



TECHNICAL MANUAL

HYDRO MODULE UNIT

HMU-KIT-1

· Notes:

- (1) Regarding the outdoor unit KXZE1 series, refer to the No.'14 · KX-DB-201 and No.'14 · KX-SM-202.
- (2) Regarding the outdoor unit KXZXE1 series, refer to the No.'14 · KX-DB-203 and No.'14 · KX-SM-204.
- (3) Regarding the indoor unit KXZ series, refer to the No.'17 · KX-T-266.

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1. OVERALL CONFIGURATION OF HMU-KIT

1.1 Explanation of product

1.1.1 What is the hydro module unit? (Hydro module unit = HMU)

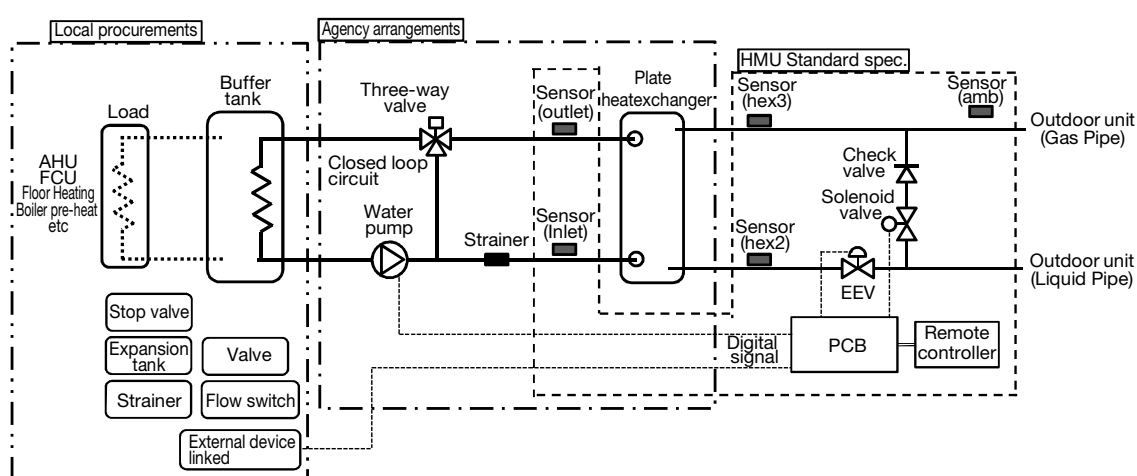
This unit is an auxiliary device for use with the VRF type multi systems to control water temperatures.

It employs the plate heat exchanger in place of fin heat exchanger, and produces cold or hot water by exchanging heat between refrigerant and water.

Since it can produce hot or cold water using the VRF type multi systems as the heat source, it allows to configure a chiller system in a simple way on the one hand. On the other, it can expand the range of applications of air-conditioner because it can be used mixed with the multiple indoor unit for building.

1.1.2 What is HMU-KIT?

HMU-KIT is a control kit to control a refrigerant system of HMU connected to KXZ-series outdoor units. (Refer to the figure below in detail.)



- HMU-KIT is configured as follows.

Type	Description	Purpose
HMU-KIT	Control box	EEV control, communication with outdoor unit
EEV6-160-E/A	Expansion valve set (14.0 kW)	One set is required for each control box
EEV6-280-E/A	Expansion valve set (28.0 kW)	

- HMU-KIT is the control box only. Ancillary parts is needed to be procured separately.
- EEVSET is composed of the expansion valve, expansion valve coil and strainer. It is selected from two types depending on the capacity of heat exchanger.
- HMU-KIT is used in combination with KXZ outdoor unit.

Type	Description	Purpose
FDC-KXZ1	KXZ Series outdoor unit	Mixed operation only (*)
FDC-KXZEX1	KXZ-X Series outdoor unit	HMU only operation and mixed operation

Mixed operation means air to air indoor unit and HMU operate simultaneously.

(*) HMU only operation can be used with additional limitation.

Please refer to section 3.5.

- HMU-KIT can be connected to Superlink system.
- Following remote controller can be used.

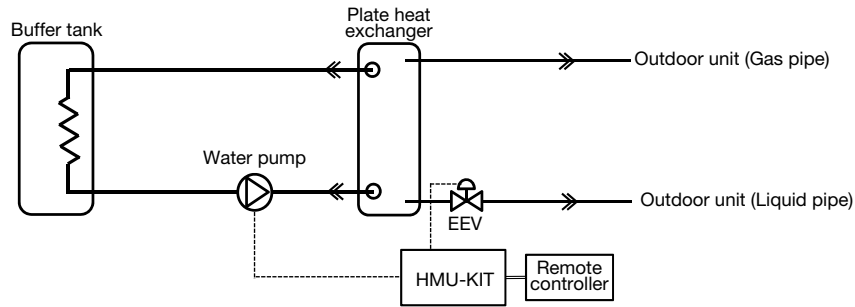
Type	Description	Purpose
RC-EX3H	Remote controller	Exclusive model for HMU

- It can output the start/stop command to the water pump.
- It can select the remote controller sensor temperature control, inlet water temperature control and outlet water temperature control.

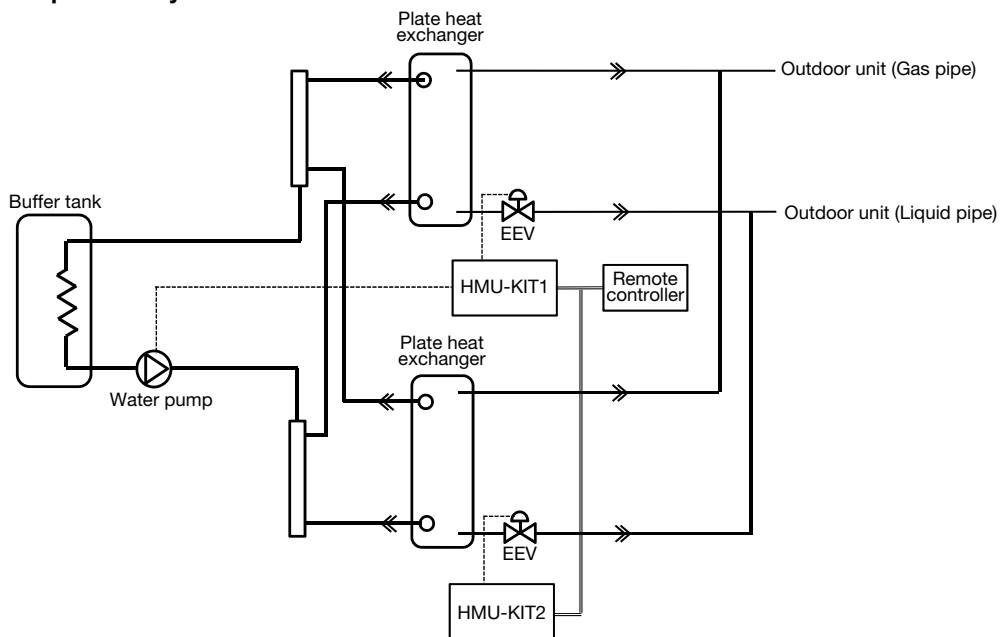
1.1.3 HMU-KIT system

Use one water circuit for each refrigerant system.

