Manual No.'22・KX-T-416

MITSUBISHI HEAVY INDUSTRIES

TECHNICAL MANUAL

HYDRO MODULE UNIT

HMU140KXZE1
HMU280KXZE1

・Notes:
(1) Regarding the outdoor unit KXZXE1 series, refer to the No.'14・KX-DB-203 and No.'14・KX-SM-204.
(2) Regarding the indoor unit KXZ series, refer to the No.'17・KX-T-266.
(3) Regarding the outdoor unit KXZE2 and KXZXE2 series, refer to the No.'21・KX-T-378.

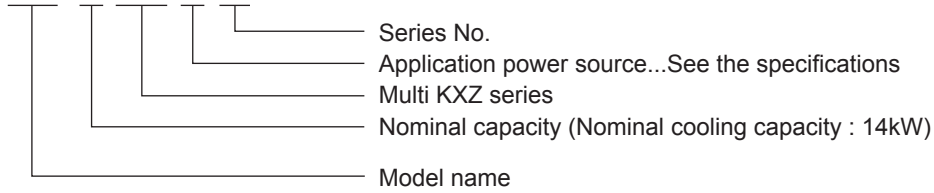
MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.

CONTENTS

1. INFORMATION

• Model description

Example: HMU 140 KXZ E 1



• Wired remote control (Option)

Model	Remote control model	Type
HMU140KXZE1 HMU280KXZE1	RC-EX3H	Eco touch

2. SPECIFICATIONS

2.1 Particular specifications

Indoor model				HMU140KXZE1	HMU280KXZE1
Operation range	Max. cooling capacity		kW	14	28
	Max. heating capacity			14	28
	Power consumption (Rated/Max.)	Cooling	kW	0.220/0.360	0.316/0.360
		Heating		0.220/0.360	0.316/0.360
	Current (Rated/Max.)	Cooling	A	1.00-0.92/1.54	1.44-1.32/1.54
		Heating		1.00-0.92/1.54	1.44-1.32/1.54
	Outdoor temperature	Cooling	˚C	15–46	
		Heating		-20–32(Mixed Use*1: -20–20)	
	Indoor temperature		˚C	0–32(Without freezing)	
	Indoor relative humidity		%	≦90	
	Inlet water temperature	Cooling	˚C	12–30(Mixed Use*1: 19–24)	
		Heating*2		20–50(Mixed Use*1: 20–35)	
		Heating*3		25–50(Mixed Use*1: 25–35)	
	Outlet water temperature	Cooling	˚C	7–25(Mixed Use*1: 14–19)	
		Heating*2		25–55(Mixed Use*1: 25–40)	
		Heating*3		30–55(Mixed Use*1: 30–40)	
	Water flow (Rated/Min.–Max.)		L/min	40/20–40	80/24–80
	External water pressure @Rated flow		kPa	98	80
	Allowable operating pressure (water)		kPa	30–600	
	Minimum suction head at 50°C		kPa	30	
	Inlet water pressure		kPa	30–600	
Sound pressure level@Cooling*4			dB(A)	32	32
Sound power level@Cooling*4, 6				48	48
Sound pressure level@Heating*5			dB(A)	27	31
Sound power level@Heating*5, 6				46	49
Exterior dimensions(Height x Width x Depth)			mm	860(110*7) x 550 x 400	
Exterior appearance				Ceramic white	
Weight (without water)			kg	46	48
Weight(Including water)			kg	47.8	50.6
Power source				1 phase/ 220–240V/ 50Hz	
Deviation, incoming supply			%	± 10%(Min.85% at starting)	
Minimum amount of water in the water circuit			L	150	230
IP Grade				IP20	
Set pressure of safety valve			kPa	600	
Water pipe connection				R1-1/2	
Refrigerant pipe connection (liquid / gas)				ϕ 9.52 / ϕ 15.88	ϕ 9.52 / ϕ 19.05

*1 Mixed use means HMU and air to air indoor unit mixed operation.

*2 In case outdoor tempearature more than 0˚C (0˚C< Outdoor temperature)

*3 In case outdoor tempearature is 0˚C or less (Outdoor temperature ≦ 0˚C)

*4 Sound test condition for cooling: Cooling condition 1

*5 Sound test condition for heating: Heating condition 3

*6 MIC position: 1m from the center of the HMU

*7 Outside piping length

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Performance data	Indoor model			HMU280KXZE1
	Outdoor model			FDC280KXZE2
	Heating nominal capacity	condition 1	kW	23.00
		condition 2	kW	23.15
		condition 3	kW	25.20
	Heating power consumption	condition 1	kW	8.40
		condition 2	kW	6.90
		condition 3	kW	6.00
	COP	condition 1	–	2.74
		condition 2	–	3.36
		condition 3	–	4.20
	ηsh	condition 3 base		151
	Cooling nominal capacity	condition 1	kW	25.80
		condition 2	kW	18.80
	Cooling power consumption	condition 1	kW	6.35
		condition 2	kW	6.25
	EER	condition 1	–	4.06
		condition 2	–	3.01

Note	Heating condition 1: Inlet/outlet water temperature 47˚C/55˚C, Outdoor temperature 7˚CDB/6˚CWB Heating condition 2: Inlet/outlet water temperature 40˚C/45˚C, Outdoor temperature 7˚CDB/6˚CWB Heating condition 3: Inlet/outlet water temperature 30˚C/35˚C, Outdoor temperature 7˚CDB/6˚CWB Cooling condition 1: Inlet/outlet water temperature 23˚C/18˚C, Outdoor temperature 35˚CDB/- Cooling condition 2: Inlet/outlet water temperature 12˚C/7˚C, Outdoor temperature 35˚CDB/-

2.2 Water quality

Water quality must be according to Table 1.

Table 1 Water quality standards

Item*1			Cooling water system *2		Hot water system *3		Tendency *4	
			Circulation	Makeup water	Circulation system (20˚C - 60˚C)	Makeup water	Corrosion	Scale
Standard items	pH (25˚C)	-	6.5 - 8.2	6.0 - 8.0	7.0 - 8.0	7.0 - 8.0	○	○
	Electric conductivity (25˚C)	mS/m	≦80	≦30	≦30	≦30	○	○
	Chloride ion	mgCl^-/L	≦200	≦50	≦50	≦50	○	
	Sulphate ion	mgSO_4^{2-}/L	≦200	≦50	≦50	≦50	○	
	Acid consumption (pH4.8)	mg$CaCO_3$/L	≦100	≦50	≦50	≦50		○
	Total hardness	mg$CaCO_3$/L	≦200	≦70	≦70	≦70		○
	Calcium hardness	mg$CaCO_3$/L	≦150	≦50	≦50	≦50		○
	Ionic silica	mgSiO_2/L	≦50	≦30	≦30	≦30		○
Reference items	Iron	mgFe/L	≦1.0	≦0.3	≦1.0	≦0.3	○	○
	Copper	mgCu/L	≦0.3	≦0.1	≦1.0	≦0.1	○	
	Sulphide ion	mgS^{2-}/L	Not detected	Not detected	Not detected	Not detected	○	
	Ammonium ion	mgNH_4^+/L	≦1.0	≦0.1	≦0.3	≦0.1	○	
	Residual chlorine	mgCl/L	≦0.3	≦0.3	≦0.25	≦0.3	○	
	Free carbon	mgCO_2/L	≦4.0	≦4.0	≦0.4	≦4.0	○	
	Stability index	-	6.0 - 7.0	-	-	-	○	○

*1 The fifteen items in the table represent typical causes of corrosion and scale.

*2 In a condenser water circuit that uses a closed cooling tower,the closed circuit circulating water and makeup water must satisfy its water quality standards for the hot water systems, and passing water and makeup water must satisfy those for the circulation type cooling water system.

*3 Corrosion has a tendency to occur when water temperature is high (40˚C or higher), and if metals with no protective coating whatever are directly exposed to water, it would be a good idea to take effective measures against corrosion such as adding a corrosion inhibitor or deaeration treatment.

*4 The columns show a factor of corrosion or scale.

*5 The supply water must be clean tap water,industrial water or clean ground water.

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2.3 Connection to Superlink system

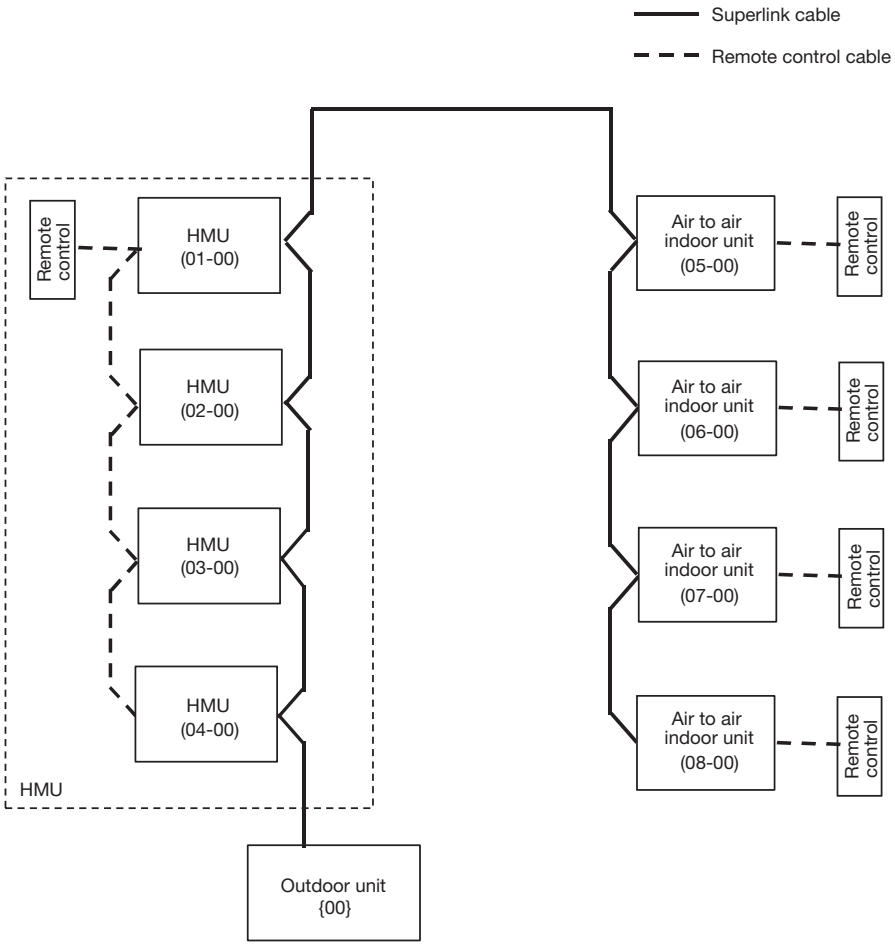
HMU and outdoor units are communicated with Superlink.
Therefore, HMU can be connected to Superlink network with air to air indoor units.
HMU can be operated with RC-EX3H which is exclusive model for HMU.
RC-EX3H can be connected with RC wire (X,Y) as with RC-EX3.
HMU can be connected to the central control for air-conditioning.
However, functions such as setting and display of water temperature are limited.

<Example : HMU with SL4>

1) Setting Temperature with limited range
   [Set temperature control] (Outlet water temperature for HMU)
   10.0 – 30.0˚C (heating), 16.0 – 35.0˚C (cooling)
   [Set temperature monitoring] (Outlet water temperature for HMU)
   0.0 – 49.0˚C
   [Room temperature monitoring] (Inlet water temperature or Room temperature(*) for HMU)
   0.0 – 49˚C
   (*)depend on the HMU setting

2) HMU is treated as one indoor unit
   SL4 can not distinguish which one is HMU.

Example of HMU × 4 units + Air-conditioner × 4 units
( ) shows the indoor address setting. (Indoor-outdoor)
{ } shows the outdoor address setting. (Outdoor)



2.4 Lineup

(1) Indoor unit

Category	Name	Model name	Remark
Indoor unit	5HP	HMU140KXZE1	Single
	10HP	HMU280KXZE1	Single

(2) Outdoor unit

Category	Name	Model name	Remark
Outdoor unit (for HMU)	High COP 8HP	FDC224KXZXE1	Single
	High COP 10HP	FDC280KXZXE1	Single
	High COP 12HP	FDC335KXZXE1	Single
	High COP 16HP	FDC450KXZXE1	Combination
	High COP 18HP	FDC500KXZXE1	Combination
	High COP 20HP	FDC560KXZXE1	Combination
	High COP 22HP	FDC615KXZXE1	Combination
	High COP 24HP	FDC670KXZXE1	Combination
	High COP 26HP	FDC735KXZXE1	Combination
	High COP 28HP	FDC800KXZXE1	Combination
	High COP 30HP	FDC850KXZXE1	Combination
	High COP 32HP	FDC900KXZXE1	Combination
	High COP 34HP	FDC950KXZXE1	Combination
	High COP 36HP	FDC1000KXZXE1	Combination

Category	Name	Model name	Remark
Outdoor unit (for HMU)	Standard 10HP	FDC280KXZE2	Single
	Standard 12HP	FDC335KXZE2	Single
	Standard 14HP	FDC400KXZE2	Single
	Standard 16HP	FDC450KXZE2	Single
	Standard 17HP	FDC475KXZE2	Single
	Standard 18HP	FDC500KXZE2	Single
	Standard 20HP	FDC560KXZE2	Single
	Standard 22HP	FDC615KXZE2	Combination
	Standard 24HP	FDC670KXZE2	Combination
	Standard 26HP	FDC735KXZE2	Combination
	Standard 28HP	FDC800KXZE2	Combination
	Standard 30HP	FDC850KXZE2	Combination
	Standard 32HP	FDC900KXZE2	Combination
	Standard 34HP	FDC950KXZE2	Combination
	Standard 36HP	FDC1000KXZE2	Combination
	Standard 38HP	FDC1060KXZE2	Combination
	Standard 40HP	FDC1120KXZE2	Combination
	Standard 42HP	FDC1200KXZE2	Combination
	Standard 44HP	FDC1250KXZE2	Combination
	Standard 46HP	FDC1300KXZE2	Combination
	Standard 48HP	FDC1350KXZE2	Combination
	Standard 50HP	FDC1425KXZE2	Combination
	Standard 52HP	FDC1450KXZE2	Combination
	Standard 54HP	FDC1500KXZE2	Combination
	Standard 56HP	FDC1560KXZE2	Combination
	Standard 58HP	FDC1620KXZE2	Combination
	Standard 60HP	FDC1680KXZE2	Combination
	High COP 20HP	FDC560KXZXE2	Combination
	High COP 30HP	FDC850KXZXE2	Combination
	High COP 32HP	FDC900KXZXE2	Combination
	High COP 34HP	FDC950KXZXE2	Combination
	High COP 36HP	FDC1000KXZXE2	Combination
	High COP 38HP	FDC1060KXZXE2	Combination
	High COP 40HP	FDC1120KXZXE2	Combination

2.5 Range of usage & limitations

(a) In case of mixed connection of HMU and air to air-conditioner

		FDC224KXZXE1	FDC280KXZE2 FDC280KXZXE1	FDC335KXZE2 FDC335KXZXE1	FDC400KXZE2	FDC450KXZE2 FDC450KXZXE1	FDC475KXZE2	FDC500KXZE2 FDC500KXZXE1	FDC560KXZE2 FDC560KXZXE1,2
Indoor units that can be used in combination	Number of connected units	2 – 6	2 – 20	2 – 21	2 – 26	2 – 31	2 – 32	2 – 35	2 – 40
	Connectable capacity (1), (2)	180– 448	224 – 560	268 – 670	200 – 800	360 – 900	238 – 760	400 – 800	448 – 896
Total piping length		510m or less							
Single direction piping length		Actual length : 120m or less, Equivalent length : 135m or less							
Main pipe length		90m or less							
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less (3))							
Elevation difference between the first branching point and the indoor unit		18m or less							
Elevation difference between indoor and outdoor units	Outdoor unit is higher	40m or less							
	Outdoor unit is lower	40m or less							
Elevation difference of indoor units in a system		18m or less							
Elevation difference 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							
Additional refrigerant quantity limitation		Single: 30kg, 2 units: 60kg, 3 units: 90kg							
Limitation of indoor unit connection		Standard : 80 – 130%, Hi-COP (280–450): 80 – 200%, Hi-COP(475–560): 80 – 160% (1), (4), (5)							
Minimum capacity		Minimum capacity of HMU must be 5HP (14kW) or higher. Ex: When HMU of 15HP is connected, water flow rate must be 40L / min (33% of the rated water flow rate) or more.							
Minimum capacity(only for cooling operation)		When outdoor temperature is -10˚C – -5˚C, minimum capacity must be 10HP (28kW) or higher. Ex: When HMU of 15HP is connected, water flow rate must be 80L / min (67% of the rated water flow rate) or more.							
Limitation of water flow rate when using HMU		Water flow rate must be 30% - 100% of the rated water flow rate. When outdoor temperature is 5˚C or lower, water flow rate must be the rated or more.							
Outlet water temperature of HMU cooling operation		14 – 19˚C							
Outlet water temperature of HMU heating operation		20 (or 25) – 40˚C							

Note (1) The capacity of air-conditioners (not HMU) must be 50% or more of the outdoor unit capacity.
Note (2) When indoor capacity is over 130%, the ratio of air-conditioners and HMUs must be the same.
Note (3) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to section 8.(a).
Note (4) When connecting the indoor unit type FDK,FDFL,FDFU or FDFW series, limit the connectable capacity not higher than 130%.
Note (5) When indoor unit connection is over 130%, the ratio of HMU and air-conditioner must be the same. In addition, simultaneous operation must be 100% or less.
Note (6) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable of 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-144). 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.
Note (7) Setting of microcomputer of outdoor unit needs to be changed in case of mixed connection.(See " ⑦ Setting of microcomputer of outdoor unit" in 11.2 Electric wiring work instruction on page 53.)

		FDC615KXZE2 FDC615KXZXE1	FDC670KXZE2 FDC670KXZXE1	FDC735KXZE2 FDC735KXZXE1	FDC800KXZE2 FDC800KXZXE1	FDC850KXZE2 FDC850KXZXE1,2	FDC900KXZE2 FDC900KXZXE1,2	FDC950KXZE2 FDC950KXZXE1,2	FDC1000KXZE2 FDC1000KXZXE1,2
Indoor units that can be used in combination	Number of connected units	2 – 44	2 – 49	3 – 55	3 – 61	3 – 64	3 – 69	3 – 74	3 – 78
	Connectable capacity	492 – 984	536 – 1072	588 – 1176	640 – 1280	680 – 1360	720 – 1440	760 – 1520	800 – 1600

		FDC1060KXZE2 FDC1060KXZXE2	FDC1120KXZE2 FDC1120KXZXE2	FDC1200KXZE2	FDC1250KXZE2	FDC1300KXZE2	FDC1350KXZE2	FDC1425KXZE2
Indoor units that can be used in combination	Number of connected units	4 – 80	4 – 80	4 – 80	4 – 80	4 – 80	4 – 80	4 – 80
	Connectable capacity	848 – 1378	896 – 1456	960 – 1560	1000 – 1625	1040 – 1690	1080 – 1755	1140 – 1852

		FDC1450KXZE2	FDC1500KXZE2	FDC1560KXZE2	FDC1620KXZE2	FDC1680KXZE2
Indoor units that can be used in combination	Number of connected units	5 – 80	5 – 80	5 – 80	5 – 80	5 – 80
	Connectable capacity	1160 – 1885	1200 – 1950	1240 – 2080	1296 – 2106	1344 – 2184

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(b) In case of only HMU connection

		FDC280KXZE2 FDC280KXZXE1	FDC335KXZE2 FDC335KXZXE1	FDC450KXZE2 FDC450KXZXE1	FDC475KXZE2	FDC500KXZE2 FDC500KXZXE1	FDC560KXZE2 FDC560KXZXE1,2	FDC615KXZE2 FDC615KXZXE1	FDC670KXZE2 FDC670KXZXE1
Indoor units that can be used in combination	Number of connected units	1 – 2	1 – 2	2 – 3	2 – 3	2 – 3	2 – 4	2 – 4	2 – 4
	Connectable capacity	224 – 280	268 – 335	360 – 450	380 – 475	400 – 500	448 – 560	492 – 615	536 – 670
Total piping length		510m or less							
Single direction piping length		Actual length : 120m or less, Equivalent length : 135m or less							
Main pipe length		90m or less							
Allowable pipe length from the first branching		90m or less (However, difference between the longest and shortest piping : 40m or less (1))							
Elevation difference between the first branching point and the indoor unit		18m or less							
Elevation difference between indoor and outdoor units	Outdoor unit is higher	40m or less							
	Outdoor unit is lower	40m or less							
Elevation difference of indoor units in a system		18m or less							
Elevation difference 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							
Additional refrigerant quantity limitation		Single :20kg, 2 units :40kg, 3 units :60kg							
Limitation of indoor unit connection		Hi-COP (280–450) : 80 – 100%, Hi-COP (475–560) : 80 – 100%							
Minimum capacity		Minimum capacity of HMU must be 5HP (14kW)or higher. Ex: When HMU of 15HP is connected, water flow rate must be 40L/min (33% of the rated water flow rate)or more.							
Minimum capacity (only for cooling operation)		When outdoor temperature is -10˚C – -5˚C, minimum capacity must be 10HP (28kW)or higher. Ex: When HMU of 15HP is connected, water flow rate must be 80L/min (67% of the rated water flow rate)or more.							
Limitation of water flow rate when using HMU		Water flow rate must be 30% - 100% of the rated water flow rate. When outdoor temperature is 5˚C or lower, water flow rate must be the rated or more.							
Outlet water temperature of HMU cooling operation		7 – 25˚C							
Outlet water temperature of HMU heating operation		25 (or 30) – 55˚C							

Note (1) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to section 8.(b).

Note (2) If Superlink I (previous Superlink) is selected, all the range of usage and limitations, not only the limitations of connectable of 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-144). 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.

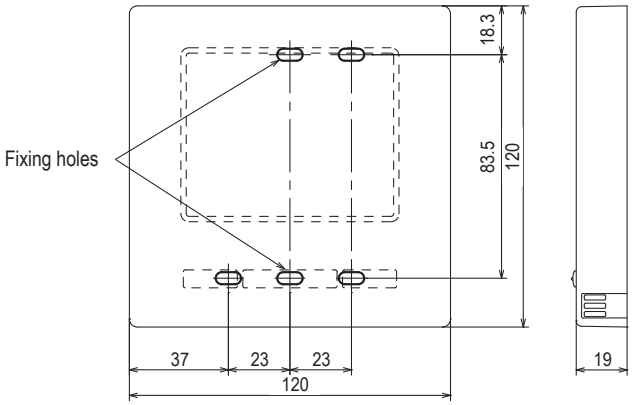
		FDC735KXZE2 FDC735KXZXE1	FDC800KXZE2 FDC800KXZXE1	FDC850KXZE2 FDC850KXZXE1,2	FDC900KXZE2 FDC900KXZXE1,2	FDC950KXZE2 FDC950KXZXE1,2	FDC1000KXZE2 FDC1000KXZXE1,2
Indoor units that can be used in combination	Number of connected units	3 – 5	3 – 5	3 – 6	3 – 6	3 – 6	3 – 7
	Connectable capacity	588 – 735	640 – 800	680 – 850	720 – 900	760 – 950	800 – 1000

2.6 Remote control (Option part)

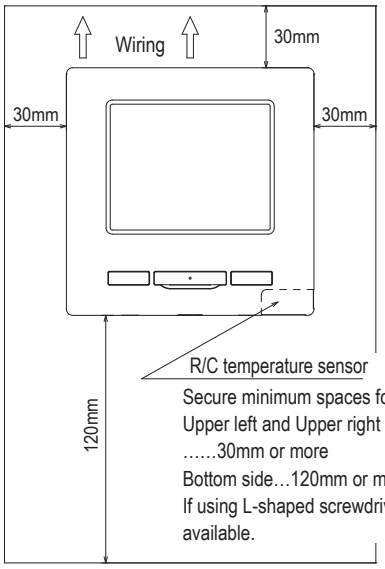
(1) Wired remote control

Model RC-EX3H

Dimensions (Viewed from front)



Installation space



Secure minimum spaces for disassembling the case.
Upper left and Upper right sides
……30mm or more
Bottom side…120mm or more
If using L-shaped screwdriver, 50mm or more is available.

● Do not install the remote control at following places.

(1) It could cause break-down or deformation of remote control.
- Where it is exposed to direct sunlight
- Where the ambient temperature becomes 0 °C or below, or 40 °C or above
- Where the surface is not flat
- Where the strength of installation area is insufficient

(2) Moisture may be attached to internal parts of the remote control, resulting in a display failure.
- Place with high humidity where condensation occurs on the remote control
- Where the remote control gets wet

(3) Accurate room temperature may not be detected using the temperature sensor of the remote control.
- Where the average room temperature cannot be detected
- Place near the equipment to generate heat
- Place affected by outside air in opening/closing the door
- Place exposed to direct sunlight or wind from air-conditioner
- Where the difference between wall and room temperature is large

(4) When you are using the automatic grille up and down panel in the IU, you may not be able to confirm the up and down motion.
- Where the IU cannot be visually confirmed

● When installing the unit at a hospital, telecommunication facility, etc., take measures to suppress electric noises.

It could cause malfunction or break-down due to hazardous effects on the inverter, private power generator, high frequency medical equipment, radio communication equipment, etc.
The influences transmitted from the remote control to medical or communication equipment could disrupt medical activities, video broadcasting or cause noise interference.

R/C cable:0.3mm² x 2 cores

When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm^2 . Connect them to wires of larger size near the outside of R/C. When wires are connected, take measures to prevent water, etc. from entering inside.

≦ 200 m	0.5 mm^2 x 2 cores
≦ 300m	0.75 mm^2 x 2 cores
≦ 400m	1.25 mm^2 x 2 cores
≦ 600m	2.0 mm^2 x 2 cores

Adapted RoHS directive

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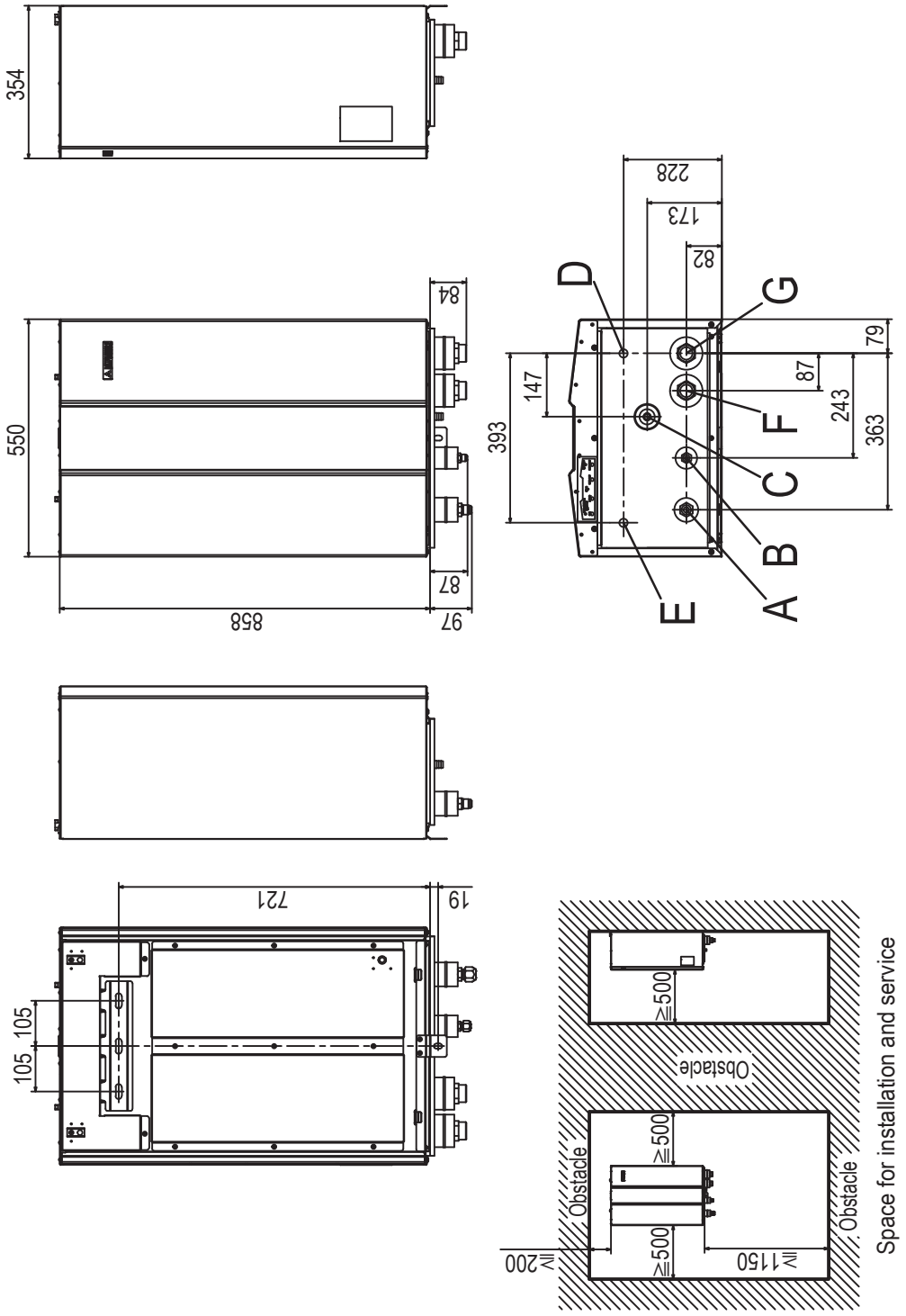
3. EXTERIOR DIMENSIONS

Unit:mm

Symbol	Content	
A	Gas piping	ϕ 15.88 (7/8") (Flare)
B	Liquid piping	ϕ 9.52 (5/8") (Flare)
C	Drain socket (Gravity drainage)	1.D.13 , 0.D.17
D	Hole for power cable	ϕ 20
E	Hole for signal line	ϕ 20
F	Water inlet	PT1−1/4
G	Water outlet	PT1−1/4



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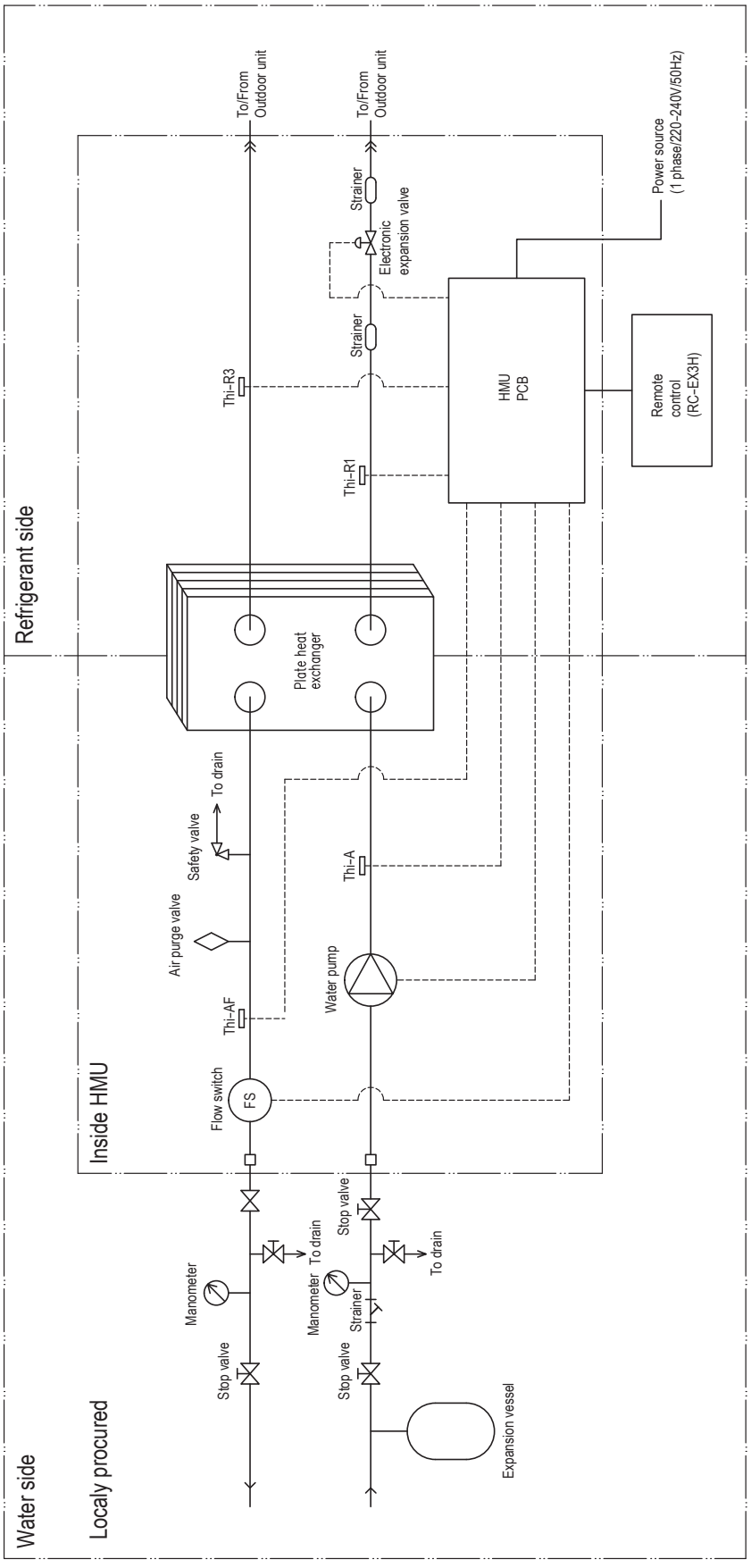
4. PIPING DIAGRAM



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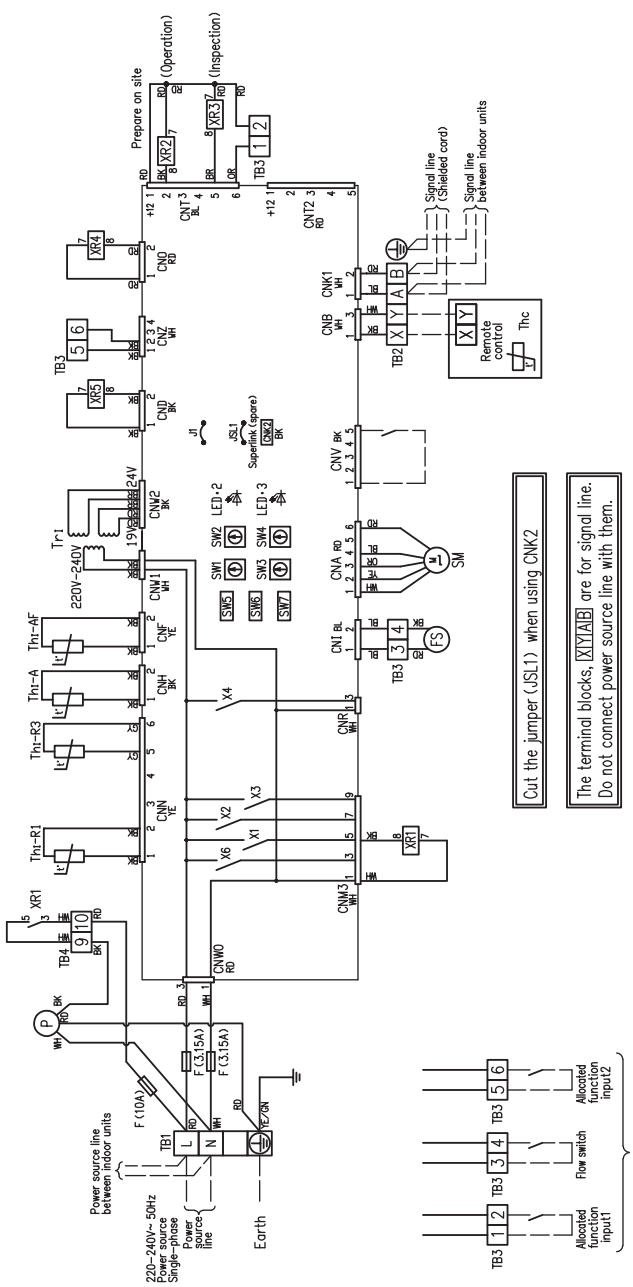
5. ELECTRICAL WIRING



Desciption of Items

Item	Description	Note
CND	Allocated function output2 (Operation information output)	
CNI	Water pump interlock (Remote operation input)	
CNK1	Superlink (Signal line)	
CNK2	Superlink (Spare)	
CNM3	Water pump operation (Operation information output)	
CNO	Allocated function output1 (Operation information output)	
CNT–2	Operation (Operation information output)	
CNT–5	Inspection (Operation information output)	
CNT–6	Allocated function input1 (Remote operation input)	
CNV	Offset setting for set temperature of thermostat : valid / invalid (▲OPEN / SHORT)	
CNZ	Allocated function input2 (Remote operation input)	
F	Fuse	
FS	Flow switch	
JSL1	Spare Superlink connector change	
LED·2	Indication lamp (Green–Normal operation)	
LED·3	Indication lamp (Red–Inspection)	
SM	Stepping motor (for electronic expansion valve)	
SW1	Indoor unit address : tens place	
SW2	Indoor unit address : ones place	
SW3	Outdoor unit address : tens place	
SW4	Outdoor unit address : ones place	
SW5–2	Indoor unit address: hundreds place (▲OFF)	
SW6–1~4	Model capacity setting (▲ON)	
SW7–1	Operation check (▲OFF)	
SW7–2	Target setting of thermostat : Outlet water / Inlet water (OFF / ▲ON)	
SW7–3	Target setting of thermostat by remote operation input : Outlet water / Inlet water (▲OFF / ON)	
SW7–4	Model setting (▲ON)	
TB1	Terminal block (Power source) (Unmark)	Screw : M4
TB2	Terminal block (Signal line) (Unmark)	Screw : M3.5
TB3	Terminal block (High power electric relay connection) (Unmark)	Screw : M3.5
TB4	Terminal block (Low power electric relay connection) (Unmark)	Screw : M3.5
Thc	Temperature sensor (Remote control)	
Th1–A	Temperature sensor (Inlet water)	
Th1–AF	Temperature sensor (Outlet water)	
Th1–R1, 3	Temperature sensor (Heat exchanger)	
Tr1	Transformer	
XR1–5	Relay for operation information output	

★ Factory default
Refer to the technical documents in detail.

Error code indoor unit

Display on remote control	LED on indoor circuit board red (checking)	green (normal)	Content		
Off	Off	Continuous blinking	Normal		
	Off	Off	Fault in power source,indoor power off or one phase down		
E1	Off	Continuous blinking	Fault on the transmission between indoor circuit board and remote control		
		Not sure	Indoor computer abnormal		
E2	blinking once	Continuous blinking	Duplication of indoor address No. (can only be detected during operation)		
			Excess number of remote controllers (can only be detected during operation)		
E3	blinking twice	Continuous blinking	Outdoor power off or one phase down There is no corresponding outdoor unit address.		
			Address setting error	Indoor unit address switch Indoor No. Outdoor No. 000 49	
E5	blinking twice	Continuous blinking	Fault on outdoor–indoor transmission		
E6	blinking once	Continuous blinking	Indoor heat exchanger thermistor interrupted or short–circuit		
E7	blinking once	Continuous blinking	Inlet water thermistor interrupted or short–circuit		
E9	blinking once	Continuous blinking	Water exchanger freezing anomaly		
E10	Off	Continuous blinking	Excess number of remote control connections		
E11	Off	Continuous blinking	The master indoor unit is not set properly.		
E12	blinking once	Continuous blinking	Address setting error	Indoor unit address switch Indoor No. Outdoor No. 001–127 49	
E14	blinking three times	Continuous blinking	Communication abnormal between master–slave indoor units		
E15	blinking once	Continuous blinking	Outlet water temperature sensor interrupted or short–circuit		
E16	blinking once	Continuous blinking	Water pump interlock anomaly		
E18	blinking once	Continuous blinking	The address configuration fault for master–slave indoor units		
E22	blinking twice	Continuous blinking	HMI system connection anomaly		
E28	Off	Continuous blinking	Remote control thermistor anomaly		
E30	blinking once	Continuous blinking	Indoor unit system connection abnormal		
Over E30	Off	Continuous blinking	Outdoor unit checking (outdoor circuit board LED checking)		

Color Marks

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

Specifications for operation information output (Specification of LY2F manufactured by OMRON)

	Resistive load	Inductive load
Rated load	10 A at AC110V	7.5 A at AC110V
	10 A at DC24V	7.5 A at DC24V
Carry current	10A	
Maximum operating voltage	AC250V DC125V	
Maximum operating current	10A	10A

Notes 1. —— indicates wiring on site.
2. Use twin core cable (0.75–1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
3. Terminal A B are signal terminal. (DC 5volt)
4. Use 2 cores cable (0.3mm²) at remote control line. See spec sheet of remote control in case that the total length is more than 100m.
5. Do not put signal line and remote control line alongside power source line.

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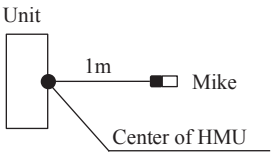
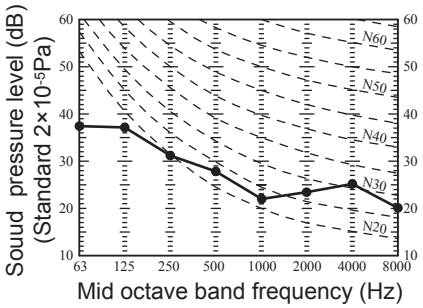
6. NOISE LEVEL

Notes (1) The data are based on the following conditions.
(2) The data in the chart are measured in an anechoic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.
(4) Measured based on JIS B 8616. Mike position is as right.

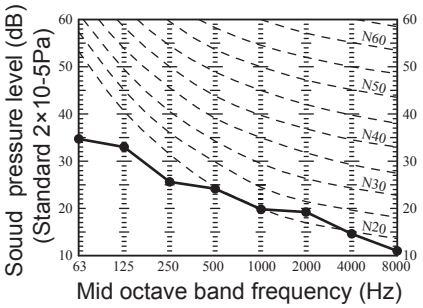


Sound test condition	Inlet water temperature	Outlet air temperature	Outdoor air temperature	Water flow	
				HMU140KXZE1	HMU280KXZE1
Cooling	23˚C	18˚C	35˚CDB	40L/min	80L/min
Heating	30˚C	35˚C	7˚CDB/6˚CWB		

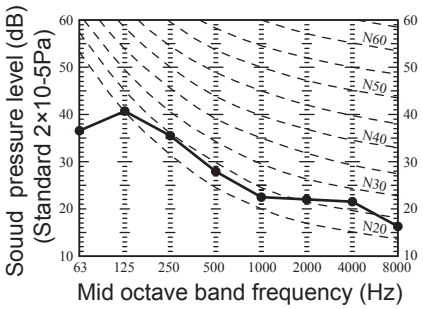
HMU140KXZE1
Cooling condition
Noise level 32dB(A) at pump setting 3



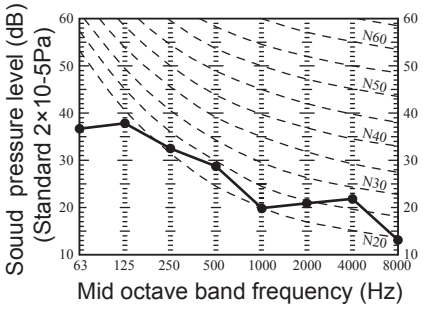
Heating condition
Noise level 27dB(A) at pump setting 3



HMU280KXZE1
Cooling condition
Noise level 32dB(A) at pump setting 3



Heating condition
Noise level 31dB(A) at pump setting 3



SPL and PWL of HMU140, 280KXZE1 are as follows. [dB(A)]

Model	Pump setting: 2*				Pump setting: 3			
	Cooling		Heating		Cooling		Heating	
	SPL	PWL	SPL	PWL	SPL	PWL	SPL	PWL
HMU140KXZE1	29	46	26	44	32	48	27	46
HMU280KXZE1	29	46	27	45	32	48	31	49

*:For reference

7. HYDRAULIC PERFORMANCE

(1) Hydraulic performance curve of HMU140KXZE1

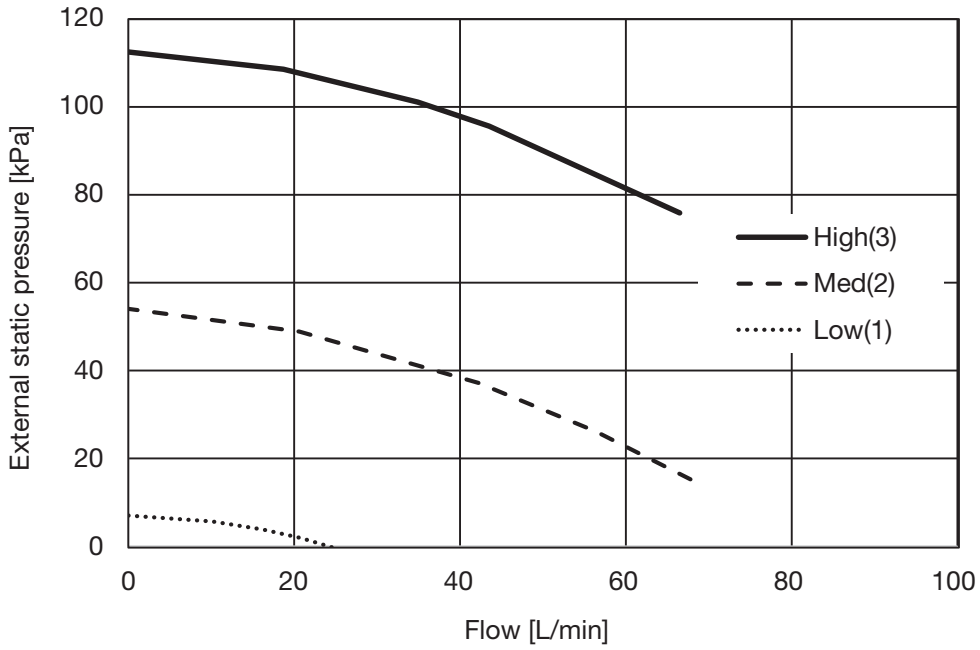
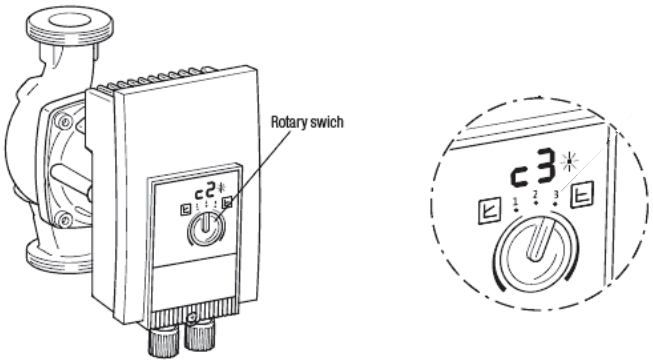


Fig1. Hydraulic performance curve for HMU140KXZE1

Note

- ●Above figure is for constant speed mode of the pump. The Pump (Wilo-Yonos PARA high Flow 25/12) has Δ p-v mode and Δ p-c mode. See technical manual of the pump for more information.
- ●The pump speed can be set in one of three fixed speed stages that can be set in constant speed mode. You can change the speed by changing the rotary switch on the pump. (Rotary switch 3: High, Rotary switch 2: Med, Rotary switch 1: Low)



(2) Hydraulic performance curve of HMU280KXZE1

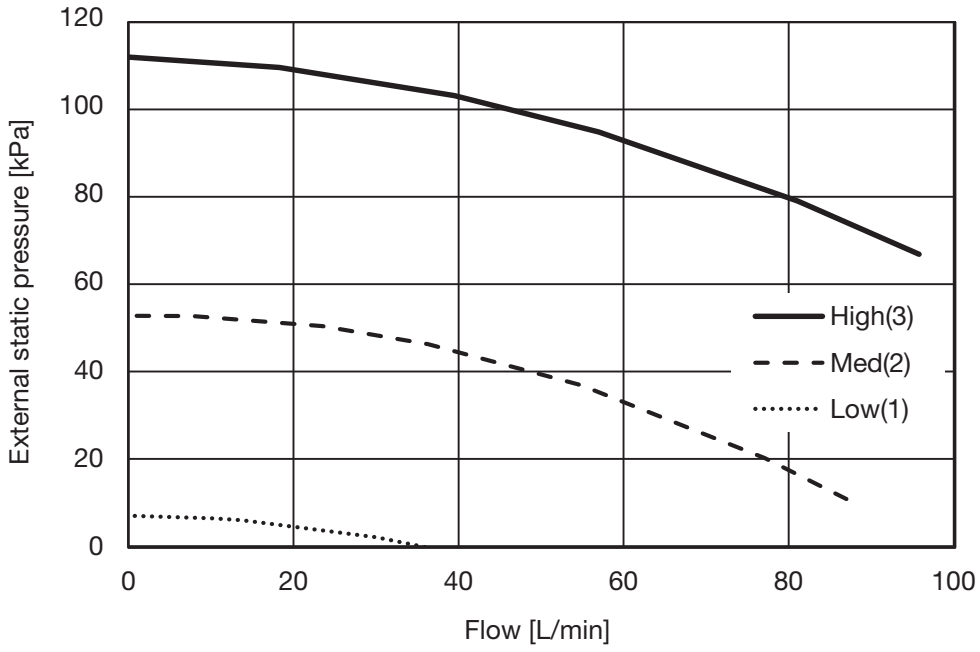
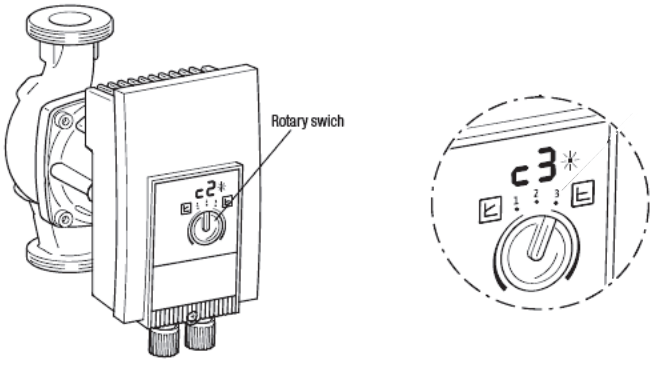


Fig2. Hydraulic performance curve for HMU280KXZE1

Note

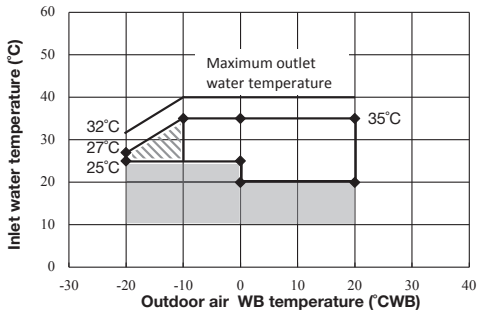
- Above figure is for constant speed mode of the pump. The Pump (Wilo-Yonos PARA high Flow 25/12) has Δ p-v mode and Δ p-c mode. See technical manual of the pump for more information.
- The pump speed can be set in one of three fixed speed stages that can be set in constant speed mode. You can change the speed by changing the rotary switch on the pump. (Rotary switch 3: High, Rotary switch 2: Med, Rotary switch 1: Low)



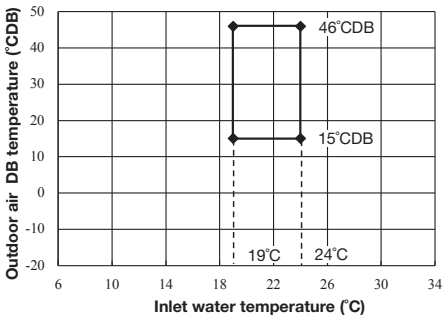
8. OPERATING TEMPERATURE RANGE

(a) In case of mixed connection of HMU and air to air-conditioner

Heating operation



Cooling operation



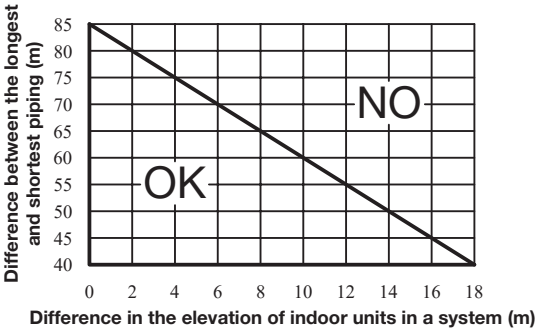
a) In cace outdoor temperature is higher than 0˚C, lowest inlet water temperature limit is 20˚C.
b) In cace outdoor temperature is 0˚C or less, lowest inlet water temperature limit is 25˚C.
c) Operation in colored area (▭) is allowed only within 30 minutes of the start of the heating operation.

*In case of the hatched area (▨) , all these limits must be followed.
1) Outdoor unit position must be equal or higher than indoor unit position.
2) Elevation difference of indoor units in a system is NOT allowed.

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

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.



Setting of microcomputer of outdoor unit needs to be changed in case of mixed connection. (See installation manual.)

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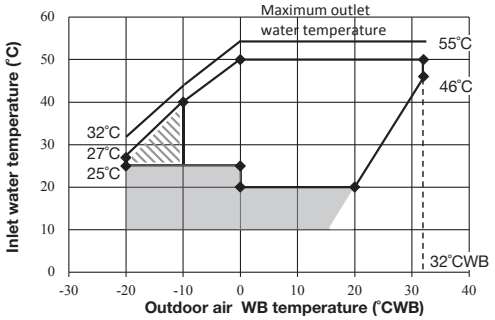
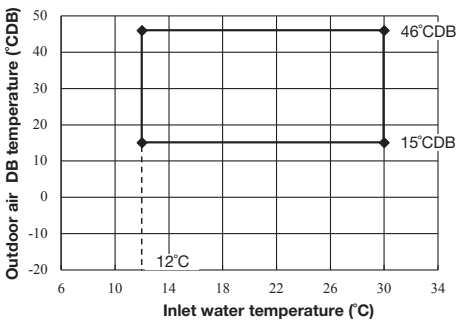
(b) In case of only HMU connection

Heating operation



Cooling operation



a) In cace outdoor temperature is higher than 0˚C, lowest inlet water temperature limit is 20˚C.
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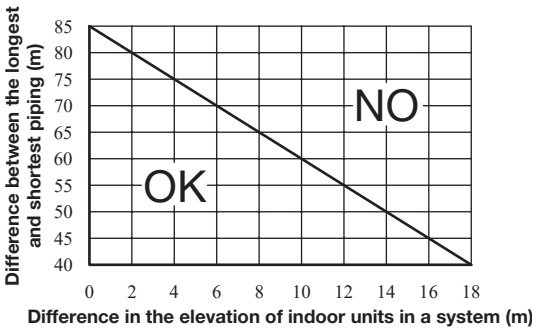
Specification for installation with the difference between the longest and shortest piping more than 40m

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

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.



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9. HMU SELECTION CHART

The calculation flow for system design is shown below.

(1) (a) Check of design condition (Confirmation of customer's requirement)
↓
(1) (b) Check of range of usage
↓
(2) Selection of HMU
↓
(3) Selection of outdoor unit
↓
Check the settings (→ Refer to section 4 and 5)
↓
Fill in HMU Check Sheet.

(1) Confirmation of design conditions

(a) Confirmation of design conditions (Water volume, inlet water temperature, target outlet water temperature)

Design air condition

Summer	Indoor air		˚CDB
			˚CWB
	Outdoor air		˚CDB
			˚CWB
Winter	Indoor air		˚CDB
			˚CWB
	Outdoor air		˚CDB
			˚CWB

Design requirement capacity condition (Air-conditioner)

Summer	Cooling capacity (REC_A)		kW
Winter	Heating capacity (RCC_A)		kW

Design requirement capacity condition (HMU)

Summer	Cooling capacity (REC_H)		kW
	Inlet water temp.		˚C
	Target outlet water temp.		˚C
	Water volume		L/min
Winter	Heating capacity (RCC_H)		kW
	Inlet water temp.		˚C
	Target outlet water temp.		˚C
	Water volume		L/min

(b) Confirmation of range of usage

Confirm that the operating conditions are within the following ranges of use, depending on the operation mode.

Operation mode	Range of usage	Judgment
A/C mode	21·KX-T-378 or '14·KX-SM-204.	OK · NG
HMU mode	See section 1.3 and 1.4	OK · NG

REC (Requested Evaporator Capacity) = REC_A + REC_H
RCC (Requested Condensor Capacity) = RCC_A + RCC_H

(2) Confirmation of calculation conditions for HMU

(a) Use HMU having following specifications.

No.	Model	Remark
1	HMU140KXZE1	For 14.0kW Capacity on the rated condition
2	HMU280KXZE1	For 28.0kW Capacity on the rated condition

(3) HMU calculation

(a) Examination of the number of divisions of HMU

Divide the heat exchanger taking the following items into consideration depending on the required cooling capacity.

・Select the unit of divided capacity from the following capacities, which can be set on HMU.

14.0 kW, 28.0 kW

(4) Outdoor unit selection

It is necessary to select the required capacity of outdoor unit correctly by implementing the correction according to operating conditions.

Select the outdoor unit for each refrigerant system according to the following flow.

(a) Operation mode selection

(i) Connecting indoor unit

Select a connection pattern for indoor unit.

- HMU only : Connecting indoor unit is HMU only.
- Mixed with air-conditioner : HMU and air to air conditioner are mixed in connecting indoor units.

	HMU only	Mixed with air-conditioner
Standard model	○	○
High COP model	○	○

(ii) HMU operation mode

Setting temperature range are as follows.

