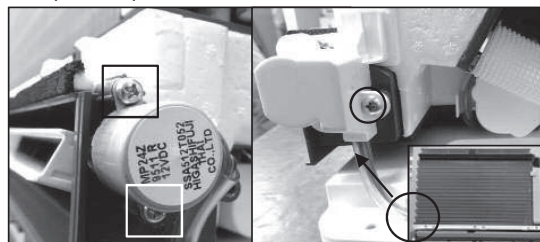
PROCEDURE & PICTURES (FDFW series)

**1. To remove the control box**

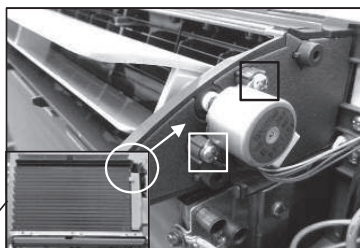
- (1) Remove hooks of the front panel and remove it.
- (2) Remove 5 filter assembly fixing screws and remove it.(○ mark)
- (3) Remove 3 control box and lid fixing screws, and remove it.(□ mark)
- (4) Pull the control box forward.

2. To remove the lower flap motor (LFM)

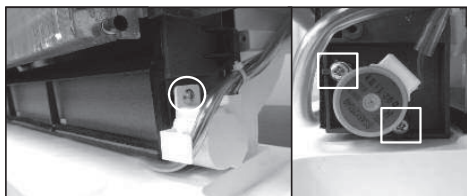
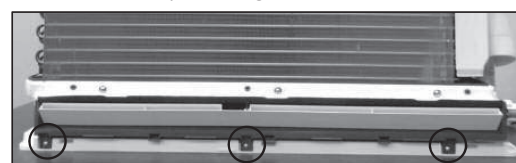
- (1) Remove the control box.(See No.1.)
- (2) Disconnect the lower flap motor connector(CNJ3) in the way of wiring.
- (3) Remove the cover fixing screw and remove it.(○ mark)
- (4) Remove 2 lower flap motor screws and remove it.(□ mark)

**3. To remove the upper flap motor (UFM)**

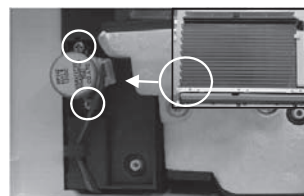
- (1) Remove the control box.(See No.1.)
- (2) Disconnect the upper flap motor connector(CNJ4) in the way of wiring.
- (3) Remove 2 upper flap motor fixing screws and remove it.(□ mark)

**4. To remove drain pan**

- (1) Remove the lower flap motor.(See No.3.)
- (2) Remove 3 drain pan fixing screws and remove it.(○ mark)

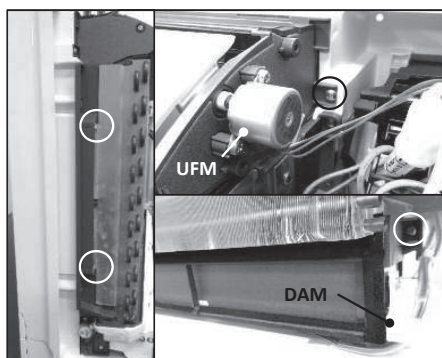
**5. To remove the damper arm motor (DAM)**

- (1) Remove the control box.(See No.1.)
- (2) Disconnect the damper arm motor connector(CNJ2) in the way of wiring.
- (3) Remove the cover fixing screw and remove it.(○ mark)
- (4) Remove 2 damper arm motor fixing screws and remove it.(□ mark)

**6. To remove the damper motor (DM)**

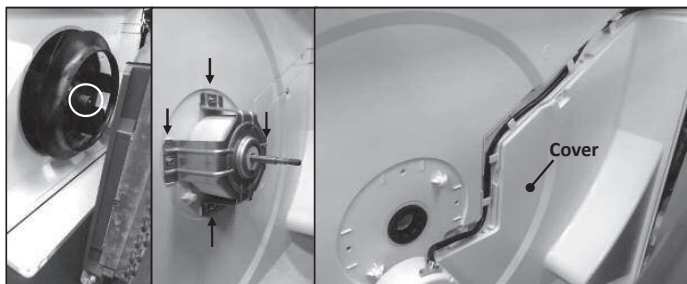
- (1) Remove the control box.(See No.1.)
- (2) Disconnect the damper motor connector(CNJ1) in the way of wiring.
- (3) Remove 2 damper arm motor fixing screws and remove it.(○ mark)

PROCEDURE & PICTURES



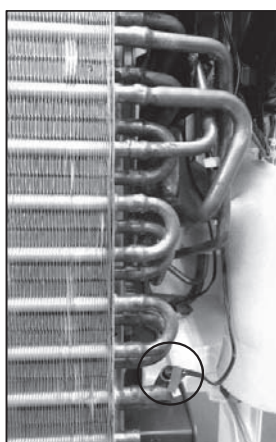
7. To remove the heat exchanger assembly

- (1) Remove the drain pan.(See No.4.)
- (2) Remove 4 heat exchanger assy fixing screws and remove it.(O mark)



8. To remove the impeller and motor (FM)

- (1) Remove control box.(See No.1.)
- (2) Disconnect the motor connector(CNM) on PCB in control box.
- (3) Remove the heat exchanger assembly.(See No.7.)
- (4) Remove the impeller fixing nut and remove it.(O mark)
- (5) Remove 4 motor fixing bolts and remove it.(← mark)
- (6) Take off the hooks of cover and remove it.

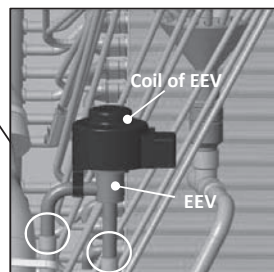


9. To remove the temperature sensors (example"Thi-R1")

- (1) Remove control box.(See No.1.)
- (2) Disconnect the Tho-R1 connector(CNN) on PCB in control box.
- (3) Pull out the temperature sensor"Thi-R1" from the sensor holder.

10. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly.(See No.7.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding.(O mark)



General view

DISASSEMBLY PROCEDURE

WARNING Precautions for safety

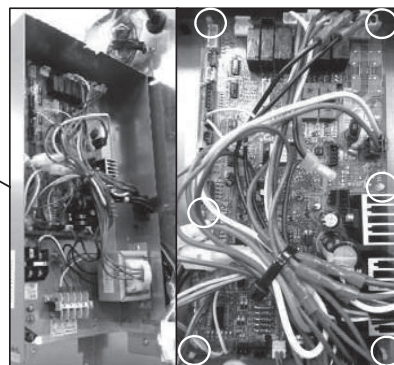
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (FDFU • FDFL series)

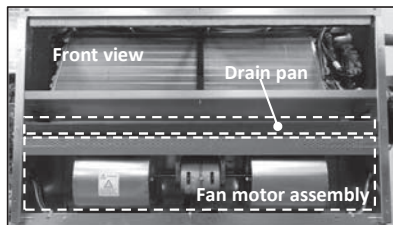
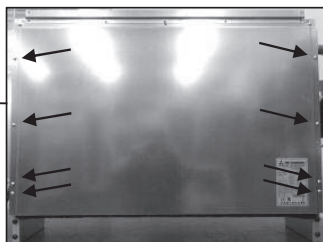