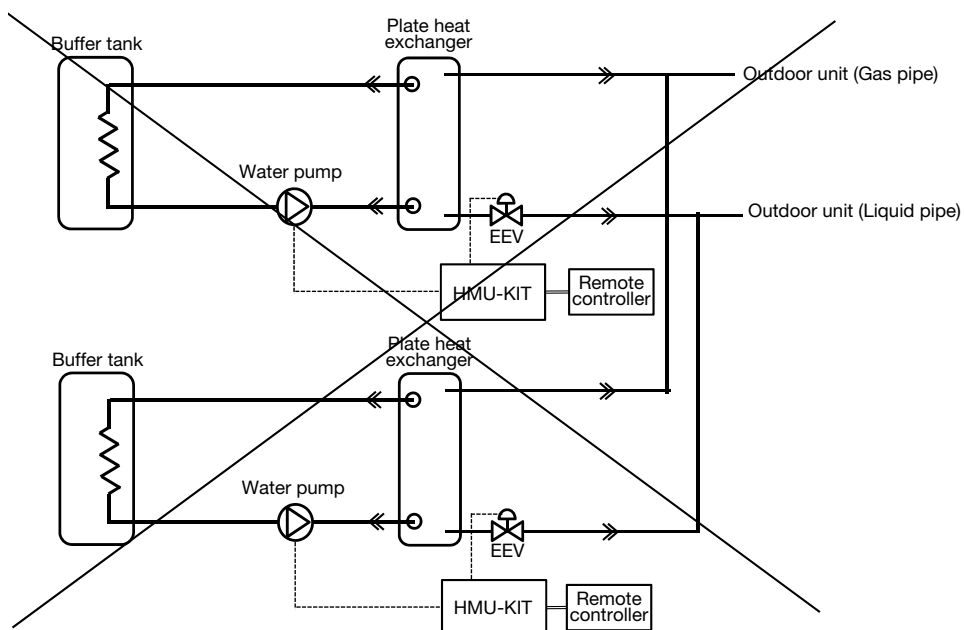
(1) 1 HMU system



(2) Multiple HMU system



Note) HMU-KIT1 and HMU-KIT2 can be set each different set point to operate gradually.



Note) Two or more water circuits cannot be used in one refrigerant system.

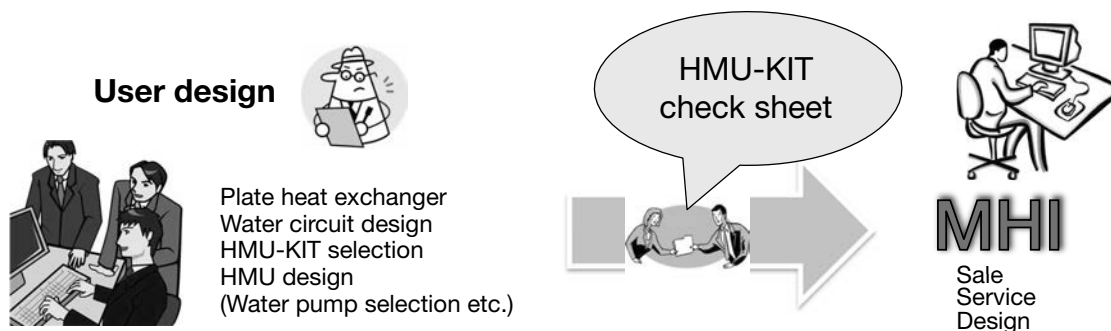
1.1.4 List of main functions of HMU-KIT

The main features of HMU

Target outlet water temperature constant control	By the control of compressor speed and electronic expansion valve
	Controlling the number of HMUs in accordance with the load
Mixed operation	HMU can be operated with air to air indoor unit simultaneously.
	During the operation of HMU only, it can accommodate a wide range of outlet water temperature controlled by a dedicated control. In the case of HMU only operation, the range of target outlet water temperature is wider than mixed operations.
	In the case of mixed operation, it can be set HMU priority and the air to air conditioner priority.
Antifreeze control	Corresponding to the anti-freeze protection control
Connection with external equipment	HMU can output an interlocking signal to an external heat source for the secondary heating
	Target setting temperature from the external device (3 points)
	Water pump control (ON / OFF) can be changed.

1.1.5 HMU Check Sheet

- You need to select a plate heat exchanger for HMU, which is specified by MHI.
- To make sure that your equipment complies with the selection criteria of MHI, please fill in all necessary items on HMU-KIT Check Sheet and submit a copy to your local MHI distributor.
HMU-KIT is a product of which the performance is warranted after confirming this Check Sheet.
- Although HMU-KIT is the controller for the refrigerant system, HMU system needs to be designed for your arrangements.
HMU-KIT is one of components (Control box) used in HMU system, and MHI cannot guarantee the entire HMU system and the components supplied by others.