1) For outlet water temperature control

Cooling mode	Target outlet water temperature range: 7 – 25˚C
Heating mode	Target outlet water temperature range: 25 (or 30) – 55˚C

2) For inlet water temperature control

Cooling mode	Target inlet water temperature range: 12 – 30˚C
Heating mode	Target inlet water temperature range: 20 (or 25) – 50˚C

(b) Correction coefficient B1, B2

Ratios of air to air conditioner and HMU to total indoor units

	HMU only	Mixed with air-conditioner
Ratio of air to air conditioner, B1※1	0	B1 + B2 = 1
Ratio of HMU, B2※2	1	

※1 $B1 = \dfrac{\text{Air to air indoor unit capacity index}}{\text{Total indoor unit capacity index}}$

※2 $B2 = \dfrac{\text{HMU capacity index}}{\text{Total indoor unit capacity index}}$

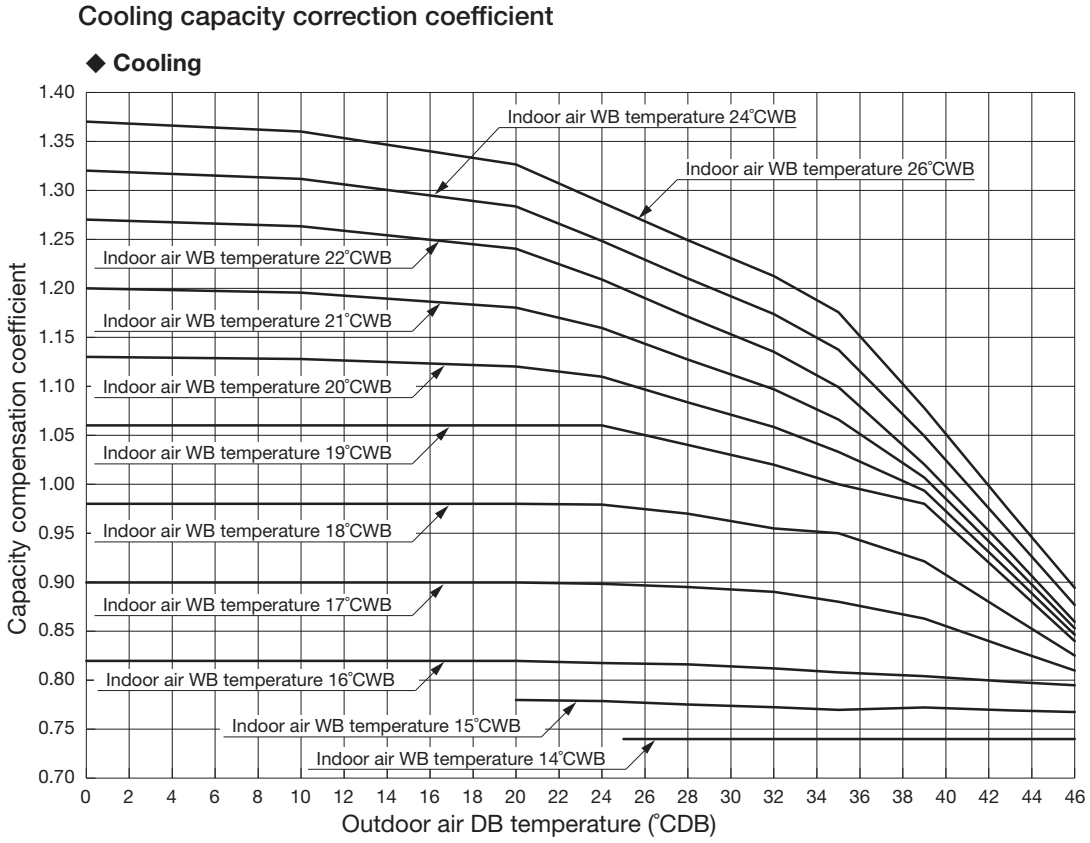
(c) Correction coefficient C1

Capacity correction along with the outdoor and indoor air-conditions during air to air-conditioner operation

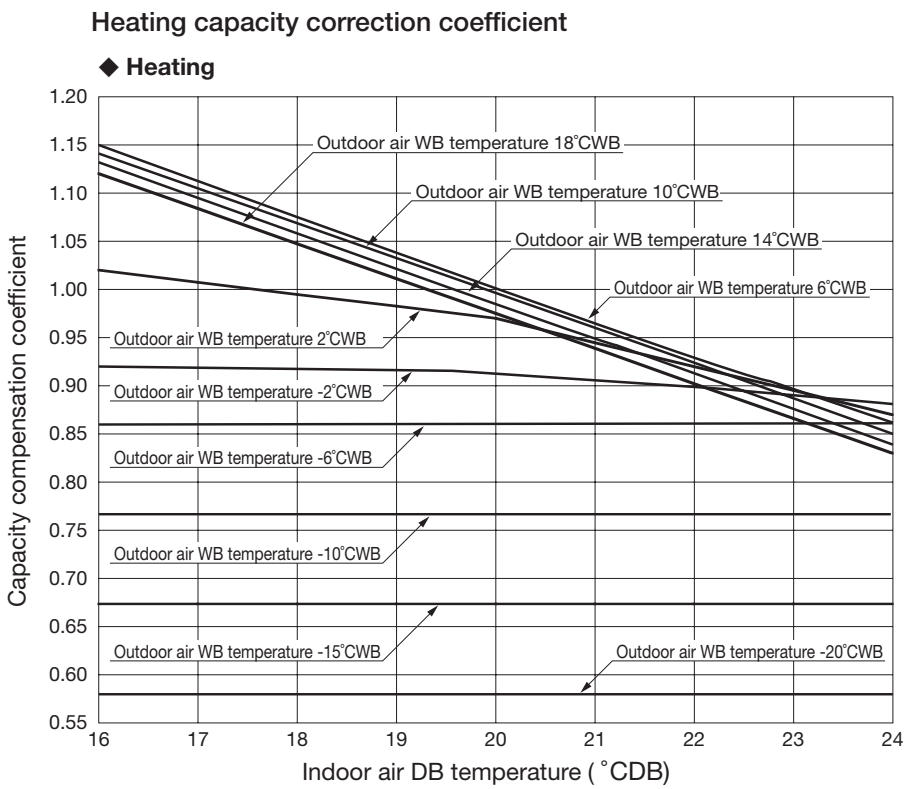
Capacity correction coefficient is calculated from the following graph according to the operation mode.

$$\text{Capacity compensation coefficient} = \frac{\text{Actual capacity outdoor unit}}{\text{Rated capacity outdoor unit}}$$

(i) Cooling mode



(ii) Heating mode



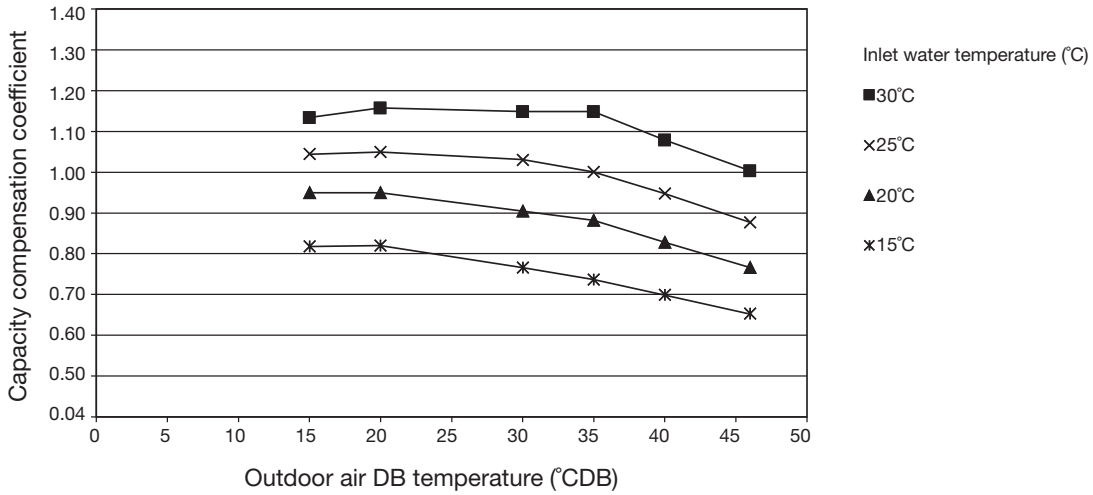
(d) Correction coefficient C2

Capacity correction along with the outdoor air conditions and the indoor inlet water temperature during HMU operation

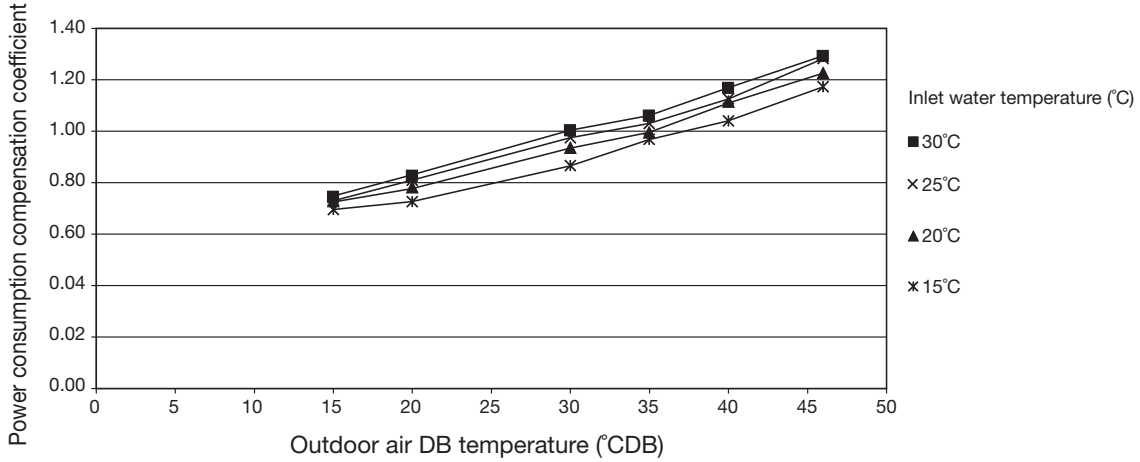
Capacity correction coefficient is calculated from the following graph according to the operation mode.

(i) Cooling mode

Cooling capacity characteristic



Cooling power consumption characteristic



Notes 1. The above-mentioned figure shows a typical condition among conditions to occur via controlling an unit.
2. The cooling capacity may decrease by frequent actuation of anti-frost control in low outdoor temperature. Please avoid using the units for computer rooms or industrial uses which require annual cooling operation.

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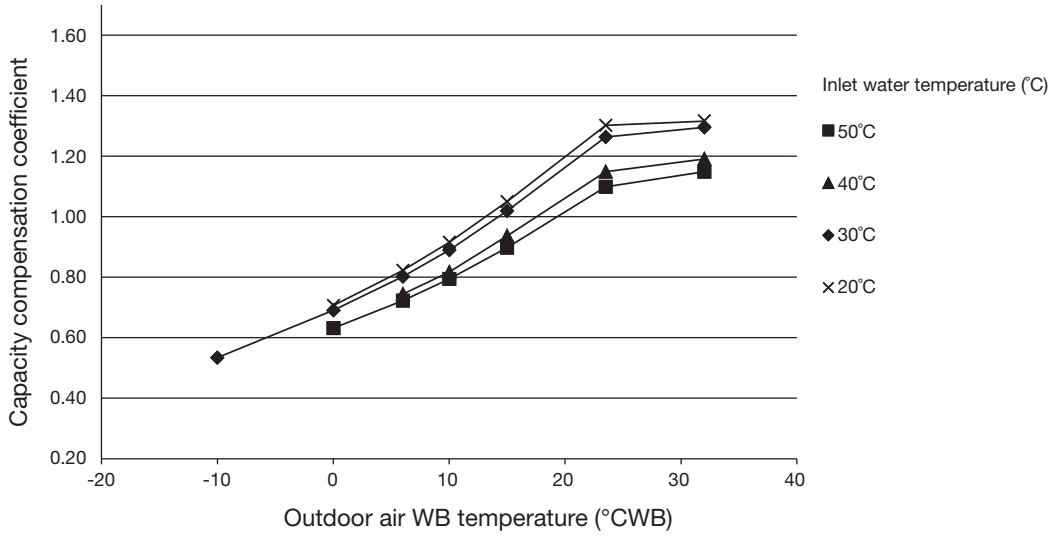
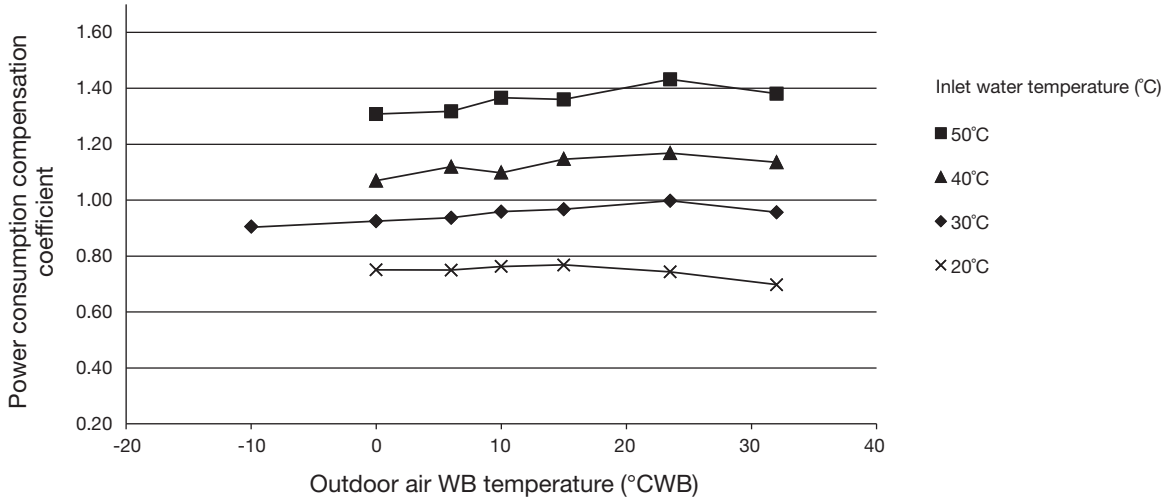
(ii) Heating mode

Heating capacity characteristic



Heating power consumption characteristic



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(e) Correction coefficient D

Correction based on the pipe length

Calculate the capacity correction coefficient from the following graph.

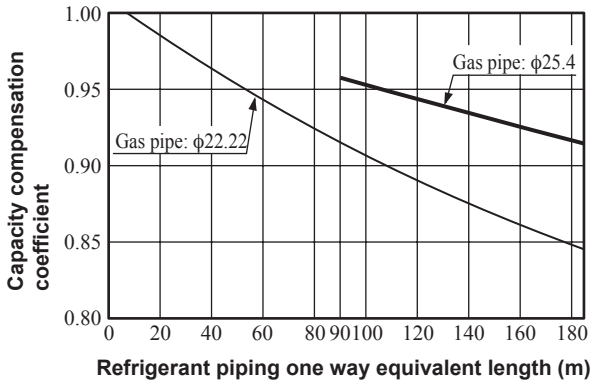
Take note that the correction coefficient varies depending on the pipe size.

Correction coefficient is same regardless of hose powers in case of the heating capacity correction.

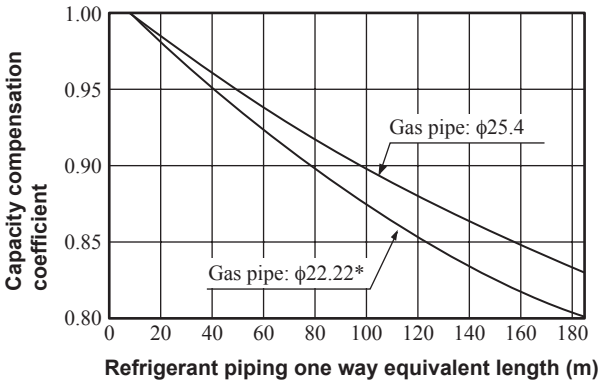
(i) KXZE2 series

1) Cooling

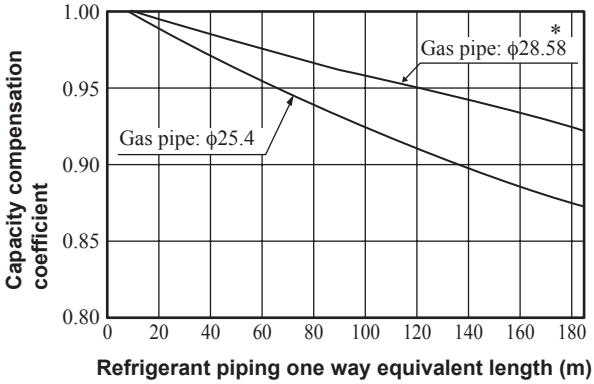
Model FDC280KXZE2



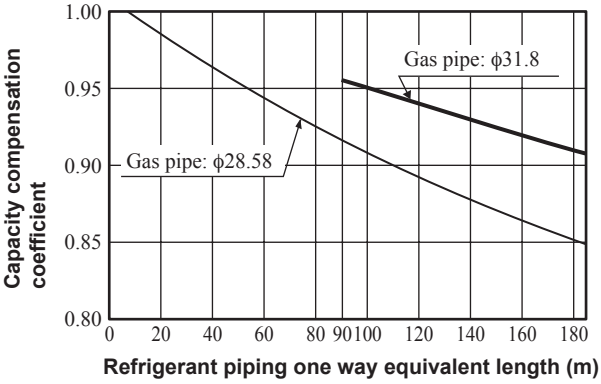
Model FDC335KXZE2



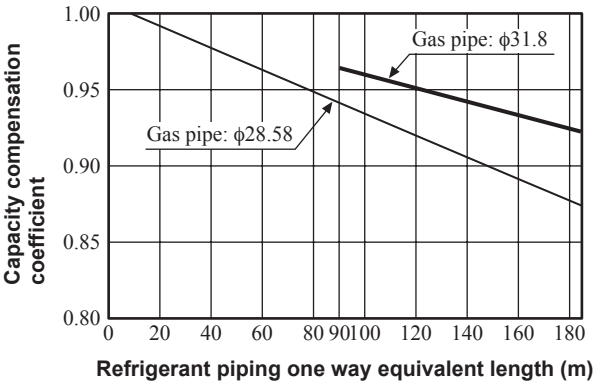
Model FDC400KXZE2



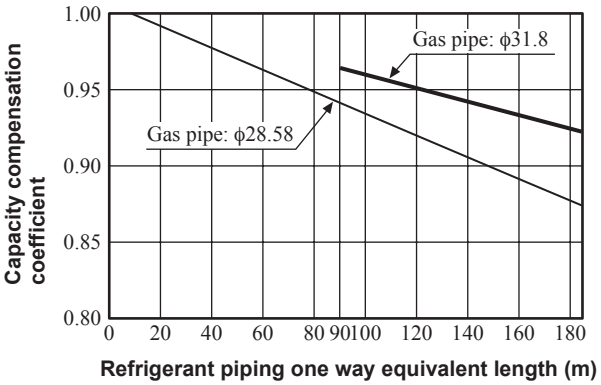
Model FDC450KXZE2



Model FDC475KXZE2

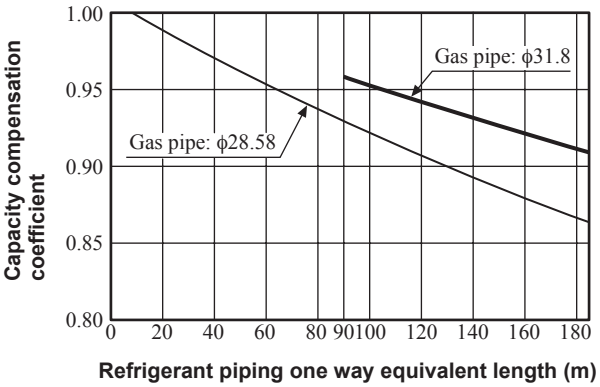


Model FDC500KXZE2

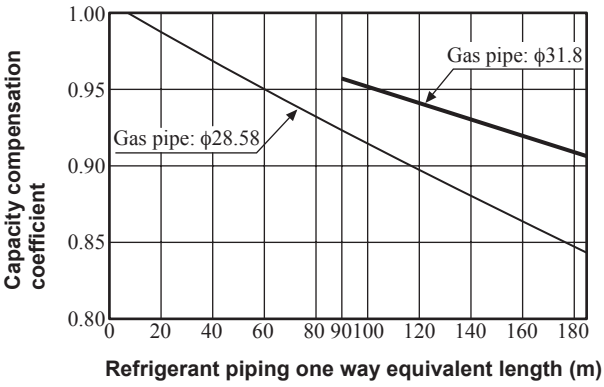


Note (1) Parts with the * mark show the piping size in case used in Europe.

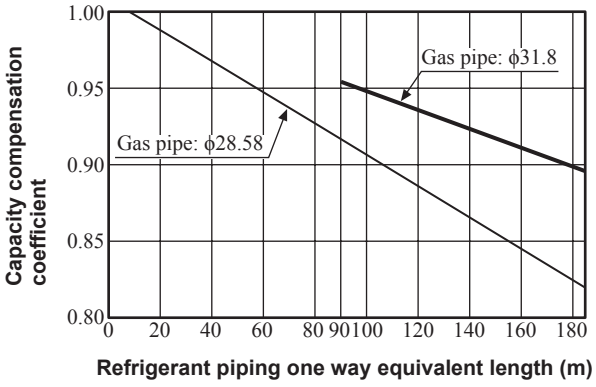
Model FDC560KXZE2,KXZXE2



Model FDC615KXZE2



Model FDC670KXZE2



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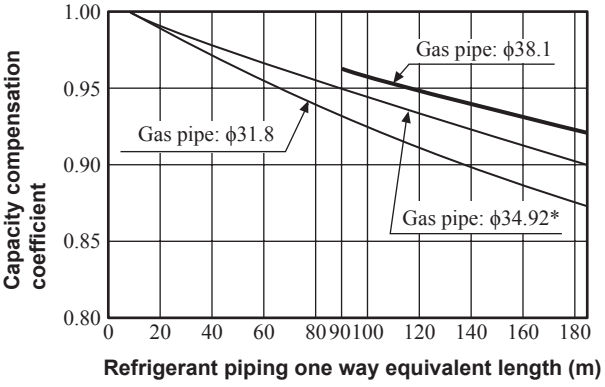
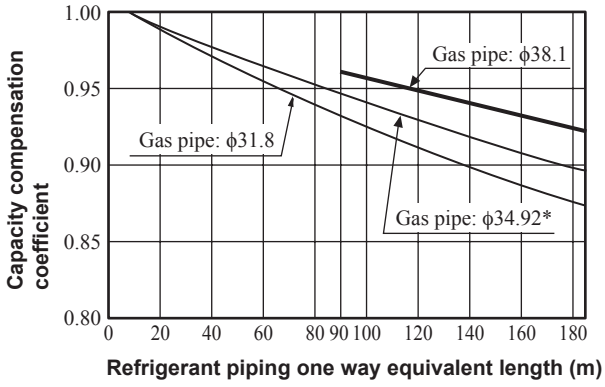
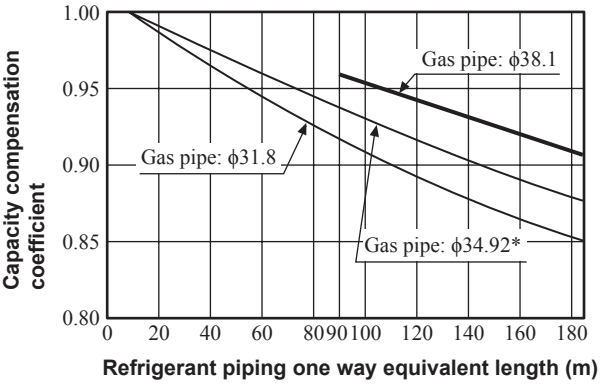


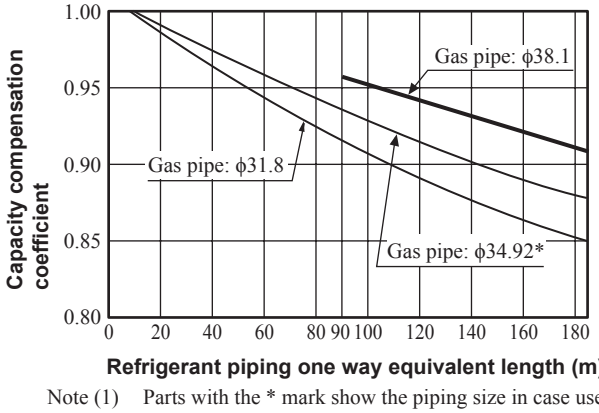
Model FDC800KXZE2



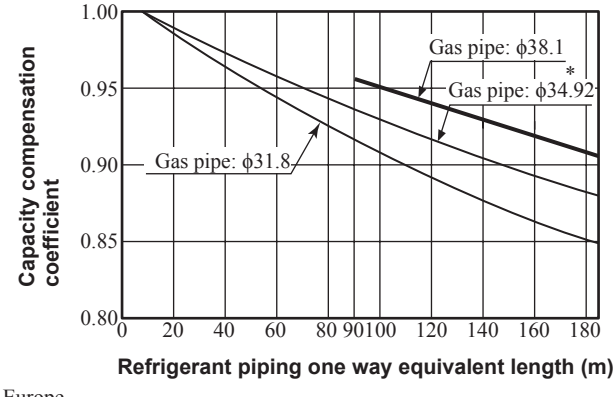
Model FDC850KXZE2,KXZXE2



Model FDC900KXZE2,KXZXE2

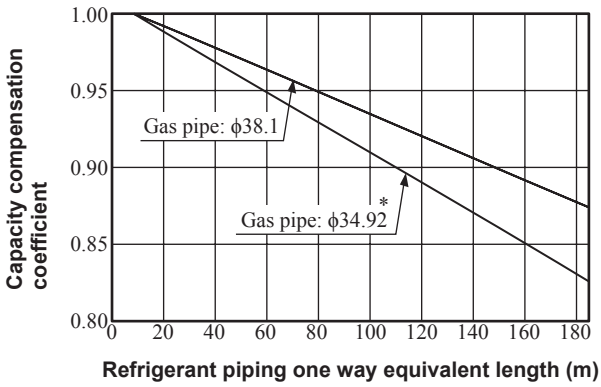


Model FDC950KXZE2,KXZXE2

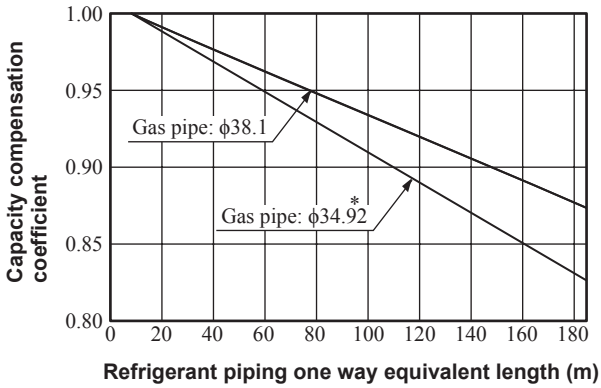


Note (1) Parts with the * mark show the piping size in case used in Europe.

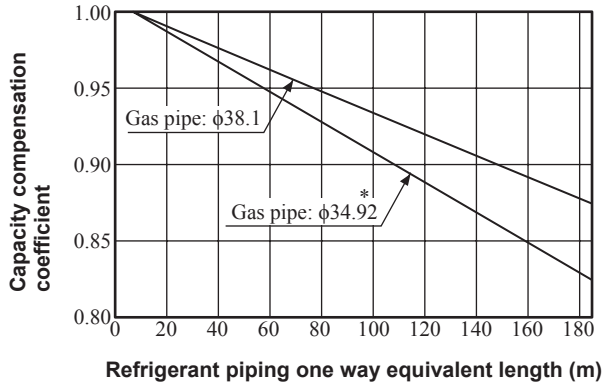
Model FDC1000KXZE2,KXZXE2



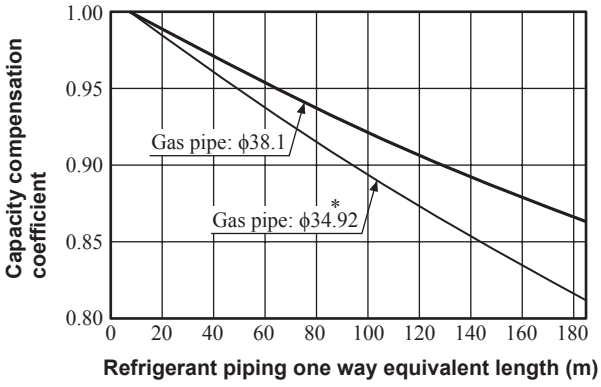
Model FDC1060KXZE2,KXZXE2



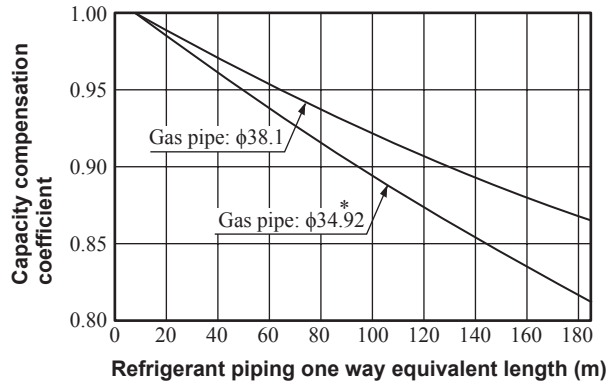
Model FDC1120KXZE2,KXZXE2



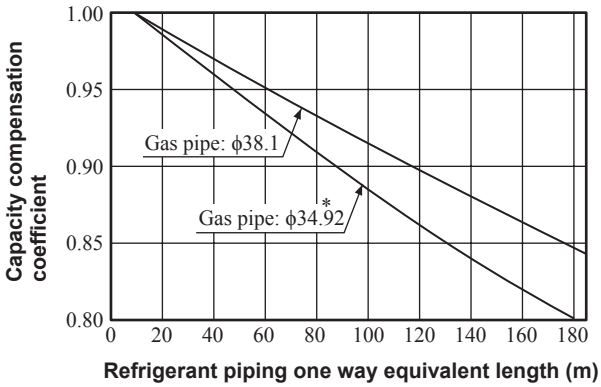
Model FDC1200KXZE2



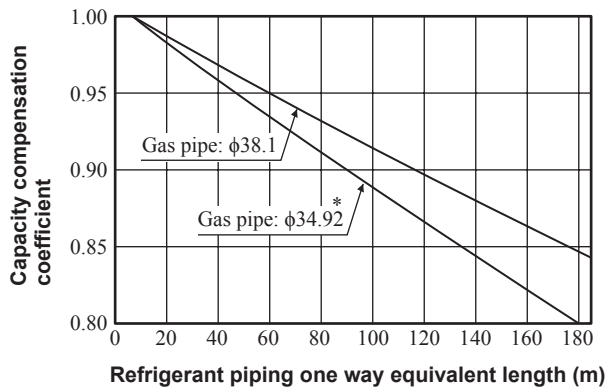
Model FDC1250KXZE2



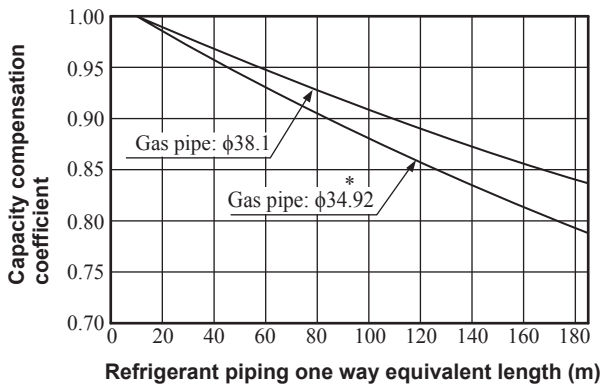
Model FDC1300KXZE2



Model FDC1350KXZE2

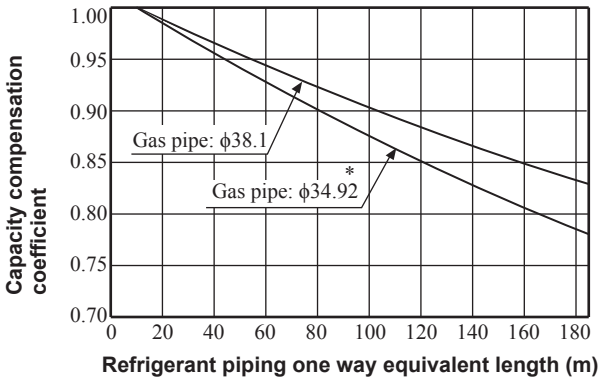


Model FDC1425KXZE2

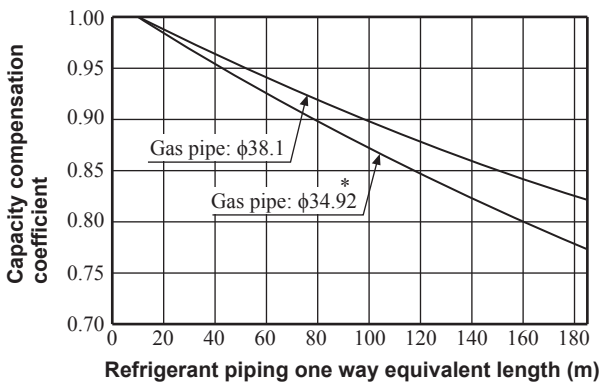


Note (1) Parts with the * mark show the piping size in case used in Europe.

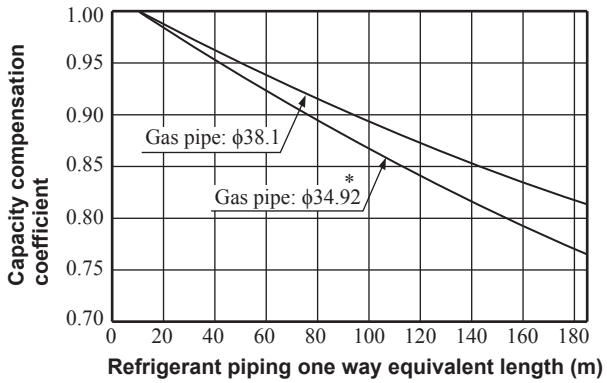
Model FDC1450KXZE2



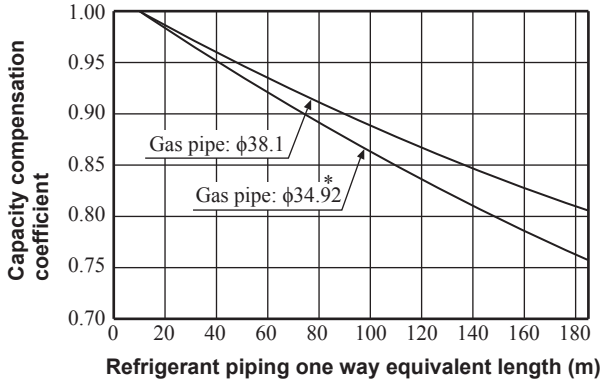
Model FDC1500KXZE2



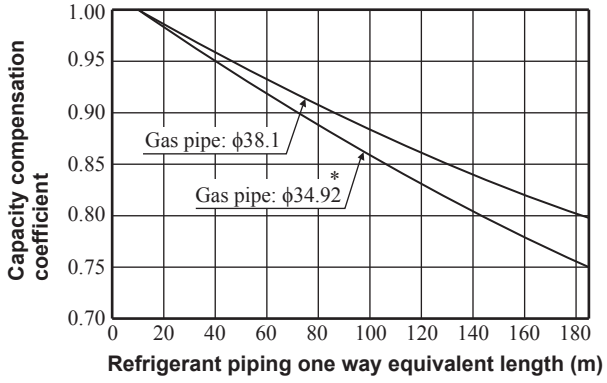
Model FDC1560KXZE2



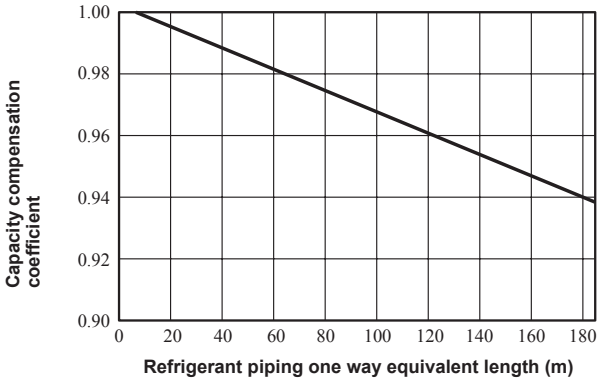
Model FDC1620KXZE2



Model FDC1680KXZE2



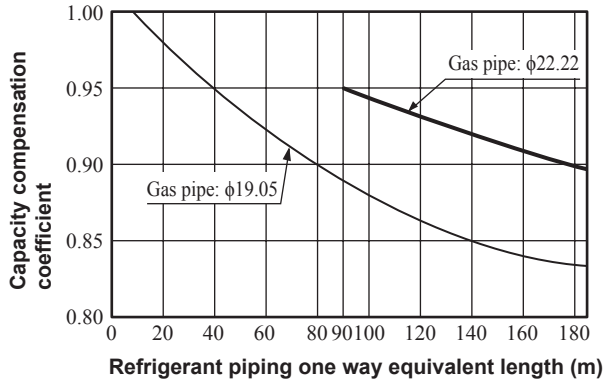
2) Heating



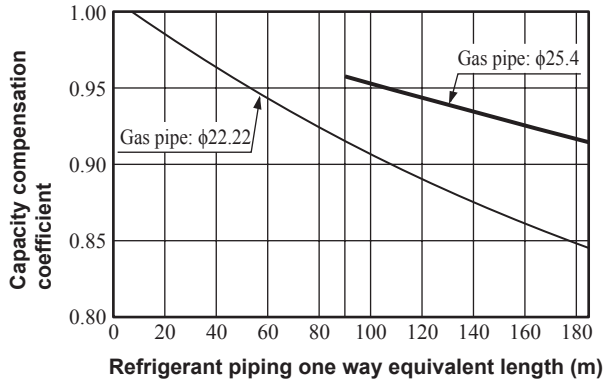
(ii) KXZXE1 series

1) Cooling

Model FDC224KXZXE1

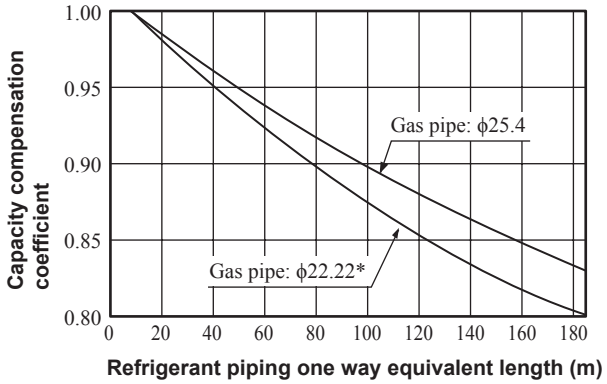


Model FDC280KXZXE1

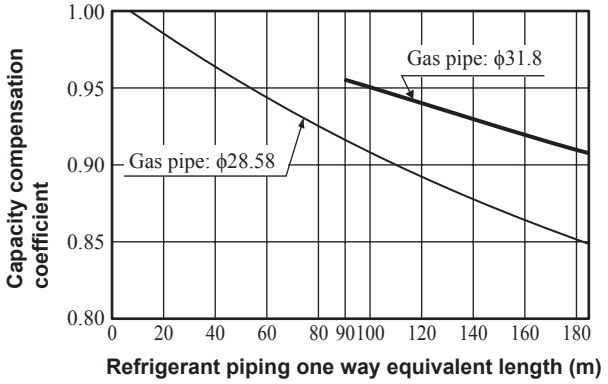


Note (1) Parts with the * mark show the piping size in case used in Europe.

Model FDC335KXZXE1



Model FDC450KXZXE1



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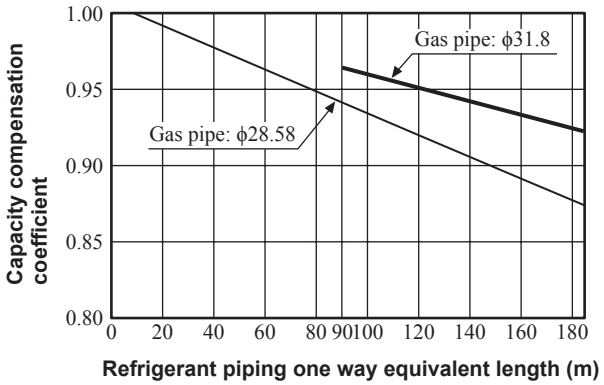
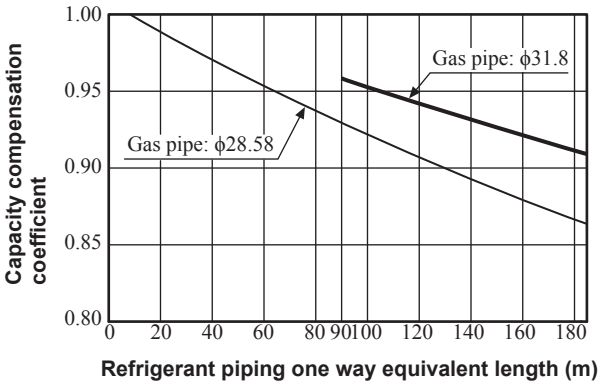
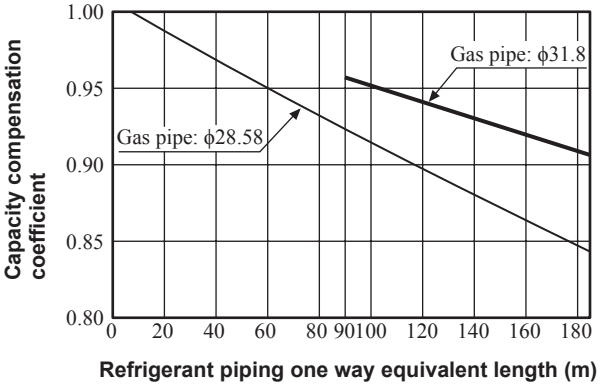


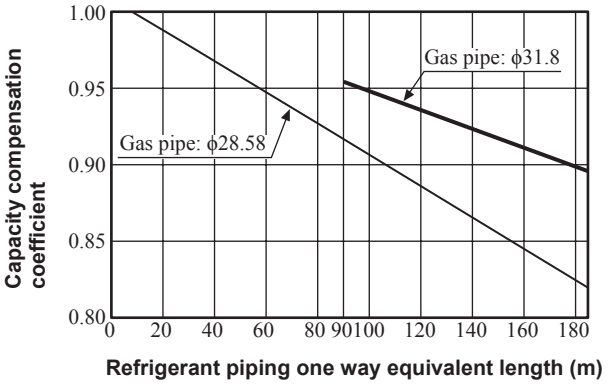
Model FDC560KXZXE1



Model FDC615KXZXE1



Model FDC670KXZXE1



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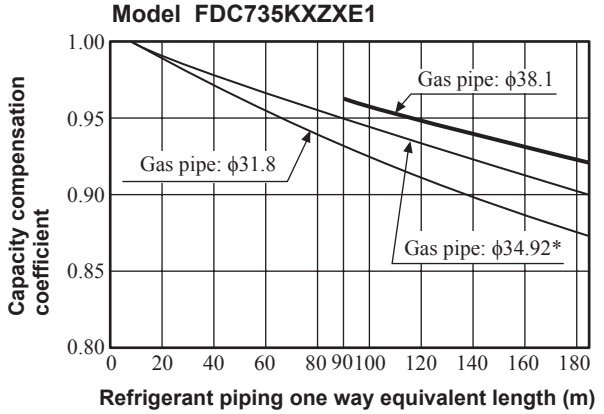
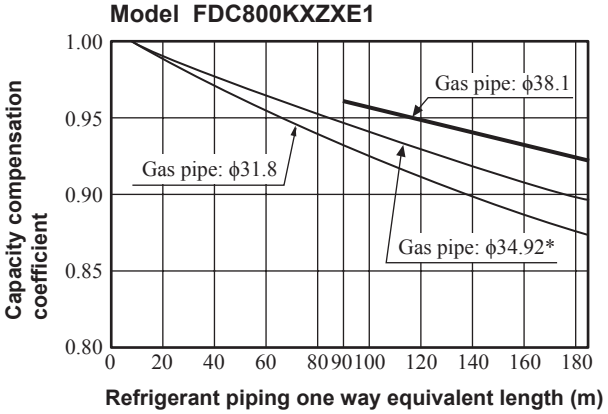
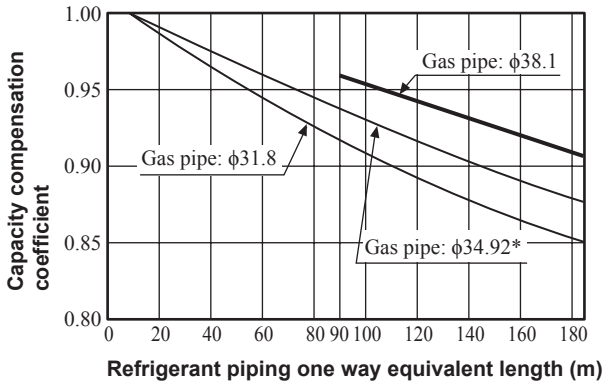


Model FDC800KXZXE1

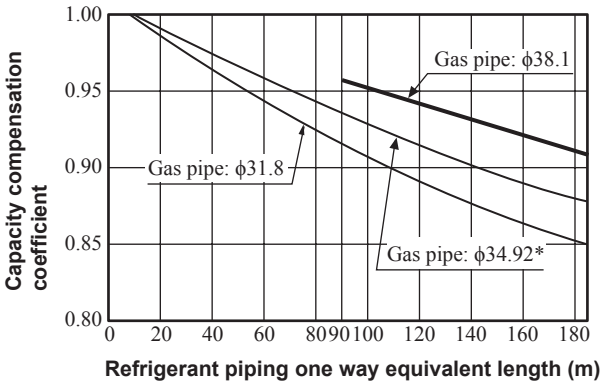


Note (1) Parts with the * mark show the piping size in case used in Europe.

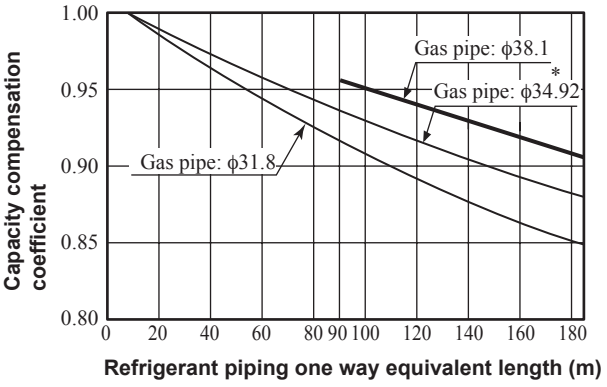
Model FDC850KXZXE1



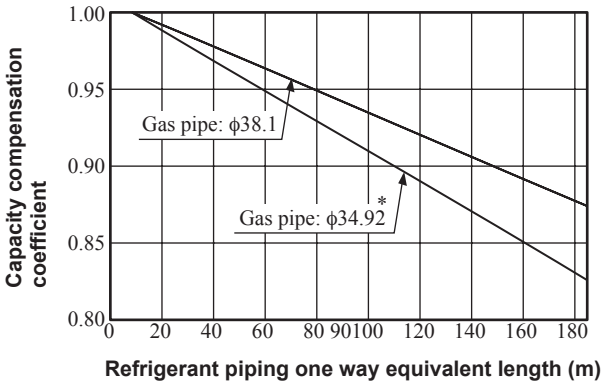
Model FDC900KXZXE1



Model FDC950KXZXE1

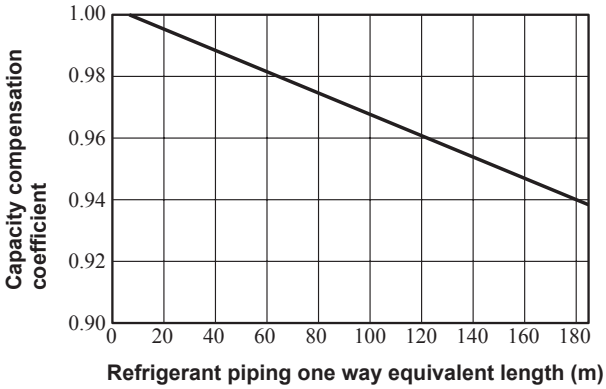


Model FDC1000KXZXE1



Note (1) Parts with the * mark show the piping size in case used in Europe.

2) Heating



Note (1) Equivalent piping length can be obtained by calculating as follows.
Equivalent piping length = Real gas piping length + Number of bends in gas piping × 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

(f) Correction coefficient E

Correction based on the hight difference of indoor and outdoor unit

Calculate the capacity correction coefficient from the following table.

Do this correction only when the outdoor unit is positioned at the bottom during cooling or when the outdoor unit is positioned at the top during heating.

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

Height difference between the indoor unit and outdoor unit in the vertical height difference	30 m	35 m	40 m
Adjustment coefficient	0.94	0.93	0.92

(g) Correction coefficient F

Correction coefficient related to the frost on the outdoor unit heat exchanger during heating (Heating only)

Correct the heating capacity for the frost on the outdoor unit heat exchanger.

Do this correction only when calculating the heating capacity.

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.

(h) Calculation of overall correction coefficient

Calculate the overall correction coefficient by multiplying the correction coefficients B – F.

	Overall correction coefficient
Cooling mode	(B1 x C1 + B2 × C2) × D × E = α
Heating mode	(B1 x C1 + B2 × C2) × D × E × F = β

(i) Calculation of rated capacity of outdoor unit

Calculate necessary rated capacity of outdoor unit from the total capacity of indoor units and the overall correction coefficient using the following formula.

Calculate for heating and cooling respectively.

	Necessary rated capacity of outdoor unit			Rated capacity of selected outdoor unit		Judgement (Selected outdoor unit ≧ Necessary rated capacity of outdoor unit → OK)
Cooling	REC / α		kW		kW	
Heating	RCC / β		kW		kW	

Note (1) Cooling or heating capacity of each indoor unit might fluctuate depending on the water or air temperature among multiple indoor units.

10. OUTLINE OF WATER SYSTEM

10.1 Caution for water piping

● The HMU system must be operated within the following limitation for use.

Item	Limitation for use
Inlet water temperature	12˚C–50˚C
Water pressure	0.03MPa to 0.6MPa
Water flow rate	See section 7
Water quality	See section 7.2
Water circuit	Closed *

* The water circuit connected to the HMU must be closed circuit type.
Open circuit type could cause clogging or corrosion on the HMU.

10.2 Outline of water piping

(1) Key consideration for water piping (Locally procured items)

Please consider following point for designing and installing (Description of ① - ⑦ in figure below)

① Expansion vessel

The volume of expansion vessel

The below table shows that volume ratio of expansion vessel/total of water system for reference.
Volume of HMU140KXZE1 is 1.8 liter, and that of HMU280KXZE1 is 2.6 liter.

Top of HMU	5m higher than expansion vessel	0m	5m lower than expansion vessel
Volume ratio of expansion vessel/total of water system	4.6%	5.4%	7.5%

Contact your local dealer for the recommended maximum height difference between the expansion vessel and the highest point of the water circuit. Generally, the maximum height difference is 5 m.

② Stop valve — Be sure to install for servicing such as draining work.

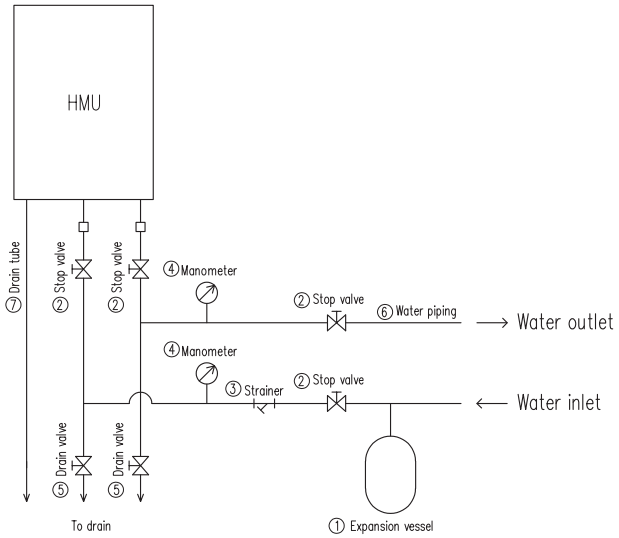
③ Strainer — Be sure to install a strainer (40 mesh or more) at the inlet port of the unit to avoid intrusion of foreign matter into the unit. Strainer shall be maintained as per strainer manufactuieri's user manual. Plaease keep HMU inlet pressure more than 0.03 Mpa.

④ Manometer — Be sure to install a manometer at inlet and outlet of HMU. The inlet manometer is for monitoring the pressure after the strainer.The outlet manometer is for adjusting the flow rate to the required flow rate.

⑤ Drain valve — Be sure to install it in order to drain off the water from the system at servicing.
Select carefully a position where water can be drained completely from the piping.

⑥ Water piping — Water piping work should be carried out with consideration to easily purge air in the water pipe. Insulation work shall be done sufficiently. (thickness: more than 20mm)

⑦ Drain tube — Condensing water inside HMU and water from safety valve is discharged from drain socket at the bottom of HMU. Be sure to connect drain tube to drain pit, i.e. existing floor drainage.



(2) Caution for corrosion

(a) Water quality
It is important to check in advance whether the water is good quality.
Be sure to use the water whose qualities are within the range of water quality standards mentioned in section 2.2.

(b) Foreign matter in water
If solid matter such as sand and small stone and/or floating suspended solid such as corrosion product exist in water, the heat-transfer surface of heat exchanger is directly attacked by water flow, and corrosion may be created locally.
In order to avoid such corrosion by these foreign matters, be sure to fit a cleanable strainer (40 mesh or higher) at the water inlet port of the unit to remove foreign matters.

(3) Others

(a) Water pipe shall have no water leak and no air intrusion.
Especially if air intrudes at suction side of pump, pump performance decrease and it may cause generation of noise.

(b) Be sure to take into consideration for water pipe not to freeze at stopping operation in winter.

10.3 Water pipe connection

- Check the connecting positions at water inlet/outlet of HMU. (See"3. EXTERIOR DIMENSIONS".)
- Water pipe joints in HMU are made of copper. When a pipe made of other kind of metal is connected to the joint, use an insulating material between them to prevent corrosion resulting from such combination of different metals.
- Size of water pipe should be same or larger than the size of water pipe at the HMU side.
- To avoid from the weight of water pipes being exerted to joints of the HMU, support the water pipes at places in the building, which are sufficiently strong.
- Be sure to provide anti-freezing means where a risk of freezing is suspected.

11. APPLICATION DATA

MCD012Z002 A

11.1 Installtion manual for hydro module unit(HMU)

This manual is for the installation of the indoor unit.
HMU is a partial unit air-conditioner (indoor unit), complying with partial unit requirements of the International Standard, and must only be connected to KXZE2 or KXZXE1 (outdoor unit) that have been confirmed as complying to corresponding partial unit requirements of the International Standard.
For electrical wiring work (Indoor unit), refer to the electrical wiring work installation manual. For wired remote control installation, refer to the installation manual attached to the remote control. For electrical wiring work (Outdoor unit) and refrigerant pipe work installation for outdoor unit, refer to the installation manual attached to the outdoor unit, except for "Additional refrigerant charge".

SAFETY PRECAUTIONS

- We recommend you to read this “SAFETY PRECAUTIONS” carefully before the installation work in order to gain full advantage of the functions of the unit and to avoid malfunction due to mishandling.
- The precautions described below are divided into ⚠WARNING and ⚠CAUTION . The matters with possibilities leading to serious consequences such as death or serious personal injury due to erroneous handling are listed in the ⚠WARNING and the matters with possibilities leading to personal injury or damage of the unit due to erroneous handling including probability leading to serious consequences in some cases are listed in ⚠CAUTION . These are very important precautions for safety.
  Be sure to observe all of them without fail.
- Be sure to confirm no anomaly on the equipment by commissioning after completed installation and explain the operating methods as well as the maintenance methods of this equipment to the user according to the owner's manual.
- Keep the installation manual together with owner’s manual at a place where any user can read at any time. Moreover if necessary, ask to hand them to a new user

⚠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 water leaks, electric shocks, fire and personal injury.
- **When installing in small rooms, take prevention measures not to exceed the density limit of refrigerant in the event of leakage.**
  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 with 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.
  For HMU, the mounting wall must be durable enough to mount HMU weight of 65kg, preferably a concrete wall. And the wall surface must be firm, flat, incombustible, and vertical. For remote control unit, the mounting surface must be firm, flat, incombustible, and vertical.
- **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.
- **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.
- **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.
- **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, air can be sucked into refrigerant circuit, which can cause bust 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
- **Only use prescribed option parts. The installation must be ca rried 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 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 front 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.
- **Do not perform any change of protective device itself or its setup condition.**
  The forced operation by short-circuiting protective device of flow switch and temperature sensor or the use of non specified component can cause damage of heat exchanger 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 disconnecting refrigerant pipes in case of pump down operation.**
  If disconnecting refrigerant pipes in state of opening service valves before compressor stopping, air can be sucked, which can cause burst or personal injury due to anomalously high pressure in the refrigerant circuit.

⚠CAUTION

- **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 due to short-circuiting.
- **Use the circuit breaker with sufficient breaking capacity.**
  If the breaker does not have sufficient breaking capacity, it can cause the unit malfunction and fire.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause 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.**
  If leaked gases accumulate around the unit, it can cause fire.
- **Do not install the unit where corrosive gas (such as sulfurous 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.
- **Do not use the indoor unit at the place where water splashes may occur such as in laundries.**
  Since the indoor unit is not waterproof, it can cause electric shocks and fire.
- **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 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 where the unit is exposed to chimney smoke.
  - Locations at high altitude. (more than 1000m high)
  - Locations with ammonic atmospheres.
  - Locations where heat radiation from other heat source can affect the unit.
  - Locations without good air circulation.
  - Locations where operating sound of the HMU can bother user. HMU makes water pump operation noise and refrigerant flow noise.

・Locations where vibration can be amplified and transmitted due to insufficient strength of structure.
・Locations where vibration and operation sound generated by HMU can affect seriously. (at the place near bed room. etc.)
・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 cause remarkable decrease in performance, corrosion and damage of components, malfunction and fire or affect surrounding environment.

- **Do not install the remote control at the direct sunlight.**
  It can cause malfunction or deformation of the remote control.
- **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.
- **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 nails, wood, and sheet metal.
- **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 and water 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.
- **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 breakdown.
- **Do not control the system with main power switch.**
  It can cause fire or water leakage.
- **Do not touch any refrigerant and water pipes with your hands when the system is in operation.**
  During operation the refrigerant and water pipes become extremely hot or extremely cold depending the operating condition, and it can cause burn injury or frost injury.
- **Take care when carring and installing the unit by hands.**
  Be careful not to drop it during transportation.
  It must be carried and lifted by two or more persons. Always use the handle when lift up the unit by hand. Use gloves to minimize the risk of cuts by sheet metal.
- **Check that there is no water leakage from the water circuit before starting commisioning.**
  If there is water leakage, you may get scalded by hot water.
  And there is risk that the indoor unit or electric equipment will be damaged by water.
- **Be careful to route cables not to be damaged by metal edge or trapped by panels.**
  Disconnection of wiring can cause unit faults such as electric shocks due to shortcircuiting.
- **When laying cables into indoor units and controls, be sure the cable securely with the wire cramps and cable grommets so as not to apply excessive force to the terminal block.**
  If excesive force is applied to the wiring, it may come off the terminal block and short circuit.

Warning and Notabilia for units designed for R410A

- Only use R410A refrigerant. R410A is the refrigerant whose pressure is 1.6 times as high as that of conventional refrigerant.
- The size of charging port of service valve and check joint for R410A are altered from that for conventional refrigerant in order to prevent the system being charged with the incorrect refrigerant by mistake. And the protruding dimension of pipe for flare processing and flare nut size for R410A are also altered from that for conventional refrigerant in order to reinforce strength against the pressure for R410A. Accordingly the dedicated tools for R410A listed in the below mentioned table should be prepared for installation and servicing.
- Do not use charging cylinder. Using charging cylinder may alter the composition of refrigerant, which results in making the performance of the system worse.
- Refrigerant must be charged always in liquid state from the bottle.

Dedicated tools for R410A	
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charge
d)	Torque wrench
e)	Flare tool
f)	Protrusion control gauge for copper pipe
g)	Vacuum pump adapter
h)	Gas leak detector

① Before installation

● Install the unit correctly according to this installation manual.
● Check the following items:
○ Unit type/Power source specification ○ Piping/Wiring/Small parts ○ Accessory

Accessory

For unit hanging	For drain pipe
Hanging bracket	Drain socket
	
1 pc.	1 pc.
For unit hanging	For drain pipe connecting

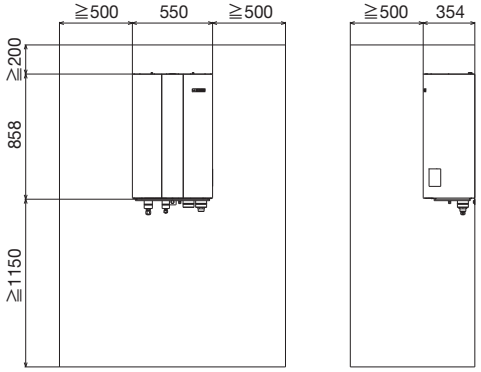
② Selection of installation location for HMU

① Select the suitable areas to install the unit under approval of the user, most suitably in a utility room or boiler room.
- Areas where there is enough space to install and do maintenace
- Areas where it can be drained properly, Areas where drain pipe descending slope can be taken
- Areas not exposed to direct sunlight
- Areas where dew point is lower than around 28°C and relative humidity is lower than 80%
  This indoor unit is tested under the condition of JIS (Japan Industrial Standard) high humidity condition and confirmed there is no problem. However, there is some risk of condensation drop if the HMU is operated under the severer condition than mentioned above.
- Areas where TV and radio stays away more than 1m (It could cause jamming and noise.)
- Areas where any items which will be damaged by getting wet are not placed such as food, table ware, server, or medical equipment under the unit
- Areas where there is no influence by the heat which cookware generates

② Check if the place where the HMU is installed is strong enough to support the weight of the unit. For HMU, the mounting wall must be durable enough to mount HMU (65 kg), preferably a concrete wall. And the wall surface must be film, flat, incombustible and vertical. If the strength is not enough, the unit may fall and it could injure someone.
③ If there are 2 units using wireless remote control, keep them away for more than 6m to avoid malfunction due to cross communication.
④ When plural indoor units are installed nearby, keep them away for more than 4 to 5m.

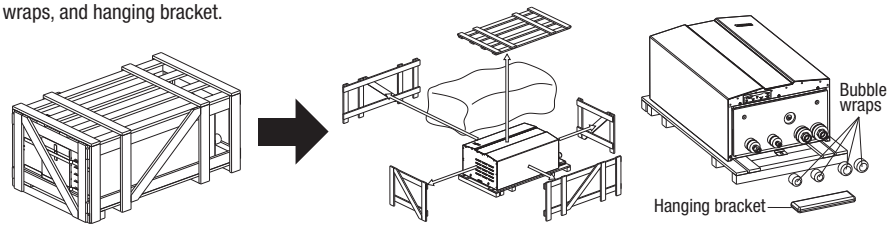
Space for installation and maintenance

● Install the unit with sufficient maintenance space as below figures.

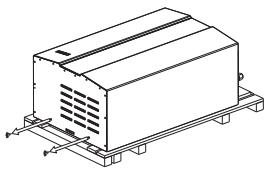


③ Preparation before installation

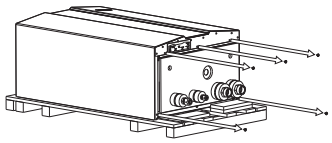
● Unpack the HMU as per following.
1. Remove the top and side wooden frames, the cover, document set, bubble wraps, and hanging bracket.