1. To remove the lid of control box
(1) Remove 2 lid fixing screws and remove it.

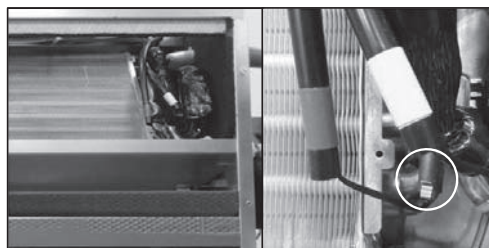
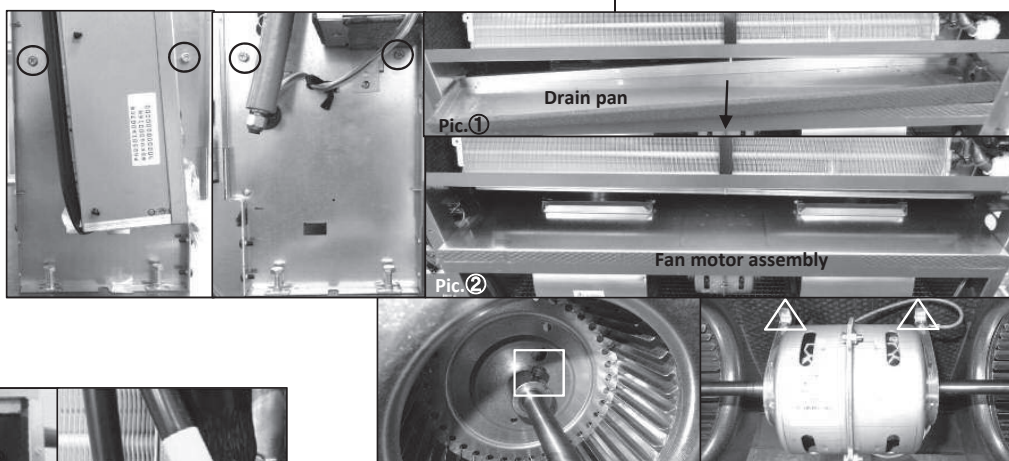
2. To remove the printed circuit board (PCB)
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Take off 6 power PCB fixing locking supports and remove it.



3. To remove the front panel (FDFU)
(1) Remove 8 front panel fixing screws and remove it.



4. To remove the impeller and motor (FM)
(1) Remove the lid of control box.(See No.1.), remove the front panel.(See No.3.)
(2) Disconnect the motor connector(CNF1) in the way of wiring.
(3) Pull drain pan in the direction of the arrow and remove.(Pic.①)
(4) Remove 4 fan base fixing screws and remove fan motor assembly.(○ mark)
(5) Remove the impeller fixing bolt and remove it.(□ mark)
(6) Remove 2 motor fixing screws and remove it.(△ mark)



5. To remove the temperature sensors (example"Thi-R1")
(1) Remove the lid of control box.(See No.1.)
(2) Disconnect the Tho-R1 connector(CNNx) in the way of wiring.
(3) Remove the front panel.(See No.3.)
(4) Pull out the temperature sensor"Thi-R1" from the sensor holder.

PROCEDURE & PICTURES

6. To remove the heat exchanger assembly

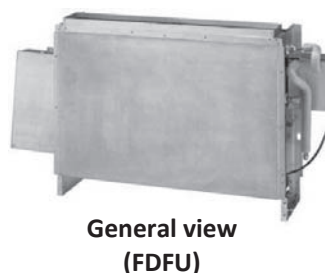
- (1) Remove 9 top panel fixing screws and remove it. (Pic.① ②)
- (2) Remove 2 support fixing screws and remove it. (Pic.③)
- (3) Remove the lid of EEV box fixing screw and remove it. (□ mark, Pic.④)
Remove 3 EEV box fixing screws and remove it. (○ mark, Pic.④)
- (4) Remove 2 screws on the left side panel. (Pic.⑤)
- (5) Remove 3 screws on the back side panel. (Pic.⑥)
- (6) Remove 4 screws on the right side panel and pull the heat exchanger assembly to the right. (Pic.⑦)

7. To remove the running capacitor of fan motor

- (1) Remove the fan motor assembly. (See No.4.)
- (2) Remove faston terminal.
- (3) Remove the running capacitor fixing screw and remove it.

8. To remove the Electronic Expansion Valve (EEV)

- (1) Remove the heat exchanger assembly. (See No.9.)
- (2) Remove the coil of EEV by pull out on the top.
- (3) Remove welded part of EEV by welding. (○ mark)



DISASSEMBLY PROCEDURE

⚠ WARNING**Precautions for safety**

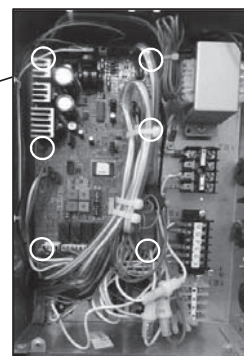
- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- When parts of refrigerant cycle is disassembled by welding, be sure to work after collecting a refrigerant, if the refrigerant isn't collected, the unit might explode.
- Be sure to collect refrigerant without spreading it in the air.
- These contents are an example. Please refer to a similar part of actual unit.

PROCEDURE & PICTURES (SAF-DX series)



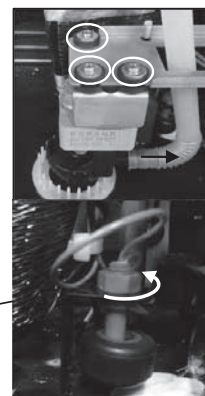
- 1. To remove the lid of control box**
(1) Remove 2 lid fixing screws and remove it.

- 2. To remove the printed circuit board (PCB)**
(1) Remove the lid of control box.(See No.1.)
(2) Pull off all the inserted connectors.
(3) Take off 6 PCB fixing locking supports(○ mark)



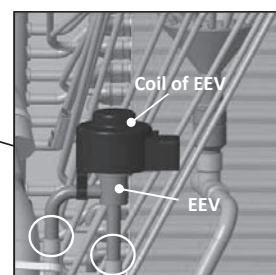
- 3. To remove the drain pan**
(1) Remove 10 bottom panel fixing screws and remove it.
(2) Pull the drain pan and remove it.

- 4. To remove the heat exchanger assembly**
(1) Remove the bottom panel(See No.3.)
(2) Remove 4 fixing screws on the attached plate of heat exchanger and remove it.

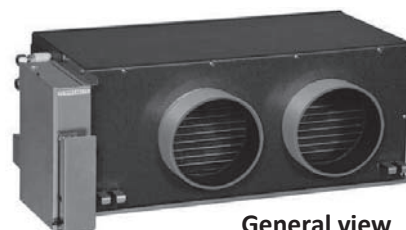


- 5. To remove the drain pump(DM) and float switch(FS)**
(1) Remove the lid of control box.(See No.1.)
(2) Remove the drain pan.(See No.3.)
(3) Disconnect the drain pump connector(CNRx) in the middle of wiring.
(4) Disconnect the float switch connector(CNix) in the middle of wiring.
(5) Pull a hose to the arrow direction and remove it.
(6) Remove 3 drain pump fixing screws and remove it.(○ mark)
(7) Turn float switch to the left and remove it.

- 6. To remove the Electronic Expansion Valve (EEV)**
(1) Remove the heat exchanger assembly.(See No.8.)
(2) Remove the coil of EEV by pull out on the top.
(3) Remove welded part of EEV by welding.(○ mark)



- 7. To remove the temperature sensors, (example"Thi-R3")**
(1) Remove the drain pan.(See No.3.)
(2) Pull out the temperature sensor"Thi-R3" from the sensor holder.



General view

(14) Panel

PSC012D109A 

DISASSEMBLY PROCEDURE

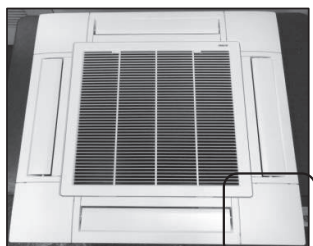
⚠ WARNING

Precautions for safety

- Read these "Precautions for safety" carefully before starting disassembly work and do it in the proper way.
- When disassembling, be sure to turn off the power. When disassembling the electrical components, check the electrical wiring diagram.
- The electrical components are under high voltage by the operation of the booster capacitor.
Fully discharge the capacitor before commencing a repair work. Failure to observe this warning could result in electric shock.
- These contents are an example. Please refer to a similar part of actual unit.