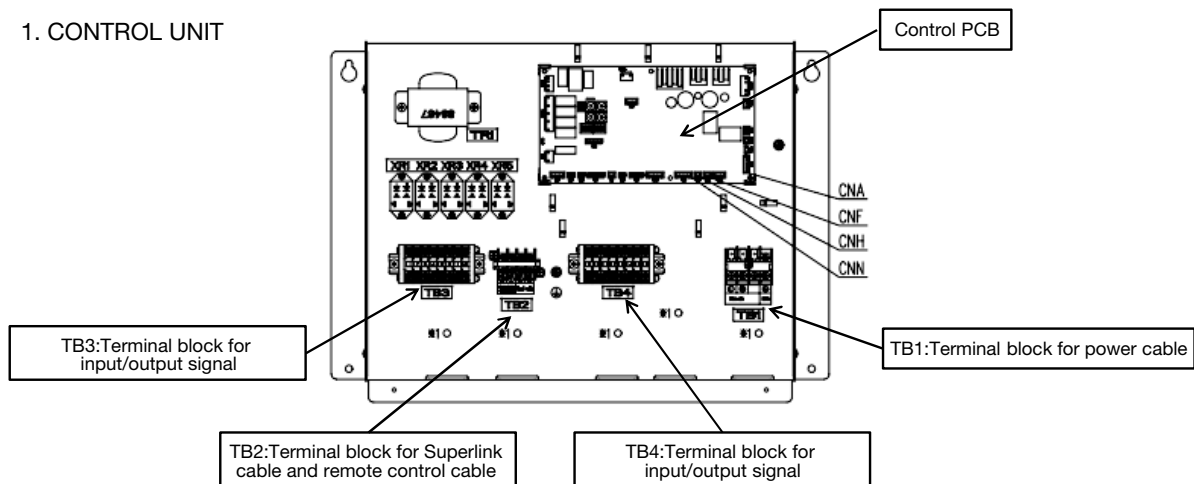


1.1.6 Configuration of HMU-KIT

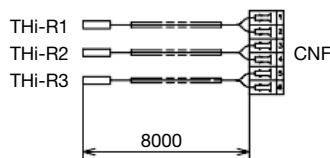
Type: HMU-KIT

NO.	Name	Q'ty	Remark
1	CONTROL UNIT	1	
2	SENSOR ASSY(TEMP)	1	Thi-R1,R2,R3(For heat exchanger temperature [refrigerant side])
3	SENSOR (TEMPERATURE)	1	Thi-A(For inlet water temperature)
4	SENSOR (TEMPERATURE)	1	Thi-AF(For outlet water temperature)
-	DOCUMENTS SET	1	
-	LABEL,WIRNIG	1	Wiring diagram to be attached
-	BAND	9	Wiring band
5	SPRING, LEAF	5	Sensor fixing spring (For Thi-R1, R2, R3, A, AF)

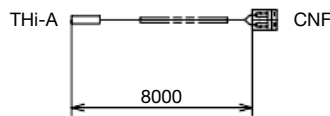
1. CONTROL UNIT



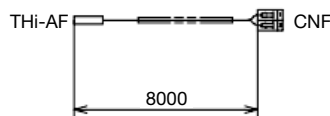
2. SENSOR ASSY (TEMP)



3. SENSOR (TEMPERATURE)



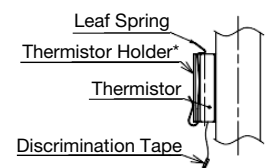
4. SENSOR (TEMPERATURE)



5. SPRING, LEAF



Mounting method of sensor



* Thermistor Holder* Provided locally

Thermistor	φ	Material
For Thi-R3	φ9.52×t0.6	Copper tube
For Thi-A, AF, R1 and R2	φ8.0×t0.6	Copper tube

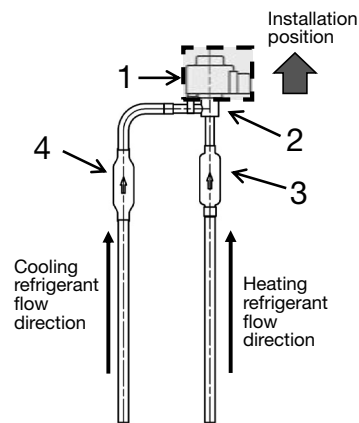
1.1.7 Configuration of EEVSET

Components of EEV-Set

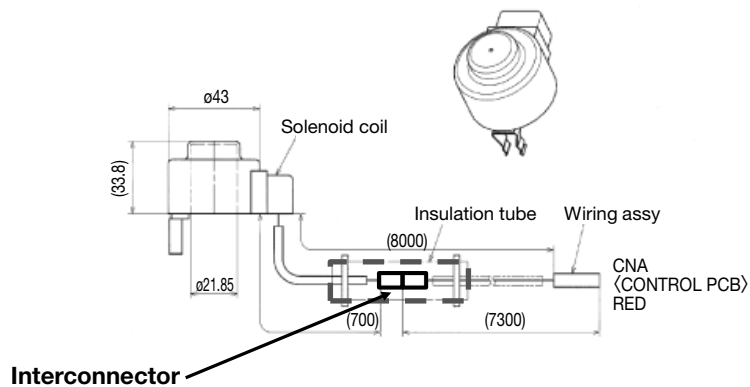
No.	Part name	EEV6-160-E EEV6-280-E
1	COIL, SOLENOID	1
2	VALVE, BODY (EXP) ASSY	1
3	STRAINER	1
4	STRAINER	1

1. Select suitable model according to the required capacity.
2. One EEV-set is for one part of heat exchanger.
3. Number of pcs. in () is just for reference. These parts are included in VALVE, BODY (EXP) ASSYs respectively.

Electronic expansion valve assy



COIL, SOLENOID : EEV coil



Note) Do not place the interconnector in the air flow to prevent any water intrusion into the connector. Protect the connector from water intrusion.

1.1.8 Connection to Superlink system

HMU-KIT and outdoor units are communicated with Superlink.

Therefore, HMU-KIT can be connected to Superlink network with air to air indoor units.

HMU-KIT can be operated with RC-EX3H which is exclusive model for HMU-KIT.

RC-EX3H can be connected with RC wire (X,Y) as with RC-EX3.

HMU-KIT can be connected to the central control for air-conditioning.

However, functions such as setting and display of water temperature are limited.

<Example : HMU-KIT 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

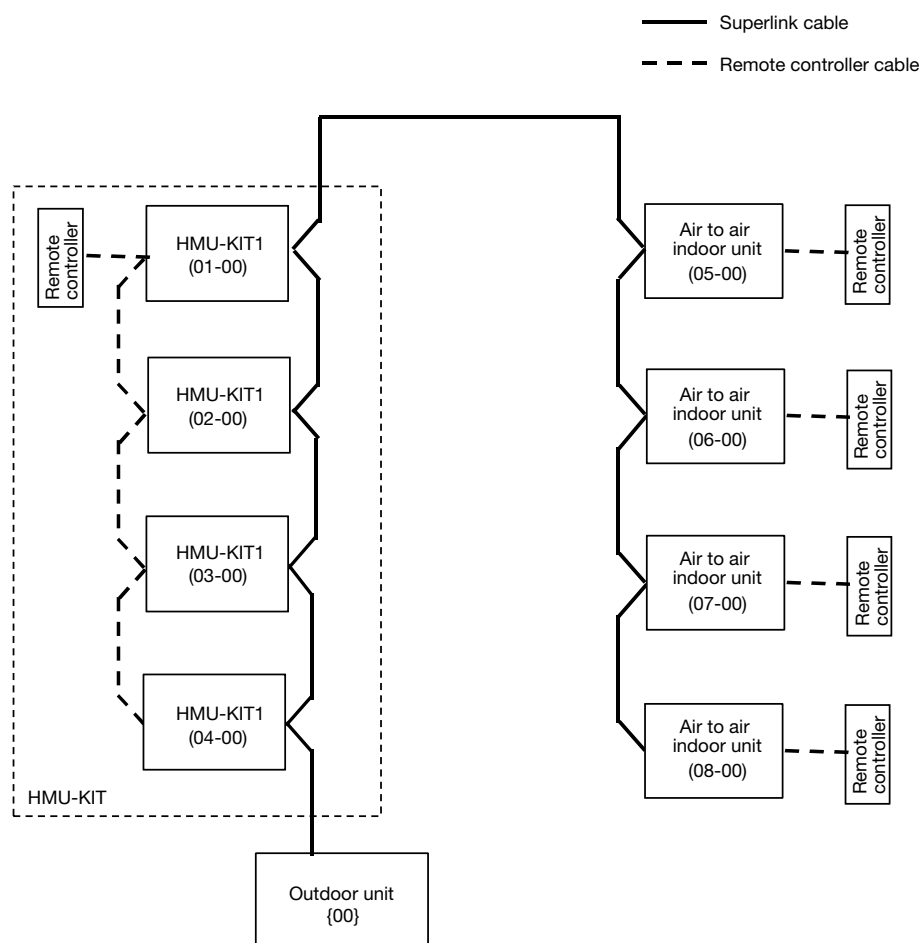
2) HMU-KIT is treated as one indoor unit