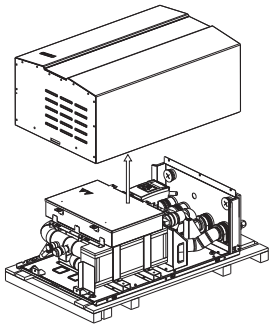
2. Remove the top screws. (2 screws)



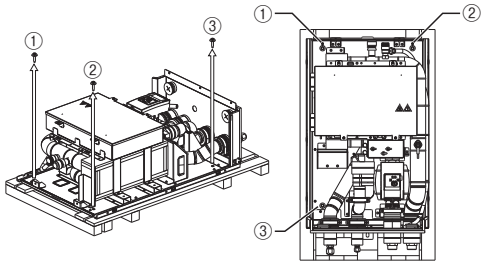
3. Remove the bottom screws. (5 screws)



4. Remove the front panel.

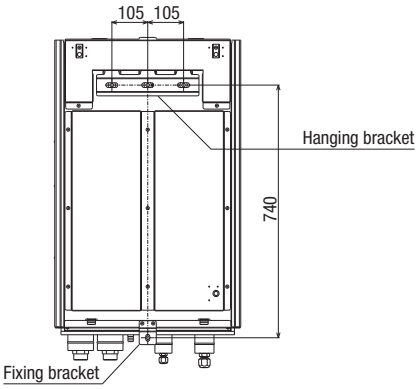


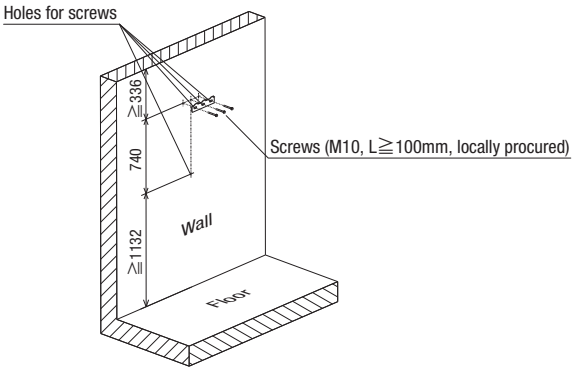
5. Remove the screws. (3 screws)



● Installation of hanging bracket.

1. Place the hanging bracket attached onto the wall so that HMU is not tilted, and make 4 holes for hanging and fixing bracket, then, fix the hanging bracket with 3 screws(M10, L ≧ 100mm, locally procured).
   HMU weighs 65kg including water inside.





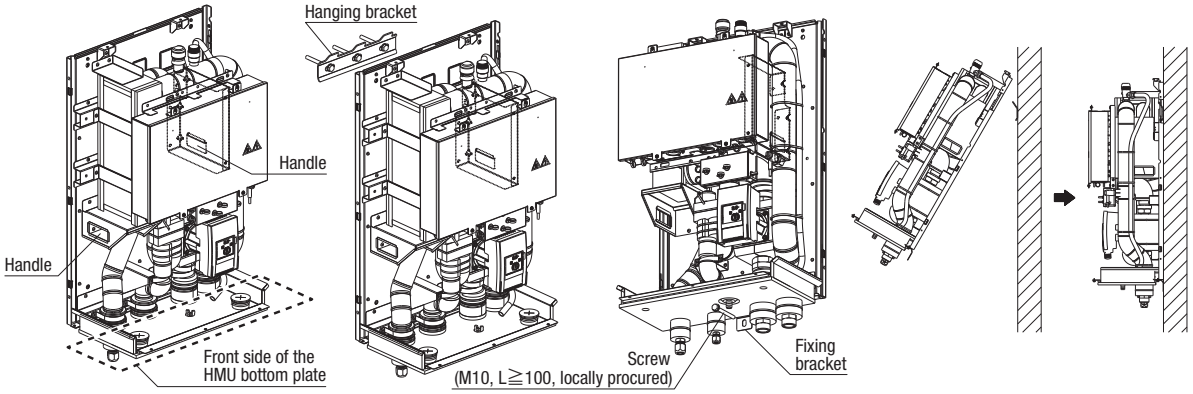
Caution

● The mounting wall must be durable enough to mount HMU weight of 65kg. Unsuitable installation can cause the unit to fall and/or collapse of the wall.

④ Installation of indoor unit

Work procedure

1. Hook the 3 holes on the backside of the unit to the hanging bracket attached to the wall.
2. Fix the fixing bracket with screw (M10, L ≧ 100, Locally procured).



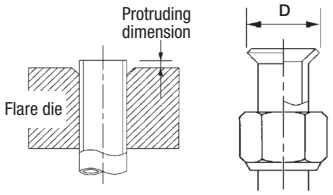
Caution

● Make sure to install the indoor unit properly without tilting it to the hanging bracket. Improper installation may cause air leakage, dew condensation, water leakage and noise.
● When lifting the HMU, do not hold the front side of the HMU bottom plate.

⑤ Refrigerant pipe

Caution

● **Be sure to use new pipes for the refrigerant pipes. Use the flare nut attached to the product.**
Regarding whether existing pipes can be reused or not, and the washing method, refer to the instruction manual of the outdoor unit, catalogue or technical data.
1) In case of reuse: Do not use old flare nut, but use the nut attached to the unit.
2) In case of reuse: Flare the end of pipe replaced partially for R410A.

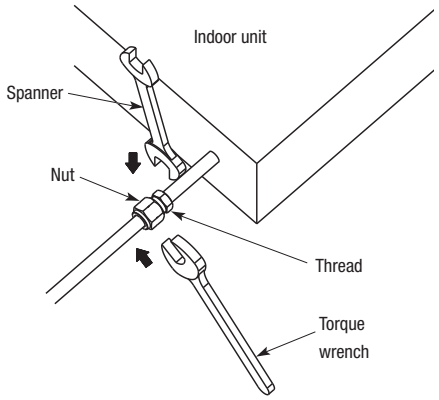


Pipe diameter d mm	Min. pipe wall thickness mm	Protruding dimension for flare, mm		Flare O.D. D mm	Flare nut tightening torque N·m
		Rigid (Clutch type)			
		For R410A	Conventional tool		
9.52	0.8	0.05	0.7-1.3	12.8–13.2	34–42
15.88	1			19.3–19.7	68–82
19.05	1.2			23.6–24.0	100–120

● Use phosphorus deoxidized copper alloy seamless pipe (C1220T) for refrigeration pipe installation. In addition, make sure there is no damage both inside and outside of the pipe, and no harmful substances such as sulfur, oxide, dust or a contaminant stuck on the pipes.
● Do not use any refrigerant other than the designated refrigerant.
Using other refrigerant except the designated refrigerant, may degrade inside refrigeration oil. And air getting into refrigeration circuit may cause over-pressure and resultant it may result in bursting, etc.
● Store the copper pipes indoors and seal the both end of them until they are brazed in order to avoid any dust, dirt or water getting into pipe. Otherwise it will cause degradation of refrigeration oil and compressor breakdown, etc.
● Use special tools for R410A refrigerant.

Work procedure

1. Remove the flare nut and blind flanges on the pipe of the indoor unit.
※ Make sure to loosen the flare nut with holding the nut on pipe side with a spanner and giving torque to the nut with another spanner in order to avoid unexpected stress to the copper pipe, and then remove them.
(Gas may come out at this time, but it is not abnormal.)
● Pay attention whether the flare nut pops out. (as the indoor unit is sometimes pressured.)
2. Make a flare on liquid pipe and gas pipe, and connect the refrigeration pipes on the indoor unit.
※ Bend radius of pipe must be 4D or larger. Once a pipe is bent, do not readjust the bending.
Do not twist a pipe or collapse to 2/3D or smaller.
● Make sure to use flare nuts assembled on the unions. Usage of other flare nuts could cause refrigerant leakage.
※ Do a flare connection as follows:
● Make sure to hold the nut on indoor unit pipe side using double spanner method as indicated when fastening / loosening flare nuts in order to prevent unintentional twisting of the copper pipe.
● When fastening the flare nut, align the refrigeration pipe with the center of flare nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table above.
3. Cover the flare connection part of the indoor unit with insulation material (locally procured) after a gas leakage inspection.
● Make sure to insulate both gas pipes and liquid pipes completely.
※ Incomplete insulation may cause dew condensation or water dropping, and burn or frost injury.
● Use heat-resistant (120 °C or more) insulations on the gas side pipes.
● In case of using at high humidity condition, reinforce insulation of refrigerant pipes.
Surface of insulation may cause dew condition or water dropping, if insulations are not reinfoced.
4. Refrigerant is charged in the outdoor unit.
As for the additional refrigerant charge for the indoor unit and piping, refer to next page.



Caution:
Refrigerating machine oil should not be applied to the threads of union or external surface of flare. It is because, even if the same tightening torque is applied, the oil is likely to decrease the slide friction force on the threads and increase, in turn, the axial component force so that it could crack the flare by the stress corrosion.
Refrigerating machine oil may be applied to the internal surface of flare only.

⑥ Additional refrigerant charge

Regarding the calculation of additional refrigerant charge, please follow the instruction below in the refrigerant system which contains HMU.
Determine the amount of refrigerant to be charged additionally using the following formula.
(The outdoor unit contains some amount of refrigerant so please refer to its installation manual with regard to the amount of factory refrigerant charge.)
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 - O - H
S: standard additional refrigerant quantity (kg)

<KXZ series>

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

<KXZ High COP series>

Outdoor unit	S (kg)
224	0
280	2.1
335	2.1
450	0
500	2.1
560	4.2
615	4.2
670	4.2

Outdoor unit	S (kg)
735	2.1
800	4.2
850	6.3
900	6.3
950	6.3
1000	6.3

P: Additional refrigerant quantity for piping (kg)

P = (L1×0.37) + (L2×0.26) + (L3×0.18) + (L4×0.12) + (L5×0.059) + (L6×0.022)

L1: ϕ 22.22 total length (m) L2: ϕ19.05 total length (m) L3: ϕ15.88 total length (m)
L4: ϕ 12.7 total length (m) L5: ϕ9.52 total length (m) L6: ϕ6.35 total length (m)

Refrigerant liquid pipe size	ϕ22.22	ϕ19.05	ϕ15.88	ϕ12.7	ϕ9.52	ϕ6.35
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 unit capacity is larger than outdoor unit capacity, then calculate the additional refrigerant quantity for indoor units.

D = {(Total indoor units capacity) - (outdoor unit capacity)}
When D > 0, calculate I using the above equation;
When D ≦ 0, take it as I = 0.

<Example>
When you connect FDC400 to FDT140 × 3 units:
D= 140 × 3 - 400= 20 (> 0)
I = 20 × 0.01 = 0.2 (kg)

O: Reduced refrigerant quantity for outdoor units(kg)

If the total indoor unit capacity is smaller than the standard outdoor unit capacity, then calculate the reduced refrigerant quantity for outdoor units.
Regarding the standard outdoor unit capacity, please refer to table below.
Do = {(Standard outdoor unit capacity) - (Total indoor units capacity)}
O = Do × 0.01
When Do > 0, calculate O using the above equation.
When Do ≦ 0, take it as O = 0.

<KXZE2 series>

Outdoor unit	Standard outdoor unit capacity
280	335
335	
400	450
450	
475	560
500	
560	

Outdoor unit	Standard outdoor unit capacity
615	670
670	
735	785
800	900
850	
900	
950	1120
1000	
1060	
1120	

Outdoor unit	Standard outdoor unit capacity
1200	1350
1250	
1300	
1350	
1425	1680
1450	
1500	
1560	
1620	
1680	

<KXZE1 High COP series>

Outdoor unit	Standard outdoor unit capacity
224	224
280	335
335	

Outdoor unit	Standard outdoor unit capacity
450	450
500	670
560	
615	
670	

Outdoor unit	Standard outdoor unit capacity
735	783
800	894
850	1000
900	
950	
1000	

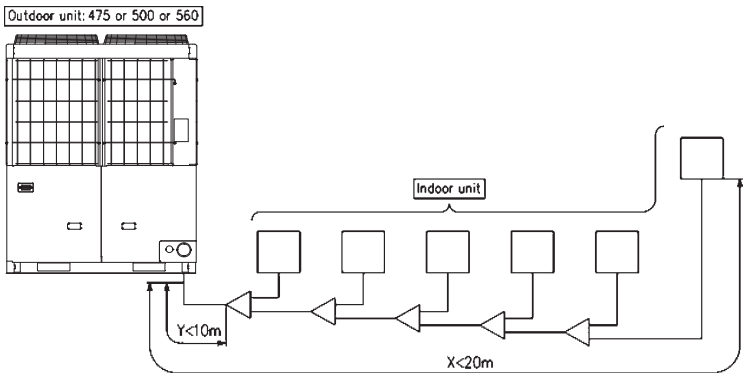
H: Reduced refrigerant quantity for hydro module unit
H = (total hydro module unit capacity) × 0.003

<Example>
When you connect FDT90 × 2units and HMU140 × 1unit.
H=140 × 0.003=0.42kg ≒ 0.4 (kg)

■Refrigerant charge quantity calculation notes in case outdoor unit capacity is 475,500 and 560※.

●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）

① Factory charge 475,500,560 ：11.5kg kg + ② Total additional refrigerant quantity (D) ※ kg − ③ Reduction refrigerant quantity (E) kg = ①+②-③ Total refrigerant quantity in the system (Total charge) kg

※Please calculate the additional refrigerant charge quantity (D) accordin g to the formula on the installation sheet

●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)

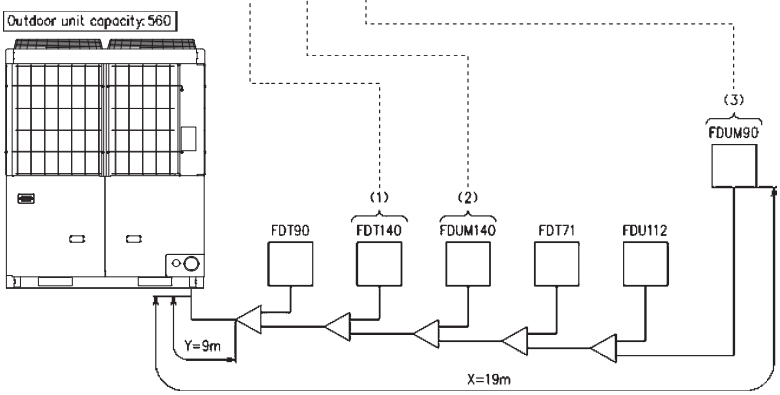
・Indoor units list of the refrigerant reduction

FDT140	FDTW140	FDU140	FDUM14 0	FDT160	FDU160	FDUM16 0	FDU90	

＜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:64 3



⑦ Water pipe

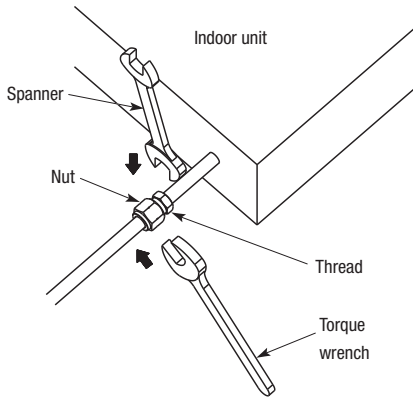
Caution

- **Connect the pipe securely to avoid water leakage from the joint.**
- **Insulate the pipe properly to avoid condensation drop, and burn or frost injury.**
- **The HMU is permanently connected to the closed water circuit and not connected by a hose-set.**
- **Please equip strainer, expansion vessel, heat insulation, and valves as described in '22·KX-T-416, clause 10.**

Work procedure

1. Connect the pipes on the indoor units.
   - Make sure to hold the nut on indoor unit pipe side using double spanner method as indicated when fastening / loosening nuts in order to prevent unintentional twisting of the copper pipe.
   - When fastening the nut, align the pipe with the center of nut, screw the nut for 3-4 times by hand and then tighten it by spanner with the specified torque mentioned in the table below.
2. Cover the connection part of the indoor unit with insulation material (locally procured) after a leakage inspection, and tighten both ends with attached straps.
   - Make sure to insulate both inlet pipes and outlet pipes completely.
     ※ Incomplete insulation may cause dew condensation or water dropping.
   - Use thermal insulations on the water pipes. (t ≧20mm)
   - In case of using at high humidity condition, reinforce insulation of refrigerant pipes.
     Surface of insulation may cause dew condition or water dropping, if insulations are not reinfoced.

Pipe diameter d mm	Min. pipe wall thickness mm	Threaded connection
28.58	1.2	PT 1- 1/4



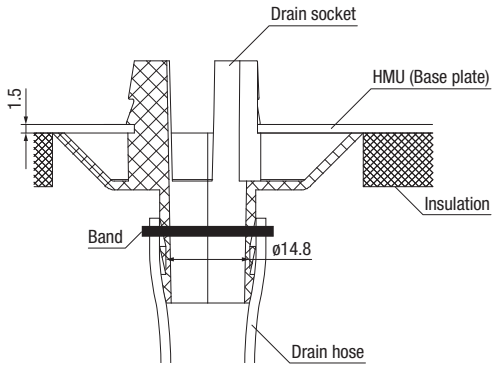
⑧ Drain pipe

Caution

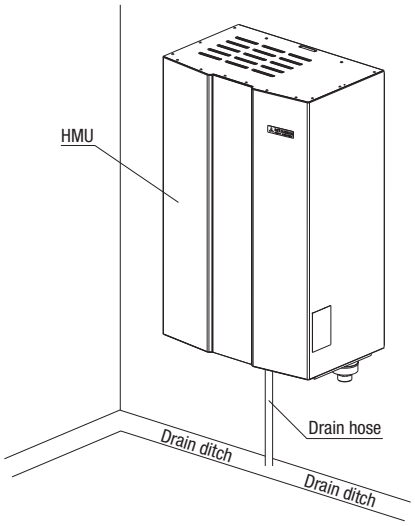
- **Install the drain pipe according to the installation manual in order to drain properly.**
  Imperfection in draining may cause flood indoors and wetting the household goods,etc.
- **Do not put the drain pipe directly into the ditch where toxic gas such as sulfur, the other harmful and inflammable gas is generated.**
  Toxic gas would flow into the room and it would cause serious damage to user's health and safety (some poisoning or deficiency of oxygen). In addition, it may cause corrosion of heat exchanger and bad smell.
- **Connect the pipe securely to avoid water leakage from the joint.**
- **Check if the water can flow out properly from both the drain outlet on the indoor unit and the end of the drain pipe after installation.**
- **Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.**
  Check if water is drained out properly from the pipe during commissioning. Also, keep sufficient space for inspection and maintenance.

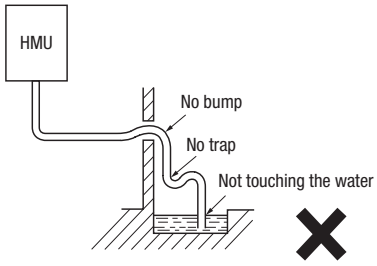
Work procedure

1. Make sure to insert the drain hose (PVC, ϕ 17(O.D), t1.2)) to drain socket.
   Attach the band to the drain hose around 10mm from the end, and fasten.
   - **Do not apply adhesives on this end.**



2. Make sure to make descending slope of greater than 1/100 and do not make up-down bend and/or trap in the midway.
   - Pay attention not to give stress on the pipe on the indoor unit side, and support and fix the pipe as close place to the unit as possible when connecting the drain pipe.



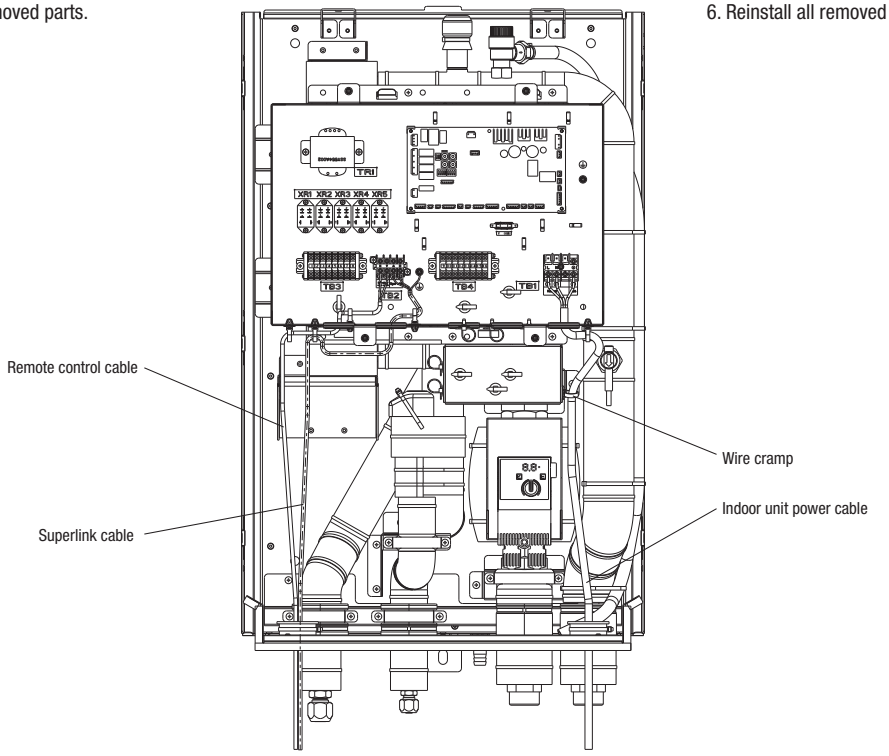


⑨ Wiring-out position and wiring connection

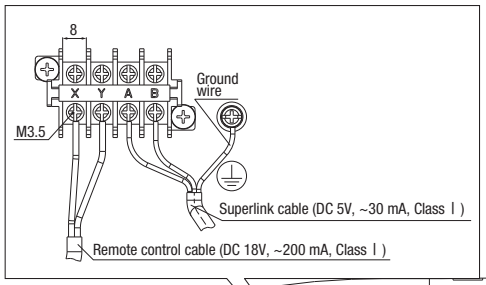
- Electrical installation work must be performed according to the installation manual by an electrical installation service provider qualified by a power provider of the country, and be executed according to the technical standards and other regulations applicable to electrical installation in the country. Be sure to use an exclusive circuit.
- Use specified cord, fasten the wiring to the terminal firmly, and hold the cord securely in order not to apply unexpected stress on the terminal.
- Do not put both power source line and signal line on the same route. It may cause miscommunication and malfunction.
- Be sure to do D type earth work.
- For the details of electrical wiring work, see attached instruction manual for electrical wiring work.

<Connection procedure>
1. Remove the 2 screws of lid of control box.
2. Slide the lid up.
3. Remove the lid.
4. Introduce wires in the unit and connect them securely to the terminal block.
5. Fix each wire with the wire clamp.
6. Reinstall all removed parts.

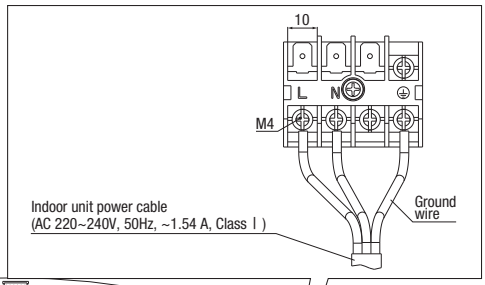
<Disconnection procedure>
1. Remove the 2 screws of lid of control box.
2. Slide the lid up.
3. Remove the lid.
4. Disconnect the wires.
5. Fix each wire with the wire clamp.
6. Reinstall all removed parts.

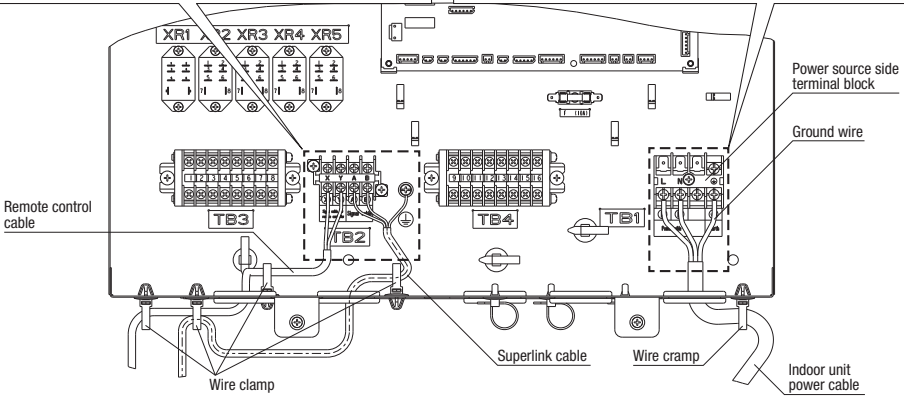


Detail of TB2



Detail of TB1

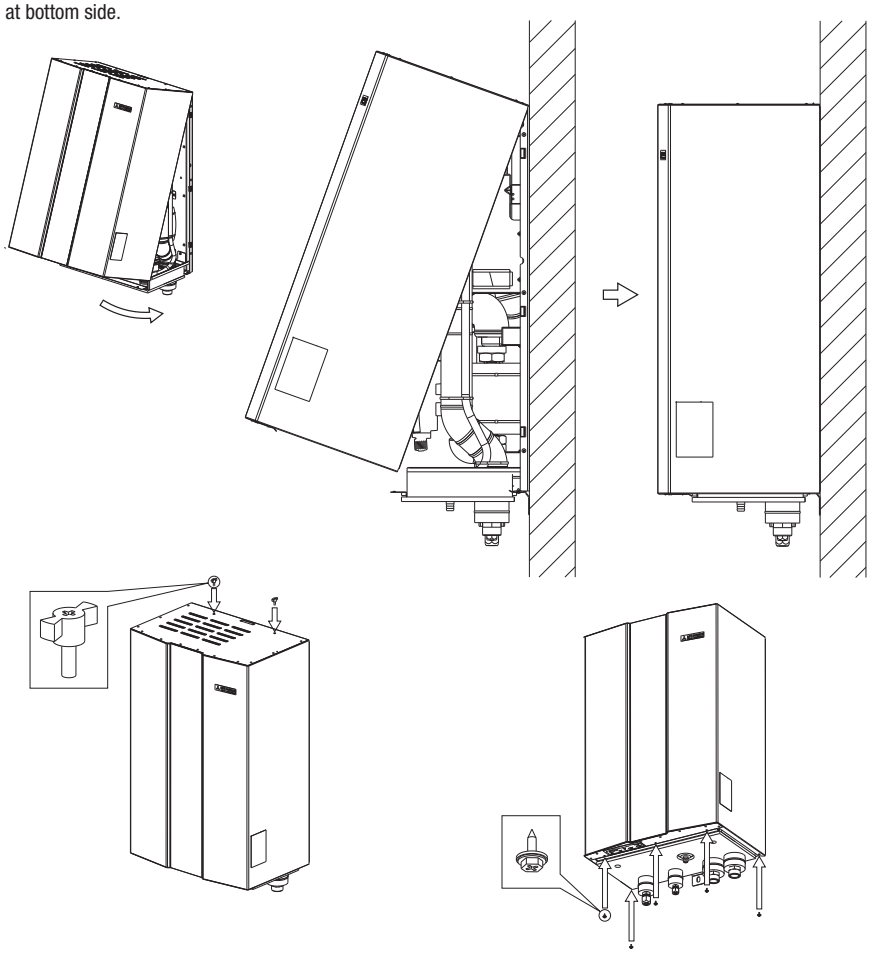




⑩ Front panel installation

● Attach the front panel on the indoor unit after electrical wiring work.

1. Attach the front panel from top side.
2. Attach 2 screws at top side.
3. Attach 5 screws at bottom side.



⑪ Check list after installation

● Check the following items after all installation work completed.

Check if;	Expected trouble	Check
The indoor and outdoor units are fixed securely?	Falling, vibration, noise	
Inspection for leakage is done?	Insufficient capacity	
Insulation work is properly done?	Water leakage	
Water is drained properly?	Water leakage	
Power source voltage is same as mentioned in the model name plate?	PCB burnt out, not working at all	
There is mis-wiring or mis-connection of piping?	PCB burnt out, not working at all	
Earth wiring is connected properly?	Electric shock	
Cable size comply with specified size?	PCB burnt out, not working at all	
Any obstacle blocks air flow on air inlet and outlet?	Insufficient capacity	

⑫ Start up

1. Filling the water circuit.

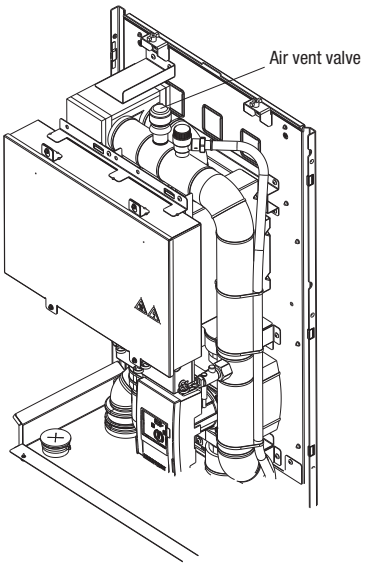
Caution

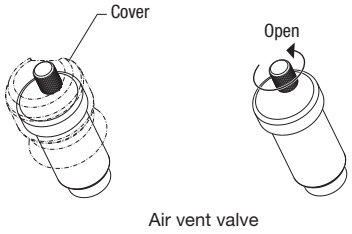
- Please make sure that the service valves (locally procured) are fully open.
- Take care of water leakage especially from the pipe connection.
- Do not run the pump before filling water. The pump may be damaged.
- The pump runs by pressing the “Run/Stop” switch.

2. Venting the water circuit. HMU has an automatic air vent valve.

Caution

- Please check that the automatic air vent valve is open.





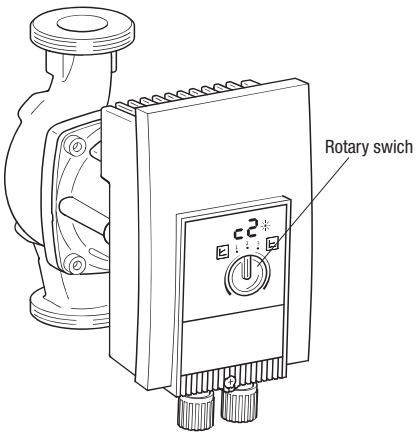
3. Press the "Run/Stop" switch on the remote control to run the pump.

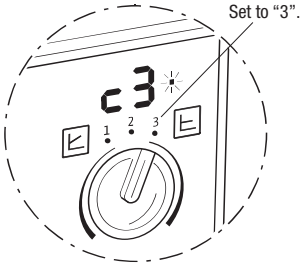
Caution

- Please make sure that the service valves (locally procured) are fully open.

4. Setting system flow.

- Set the rotary switch on the pump to “3”. Pump runs at maximum speed.
- The flow rate can be estimated from Fig.1 or Fig.2. External static pressure (ESP) is indicated on the HMU outlet manometer (locally procured).
- Adjust to the required flow by following two methods.
  1. In case flow is slightly high, adjust the ESP. (e.g. adjusting opening of locally procured service valve)
  2. In case flow is significantly high, set the rotary switch on the pump to “2” or “1”. (“2”: Medium speed, “1”: Low speed)
     Changing the rotary switch from "3" to "2" or from "2" to "1" saves power consumption.





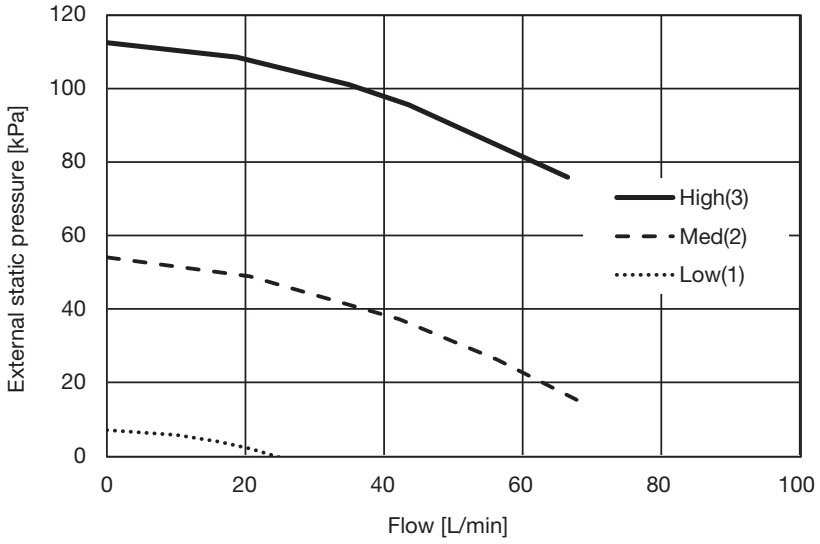


Fig.1 Hydraulic performance curve for HMU140KXZE1

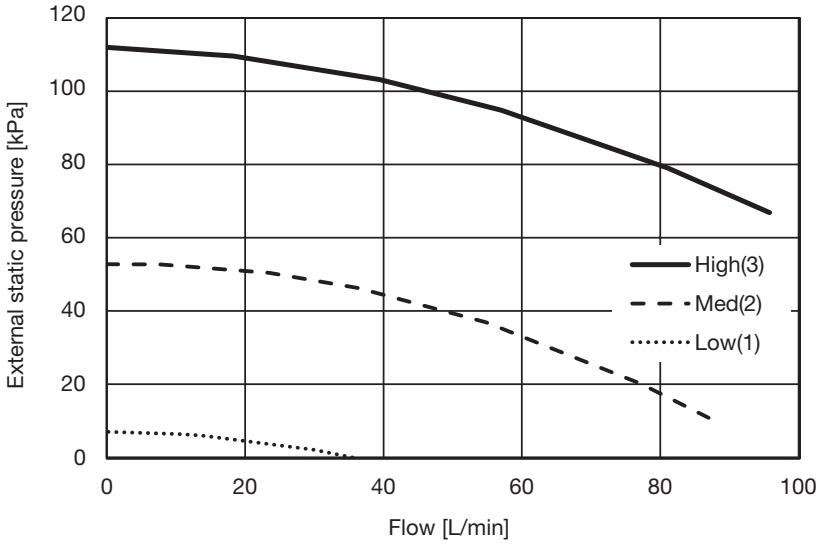


Fig.2 Hydraulic performance curve for HMU280KXZE1

Note

- Above instruction , Fig1 and Fig.2 are for constant speed mode of the pump. The pump (Wilo-Yonos PARA high Flow 25/12) has Δ p-v mode and Δ p-c mode. See technical manual of the pump for more information.

MCD012Z003 A

11.2 Electric wiring work instruction

Electrical wiring work must be performed by an electrician qualified by a local power provider according to the electrical installation technical standards and interior wiring regulations applicable to the installation site.

Security instructions

- Read the “SAFETY PRECAUTIONS” carefully first of all and then strictly follow it during the installation work in order to protect yourself.
- The precautionary items mentioned below are distinguished into two levels, ⚠WARNING and ⚠CAUTION.
  ⚠WARNING :Wrong installation would cause serious consequences such as injuries or death.
  ⚠CAUTION :Wrong installation might cause serious consequences depending on circumstances.
- Both mentions the important items to protect your health and safety so strictly follow them by any means.
- 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.

- Accord with following items. Otherwise, there will be the risks of electric shock and fire caused by overheating or short circuit.

⚠WARNING

- **Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit.**
  Power source with insufficient capacity and improper work can cause electric shock and fire.
- **Use specified wire for electrical wiring, fasten the wiring to the terminal securely, and hold the cable securely in order not to apply unexpected stress on the terminal.**
  Loose connections or hold could result in abnormal heat generation or fire.
- **Arrange the electrical wires in the control box properly to prevent them from rising. Fit the lid of the services panel property.**
  Improper fitting may cause abnormal heat and fire.
- **Use the genuine optional parts. And installation should be performed by a specialist.**
  If you install the unit by yourself, it could cause water leakage, electric shock and fire.
- **Do not repair by yourself. And consult with the dealer about repair.**
  Improper repair may cause water leakage, electric shock or fire.
- **Consult the dealer or a specialist about removal of the air conditioner.**
  Improper installation may cause water leakage, electric shock or fire.
- **Turn off the power source during servicing or inspection work.**
  If the power is supplied during servicing or inspection work, it could cause electric shock and injury by the operating fan.
- **Shut off the power before electrical wiring work.**
  It could cause electric shock, unit failure and improper running.

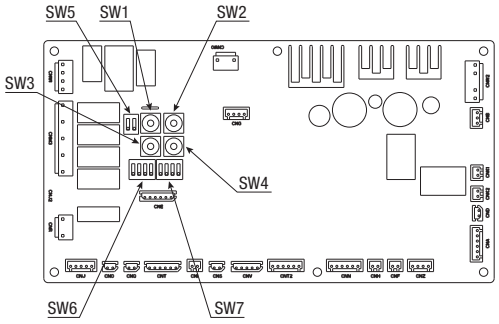
⚠CAUTION

- **Perform earth wiring surely.**
  Do not connect the earth wiring to the gas pipe, water pipe, lightning rod and telephone earth wiring. Improper earth could cause unit failure and electric shock due to a short circuit.
- **Earth leakage breaker must be installed.**
  If the earth leakage breaker is not installed, it can cause electric shocks.
- **Make sure to install earth leakage breaker on power source line. (countermeasure thing to high harmonics.)**
  Absence of breaker could cause electric shock.
- **Use the circuit breaker of correct capacity. Circuit breaker should be the one that disconnect all poles under over current.**
  Using the incorrect one could cause the system failure and fire.
- **Do not use any materials other than a fuse of correct capacity where a fuse should be used.**
  Connecting the circuit by wire or copper wire could cause unit failure and fire.
- **Use power source line of correct capacity.**
  Using incorrect capacity one could cause electric leak, abnormal heat generation and fire.
- **Do not mingle solid cord and stranded cord on power source and signal side terminal block.**
  In addition, do not mingle difference capacity solid or stranded cord.
  Inappropriate cord setting could cause loosing screw on terminal block, bad electrical contact, smoke and fire.
- **Do not turn off the power source immediately after stopping the operation.**
  Be sure to wait for more than 5 minutes. Otherwise it could cause water leakage or breakdown.
- **Do not control the operation with the circuit breaker.**
  It could cause fire or water leakage. In addition, the fan may start operation unexpectedly and it may cause injury.

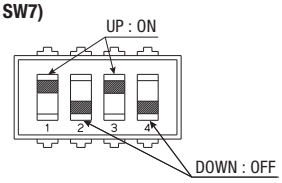
Control mode switching

Type	Code	Description
Rotary switch	SW1	Indoor address (10' place)
	SW2	Indoor address (1's place)
	SW3	Outdoor address (10's place)
	SW4	Outdoor address (1's place)
DIP swich	SW5-2	Indoor address (100's place) (☆OFF)
	SW6-1	Model capacity setting (HMU140 ☆OFF, HMU280 ☆ON)
	SW6-2	Model capacity setting (HMU140 ☆OFF, HMU280 ☆ON)
	SW6-3	Model capacity setting (☆ON)
	SW6-4	Model capacity setting (☆ON)
	SW7-1	Operation check (☆OFF)
	SW7-2	Target setting of thermostat: Outlet water/Inlet water (☆OFF/ON)
	SW7-3	Target setting of thermostat by remote operation input: Outlet water/Inlet water (☆OFF/ON)
	SW7-4	Model setting (☆ON)

☆: Factory setting



EXAMPLE (SW6 & SW7)

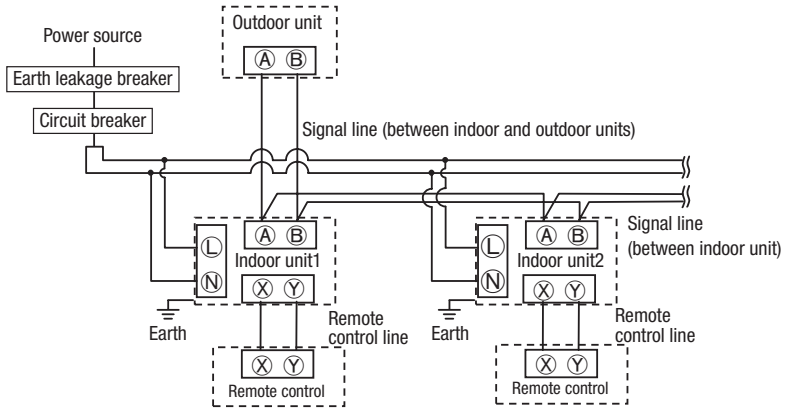


① Electrical wiring connection

- Electrical wiring work must be performed by an electrician an qualified by a local power provider. These wiring specifications are determined on the assumption that the following instructions are observed:
  - ① Do not use cords other than copper ones.
    Do not use any supply line 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);
  - ② Provide a separate power outlet for each outdoor or indoor unit.
  - ③ All indoor units grouped in one system must have power source that can be turned on or off simultaneously.
  - ④ Pay extra attention so as not to confuse signal line and power source line connection, because an error in their connection can be burn all the boards at once.
- Connect ground wires before connecting wires between the indoor and outdoor units and between indoor units. The ground wires need to be longer than the wires between the indoor and outdoor units, and protected from undue stress.
- Do not turn on the power supply before completing the work.
- The ground wires must be connected by the Class D grounding connection.
- Use the round crimp terminals for connections to the terminal block.
- Use dedicated branch circuits, avoiding combination with other devices. Otherwise, it could trip the power source breaker, resulting in secondary accidents.

- Install the overcurrent and earth leakage breakers specified to respective models.
- A pull disconnection under over voltage category Ⅲ conditions must be incorporated in the fixed wiring in according with the wring rules.
- Do not connect indoor and outdoor signal cables to extension cables on the way. If the joint is wetted with intruding water, it could cause a ground insulation failure or poor connection, resulting in communication errors. (If it is inevitable to connect cables on the way, make sure to prevent the water intrusion completely.)
- When running wires (wires for power source, remote controller, connecting between indoor and outdoor units, or other) behind the ceiling, protect them using copper or other pipes against assault by rat, or other.
- It is up to 3.5 mm^2 the size of power supply cables connected to indoor units. When using cables of 5.5 mm^2 or larger, provide a dedicated pull box for branching connection to indoor units.
- If signal and power source cables are connected mistakenly, it could burn down all PCBs.
  - ① Even if the power source of 220/240/380/415 V is connected mistakenly to A-B signal cable, it is protected at initial occasion only.
  - ② If the remote control fails to detect the unit No. (address) at 15 minutes after turning the power on, check and repair all signal cables for misconnection.
  - ③ Cut the jumper wire J10SL1 of burnt PCB, and reconnect connectors CnK (yellow) and CnK1 (white) to CnK2 (black).
  - ④ If any anomaly is found on wires between the A-B terminal block and the PCB, replace them.
- At the outside of indoor and outdoor units, take care to avoid direct contacts between remote control and power source cables.
- In no event connect the power source of 220/240/380/415 V to the remote control terminal block. It could cause failures.
- Connections of wiring between units, ground wire and remote control cable
  - ① When connecting wires between units, ground wire or remote control wire, connect them according to the number of terminals on the power source terminal block or signal terminal block in the control box. Connect the ground wire to the ground terminal on the power source terminal block.
  - ② Make sure to install an earth leakage breaker for the power source. Select a breaker for inverter circuit.
  - ③ When the earth leakage breaker is exclusive for the earth leakage protection, it is necessary to connect also an isolating switch (Switch + Class B fuse) or wiring circuit breaker in series to the earth leakage breaker.
  - ④ Install the isolating switch close to the unit.
- Connect wires securing by tightening screws firmly. Confirm also no connector or wire (from terminal) is disconnected in the control box.
- When installing an auxiliary electric heater, consult the electric heater manual or technical data.

Cabling system diagram (Outdoor/indoor unit connection procedure)



Power source specifications

● When connecting indoor units to the power source individually:

Model capacity	Leakage breaker rating	Switch capacity	Fuse	Power source cable size	Wire length	Signal cable	Remote control cable	Ground wire
140-280 types	15A 30mA 0.1sec	30A	15A	2.0mm^2×2	109m	0.75~1.25mm^2 ×2	0.3mm^2×2-core	2.0mm^2

Note 1. The wire length is calculated with a voltage drop of 2%. If the wire length should exceed the above data, review the wire size to use in accordance with extension wire regulations in your country.

Note 2. When total length of remote control cable is longer than 100 m, review the cable size according to **③ Remote control installation**

● When connecting multiple indoor units to one power source:

Total current of indoor units	Cable size (mm^2)	Cable length (m)	Rated current of wiring leakage breaker
< 7A	2	21	20A
< 11A	3.5	21	20A
< 12A	5.5	33	20A
< 16A	5.5	24	30A
< 19A	5.5	20	40A
< 22A	8	27	40A
< 28A	8	21	50A

Note 1. Cable length in the able is applicable when indoor units are connected in series. Cable size and length for each range of total current of indoor units are calculated with a voltage drop of less than 2%. If the current should exceed values in the left table, review the cable size to use in accordance with extension cable regulations in your country.

Note 2. During servicing (when the power source is turned off), refrain from taking power for indoor units in other refrigerant pipe system from the same power source.

For the rated sensitivity current of leakage breaker, refer to the following equation and judgment method.

Note 3. Following equation is a guide which could vary depending on the equipment at site and contents of installation work. When the leakage breaker trips frequently, select a breaker suitable to these conditions.

<Equation> Necessary sensitivity current =
Total value of (Model coefficient of each indoor unit × Number of units) + (Cable coefficient × Cable length [km])

<Model coefficient>

Model	Coefficient
FDT, FDTC	3.5
FDTW, FDTS, FDR, FDU, FDE, FDK, FDU-F	2.5
HMU and other models	1

<Wire coefficient>

Power source cable size	Coefficient
2.0mm^2	50
3.5mm^2	60
5.5mm^2	60
8.0mm^2	60

<Judgment method> *Following judgment method is for reference. Allowance of leakage current and capacity of rated sensitivity current should be selected according to applicable standards in your country.

(i) Necessary sensitivity current ≦ 30 — Use a product of rated sensitivity current at 30 mA (0.1 s or less).

(ii) 30 < Necessary sensitivity current ≦ 100 — Divide the leakage breaker system, in principle, so that the necessary sensitivity current will become less than 30 mA.
Depending on the situation of installation (according to standards in respective countries), it may be possible to use a product of rated sensitivity current at 100 mA (0.15 or less).

(iii) 100 < Necessary sensitivity current — It is necessary to divide (add) the leakage breaker system.

② Address setting

Address setting is done by Manual address setting.
As for details of setting procedure, refer to instructions attached to the outdoor unit for details.

③ Remote control, wiring and functions

● Do not install it on the following places.

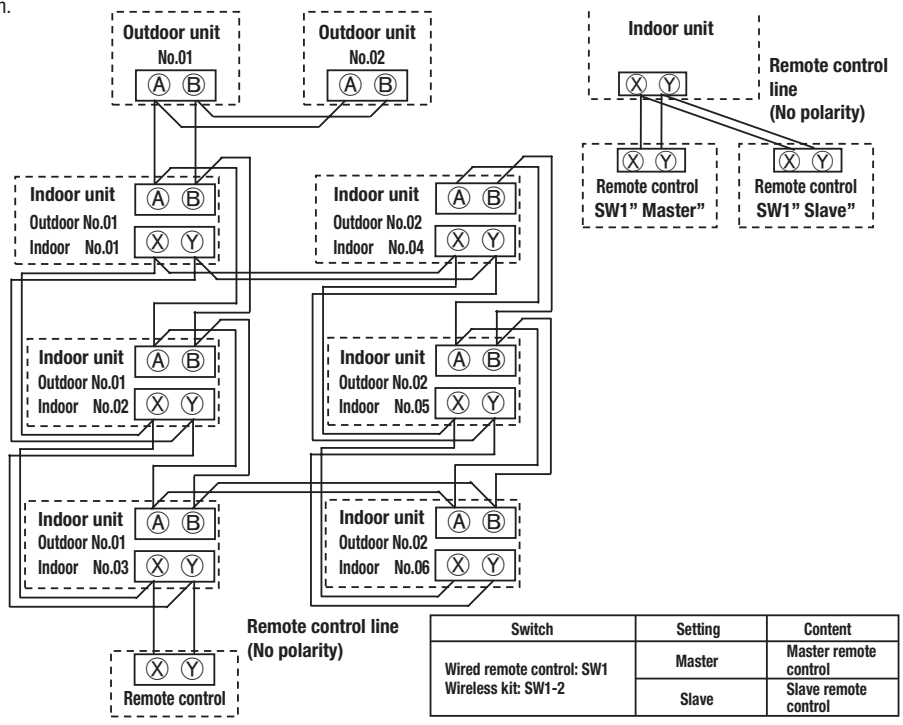
(1) Place exposed to direct sunlight
(2) Places near heat devices
(3) High humidity places
(4) Hot surface or cold surface enough to generate condensation
(5) Place exposed to oil mist or steam directly
(6) Uneven surface

Installation and wiring of remote control

① Install remote control referring to the attached manual.
② Wiring of remote control should use 0.3mm^2 x 2 cores wires or cables.
The insulation thickness is 1mm or more. (on-site configuration)
③ Maximum prolongation of remote control wiring is 600 m.
If the prolongation is over 100m, change to the size below.But, wiring in the remote control case should be under 0.5mm^2. Change the wire size outside of the case according to wire connecting. Waterproof treatment is necessary at the wire connecting section. Be careful about contact failure.
100-200m .....0.5mm^2×2 cores
Under 300m.....0.75mm^2 × 2 cores
Under 400m.....1.25mm^2 × 2 cores
Under 500m.....2.0mm^2 × 2 cores
④ Avoid using multi-core cables to prevent malfunction.
⑤ Keep remote control line away from earth (frame or any metal of building).
⑥ Make sure to connect remote control line to the remote control and terminal block of indoor unit. (No polarity)

Control plural indoor units by a single remote control

① A remote control can control plural indoor units (up to 16)
In above setting, all plural indoor units will operate under same mode and temperature setting.
② Connect all indoor units with 2 cores remote control line for group control.
③ Use the function of manual address setting to set the indoor and outdoor address number.
○ Do not forget to set the number for the outdoor units.
④ As shown in the following figure, the remote control can be used to control multiple outdoor units.
⑤ One remote control is able to perform group control for multiple units (maximum 16 units).
○ Use the rotary switches SW1 and SW2 provided on the indoor unit PCB (Printed circuit board) to set unique remote control communication address avoiding duplication.



Switch	Setting	Content
Wired remote control: SW1 Wireless kit: SW1-2	Master	Master remote control
	Slave	Slave remote control

Master/slave setting when more than one remote control unit are used

A maximum of two remote control units can be connected to one indoor unit (or one group of indoor units).
Latest "function setting" is superior than previous one.
Acceptable combination is "two (2) wired remote controls", "one (1) wired remote control and one (1) wireless kit" or "two (2) wireless kits".
Set one to “Master” and the other to “Slave”.
Note:The setting "Remote control unit sensor enabled" is only selectable with the master remote control unit in the position where you want to check room temperature.

③④ Operation and confirmation from remote control

No.	Item	Operation from the eco touch remote control (RC-EX3H)
1	Check the number of units connected in the multi remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address]
2	Check if each unit is connected properly in the remote control system.	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [IU address] ⇒ [Check run mode]
3	Setting main/sub remote controls	[Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Service password] ⇒ [Main/Sub of R/C]
4	Checking operation data	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Operation data]
5	Checking inspection display	[Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password] ⇒ [Error display]
6	Cooling test run from remote control	[Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password] ⇒ [Test run] ⇒ [Cooling test run] ⇒ [Start]

The menu configuration may vary depending on models of the remote control. If the model of your remote control is different, refer to the installation manual attached to the remote control.

⑤ External I/O terminal

Type	Code	Terminal block	Description
Input	CnOI	3-4	Ext. input error (Interlock) Shorted (Normal)/Open (Error [E16])
Output	CnI	15-16	Function select external input 1
Output	CnD	7-8	Function select external input 2
Input	CnT-6	1-2	Select input 1, ①Start/stop, ②Op. permit/prohibit, ③Cooling/heating, ④Emerg. stop, ⑤Forced thermo OFF, ⑥Temporary stop, ⑦Set temp. select 1, ⑧Set temp. select 2
Output	CnT-2	11-12	Operation output
Output	CnT-3		Heating output
Output	CnT-4		Thermo ON output
Output	CnT-5	13-14	Inspection/error output
Output	CnNM3	9-10	Water pump operation output
Input	CnV		Outlet-/inlet water temp. correction invalid select, Shorted (Invalid)/Open (Valid)
Input	CnZ	5-6	Select input 2, ①Start/stop, ②Op. permit/prohibit, ③Cooling/heating, ④Emerg. stop, ⑤Forced thermo OFF, ⑥Temporary stop, ⑦Set temp. select 1, ⑧Set temp. select 2

⑥ Operation and setting from remote control

<Note of "eco-touch remote control">
A : Refer to the instruction manual for RC-EX3H C : Loading a utility software vie Internet
B : Refer to the installation manual for RC-EX3H D : Refer to the HMU technical manual

<Availability of setting/operation on standard remote controls>
○ : Nearly same function setting and operations are possible.
△ : Similar function setting and opperations are possible.
Blank column: Standard remote controls have not this function.

Setting & display item			Description	RC-EX3H
1.Remote Control network				
1	Main/sub setting of remote controls		A pair of remote controls (including option wireless remote control) can be connected within the remote control network. Set one to "Main" and the other to "Sub".	B
2.TOP scrren, Switch manipulation				
1	Menu		"Control","State", or "Details" can be selected. (3-8)	A
2	Operation mode		"Cooling","Heating" or "Auto" can be set.	A
3	Set temp.		"Set temperature" can be set by 0.5˚C interval.	A
4	Air flow direction		Invalid for HMU	A
5	Fan speed		Invalid for HMU	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
10	Select the language		Select the language to display on the remote control. ・ Select from English, German, French, Spanish, Italian, Dutch, Turkish, Portuguese, Russian and Polish.	A
3.Useful functions				
1	Individual flap control		Invalid for HMU	A
2	Anti draft setting When the panel with the anti-draft function is assembled.		Invalid for HMU	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-12houres (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-12houres (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]		Invalid for HMU	A
7	External Ventilation When the ventilator is combined.		Invalid for HMU	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 and Polish.	A
9	Silent mode control		The period of time to operate the unit by prioritizing the quietness can be set. ・ Start and end can be set for the silent mode	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 miuutes 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 restructing 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.	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	Motion sensor control When the panel with the motion sensor is assembled.		Invalid for HMU	A
5.Filter				
1	Filter sign reset	Filter sign reset	The filter sign can be reset.	A
		Setting next cleaning date	The next cleaning date can be set.	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-90 sec (5sec interval).	A
		Controller sound	It can set with or without [Controller 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 *3]	A
		Outdoor unit silent mode timer	The period of time to operate the outdoor unit by prioritizing the quiteness 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 aday by 5 minutes interal.	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

Setting & display item			Description	RC-EX3H
		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
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")	A
			The administrator password can be reset.	B
		F1/F2 function setting	Functions can be set for F1 and F2. Selectable functions: [Anti draft ON/OFF] [Energy-saving operation], [Silent mode cont.], [Favorite set 1], [Favorite set 2].	A
7.Service setting				
1	Installer settings [Service password]	Installation date	The [Installation date] can be registed. ・When registering the [Instaration 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 registed and can be displayed on the R/C. ・The [Company] can be registered within 26 characters. ・The [Phone No.] can be registed within 13 digits.	B
		Test run	On/Off operation of the test run can be done.	B
		Cooling test run	The [Cooling test run] can be done at 5˚C of set temp. for 30 minutes.	
		Drain pump test run	Only drain pump can be operated.	
		Staric pressure adjustment	Invalid for HMU	B
		Change auto-address	Invalid for HMU	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
		Motion sensor setting When the panel with the motion sensor is assembled.	Invalid for HMU	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	Invalid for HMU	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	Invalid for HMU	B
		ºC / ºF	Invalid for HMU	B
		Fan speed	Invalid for HMU	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	Invalid for HMU	B
		Left/right flap control	Invalid for HMU	B
		Ventilation setting	Invalid for HMU	B
		Auto-restart	The operation control method after recovery of power failure happened during operation can be set.	B
		Auto temp setting	Invalid for HMU	B
		Auto fan speed	Invalid for HMU	B
3	IU settings [Service password]	Fan speed setting	Invalid for HMU	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	Invalid for HMU	B
		Return temperature adjustment	Invalid for HMU	B
		Fan control in cooling thermo-OFF	Invalid for HMU	B
		Fan control in heating thermo-OFF	Invalid for HMU	B
		Anti-frost temp	Invalid for HMU	B
		Anti-frost control	Invalid for HMU	B
		Drain pump operation	Invalid for HMU	B
		Keep fan operating after cooling is stopped	Invalid for HMU	B
		Keep fan operating after heating is stopped	Invalid for HMU	B
		Intermittent fan operation in heating	Invalid for HMU	B
		Fan circulator operation	Invalid for HMU	B
		Control pressure adjust	Invalid for HMU	B
		Auto operation mode	The [Auto rule selection] for switching the operation mode automatically can be selected from 3 patterns.	B
		Thermo. rule setting	Invalid for HMU	B
		Auto fan speed control	Invalid for HMU	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
		External output setting	Invalid for HMU	B
4	IU settings 2 [Service password]	Auto air filter cleaning	Equipment cleaning auto setting of [Invalid/valid] can be changed.	D
		Operation by external input only	Remote operation input complete select setting of [Invalid/valid] can be changed.	D
		Water pump residual operation time	The time period residual pump operation after stopping or thermo-off can be set.	D
		External output function 1	Functions assigned to the external outputs (CNO) can be set.	D
		External output function 2	Functions assigned to the external outputs (CND) can be set.	D
		Target outlet water temp	Target value of heating can be set within the range of 0 to 10°C.	D
		Set temp 2	Set temp 2 can be set.	D
		Set temp A/B/C by external input	Set temp A/B/C by external input can be set.	D
		Inlet water sensor offset in cooling/heating	The detected inlet water temperature can be corrected.	D
		Outlet water sensor offset in cooling/heating	The detected outlet water temperature can be corrected.	D
		Thermo ON temp (Inlet/Outlet water)	Thermo ON temp (Inlet/Outlet water) can be set.	D
		Thermo OFF temp (Inlet/Outlet water)	Thermo OFF temp (Inlet/Outlet water) can be set.	D
		Thermo OFF temp 2 (Outlet water)	Thermo OFF temp 2 (Outlet water) can be set.	D
		Thermo OFF detection time (Outlet water)	Thermo OFF detection time (Outlet water) can be set.	D
		Temp offset for anti-freezing (Water)	Temp offset for anti-freezing (Water) can be set.	D
		Anti-freezing control (HEX)	Anti-freezing control mode (HEX) can be changed.	D
		Temp offset for anti-freezing (HEX)	Temp offset for anti-freezing (HEX) can be set.	D
		Temp offset for anti-freezing control (HEX)	Temp offset for anti-freezing control mode (HEX) can be changed.	D

Setting & display item			Description	RC-EX3H
5	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 pump.	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		B
		Error history	The error history can be displayed.	
		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 I/U 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
8.Contact company			Shows registered [Contact company] and [Contact phone].	
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.

⑦ Setting of microcomputer of outdoor unit

Setting of microcomputer of outdoor unit needs to be changed as below, when the HMU and air to air indoor unit are connected (mixed use) .

Configuration of indoor unit	7-segment P81	Remark
Mixed use	1	
Only HMU	0	Factory setting

12. OPERATING METHOD

12.1 Various settings

12.1.1 Indoor PCB input switch

Type	Code	Description
Rotary switch	SW1	Indoor address (10' place)
	SW2	Indoor address (1's place)
	SW3	Outdoor address (10's place)
	SW4	Outdoor address (1's place)
DIP switch	SW5-2	Indoor address (100's place) (☆OFF)
	SW6-1	Model capacity setting (☆ON)
	SW6-2	Model capacity setting (☆ON)
	SW6-3	Model capacity setting (☆ON)
	SW6-4	Model capacity setting (☆ON)
	SW7-1	Operation check (☆OFF)
	SW7-2	Target setting of thermostat: Outlet water/Inlet water (☆OFF/ON)
	SW7-3	Target setting of thermostat by remote operation input: Outlet water/Inlet water (☆OFF/ON)
	SW7-4	Model setting (☆ON)

☆Factory default

12.1.2 Model capacity setting

	Model capacity	
	140	280
SW6-1	OFF	ON
SW6-2	OFF	ON
SW6-3	ON	ON
SW6-4	ON	ON

12.1.3 External I/O terminal

Type	Code	Terminal block	Description
Input	CnOI	3-4	Ext. input error (Interlock) Shorted (Normal)/Open (Error [E16])
Output	CnI	15-16	Function select external input 1
Output	CnD	7-8	Function select external input 2
Input	CnT-6	1-2	Select input 1, ①Start/stop, ②Op. permit/prohibit, ③Cooling/heating, ④Emerg. stop, ⑤Forced thermo OFF, ⑥Temporary stop, ⑦Set temp. select 1, ⑧Set temp. select 2
Output	CnT-2	11-12	Operation output
Output	CnT-3		Heating output
Output	CnT-4		Thermo ON output
Output	CnT-5	13-14	Inspection/error output
Output	CnNM3	9-10	Water pump operation output
Input	CnV		Out-/inlet w temp. correction invalid select, Shorted (Invalid)/Open (Valid)
Input	CnZ	5-6	Select input 2, ①Start/stop, ②Op. permit/prohibit, ③Cooling/heating, ④Emerg. stop, ⑤Forced thermo OFF, ⑥Temporary stop, ⑦Set temp. select 1, ⑧Set temp. select 2

12.2 Operating method of remote control

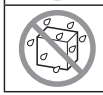
12.2.1 Before you use

(1) Safety precautions

●Please read the precautions written here carefully to operate the unit properly.
You are required to observe these fully because every item of these instructions is important for safety.

⚠WARNING	Failure to follow these instructions may result in serious consequences such as death, severe injury, etc.
⚠CAUTION	Failure to follow these instructions may cause injury, property damage or, serious consequences depending on.

●The following pictograms are used in the text.

	Never do.		Always follow the instructions given.
	Absolutely keep water away.		Absolutely keep wet hands away.

●Keep this manual in a safe place where you can consult with whenever necessary. Show this manual to installers when moving or repairing the unit. When the ownership of the unit is transferred, this manual should be given to a new owner.