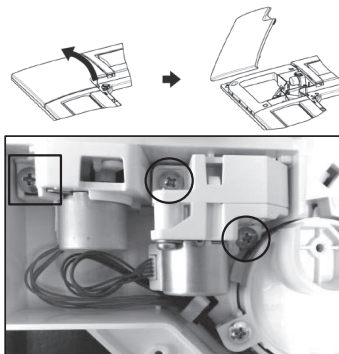
PROCEDURE & PICTURES

FDT series

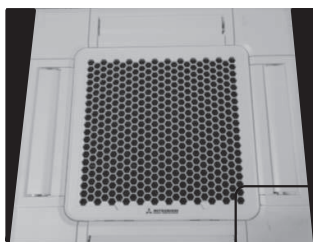


Corner lid

- 1. To remove the corner lid**
 - (1) Remove the inlet grille.
 - (2) Pull the corner lid toward the direction indicated by the arrow and remove it.
(The four corner lids are the same way.)
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1.)
 - (2) Remove the louver motor fixing screw and remove it.(□ mark)
- 3. To remove anti draft motor (AM)**
 - (1) Remove the corner lid.(See No.1.)
 - (2) Remove 2 gear box fixing screws and remove it.(O mark)

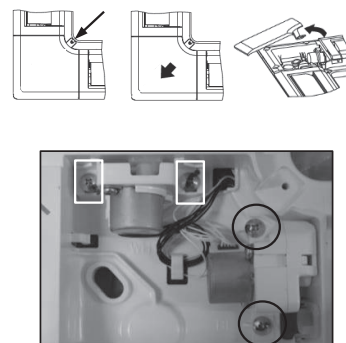


FDTC series

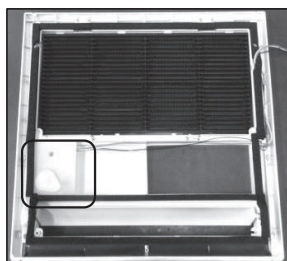


Corner lid

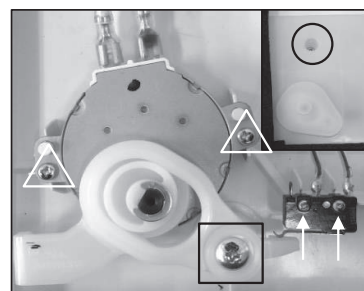
- 1. To remove the corner lid**
 - (1) Remove the inlet grille.
 - (2) Remove the screw(← mark), pull the corner lid toward the direction indicated by the arrow mark.
(The four corner lids are the same way.)
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1.)
 - (2) Remove 2 louver motor fixing screws and remove it.(□ mark)
- 3. To remove anti draft motor (AM)**
 - (1) Remove the corner lid.(See No.1.)
 - (2) Remove 2 gear box fixing screws and remove it.(O mark)



FDTS•FDTQ series



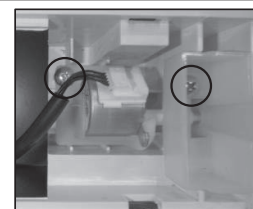
- 1. To remove the louver motor (LM)**
 - (1) Remove the cover fixing screw and remove it.(O mark)
 - (2) Remove the cam fixing screw and remove it.(□ mark)
 - (3) Remove 2 louver motor fixing screws and remove it.(△ mark)
- 2. To remove the limit switch (LS)**
 - (1) Remove the cover fixing screw and remove it.(O mark)
 - (2) Remove 2 limit switch fixing screws and remove it.(← mark)



FDTW series



- 1. To remove the corner lid**
 - (1) Take off the corner panel fixing hooks by a flathead screwdriver and remove it.
- 2. To remove the louver motor (LM)**
 - (1) Remove the corner lid.(See No.1.)
 - (2) Remove 2 louver motor fixing screws and remove it.(O mark)