SL4 can not distinguish which one is HMU-KIT.

Example of MHU × 4 units + Air-conditioner × 4 units

() shows the indoor address setting. (Indoor-outdoor)

{ } shows the outdoor address setting. (Outdoor)



1.2 Lineup

(1) HMU

Name	Model name
Control kit	HMU-KIT
Expansion valve set (for max 14.0kW)	EEV6-160-E
Expansion valve set (for max 28.0kW)	EEV6-280-E
Remote controller	RC-EX3H

Please use the specified plate heat exchanger.

Please refer to section 2.5.1.

(2) Outdoor unit

Category	Name	Model name	Remark
Outdoor unit (for HMU-KIT)	Standard 10HP	FDC280KXZE1	Single
	Standard 12HP	FDC335KXZE1	Single
	Standard 14HP	FDC400KXZE1	Single
	Standard 16HP	FDC450KXZE1	Single
	Standard 17HP	FDC475KXZE1	Single
	Standard 18HP	FDC500KXZE1	Single
	Standard 20HP	FDC560KXZE1	Single
	Standard 22HP	FDC615KXZE1	Combination
	Standard 24HP	FDC670KXZE1	Combination
	Standard 26HP	FDC735KXZE1	Combination
	Standard 28HP	FDC800KXZE1	Combination
	Standard 30HP	FDC850KXZE1	Combination
	Standard 32HP	FDC900KXZE1	Combination
	Standard 34HP	FDC950KXZE1	Combination
	Standard 36HP	FDC1000KXZE1	Combination
	Standard 38HP	FDC1060KXZE1	Combination
	Standard 40HP	FDC1120KXZE1	Combination
	Standard 42HP	FDC1200KXZE1	Combination
	Standard 44HP	FDC1250KXZE1	Combination
	Standard 46HP	FDC1300KXZE1	Combination
	Standard 48HP	FDC1350KXZE1	Combination
	Standard 50HP	FDC1425KXZE1	Combination
	Standard 52HP	FDC1450KXZE1	Combination
	Standard 54HP	FDC1500KXZE1	Combination
	Standard 56HP	FDC1560KXZE1	Combination
	Standard 58HP	FDC1620KXZE1	Combination
	Standard 60HP	FDC1680KXZE1	Combination
	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

1.3 Range of usage

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

		FDC280KXZE1 FDC280KXZXE1	FDC335KXZE1 FDC335KXZXE1	FDC400KXZE1	FDC450KXZE1 FDC450KXZXE1	FDC475KXZE1	FDC500KXZE1 FDC500KXZXE1	FDC560KXZE1 FDC560KXZXE1
Indoor units that can be used in combination	Number of connected units	2 - 15 (KXZ) 2 - 20 (KXZX)	2 - 15 (KXZ) 2 - 21 (KXZX)	2 - 26 (KXZ)	2 - 30 (KXZ) 2 - 31 (KXZX)	2 - 32 (KXZ)	2 - 35 (KXZ) 2 - 35 (KXZX)	2 - 40 (KXZ) 2 - 40 (KXZX)
	Connectable capacity (2), (3)	224 - 364 (KXZ) 224 - 560 (KXZX)	268 - 435 (KXZ) 268 - 670 (KXZX)	320 - 520 (KXZ)	360 - 585 (KXZ) 360 - 900 (KXZX)	380 - 617 (KXZ)	400 - 650 (KXZ) 400 - 800 (KXZX)	448 - 728 (KXZ) 448 - 896 (KXZX)
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 (7))						
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% (8), (9)						
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		15 - 40°C						

Note (1) Minimum capacity of HMU is 140.

Note (2) The capacity of air-conditioners (not HMU) must be 50% or more of the outdoor unit capacity.

Note (3) When indoor capacity is over 130%, the ratio of air-conditioners and HMUs must be the same.

Note (4) When connecting the indoor unit type FDK,FDL,FDL or FDFW series, limit the connectable capacity not higher than 130%.

Note (5) It must be less than 30m when conducting the cooling operation with the outdoor air temperature lower the 10°C.

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

Note (8) Capacity of connected air-conditioners must be 50% of the outdoor unit capacity or more.

Note (9) 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.

		FDC615KXZE1 FDC615KXZXE1	FDC670KXZE1 FDC670KXZXE1	FDC735KXZE1 FDC735KXZXE1	FDC800KXZE1 FDC800KXZXE1	FDC850KXZE1 FDC850KXZXE1	FDC900KXZE1 FDC900KXZXE1	FDC950KXZE1 FDC950KXZXE1	FDC1000KXZE1 FDC1000KXZXE1
Indoor units that can be used in combination	Number of connected units	2 - 44 (KXZ) 2 - 44 (KXZX)	2 - 49 (KXZ) 2 - 49 (KXZX)	3 - 55 (KXZ) 3 - 55 (KXZX)	3 - 61 (KXZ) 3 - 61 (KXZX)	3 - 64 (KXZ) 3 - 64 (KXZX)	3 - 69 (KXZ) 3 - 69 (KXZX)	3 - 74 (KXZ) 3 - 74 (KXZX)	3 - 78 (KXZ) 3 - 78 (KXZX)
	Connectable capacity	492 - 799 (KXZ) 492 - 984 (KXZX)	536 - 871 (KXZ) 536 - 1072 (KXZX)	588 - 955 (KXZ) 588 - 1176 (KXZX)	640 - 1040 (KXZ) 640 - 1280 (KXZX)	680 - 1105 (KXZ) 680 - 1360 (KXZX)	720 - 1170 (KXZ) 720 - 1440 (KXZX)	760 - 1235 (KXZ) 760 - 1520 (KXZX)	800 - 1300 (KXZ) 800 - 1600 (KXZX)