●**Electrical wiring work must be implemented only by qualified specialists.**

⚠WARNING

Consult your dealer or a professional contractor to install the unit.
Improper installation made on your own may cause electric shocks, fire or dropping of the unit.

Consult your dealer when moving, disassembling or repairing the unit. Never modify the unit.
Improper handling may result in injury, electric shocks, fire, etc.

Avoid using combustible substances (hair spray, insecticide, etc.) near the unit.
Do not use benzene or paint thinner to clean the unit.
It could cause cracks, electric shocks or fire.

Stop operation under abnormal situation.
If continued, it could result in break-down, electric shocks, fire, etc.
If any abnormal condition (burnt odor etc.) occurs, stop operation, turn off the power switch and consult your dealer.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

⚠CAUTION

Do not use or let use the unit or remote control as play equipment.
Improper operations could cause ill health or health disorder.

Never disassemble the remote control.
If you touch internal parts accidentally, you could get electric shocks or cause trouble.
Consult your dealer when it is necessary to inspect its interior.

Do not wash the remote control with water or liquid.
It could cause electric shocks, fire or break-down.

Do not touch electric parts or operate buttons or screens with wet hands.
It could cause electric shocks, fire or break-down.

Do not dispose the remote control by yourself.
It could destruct the environment. Ask your dealer when it is necessary to dispose the remote control.

Note

The remote control should not be installed where it is exposed to direct sunlight or the ambient temperatures become higher than 40˚C or lower than 0˚C.
It could cause deformation, discoloration or break-down.

Do not use benzene, paint thinner, wipes etc. to clean the remote control.
It could discolor or break-down the remote control. Wipe it with a piece of cloth which is squeezed tightly after wetting with diluted neutral detergent. Finish up the cleaning by wiping with a piece of dry cloth.

Do not pull or twist the cable of the remote control.
It could cause break-down.

Do not tap the remote control buttons or screen with pointed objects.
It could damage or cause break-down.

(2) Precautions for waste disposal

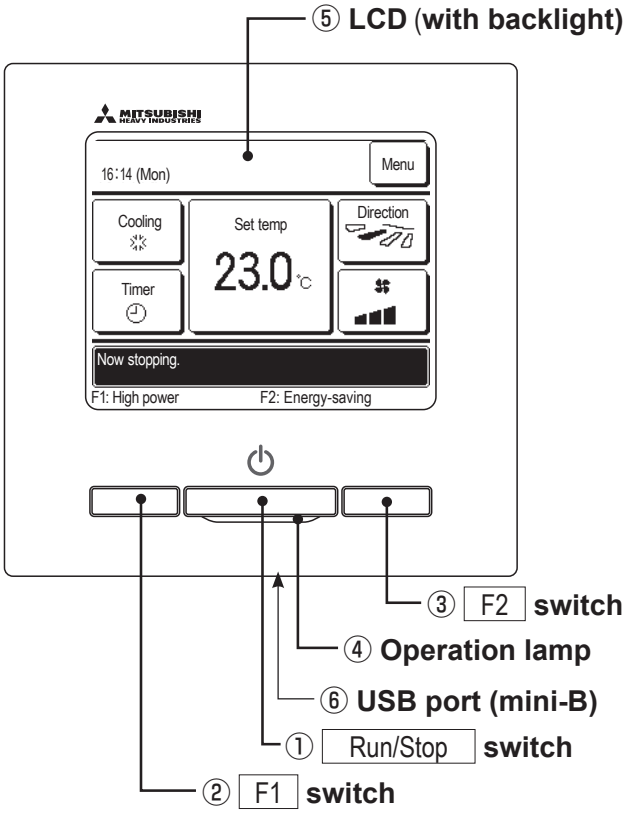
Your air-conditioning product may be marked with this symbol. It means that waste electrical and electronic equipment (WEEE as in directive 2012/19/EU) should not be mixed with general household waste. Air-conditioners should be treated at an authorized treatment facility for re-use, recycling and recovery and not be disposed of in the municipal waste stream. Please contact the installer or local authority for more information.

(3) Unit specifications

Item	Description
Product dimensions	120 (W) x 120 (H) x 19 (D) mm (not including protruded section)
Weight	0.20 kg
Power source	DC 18 V
Power consumption	0.6 W
Usage environment	Temperature: 0 to 40 °C
Material	Casing: ABS

(4) Names and functions of sections on the R/C

(a) Operating section



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

① Run/Stop switch

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

② F1 switch ③ F2 switch

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

④ Operation lamp

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

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.
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.)

⑥ USB port

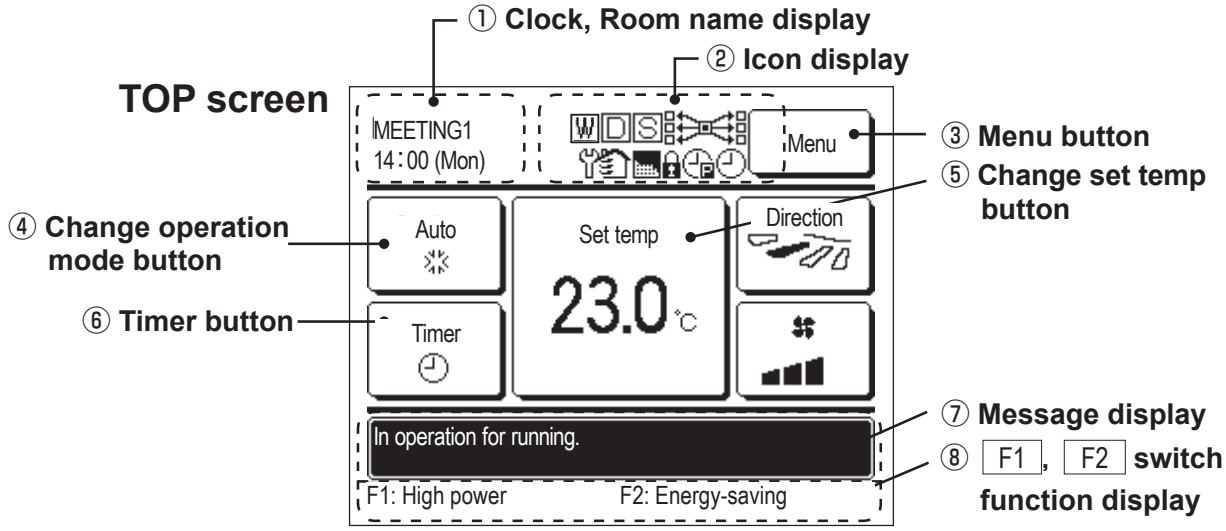
USB connector (mini-B) allows connecting to a personal computer.
For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

Note

・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.

(b) Display

✻All icons are shown for the sake of explanation.



① Clock, Room name display

Displays the current time and the room name .

② Icon display

Each icon is displayed when one of following settings is going on.

D When the demand control is effective.

S When setting is made from the sub R/C.

When the central control (Option) is running.

When the periodical inspection is necessary.

When the Permission/ Prohibition setting is made.

When ”filter sign” is up.

When the weekly timer is set.

When the peak-cut timer is set.

When HMU is connected.

③ Menu button

When setting or changing other than the following ④-⑥, tap the menu button. Then menu items are displayed, select one and set.

④ Change operation mode button

Displays the operation mode which is selected currently. Tap this button to change the operation mode.

⑤ Change set temp button

Displays the temperature which is set currently. Tap this button to change the set temperature.

⑥ Timer button

Displays simplified contents of the timer which is set currently.
(When two or more timers are set, contents of the timer which will be operated immediately after is displayed.)
Tap this button to set the timer.

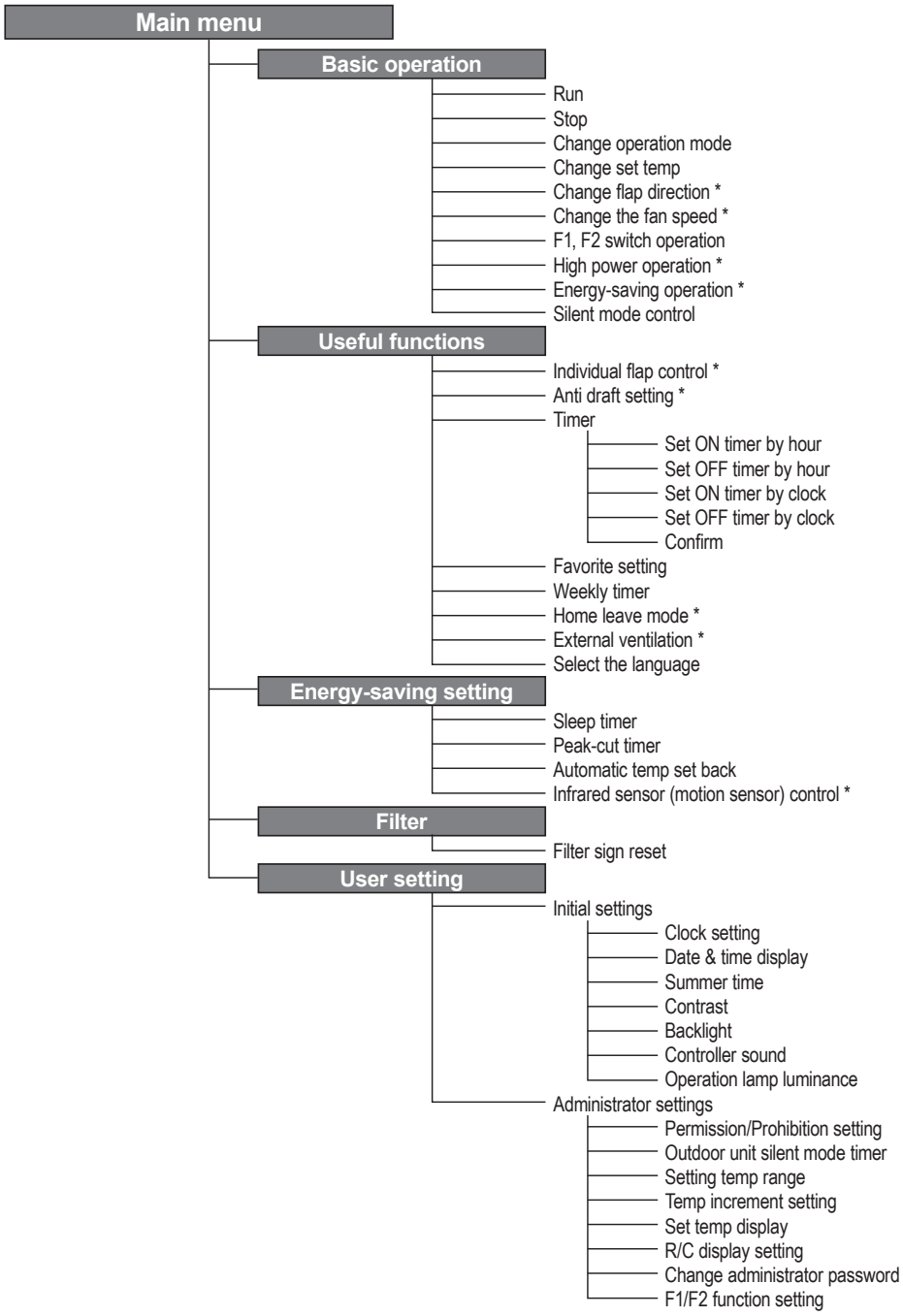
⑦ Message display

Status of air-conditioner operation and messages of the R/C operations etc. are displayed.

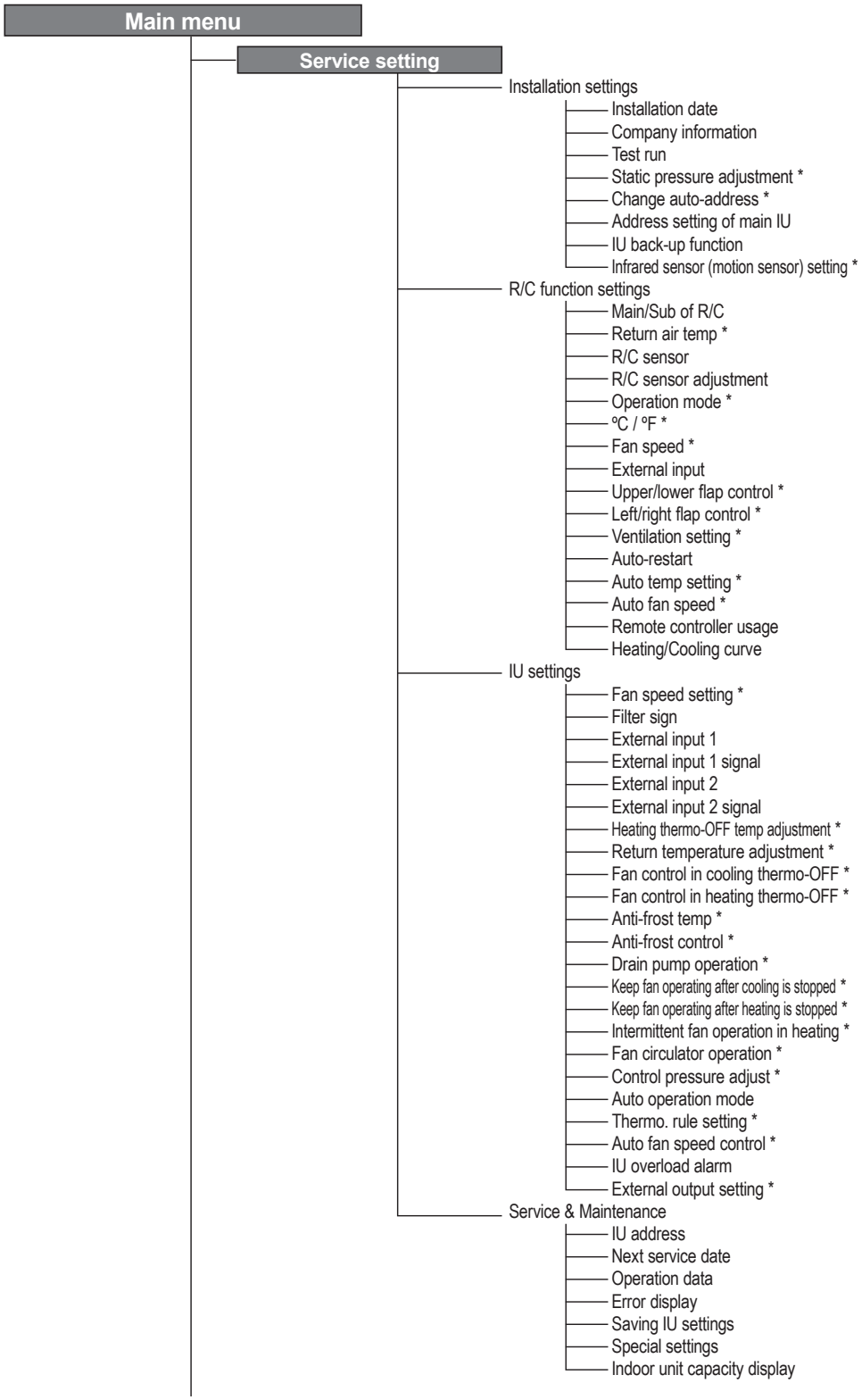
⑧ F1, F2 switch function Display

Displays the function that is set for each F1, F2 switch.
The function for these switches can be changed in F1/F2 function setting.

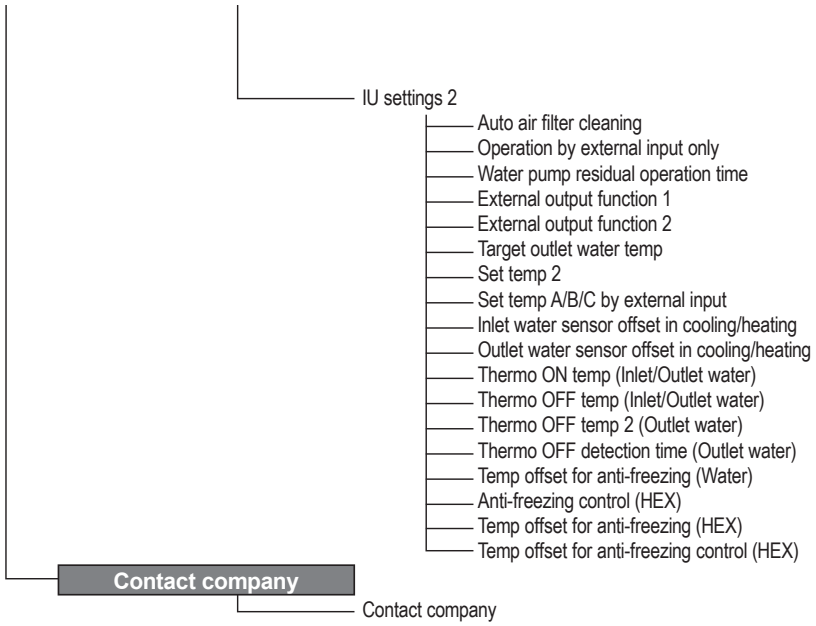
(5) Menu item



*Invalid for HMU.

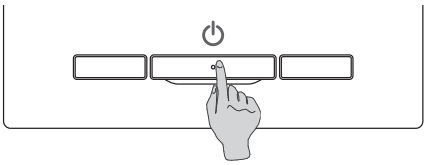


*Invalid for HMU.


IU settings 2
Auto air filter cleaning
Operation by external input only
Water pump residual operation time
External output function 1
External output function 2
Target outlet water temp
Set temp 2
Set temp A/B/C by external input
Inlet water sensor offset in cooling/heating
Outlet water sensor offset in cooling/heating
Thermo ON temp (Inlet/Outlet water)
Thermo OFF temp (Inlet/Outlet water)
Thermo OFF temp 2 (Outlet water)
Thermo OFF detection time (Outlet water)
Temp offset for anti-freezing (Water)
Anti-freezing control (HEX)
Temp offset for anti-freezing (HEX)
Temp offset for anti-freezing control (HEX)
Contact company
Contact company

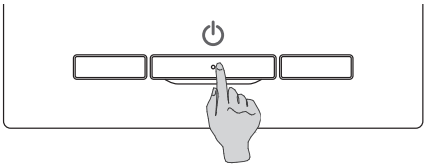
12.2.2 Menu items

(1) Run

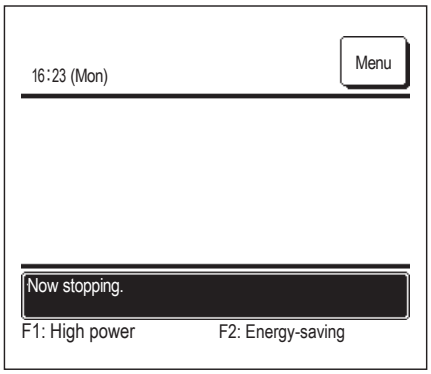


Push the Run/Stop switch.
Operation lamp (green) lights and operation starts.

(2) Stop



Press the Run/Stop switch while the unit is in operation.
The operation lamp turns off and the operation stops.



When the operation stops, all operation buttons on the screen turn off.
When the set lighting time of backlight is counted up, the backlight turns off.

When the screen is tapped, the backlight lights, and all operation buttons are displayed.

Note

・Do not shut down the power source immediately after the stop of operation.
It should be waited for more than 5 minutes till the residual operation time of drain motor is counted up. Otherwise, it could cause water leakage or breakdown.

Advice

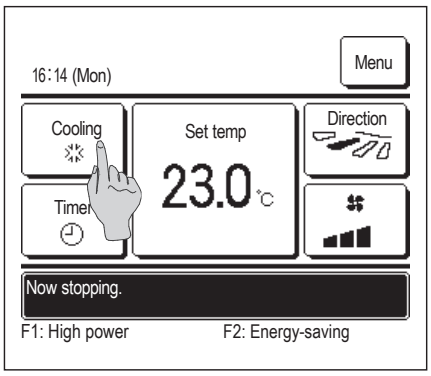
・A message “Invalid request” may be displayed when a button is pushed. This is not a fault but it is because the button operation is set to the “Disable”.
・The unit starts to operate initially with the following settings after the power on. These settings can be changed as desired.

Central control	····· OFF
Operation mode	····· With auto mode: Auto cooling
	····· Without auto mode: Cooling
Set temp	····· 23.0°C
Fan speed	····· 3-speed
Flap direction	····· When cooling: position 2, when heating: position 3

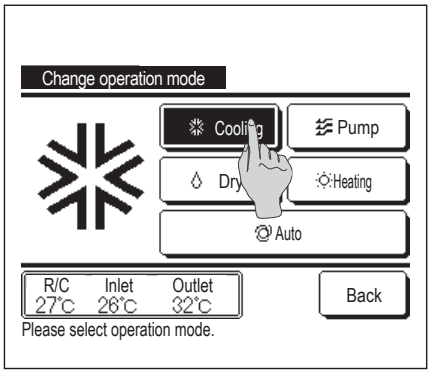
＊When an FDK with a left/right flap is connected, left/right flap direction: center, 3D AUTO: disabled

・In the following cases, a message “Operation mode is invalid.” is displayed and it changes to the fan operation, because operation modes are not matched.
① When Heating (including auto heating) is selected for Operation mode while using an OU for cooling only.
② When Heating is selected for Operation mode while controlling multiple units including units allowed for both cooling and heating and units for cooling only.
③ When different operation modes are selected between IUs which are connected to a OU that do not allow mixed operation of cooling and heating.

(3) Change operation mode



1 Tap the Change operation mode button on the TOP screen.



2 When the Change operation mode screen is displayed, tap the button of desired mode.

The operation mode changes, and the display returns to the TOP screen.

Icons displayed have the following meanings.

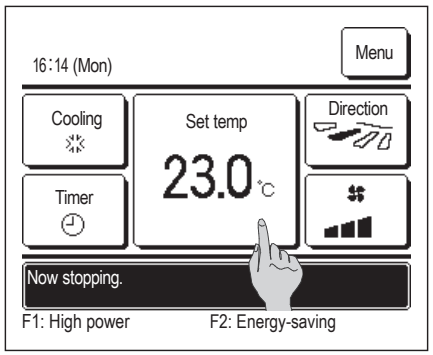
Cooling	**Pump**
Dry *	**Heating**
Auto	

*Invalid for HMU

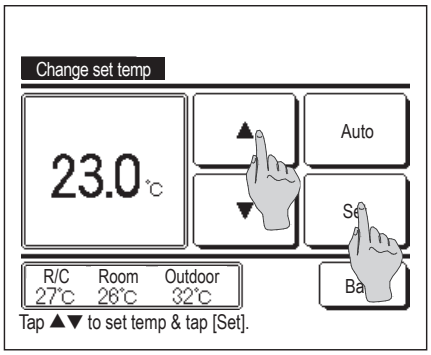
■Operation modes which cannot be selected depending on combinations of IU and OU are not displayed.

■When the Auto is selected, the cooling and heating switching operation is performed automatically according to indoor and outdoor temperatures.

(4) Change set temp



1 Tap the Change set temp button on the TOP screen.



2 When the Change set temp screen is displayed, select the temperature as desired with using [▲] [▼] buttons.

3 After selecting the set temp, tap the [Set] button. The display returns to the TOP screen.

■For allowable temperature setting ranges, refer to the range setting of set temp

*1 : Do not set the temperature lower than 7°C in cooling mode.
If the remote control is set lower than 7°C, it will automatically be set to 7°C.

*2 : Do not set the temperature lower than 25°C (or 30°C) in heating mode, even though it can be set 15°C – 25°C. It may cause protection stop depending on the situation.
The minimum set temperature (25°C or 30°C) depends on outdoor temperature.
(See "Operation range", page 13.)

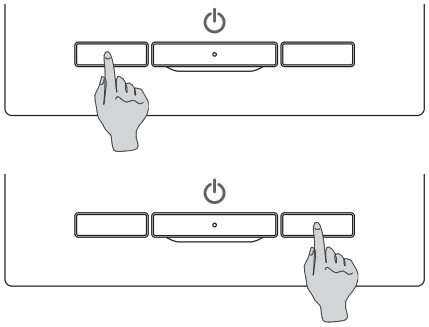
■If the [Auto] is selected for the set temp, the set temp display shows “0”. Temperature can be adjusted higher or lower with using [▲] [▼] buttons. Note that [Auto] is not displayed and cannot be set when SC-SL2, SC-SL3, or SC-SL4 is connected.

■If the [Back] button is tapped without tapping the [Set] button, the selected set temp is invalidated and the display returns to the TOP screen.

(5) F1/F2 switch operation

You can set any of the following functions to the [F1] and [F2] switches.
The [F1] / [F2] switches act as shortcuts; it can be much easier and faster than starting an operation from the usual [Menu] on the TOP screen.

- Silent mode control
- Favorite setting operation
- Filter sign reset



Changing the function of the [F1] or [F2] switch can be performed with the F1/F2 function setting.
The following functions are set as factory settings.
You may change these settings as desired.
[F1] switch ⋯Silent mode cont.
[F2] switch ⋯Favorite set 1

12.2.3 Quick reference of menu items

(1) Quick reference of menu items

It is necessary to input the Administrator password for menu items showing.

Setting and display items			Details
Useful functions	Timer	Set ON timer by hour	Set the time to operate the unit after stopping the operation within the range of 1 - 12 hours (at 1-hour intervals).
		Set OFF timer by hour	Set the time to stop the operating unit within the range of 1 - 12 hours (at 1-hour intervals).
		Set ON timer by clock	Set the clock time to start operation. ■The time can be set at 5-minute intervals. ■It can be selected from once (only one day) or every time (every day). ✻Clock setting is necessary to set the timer.
		Set OFF timer by clock	Set the time to stop operation. ■The time can be set at 5-minute intervals. ■It can be selected from once (only one day) or every time (every day). ✻Clock setting is necessary to set the timer.
	Favorite setting Administrator password		Set each operation mode and setting temperature, fan speed※, flap direction※ for Favorite setting 1 or Favorite setting 2.
	Weekly timer		On timer or Off timer on weekly basis can be set. ■8-operation patterns per day can be set at the maximum. ■The time can be set at 5-minute intervals. ■Holiday setting (including temporary day off) is available. ✻Clock setting is necessary to set the time.
	Select the language		Set the language to be displayed on the R/C.
Energy-saving setting Administrator password	Sleep timer		Set the time period from start to stop of operation. ■The selectable range of setting time is from 30 to 240 minutes (at 10-minute intervals). ■When the setting is “Enable”, this timer will activate whenever any operation starts.
	Peak-cut timer		Set the times to start and stop the capacity limiting operation and the peak-cut %. ■4 operation patterns per day can be set at the maximum. ■The setting time can be changed at 5-minute intervals. ■The selectable range of peak-cut % is from 0.40 to 80% (at 20% intervals). ■Holiday setting (including temporary day off) is available. ✻Clock setting is necessary.
	Automatic temp set back		It returns to the set temperature when the set time is counted up. ■The selection range of the set time is from 20 to 120 minutes (at 10-minute intervals).

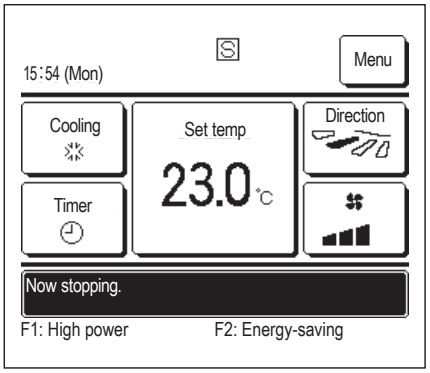
※This function is not available for HMU.

Setting and display items			Details
Filter	Filter sign reset		Reset the filter sign. Set next cleaning date.
User setting	Initial settings	Clock setting	Set and correct the current date and time. ■When the power supply is interrupted for 80 hours or less, the clock continues to operate with the built-in backup batteries. If it is interrupted for more than 80 hours, it is necessary to renew the setting.
		Date & time display	Set whether the date and time are displayed or not, and select 12H or 24H and AM or PM position.
		Summer time	Current time is advanced or delayed by 1 hour.
		Contrast	Contrast of LCD can be adjusted.
		Backlight	Select whether the backlight is used or not, and set the lighting time.
		Controller sound	Select whether the controller sound is actuated at the touch panel operation or not.
		Operation lamp luminance	Adjust operation lamp luminance.
	Administrator settings Administrator password	Permission/ Prohibition setting	■Set the permission/prohibition for each of following operations: [Run/Stop] [Change set temp] [Operation mode] [Change flap direction]※ [Change the fan speed]※ [High power operation]※ [Energy-saving operation] [Timer] ■Set the administrator password request during operation. [Individual flap control]※ [Weekly timer] [Select the language] [Filter sign reset]
		Outdoor unit silent mode timer	The period of time to operate the unit by prioritizing the quietness can be set. ■Starting and stopping times can be set for the silent mode operation. ■The time can be set at 5-minute intervals.
		Setting temp range	Restrict the setting range of temperature. ■Temperature range can be restricted depending on operation modes.
		Temp increment setting	Set the interval for setting temperature (0.5°C/1.0°C).
		Set temp display	Set temperature display method can be selected.
		R/C display setting	Register the names of remote control and indoor unit. Set Yes or No for the need of indoor temperature display. Set Yes or No for the need for the display of error code, heating standby, defrosting operation on and automatic cooling/heating.
		Change administrator password	Change the administrator password.
		F1/F2 function setting	Set the functions of F1 and F2 switch. Available functions: [High power operation]※ [Energy-saving operation] [Silent mode cont.] [Home leave mode]※ [Favorite set 1] [Favorite set 2] [Filter sign reset]
Contact company & Error display			Address of the service contact is displayed.

It is necessary to input the administrator password for menu items indicated with Administrator password .

※This function is not available for HMU.

(2) Restrictions on the sub R/C

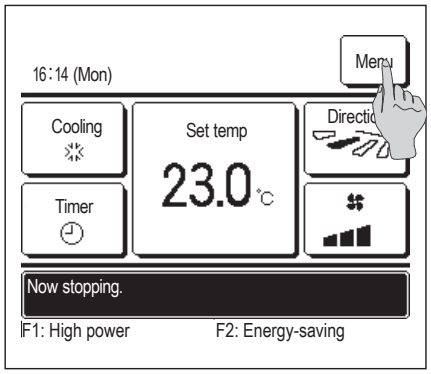


When one IU is controlled with 2 R/Cs, the following settings cannot be made on the sub R/C. It is necessary to use the main R/C.
In case of the sub R/C, the icon [S] is displayed on the R/C screen.

○: operable ×: not operable

R/C operations			Main	Sub
Run/Stop, Change set temp			○	○
Silent mode control			○	×
Useful functions	Timer		○	○
	Favorite setting		○	○
	Weekly timer		○	×
	Select the language		○	○
Energy-saving setting			○	×
Filter	Filter sign reset		○	○
User setting	Initial settings		○	○
	Administrator settings	Permission/Prohibition setting	○	×
		Outdoor unit silent mode timer	○	×
		Setting temp range	○	×
		Temp increment setting	○	×
		Set temp display	○	○
		R/C display setting	○	○
		Change administrator password	○	○
		F1/F2 function setting	○	○

(3) Operations on menu screens

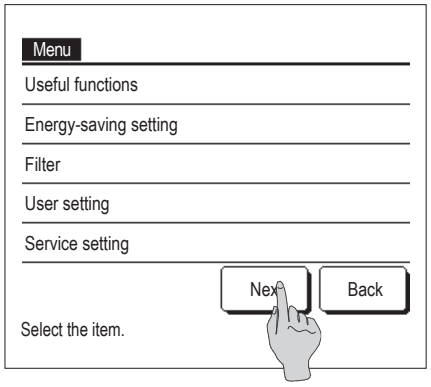


1 Tap the Menu button on the TOP screen.

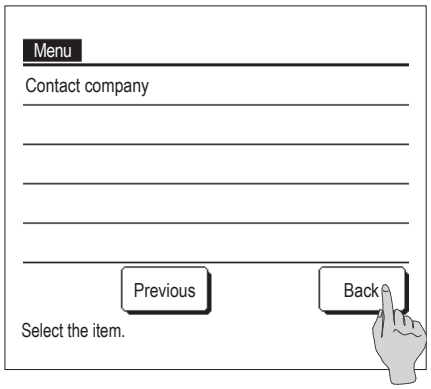
Main menu screen is displayed.

When a desired menu item is tapped, setting screen for each item is displayed.

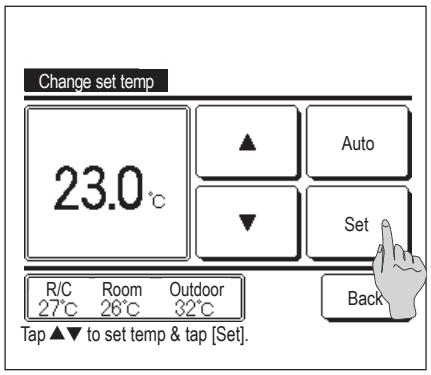
When there are two or more pages, the Next button is displayed at the leading page and the Previous button is displayed at the last page. The Next and Previous buttons are displayed on pages in between.



2 When the Next button is tapped, next main menu screen is displayed.

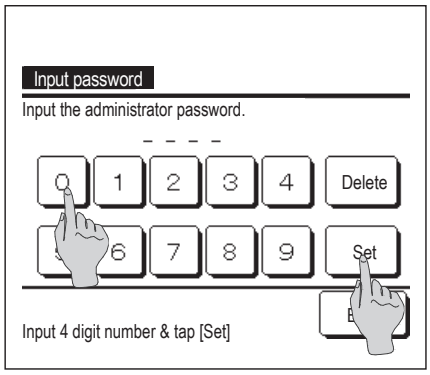


3 When the Back button is tapped, the display returns to the TOP screen.



4 When the Set button is displayed on the setting screen for each item, tapping this button confirms the setting.

■If you tap Back without tapping the Set button, the settings made will not be applied, and the display returns to the original screen.



5 When an item is referenced to Administrator password in this manual, the Input password screen is displayed after selecting the menu.

Enter the administrator password (4-digit number) and tap the Set button.

When the password is unknown or wrong, the setting cannot be changed.

Advice

· The administrator password is provided so that these operations and settings are restricted to administrators/managers only (such as the owner of the building).
· For the administrator password at the factory setting, refer to the Installation Manual.
When your administrator password is forgotten, initialize the password by referring to the Installation Manual.

(4) Cautions for each setting screen

・When returning to the screen mentioned below from each setting screen, operate the following buttons or switches.
■Return to Main screen ⋯ Menu button
■Return to the last previous screen ⋯ Back button
■Return to TOP screen ⋯ Run/Stop switch

・When the Back button is tapped without tapping the Set button on the way of setting, contents of the setting are invalidated, and the display returns to the last previous screen. If the Run/Stop switch is pushed on the way of setting, contents of the setting are invalidated, the setting mode is terminated and the display returns to the TOP screen.

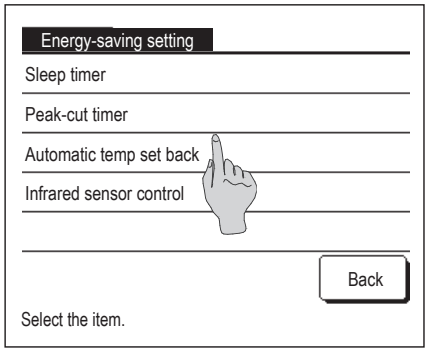
・If no button is operated for approx. 5 minutes on the way of setting each item, the display returns to the TOP screen automatically. Contents of the setting on the way become invalid.

・Message “Invalid request” may be displayed when a button is pushed. This is not a fault but it is because the button is set to the Prohibition.

・It is necessary to stop the unit by pushing the Run/Stop switch before starting the following settings.
If the Set button is tapped on the menu screen while the unit is operating, the message “Invalid request.” is displayed.
■Individual flap control ■Anti draft setting ■Select the language
■Energy-saving setting ■Administrator settings

12.2.4 Settings and operations

(1) Energy-saving setting [Administrator password]



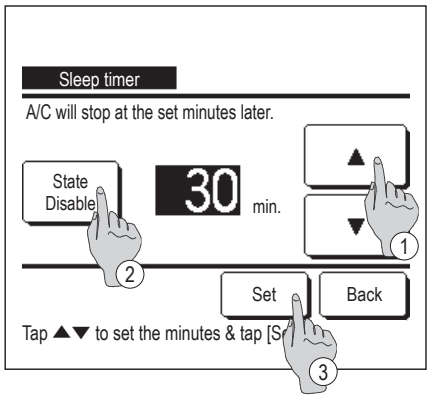
1 Tap the Menu button on the TOP screen and select Energy-saving setting. The Energy-saving setting menu screen is displayed.

2 When the Energy-saving setting screen is displayed, select a desired item.

- Sleep timer
- Peak-cut timer
- Automatic temp set back

■Sleep timer

Stops operation when the amount of time set has elapsed since the start of each operation.



1 Tap the Menu button on the TOP screen and select Energy-saving setting ⇒ Sleep timer. The Sleep timer screen is displayed.

2 Select a desired time with ① ▲ ▼ buttons.
Setting range: 30 to 240 minutes, at 10-min intervals.

3 Tap the ② State button to switch between “State Enable” and “State Disable”.

- “Enable”: operation stops at the set time every time.
- “Disable”: the sleep timer does not operate.

  Unless the Sleep timer is used, set at the “State Disable”.

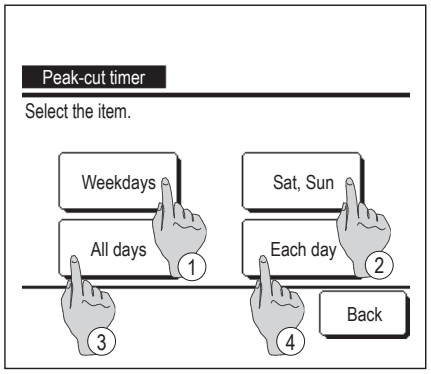
4 After the setting, tap the ③ Set button. The display returns to the Energy-saving setting menu screen.

■Peak-cut timer

Set the times to start and stop the capacity (upper limit) limiting operation and the peak-cut %.

Advice

· When the peak-cut timer is used, be sure to make the Clock setting in advance.
· The peak-cut timer control may not be performed depending on combination of IU and OU.

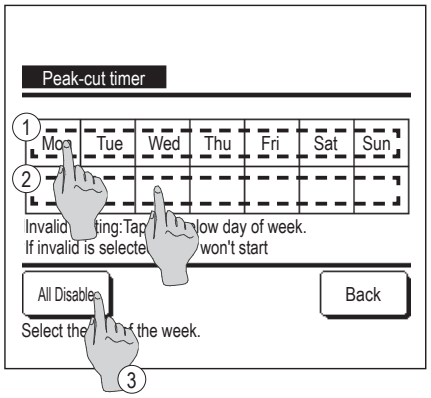


1 Tap the [Menu] button on the TOP screen and select [Energy-saving setting] ⇒ [Peak-cut timer].

When the setting range selection screen for the peak-cut timer is displayed, select the day of the week to be set.

① Weekdays : Monday - Friday
② Sat. Sun : Saturday, Sunday
③ All days : Monday - Sunday
(☞**4**)

④ Each day : Moves to the day of the week setting screen. (☞**2**)



2 If a desired day of the week ① is tapped on the display, contents of current setting for the day are displayed.
(☞**5**)

3 For the holiday setting, tap the block ② under a day to switch between "🕗" (the holiday setting) and "(Blank)" (reset).

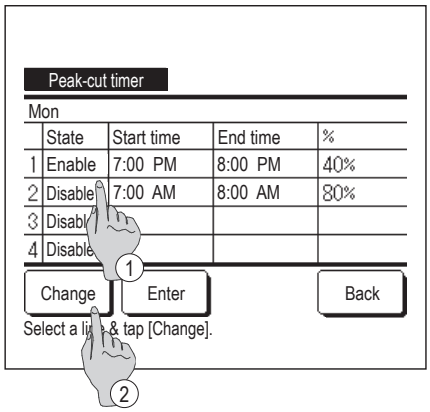
Timer does not operate on the day set as holiday.

Two or more holidays can be set.

■To enable the timer on the day set as holiday, it is necessary to reset the holiday setting.

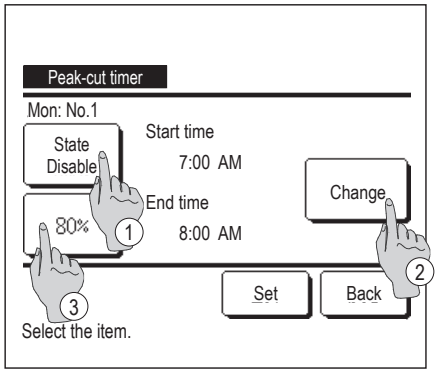
4 When tapping ③ "All Disable" button, the timer does not operate on all days of the week.

When the timer is used, be sure not to set "All Disable".



5 Screen to check contents of current setting is displayed.

When the contents are changed or new setting is added, select a ① setting line No. and tap the ② Change button.

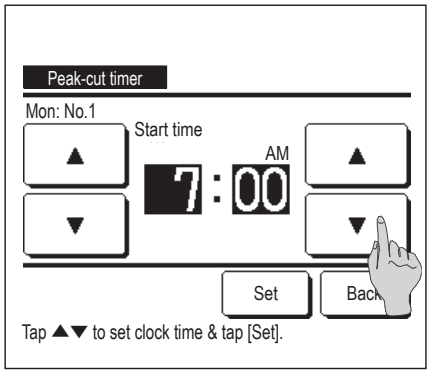


6 Detail setting screen for the timer setting contents is displayed.

① Tap the State button to switch between "State Enable" and "State Disable".

② If the Change button is tapped, the start time and the end time can be set. (☞**7**)

③ If the Peak-cut button is tapped, the peak-cut % can be set. (☞**9**)

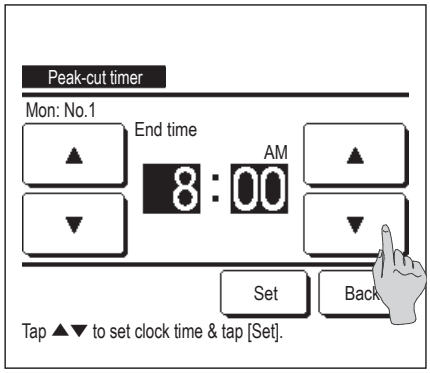


7 Set the Start time.

Set the hour and minute with the ▲ ▼ buttons.

Setting time can be set at 5-min intervals.

Tap the Set button after the setting. (☞**8**)



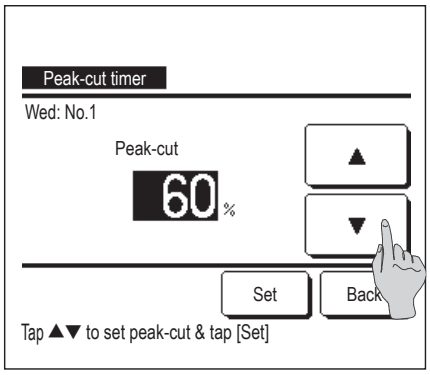
8 Set the End time.

Set the hour and minute with the ▲ ▼ buttons.

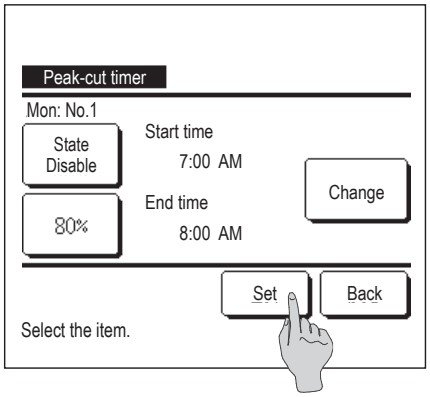
End time can be set from 5 minutes after the Start time up to 24:00 at 5-min intervals

Tap the Set button after the setting.

(☞**10**)



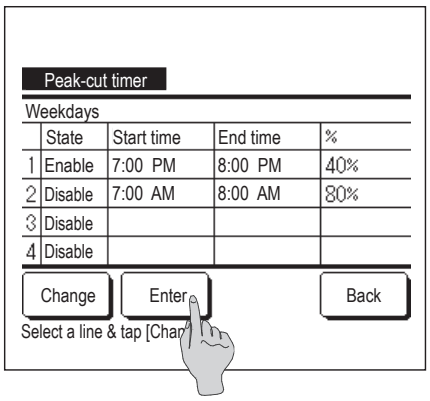
9 Set the peak-cut %.
Set the peak-cut % with the ▲ ▼ buttons.
The peak-cut % can be set at 0%, 40%, 60% or 80%.
The lower the peak-cut % is, the higher the effect of energy-saving becomes.
Tap the Set button after the setting.
(☞**10**)



10 The setting content check screen (☞**6**) is displayed. If the Set button is tapped, the contents are confirmed and a day of the week setting content check screen (☞**5**) is displayed.

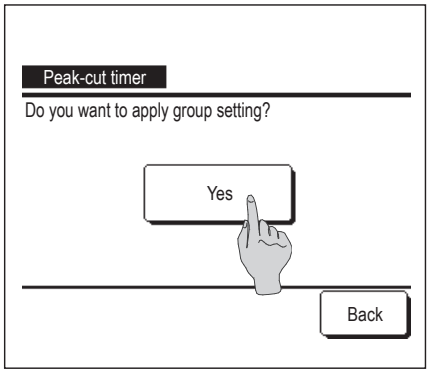
11 If the settings are corrected or added further within the same day, repeat the setting. (☞**5**)

■When contents of the setting are duplicated, the priority is given to the set contents of smaller peak-cut %.



12 Display a day of the week setting content check screen. To save the setting, tap the Enter button.

a) In case of group setting: (1-①Weekdays, 1-②Sat, Sun, 1-③ All days) Move to the group setting check screen. (☞**13**)
b) In case of individual setting: (1-④Each day) Save the setting and move to a day of the week selection screen (☞**2**)

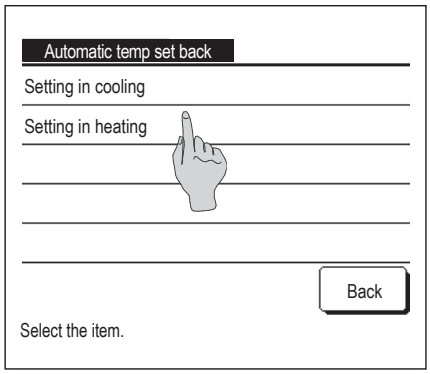


13 Display the group setting acknowledge screen.
Tap the Yes button to save the setting.
The display changes to a day of the week setting check screen after the saving. (☞**2**)

14 When making the setting after changing a day of the week, repeat the setting from the step **2**.

■Automatic temp set back

It returns to the set temperature when the set time is counted up.



1 Tap the [Menu] button on the TOP screen and select [Energy-saving setting] ⇒ [Automatic temp set back]. The Automatic temp set back screen is displayed.

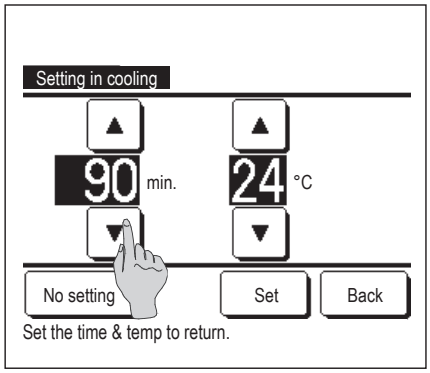
Tap [Setting in cooling] when setting for the cooling operation or [Setting in heating] when setting for the heating operation.

The Setting in cooling operation includes the cooling, dry and auto.

The Setting in heating is for the heating operation only.

Setting time range: 20 - 120 min, at 10-min intervals

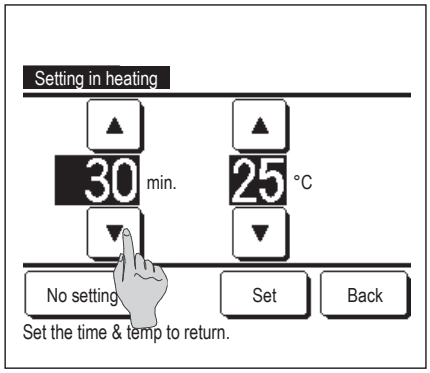
Set temp range: It can be set within the preset temp range set according to the set temp range menu.



2 Set desired time and temperature with the [▲] [▼] buttons.

When the [Set] button is tapped, contents of setting are confirmed, and the display returns to the last previous screen.

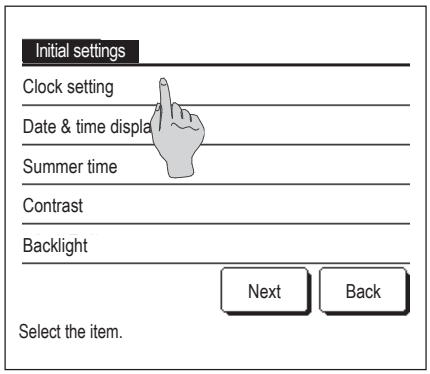
When the [No setting] button is tapped, "-- min. --°C" is displayed, and the "Automatic temp set back" is not performed.



3 The same setting method as the Setting in the cooling operation can be applied to the Setting in heating.

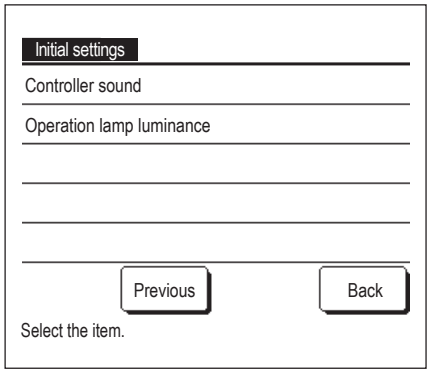
(2) Initial settings

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings].



2 When the “Initial settings” menu screen is displayed, tap a desired item.

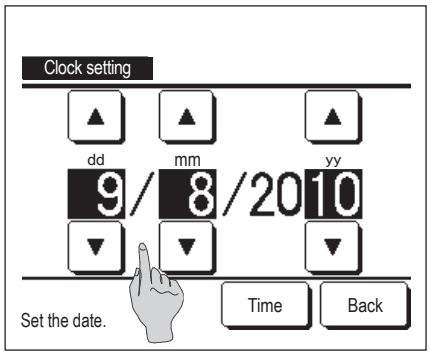
- Clock setting
- Date & time display
- Summer time
- Contrast
- Backlight
- Controller sound
- Operation lamp luminance



■Clock setting

You can set and correct the current date and time.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Clock setting].



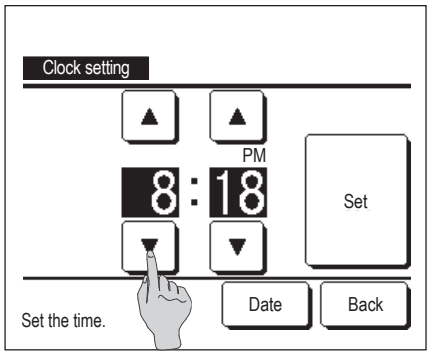
2 The “Clock setting” screen is displayed.

Set the “dd/mm/yy” with the [▲] [▼] buttons.

Tap the [Time] button after the setting.

■The “clock setting” is necessary for the following settings.

- Peak-cut timer
- Set ON timer by clock, Set OFF timer by clock
- Weekly timer
- Outdoor unit silent mode timer
- Filter sign reset, Setting next cleaning date



3 Set the "hour : minute" with the ▲ ▼ buttons on the clock setting screen.

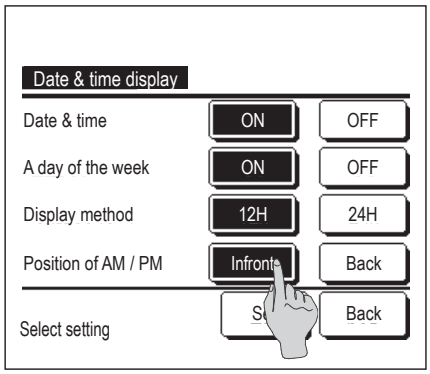
Tap the Set button after the setting.

To change "dd/mm/yy" tap the Date button.

■Date & time display

You can set and correct the date & time display.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Initial settings ⇒ Date & time display.



2 The Clock setting screen is displayed.

Tap OFF / ON for the Date and time.

Tap OFF / ON for A day of the week.

Tap Display method "12H or 24H".

12H Hours … If it is 3:50 PM, it displays "3:50PM".

24H Hours … If it is 3:50 PM, it displays "15:50".

Set the position of AM/PM.

Set Infront ... "PM3:50" is displayed.

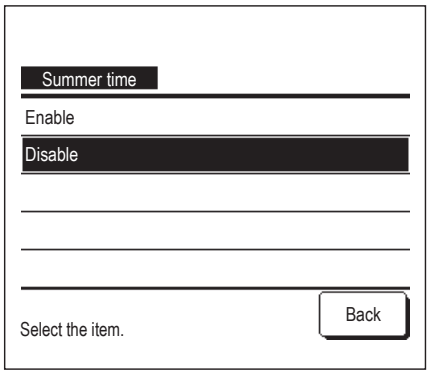
Set Back ... "3:50PM" is displayed.

3 Tap the Set button after the setting.

■Summer time

You can adjust the current time by one hour.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Summer time].



2 The Summer time setting screen is displayed.

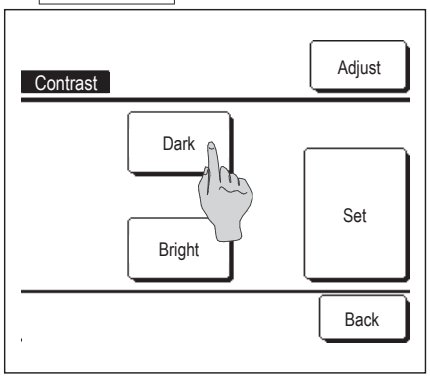
Changing from [Disable] to [Enable] … (Current time + 1 hr) is displayed.

Changing from [Enable] to [Disable] … (Current time – 1 hr) is displayed.

■Contrast

You can adjust the contrast of the LCD.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Contrast].

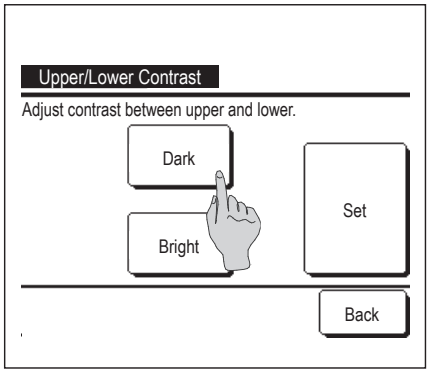


2 The Contrast Adjustment screen is displayed.

Tap the “Contrast” on the Initial settings menu screen. The contrast on the screen changes by tapping the [Dark] or [Bright] button to select a desired contrast.

3 Tap the [Set] button after the setting.

[When the contrast differs between the top and bottom of the screen]



4 Tap the [Adjust] button to display the Upper/Lower Contrast screen.

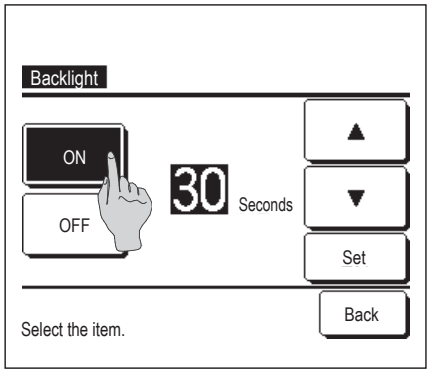
5 The contrast of the lower half of the screen changes when you tap the [Dark] / [Bright] button. Adjust the contrast so that the upper and lower halves of the screen match.

6 After you make the settings, tap the [Set] button.

■Backlight

You can turn ON/OFF the backlight and set the lighting period.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Backlight].



2 The Backlight setting screen is displayed.

Tap the ON or OFF buttons for the backlight lighting and the lighting Period (5 - 90 sec, at 5-sec intervals).

[ON] … The “Backlight” lights when the LCD is tapped.

If no operation is made for the set time, it turns off automatically.

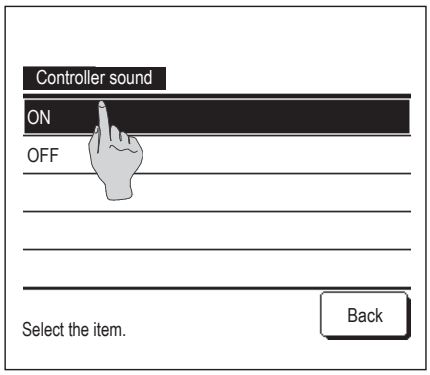
[OFF] … The “backlight” does not light even if the LCD is tapped.

3 Tap the [Set] button after the setting.

■Controller sound

You can set to have the controller sound ON/OFF when the touch panel is operated.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Controller sound].



2 The Controller sound setting screen is displayed.

Tap ON or OFF for the controller sound.

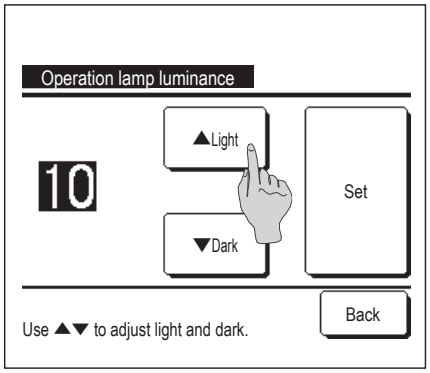
[ON] … When a button on the screen is tapped, a “beep” sounds.

[OFF] … There is no beep.

■Operation lamp luminance

You can adjust the operation lamp luminance.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Initial settings] ⇒ [Operation lamp luminance].



2 The Operation lamp luminance adjustment screen is displayed.

You can adjust the luminance of the operation lamp to a desired level by tapping the [▲ Light] / [▼ Dark] button.

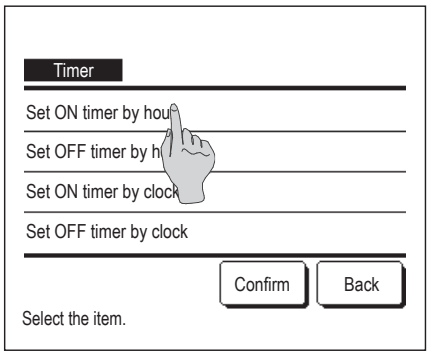
3 After you make the settings, tap the [Set] button.

(3) Timer

Advice

· The Clock setting must be made when the Set ON timer by clock or Set OFF timer by clock is used.

1 Tap the [Menu] button on the TOP screen and select [Useful functions] ⇒ [Timer]



2 Tap a desired item on the Timer menu.

- Set ON timer by hour
- Set OFF timer by hour
- Set ON timer by clock
- Set OFF timer by clock
- Confirm

When the timer is set, the [Confirm] button is displayed.

The button is not displayed unless the timer is set.

■Operation of each timer

・Sleep timer
Stops the operation of the unit when the amount of time set has elapsed since the start of the operation. When the setting is enabled, this timer will activate whenever any operation starts.

・Set ON timer by hour
When the set time elapses, the unit starts.
Operating conditions at the start of operation can be set.
Operation takes place once at each setting.

・Set OFF timer by hour
When the set time elapses, the unit stops.
Operation takes place once at each setting.

・Set ON timer by clock
The unit starts at the set time.
Operating conditions at the start of operation can be set.
Only one day (Once) operation or operation Everyday can be set.

・Set OFF timer by clock
The unit stops at the set time.
Only one day (Once) operation or operation Everyday can be set

・Weekly timer
On timer and Off timer on weekly basis can be set.

■Setting of each timer can be combined. Allowable combination settings are as shown below.

Allowable combination setting (○: Allowed, ×: Prohibited)

	Sleep	OFF: Hours	ON: Hours	OFF: Clock	ON: Clock	Weekly
Sleep		×	×	○	○	○
OFF: Hours	×		×	×	×	×
ON: Hours	×	×		×	×	×
OFF: Clock	○	×	×		○	×
ON: Clock	○	×	×	○		×
Weekly	○	×	×	×	×	

If a prohibited combination setting is made, a message “The combination can't be accepted” is displayed for 3 seconds.

■Priority order of the timer settings (①→③) is as follows.

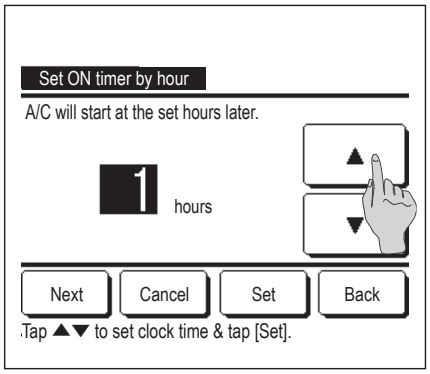
① Set OFF timer by hour/clock, weekly OFF timer
② Sleep timer
③ Set ON timer by hour/clock, weekly ON timer

■On the TOP screen, the timer is displayed from the earliest one out of OFF time of the sleep timer, ON time and OFF time.

■Set ON timer by hour

When the set time elapses, the air-conditioner starts.

1 Tap the Menu button on the TOP screen and select Useful functions ⇒ Timer ⇒ Set ON timer by hour.



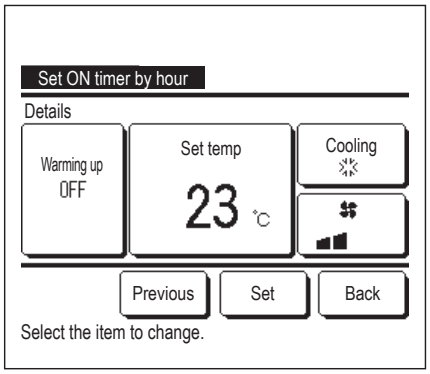
2 The Set ON timer by hour setting screen is displayed.