12. TECHNICAL INFORMATION

12.1 Outdoor units

PSA012J141

| Model(s) : | | FDC280KXZE2M | |
|--|---------------------|---|--------------------------------------|
| Outdoor side heat exchanger of air-conditioner : | | air | |
| Indoor side heat exchanger of air-conditioner : | | air | |
| Type : | | vapour compression | |
| If applicable : | | electric motor | |
| Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 28.0 | kW |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | |
| Tj=+35°C | Pdc | 28.0 | kW |
| Tj=+30°C | Pdc | 20.6 | kW |
| Tj=+25°C | Pdc | 13.2 | kW |
| Tj=+20°C | Pdc | 10.1 | kW |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - |
| Power consumption in other than 'active mode' | | | |
| Off mode | P _{OFF} | 0.010 | kW |
| Thermostat-off mode | P _{TO} | 0.050 | kW |
| Other items | | | |
| Capacity control | | variable | |
| Sound power level, outdoor | L _{WA} | 75.0 | dB |
| If engine driven: Emissions of nitrogen oxides | NO _x *** | - | mg/kWh fuel input GCV |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) |
| Contact details | | Mitsubishi heavy industries thermal systems,LTD | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | |
| *** from 26 September 2018 | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC280KXZE2M | | | |
|--|------------------|---|-----------------------------------|--|-----------------------------|-------|-------------------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 31.5 | kW | Seasonal space heating energy efficiency ηs,h | | 192.2 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature Tj | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=-7°C | Pdh | 16.4 | kW | Tj=-7°C | COPd or GUEh,bin / AEFh,bin | 339.0 | % |
| Tj=+2°C | Pdh | 10.0 | kW | Tj=+2°C | COPd or GUEh,bin / AEFh,bin | 479.0 | % |
| Tj=+7°C | Pdh | 6.4 | kW | Tj=+7°C | COPd or GUEh,bin / AEFh,bin | 790.0 | % |
| Tj=+12°C | Pdh | 6.4 | kW | Tj=+12°C | COPd or GUEh,bin / AEFh,bin | 870.0 | % |
| Tbiv=bivalent temperature | Pdh | 18.5 | kW | Tbiv=bivalent temperature | COPd or GUEh,bin / AEFh,bin | 313.0 | % |
| TOL=operation limit | Pdh | 15.3 | kW | TOL=operation limit | COPd or GUEh,bin / AEFh,bin | 233.0 | % |
| For air-to-water heat pumps : Tj=-15°C (if TOL < -20°C) | Pdh | - | kW | For air-to-water heat pumps: Tj=-15°C (if TOL < -20°C) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | Tbiv | -10.0 | °C | For water-to-air heat pumps: Operation limit Ta temperature | | - | °C |
| Degradation coefficient heat pumps** | Cdh | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P _{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P _{TO} | 0.060 | kW | Type of energy input | P _{SB} | 0.010 | kW |
| Crankcase heater mode | P _{CK} | 0.035 | kW | Standby mode | | | |
| Other items | | | | For air-to-air heat pumps: | | | |
| Capacity control | | variable | | air flow-rate, outdoor measured | | 13500 | m ³ /h |
| Sound power level, outdoor measured | L _{WA} | 76.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m ³ /h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | | Mitsubishi heavy industries thermal systems.LTD | | | | | |
| ** If Cdh is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Model(s) : FDC335KXZE2M | | | |
|--|--------------------------------|---|--------------------------------------|
| Outdoor side heat exchanger of air-conditioner : | | air | |
| Indoor side heat exchanger of air-conditioner : | | air | |
| Type : vapour compression | | | |
| if applicable : electric motor | | | |
| Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 33.5 | kW |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | |
| Tj=+35°C | Pdc | 33.5 | kW |
| Tj=+30°C | Pdc | 24.6 | kW |
| Tj=+25°C | Pdc | 15.8 | kW |
| Tj=+20°C | Pdc | 10.7 | kW |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - |
| Power consumption in other than 'active mode' | | | |
| Off mode | P _{OFF} | 0.010 | kW |
| Thermostat-off mode | P _{TO} | 0.050 | kW |
| Other items | | | |
| Capacity control | | variable | |
| Sound power level, outdoor | L _{WA} | 82.0 | dB |
| If engine driven: Emissions of nitrogen oxides | NOx *** | - | mg/kWh fuel input GCV |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) |
| Seasonal space cooling energy efficiency η _{s,c} | | | |
| | | 298.5 | % |
| Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=+35°C | EERd or GUEc,bin / AEFc,bin | 373.0 | % |
| Tj=+30°C | EERd or GUEc,bin / AEFc,bin | 557.0 | % |
| Tj=+25°C | EERd or GUEc,bin / AEFc,bin | 900.0 | % |
| Tj=+20°C | EERd or GUEc,bin / AEFc,bin | 1478.0 | % |
| Crankcase heater mode | | | |
| | P _{CK} | 0.035 | kW |
| Standby mode | | | |
| | P _{SB} | 0.010 | kW |
| For air-to-air air-conditioner: air flow-rate, outdoor measured | | | |
| | | 17640 | m ³ /h |
| Contact details | | Mitsubishi heavy industries thermal systems,LTD | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | |
| *** from 26 September 2018 | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC335KXZE2M | | | |
|--|-----------|---|--------------------------------------|---|--------------------------------|-------|-------------------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 37.5 | kW | Seasonal space heating energy efficiency $\eta_{s,h}$ | | 184.3 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature T_j | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j | | | |
| $T_j = -7^\circ\text{C}$ | Pdh | 19.0 | kW | $T_j = -7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 302.0 | % |
| $T_j = +2^\circ\text{C}$ | Pdh | 12.0 | kW | $T_j = +2^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 411.0 | % |
| $T_j = +7^\circ\text{C}$ | Pdh | 7.7 | kW | $T_j = +7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 743.0 | % |
| $T_j = +12^\circ\text{C}$ | Pdh | 6.5 | kW | $T_j = +12^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 860.0 | % |
| T_{biv} =bivalent temperature | Pdh | 22.2 | kW | T_{biv} =bivalent temperature | COPd or GUEh,bin / AEFh,bin | 276.0 | % |
| T_{OL} =operation limit | Pdh | 18.3 | kW | T_{OL} =operation limit | COPd or GUEh,bin / AEFh,bin | 217.0 | % |
| For air-to-water heat pumps : $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | Pdh | - | kW | For air-to-water heat pumps: $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | T_{biv} | -10.0 | °C | For water-to-air heat pumps: Operation limit T_a temperature | | - | °C |
| Degradation coefficient heat pumps** | Cdh | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P_{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P_{TO} | 0.060 | kW | Type of energy input Standby mode | P_{SB} | 0.010 | kW |
| Crankcase heater mode | P_{CK} | 0.035 | kW | | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 16980 | m ³ /h |
| Sound power level, outdoor measured | L_{WA} | 81.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m ³ /h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | | Mitsubishi heavy industries thermal systems.LTD | | | | | |
| ** If Cdh is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Model(s) : | | FDC400KXZE2M | |
|--|------------------|---|--------------------------------------|
| Outdoor side heat exchanger of air-conditioner : | | air | |
| Indoor side heat exchanger of air-conditioner : | | air | |
| Type : | | vapour compression | |
| if applicable : | | electric motor | |
| Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 40.0 | kW |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | |
| Tj=+35°C | Pdc | 40.0 | kW |
| Tj=+30°C | Pdc | 29.4 | kW |
| Tj=+25°C | Pdc | 18.9 | kW |
| Tj=+20°C | Pdc | 16.6 | kW |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - |
| Power consumption in other than 'active mode' | | | |
| Off mode | P _{OFF} | 0.010 | kW |
| Thermostat-off mode | P _{TO} | 0.068 | kW |
| Other items | | | |
| Capacity control | | variable | |
| Sound power level, outdoor | L _{WA} | 80.0 | dB |
| If engine driven: Emissions of nitrogen oxides | NOx *** | - | mg/kWh fuel input GCV |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) |
| Contact details | | Mitsubishi heavy industries thermal systems,LTD | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | |
| *** from 26 September 2018 | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC400KXZE2M | | | |
|--|-----------|---|--------------------------------------|---|--------------------------------|-------|-------------------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 45.0 | kW | Seasonal space heating energy efficiency $\eta_{s,h}$ | | 191.8 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature T_j | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j | | | |
| $T_j = -7^\circ\text{C}$ | Pdh | 23.0 | kW | $T_j = -7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 355.0 | % |
| $T_j = +2^\circ\text{C}$ | Pdh | 14.0 | kW | $T_j = +2^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 458.0 | % |
| $T_j = +7^\circ\text{C}$ | Pdh | 10.7 | kW | $T_j = +7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 680.0 | % |
| $T_j = +12^\circ\text{C}$ | Pdh | 13.4 | kW | $T_j = +12^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 726.0 | % |
| T_{biv} =bivalent temperature | Pdh | 25.9 | kW | T_{biv} =bivalent temperature | COPd or GUEh,bin / AEFh,bin | 300.0 | % |
| T_{OL} =operation limit | Pdh | 26.5 | kW | T_{OL} =operation limit | COPd or GUEh,bin / AEFh,bin | 200.0 | % |
| For air-to-water heat pumps : $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | Pdh | - | kW | For air-to-water heat pumps: $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | T_{biv} | -10.0 | °C | For water-to-air heat pumps: Operation limit T_a temperature | | - | °C |
| Degradation coefficient heat pumps** | C_{dh} | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P_{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P_{TO} | 0.078 | kW | Type of energy input | P_{SB} | 0.010 | kW |
| Crankcase heater mode | P_{CK} | 0.043 | kW | Standby mode | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18240 | m ³ /h |
| Sound power level, outdoor measured | L_{WA} | 82.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m ³ /h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | | Mitsubishi heavy industries thermal systems.LTD | | | | | |
| ** If C_{dh} is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Model(s) : FDC450KXZE2M | | | |
|--|-----------------------------|---|-----------------------------------|
| Outdoor side heat exchanger of air-conditioner : | | air | |
| Indoor side heat exchanger of air-conditioner : | | air | |
| Type : vapour compression | | | |
| if applicable : electric motor | | | |
| Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 45.0 | kW |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | |
| Tj=+35°C | Pdc | 45.0 | kW |
| Tj=+30°C | Pdc | 33.1 | kW |
| Tj=+25°C | Pdc | 21.3 | kW |
| Tj=+20°C | Pdc | 16.9 | kW |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - |
| Power consumption in other than 'active mode' | | | |
| Off mode | P _{OFF} | 0.010 | kW |
| Thermostat-off mode | P _{TO} | 0.068 | kW |
| Other items | | | |
| Capacity control | | variable | |
| Sound power level, outdoor | L _{WA} | 81.0 | dB |
| If engine driven: Emissions of nitrogen oxides | NOx *** | - | mg/kWh fuel input GCV |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) |
| Seasonal space cooling energy efficiency η _{s,c} | | | |
| | | 277.4 | % |
| Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=+35°C | EERd or GUEc,bin / AEFc,bin | 322.0 | % |
| Tj=+30°C | EERd or GUEc,bin / AEFc,bin | 530.0 | % |
| Tj=+25°C | EERd or GUEc,bin / AEFc,bin | 879.0 | % |
| Tj=+20°C | EERd or GUEc,bin / AEFc,bin | 1260.0 | % |
| Crankcase heater mode | | | |
| | P _{CK} | 0.043 | kW |
| Standby mode | | | |
| | P _{SB} | 0.010 | kW |
| For air-to-air air-conditioner: air flow-rate, outdoor measured | | | |
| | | 18240 | m ³ /h |
| Contact details | | Mitsubishi heavy industries thermal systems,LTD | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | |
| *** from 26 September 2018 | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC450KXZE2M | | | |
|--|-----------|---|--------------------------------------|---|--------------------------------|-------|-------------------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 50.0 | kW | Seasonal space heating energy efficiency $\eta_{s,h}$ | | 171.4 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature T_j | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j | | | |
| $T_j = -7^\circ\text{C}$ | Pdh | 26.2 | kW | $T_j = -7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 341.0 | % |
| $T_j = +2^\circ\text{C}$ | Pdh | 16.0 | kW | $T_j = +2^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 371.0 | % |
| $T_j = +7^\circ\text{C}$ | Pdh | 11.1 | kW | $T_j = +7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 650.0 | % |
| $T_j = +12^\circ\text{C}$ | Pdh | 12.2 | kW | $T_j = +12^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 726.0 | % |
| T_{biv} =bivalent temperature | Pdh | 29.6 | kW | T_{biv} =bivalent temperature | COPd or GUEh,bin / AEFh,bin | 279.0 | % |
| T_{OL} =operation limit | Pdh | 26.2 | kW | T_{OL} =operation limit | COPd or GUEh,bin / AEFh,bin | 228.0 | % |
| For air-to-water heat pumps : $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | Pdh | - | kW | For air-to-water heat pumps: $T_j = -15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | T_{biv} | -10.0 | °C | For water-to-air heat pumps: Operation limit T_a temperature | | - | °C |
| Degradation coefficient heat pumps** | C_{dh} | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P_{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P_{TO} | 0.078 | kW | Type of energy input | P_{SB} | 0.010 | kW |
| Crankcase heater mode | P_{CK} | 0.043 | kW | Standby mode | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18240 | m ³ /h |
| Sound power level, outdoor measured | L_{WA} | 82.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m ³ /h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | | Mitsubishi heavy industries thermal systems.LTD | | | | | |
| ** If C_{dh} is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Model(s) : FDC475KXZE2M | | | | | | | |
|--|---|----------|-----------------------------------|---|-----------------------------|--------|-------------------|
| Outdoor side heat exchanger of air-conditioner : air | | | | | | | |
| Indoor side heat exchanger of air-conditioner : air | | | | | | | |
| Type : vapour compression | | | | | | | |
| if applicable : electric motor | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 47.5 | kW | Seasonal space cooling energy efficiency ηs,c | | 270.6 | % |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | | Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=+35°C | Pdc | 47.5 | kW | Tj=+35°C | EERd or GUEc,bin / AEFc,bin | 340.0 | % |
| Tj=+30°C | Pdc | 35.0 | kW | Tj=+30°C | EERd or GUEc,bin / AEFc,bin | 542.0 | % |
| Tj=+25°C | Pdc | 22.5 | kW | Tj=+25°C | EERd or GUEc,bin / AEFc,bin | 724.0 | % |
| Tj=+20°C | Pdc | 10.7 | kW | Tj=+20°C | EERd or GUEc,bin / AEFc,bin | 1465.0 | % |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - | | | | |
| Power consumption in other than 'active mode' | | | | | | | |
| Off mode | P _{OFF} | 0.010 | kW | Crankcase heater mode | P _{CK} | 0.071 | kW |
| Thermostat-off mode | P _{TO} | 0.096 | kW | Standby mode | P _{SB} | 0.010 | kW |
| Other items | | | | For air-to-air air-conditioner: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18000 | m ³ /h |
| Sound power level, outdoor | L _{WA} | 81.0 | dB | | | | |
| If engine driven: Emissions of nitrogen oxides | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0.25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC475KXZE2M | | | |
|--|------------------|---|-----------------------------------|--|-----------------------------|-------|------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 53.0 | kW | Seasonal space heating energy efficiency ηs,h | | 175.1 | % |
| Declared heating capacity for part load at indoor temperature 20 °C and outdoor temperature Tj | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=-7°C | Pdh | 27.9 | kW | Tj=-7°C | COPd or GUEh,bin / AEFh,bin | 288.0 | % |
| Tj=+2°C | Pdh | 17.0 | kW | Tj=+2°C | COPd or GUEh,bin / AEFh,bin | 400.0 | % |
| Tj=+7°C | Pdh | 12.6 | kW | Tj=+7°C | COPd or GUEh,bin / AEFh,bin | 689.0 | % |
| Tj=+12°C | Pdh | 6.4 | kW | Tj=+12°C | COPd or GUEh,bin / AEFh,bin | 808.0 | % |
| Tbiv=bivalent temperature | Pdh | 31.5 | kW | Tbiv=bivalent temperature | COPd or GUEh,bin / AEFh,bin | 240.0 | % |
| TOL=operation limit | Pdh | 26.8 | kW | TOL=operation limit | COPd or GUEh,bin / AEFh,bin | 213.0 | % |
| For air-to-water heat pumps : Tj=-15°C (if TOL < -20°C) | Pdh | - | kW | For air-to-water heat pumps:Tj=-15°C (if TOL < -20°C) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | Tbiv | -10.0 | °C | For water-to-air heat pumps:Operation limit Ta temperature | | - | °C |
| Degradation coefficient heat pumps** | Cdh | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P _{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P _{TO} | 0.106 | kW | Type of energy input Standby mode | P _{SB} | 0.010 | kW |
| Crankcase heater mode | P _{CK} | 0.071 | kW | | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18000 | m³/h |
| Sound power level, outdoor measured | L _{WA} | 81.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m³/h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | | Mitsubishi heavy industries thermal systems,LTD | | | | | |
| ** If Cdh is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |


| Model(s) : FDC500KXZE2M | | | |
|--|-----------------------------|----------|-----------------------------------|
| Outdoor side heat exchanger of air-conditioner : air | | | |
| Indoor side heat exchanger of air-conditioner : air | | | |
| Type : vapour compression | | | |
| if applicable : electric motor | | | |
| Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 50.0 | kW |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | |
| Tj=+35°C | Pdc | 50.0 | kW |
| Tj=+30°C | Pdc | 36.8 | kW |
| Tj=+25°C | Pdc | 23.6 | kW |
| Tj=+20°C | Pdc | 10.5 | kW |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - |
| Power consumption in other than 'active mode' | | | |
| Off mode | P _{OFF} | 0.010 | kW |
| Thermostat-off mode | P _{TO} | 0.096 | kW |
| Other items | | | |
| Capacity control | | variable | |
| Sound power level, outdoor | L _{WA} | 81.0 | dB |
| If engine driven: Emissions of nitrogen oxides | NO _x *** | - | mg/kWh fuel input GCV |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) |
| Seasonal space cooling energy efficiency η _{s,c} | | | |
| | | 288.6 | % |
| Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=+35°C | EERd or GUEc,bin / AEFc,bin | 358.0 | % |
| Tj=+30°C | EERd or GUEc,bin / AEFc,bin | 555.0 | % |
| Tj=+25°C | EERd or GUEc,bin / AEFc,bin | 772.0 | % |
| Tj=+20°C | EERd or GUEc,bin / AEFc,bin | 1698.0 | % |
| Crankcase heater mode | | | |
| | | 0.071 | kW |
| Standby mode | | | |
| | | 0.010 | kW |
| For air-to-air air-conditioner: air flow-rate, outdoor measured | | | |
| | | 18000 | m ³ /h |
| Contact details Mitsubishi heavy industries thermal systems,LTD | | | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | |
| *** from 26 September 2018 | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC500KXZE2M | | | |
|--|----------|----------|-----------------------|--|-----------------------------|-------|------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 56.0 | kW | Seasonal space heating energy efficiency ηs,h | | 180.2 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature Tj | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=-7°C | Pdh | 29.5 | kW | Tj=-7°C | COPd or GUEh,bin / AEFh,bin | 287.0 | % |
| Tj=+2°C | Pdh | 17.9 | kW | Tj=+2°C | COPd or GUEh,bin / AEFh,bin | 407.0 | % |
| Tj=+7°C | Pdh | 12.6 | kW | Tj=+7°C | COPd or GUEh,bin / AEFh,bin | 714.0 | % |
| Tj=+12°C | Pdh | 6.4 | kW | Tj=+12°C | COPd or GUEh,bin / AEFh,bin | 860.0 | % |
| Tbiv=bivalent temperature | Pdh | 33.3 | kW | Tbiv=bivalent temperature | COPd or GUEh,bin / AEFh,bin | 240.0 | % |
| TOL=operation limit | Pdh | 28.9 | kW | TOL=operation limit | COPd or GUEh,bin / AEFh,bin | 210.0 | % |
| For air-to-water heat pumps : Tj=-15°C (if TOL < -20°C) | Pdh | - | kW | For air-to-water heat pumps: Tj=-15°C (if TOL < -20°C) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | Tbiv | -10.0 | °C | For water-to-air heat pumps: Operation limit Ta temperature | | - | °C |
| Degradation coefficient heat pumps** | Cdh | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | Poff | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | Pto | 0.106 | kW | Type of energy input | Psb | 0.010 | kW |
| Crankcase heater mode | Pck | 0.071 | kW | Standby mode | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18000 | m³/h |
| Sound power level, outdoor measured | LWA | 82.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m³/h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO2 eq. (100years) | | | | |
| Contact details | | | | Mitsubishi heavy industries thermal systems.LTD | | | |
| ** If Cdh is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Model(s) : FDC560KXZE2M | | | | | | | |
|--|---|----------|--------------------------------------|--|--------------------------------|--------|-------------------|
| Outdoor side heat exchanger of air-conditioner : air | | | | | | | |
| Indoor side heat exchanger of air-conditioner : air | | | | | | | |
| Type : vapour compression | | | | | | | |
| if applicable : electric motor | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated cooling capacity | Prated,c | 56.0 | kW | Seasonal space cooling energy efficiency $\eta_{s,c}$ | | 266.3 | % |
| Declared cooling capacity for part load at given outdoor temperatures Tj and indoor 27°C/19°C(dry/wet bulb) | | | | Declared energy efficiency ratio or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures Tj | | | |
| Tj=+35°C | Pdc | 56.0 | kW | Tj=+35°C | EERd or GUEc,bin / AEFc,bin | 320.0 | % |
| Tj=+30°C | Pdc | 41.2 | kW | Tj=+30°C | EERd or GUEc,bin / AEFc,bin | 514.0 | % |
| Tj=+25°C | Pdc | 26.5 | kW | Tj=+25°C | EERd or GUEc,bin / AEFc,bin | 714.0 | % |
| Tj=+20°C | Pdc | 11.7 | kW | Tj=+20°C | EERd or GUEc,bin / AEFc,bin | 1507.0 | % |
| Degradation coefficient for air conditioners** | Cdc | 0.25 | - | | | | |
| Power consumption in other than 'active mode' | | | | | | | |
| Off mode | P _{OFF} | 0.010 | kW | Crankcase heater mode | P _{ck} | 0.071 | kW |
| Thermostat-off mode | P _{TO} | 0.096 | kW | Standby mode | P _{SB} | 0.010 | kW |
| Other items | | | | For air-to-air air-conditioner: air flow-rate, outdoor measured | | | |
| Capacity control | | variable | | | | 18000 | m ³ /h |
| Sound power level, outdoor | L _{WA} | 82.0 | dB | | | | |
| If engine driven: Emissions of nitrogen oxides | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |
| ** If Cdc is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners, the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