		FDC1060KXZE1	FDC1120KXZE1	FDC1200KXZE1	FDC1250KXZE1	FDC1300KXZE1	FDC1350KXZE1	FDC1425KXZE1
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

		FDC1450KXZE1	FDC1500KXZE1	FDC1560KXZE1	FDC1620KXZE1	FDC1680KXZE1
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

PCH00Z444A

(b) In case of only HMU connection

		FDC280KXZE1	FDC335KXZE1	FDC450KXZE1	FDC500KXZE1	FDC560KXZE1	FDC615KXZE1	FDC670KXZE1
Indoor units that can be used in combination	Number of connected units	1 - 2	1 - 2	2 - 3	2 - 3	2 - 4	2 - 4	2 - 4
	Connectable capacity	224 - 280	268 - 335	360 - 450	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 (4))						
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		Standard : NOT allowed. 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		5 - 25°C						
Outlet water temperature of HMU heating operation		15 - 5°C						

Note (1) Minimum capacity of HMU is 140.

Note (2) It must be less than 30m when conducting the cooling operation with the outdoor air temperature lower the 10°C.

Note (3) 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 (4) When it is required to install in the difference between the longest and shortest piping more than 40m, refer to the specification in the next page.

		FDC735KXZE1	FDC800KXZE1	FDC850KXZE1	FDC900KXZE1	FDC950KXZE1	FDC1000KXZE1
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

Note (5) FDC-KXZE1 can be connected to HMU only under any of the following conditions.

(a) FDC280 KXZE1 and FDC335 KXZE1 can be used if additional refrigerant charge quantity at the site is 5 kg or less.

(b) In case of cooling operation only, FDC-KXZE1 can be used with following conditions.

- Disable heating operation by remote controller.

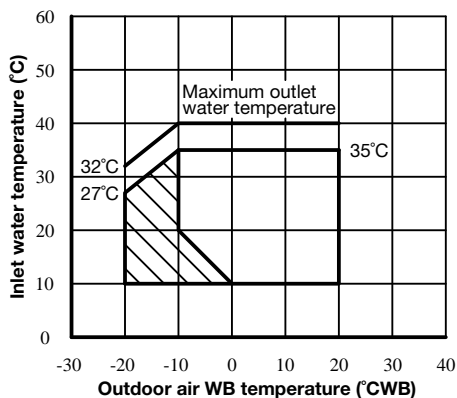
(c) In case of heating operation only, FDC-KXZE1 can be used with following conditions.

- Disable cooling operation by remote controller.
- Outdoor unit should be installed higher position than indoor unit.
- Elevation difference between indoor units is 0m.
- The additional refrigerant charge quantity is calculated by specified for heating operation only.
(Reduce the specified quantity.)
- Please refer to section 3.5.

1.4 Operating temperature range

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

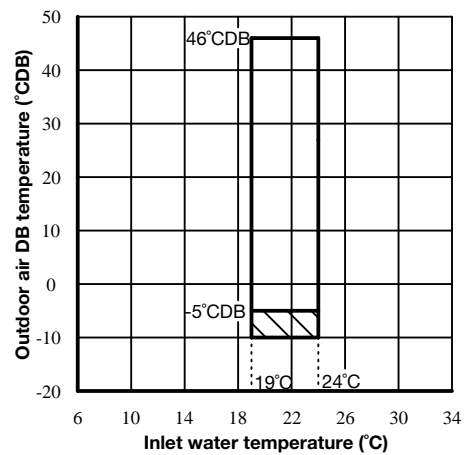
Heating operation



*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.

Cooling operation

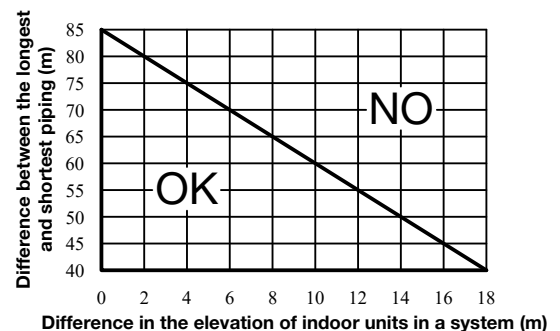


*In case of the hatched area, connectable HMU model is limited to 280.

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

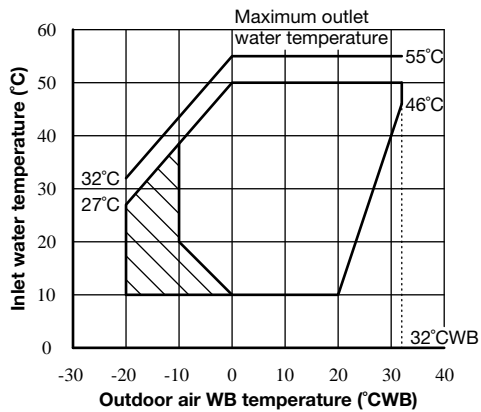
When the difference between the longest and shortest piping is longer than 40m, adjust the difference in the elevation of indoor units in a system such that it will fall in the OK range on the following graph

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.

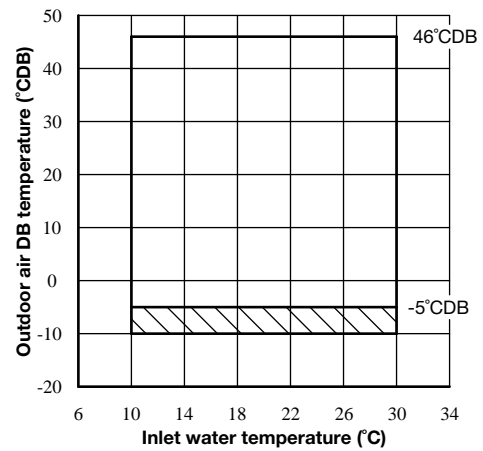


(b) In case of only HMU connection

Heating operation



Cooling operation



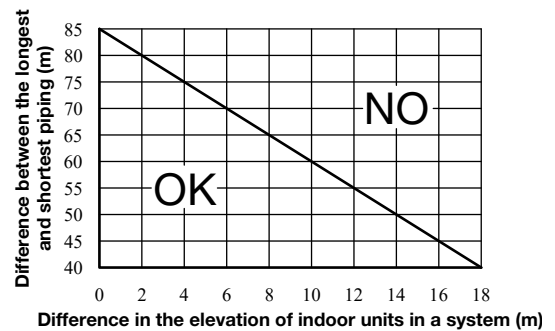
- *In case of the hatched area, all these limits must be followed.
- 1) Outdoor unit position must be equal or higher than indoor unit position.
 - 2) Elevation difference of indoor units in a system is NOT allowed.