Select desired hours for the period to start operation by timer with the ▲ ▼ buttons.

Range of setting time: 1 to 12 hours (at 1-hr intervals)

3 When operating conditions at the start of operation are set, tap the Next button. (☞4)

When operating conditions are not set, tap the Set button.



4 Set the following operating conditions.

① Warming up ON/OFF (the Main R/C only)

② Operation mode ··· ☞5

③ Set temp ··· ☞6

④ Fan speed ··· ☞7

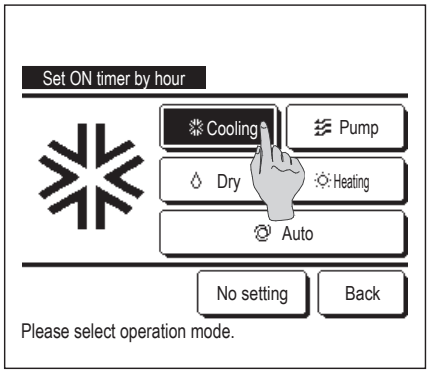
■Warming up setting can be made with the main R/C only.

■Set the operation mode before setting the set temperature.

Advice **Warming up**

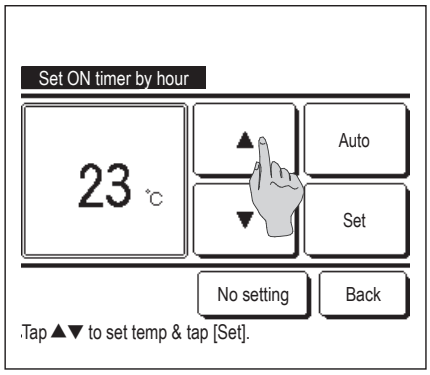
· To warm up the room temperature closed to the set temperature at the set start time of the operation, the microcomputer estimates the start time of the operation based on the last warming up operation and starts the operation 5 to 60 minutes earlier.

· When the warming up is turned ON, set the timer at one hour earlier or more than the start operation by timer.
If it is set in less than one hour, a message “Warming up cancelled” is displayed on the screen. (This is used as the Set ON timer by hour and clock.)



5 Tap a desired operation mode.

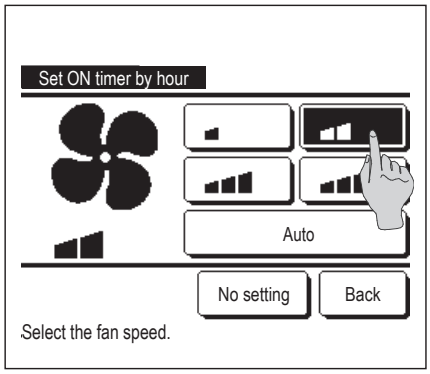
If the No setting button is tapped, it starts operation at the last action. (☞4)



6 Select a desired temperature (at 1°C intervals) with the ▲ ▼ buttons. Or tap the Auto button and select the auto temp setting.

Tap the Set button after the adjustment. (☞4)

When the No setting button is tapped, "--°C" is displayed, and it starts operation at the last setting temperature.



7 Tap a desired fan speed.

If the No setting button is tapped, it operates at the last action. (☞4)

(This function is not available for HMU.)

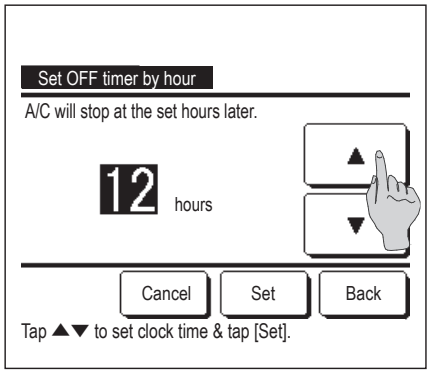
8 After setting the desired contents at the screen of the step **4** on the previous page, tap the Set button.

Operation will start at set hours later.

■Set OFF timer by hour

When the set time elapses, the air-conditioner stops.

1 Tap the Menu button on the TOP screen and select Useful functions ⇒ Timer ⇒ Set OFF timer by hour.



2 The Set OFF timer by hour setting screen is displayed.

Select desired hours to stop operation with the ▲ ▼ buttons.

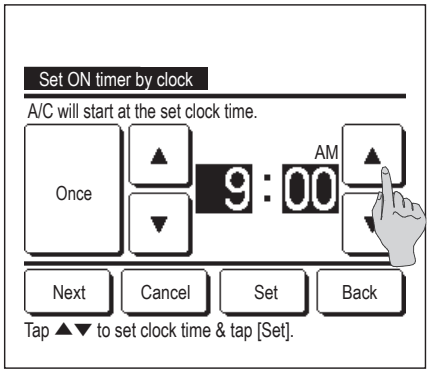
Range of setting time: 1 to 12 hours (at 1-hr intervals)

3 Tap the Set button after the setting.

■Set ON timer by clock

Starts the operation of the unit at the set clock time.

1 Tap the Menu button on the TOP screen and select Useful functions ⇒ Timer ⇒ Set ON timer by clock.



2 The Set OFF timer by hour setting screen is displayed.

Select a desired time to start operation (5-min intervals) with the ▲ ▼ buttons.

3 When operating conditions at the start of operation are set, tap the Next button to set operation conditions.

The operation conditions can be set the same way as the Set ON timer by hour settings.

If operating conditions are not set, tap the Set button.

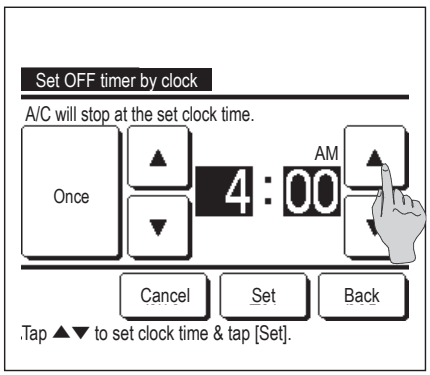
The Set ON timer by clock can be operated one day (Once) or every day.

If it is operated every day, tap the Once / Everyday button to change the display to “Everyday”.

■Set OFF timer by clock

Stops the operation of the unit at the set clock time.

1 Tap the Menu button on the TOP screen and select Useful functions ⇒ Timer ⇒ Set OFF timer by clock.



2 The Set OFF timer by clock setting screen is displayed.

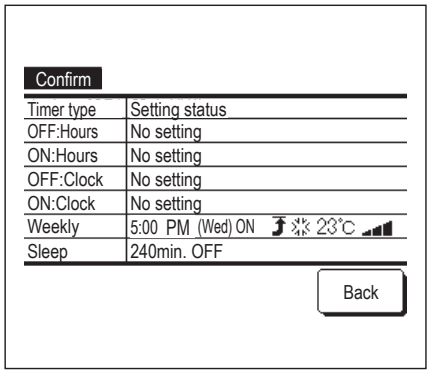
Select a desired time to stop operation (5-min intervals) with the ▲ ▼ buttons.

3 Tap the Set button after the setting.

The Set OFF timer by clock can be operated one day (Once) or every day.

If it is operated every day, tap the Once / Everyday button to change the display to “Everyday”.

■Confirm



1 When you tap the Confirm button on the Timer menu screen, the contents of the current timer settings are displayed.

■When the warming up is set, " " is displayed in front of the operation mode on confirmation screen.

(4) Weekly timer

You can set four on timer and off timer operations for each day of the week.

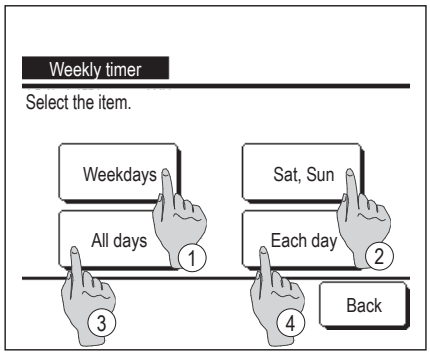
Advice

· The Clock setting must be made when the weekly timer is used.
· The weekly timer can be set from the main R/C only.

1 Tap the Menu button on the TOP screen and select Useful functions ⇒ Weekly timer.

Enter the administrator password if the administrator password input screen is displayed.

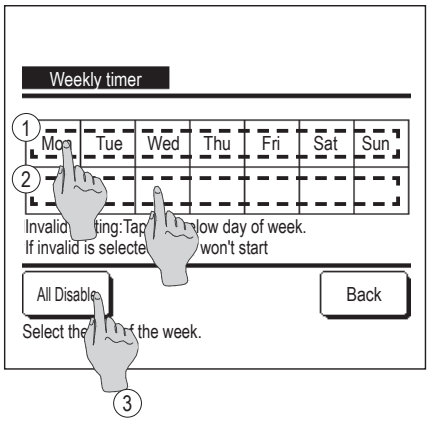
■There are cases that the Input password screen is displayed by the Permission/Prohibition setting.



2 When the screen to select the setting range, select a day of the week to be set.

① Weekdays : Monday - Friday
② Sat. Sun : Saturday, Sunday
③ All days : Monday - Sunday
(☞**5**)

④ Each day : Moves to the day of the week setting screen. (☞**3**)



3 When a desired day of the week ① is tapped on the display, contents of current setting for the day are displayed. (☞**5**)

4 For the holiday setting, tap the block ② under the day to switch between "⊘" (the holiday setting) and "(Blank)" (reset).

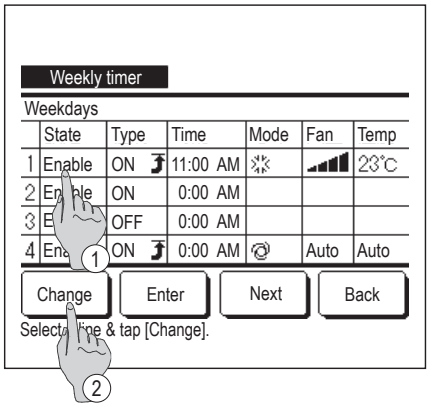
Timer does not operate on the day set as holiday.

Two or more holidays can be set.

■To enable the timer on the day set as holiday, it is necessary to reset the holiday setting.

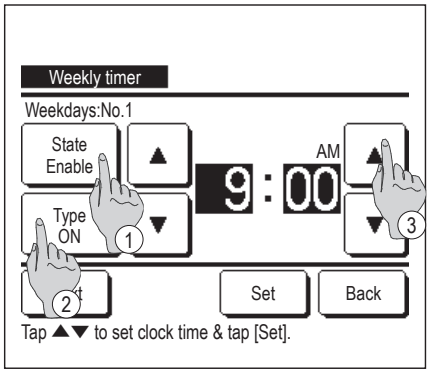
When tapping ③ "All Disable" button, the timer does not operate on all days of the week.

When the timer is used, be sure not to set "All Disable".



5 Screen to check contents of current setting is displayed.

When the contents are changed or new setting is added, select a ① setting line No. and tap the ② Change button.



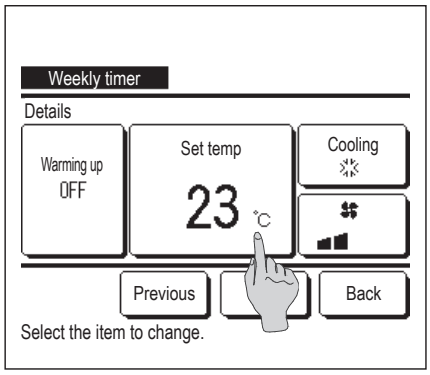
6 Detail setting screen for the timer setting contents is displayed.

① Tap the State button to switch between "State Enable" and "State Disable".

② Tap the Type button to switch between the "OFF timer" and the "ON timer".

③ Select a desired time (at 5-min intervals) with the ▲ ▼ buttons.

④ In case of "ON timer" when the Next button is tapped, operating conditions at the start of operation can be set. (☞**7**)



7 Set the following operating conditions.

① Warming up ON/OFF

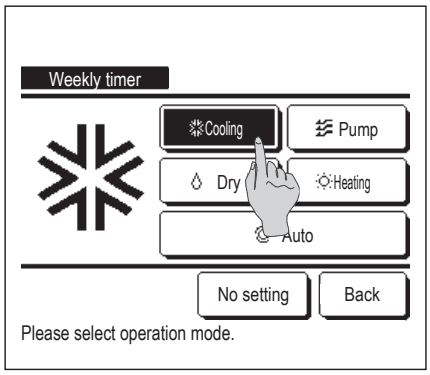
(Operation starts 5 to 60 minutes earlier in order to warm up the room temperature closed to the set temp at the set start time of operation.)

② Operation mode …☞**8**

③ Set temp …☞**9**

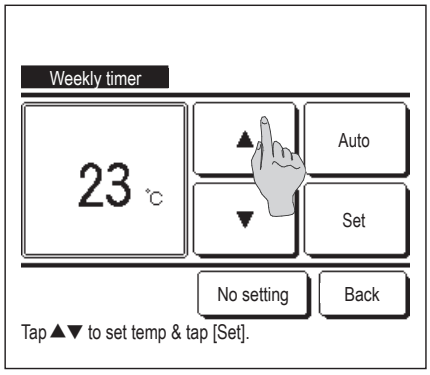
④ Fan speed …☞**10**

■Set the operation mode before setting the set temperature.



8 Tap a desired operation mode.

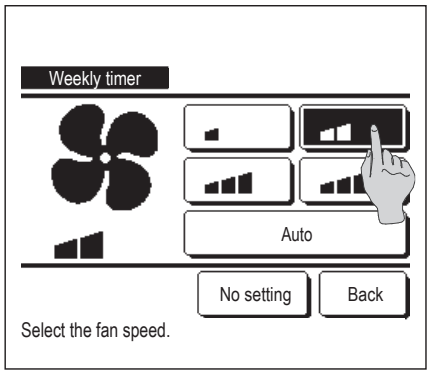
When the No setting button is tapped, it operates with the same operation mode at the last action. (☞**7**)



9 Select a desired temperature (at 1°C intervals) with the ▲ ▼ buttons. Or tap the Auto button to select the Auto temp setting.

Tap the Set button after the selection. (☞**7**)

When the No setting button is tapped, "--°C" is displayed, and it starts operation at the last setting temperature.

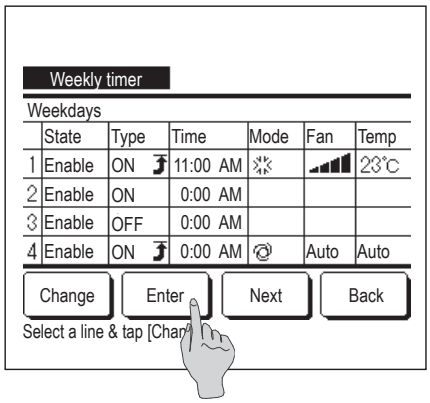


10 Tap a desired fan speed.

When the No setting button is tapped, starts operation at the last fan speed. (☞**7**)

(This function is not available for HMU.)

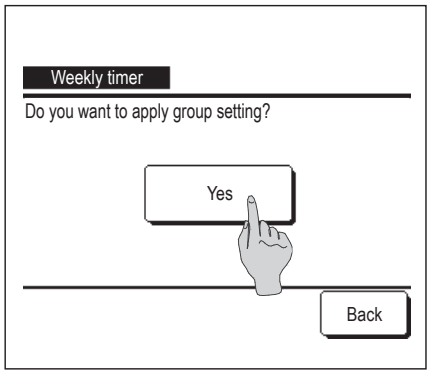
11 After setting desired contents at the screen of 7, tap the Set button.



12 Display the setting contents check screen. To register the setting, tap the Enter button.

(1) In case of group setting (2-①Weekdays, 2-②Sat/Sun, 2-③All days setting), move to the group setting screen. (☞**13**)

(2) In case of the individual setting (2-④Each day setting), save the setting and move to a day of the week selection screen. (☞**3**)



13 Display the group setting acknowledge screen. Tap the Yes button and save the setting.

The display changes to a day of the week setting check screen after saving. (☞**3**)

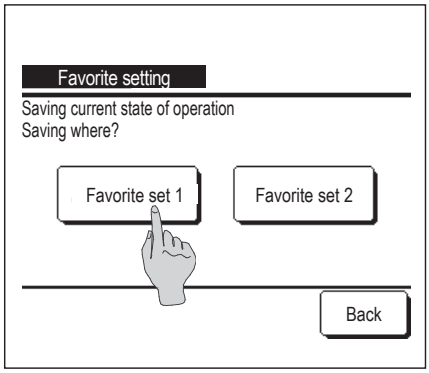
When making the setting after changing a day of the week, repeat the setting from the step **3**.

(5) Registering favorite settings

Operation mode, set temp, can be registered as Favorite set 1 and Favorite set 2.

Allocating these settings to the F1 and F2 switches allows you to perform operations with these registered settings with a single tap of the button.

Refer to the F1/F2 function setting on how to set the F1 and F2 switches.



1 On the TOP screen, set the desired operation mode, set temp.

Tap the Menu button on the TOP screen and select Useful functions ⇒ Favorite setting.

The administrator password input screen is displayed.

Enter the administrator password.

■You cannot register the favorite settings during high power and energy-saving operations.

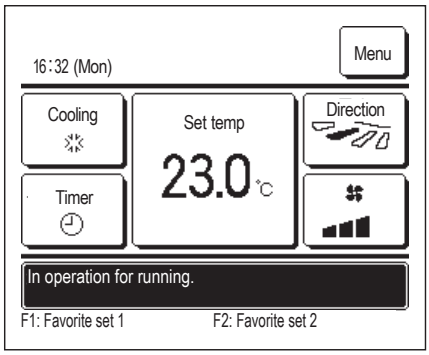
2 The save location selection screen for favorite settings is displayed.

Select the save location.

If there is any data that was previously saved, that data will be overwritten.

(6) Favorite setting operation

You can start an operation with the operation mode, set temp, registered to Favorite set 1 and Favorite set 2.
Settings for the operation mode, set temp, can be registered from Favorite setting on the menu.
Favorite setting operation must be set to the F1 or F2 switch.



1 When you press the F1 (F2) switch, the operation mode, set temp,registered to Favorite set 1 or Favorite set 2 will be enabled.

■Operation will start even if you press the F1 (F2) switch while the unit is stopped.

■You can change the operation mode, set temp, after the operation has started with the favorite setting operation.

■Following power on, the unit starts to operate initially with the following settings for both Favorite set 1 and Favorite set 2.

Operation mode ...Cooling

Set temp ...28°C

3D AUTO ...Disabled

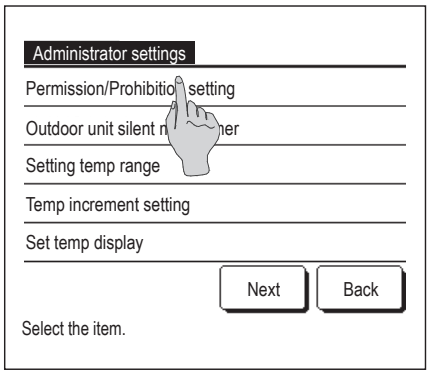
■When Change set temp, Change operation mode, are restricted by the Permission/Prohibition setting, restricted items will not be reflected to the Favorite setting operation.

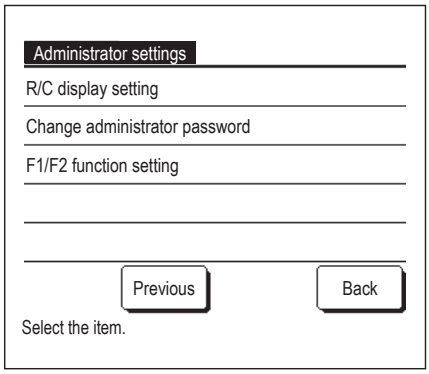
(7) Administrator settings [Administrator password]

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings.

The administrator password input screen is displayed.

Enter the administrator password.



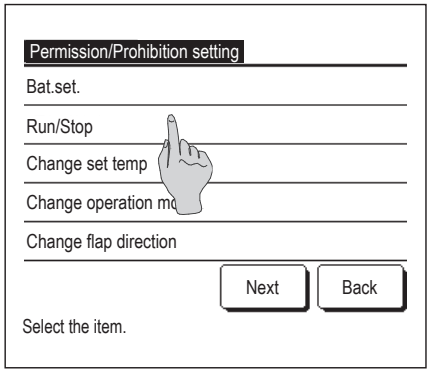


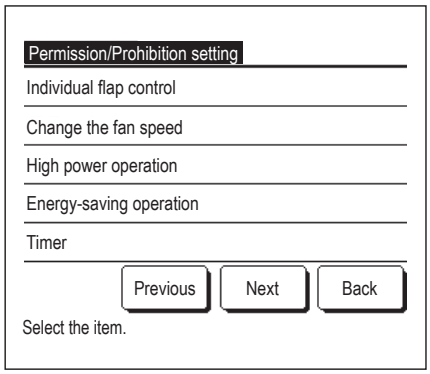
2 When the administrator setting menu is displayed, tap a desired item.

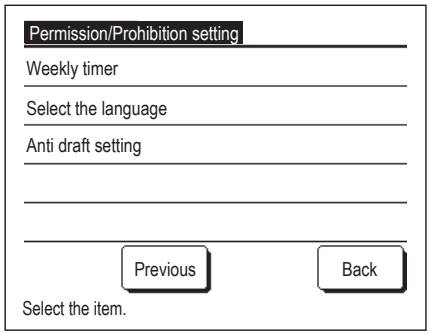
- Permission/Prohibition setting
- Outdoor unit silent mode timer
- Setting temp range
- Temp increment setting
- Set temp display
- R/C display setting
- Change administrator password
- F1/F2 function setting

■Permission/Prohibition setting

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ Permission/Prohibition setting. The Permission/Prohibition setting menu is displayed.







2 Following items can be selected, and the Permission or Prohibition can be set for them.

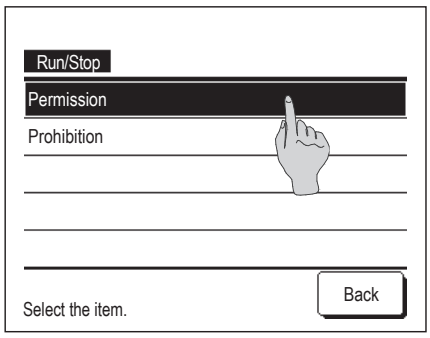
If the Permission is set, the operation is accepted.

If the Prohibition is set, the message “Invalid request” is displayed for 3 seconds.

Some items may require the administrator password.

■Operation with Prohibition setting

① Bat.set	.... Can set to permit/prohibit all items from ② to ⑬ at once.
② Run/Stop	... Run/Stop operation is prohibited.
③ Change set temp	... Change set temp operation is prohibited.
④ Change operation mode	... Change operation mode operation is prohibited.
⑤ Change flap direction	... Invalid for HMU mode.
⑥ Individual flap control	... Invalid for HMU mode.
⑦ Change the fan speed	... Invalid for HMU mode.
⑧ High power operation	... Invalid for HMU mode.
⑨ Energy-saving operation	... Invalid for HMU mode.
⑩ Timer	... Timer setting operation is prohibited.
⑪ Weekly timer	... Administrator password is required for these settings.
⑫ Select the language	... Administrator password is required for this selection.
⑬ Anti draft setting	... Invalid for HMU mode.



3 Tap [Permission] or [Prohibition] for each item.

■Outdoor unit silent mode timer

Set the period of time to operate the OU with prioritizing the quietness.

When the Outdoor unit silent mode timer setting is Enabled, the silent mode operation starts and ends every day at the same time until the setting is Disable.

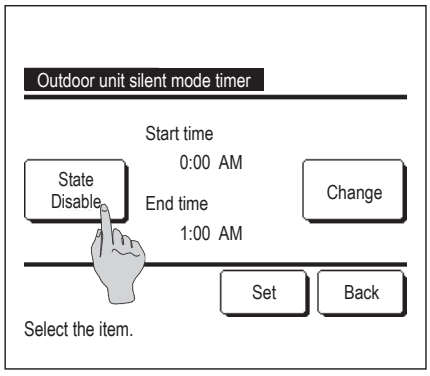
Silent mode operation can be started from an R/C operation without using the timer.

Use Silent mode cont. for the [F1] and [F2] switches.

Advice

· When the Outdoor unit silent mode timer is used, the Clock setting must be made.
· The Outdoor unit silent mode timer can be set from the main R/C only.
· The unit cannot be operated at the maximum capacity during the silent mode operation.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Administrator settings] ⇒ [Outdoor unit silent mode timer].



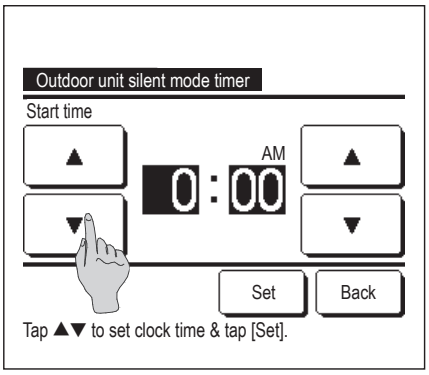
2 The Outdoor unit silent mode timer setting screen is displayed.

If it is OK that the Silent mode operation is performed at the start and end time displayed on the screen, tap the [State] button to select "State Enable".

■ When the [State] button indicates "State Disable", the Outdoor unit silent mode timer is not controlled.

After changing to a desired setting, tap the [Set] button.

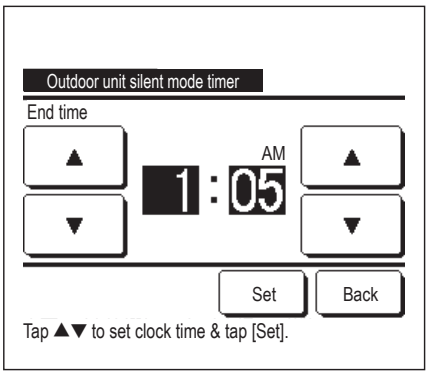
To change the start time or the end time, tap the [Change] button.



3 Set the start time for the Outdoor unit silent mode timer.

Select a desired time (at 5-min intervals) with the ▲ ▼ buttons.

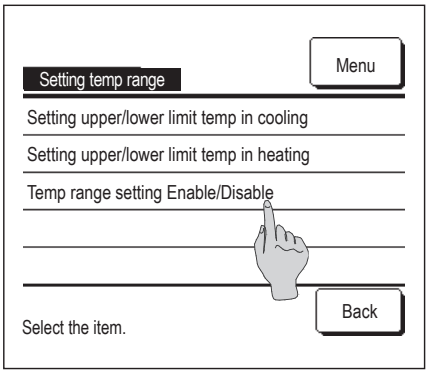
If the Set button is tapped after setting the start time, the display changes to the end time setting screen. Set a desired time (at 5-min intervals) for the end time and tap the Set button.



■Setting temp range

Limited range of setting temperature in the heating or the cooling operation can be selected.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ Setting temp range.

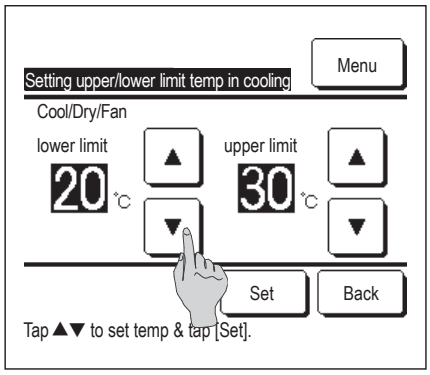


2 Setting temp range menu screen is displayed.

① Setting upper/lower limit temp in cooling (☞**2**)
... Set the range of setting temperature in the cooling operation. (Including the Dry and Auto operations)

② Setting upper/lower limit temp in heating (☞**3**)
... Set the range of setting temperature in the heating operation.

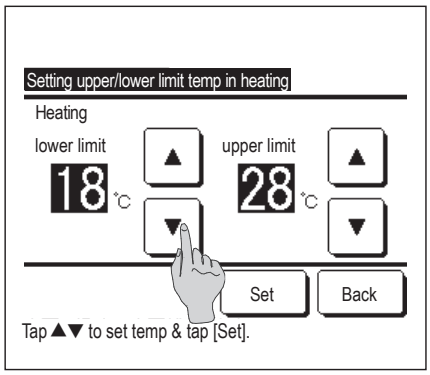
③ Temp range setting Enable/Disable (☞**4**)
... Set whether the limit on the setting temperature range is enabled or disabled.



3 Set the range of setting temperature in the cooling operation.

Select at desired lower and upper limit temperatures (at 1°C intervals) with the ▲ ▼ buttons.

After Selecting the desired settings, tap the Set button.



4 Set the range of setting temperature in the heating operation.

Select desired lower and upper limit temperatures (at 1°C intervals) with the ▲ ▼ buttons.

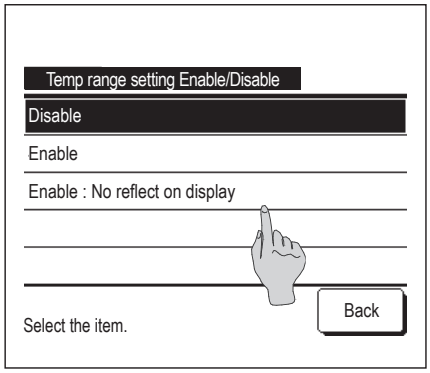
After selecting the desired settings, tap the Set button.

■Setting temperatures can be set in the following ranges.

	Lower limit value	Upper limit value
Cooling/Auto	7 *1 to 28°C	28 to 30°C
Heating	22°C *2	22 to 55°C

*1 : Do not set minimum temperature lower than 7°C. Even though it can be set down to 5°C.

*2 : Do not set minimum temperature lower than 22°C. Even though it can be set down to 15°C.



5 Select the control contents of restriction on the setting temperature range.

① Disable

... Restriction on the setting temperature range is disabled.

② Enable

... The operation is restricted within the set temperature range.

③ Enable: No reflect on display

... The set temperature on the R/C can be displayed beyond the set temperature range but actual operation is restricted within the set temperature range.

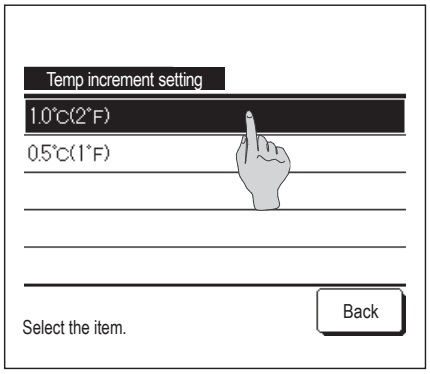
Advice

· Over-cooling during the cooling operation or over-heating during the heating operation is not economical.
· It is recommended to set the temperature range a little higher in the cooling operation or a little lower in the heating operation.

■Temp increment setting

Temperature increment for the change of the set temp can be changed.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ Temp increment setting.



2 The Temp increment setting screen is displayed.

Tap a desired temperature increment.

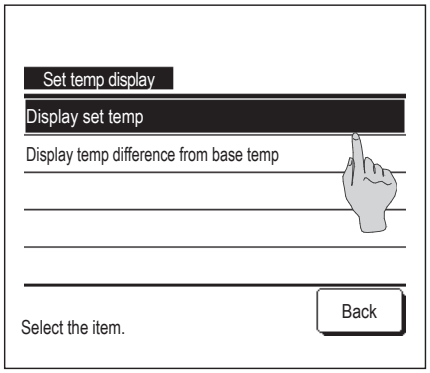
① 1.0°C..... Setting temperature can be set at 1.0°C intervals.
(ex. ⋯⇔ 24.0°C ⇔ 25.0°C ⇔ 26.0°C ⇔⋯)

② 0.5°C..... Setting temperature can be set at 0.5°C intervals.
(ex. ⋯⇔ 24.0°C ⇔ 24.5°C ⇔ 25.0°C ⇔⋯)

■Set temp display

Set temp displayed on the TOP screen can be changed.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ Set temp display.



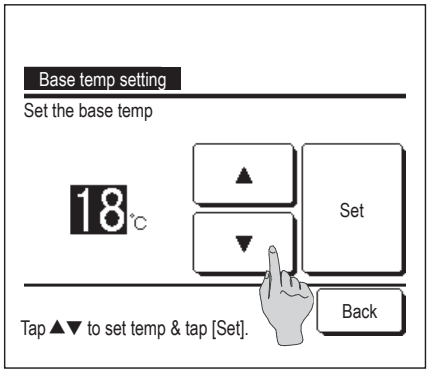
2 The Set temp display menu is displayed.

① Display set temp

... Set temp is displayed.

② Display temp difference from base temp

... The difference from the base temperature is displayed. When you select the Display temp difference from base temp, the Base temp setting screen is displayed (☞2).

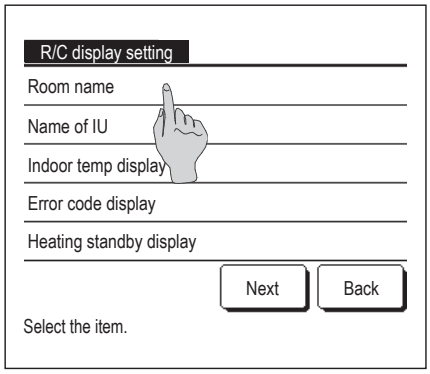


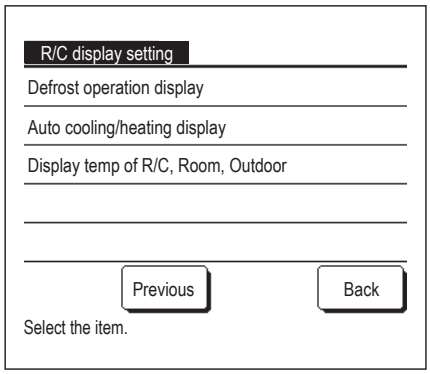
3 Set the base temperature.

■R/C display setting

Contents of display on the R/C can be changed.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting.





2 The R/C display setting menu screen is displayed.

① Room name

② Name of I/U

③ Indoor temp display

④ Error code display

⑤ Heating standby display

⑥ Defrost operation display

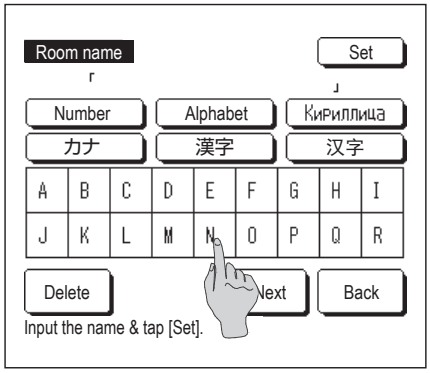
⑦ Auto cooling/heating display

⑧ Display temp of R/C, Room, Outdoor

① Room name

Set the room name to be displayed on the TOP screen.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Room name.



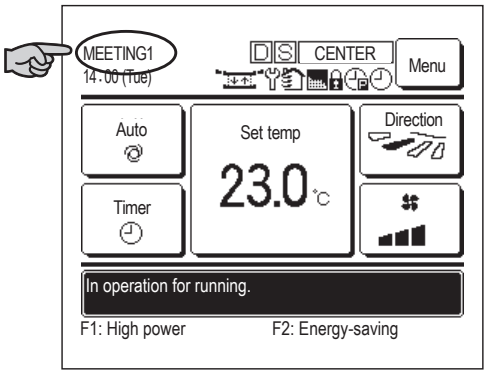
2 The Room name input screen is displayed.

The room name can be set with up to 9 2-byte letters (18 1-byte letters).

You can enter alphanumeric, Japanese Kana, Kanji, Cyrillic, or Chinese characters.

Tap the Previous or Next button to display next character group.

When you have finished inputting the room name, tap Set.

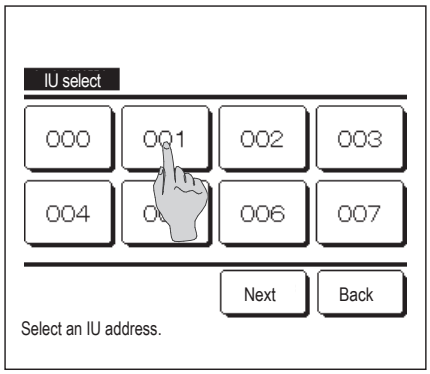


The room name is displayed on the TOP screen.

② Name of IU

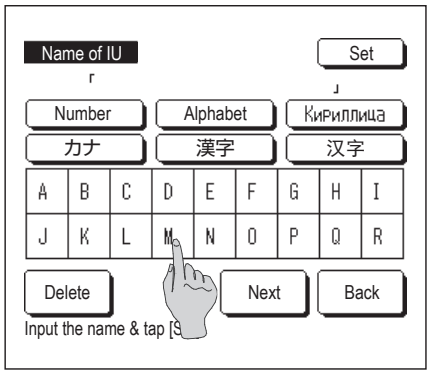
Set the name of IU to be added to the IU address button.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Name of IU.



2 The IU select screen is displayed.

When two or more IUs are connected to the R/C, a list of IUs is displayed. Tap the button for the IU (address number) to set the name.



3 When the letter selection screen is displayed same as at the setting of the name of R/C, enter letters.

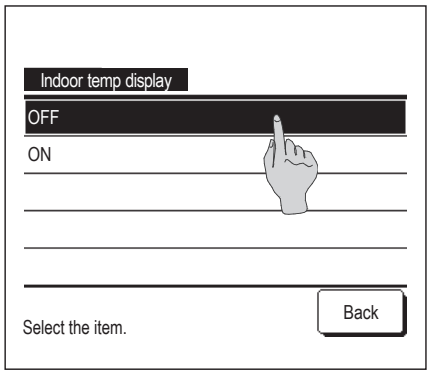
The name of IU can be entered up to 4 2-byte (8 1-byte) letters.

When the input is over, tap the Set button. The text “The registration is completed.” is displayed, and the settings are completed.

③ Indoor temp. display

Select ON/OFF for the room temperature display.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Indoor temp display.

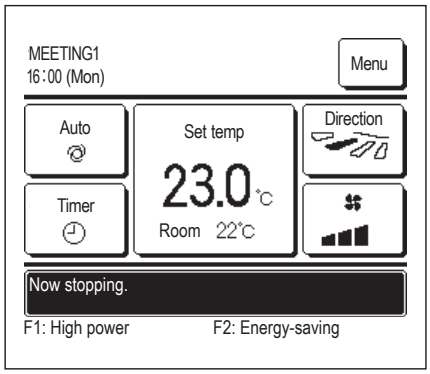


2 The Indoor temp display screen is displayed.

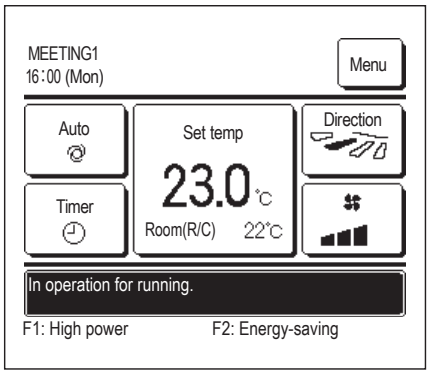
On the Indoor temp display screen, select ON/OFF of the display. When R/C sensor setting is enabled, the room temperature (R/C) is displayed (refer to the installation manual on how to make these settings).

OFF … Room temperature is not displayed on the TOP screen.

ON … Room temperature is displayed on the TOP screen.



When R/C sensor setting is disabled, the room temperature ○ °C is displayed.

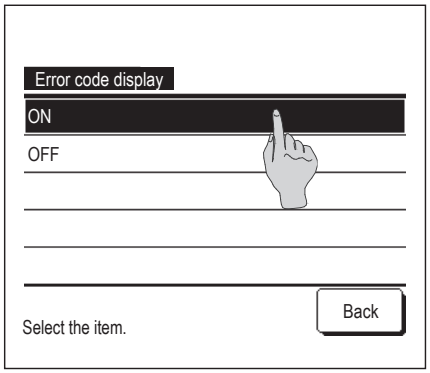


When R/C sensor setting is enabled, the room temperature (R/C) ○ °C is displayed (refer to the installation manual on how to make these settings).

④ Error code display

Select ON/OFF for the Error code display.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Error code display.



2 The Error code display screen is displayed.

On the Error code display selection screen, select ON/OFF of the display.

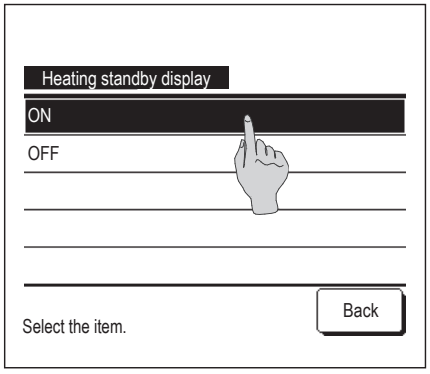
ON ... When there is any error on the unit, the message "Prot.stp.ON E○ Touch here for contact. History can be checked from Menu." is displayed on the TOP screen message display.

OFF ... The message is not displayed even if there is any error.

⑤ Heating standby display

Select ON/OFF for the Heating standby display.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Heating standby display.



2 The Heating standby display selection screen is displayed.

On the Heating standby display selection screen, select ON/OFF of the display.

The heating standby control is operated to prevent blowing of cold air at the start of heating operation.

ON … The message "Heating standby" is displayed during the heating standby control.

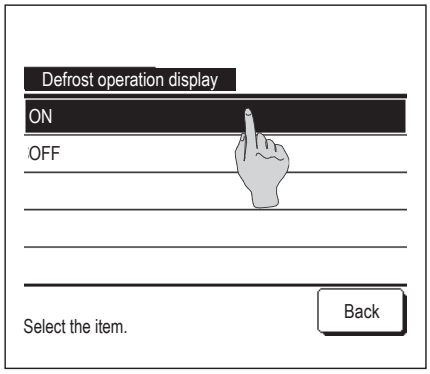
OFF … The message "Heating standby" is not displayed.

(This function is not available for HMU.)

⑥ Defrost operation display

When frost on the OU heat exchanger is accumulated and the starting conditions of defrost operation are satisfied, the defrost operation control is performed automatically. Select ON/OFF for the Defrost operation display.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Administrator settings] ⇒ [R/C display setting] ⇒ [Defrost operation display].



2 The Defrost operation display selection screen is displayed.

On the Defrost operation display selection screen, select ON/OFF of the display. The heating standby control is operated to prevent blowing of cold air at the start of a heating operation.

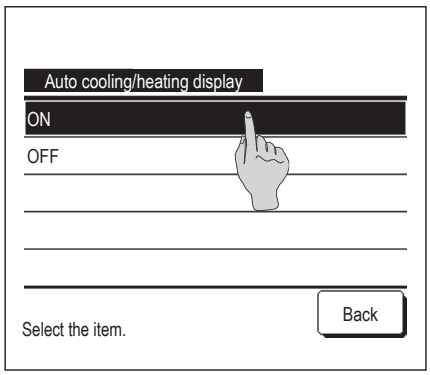
ON … The message “Defrost operation” is displayed during the defrost operation.

OFF … The message “Defrost operation” is not displayed.

⑦ Auto cooling/heating display

Select ON/OFF for the display of the Auto cooling or heating.

1 Tap the [Menu] button on the TOP screen and select [User setting] ⇒ [Administrator settings] ⇒ [R/C display setting] ⇒ [Auto cooling/heating display].



2 The Auto cooling/heating display selection screen is displayed.

On the Auto cooling/heating display selection screen, select ON/OFF of the display.

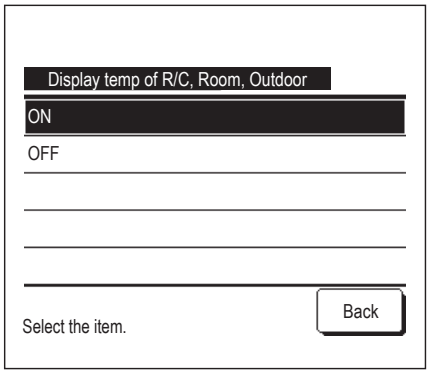
ON … The message “Auto Cooling” or “Auto Heating” is displayed on the “Change operation mode” button at the TOP screen during the auto mode operation.

OFF … The message “Auto” is displayed on the “Change operation mode” button at the TOP screen.

⑧ Display temp of R/C, Room, Outdoor

Select ON/OFF for the display of the R/C sensor temperature, room temperature and outdoor temperature.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ R/C display setting ⇒ Display temp of R/C, Room, Outdoor.



2 The Display temp of R/C, Room, Outdoor selection screen is displayed.

On the Display temp of R/C, Room, Outdoor selection screen, select ON/OFF of the display.

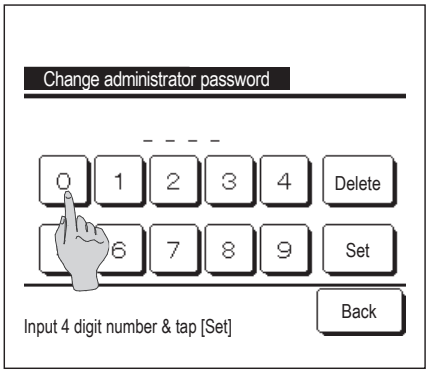
ON … Each temperature is displayed on the TOP screen.

OFF … These temperatures are not displayed on the TOP screen.

■Change administrator password

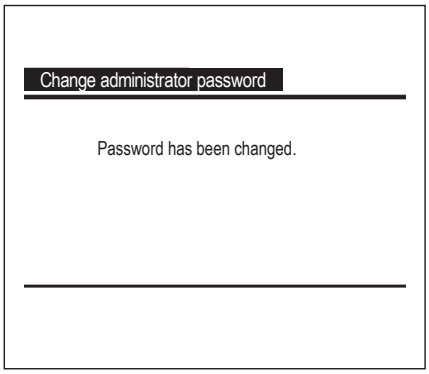
Administrator password can be changed.

1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ Change administrator password.



2 The Change administrator password screen is displayed.

Enter the password (4-digit number) and tap the Set button.

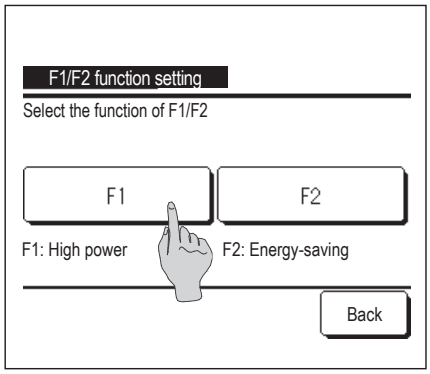


3 The password change confirmation screen is displayed for 3 seconds, and the display returns to the administrator settings menu screen.

■F1/F2 function setting

Use the F1 and F2 switches to change the functions to operate.

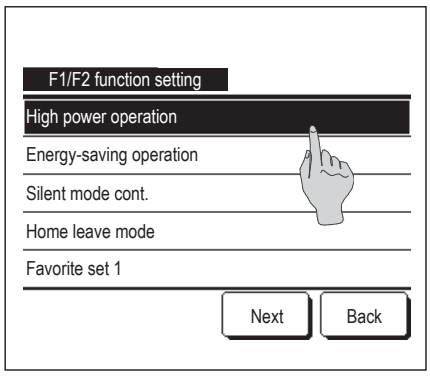
1 Tap the Menu button on the TOP screen and select User setting ⇒ Administrator settings ⇒ F1/F2 function setting.



2 The F1/F2 function setting screen is displayed.

On the F1/F2 function setting screen, tap the side (F1 or F2 switch) you desire to change.

The currently set functions are displayed below the buttons.



3 Select the function to set to the F1 or F2 switch.

The following functions can be selected.

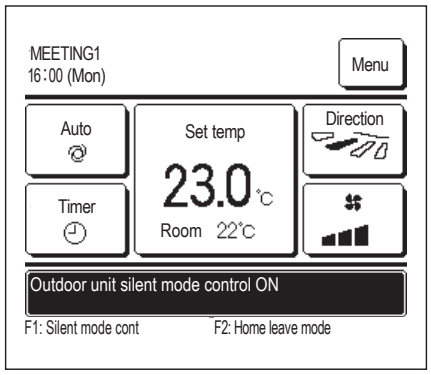
- High power operation*
- Energy-saving operation*
- Silent mode control
- Home leave mode*
- Favorite setting operation
- Filter sign reset

* Invalid for HMU mode

(8) Silent mode control

The OU is controlled with priority on quietness. You can start/stop the silent mode control with a single tap of a button. Silent mode control must be set to the F1 or F2 switch. Use the Outdoor unit silent mode timer to set the start and end time.

1 When you press the F1 (F2) switch, the administrator password input screen is displayed.
After you enter the password, the silent mode control will start.



2 During silent mode control, “Outdoor unit silent mode control ON” will be displayed on the message display.

3 When you press the F1 (F2) switch during silent mode control, the display changes to the administrator password input screen. After you enter the password, the silent mode control will terminate.

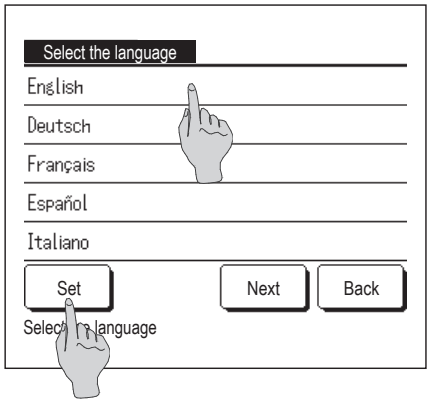
- Silent mode control will not be disabled even if you press the Run/Stop switch.
  Terminate the control with the F1 (F2) switch.
- This operation is to select enable/disable of silent mode control. You cannot start the operation with the F1 (F2) switches.
  Start the operation with the Run/Stop switch.
- When the sub R/C is set, the silent mode control cannot be used.
- During silent mode control, operation with maximum capacity is not allowed.

(9) Select the language

Select the language to be displayed on the R/C.

1 Tap the [Menu] button on the TOP screen and select [Useful functions] ⇒ [Select the language].

■Depending on how the Permission/Prohibition setting is set, the administrator password input screen may be displayed.



2 The menu for select the language is displayed.

Select the language to be displayed on the R/C and tap the [Set] button.

You can select from the following languages:

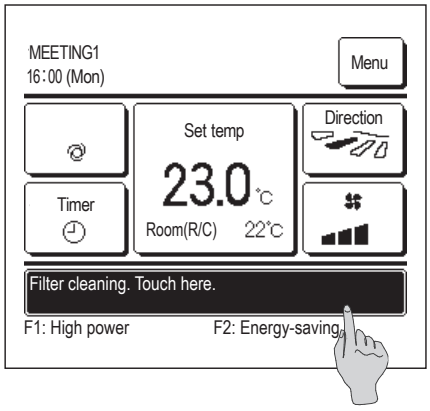
English/German/French/Spanish/Italian/

Dutch/Turkish/Portugal/Russian/

Polish

(10) Filter sign reset

In order to announce the time for cleaning of the air filter, the message of “Filter cleaning. Touch here.” is displayed when the cumulative operation time of the IU reaches the preset time. After you clean the filter, you must reset the operation time.



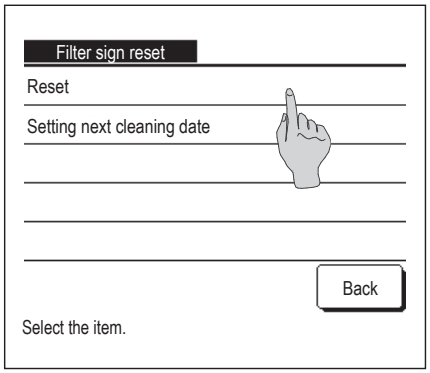
1 Tap the message display on the TOP screen.

You can also perform filter sign reset from the menu before the message “Filter cleaning. Touch here.” is displayed.

Tap the [Menu] button on the TOP screen and select [Filter] ⇒ [Filter sign reset].

You can also use the [F1] and [F2] switches to perform this operation.

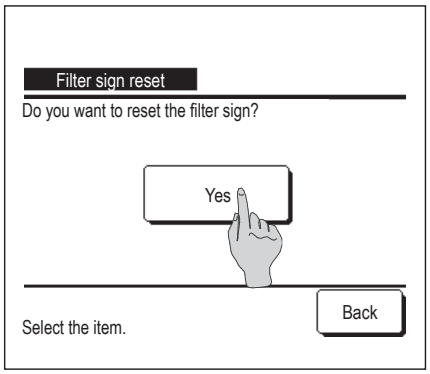
Set the filter sign reset to the [F1] ([F2]) switch using the Switch function (☞page 105) to perform this operation.



2 The filter sign reset menu screen is displayed.

To reset the filter sign, tap Reset **. (**☞**3)**

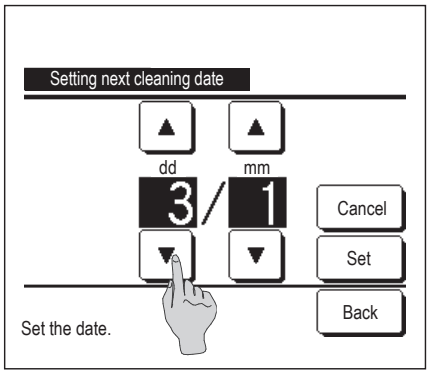
To set next cleaning date, tap Setting next cleaning date. (☞**4**)



3 Acknowledge screen for the Filter sign reset screen is displayed.

Tap the Yes button.

If you do not want to reset, tap the Back button.



4 The Setting next cleaning date screen is displayed.

Select a desired date with the ▲ ▼ buttons and tap the Set button.

The message of “Filter cleaning. Touch here.” will be displayed on the set date.

Advice

· When setting next cleaning date, the Clock setting must be made.

12.2.5 Maintenance of unit and LCD

■Wipe the surface of LCD and main body of the remote control with a dry cloth when cleaning is required.

■If the dirt on the surface cannot be removed, soak the cloth in neutral detergent diluted with water, squeeze the cloth tightly, and clean the surface. Wipe the surface with a dry cloth then.

Note

Do not use any paint thinner, organic solvent, or strong acid.

⚠Warning

Do not use flammable materials (e.g. hairspray or insecticide) near the unit.

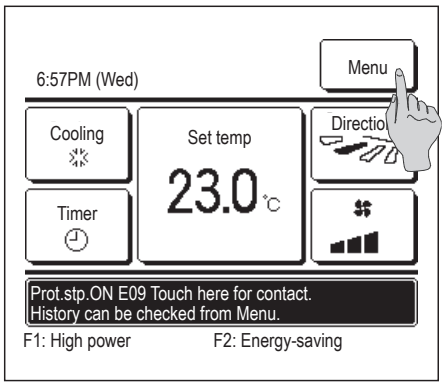
Do not clean the unit with benzene or paint thinner.

It could cause crack damage to the unit, electric shocks, or fire.

12.2.6 Useful information

■Contact company & Error display

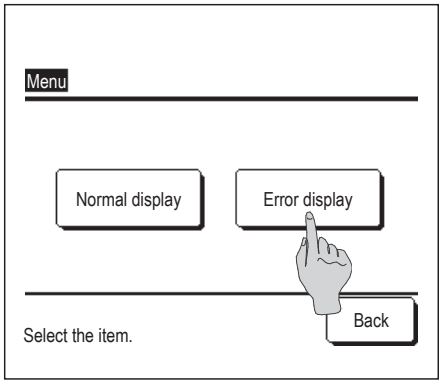
If any error occurs on the unit, the “Unit protection stop” is indicated on the message display. Take the following measures, stop the operation and consult your dealer.

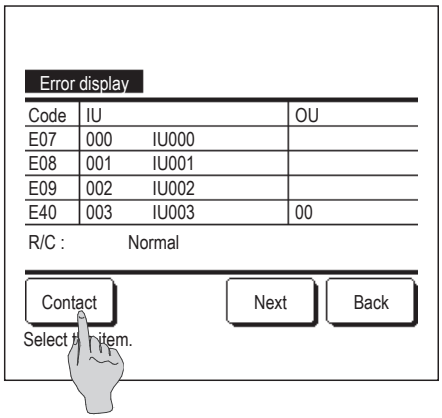


1 The “Unit protection stop” is displayed on the message display.

Tap the Menu button.

When the Normal display and Error display button is displayed, tap the Error display button.

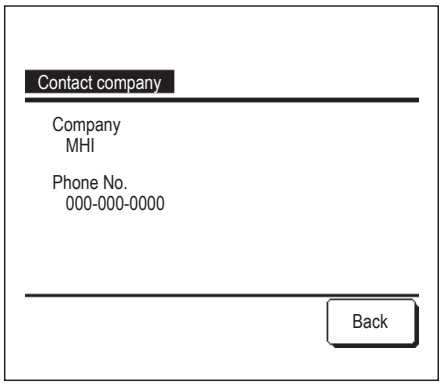




2 Contents of error are displayed.

After checking the error contents (Code), tap the Contact button.

Or tap the Normal display button on the previous screen and select the “Contact company” on the menu screen and tap it.

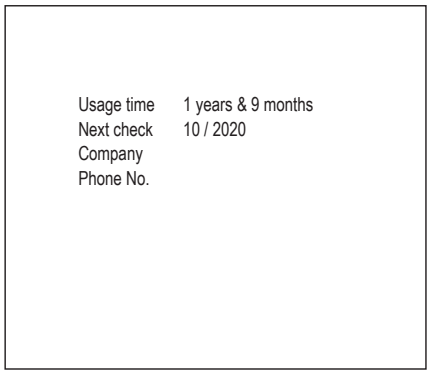


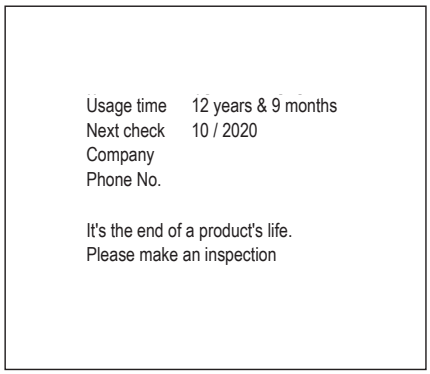
3 Company information (Name and phone No. of contact) is displayed.

This is displayed when it has been preset by your dealer.

12.2.7 Notice of inspection date

If the next service date is set on the Service & Maintenance menu by your dealer, the following screen is displayed for 5 seconds at the start of operation and for 20 seconds from the end of operation on the beginning of the month which includes the set date.
When this screen is displayed, contact your dealer.



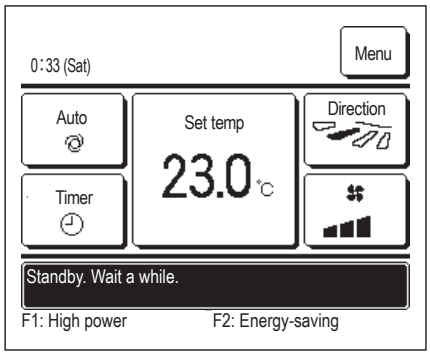


When the period of use exceeds 10 years, the screen shown at left is displayed.
When this screen is displayed, contact your dealer.

12.2.8 Message display

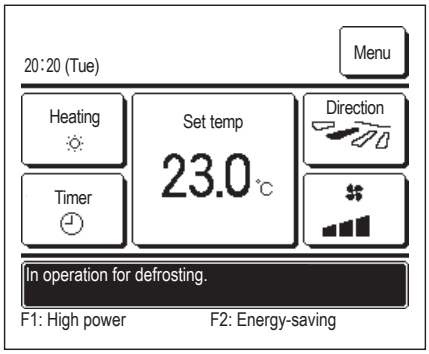
During operation, the following messages will be displayed on the message display to notify the current condition of the unit.

■“Standby. Wait a while.” displayed



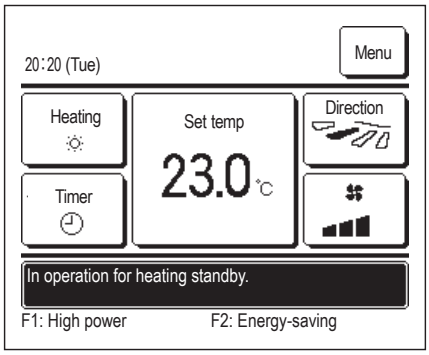
The message “Standby. Wait a while.” may be displayed (maximum of 30 minutes) on the R/C during the first operation following a breaker power on or power loss.
This does not indicate a failure; it is caused by the cooling machine oil protect control that is activated in order to protect the compressor.
Please wait until the message “Standby. Wait a while.” disappears.

■"In operation for defrosting." display



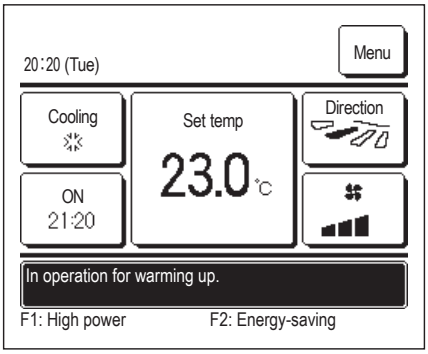
When frost forms on the OU, the heating performance will decrease. This will cause the unit to automatically switch to defrost operation, and hot air will stop blowing out from the IO.
The message "In operation for defrosting." will be displayed on the message display. After the defrost operation has completed, "In operation for defrosting." will disappear, and the unit will switch back to its normal heating operation.