| Information to identify the model(s) to which the information relates : | | | | FDC560KXZE2M | | | |
|---|---|----------|--------------------------------------|---|--------------------------------|-------|-------------------|
| Outdoor side heat exchanger of heat pump : | | | | air | | | |
| Indoor side heat exchanger of heat pump : | | | | air | | | |
| Indication if the heater is equipped with a supplementary heater : | | | | No | | | |
| if applicable : | | | | electric motor | | | |
| Parameters shall be declared for the average heating season , parameters for the warmer and colder heating seasons are optional. | | | | | | | |
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Rated heating capacity | Prated,h | 63.0 | kW | Seasonal space heating energy efficiency $\eta_{s,h}$ | | 169.0 | % |
| Declared heating capacity for part load at indoor temperature 20°C and outdoor temperature T_j | | | | Declared coefficient of performance or gas utilization efficiency / auxiliary energy factor for part load at given outdoor temperatures T_j | | | |
| $T_j=-7^\circ\text{C}$ | Pdh | 32.7 | kW | $T_j=-7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 264.0 | % |
| $T_j=+2^\circ\text{C}$ | Pdh | 19.9 | kW | $T_j=+2^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 388.0 | % |
| $T_j=+7^\circ\text{C}$ | Pdh | 12.8 | kW | $T_j=+7^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 644.0 | % |
| $T_j=+12^\circ\text{C}$ | Pdh | 6.4 | kW | $T_j=+12^\circ\text{C}$ | COPd or GUEh,bin / AEFh,bin | 845.0 | % |
| T_{biv} =bivalent temperature | Pdh | 37.0 | kW | T_{biv} =bivalent temperature | COPd or GUEh,bin / AEFh,bin | 230.0 | % |
| T_{OL} =operation limit | Pdh | 28.7 | kW | T_{OL} =operation limit | COPd or GUEh,bin / AEFh,bin | 209.0 | % |
| For air-to-water heat pumps : $T_j=-15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | Pdh | - | kW | For air-to-water heat pumps: $T_j=-15^\circ\text{C}$ (if $T_{OL} < -20^\circ\text{C}$) | COPd or GUEh,bin / AEFh,bin | - | % |
| Bivalent temperature | T_{biv} | -10.0 | °C | For water-to-air heat pumps: Operation limit T_a temperature | | - | °C |
| Degradation coefficient heat pumps** | C_{dh} | 0.25 | - | | | | |
| Power consumption in modes other than 'active mode' | | | | Supplementary heater back-up heating capacity | | | |
| Off mode | P_{OFF} | 0.010 | kW | | elbu | - | kW |
| Thermostat-off mode | P_{TO} | 0.106 | kW | Type of energy input | P_{SB} | 0.010 | kW |
| Crankcase heater mode | P_{CK} | 0.071 | kW | Standby mode | | | |
| Other items | | | | For air-to-air heat pumps: air flow-rate,outdoor measured | | | |
| Capacity control | | variable | | | | 17040 | m ³ /h |
| Sound power level, outdoor measured | L_{WA} | 83.0 | dB | For water-/brine-to-air heat pumps : Rated brine or water flow-rate, outdoor side heat exchanger | | - | m ³ /h |
| Emissions of nitrogen oxides(if applicable) | NOx *** | - | mg/kWh fuel input GCV | | | | |
| GWP of the refrigerant | | 2088 | kg CO ₂ eq. (100years) | | | | |
| Contact details | Mitsubishi heavy industries thermal systems.LTD | | | | | | |
| ** If C_{dh} is not determined by measurement then the default degradation coefficient air-conditioners shall be 0,25. | | | | | | | |
| *** from 26 September 2018 | | | | | | | |
| Where information relates to multi-split air-conditioners,the test result and performance data be obtained on the basis of the performance of the outdoor unit, with a combination of indoor unit(s) recommended by the manufacturer or importer. | | | | | | | |