*In case of the hatched area, only 280 HMU model is allowed to be connected.

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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2. SPECIFICATIONS

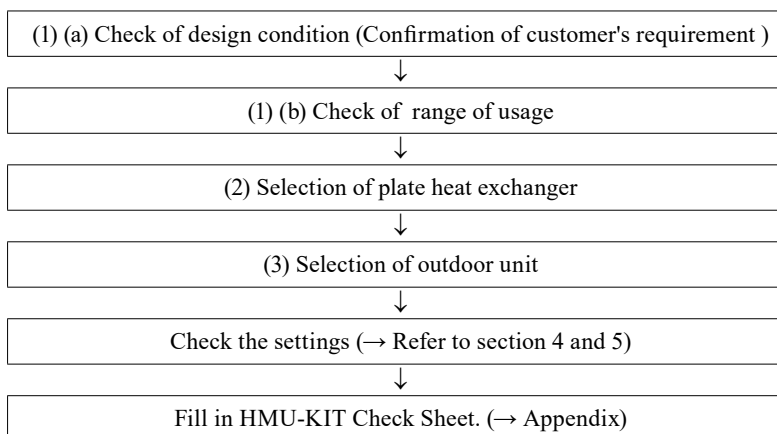
Model			HMU-KIT	
Power source			1-phase / 220-240V / 50Hz	
Nominal capacity	Cooling	[kW]	14.0 , 28.0	
	Heating	[kW]	14.0 , 28.0	
Max power input		[kW]	0.0544	
Max current		[A]	0.21	
Connectable outdoor unit			KXZE1, KXZXE1	
Dimensions	Height	[mm]	100	
	Width	[mm]	495	
	Depth	[mm]	355	
Inlet Water temperature range of cooling	HMU only	[°C]	10-30	
	Mixed use (*1)		19-24	
Inlet Water temperature range of heating	HMU only	[°C]	10-50	
	Mixed use (*1)		10-35	
Water flow rate range		[%]	30-100 (*2)	
MIN outlet water temperature of cooling	HMU only	[°C]	5	
	Mixed use (*1)		14	
MAX outlet water temperature of heating	HMU only	[°C]	55	
	Mixed use (*1)		40	
Outdoor temperature		[°C]	<Nominal cooling condition> 35°CDB	<Nominal heating condition> 7°CDB/6°CWB
Inlet water temperature		[°C]	23	30
Outlet water temperature		[°C]	18	35
Water flow rate		[ℓ/min]	14kW : 40 , 28kW : 80	14kW : 40 , 28kW : 80

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

*2 100% of water flow rate means nominal conditions.

2.1 HMU refrigerant system design

The calculation flow for system design is shown below.



(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
	Target blow-off temp.		°C
Winter	Heating capacity (RCC_A)		kW
	Target blow-off temp.		°C

Design requirement capacity condition (HMU)

Summer	Cooling capacity (REC_H)		kW
	Inlet water temp.		°C
	Target outlet water temp.		°C
	Water volume		m ³ /h
Winter	Heating capacity (RCC_H)		kW
	Inlet water temp.		°C
	Target outlet water temp.		°C
	Water volume		m ³ /h

(b) Confirmation of range of use

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	14-KX-DB-201 or 203	OK · NG
HMU mode	See section 1.3 and 1.4	OK · NG

REC (Requested Evaporator Capacity) = REC_A + REC_H

RCC (Requested Condensator Capacity) = REC_A + RCC_H

(2.1) Confirmation of calculation conditions for plate heat exchanger

(a) Use a plate heat exchanger having following specifications.

No.	Name	Model	Remark
1	HEAT EXCH(W)	SWEP: V26H×26	For 14.0kW Capacity on the rated condition
2	HEAT EXCH(W)	SWEP: V26H×50	For 28.0kW Capacity on the rated condition

(b) Connection pipe size

Heat exchanger capacity [kW]	14.0	28.0
Liquid pipe	φ9.52	φ9.52
Gas pipe	φ15.88	φ22.22

(c) Design pressure for piping connected to the plate heat exchanger

Relevant piping should be: Design pressure \geq 4.15 MPa (For R410A).

(2.2) Plate heat exchanger calculation

(a) Examination of the number of divisions of heat exchanger

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-KIT.

14.0 kW, 28.0 kW

(b) EEVSET selection

Select EEVSET for each divided heat exchanger.

- 14.0 kW → EEVSET-160
- 28.0 kW → EEVSET-280

(3) 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.
- * When connecting HMU only to indoor unit, select outdoor unit from high COP models.

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

(ii) HMU operation mode

Select an operation mode according to the purpose of use.

- HMU operation is used in cooling mode only.
- HMU operation is used in heating mode only.
- HMU operation is used in both cooling and heating modes.

Setting temperature range are as follows.

1) For outlet water temperature control

Cooling mode	Target outlet water temperature range: 5 – 25°C
Heating mode	Target outlet water temperature range: 15 – 55°C

2) For inlet water temperature control

Cooling mode	Target outlet water temperature range: 10 – 30°C
Heating mode	Target outlet water temperature range: 10 – 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	0	B1 + B2 = 1
Ratio of HMU, B2	1	