■"In operation for heating standby." displayed



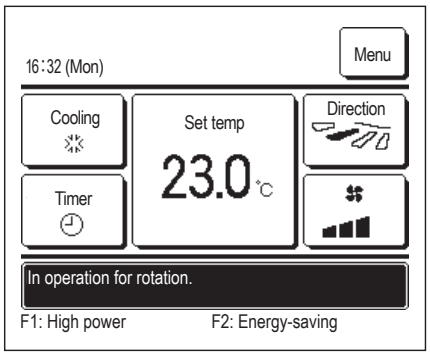
To prevent any cold air blowing out from the IO at the start of a heating operation, the unit stops the fan and displays "In operation for heating standby." on the message display.
When the unit is ready to blow out hot air, the message "In operation for heating standby." disappears, and the unit will start heating operation.
(This function is not available for HMU.)

■"In operation for warming up." display



When you select to enable warming up by the Set ON timer by hour or Set ON timer by clock, the operation will start 50 to 60 minutes earlier, which is predicted based on the previous warm up operation, so that the room will be close to the set temp by the time it reaches the operation start time.
During the warm up operation, the message "In operation for warming up." will be displayed on the message display.
This message will disappear at the time set for operation start.

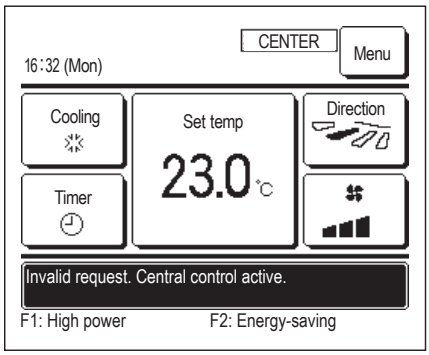
■"In operation for rotation.", "In operation for capacity back-up", "In operation for fault back-up" displays



When rotation, capacity back-up, or fault back-up operation is enabled during installation, a message indicating the operation that is set and running will be displayed on the message display.
Refer to the installation manual on how to make these settings.
(This fanction of operation for capacity back-up is not available for HMU.)

■"Invalid request. Central control active." display

When the unit is controlled through a central control device (not included), and you performed an operation other than the followings, the message "Invalid request. Central control active." is displayed.

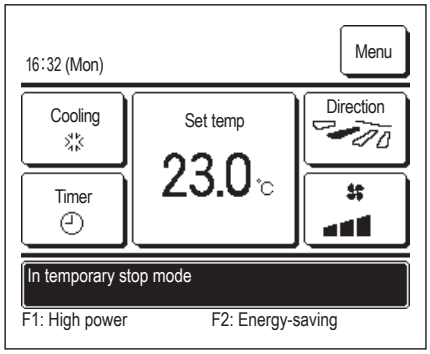


This does not indicate a failure; the message indicates that the unit is controlled through a central control device.

[Operations allowed during central control]

- Filter sign reset
- Administrator settings

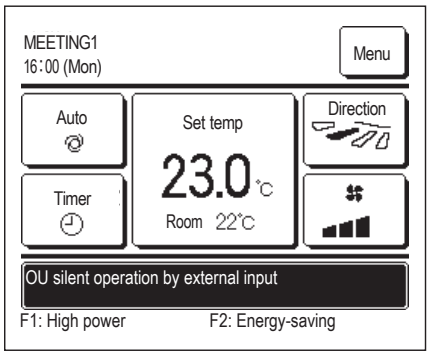
■"In temporary stop mode", "In forced thermostat OFF", "In setting temperature shift" displays



These messages will be displayed when the unit is operated through IO external input.
This does not indicate a failure; the message indicates that the unit is operated through IO external input.

■“OU silent operation by external input” display

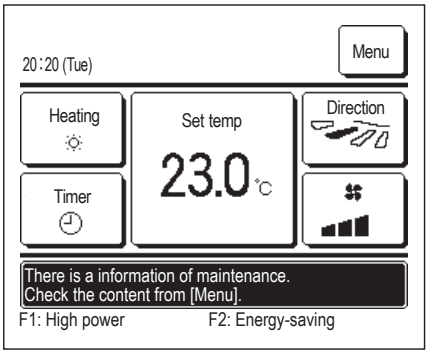
The message “OU silent operation by external input” will be displayed when silent mode control is operated through a central control device (not included) or an IO external input (not included).



When “OU silent operation by external input” is displayed, the operation performed will be the same as the silent mode control performed from the R/C.

During silent mode control, operation with maximum capacity is not allowed.

■“There is a information of maintenance. Check the content from [Menu].” display

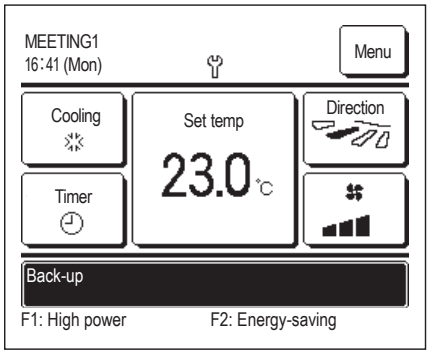


To notify any maintenance information related to the product, the message “There is a information of maintenance. Check the content from [Menu].” may be displayed in the message display.
When this message is displayed, tap the Menu button. The maintenance description will be displayed.

Contact the dealer/company shown as the Contact company and notify the details (code) of required maintenance.

■“Back-up” display

When any error occurs on the OU but its operation is continued as an emergency measure, the message of “Back-up” will be displayed.



When the “Back-up” is displayed, contact dealer/company shown as the Contact company immediately for checking.

■If the operation is continued without checking, it could result in breakdown.

12.2.9 After-sale service

● Inform your dealer

●Model name ●Date of installation ●Failure conditions: As precise as possible. ●Your address, name, and telephone number

● Moving

The moving of the unit requires special technology. Consult your dealer.

Necessary expenses for the moving of the unit will be charged.

● Repairs after Warranty Period

Consult your dealer. Fare-paying services may be possible at the request of customer.

(The warranty period is one year counting from the date of installation.)

● Inquiry about After-sale Service

Contact your dealer or the service contact.

13. MICROCOMPUTER OPERATION CONTROL FUNCTION

13.1 Remote control

13.1.1. Power on and initial setting

Set the main and sub R/C units according to the display at the power on.

・Main/Sub setting not performed => (1)

・Main/Sub setting performed => (2)

(1) **When the main and sub are not yet set,**

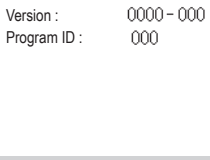
①⇒② Main/sub input screen is displayed.

When tapping the Main or Sub button, initial setting starts.

If any wrong button has been tapped by mistake, the setting can be changed after the end of the initializing operation. (5.1.3. R/C function setting④)

When using two remote controllers for one IU or one group, if the first one is set for the Main, the second is set for the Sub automatically.

① Start screen



② Main/sub set input

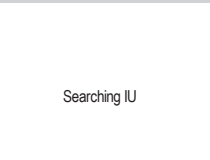
Main The screen changes to ③⇒④⇒⑤.

Sub The screen changes to ①⇒⑧⇒⑤.

Caution

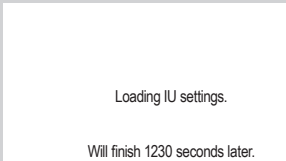
When only one unit of R/C is used, tap the Main button.
In the state of initial setting, if either one of buttons ([Main]/[Sub]) is not tapped, it keeps the screen unchanged.

③ IU search on

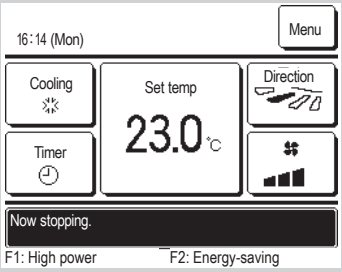


The red LED will blink if communication is not established in ten minutes.

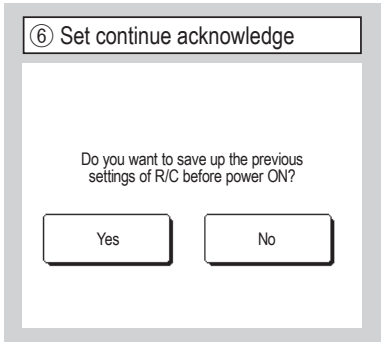
④ IU info acquisition on



⑤ TOP screen

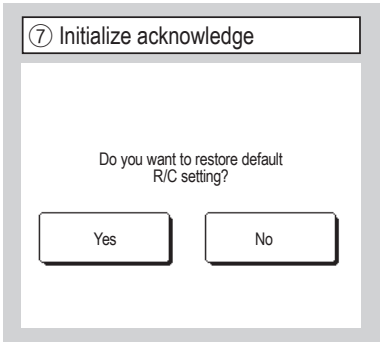


(2) **When the main and sub are set**



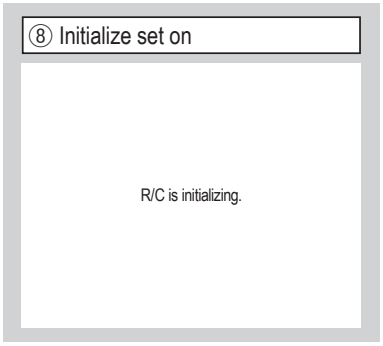
Yes The screen changes to ⑧⇒⑤.
No The screen changes to ⑦.

If the screen is not tapped for more than 15 seconds, the Yes (Continue) is selected and the display changes to the screen of ⑤.



Yes The screen changes to ①⇒②.
No The screen changes to ⑥.

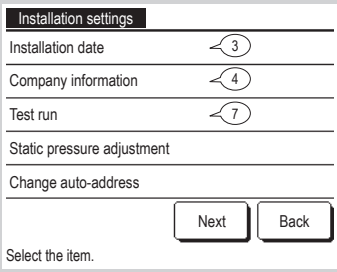
After the initializing, it returns to the default state.



13.1.2. Installation settings and test run

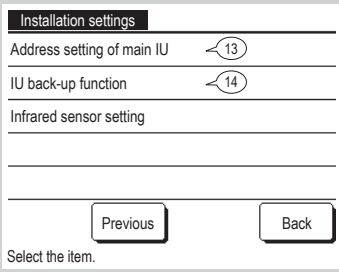
TOP screen [Menu] ⇒ [Service setting] ⇒ [Installation settings] ⇒ [Service password]

① Installation settings menu #1



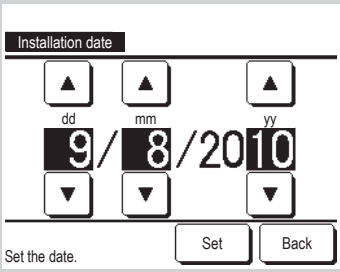
The selected screen is displayed.

② Installation settings menu #2



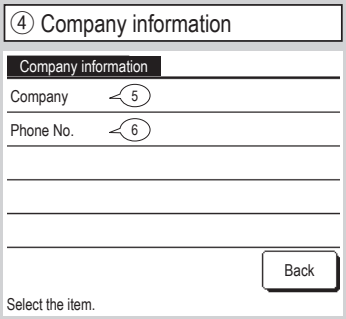
The selected screen is displayed.

③ Installation date



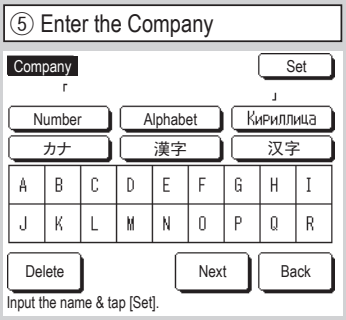
Select the date with [▲] [▼] buttons, and tap the [Set] button.

④ Company information



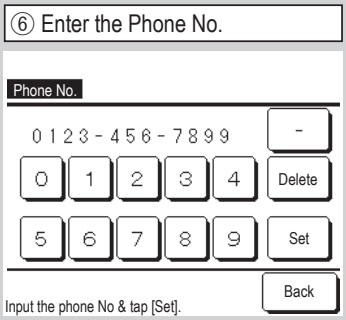
Enter the company information.

⑤ Enter the Company



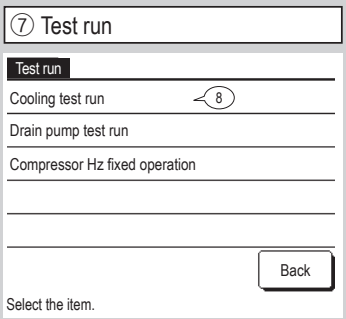
Enter the company name using up to 26 one-byte characters and then tap the [Set] button. You can enter alphanumeric, Japanese Kana, Kanji, Cyrillic, or Chinese characters.

⑥ Enter the Phone No.



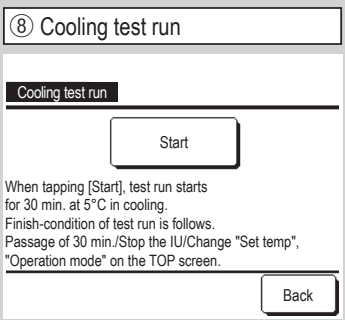
Enter the phone number of the company using up to 13 characters and then tap the [Set] button.

⑦ Test run

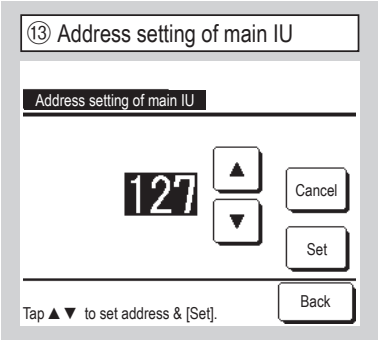


The selected screen is displayed.

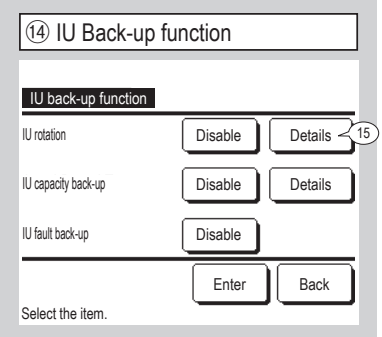
⑧ Cooling test run



This can be operated while cooling is stopped. When the room temperature is too low to start the cooling test run, it operates for 30 minutes by decreasing the set temperature to 7°C.



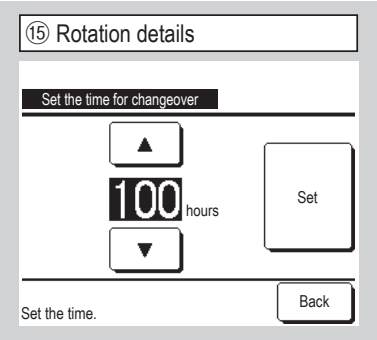
In case of Multi series (KX) models, it is possible to let indoor units (Sub IUs) follow the operation mode (Heating, cooling) of the indoor unit (Main IU). Set the address of the Main IU to the Sub IUs The Sub IUs to which the Main IU address is set follow the Main IU settings.



In case of 2 sets of indoor units (2 groups) connected to one R/C, it is available to perform back-up operation with them.

1. IU rotation: Operate 2 sets of indoor units alternately at every set time of operation interval.
2. IU capacity back-up: When the temp difference between the set temp and the actual room temp is higher than the set temp diff., 2 sets of indoor units operate.
3. IU fault back-up: If one of the IU has a fault and stops, the other one starts operation.

Select [Enable]/[Disable] (tapping [Disable] changes to [Enable]) and tap the [Enter] button to confirm the settings.



In IU rotation function, the timer to changeover the operation of 2 indoor units is set.
The timer can be set within the range of 10 to 990 hours in increments of ten hours.
After the time is changed, tap [Set] for temporary setting.
After temporary setting, return to the IU Back-up function screen and tap [Enter].

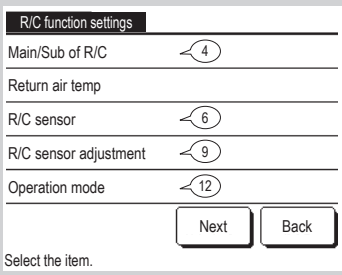
Back-up control restrictions

1. The back-up control is unavailable when the operation mode is "Auto". When the back-up control is set for the unit that specifies "Auto" for the operation mode, the operation mode changes to "Cooling" automatically.
2. When the rotation control is set, the fault back-up control will be enabled automatically. In this case, the fault back-up control cannot be disabled alone. When the rotation operation is disabled, the fault back-up control will also be disabled.
3. When the capacity back-up control is set, the fault back-up control will be enabled automatically. In this case, the fault back-up control cannot be disabled alone. When the capacity back-up control is disabled, the fault back-up control will also be disabled.
4. It is also possible to enable the fault back-up control alone.
5. The home leave mode, warming up and external input cannot be set together with the back-up control.
6. While the rotation or fault back-up control is set, either of the two target indoor units (two groups) will operate. Both units will not operate at the same time.
7. An indoor unit having younger address will start the operation first in each control.

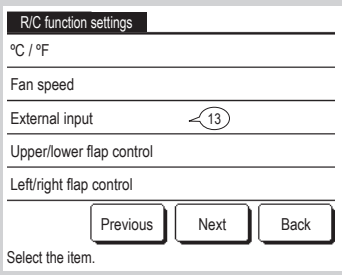
13.1.3. R/C function settings **Advice: It is valid when unit stops.**

TOP screen [Menu] ⇒ [Service setting] ⇒ [R/C function settings] ⇒ [Service password]

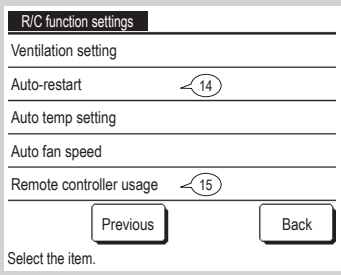
① R/C function settings menu #1



② R/C function settings menu #2

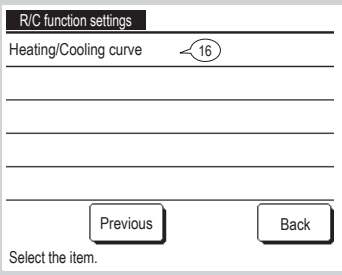


③ R/C function settings menu #3

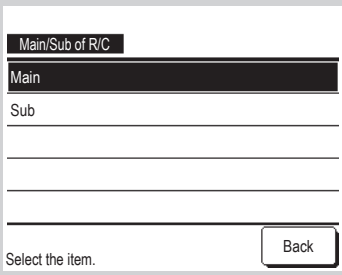


The selected screen is displayed.

④ R/C function settings menu #4

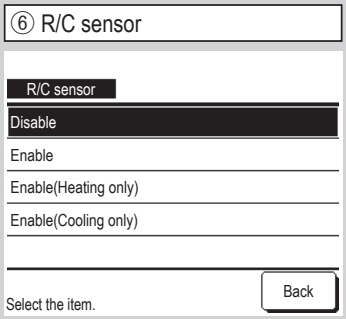


⑤ Main/Sub of R/C



Use this when changing the Main/Sub setting of R/C.

⑥ R/C sensor



You can change IU main unit return air temperature sensor to the R/C side.

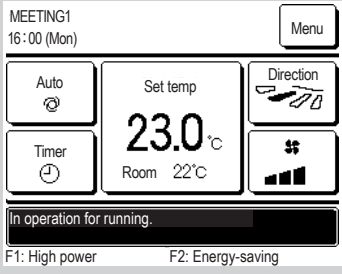
[Disable] The Indoor temp display changes to the temperature measured by the sensor at the main unit. ⇒ ⑦

[Enable] The Indoor temp display changes to the temperature measured by the R/C side sensor. ⇒ ⑧

[Enable(Heating only)] The Indoor temp display changes to the temperature measured by the R/C side sensor during heating only.

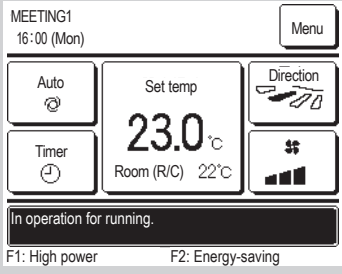
[Enable(Cooling only)] The Indoor temp display changes to the temperature measured by the R/C side sensor during cooling only.

⑦ TOP screen (sensor at main unit)



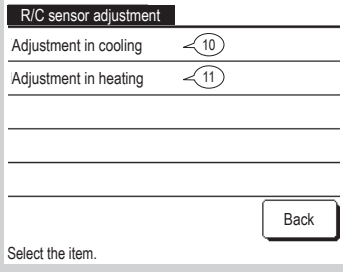
When the R/C sensor is disabled, the TOP screen displays "Room ○ °C".

⑧ TOP screen (sensor at R/C)



When the R/C sensor is enabled, the TOP screen displays "Room (R/C) ○ °C".

⑨ R/C sensor adjustment

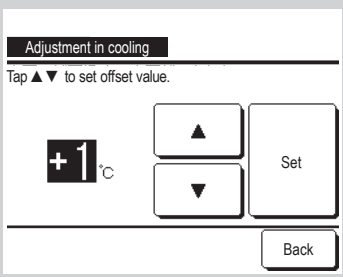


You can adjust the R/C sensor detection temperature.

[Adjustment in cooling] ⇒ ⑩

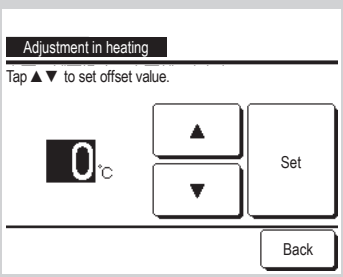
[Adjustment in heating] ⇒ ⑪

⑩ Adjustment in cooling



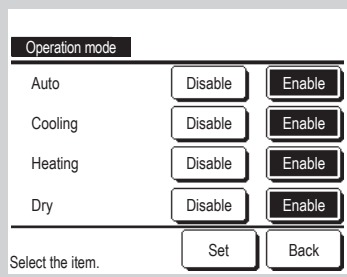
The R/C sensor detection temperature during cooling operation can be corrected. Set the value within the range of -3 to +3.

⑪ Adjustment in heating



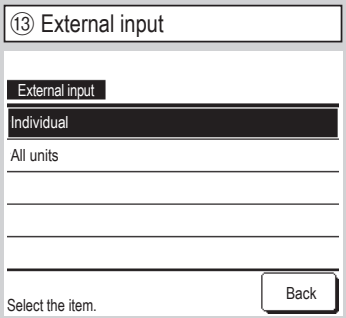
The R/C sensor detection temperature during heating operation can be corrected. Set the value within the range of -3 to +3.

⑫ Operation mode



Enable or Disable can be set for each operation mode.
If the cooling or heating is disabled, the auto is also disabled.

⑬ External input

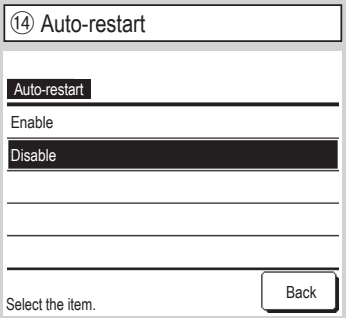


Set the range to apply the external input received through CnT of either one IU to plural indoor units connected in one system

Individual This is applied only to the IU receiving CnT input.

All units This is applied to all indoor units connected.

⑭ Auto-restart

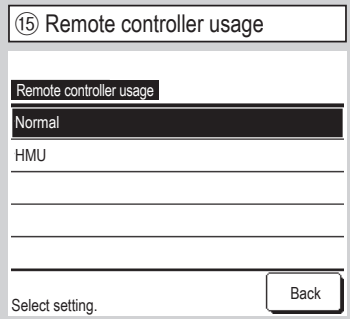


If the unit stops during operation,

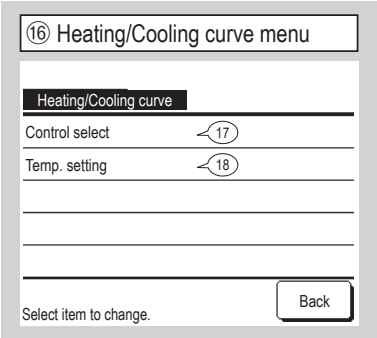
Enable It returns to the state before the power failure as soon as the power source is restored (After the end of the primary control at the power on).

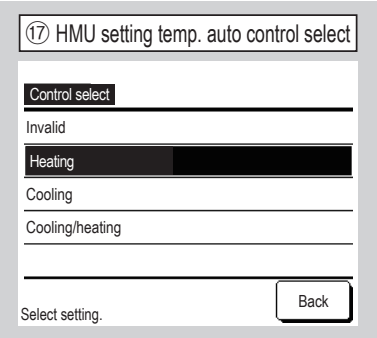
Disable It stops after the restoration of power source.

⑮ Remote controller usage

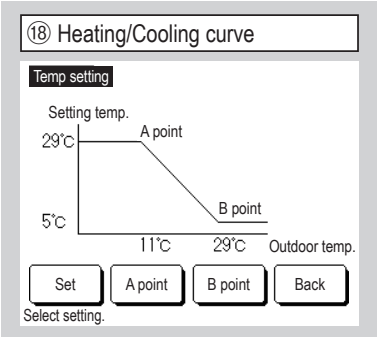


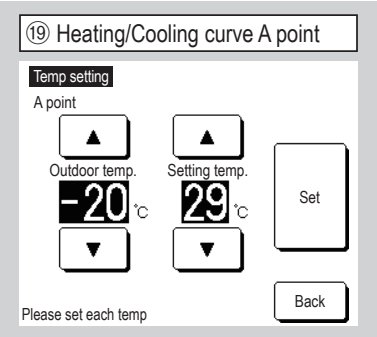
Set "HMU" when selecting HMU mode manually, while it is selected automatically.

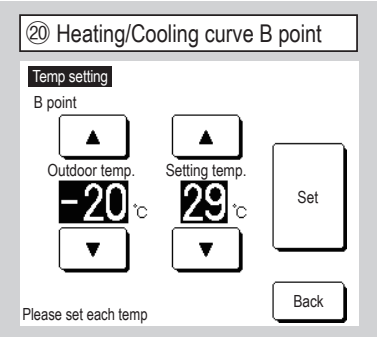




You can set wether
Heating/Cooling curve is enabled.





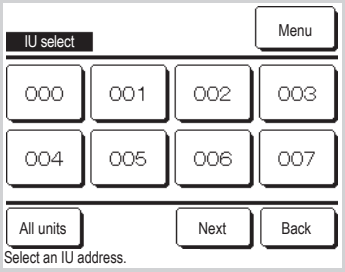


You can define Hating/Cooling curve as you like by adjusting point A and B.
When it comes to adjusting the points, set the outdoor temperature
within the range of -20 to 50ºC and the set temperature 0 to 50ºC.

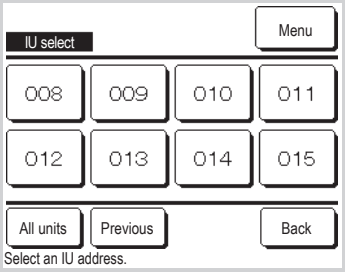
13.1.4. IU settings **Advice: It is valid when unit stops.**

TOP screen [Menu] ⇒ [Service setting] ⇒ [IU settings] ⇒ [Service password]

① IU select #1

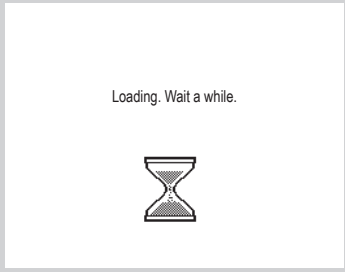


② IU select #2



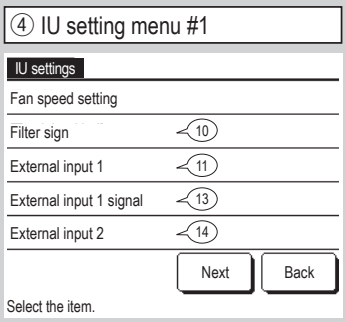
When plural indoor units are connected, they are displayed on the screen.
[000] to [015] Individual settings are performed for indoor units.
[All units] The same setting applies to all units.

③ Loading

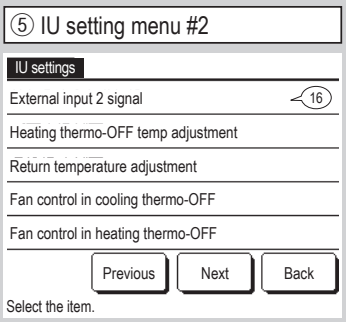


The display changes to ④ after receiving data from the IU.

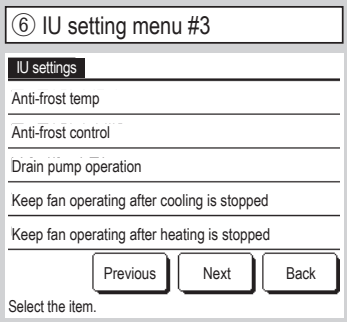
④ IU setting menu #1



⑤ IU setting menu #2

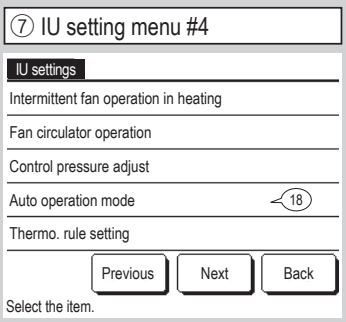


⑥ IU setting menu #3

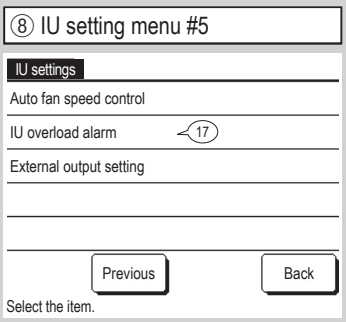


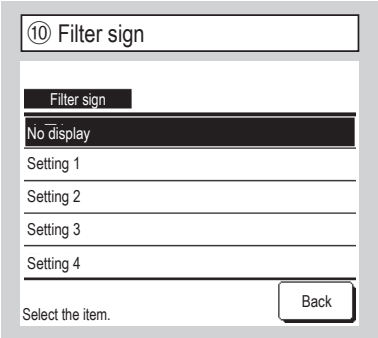
The selected screen is displayed.

⑦ IU setting menu #4



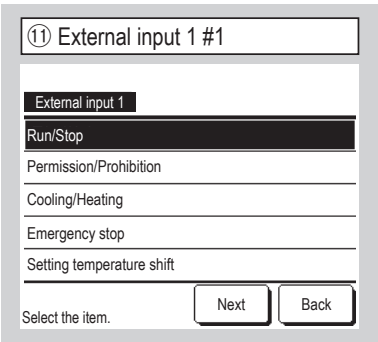
⑧ IU setting menu #5

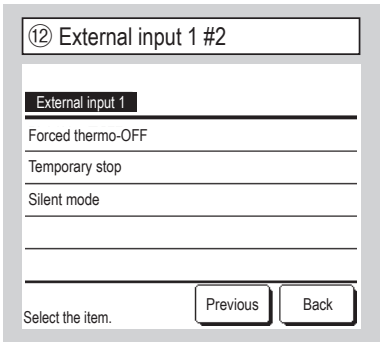




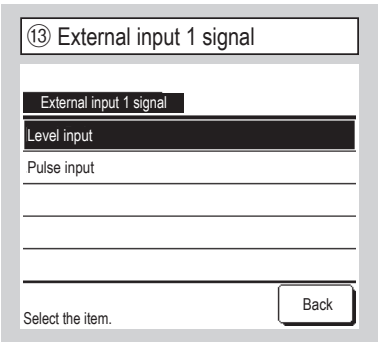
	Standard
No display	None
Setting 1	180Hr
Setting 2	600Hr
Setting 3	1,000Hr
Setting 4	1,000Hr Operation stop

Set the time to display the filter sign.



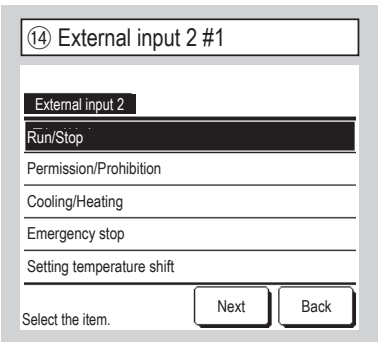


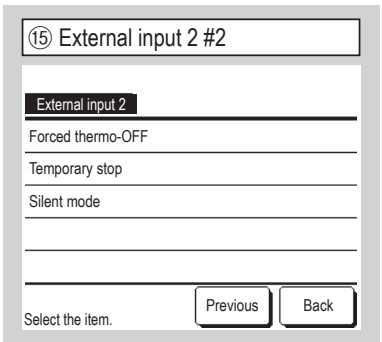
Set the control at the time when the signal is input to the external input 1 (CnT) of IU.
Refer to the engineering data for details.

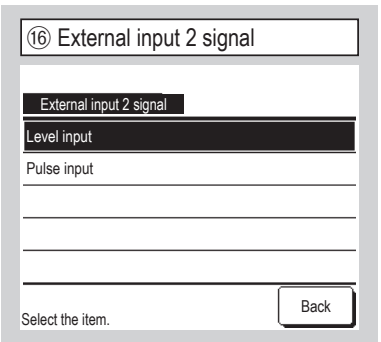


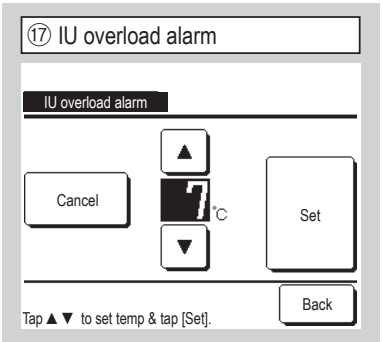
Set the signal type to input to the external input 1 (CnT) of IU.
Refer to the engineering data for details.

This is operable when the IU equipped with the external input 2 is connected. Refer to the engineering data for details.

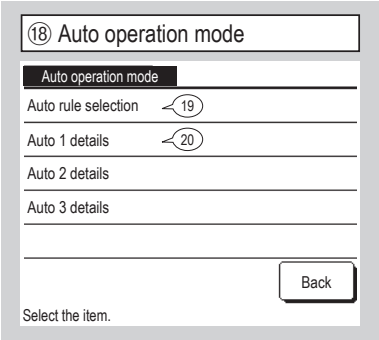


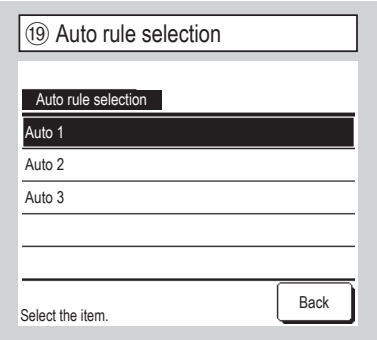






When the room temperature differs to some extent from the setting temperature at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CnT-5).



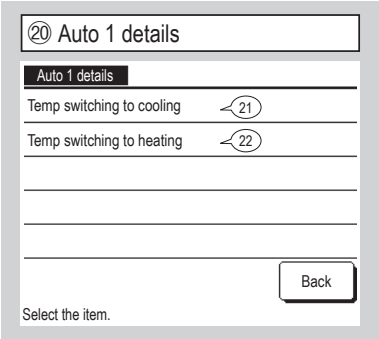


Auto 1 The temp difference between the set temp and the actual room temp switch cooling and heating.

Auto 2 Auto 2 and Auto 3 are the same as Auto 1 in the case of HMU.

Auto 3

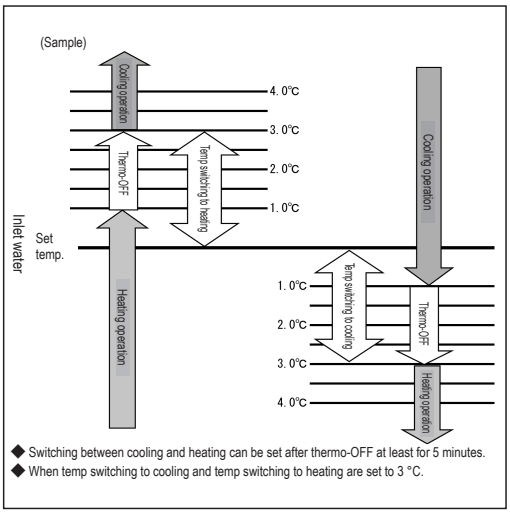
The method of switching between cooling and heating in the auto operation mode can be selected from three options.
Set the condition for each method.

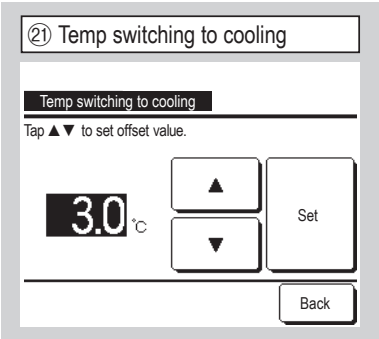


Set the temperatures switching to cooling and heating.
Switching temperatures can be set within the range of 1°C to 4°C.

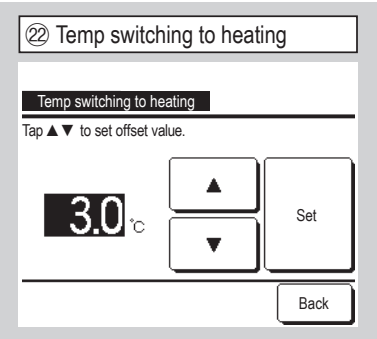
[Set temp - Temp switching to cooling] < [Inlet water temp]
⇒ Operation mode: Cooling

[Set temp + Temp switching to heating] > [Inlet water temp]
⇒ Operation mode: Heating





Set the temperature switching to cooling with Auto 1.
The temperature can be set within the range of 1 to 4 °C.

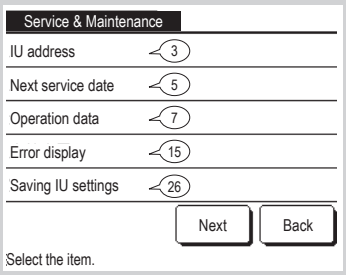


Set the temperature switching to heating with Auto 1.
The temperature can be set within the range of 1 to 4 °C.

13.1.5. Service & Maintenance

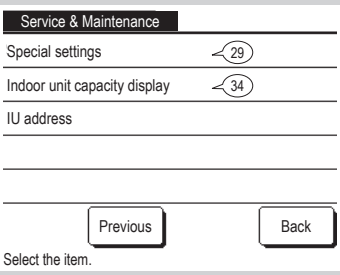
TOP screen [Menu] ⇒ [Service setting] ⇒ [Service & Maintenance] ⇒ [Service password]

① Service & Maintenance #1



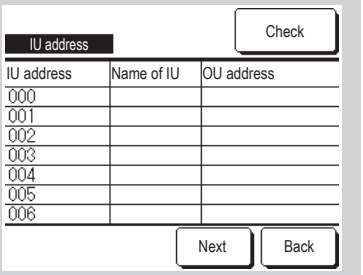
The selected screen is displayed.

② Service & Maintenance #2



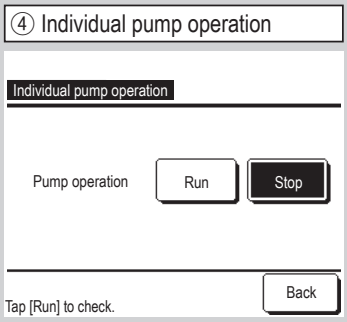
The selected screen is displayed.

③ IU address



When 8 or more units are connected, further data are displayed on the next page. When the [Check] button is tapped after selecting an IU address, the pump of the selected IU can be operated. ⇒④

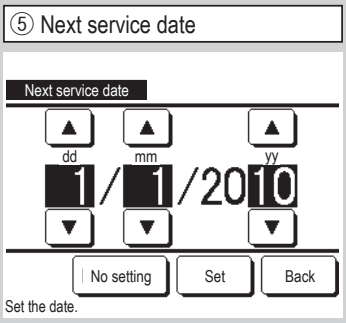
④ Individual pump operation



[Run] Tap this button to start the pump operation.

[Stop] Tap this button to stop the pump operation.

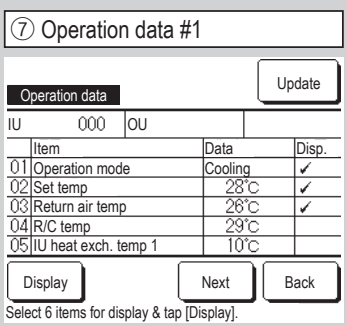
⑤ Next service date



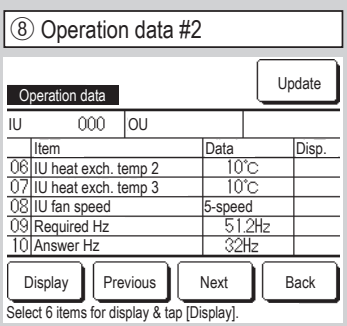
⑥ Service message

When next service date is entered, messages are displayed at the start/stop of operation on the service month.
Contents are reset if the next service date is updated.
If the [No setting] button is tapped, messages are not displayed.

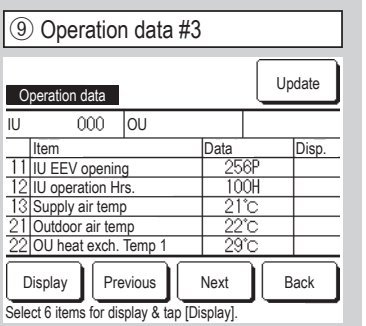
⑦ Operation data #1



⑧ Operation data #2

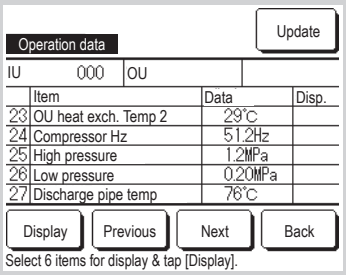


⑨ Operation data #3

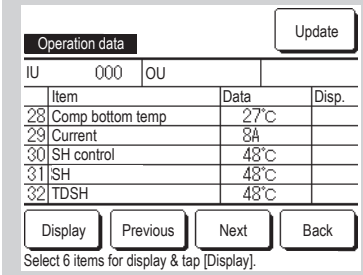


After read the indoor unit data, the operation data at the time of reading are displayed. Tapping the [Update] button to update the data.
To automatically update data and display, up to six items can be selected. Tapping the [Display] button after selecting six items changes the display to ⑭ .

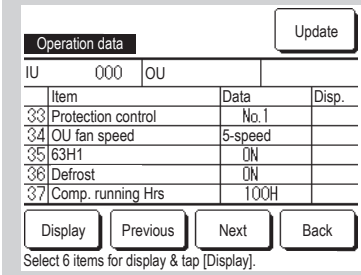
⑩ Operation data #4



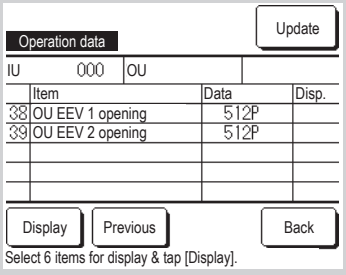
⑪ Operation data #5



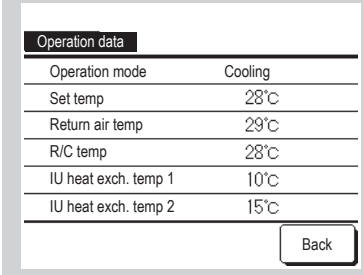
⑫ Operation data #6



⑬ Operation data #7

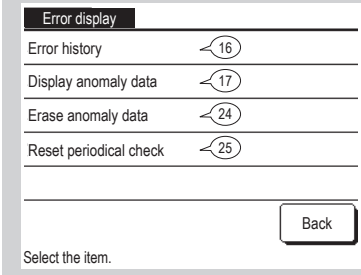


⑭ Individual display

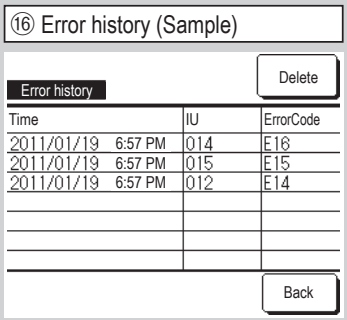


Automatically updates and displays the six selected items.

⑮ Error display

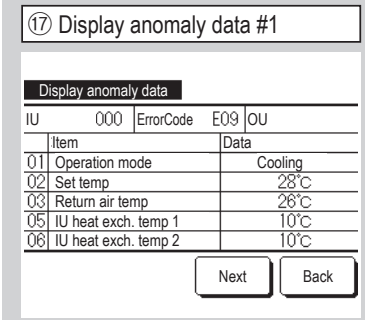


⑯ Error history (Sample)

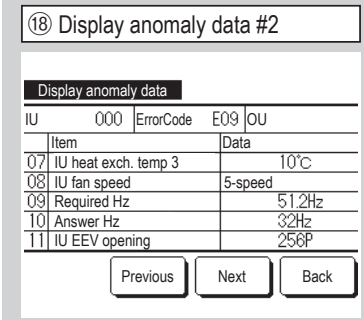


Date and time when error occurred, IU address and Error Code are displayed. Tap the Delete button to delete the error history.

⑰ Display anomaly data #1

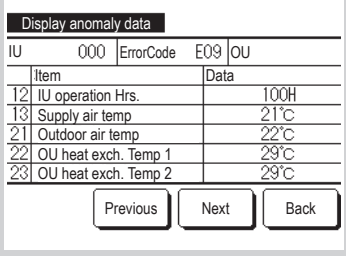


⑱ Display anomaly data #2

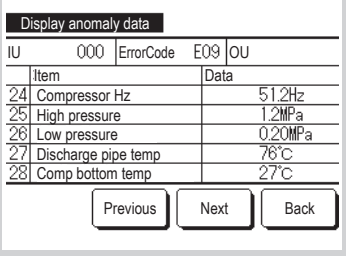


The operation data obtained just before the occurrence of an error are displayed.

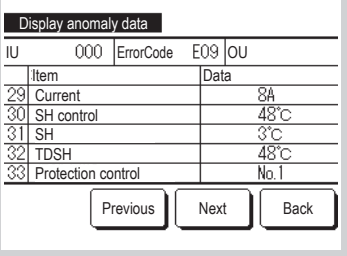
⑲ Display anomaly data #3



⑳ Display anomaly data #4

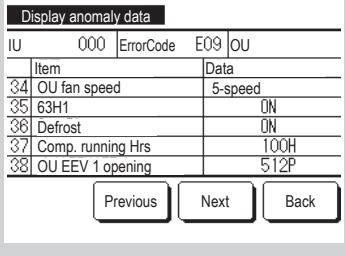


㉑ Display anomaly data #5

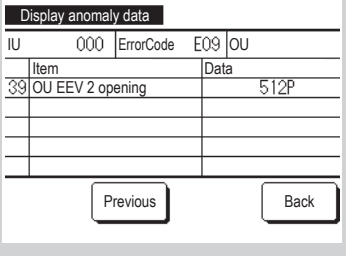


The operation data obtained just before the occurrence of an error are displayed.

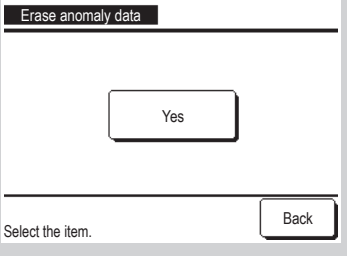
㉒ Display anomaly data #6



㉓ Display anomaly data #7

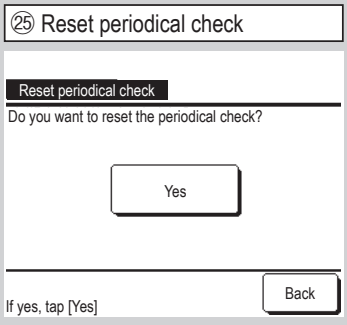


㉔ Erase anomaly data



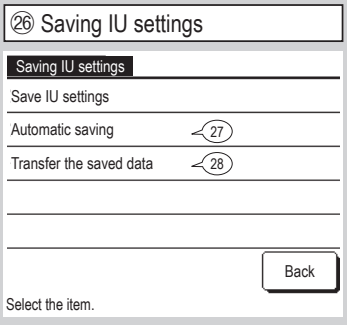
The anomaly data is erased.

㉕ Reset periodical check



The time count is reset by resetting the periodical check.

㉖ Saving IU settings

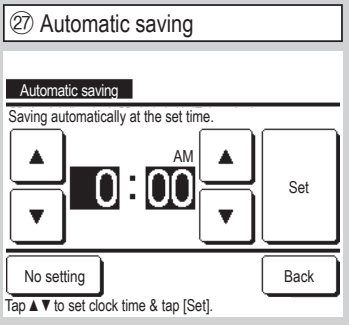


Save IU settings All settings of the IUs connected to the R/C are saved in the R/C.

Automatic saving Set the time when the automatic saving is performed every day.

Transfer the saved data The IU setting data saved in the R/C are transferred to an indoor unit.

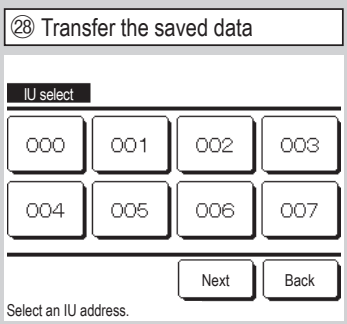
㉗ Automatic saving



Set the time when the automatic saving is performed every day.

If the No setting button is tapped, the automatic saving is not performed.

㉘ Transfer the saved data

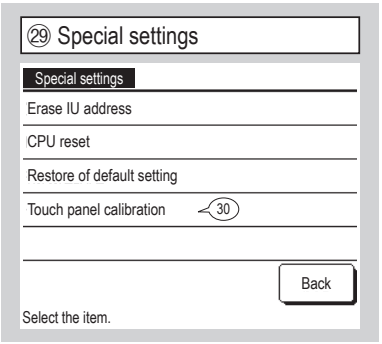


If an IU to which the saved date is transferred is selected, the Transfer the saved data acknowledge screen is displayed. Tap [Yes] to transfer the data.

Advice

Have you ever lost setting contents after replacing an IU board?

When IU settings are saved in the R/C, the saved data can be written to IU using "Transfer the saved data".



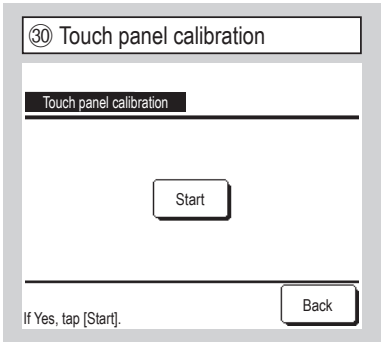
The selected screen is displayed.

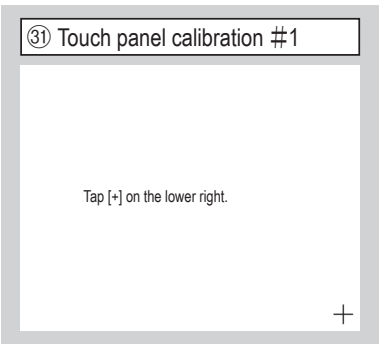
Erase IU address Memory of the IU address for multi (KX) unit is erased.

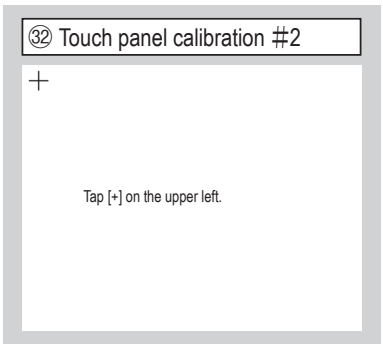
CPU reset Microcomputers of IU and OU connected are reset (State of restoration after power failure).

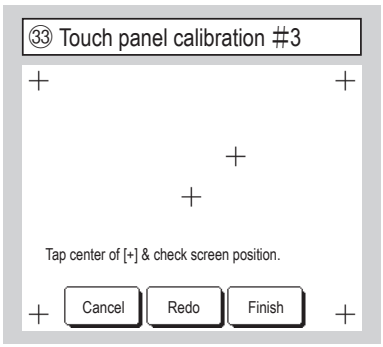
Restore of default setting Settings on R/C and IU connected are initialized (State of factory default).

Touch panel calibration Use this to correct when the display and the touch position are not matched.

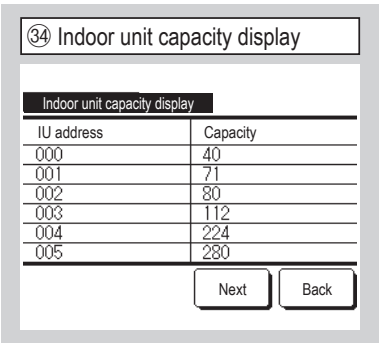








Use this when the display and the touch position are not matched.
Tap the center of [+] and check the deviation from the display.
Finish ⇒ Calibration is completed.

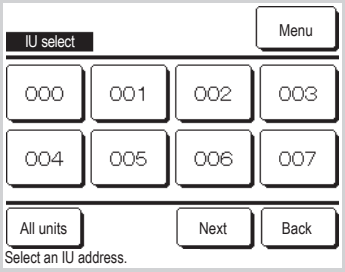


Capacities of IUs connected to the R/C are displayed.
When seven units or more are connected, tap the Next button to view all.
These items may not be displayed depending on the combination of IUs and OUs.

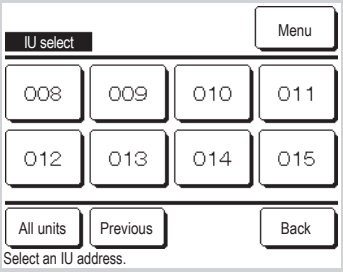
13.1.6. IU settings 2 Advice: It is valid when unit stops.

TOP screen [Menu] ⇒ [Service setting] ⇒ [IU settings 2] ⇒ [Service password]

① IU select #1

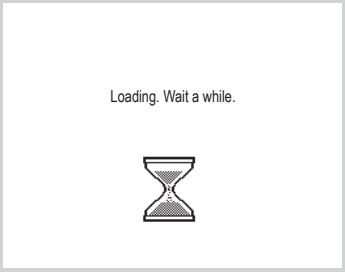


② IU select #2



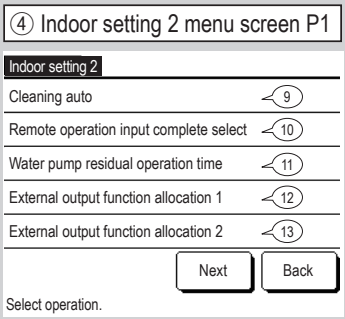
When plural indoor units are connected, they are displayed on the screen.
[000] to [015] Individual settings are performed for indoor units.
[All units] The same setting applies to all units.

③ Loading

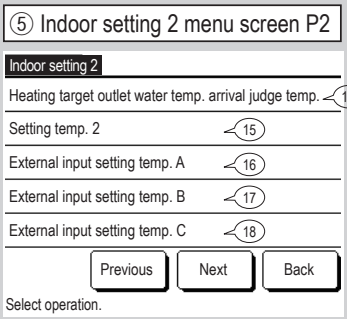


The display changes to ④ after receiving data from the IU.

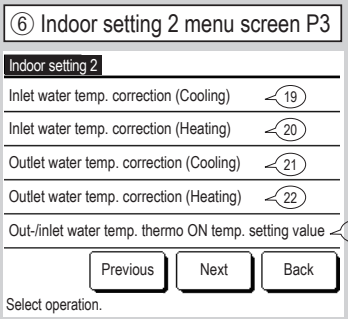
④ Indoor setting 2 menu screen P1



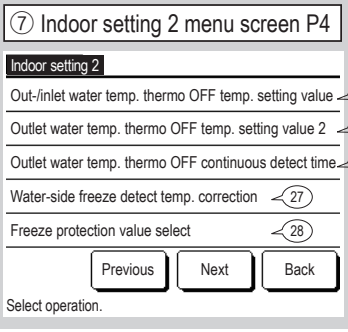
⑤ Indoor setting 2 menu screen P2



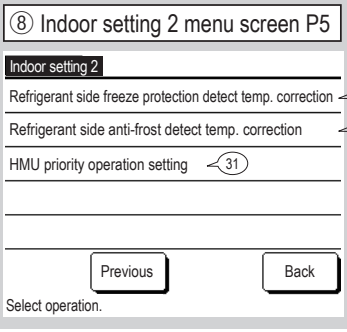
⑥ Indoor setting 2 menu screen P3

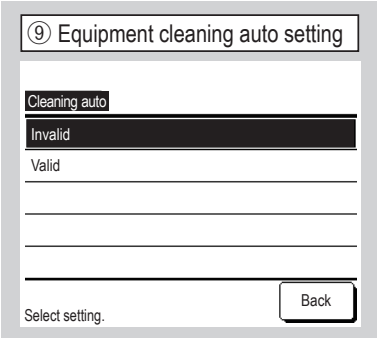


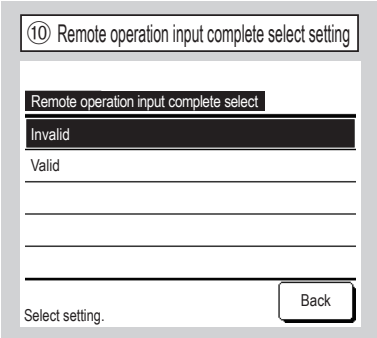
⑦ Indoor setting 2 menu screen P4



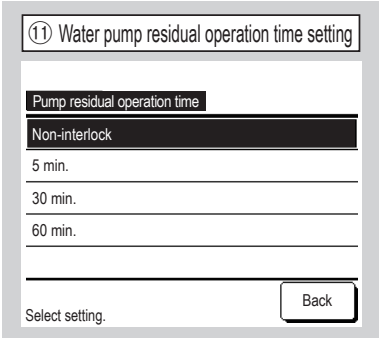
⑧ Indoor setting 2 menu screen P5



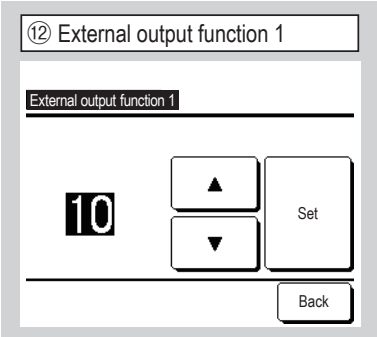




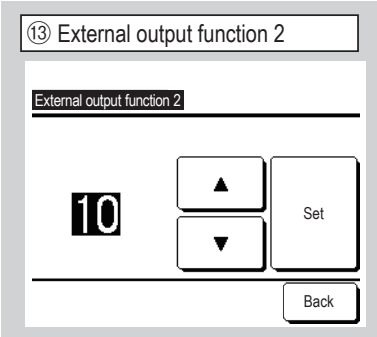
Enable
The unit cannot be switched ON/OFF by the R/C.
Disable
The unit can be switched ON/OFF by the R/C.



Select the time for which pump operation remains after the unit operation stops.

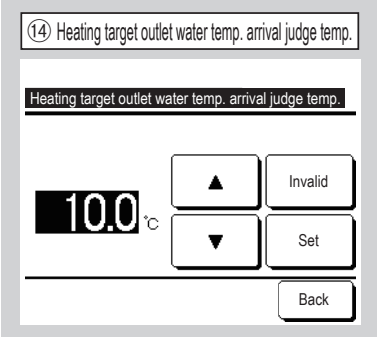


Select the function to be allocated for the connector CNO.

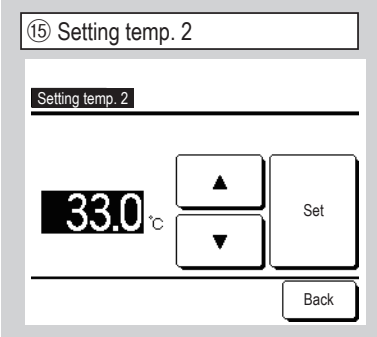


Select the function to be allocated for the connector CND.

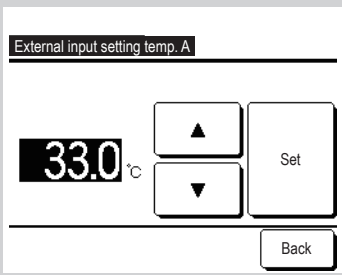
	Output function
0	Operation output
1	Heating output
2	Thermo ON output
3	Inspection (Error) output
4	Cooling output
5	Defrost output
6	Oil return output
7	Indoor unit overload alarm output
8	Heating target outlet water temp. arrival output
9	Spare
10	Spare



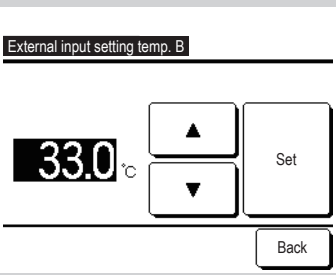
Set the target value of heating within the range of 0 to 10°C.



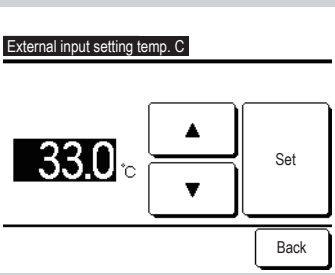
⑯ External input setting temp. A



⑰ External input setting temp. B

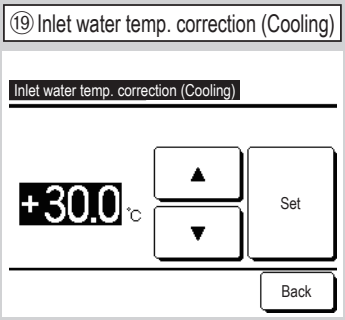


⑱ External input setting temp. C

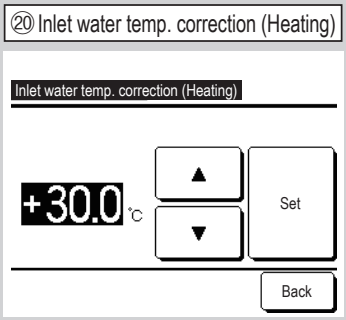


The target inlet/outlet water temperature.
Set the value within the range of 7 to 55°C.