12.2 outdoor units

PSA012J140 

| Model(s) : FDT28KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.7 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT36KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.5 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT45KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.0 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT56KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.1 | kW | Total electric power input | P_{elec} | 0.070 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT71KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.2 | kW | Total electric power input | P_{elec} | 0.080 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.9 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 62.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT90KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 7.9 | kW | Total electric power input | P_{elec} | 0.130 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT112KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 9.4 | kW | Total electric power input | P_{elec} | 0.140 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 66.0 | dB |
| Heating capacity | $P_{rated,h}$ | 12.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT140KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 10.7 | kW | Total electric power input | P_{elec} | 0.140 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 3.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 66.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDT160KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 11.5 | kW | Total electric power input | P_{elec} | 0.140 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 4.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 66.0 | dB |
| Heating capacity | $P_{rated,h}$ | 18.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM22KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.1 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.7 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM36KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.3 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.7 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM56KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.1 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.0 | kW | Total electric power input | P_{elec} | 0.200 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM90KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.7 | kW | Total electric power input | P_{elec} | 0.200 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM112KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 8.6 | kW | Total electric power input | P_{elec} | 0.290 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 67.0 | dB |
| Heating capacity | $P_{rated,h}$ | 12.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM140KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 11.2 | kW | Total electric power input | P_{elec} | 0.330 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 72.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUM160KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 12.4 | kW | Total electric power input | P_{elec} | 0.450 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 3.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 76.0 | dB |
| Heating capacity | $P_{rated,h}$ | 18.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU224KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 19.7 | kW | Total electric power input | P_{elec} | 1.180 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 75.0 | dB |
| Heating capacity | $P_{rated,h}$ | 25.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU280KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 21.9 | kW | Total electric power input | P_{elec} | 1.180 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 6.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 75.0 | dB |
| Heating capacity | $P_{rated,h}$ | 31.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK15KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.2 | kW | Total electric power input | P_{elec} | 0.020 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 54.0 | dB |
| Heating capacity | $P_{rated,h}$ | 1.7 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK22KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.8 | kW | Total electric power input | P_{elec} | 0.020 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK28KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.2 | kW | Total electric power input | P_{elec} | 0.020 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK36KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.8 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK45KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.3 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK56KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.9 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK71KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.4 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 59.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDK90KXE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.5 | kW | Total electric power input | P_{elec} | 0.050 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 61.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC15KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.4 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 47.0 | dB |
| Heating capacity | $P_{rated,h}$ | 1.7 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC22KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.1 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 49.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC28KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.4 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 49.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC36KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.9 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 54.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC45KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.5 | kW | Total electric power input | P_{elec} | 0.050 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.0 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTC56KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.2 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.3 | kW | Total electric power input | P_{elec} | 0.090 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.4 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW56KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.0 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.8 | kW | Total electric power input | P_{elec} | 0.140 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW90KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.8 | kW | Total electric power input | P_{elec} | 0.190 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW112KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 8.1 | kW | Total electric power input | P_{elec} | 0.190 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 3.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 12.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTW140KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 9.9 | kW | Total electric power input | P_{elec} | 0.190 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 4.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTS45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.3 | kW | Total electric power input | P_{elec} | 0.040 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTS71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.0 | kW | Total electric power input | P_{elec} | 0.090 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 61.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTQ22KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.8 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTQ28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.1 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDTQ36KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.5 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFL71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.3 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 62.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFU28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.7 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFU45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.8 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFU56KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.2 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFU71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.3 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.7 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU56KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.1 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU71KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.0 | kW | Total electric power input | P_{elec} | 0.250 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU90KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 6.7 | kW | Total electric power input | P_{elec} | 0.250 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 65.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU112KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 8.6 | kW | Total electric power input | P_{elec} | 0.320 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 67.0 | dB |
| Heating capacity | $P_{rated,h}$ | 12.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU140KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 11.2 | kW | Total electric power input | P_{elec} | 0.360 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 72.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU160KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 12.4 | kW | Total electric power input | P_{elec} | 0.430 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 3.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 76.0 | dB |
| Heating capacity | $P_{rated,h}$ | 18.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT15KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.2 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 52.0 | dB |
| Heating capacity | $P_{rated,h}$ | 1.7 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT22KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.7 | kW | Total electric power input | P_{elec} | 0.070 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 52.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT28KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.0 | kW | Total electric power input | P_{elec} | 0.070 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 52.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT36KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.5 | kW | Total electric power input | P_{elec} | 0.070 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 57.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT45KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.2 | kW | Total electric power input | P_{elec} | 0.080 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 58.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT56KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.9 | kW | Total electric power input | P_{elec} | 0.080 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 59.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUT71KXE6F-E | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.9 | kW | Total electric power input | P_{elec} | 0.080 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 59.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUH22KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.8 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.4 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 2.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUH28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.2 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.6 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDUH36KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.6 | kW | Total electric power input | P_{elec} | 0.060 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.0 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFW28KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.3 | kW | Total electric power input | P_{elec} | 0.020 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 55.0 | dB |
| Heating capacity | $P_{rated,h}$ | 3.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFW45KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.0 | kW | Total electric power input | P_{elec} | 0.020 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.5 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 57.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDFW56KXE6F | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.8 | kW | Total electric power input | P_{elec} | 0.030 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE36KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.7 | kW | Total electric power input | P_{elec} | 0.050 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.9 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 4.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE45KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.3 | kW | Total electric power input | P_{elec} | 0.050 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 5.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE56KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.9 | kW | Total electric power input | P_{elec} | 0.050 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 60.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.3 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE71KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 5.2 | kW | Total electric power input | P_{elec} | 0.070 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.9 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 62.0 | dB |
| Heating capacity | $P_{rated,h}$ | 8.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE112KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 7.9 | kW | Total electric power input | P_{elec} | 0.100 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 3.3 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 63.0 | dB |
| Heating capacity | $P_{rated,h}$ | 12.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDE140KXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 9.8 | kW | Total electric power input | P_{elec} | 0.130 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 4.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 66.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU650FKXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.2 | kW | Total electric power input | P_{elec} | 0.250 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 5.8 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 62.0 | dB |
| Heating capacity | $P_{rated,h}$ | 6.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU1100FKXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.1 | kW | Total electric power input | P_{elec} | 0.360 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 9.9 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 66.0 | dB |
| Heating capacity | $P_{rated,h}$ | 10.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU1800FKXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 7.4 | kW | Total electric power input | P_{elec} | 1.180 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 15.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 70.0 | dB |
| Heating capacity | $P_{rated,h}$ | 16.0 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : FDU2400FKXZE1 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 9.3 | kW | Total electric power input | P_{elec} | 1.180 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 18.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | 73.0 | dB |
| Heating capacity | $P_{rated,h}$ | 21.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : SAF-DX250E6 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.3 | kW | Total electric power input | P_{elec} | 0.007 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 0.7 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | - | dB |
| Heating capacity | $P_{rated,h}$ | 1.8 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : SAF-DX350E6 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 1.8 | kW | Total electric power input | P_{elec} | 0.007 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.0 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | - | dB |
| Heating capacity | $P_{rated,h}$ | 2.2 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : SAF-DX500E6 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 2.4 | kW | Total electric power input | P_{elec} | 0.007 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.2 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | - | dB |
| Heating capacity | $P_{rated,h}$ | 2.8 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

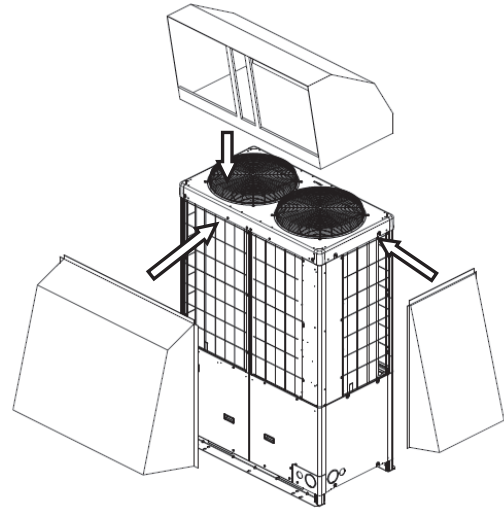
| Model(s) : SAF-DX800E6 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 3.7 | kW | Total electric power input | P_{elec} | 0.007 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 1.9 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | - | dB |
| Heating capacity | $P_{rated,h}$ | 4.5 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

| Model(s) : SAF-DX1000E6 | | | | | | | |
|-----------------------------|---|-------|------|--|------------|-------|------|
| Item | Symbol | Value | Unit | Item | Symbol | Value | Unit |
| Cooling capacity (sensible) | $P_{rated,c}$ | 4.2 | kW | Total electric power input | P_{elec} | 0.007 | kW |
| Cooling capacity (latent) | $P_{rated,c}$ | 2.1 | kW | Sound power level (per speed setting,if applicable) | L_{WA} | - | dB |
| Heating capacity | $P_{rated,h}$ | 5.6 | kW | | | | |
| Contact details | Mitsubishi heavy industries thermal systems,LTD | | | | | | |

APPENDIX : Attaching option parts

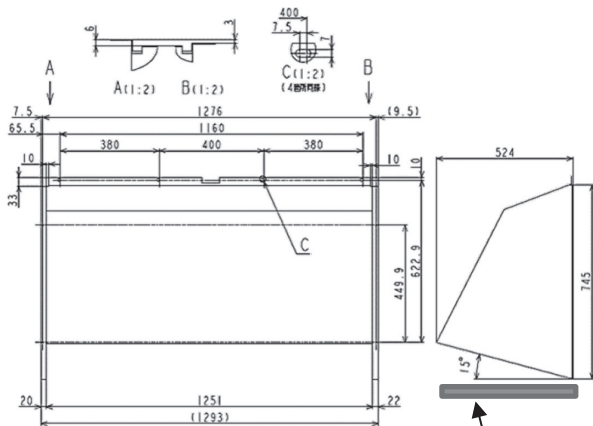
Outdoor units can be equipped with option parts as snow protection hood. Sample image of attaching parts are shown right. Please refer to the option parts drawing and manufacture them at the local distributor.