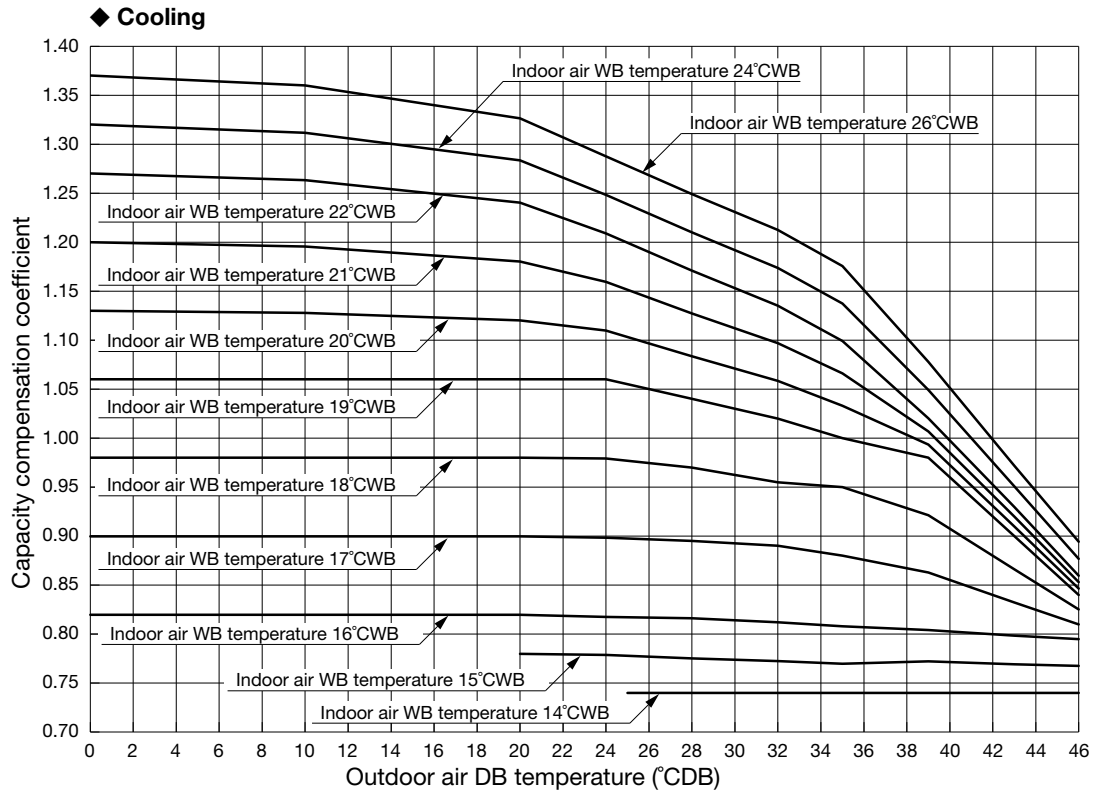
(c) Correction coefficient C1

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.

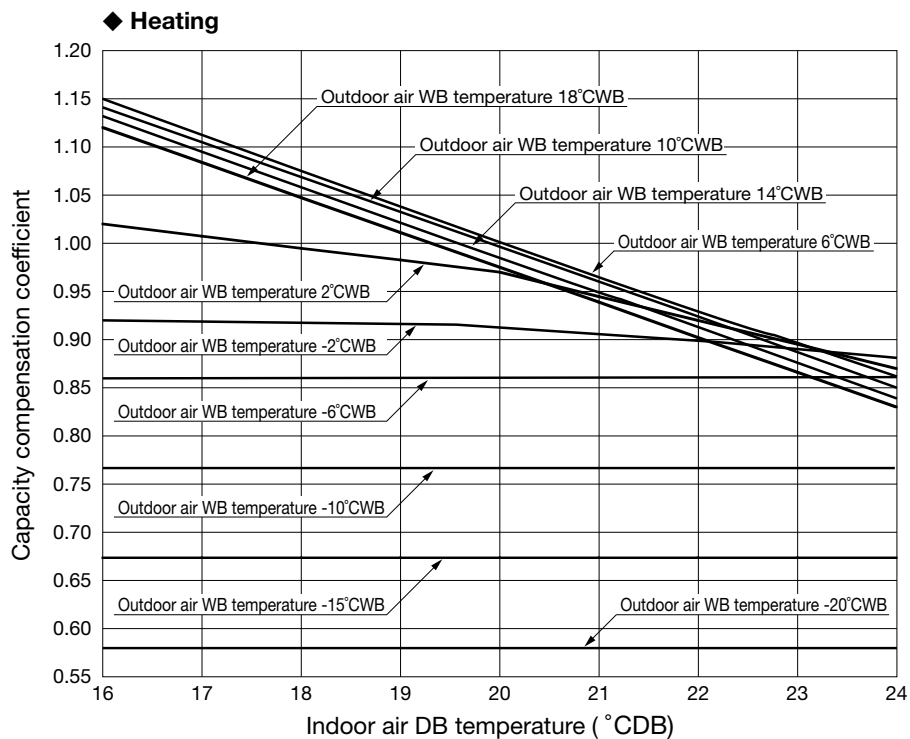
(i) For cooling mode

Cooling capacity correction coefficient



(ii) For heating mode

Heating capacity correction coefficient



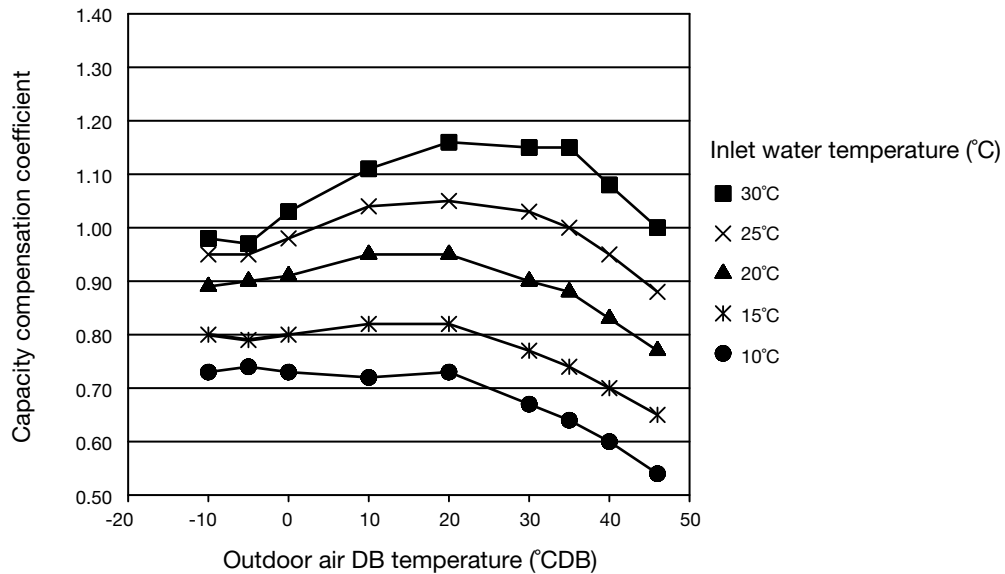
(d) Correction coefficient C2

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

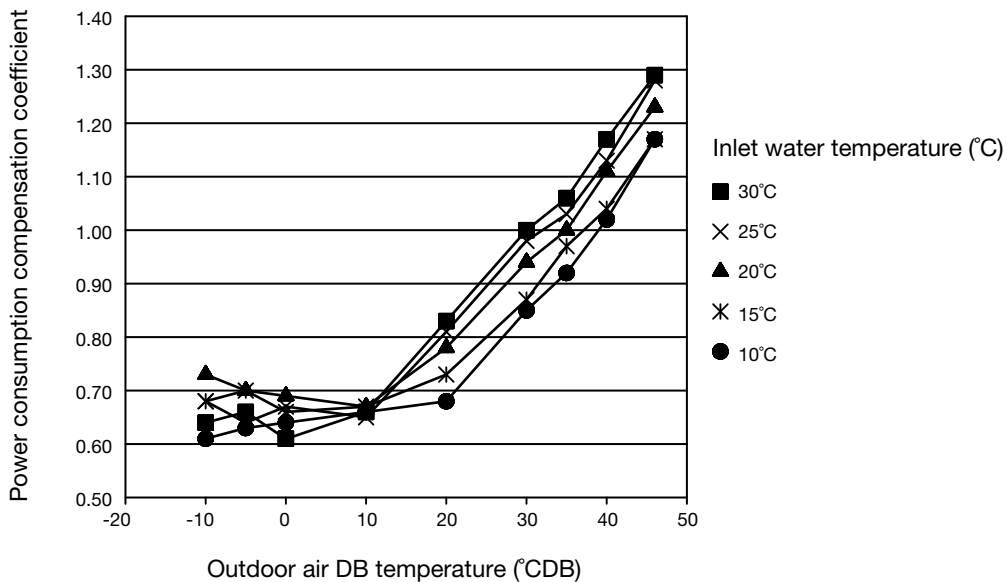
Capacity correction coefficient is calculated from the following graph according to the operation mode.