⑲ Inlet water temp. correction (Cooling)

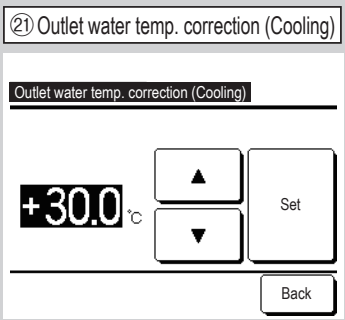


⑳ Inlet water temp. correction (Heating)

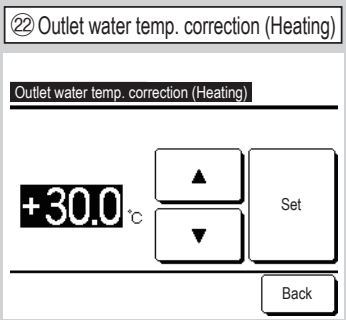


The detected inlet water temperature can be corrected.
Set the offset value within the range of -30 to +30°C.

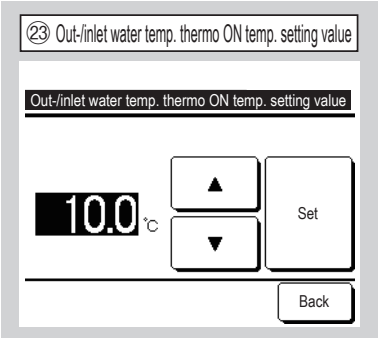
㉑ Outlet water temp. correction (Cooling)

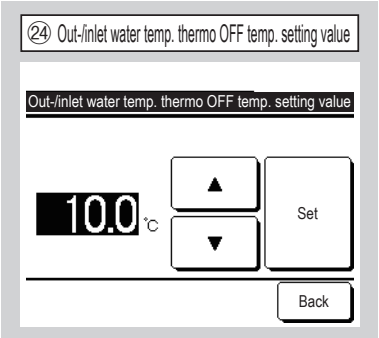


㉒ Outlet water temp. correction (Heating)

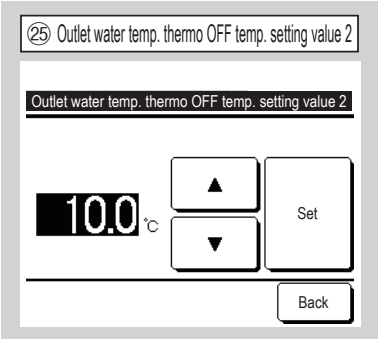


The detected outlet water temperature can be corrected.
Set the offset value within the range of -30 to +30°C.

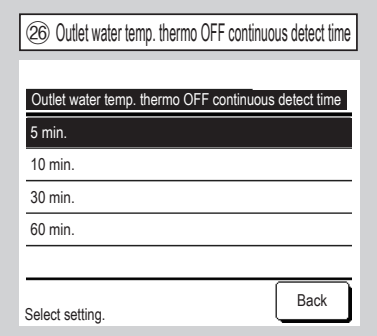




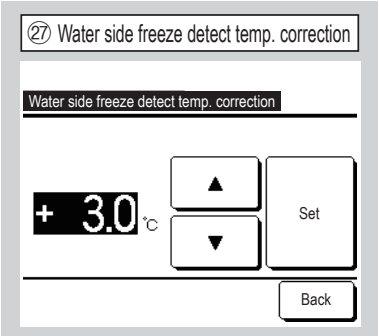
Set the gap between the present and target outlet/inlet water temperature switching to thermo-ON/OFF operation. It can be set within the range of 1 to 10°C.



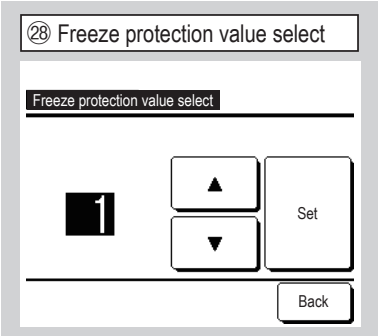
Set the gap between the present and target outlet water temperature switching to thermo-OFF operation.
It can be set within the range of 5 to 10°C.



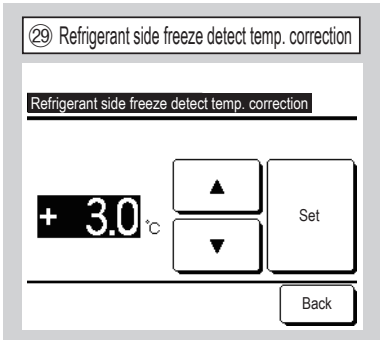
Select the time period for which the prescribed temperature is detected before thermo-OFF operation starts.



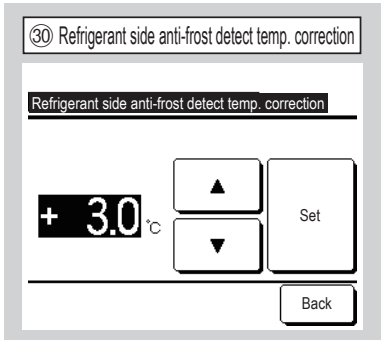
The water temperature switching to (water) can be corrected.
Set the offset value within the range of -3 to +3°C.



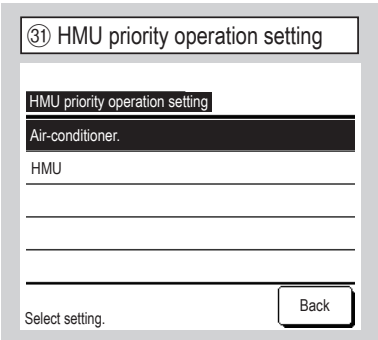
Select "0" or "1" to change the temperature switching to anti-freezing control.
Refer to engineering data for details.



The temperature switching to anti-freezing control (HEX) can be corrected.
Set the offset value within the range of -10 to +10°C.



The temperature switching to anti-frost control (HEX) can be corrected.
Set the offset value within the range of -10 to +10°C.



You can select on which type of inndoor units you would have priority concerning capacity.
Select "Air conditioner" or "HMU".

13.2 Indoor unit

13.2.1 Normal control

(1) Operation control pattern selection

Air-conditioner control method can be selected from following 6 patterns.

Op. control pattern		SW7-2	Setting temp.	Thermo control	Indoor EEV control	Compressor control
A	Outlet water temp. control 1	OFF	Outlet water temp.	Outlet water temp.	Constant SH/SC	Outlet water temp. control
B	Outlet water temp. control 2	OFF	Outlet water temp.	Outlet water temp.	Outlet water temp.	Constant pressure control
C	Constant outlet water temp. & inlet water temp. preference control 1	ON	Out-/inlet water temp.	Inlet water temp.	Constant SH/SC	Outlet water temp. control
D	Constant outlet water temp. & inlet water temp. preference control 2	ON	Out-/inlet water temp.	Inlet water temp.	Outlet water temp.	Constant pressure control
E	Constant outlet water temp. & room temp. preference control 1	ON	Outlet water temp., room temp.	Room temp. (R/C sensor)	Constant SH/SC	Outlet water temp. control
F	Constant outlet water temp. & room temp. preference control 2	ON	Outlet water temp., room temp.	Room temp. (R/C sensor)	Outlet water temp.	Constant pressure control

(a) Outlet water temperature control 1 (Operation pattern A)

This can be used when using one HMU unit.

Set the DIP switch at SW7-2 = OFF.

It controls such that the outlet water temperature will become the setting temperature.

Inlet water temperature is not controlled.

(b) Outlet water temperature control 2 (Operation pattern B)

This can be used when using two or more HMU units.

Set the DIP switch at SW7-2 = OFF.

It controls such that the outlet water temperature will become the setting temperature.

Inlet water temperature is not controlled.

(c) Constant outlet water temperature & inlet water temperature preference control 1 (Operation pattern C)

This can be used when using one HMU unit.

Set the DIP switch at SW7-2 = ON.

It controls such that the inlet water temperature will become the setting temperature.

Outlet water temperature is controlled such that it will become the setting temperature. However, the inlet water temperature setting has priority.

It controls such that the outlet water temperature will become with the setting temperature within the range in which the inlet water temperature is controlled to be the setting temperature.

(d) Constant outlet water temperature & inlet water temperature preference control 2 (Operation pattern D)

This can be used when using two or more HMU units.

Set the DIP switch at SW7-2 = ON.

It controls such that the inlet water temperature will become the setting temperature.

Outlet water temperature is controlled such that it will become the setting temperature. However, the inlet water temperature setting has priority.

It controls such that the outlet water temperature will become with the setting temperature within the range in which the inlet water temperature is controlled to be the setting temperature.

(e) Constant outlet water temperature & room temperature preference control 1 (Operation pattern E)

This can be used when using one HMU unit.

Set the DIP switch at SW7-2 = ON.

Enable R/C sensor.

It controls such that the room temperature (R/C sensor) will become the setting temperature.

Outlet water temperature is controlled such that it will become the setting temperature. However, the room temperature setting has priority.

It controls such that the outlet water temperature will become with the setting temperature within the range in which the room temperature is controlled to be the target value.

(f) Constant outlet water temperature & room temperature preference control 2 (Operation pattern F)

This can be used when using two or more HMU units.

Set the DIP switch at SW7-2 = ON.

Enable R/C sensor.

It controls such that the room temperature (R/C sensor) will become the setting temperature.

Outlet water temperature is controlled such that it will become the setting temperature. However, the room temperature setting has priority.

It controls such that the outlet water temperature will become with the setting temperature within the range in which the room temperature is controlled to be the target value.

Since the protective control has priority under protective controls (Oil return control, oil equalizing control, defrost control, etc.) at each operation pattern, actual inlet or outlet water temperature may not become constant relative to the setting temperature.

(2) Target temperature setting method

(a) Target outlet water temperature setting

Set it with individual remote control or via external input signals.

<Setting temperature range>

Cooling: 7(*1) – 25°C

Heating: 25 (or 30(*2)) – 55°C

(*1) Do not set minimum temperature lower than 7°C. Even though it can be set down to 5°C.

(*2) Do not set minimum temperature lower than 25(or 30)°C. Even though it can be set down to 15°C.

(i) Individual remote control

Set it with the setting temperature of remote control.

(ii) Target outlet water temperature setting by external input signal

When the external inputs have been allocated to the setting temperature 1, 2 with the indoor unit setting of remote control, setting temperatures can be changed by combining with external inputs.

Setting temp. select 1	Setting temp. select 2	SW7-3	Target outlet water temp.
Invalid	Invalid	OFF	R/C setting temperature
Invalid	Valid	OFF	R/C external input setting temp. A
Valid	Invalid	OFF	R/C external input setting temp. B
Valid	Valid	OFF	R/C external input setting temp. C

(b) Target inlet water temperature (room temperature) setting

Set it with individual remote control or via external input signal.

<Setting temperature range>

Cooling: 12(*3) – 30°C

Heating: 20 (or 25(*4)) – 50°C

(*3) Do not set minimum temperature lower than 12°C. Even though it can be set down to 10°C.

(*4) Do not set minimum temperature lower than 20(or 25)°C. Even though it can be set down to 10°C.

(i) Individual remote control

Set it using the setting temperature 2 of remote control.

(ii) Target inlet water temperature (room temperature) setting by external input signal

When external inputs have been allocated to the setting temperature 1, 2 with the indoor unit setting of remote control, setting temperatures can be changed by combining with external inputs.

Setting temp. select 1	Setting temp. select 2	SW7-3	Target inlet temp. (room temp.)
Invalid	Invalid	ON	R/C setting temp. 2
Invalid	Valid	ON	R/C external input setting temp. A
Valid	Invalid	ON	R/C external input setting temp. B
Valid	Valid	ON	R/C external input setting temp. C

(3) Thermostat operation

(a) Outlet water temperature control 1 (Operation control pattern A)

(b) Outlet water temperature control 2 (Operation control pattern B)

Thermostat is controlled such that the outlet water temperature sensor value will agree with the target outlet water temperature.

<Cooling>

(i) Thermostat ON condition

・Outlet water temperature sensor (Thi-AF) ≧ Target outlet water temperature Ts + 1°C (*1)

(ii) Thermostat OFF condition

When all of following conditions are satisfied:

When the operation mode changes to other than cooling, however, the thermostat is turned OFF immediately.

・It is not under the oil return control or within 10 minutes after the control.

・It is not under the oil equalizing control or within 10 minutes after the control.

・It is later than 30 minutes after the thermostat OFF.

・It has detected Outlet water temperature sensor (Thi-AF) ≦ Ts – 5°C (*2),

Or

Target overheat degree SH = 10deg, and

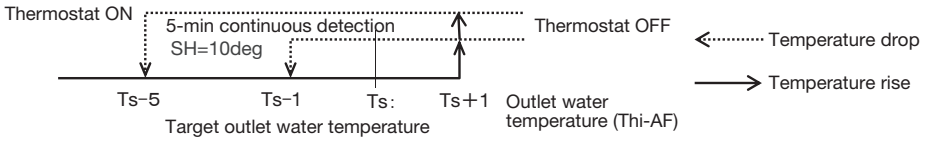
It has detected for 5 minutes (*4) continuously Outlet water temperature sensor (Thi-AF) ≦ Ts – 1°C (*3).

(*1) Indoor unit setting of R/C: It can be changed with “Thermo ON temp. (Inlet/Outlet water)”.

(*2) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp.2 (Outlet water)”.

(*3) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp. (Inlet/Outlet water)”.

(*4) Indoor unit setting of R/C: It can be changed with “Thermo OFF detection time (Outlet water)”.



<Heating>

(i) Thermostat ON condition

・Outlet water temperature sensor (Thi-AF) ≦ Target outlet water temperature Ts – 1°C (*1)

(ii) Thermostat OFF condition

When all of following conditions are satisfied:

When the operation mode changes to other than heating, however, the thermostat is turned OFF immediately.

・It is not under the oil return control or within 10 minutes after the control.

・It is not under the oil equalizing control or within 10 minutes after the control.

・It is later than 30 minutes after the thermostat ON (Answerback frequency ≠ 0).

・It has detected Outlet water temperature sensor (Thi-AF) ≧ Ts + 5°C (*2),

Or

Target outlet temperature RH = (RH – 23)°C, and

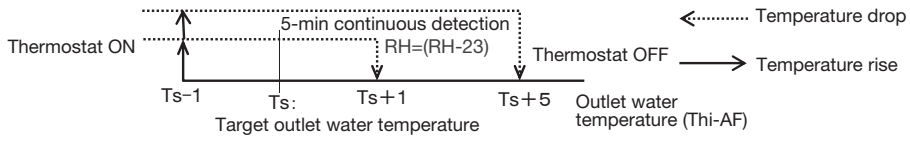
It has detected for 5 minutes (*4) continuously Outlet water temperature sensor (Thi-AF) ≧ Ts – 1°C (*3).

(*1) Indoor unit setting of R/C: It can be changed with “Thermo ON temp. (Inlet/Outlet water)”.

(*2) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp.2 (Outlet water)”.

(*3) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp. (Inlet/Outlet water)”.

(*4) Indoor unit setting of R/C: It can be changed with “Thermo OFF detection time (Ontlet water)”.



(c) Constant outlet water temperature & inlet water temperature preference control 1 (Operation control pattern C)

(d) Constant outlet water mperature & inlet water temperature preference control 2 (Operation control pattern D)

Thermostat is controlled such that the inlet water temperature sensor value will agree with the target inlet water temperature.

<Cooling>

(i) Thermostat ON condition

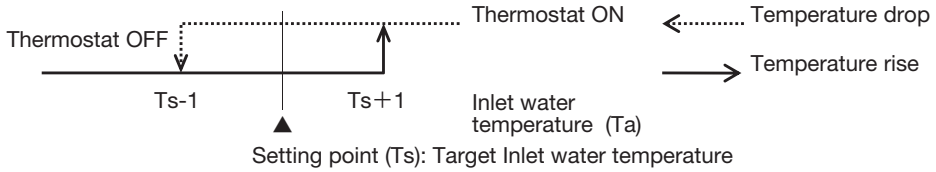
・When it has detected for 1 minute continuously Inlet water temperature sensor (Ta) ≧ Target inlet water temperature Ts + 1°C (*1).

(ii) Thermostat OFF condition

・When it has detected for 1 minute continuously Inlet water temperature sensor (Ta) ≦ Target inlet water temperature Ts - 1°C (*2).

(*1) Indoor unit setting of R/C: It can be changed with “Thermo ON temp. (Inlet/Outlet water)”.

(*2) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp. (Inlet/Outlet water)”.



<Heating>

(i) Thermostat ON condition

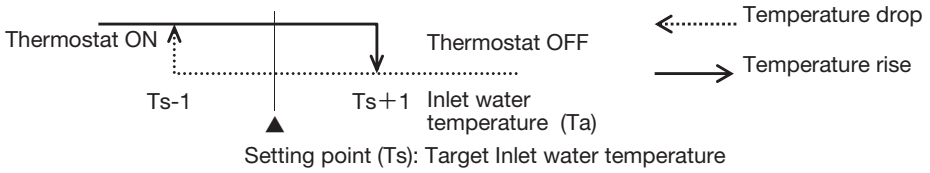
・When it has detected for 1 minute continuously Inlet water temperature (Ta) ≦ Target inlet water temperature Ts - 1°C (*1).

(ii) Thermostat OFF condition

・When it has detected for 1 minute continuously Inlet water temperature (Ta) ≧ Target inlet water temperature Ts + 1°C (*2).

(*1) Indoor unit setting of R/C: It can be changed with “Thermo ON temp. (Inlet/Outlet water)”.

(*2) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp. (Inlet/Outlet water)”.



(e) Constant outlet water temperature & room temperature preference control 1 (Operation pattern E)

(f) Constant outlet water temperature & room temperature preference control 2 (Operation pattern F)

Thermostat is controlled such that the remote control sensor value will agree with the target room temperature.

<Cooling>

(i) Thermostat ON condition

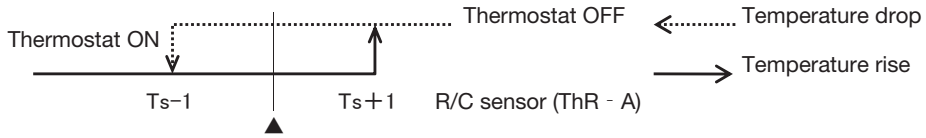
・When it has detected for 1 minute continuously R/C sensor (ThR-A) ≧ Target room temperature Ts + 1°C (*1).

(ii) Thermostat OFF condition

・When it has detected for 1 minute continuously R/C sensor (ThR-A) ≦ Target room temperature Ts - 1°C (*2).

(*1) Indoor unit setting of R/C: It can be changed with “Thermo ON temp. (Inlet/Outlet water)”.

(*2) Indoor unit setting of R/C: It can be changed with “Thermo OFF temp. (Inlet/Outlet water)”.



Setting point (Ts): Target room temperature

<Heating>

(i) Thermostat ON condition

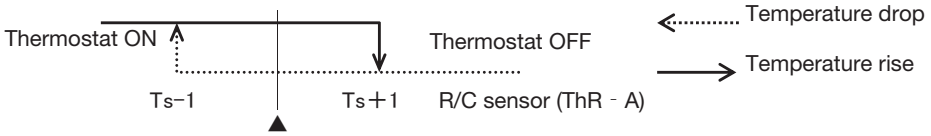
・When it has detected for 1 minute continuously R/C sensor (ThR-A) ≦ Target room temperature Ts – 1°C (*1).

(ii) Thermostat OFF condition

・When it has detected for 1 minute continuously that R/C sensor (ThR-A) ≧ Target room temperature Ts + 1°C (*2).

(*1) Indoor unit setting of R/C: It can be changed with "Thermo ON temp. (Inlet/Outlet water)".

(*2) Indoor unit setting of R/C: It can be changed with "Thermo OFF temp. (Inlet/Outlet water)".



Setting point (Ts): Target room temperature

(4) Water heat exchanger anti-freeze protection control

(a) Water temperature side conditions

When the following condition is satisfied, the thermostat is turned OFF forcibly.

Inlet water temperature (Thi-A) is lower than the water side freeze detection temperature at the water side,

Or

Outlet water temperature (Thi-AF) is lower than the water side freeze detection temperature at the water side.

When following conditions are satisfied, the thermostat returns to ON.

Inlet water temperature (Thi-A) is higher than the water side freeze detection release temperature at the water side,

And

Outlet water temperature (Thi-AF) is higher than the water side freeze detection release temperature at the water side

Water side freeze detection temperature [°C]	2 (*1)
Water side freeze detection release temperature [°C]	3 (*1)

(*1) Water side freeze detection temperature and release temperature can be corrected with the remote control setting.

(b) Refrigerant side conditions

When following conditions are satisfied, the thermostat is turned OFF forcibly.

・Cooling mode

・Later than 30 seconds after the thermostat ON

・It has detected for 30 seconds continuously that indoor heat exchanger temperature (Thi-R1) is lower than the refrigerant side freeze detection temperature,

Or

It has detected for 30 seconds continuously that the indoor heat exchanger temperature (Thi-R3) is lower than the refrigerant side freeze detection temperature.

When following conditions are satisfied, the thermostat is returned to ON.

Indoor heat exchanger temperatures (Thi-R1) are higher than the refrigerant side freeze detection release temperature,

And

Indoor heat exchanger temperature (Thi-R3) is higher than refrigerant side freeze detection release temperature,

And

It is later than 180 seconds after the forced thermostat OFF.

Note: The refrigerant side freeze detection temperature and the refrigerant side freeze detection release temperature vary depending on operating condition.

(5) HMU outdoor unit misconnection detection

If an outdoor unit, which is not adapted to HMU, is combined with HMU, the error code [E22] occurs.

13.2.2 Option control

(1) External control terminal input

There are following external input terminals.

The external control terminal input is the non-voltage contact input.

Terminal block No.	Name
1-2	Function select external input 1
3-4	External input error (Interlock) Shorted (Normal)/Open (Error [E16])
5-6	Function select external input 2

Function allocation for the function select external terminal input can be changed by the function setting from remote control.

Type of function select external input signals (Level/pulse) also can be changed by the function setting from remote control.

(a) Function select external input 1 (Terminal blocks 1-2)

Functions which can be allocated:

Start/stop
Operation permit/prohibit
Cooling/heating
Emergency stop
Forced thermostat OFF
Temporary stop
Setting temperature select 1
Setting temperature select 2

(b) Function select external input 2 (Terminal blocks 5-6)

Functions which can be allocated:

Start/stop
Operation permit/prohibit
Cooling/heating
Emergency stop
Forced thermostat OFF
Temporary stop
Setting temperature select 1
Setting temperature select 2

(c) External input error (Terminal blocks 3-4)

Error signal detection of external device can be utilized for external inputs (Cn1). If the external input (Cn1) becomes open (normally closed), the error stop [E16] occurs. (ex. water pump error signal)

1) Explanation of function select external input functions

① Start/stop

a) Remote operation input

Remote operation input connector (CnT-6 or CnTA) is provided on the indoor control PCB.

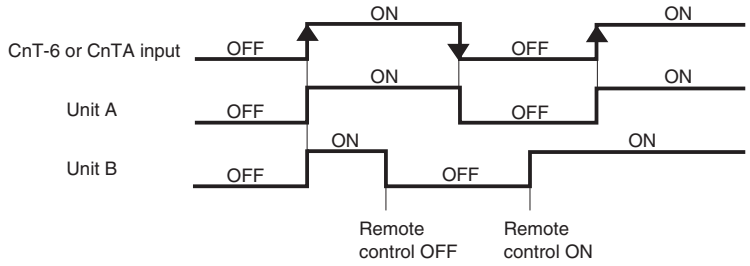
However remote operation by CnT-6 or CnTA is not effective, when “Center mode” is selected by central control.

In case of plural unit (twin, triple, double twin), remote operation input to CnT-6 or CnTA on the slave indoor unit is invalid.

Only the “LEVEL INPUT” is acceptable for external input, however when the indoor function setting of “Level input (Factory default)” or “Pulse input” is selected by the function for “External input” of the wired remote control, operation status will be 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.

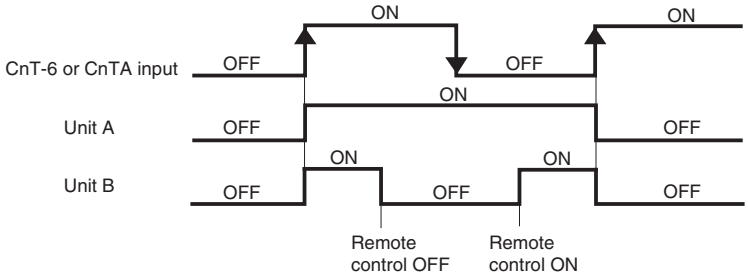


Note: The latest operation has priority

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.

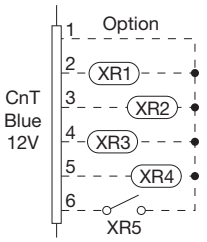


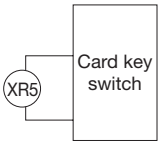
② **Operation permission/prohibition**

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

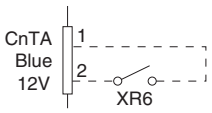
When the indoor function setting of wired remote control for "Operation permission/prohibition" is changed from "Invalid (Factory default)" to " Valid", following control becomes effective.

・CnT





・CnTA



Note (1) CnTA function can be changed by RC-EX1A.

	Normal operation (Factory default)		Operation permission/prohibition mode "Valid" (Local setting)	
CnT-6 or CnTA	ON	OFF	ON	OFF
	Operation	Stop	Operation permission*1	Operation prohibition (Unit stops)

*1 **Only the "LEVEL INPUT" is acceptable for external input**, however when the indoor function setting of "Level input (Factory default)" or "Pulse input" is selected by the function for "External input" of the wired remote control, operation status will be changed as follows.

In case of "Level input" setting	In case of "Pulse input" setting
Unit operation from the wired remote control becomes available*(1)	Unit starts operation *(2)

*(1) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Level input (Factory default)";

① 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.

② 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.

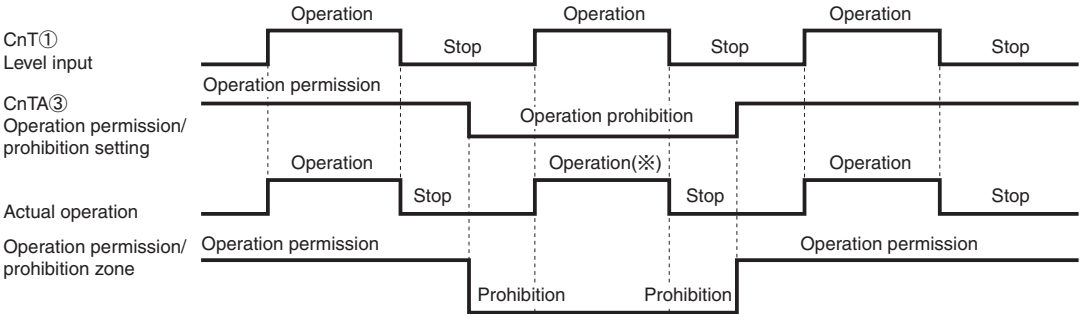
*(2) In case that "Operation permission/prohibition mode" setting is "Valid" and "External input" setting is "Pulse input (Local setting)";

① 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.

② 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.

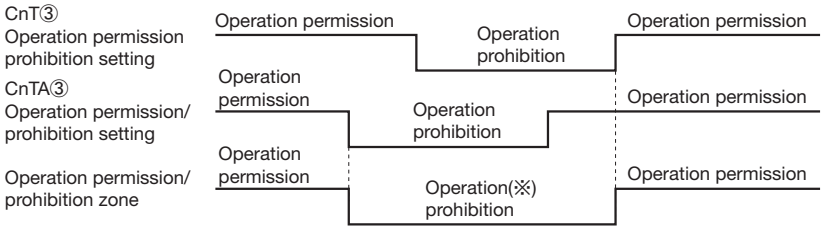
(3) This function is invalid only at "Center mode" setting done by central control.

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



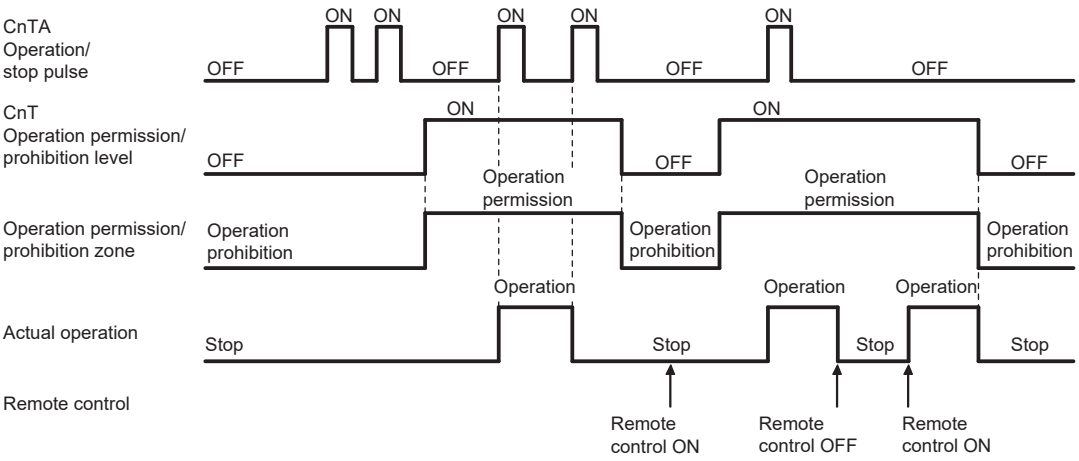
(※) CnT level input supersedes CnTA operation prohibition.

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



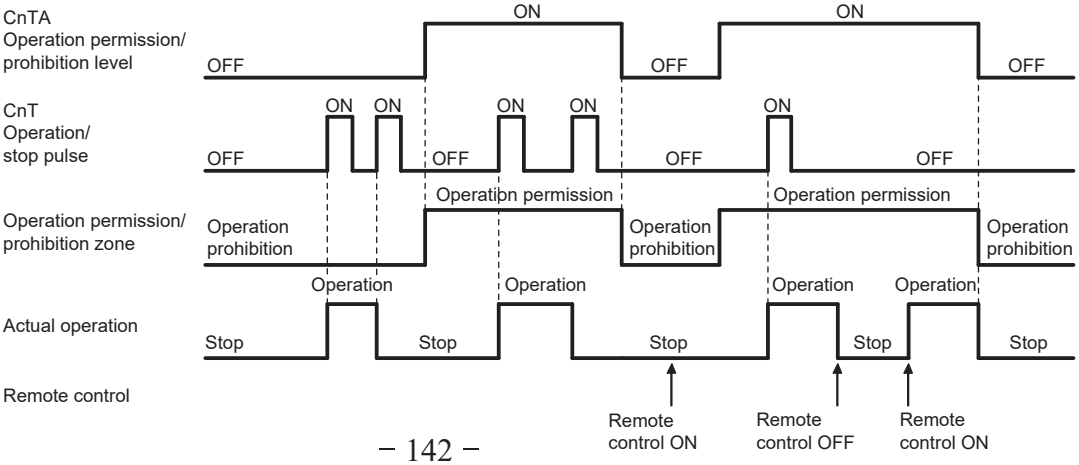
(※) Operation prohibition zone is determined by the OR judgment between CnT Operation prohibition zone and CnTA Operation prohibition zone.

c) 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.

d) In case of CnT ② Operation/stop pulse + CnTA ③ Operation permission/prohibition level



③ Selection of Cooling/Heating external input function

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

b) When the External input 1 method selection: Level input is set for the indoor unit function:

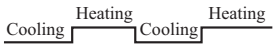
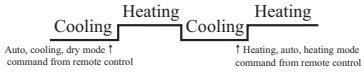
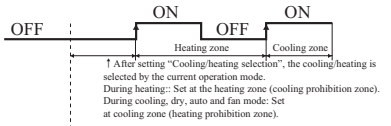
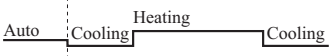
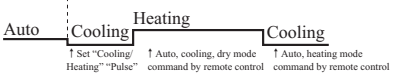
・CnT-6 or CnTA: OPEN → Cooling operation mode

・CnT-6 or CnTA: CLOSE → Heating operation mode

c) When the External input 1 method selection: Pulse input is set for the indoor unit function:
If the external input is changed OPEN → CLOSE, operation modes are inverted (Cooling → Heating or Heating → Cooling).

d) 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	
External input selection Cooling/Heating selection	⑤ Level	External terminal input (CnT or CnTA)	
		Cooling/Heating	
		Cooling/Heating (Competitive)	
	⑥ Pulse	External terminal input (CnT or CnTA)	
		Cooling/Heating	
		Cooling/Heating (Competitive)	

④ 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.

⑤ Forced thermostat OFF

This becomes valid when “Forced thermostat OFF” is selected with the external input setting.

a) In case of the level input setting
External input setting = CLOSE → Operating units are brought to the state of forced thermostat OFF.
External input setting = OPEN → It turns to the normal control.

b) In case of the pulse input setting
It is in the normal control when the power source is turned on initially.
At each time when the external input is changed from OPEN to CLOSE, it is switched between Normal control ⇔ Forced thermostat OFF.

This control is invalid during following controls.

・During defrost operation

・Within 2 minutes after the thermostat ON.

⑥ Temporary stop

This becomes valid when “Temporary stop” is selected with the external input setting.

a) In case of the level input setting

External input setting = CLOSE → It turns to the state of temporary stop.

Although the operation is same as normal stop, the remote control displays “Temporary stop”, but the operation display LED stays at ON.

External input setting = OPEN → It turns to normal control.

b) In case of the pulse control

It is in the normal control when the power source is turned on initially.

At each time when the external input is changed from OPEN to CLOSE, it is switched between Normal control ⇔ Temporary stop.

⑦ Setting temperature select 1

⑧ Setting temperature select 2

This becomes valid when “Setting temperature select 1” or “Setting temperature select 2” is selected with the external input setting.

a) In case of the level input setting

External input setting = CLOSE → It becomes valid.

External input setting = OPEN → It becomes invalid.

b) In case of the pulse input

It turns to invalid when the power source is turned ON initially.

At each time when the external input is changed from OPEN to CLOSE, it is switched between Valid ⇔ Invalid.

If this is combined with the setting temperature select 1, 2 Valid/Invalid, setting temperatures can be changed externally.

For details, refer to “5.2.1 (2) Target temperature setting method”.

List of priority order for external input

				CnZ															
				Op. stop		Op. permit/prohibit		C/H select		Emerg. stop	F thermo OFF		Temporary stop		Set temp. select 1		Set temp. select 2	
				Level	Pulse	Level	Pulse	Level	Pulse	Level	Pulse		Level	Pulse	Level	Pulse	Level	Pulse
				①	②	③	④	⑤	⑥	⑦	①	②	③	④	⑤	⑥	⑤	⑥
CnT	Op. stop	Level	①	CnT	CnT+CnZ	CnT+CnZ	CnT	CnT/CnZ	CnT/CnZ	CnT<CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
		Pulse	②	CnT	CnT+CnZ	CnT+CnZ	CnT	CnT/CnZ	CnT/CnZ	CnT<CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	Op. permit/ prohibit	Level	③	CnT>CnZ	CnT>CnZ	CnT+CnZ	CnT	CnT/CnZ	CnT/CnZ	CnT<CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
		Pulse	④	CnT	CnT	CnT+CnZ	CnT	CnT/CnZ	CnT/CnZ	CnT<CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	C/H select	Level	⑤	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
		Pulse	⑥	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	Emerg. stop		⑦	CnT>CnZ	CnT>CnZ	CnT>CnZ	CnT>CnZ	CnT/CnZ	CnT/CnZ	CNT+CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	F thermo OFF	Level	⑩	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
		Pulse	⑪	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	Temporary stop	Level	⑫	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
		Pulse	⑬	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ
	Set temp. select 1	Level	⑭	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ
		Pulse	⑮	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT	CnT/CnZ	CnT/CnZ
	Set temp. select 2	Level	⑭	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT
		Pulse	⑮	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT/CnZ	CnT	CnT

[Note]

CnT “No.” : CnT “No.” is adopted. CnZ “No.” is invalid.

CnZ “No.” : CnZ “No.” is adopted. CnT “No.” is invalid.

CnT “No.”/CnZ “No.” : CnT “No.” and CnZ “No.” are independent functions.

CnT “No.” + CnZ “No.” : CnT “No.” and CnZ “No.” are functions competing each other.

CnT “No.” > CnZ “No.” : CnT “No.” is higher in the priority order of function than CnZ “No.”.

CnT “No.” < CnZ “No.” : CnZ “No.” is higher in the priority order of function than CnT “No.”.

(2) External control terminal output

There are following external output terminals.

Terminal block No.	Name
7-8	Function select external output 2
9-10	Water pump operation output
11-12	Operation output
13-14	Error output
15-18	Function select external output 1

Non-voltage contact output is used for the external terminal output from terminal blocks.

Specifications for operation information output
(Specification of LY2F manufactured by OMRON)

	Resistive load	Inductive load
Rated load	10 A at AC110V	7.5 A at AC110V
	10 A at DC24V	7.5 A at DC24V
Carry current	10A	
Maximum operating voltage	AC250V	
	DC125V	
Maximum operating current	10A	10A

Function allocation for the function select external terminal output can be changed by the function setting from the remote control.

(a) Function select external output 1 (Terminal blocks 15-16)

Functions which can be allocated:
0 Operation output
1 Heating output
2 Thermostat ON output
3 Inspection (Error) output
4 Cooling output
5 Defrost output
6 Oil return output
7 Indoor overload alarm output
8 Heating target outlet water temperature reach output

(b) Function select external output 2 (Terminal blocks 7-8)

Functions which can be allocated:
0 Operation output
1 Heating output
2 Thermo ON output
3 Inspection (Error) output
4 Cooling output
5 Defrost output
6 Oil return output
7 Indoor overload alarm output
8 Heating target outlet water temperature reach output

(2.1) Explanation on functions of function select external output

0) Operation output
CLOSE During operation
1) Heating output
CLOSE During heating operation
2) Thermostat ON output
CLOSE When compressor is operating
3) Error output
CLOSE When anomalous condition occurs
4) Cooling output
CLOSE During cooling operation
5) Defrost output
CLOSE During defrost operation
6) Oil return output
CLOSE During oil return operation
7) IU overload alarm (IU overload alarm output)
If the following condition is satisfied at 30 minutes after starting operation, RC-EX3H shows maintenance code "M07" and the signal is transmitted to the external output.
For example of this function, LED can be turned on by this output.
Alarm temperature difference is selectable between 5 to 10°C.
(a) If the following condition is satisfied, the output is closed.
(i) Operation pattern A or B
・Cooling,Auto(Cooling)
Outlet water temp. ≧ Target outlet water temp. + Alarm temp. difference

・Heating,Auto(Heating)
Outlet water temp. ≦ Target outlet water temp. + Alarm temp. difference
(ii) Operation pattern C or D
・Cooling,Auto(Cooling)
Inlet water temp. ≧ Target inlet water temp. + Alarm temp. difference
・Heating,Auto(Heating)
Inlet water temp. ≦ Target inlet water temp. + Alarm temp. difference
(iii) Operation pattern E or F
・Cooling,Auto(Cooling)
Room temp. (R/C sensor) ≧ Target room temp. + Alarm temp. difference
・Heating,Auto(Heating)
Room temp. (R/C sensor) ≦ Target room temp. – Alarm temp. difference
(b) If the following condition is satisfied, the output is opened.
(i) Operation pattern A or B
・Cooling,Auto(Cooling)
Outlet water temp. ≦ Target outlet water temp. + Alarm temp. difference – 2
・Heating,Auto(Heating)
Outlet water temp. ≧ Target outlet water temp. + Alarm temp. difference + 2
(ii) Operation pattern C or D
・Cooling,Auto(Cooling)
Inlet water temp. ≦ Target inlet water temp. + Alarm temp. difference -2
・Heating,Auto(Heating)
Inlet water temp. ≧ Target inlet water temp. + Alarm temp. difference +2
(iii) Operation pattern E or F
・Cooling,Auto(Cooling)
Room temp. (R/C sensor) ≦ Target room temp. + Alarm temp. difference - 2
・Heating,Auto(Heating)
Room temp. (R/C sensor) ≧ Target room temp. – Alarm temp. difference + 2
(c) Alarm temperature difference can be changed by remote control.

8) Heating target outlet water temperature reach output
If the following condition is satisfied, the signal is transmitted to the external output.
(a) If all the following condition is satisfied for 5 minutes, the output is closed.
・Heating operation
・Outlet water temp. ≧ Target outlet water temp.
(b) If either the following condition is satisfied, the output is opened.
・Not heating operation
・Outlet water temp. < Target outlet water temp. -2
・Target outlet water temp. = Disable

(3) Water pump operation output

(3.1) Water pump operation control

If the following condition is satisfied, the signal is transmitted to the external output (TB4 9-10).
(a) If either the following condition is satisfied, the output is closed.
・During the operation
・5.2.1 (4) Water heat exchanger anti-freeze protection control
(b) Water temperature side conditions is satisfied.
・Oil return operation (*)
・Defrost operation (*)
(* Oil return and defrost are operated even if HMU is stopped and other units are operated.)

(3.2) Water pump residual operation control

If the following condition is satisfied, the signal is transmitted to the external output (TB4 9-10).
(a) If the following condition is satisfied, the output is closed.
・(3.1) Water pump operation control ends.
(b) The output is continued for “Water pump residual operation time”.
Water pump residual operation time can be changed by remote control.

(4) Remote control operation Valid/Invalid selection at remote operation input (Start/Stop)

Start/Stop function can be changed by individual remote control, central remote control and the remote operation input.

Start/Stop function can be invalidated from individual remote control or central control according to the remote operation input (Start/stop) only if "operation by external input only" is set on the remote control.

(5) Outlet/inlet water temperature sensor correction

(5.1) Inlet water temperature correction

The sensing temperature of inlet water temperature sensor can be adjusted respectively in heating and cooling.

(a) Cooling inlet water temperature correction

(i) CNV (1-5) = OFF (OPEN)
Correction cooling inlet water temperature (Thi-A') = Inlet water temperature sensor (Thi-A) + Inlet water sensor offset in cooling

(ii) CNV (1-5) = ON (CLOSE)
Correction cooling inlet water temperature (Thi-A') = Inlet water temperature sensor (Thi-A)

(iii) Inlet water sensor offset in cooling can be changed by remote control.

(b) Heating inlet water temperature correction

(i) CNV (1-5) = OFF (OPEN)
Correction heating inlet water temperature (Thi-A') = Inlet water temperature sensor (Thi-A) + Inlet water sensor offset in heating.

(ii) CNV (1-5) = ON (CLOSE)
Correction heating inlet water temperature (Thi-A') = Inlet water temperature sensor (Thi-A)

(iii) Inlet water sensor offset in heating can be changed by remote control.

(5.2) Outlet water temperature correction

The sensing temperature of outlet water temperature sensor can be adjusted respectively in heating and cooling.

(a) Cooling outlet water temperature correction

(i) CNV (1-5) = OFF (OPEN)
Correction cooling outlet water temperature (Thi-AF') = Outlet water temperature sensor (Thi-AF) + Outlet water sensor offset in cooling.

(ii) CNV (1-5) = ON (CLOSE)
Correction cooling outlet water temperature (Thi-AF') = Outlet water temperature sensor (Thi-AF)

(iii) Outlet water sensor offset in cooling can be changed by remote control.

(b) Heating outlet water temperature correction

(i) CNV (1-5) = OFF (OPEN)
Post correction heating outlet water temperature (Thi-AF') = Outlet water temperature sensor (Thi-AF) + Outlet water sensor offset in heating.

(ii) CNV (1-5) = ON (CLOSE)
Correction heating outlet water temperature (Thi-AF') = Outlet water temperature sensor (Thi-AF)

(iii) Outlet water sensor offset in heating can be changed by remote control.

(6) HMU priority operation setting

When air-conditioner and HMU are mixed, it can be set to which of air-conditioner or HMU the priority is given.

<Cooling>

Target outlet water temperature for control is determined as follows.

(i) HMU priority operation setting = "Air-conditioner"
・ Control target outlet water temperature Ts' = Max. [(Target outlet water temperature), (Inlet water temperature – 5 degrees)]
→ When the difference of outlet and inlet water temperatures is larger than 5 degrees, the capacity is restrained in order to prevent excessive capacity of HMU.

(ii) HMU priority operation setting = "HMU"
・ Control target outlet water temperature Ts' = Target outlet water temperature
→ Priority is given to secure the capacity of HMU even if the difference of outlet and inlet water temperatures is larger than 5 degrees so that the capacity is not restrained.

(iii) HMU priority operation setting can be changed by remote control.

<Heating>

Target outlet water temperature for control is determined as follows.

(i) In case of HMU priority operation setting = "Air-conditioner"
・ Control target outlet water temperature Ts' = Min. [(Target outlet water temperature), (Inlet water temperature + 5 degrees)]
→ When the difference of outlet and inlet water temperatures is larger than 5 degrees, the control is restrained in order to prevent excessive capacity of HMU.

(ii) In case of HMU priority operation setting = "HMU"
・ Control target outlet water temperature Ts' = Target outlet water temperature)

→ Priority is given to secure the capacity of HMU even if the difference of outlet and inlet water temperatures is larger than 5 degrees so that the capacity is not restrained.

(iii) HMU priority operation setting can be changed by remote control.

(7) Heating/Cooling curve

Setting temperatures can be set automatically according to outdoor air temperatures.

(a) Control selection range

(i) Enable/Disable setting = Disable
This control is not implemented.

(ii) Enable/Disable setting = Enable (Heating only)
This control is implemented in heating mode only.

(iii) Enable/Disable setting = Enable (Cooling only)
This control is implemented in cooling mode only.

(iv) Enable/Disable setting = Enable (Heating and Cooling)
This control is implemented in both cooling and heating modes.

(b) Control contents

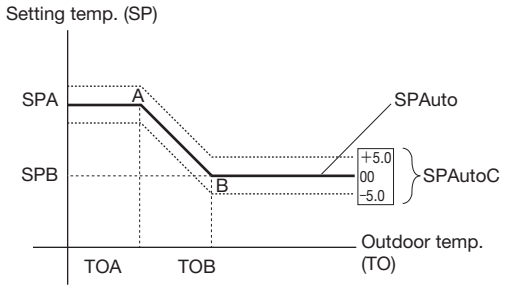
(i) Determine SPAuto according to outdoor temperatures based on the following figure.

(ii) It takes 10 minutes to update SPAuto.

(iii) SPAutoC can be set from remote control.

(iv) Determine the setting temperature (SP).
SP = SPAuto + SPAutoC

(v) TOA, TOB, SPA and SPB can be changed from the remote control setting.



(8) Operation check/water pump test run operation mode

(a) If the DIP switch (SW7-1) of the indoor control PCB is ON when electric power source is supplied, it enters the mode of operation check/water 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 with the DIP switch (SW7-1) ON, it enters the operation check mode. Unless the remote control communication is established, it enters the water pump test run mode.

Note (1) To select the water pump test run mode, disconnect the remote control connector (CNB) on the indoor control 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) Water pump test run mode
As the water pump test run is established, the water pump only operates and protective functions by the microcomputer of HMU become ineffective during the operation.

13.3 Outdoor unit

13.3.1 Common control of outdoor unit

For KXZ series outdoor unit, please refer to Service Manual '21 • KX-T-378.

For KXZX series outdoor unit, please refer to Service Manual '14 • KX-SM-204.

13.3.2 Special control for HMU

(1) Compressor control

(i) HMU only operation

a) Operation of one HMU unit

Compressor outlet water temperature control is implemented.

<Cooling>

[Starting condition]

All of following conditions are satisfied:

- The indoor unit in cooling operation is HMU only.
- One indoor unit is operating.

[Control contents]

- It is controlled such that outlet water temperature will reach the target outlet water temperature transmitted from HMU.
- Water heat exchanger outlet superheat is kept constant, and the outlet water temperature is adjusted by changing the target cooling low pressure of the compressor control.

[Ending condition]

- The start conditions are not satisfied.

<Heating>

[Starting condition]

When all of following conditions are satisfied:

- When the indoor unit in heating operation is one HMU unit.

[Control contents]

- It is controlled such that outlet water temperature will reach the target outlet water temperature transmitted from HMU.
- Water heat exchanger outlet superheat is kept constant, and the outlet water temperature is adjusted by changing the target heating high pressure of the compressor control.

[Ending condition]

- The start conditions are not satisfied.

b) Operation of two or more HMU units

Indoor EEV outlet water temperature control is implemented.

<Cooling>

[Starting condition]

All of following conditions are satisfied:

- The indoor unit in cooling operation is HMU only.
- Two of more indoor units are operating.

[Control contents]

- Set the target cooling low pressure according to the lowest value of the target outlet water temperature sent from HMU.
- The compressor control implements the target cooling low pressure constant control.
- Outlet water temperature is adjusted by changing the aperture of EEV of HMU.

[Ending condition]

- The start conditions are not satisfied.

<Heating>

[Starting condition]

All of following conditions are satisfied:

- The indoor unit in heating operation is HMU only.
- Two of more indoor units are operating.

[Control contents]

- Set the target heating high pressure according to the highest value of the target outlet water temperature sent from HMU.
- The compressor control implements the target heating high pressure constant control.
- Outlet water temperature is adjusted by changing the aperture of EEV of HMU.

[Ending condition]

- The start conditions are not established.

(ii) Mixed operation of HMU and air-conditioner

Compressor target pressure control is implemented giving priority to air-conditioner.

Indoor EEV outlet water temperature control is implemented.

<Cooling>

[Starting condition]

- Cooling operation indoor units are composed of HMU and air-conditioner.

[Control contents]

- Set the target cooling low pressure according to the air-conditioner.
- Compressor is controlled with the target cooling low pressure constant control.
- Outlet water temperature of HMU is adjusted by changing the aperture of HMU's EEV.

[Ending condition]

- When the start condition is not satisfied

<Heating>

[Starting condition]

- Heating operation indoor units are composed of HMU and air-conditioner.

[Control contents]

- Set the target heating high pressure according to the air-conditioner.
- Compressor is controlled with the target heating high pressure constant control.
- Outlet water temperature of HMU is adjusted by changing the aperture of HMU's EEV.

[Ending condition]

- When the start condition is not satisfied

(2) Protective control

(i) High pressure protective control/error

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

It reduces to 20 rps at the lowest.

(*) Values may vary under a special control or heating outlet water temperature control.

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

(ii) Low pressure protective control/error

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

It reduces to 20 rps at the lowest.

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

Regarding X value:

(a) In case of cooling operation with HMU connected

It is adjusted automatically between X = 0.40 – 0.74 MPa.

(b) In case other than (a)

X = 0.18 MPa

13.3.3 7-segment display

Setting of [PXX] and [FXX] of 7-segment display can be initialized to factory setting with following procedure.

① Set the DIP switch SW3-8 = ON and the rotary switch SW1, 2 = 46 with the power source OFF.

② Turn the power source OFF when LED changes from firm lighting to flicker after turning ON the power source.

③ Return the DIP switch SW3-8 and the rotary switch SW1, 2 to original positions.

13.3.4 Saving of operation data

Regarding some difference between HMU and air-conditioner : refer to the table below.

< 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	Inlet water temperature	
01	Indoor unit 1 Thi-R1	-19 – 71	1°C	1	Heat exchanger temp. 1	
02						
03	Indoor unit 1 Thi-R3	-19 – 71	1°C	1	Heat exchanger temp. 3	
04	Indoor unit 1 EEV	0 – 470	1 pulse	2		
05	Indoor unit I setting temperature	0 – 127	0.5°C	1	05H command	
06	Indoor unit I Operation mode/Air capacity	0 – 500	–	2	0	Not used (Data not received)
					200	Cooling stop 0-speed
					210	Cooling operation (pump stop)
					214	Cooling operation (pump operation)
					300	Pump stop
					314	Pump operation
					400	Heating stop
					410	Heating operation (pump stop)
					414	Heating operation (pump operation)
07	Indoor unit 1 Demand compressor speed	0 – 255	1 rps	1		
08	Indoor unit 1 Answer compressor speed	0 – 255	1 rps	1		
09	Indoor unit 1 Indoor local	—	—	1	Bit0	Anti-frost
					Bit1	Aperture command ON
10	Indoor unit 1 Thi spare	-10 – 52	1°C	1	Outlet water temperature	
11	Indoor unit 1 Model	0 – 85	—	1	22	HMU
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
53	Comp Target TEMP	00 – 1270	5	2	Display 10 times the value (°C)

14. SERVICE

Refer to technical manual '14 • KX-T-223 and '21 • KX-T-378 basically.

Regarding some difference between HMU and air-conditioner, refer to this manual.

14.1 Contents of troubleshooting

(a) List of inspection displays

1) Indoor and outdoor units

Remote control error code	7-segment display	Name of inspection	Classification	Page
E7	–	Indoor inlet water temperature sensor anomaly (Thi-A)	Sensor wire breakage	153
E9	–	Water heat exchanger freeze error	System error	154
E15	–	Indoor outlet water temperature sensor anomaly (Thi-AF)	Sensor wire breakage	155
E16	–	Water pump interlock error	Water pump	156
E22	–	HMU misconnection detection	Site setting error	157

Error code	LED	Green	Red	Content
Remote control: E7 7-segment display: –	Indoor	Keeps flashing	1-time flash	Indoor inlet water temperature sensor anomaly (Thi-A)
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

HMU

2. Error detection method

Detection of anomalously low temperature (resistance) of Thi-A.

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.
- Or if 48°C or higher is detected for 5 seconds continuously.

4. Presumable cause

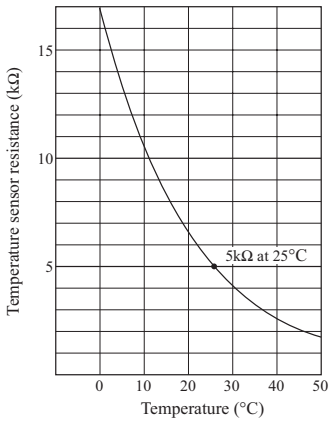
- Anomalous connection of indoor inlet water temperature sensor
- Indoor inlet water temperature sensor anomaly
- Indoor unit control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Is the connector of sensor connected properly ? — NO	Insert the connector securely.
YES → Regarding the characteristics of the sensor, see the following chart.	
Are the characteristics of sensor OK? *1 — NO	Replace sensor (Thi-A).
YES	Replace indoor unit control PCB.

*1 Check several times to prove any poor connection

Temperature-resistance characteristics of indoor inlet water temperature thermistor (Thi-A)



Note:

Error code	LED	Green	Red	Content
Remote control: E9 7-segment display: –	Indoor	Keeps flashing	1-time flash	Water heat exchanger freeze error
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

HMU

2. Error detection method

Out-/inlet water temperature sensor (Thi-A or AF) has detected unusually low temperature.
Indoor heat exchanger sensor (Thi-R1, R3) has detected unusually low temperature.

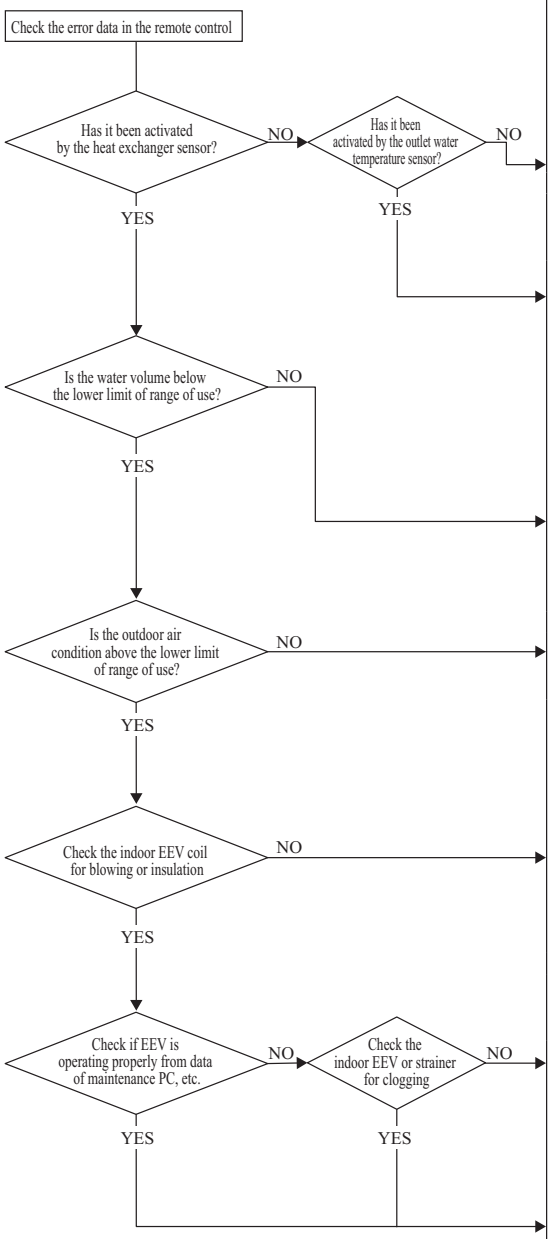
3. Condition of error displayed

- Outlet or inlet water sensor has detected lower than 2ºC for 5 seconds continuously, and that the thermostat has been turned OFF 5 times within 60 minutes.
- Indoor heat exchanger temperature sensor has detected lower than the freeze detection temperature for 30 seconds continuously, and that the thermostat has been turned OFF 5 times within 60 minutes.

4. Presumable cause

- Inlet water temperature/water temperature runout from usage limit
- Outdoor temperature condition runout from usage limit
- HMU connection capacity runout from usage limit
- Indoor EEV closure (Operation failure, connector disconnection)
- Clogged indoor refrigerant circuit (EEV, strainer, water heat exchanger)

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E15 7-segment display: –	Indoor	Keeps flashing	1-time flash	Indoor outlet water temperature sensor anomaly (Thi-AF)
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

HMU

2. Error detection method

Detection of anomalously low temperature (resistance) of Thi-AF.

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.
- Or if 48°C or higher is detected for 5 seconds continuously.

4. Presumable cause

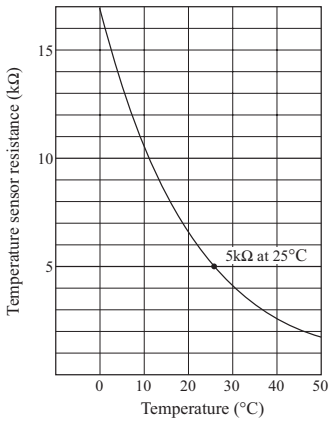
- Anomalous connection of indoor outlet water temperature sensor
- Indoor outlet water temperature sensor anomaly
- Indoor unit control PCB anomaly

5. Troubleshooting

Diagnosis	Countermeasure
Is the connector of sensor connected properly ? — NO	Insert the connector securely.
YES → Regarding the characteristics of the sensor, see the following chart.	
Are the characteristics of sensor OK? *1 — NO	Replace sensor (Thi-AF).
YES	Replace indoor unit control PCB.

*1 Check several times to prove any poor connection

Temperature-resistance characteristics of indoor outlet water temperature sensor (Thi-AF)



Note:

Error code	LED	Green	Red	Content
Remote control: E16 7-segment display: –	Indoor	Keeps flashing	1-time flash	Water pump interlock error
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

HMU

2. Error detection method

Water pump interlock wiring

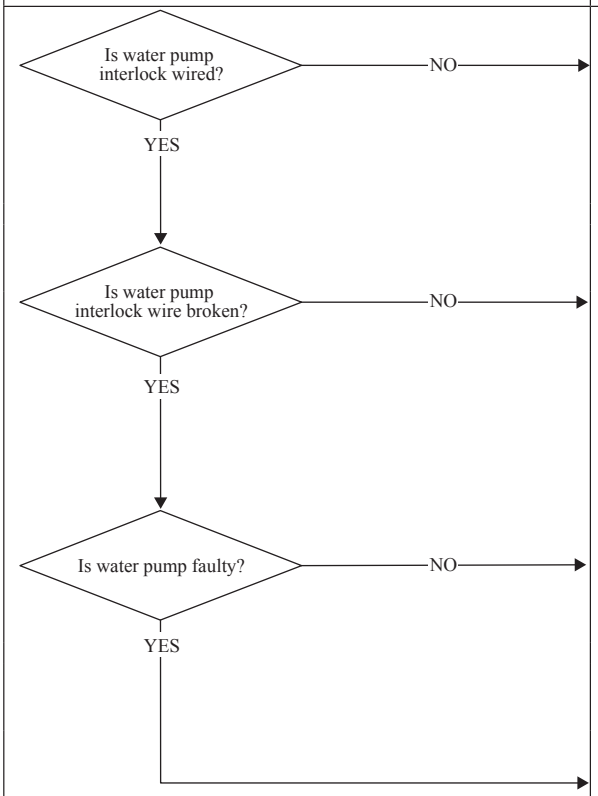
3. Condition of error displayed

When the wiring of water pump interlock has been opened for more than 3 seconds.

4. Presumable cause

- Broken wire of water pump interlock
- Error on water pump

5. Troubleshooting



Note:

Error code	LED	Green	Red	Content
Remote control: E22 7-segment display: –	Indoor	Keeps flashing	1-time flash	HMU misconnection detection
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model

HMU

2. Error detection method

When the outdoor unit is not adapted to HMU.