The screw size to attach the option parts is M5. The width of hole on option parts is 7mm.



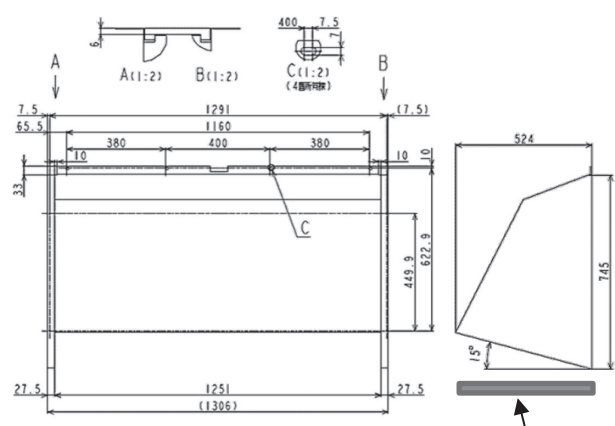
For FDC280, 335KXZE2M

<Front hood>



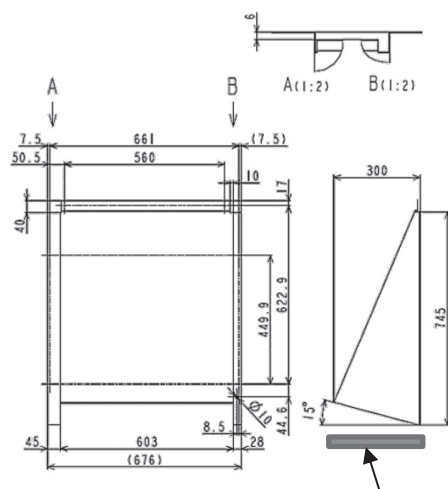
Minimum required opening area : 656cm²

<Rear hood>



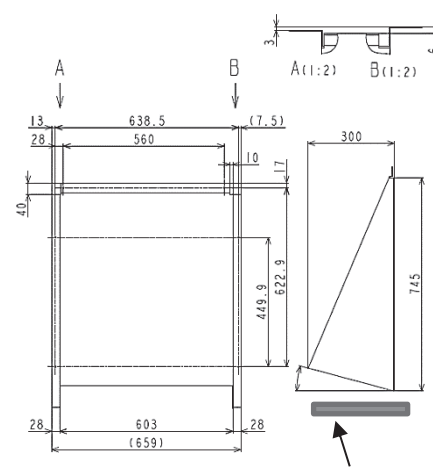
Minimum required opening area : 656cm²

<Left hood>



Minimum required opening area : 181cm²

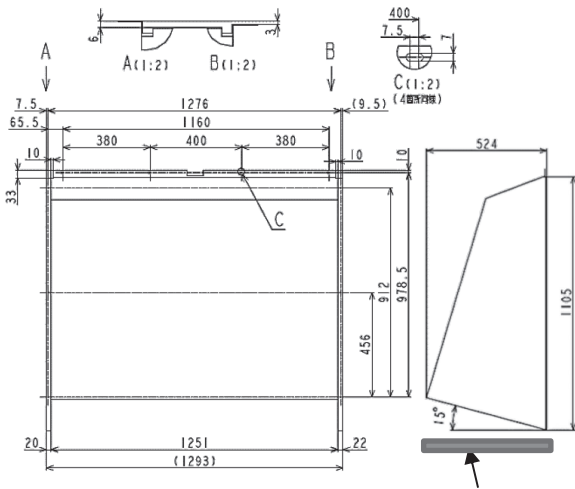
<Right hood>



Minimum required opening area : 181cm²

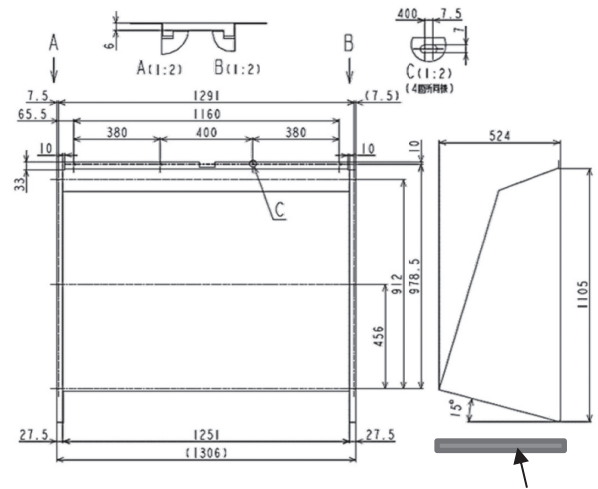
For FDC400-560KXZE2M

<Front hood>



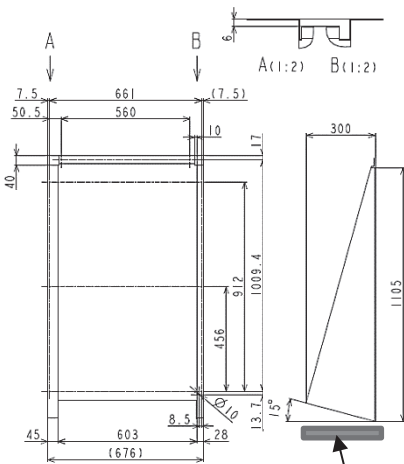
Minimum required opening area : 656cm²

<Rear hood>



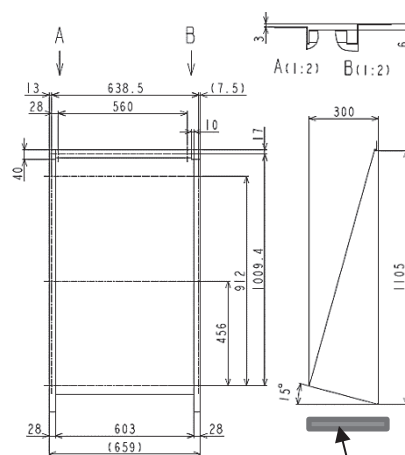
Minimum required opening area : 656cm²

<Left hood>



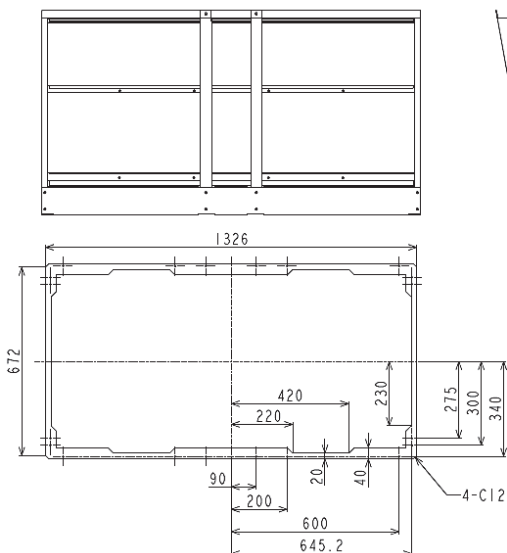
Minimum required opening area:181cm²

<Right hood>



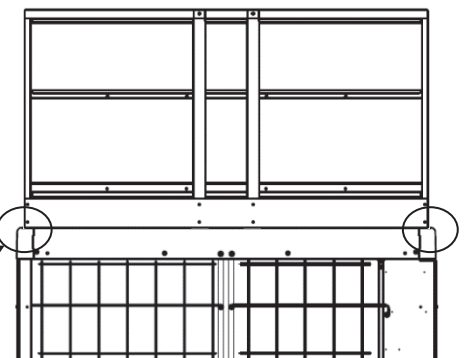
Minimum required opening area:181cm²

<Top hood for all KXZE2M models>



Minimum required opening area : 765cm²

Don't ride on the R corner. ×4



VRF INVERTER MULTI-SYSTEM AIR-CONDITIONERS



MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

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