3. Condition of Error displayed

When it has detected for 5 minutes continuously that it is connected to outdoor unit which is not adapted to HMU.

4. Presumable cause

- Outdoor unit is not adapted to HMU.
- Software version of outdoor unit is too old.

5. Troubleshooting

Diagnosis	Countermeasure
Is outdoor unit adapted to HMU? — NO	Change the outdoor unit to the one adapted to HMU.
YES	Check the software version of outdoor PCB.

Note:

14.2 Component replacement procedure

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 the electrical equipment according to this procedure.
If the electrical equipment is incorrectly replaced, 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 electrical equipment.
The electrical equipment replacement under current-carrying will cause an electric shock or fire.
・After finishing replacement, check that wiring is correctly connected with the electrical equipment before power distribution. If the electrical equipment is incorrectly replaced, it will cause an electric shock or fire.

⚠CAUTION

・To prevent electric shock, bundle the wiring so that it does not become tight.

【Replacement procedure】

Replacement parts

1.Control PCB	2.Water pump	3.Flow switch	4.Release valve	
5.Safety valve	6.Electronic expansion valve	7.Plate heat exchanger		

(0) Open Front cover

(a) Remove 5 screws from the bottom part of the HMU.(○mark,Fig.2)
(b) Remove the 2 thumbscrews from the top of the HMU.(○mark,Fig.3)
(c) Remove front cover.

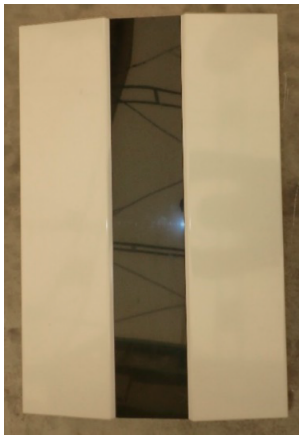


Fig1. Front

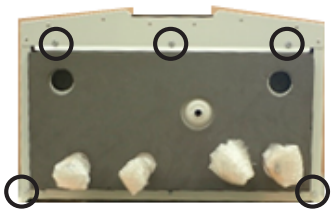


Fig2. Bottom part

Fig3. Top

Fig4. HMU with cover removed

(1) Control PCB

(a)Removing control lid

① Remove 2 lid fixing screws.(○mark,Fig.5) Loosen 2 lid fixing screws.(☐mark,Fig.5)

② Remove control lid.

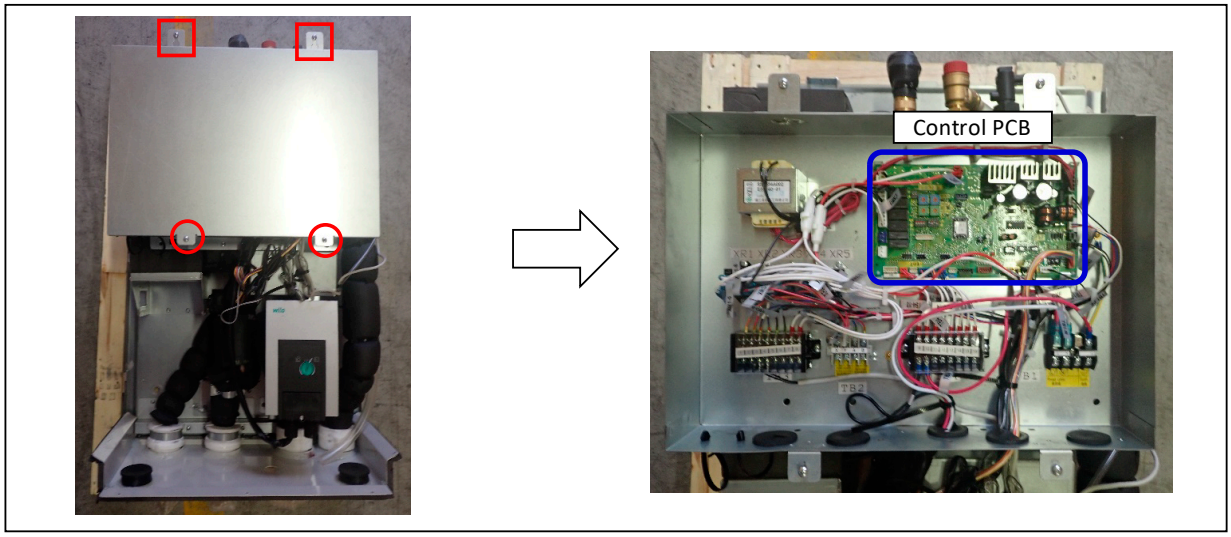


Fig5. Removing control lid

(b)Removing control PCB

① Remove all connectors on control PCB.

② Take off the PCB from locking supports.

There're 4 locking supports on the PCB. (○ mark, Fig.6)

(c) Attach new control PCB

① Set the DIP switches of the new PCB to match the PCB before replacement.(☐ mark, Fig.6)

② Attach new PCB to locking supports.

③ Reconnect all connectors as before.

※Be careful not to make connectors half-inserted.

(d) Attach the lid of the control box as before.

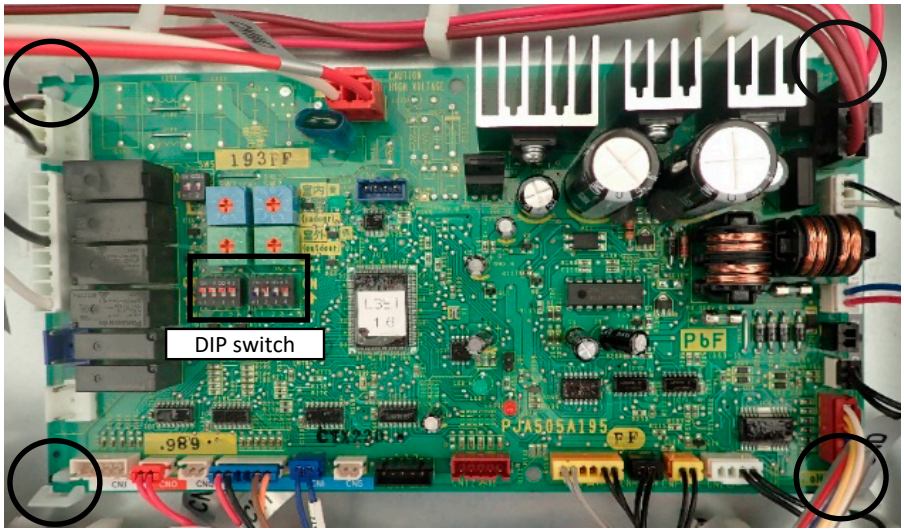


Fig6. Control PCB

(2) Water pump

(a) Loosen the screws and remove the power connections.(○ mark, Fig.7)
(b) Remove 3 screws and bracket.(☐ mark, Fig.7)
(c) Remove 4 screws and 2 clamps.(○ mark, Fig.8)
(d) Remove the insulation and insulation rubbers.(○ mark, Fig.9)
(e) Loosen the nut and remove the pump.(☐ mark, Fig.10)
(f) Attach new water pump.
(g) Attach parts as before.

※When replacing the water pump, be sure to install the gasket at the pump connection.(☐ mark, Fig.11)
※Nut tightening torque : 43.5 − 48.5N・m

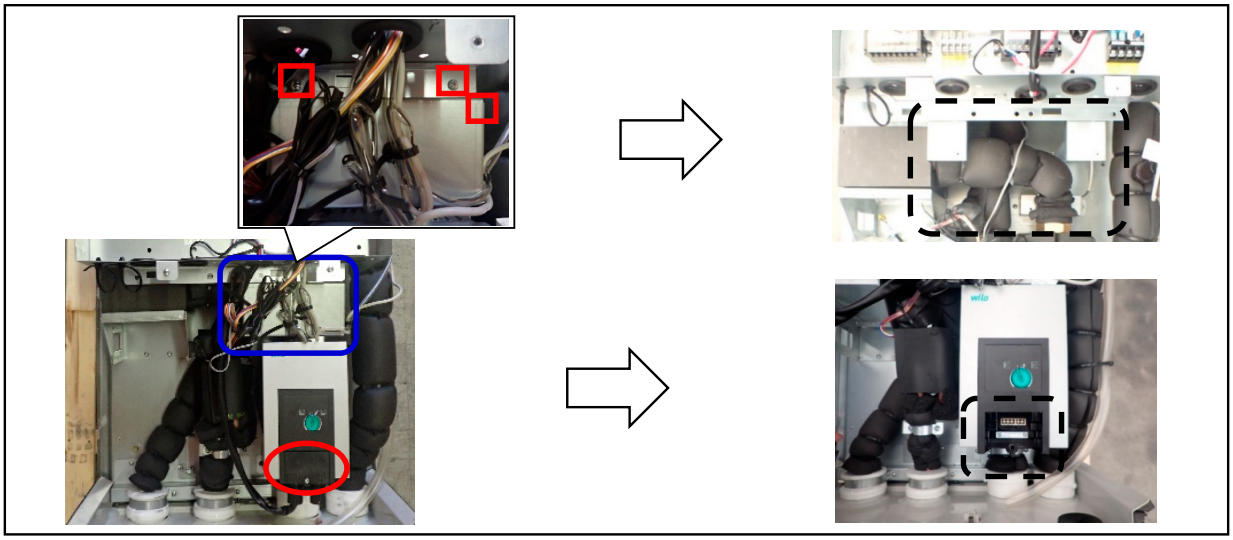


Fig7. Removing power connections and bracket

Fig8. Removing clamps

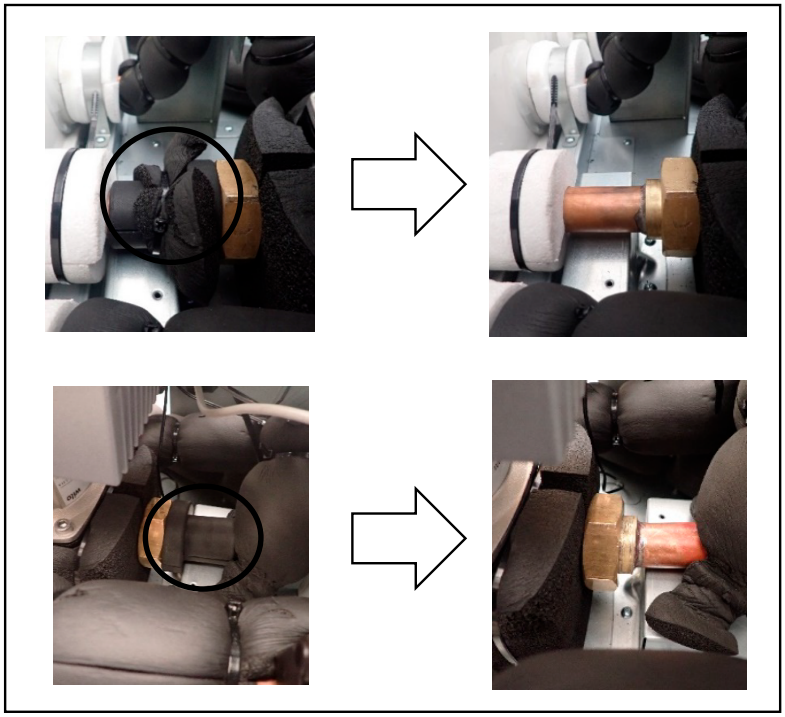


Fig9. Removing insulation and insulation rubbers

(a)Wrench position for upper nut

(b)Wrench position for lower nut

Fig10. Loosen the nut

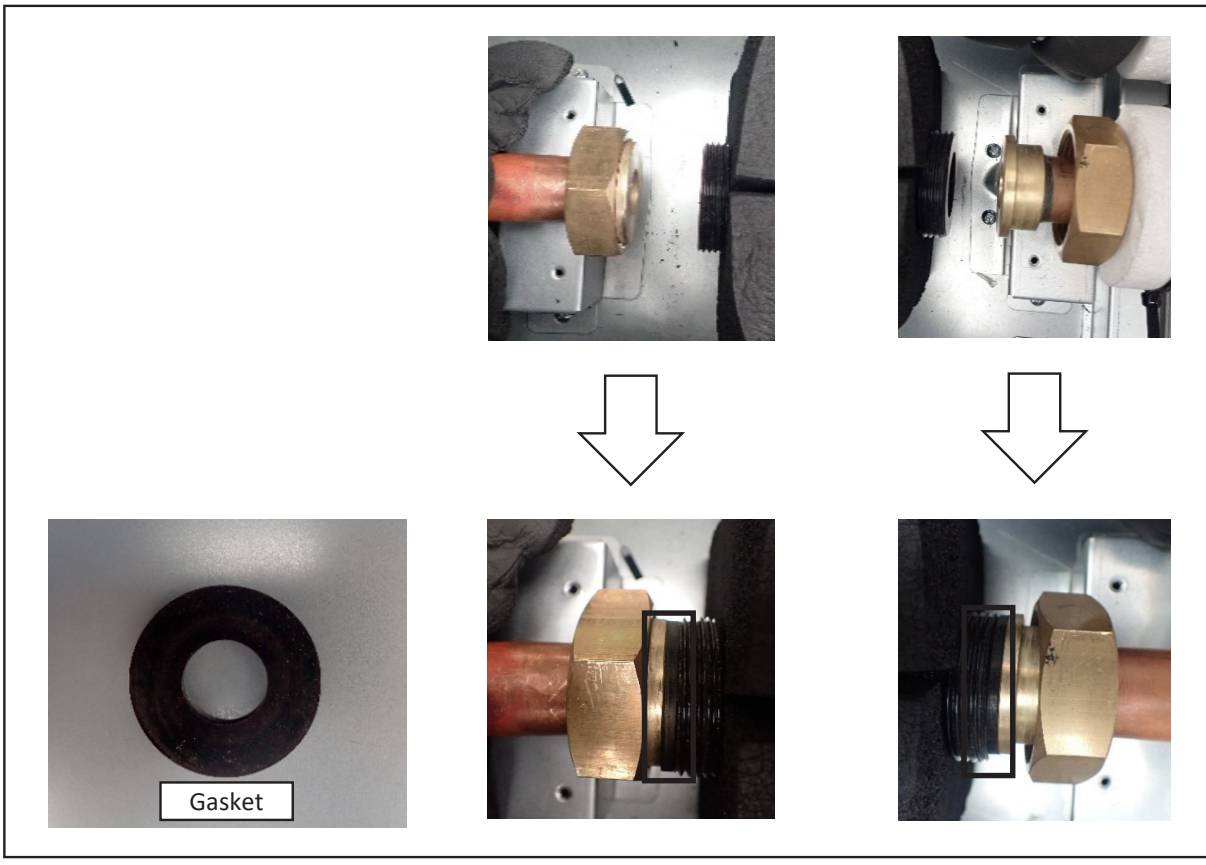


Fig11. Install the gasket

(3) Flow switch

(a) Remove the flow switch terminal screws from control box.(○ mark, Fig.13)

(b) Loosen the nut under the flow switch. Remove the flow switch.(□ mark, Fig.14)

(c) Attach new flow switch.

(d) Attach parts as before.

※When replacing flow switch,be careful flow direction.Be sure to attach the rubber ring.

※The installation angle must be within 10°of the flow direction.

※Tightening torque ： 3.0 ± 0.5N・m

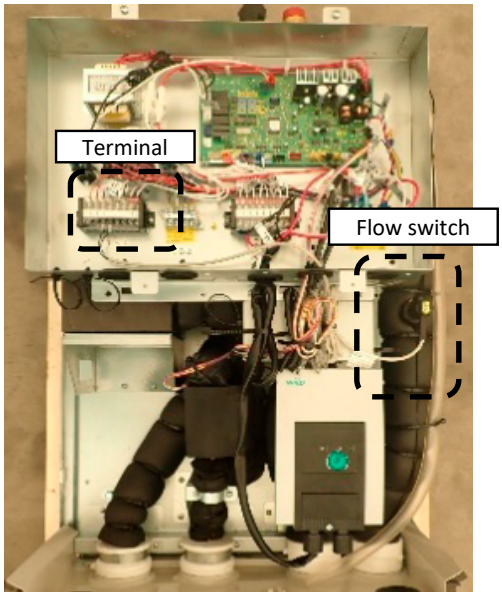


Fig12.Flow switch and terminal locations

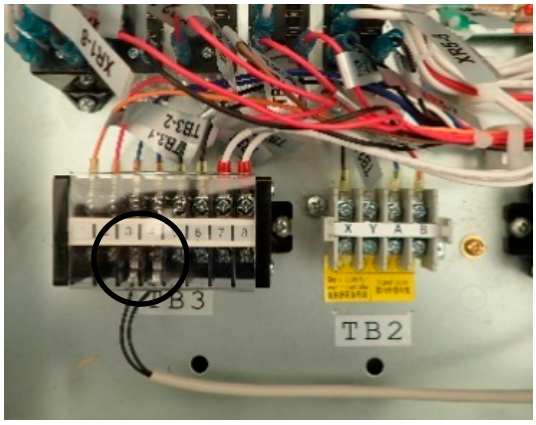


Fig13. Removing terminal screws

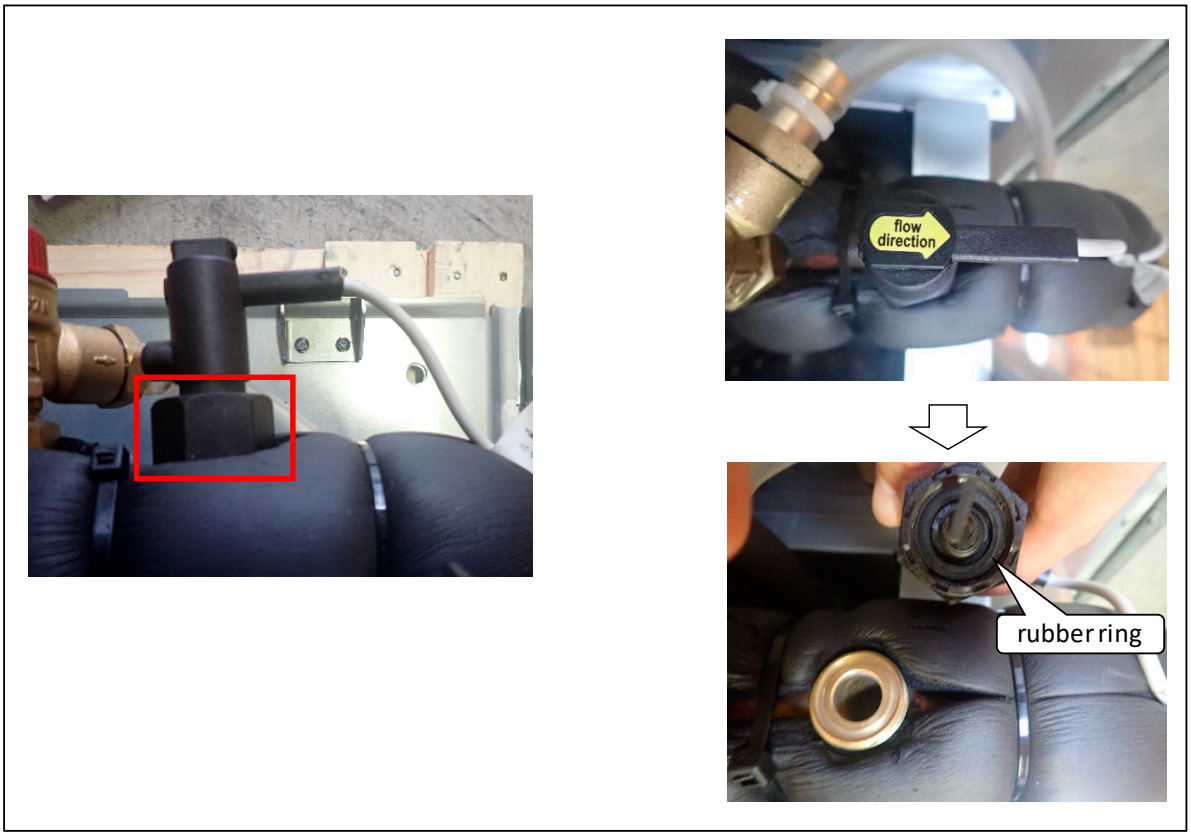


Fig14. Removing flow switch

(4) Release valve

(a) Loosen the release valve and remove the release valve.(Fig.16)

(b) Attach new release valve.

(5) Safety valve

(a) Loosen the nut under the safety valve.Remove the safety valve.(Fig.16)

(b) Attach new safety valve.

※When replacing the safety valve, be sure to install the gasket at the valve connection.(☐ mark, Fig.16)

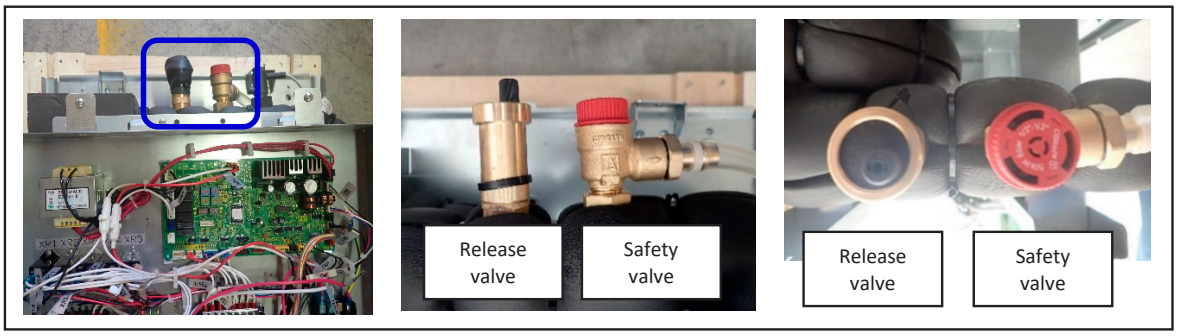


Fig15.Release valve and safety valve locations

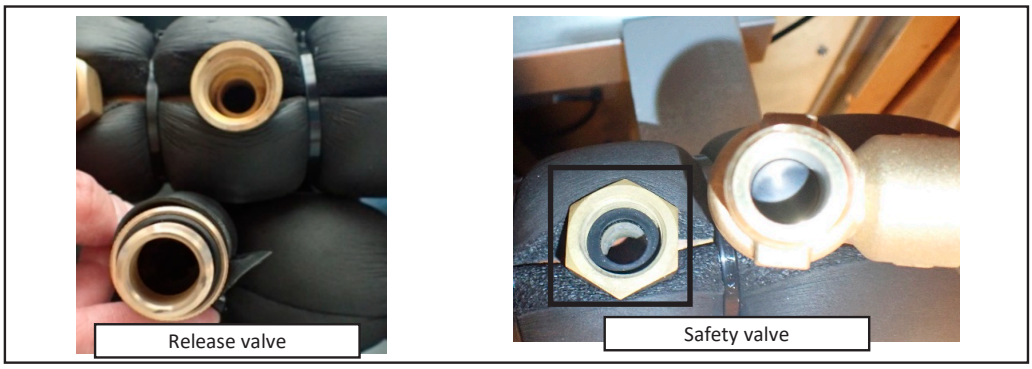


Fig16.Removing release valve and safety valve

(6) Electronic expansion valve

(a) Remove the insulation.

(b) Remove the coil cover and the electronic expansion valve coil.(○ mark, Fig.17)

(c) Remove the brazing part. (☐ mark, Fig.18)

(d) Remove the electronic expansion valve.

(e) Braze the new electronic expansion valve. (☐ mark, Fig.18)

(f) Attach parts as before.

※When removing or brazing the electronic expansion valve, keep the body temperature below 120 °C.

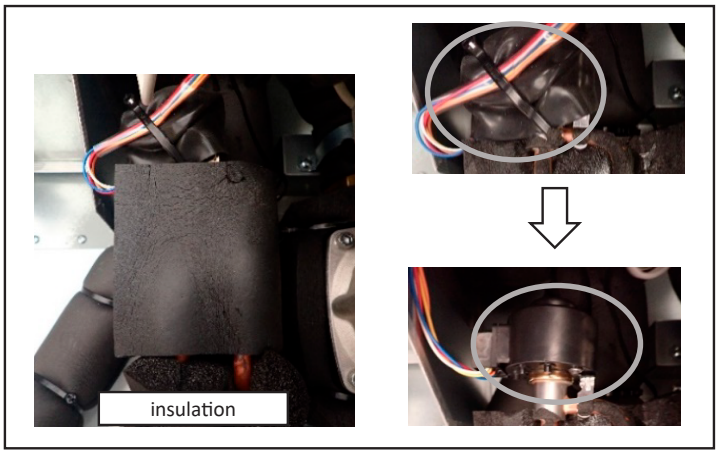


Fig17.Removing insulation and electronic expansion valve coil

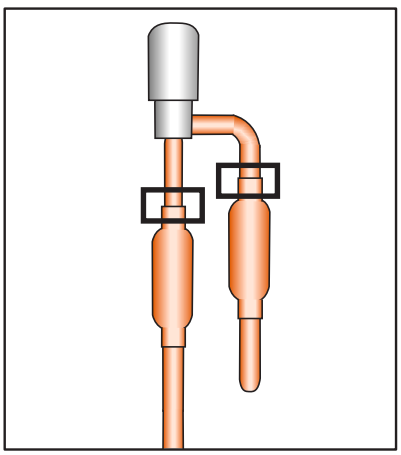


Fig18.Removing the brazing part

(7) Plate heat exchanger

(a)Removing control box

① Loosen the screws and remove the power connections.(☐ mark, Fig.19)

② Remove 4 screws. Remove the control box.(○ mark, Fig.19)

(b)Removing Flow switch ※Refer 3-(a),(b).

(c)Removing Release valve ※Refer 4-(a).

(d)Removing Safety valve ※Refer 5-(a).

(e)Removing plate heat exchanger

① Remove 8 screws. Remove 4 brackets.(○ mark, Fig.20-1)

② Remove the insulation.

③ Remove the brazing in 3 places. Loosen the nut.(○ mark,☐ mark Fig.20-2)

(f)Attach new plate heat exchanger

① Braze 3 places. Tighten the nut.(○ mark,☐ mark Fig.20-2)

② Attach parts as before.

※When removing or brazing the plate heat exchanger, keep the body temperatue below 120 °C.

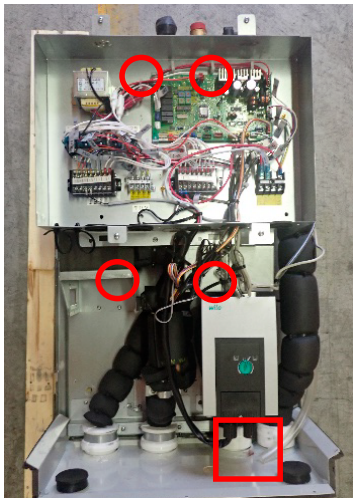


Fig19. Removing control box

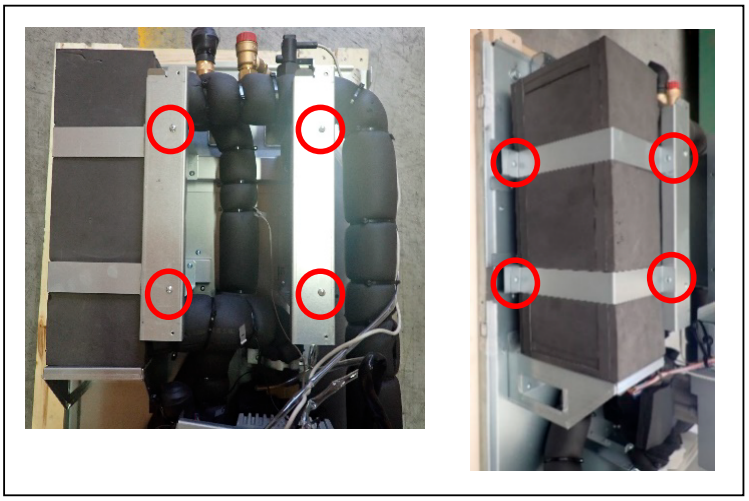
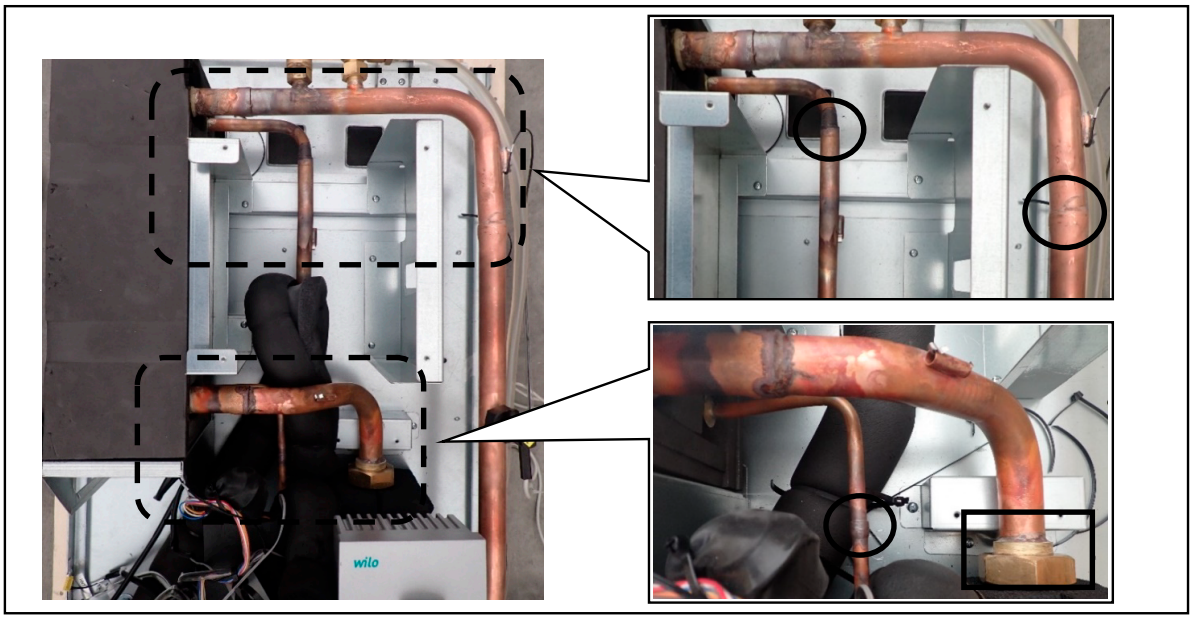


Fig20-1. Removing plate heat exchanger



14.3 Disassembly procedure

MCD012D004

⚠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(HMU series)

【Diassembly procedure】

Replacement parts

1.Control PCB	2.Water pump	3.Flow switch	4.Release valve	5.Safety valve
6.Electronic expansion valve	7.Plate heat exchanger	8.Temperature sensor		

(0) Open Front cover

(a) Remove 5 screws from the bottom part of the HMU.(○mark,Fig.2)

(b) Remove the 2 thumbscrews from the top of the HMU.(○mark,Fig.3)

(c) Remove front cover.

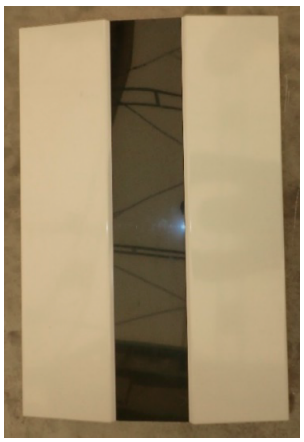


Fig1. Front

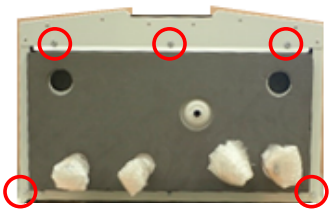


Fig2. Bottom part

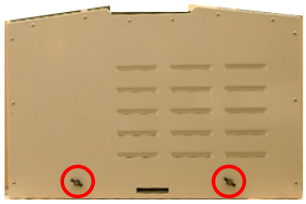


Fig3. Top

Fig4. HMU with cover removed

(1) Control PCB

(a)Removing Control lid

① Remove 2 lid fixing screws.(○mark,Fig.5) Loosen 2 lid fixing screws.(□mark,Fig.5)

② Remove Control lid.

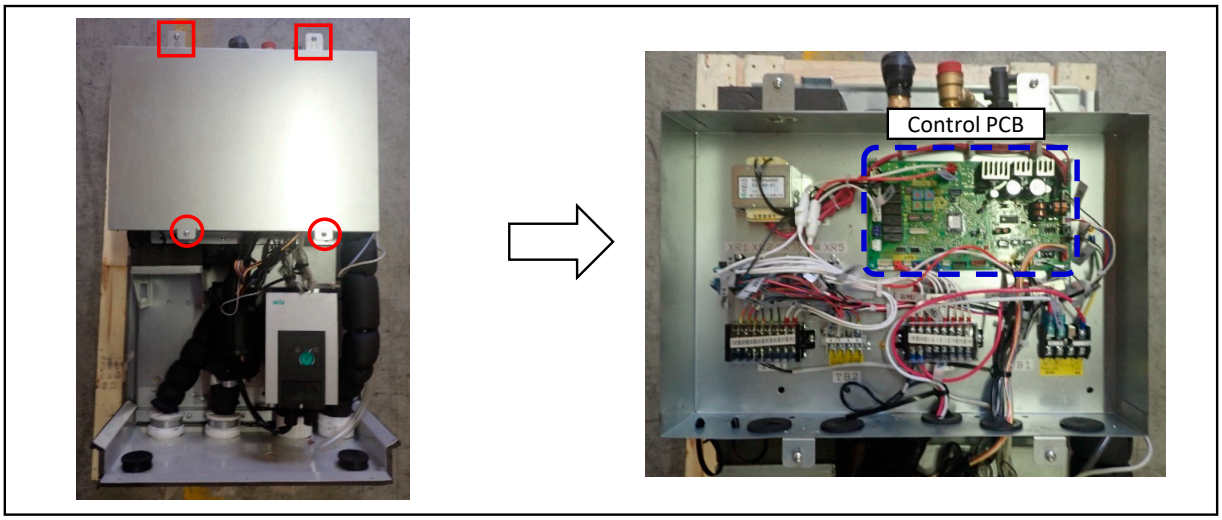


Fig5. Removing control lid

(b)Removing control PCB

① Remove all connectors on control PCB.

② Take off the PCB from locking supports.
There're 4 locking supports on the PCB. (○ mark, Fig.6)

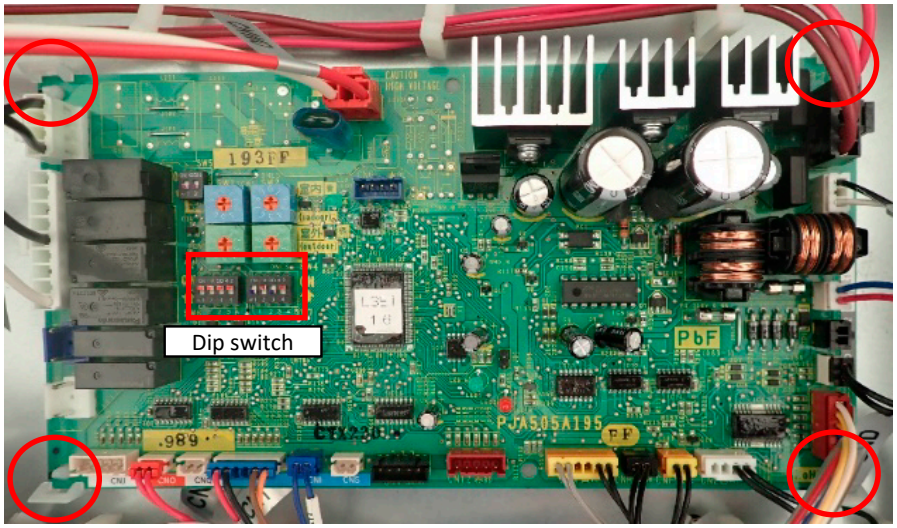


Fig6. Control PCB

(2) Water pump

(a) Loosen the screws and remove the power connections.(○ mark, Fig.7)
(b) Remove 3 screws and bracket.(□ mark, Fig.7)
(c) Remove 4 screws and 2 clamps.(○ mark, Fig.8)
(d) Remove the insulation and insulation rubbers.(○ mark, Fig.9)
(e) Loosen the nut and remove the pump.(□ mark, Fig.10)

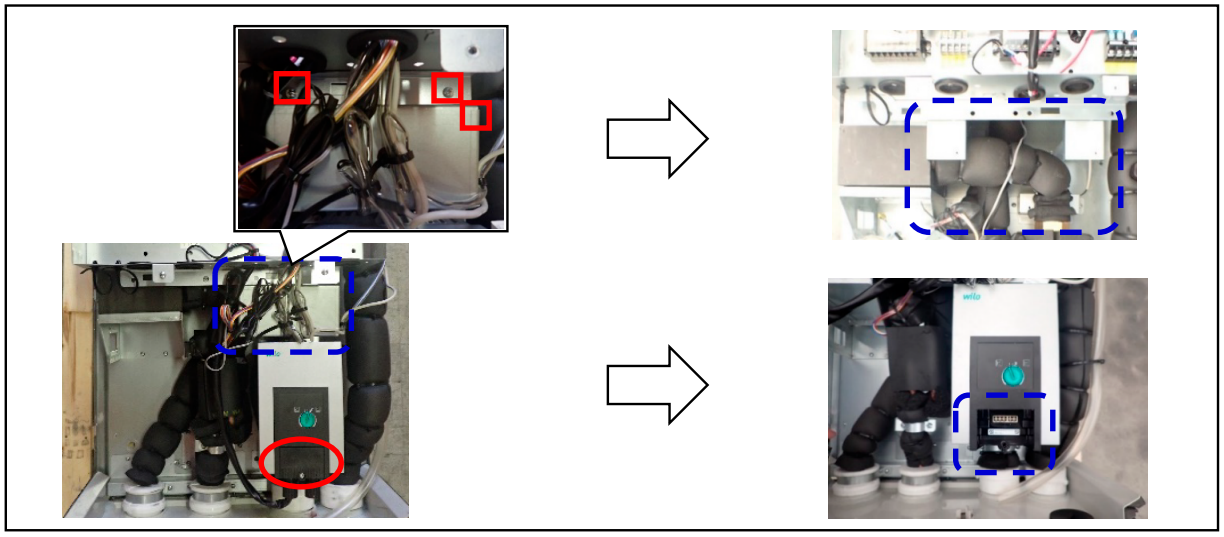


Fig7. Removing power connections and bracket

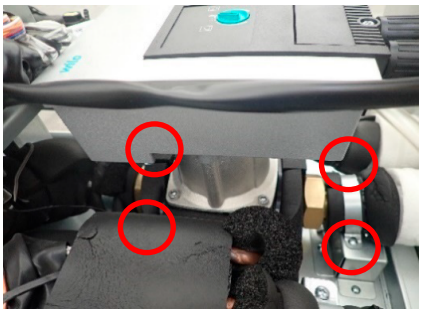


Fig8. Removing clamps

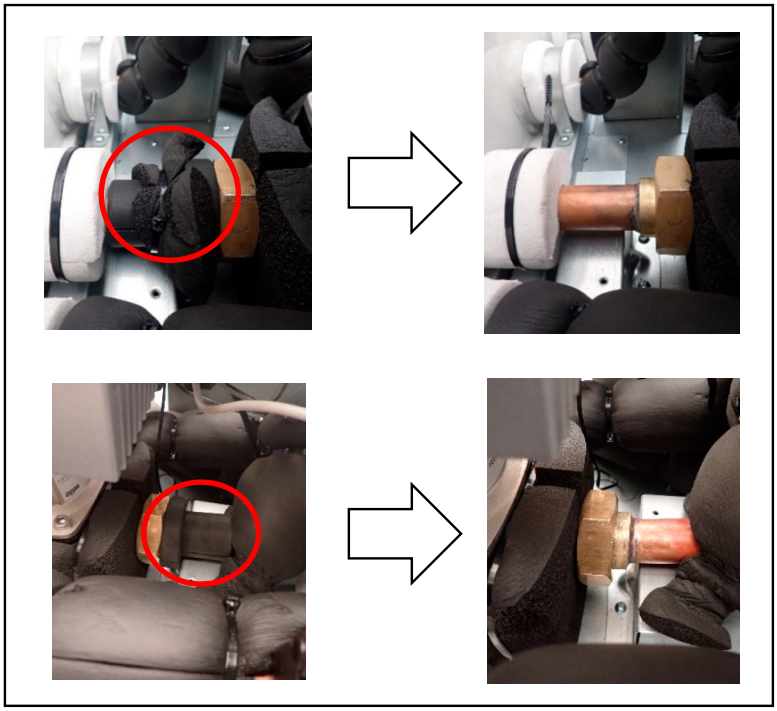
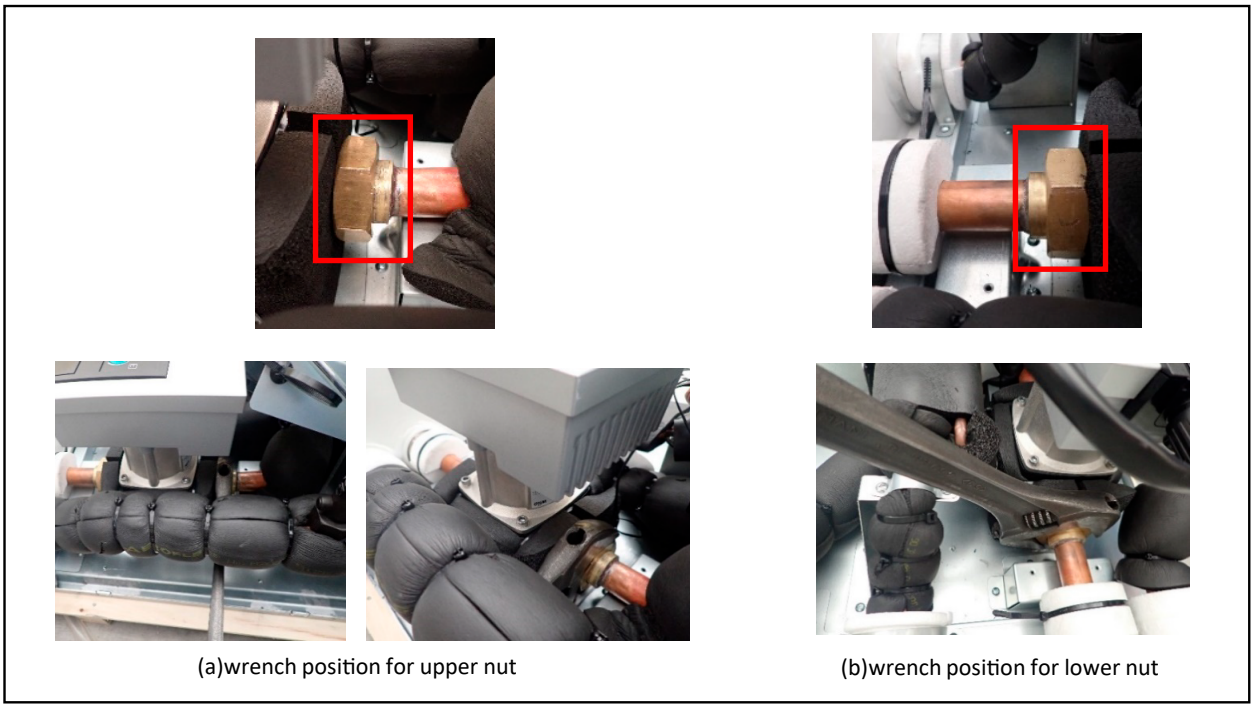


Fig9. Removing insulation and insulation rubbers



(a)wrench position for upper nut

(b)wrench position for lower nut

Fig10. Loosen the nut

(3) Flow switch

(a) Remove the flow switch terminal screws from control box.(○ mark, Fig.13)

(b) Loosen the nut under the flow switch. Remove the flow switch.(☐ mark, Fig.14)

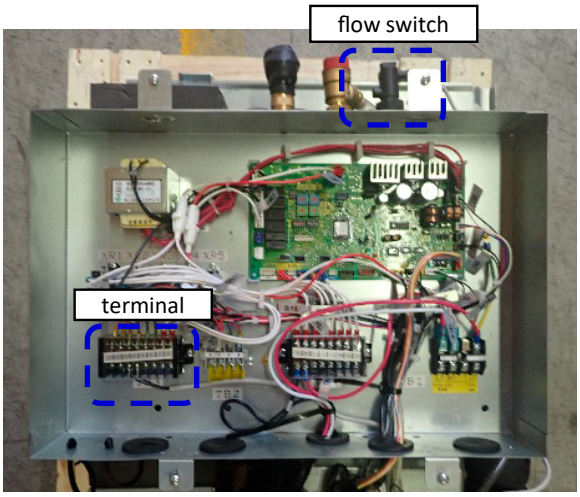


Fig12.Flow switch and terminal Locations

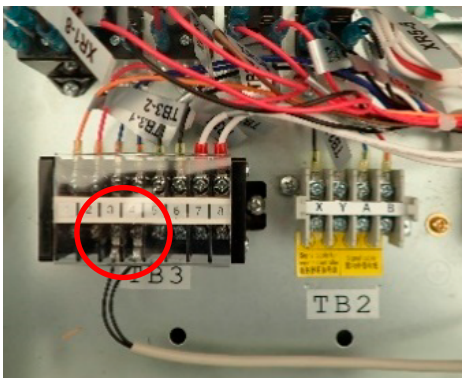


Fig13. Removing terminal screws

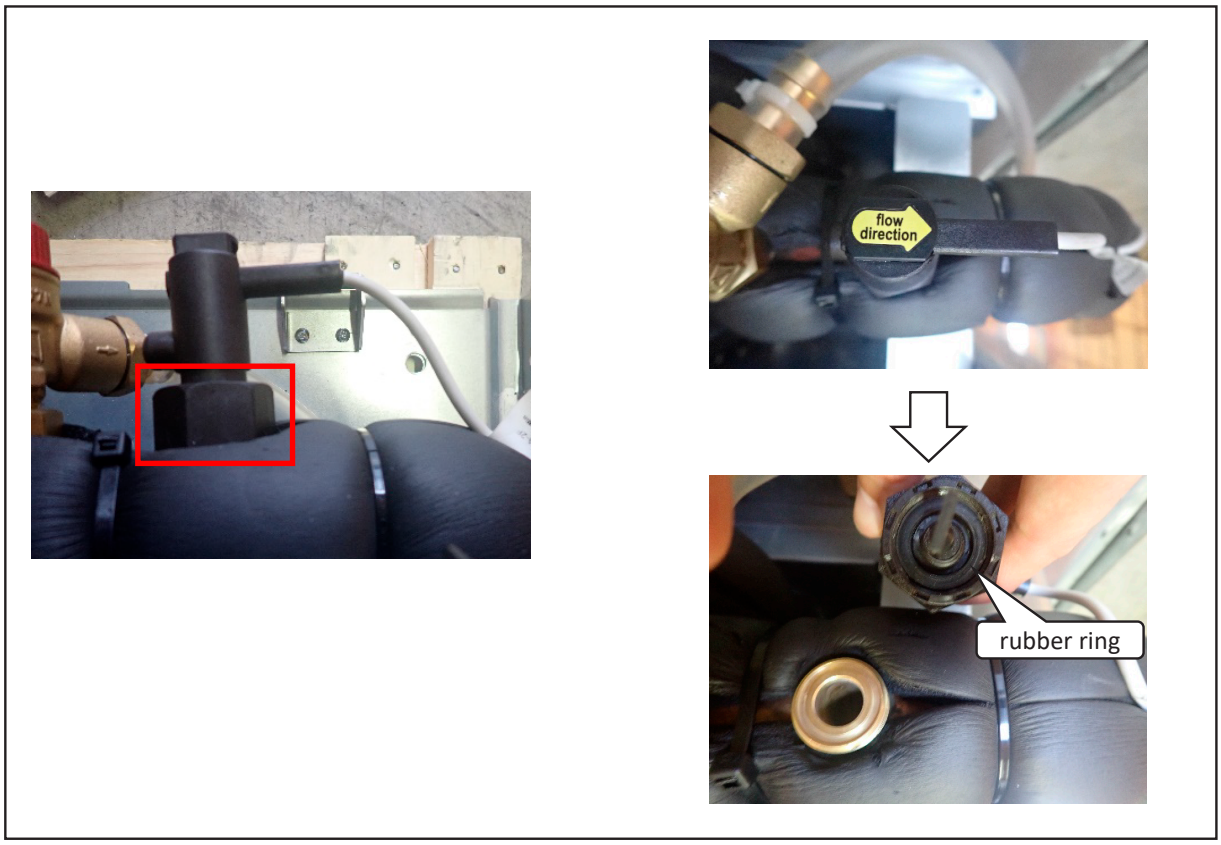


Fig14. Removing flow switch

(4) Release valve

(a) Loosen the release valve and remove the release valve. (Fig.16)

(5) Safety valve

(a) Loosen the nut under the safety valve. Remove the safety valve. (Fig.16)

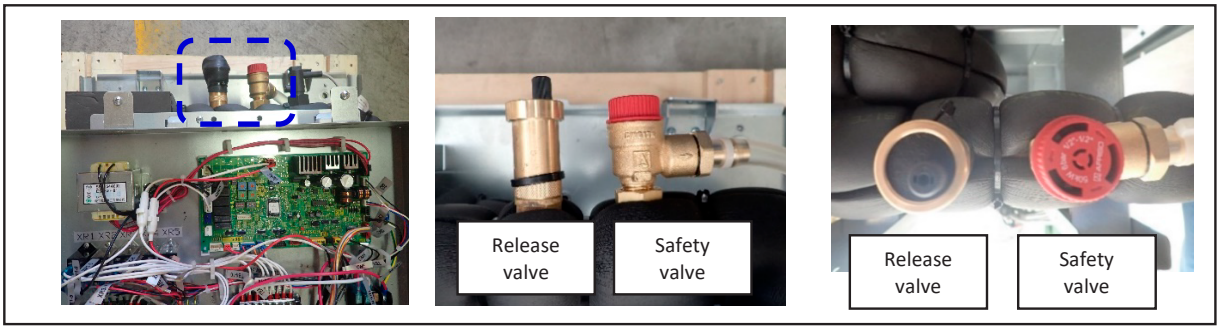


Fig15.Release valve and Safety valve Locations

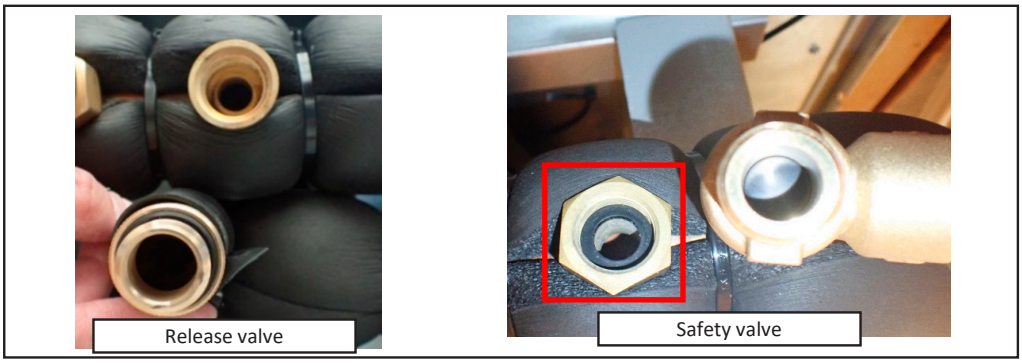


Fig16.Removing release valve and safety valve

(6) Electronic expansion valve

(a) Remove the insulation.

(b) Remove the coil cover and the electronic expansion valve coil.(○ mark, Fig.17)

(c) Remove the brazing part. (☐ mark, Fig.18)

(d) Remove the electronic expansion valve.

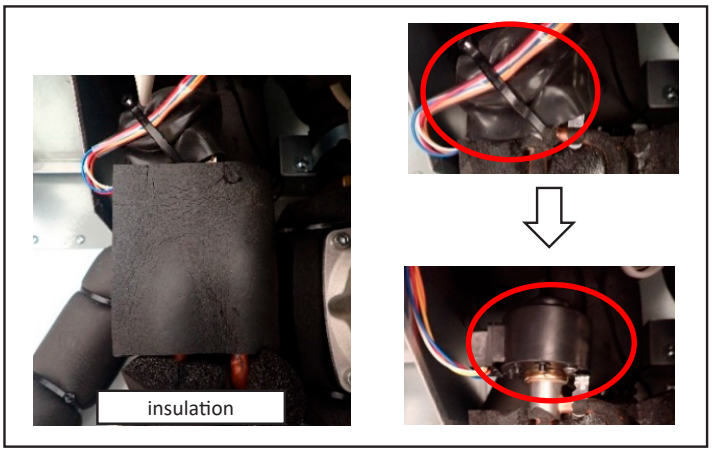


Fig17.Removing insulation and electronic expansion valve coil

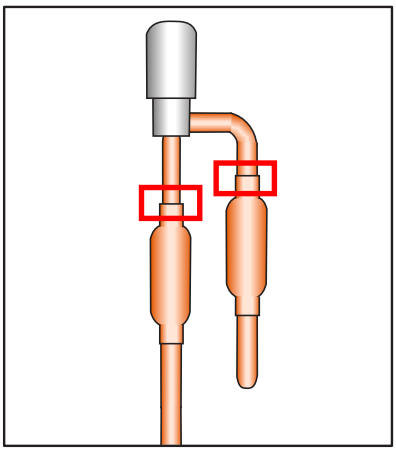


Fig18.Removing the brazing part

(7) Plate heat exchanger

(a)Removing control box

① Loosen the screws and remove the power connections.(☐ mark, Fig.19)

② Remove 4 screws. Remove the control box.(○ mark, Fig.19)

(b)Removing flow switch ※Refer 3-(a),(b).

(c)Removing release valve ※Refer 4-(a).

(d)Removing safety valve ※Refer 5-(a).

(e)Removing plate heat exchanger

① Remove 8 screws. Remove 4 brackets.(○ mark, Fig.20-1)

② Remove the insulation.

③ Remove the brazing in 3 places. Loosen the nut.(○ mark,☐ mark Fig.20-2)

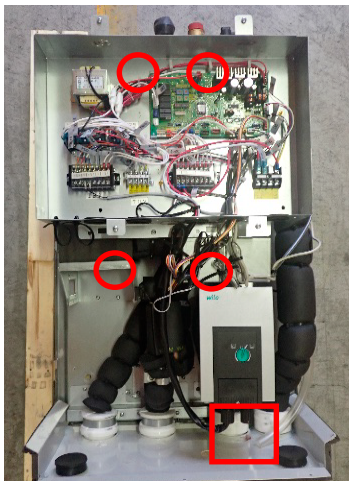


Fig19. Removing control box

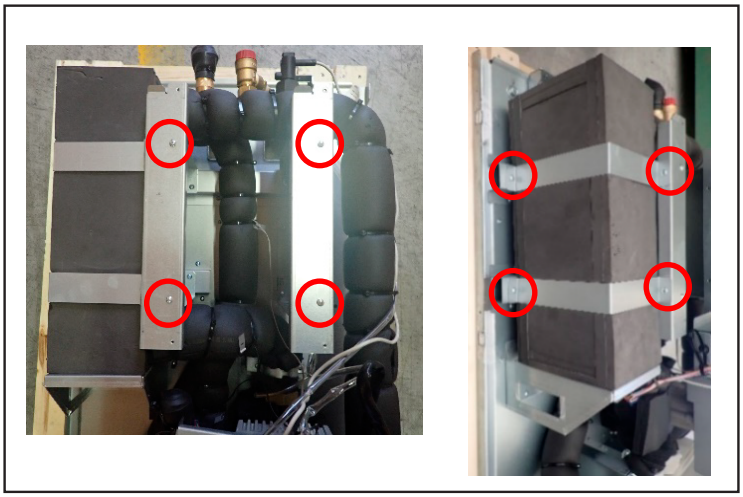


Fig20-1. Removing plate heat exchanger

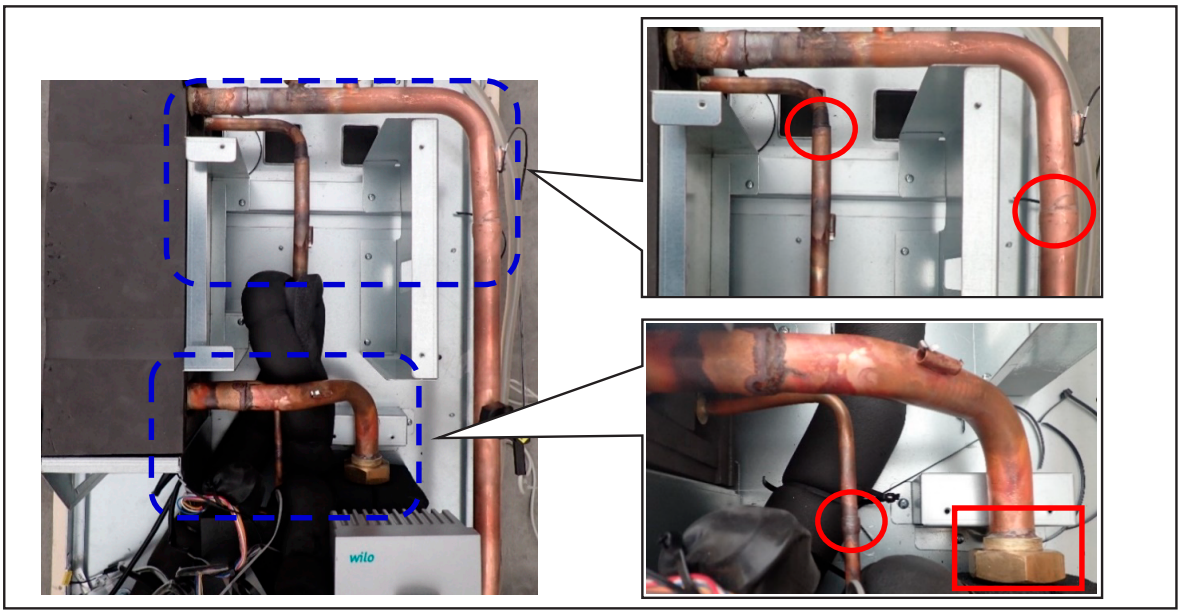


Fig20-2. Removing plate heat exchanger

(8) Temperature sensor (Thi-R1, R3, A, AF)

(a) Disconnect the Thi-R1, R3, A, AF connector (CNN, CNH, CNF) on PCB in control box. (○ mark, Fig.21-1)

(b) Pull the temperature sensor fixing clip and remove it. (○ mark, Fig.21-2)

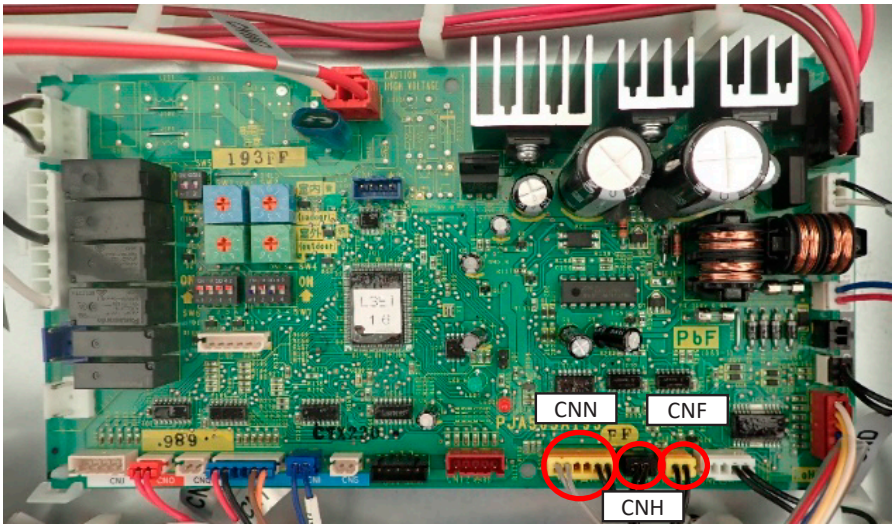


Fig21-1. Control PCB

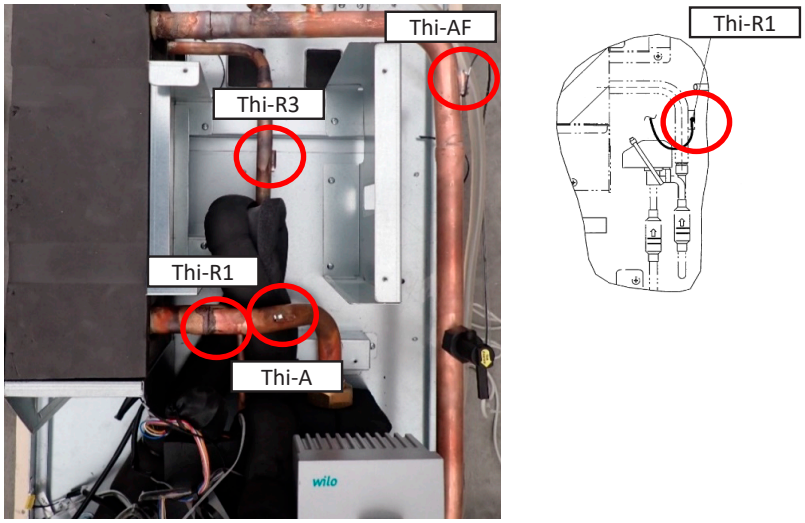


Fig21-2. Removing temperature sensors

HYDRO MODULE UNIT

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