(i) For cooling mode

Cooling capacity characteristic



Cooling power consumption characteristic

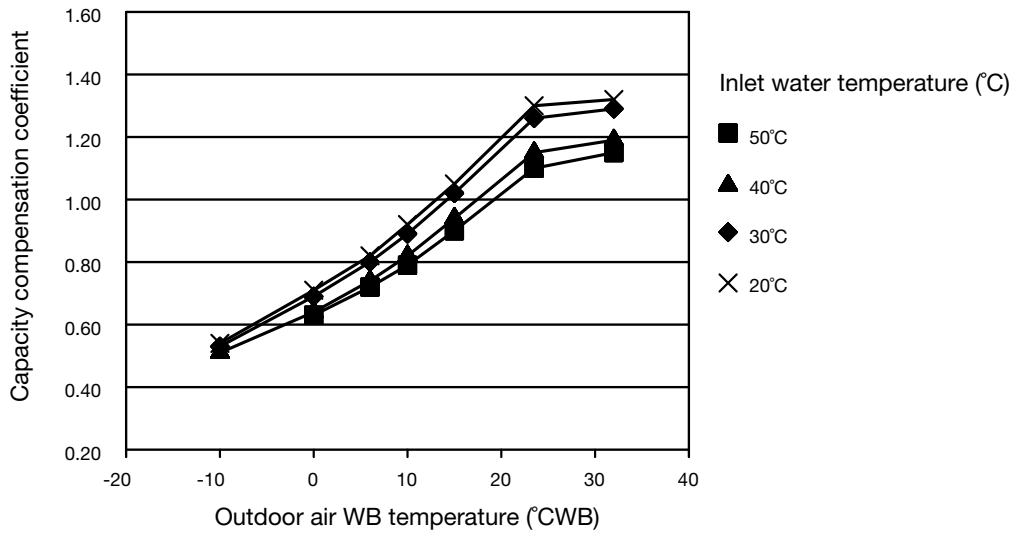


- Notes 1. The above-mentioned figure shows a typical condition among conditions to occur via controlling an unit.
2. When performing the cooling operation with the outdoor air temperature being -5°C or lower, a windbreak fence must be installed.
3. The cooling capacity may decrease by frequent actuation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

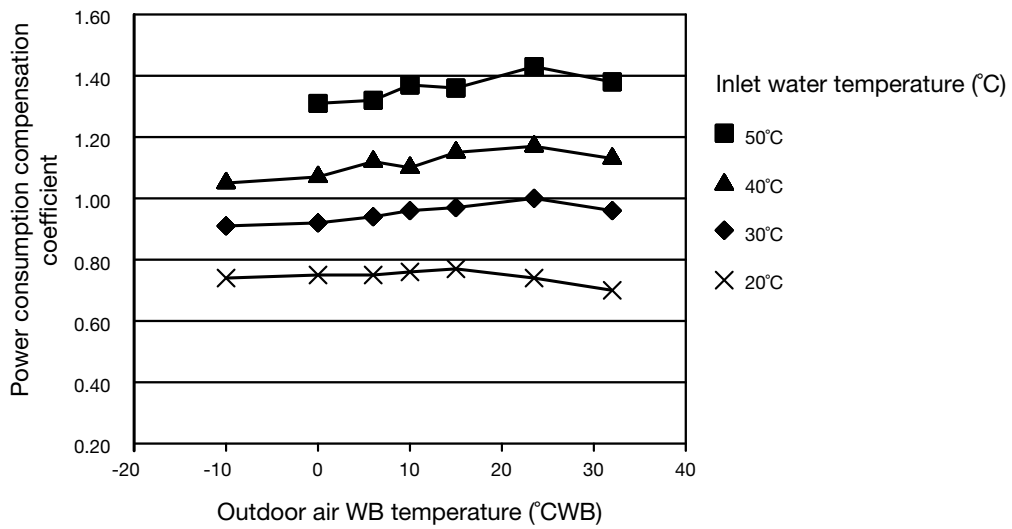
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(ii) For heating mode

Heating capacity characteristic



Heating power consumption characteristic



(e) Correction coefficient D

Correction based on the pipe length

Calculate the capacity correction coefficient from the following graph.

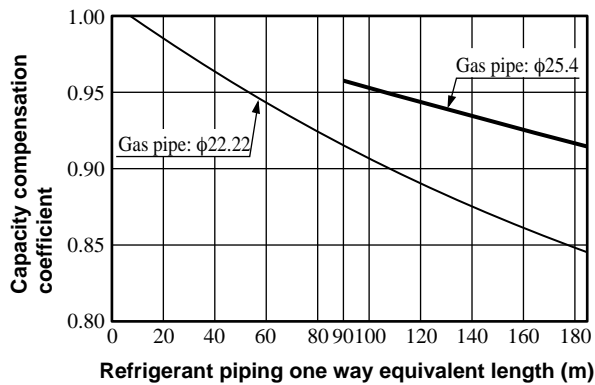
Take note that the correction coefficient varies depending on the pipe size.

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

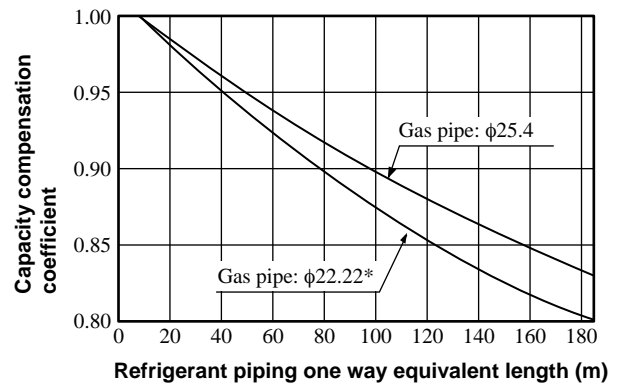
(i) Standard model

1) Cooling

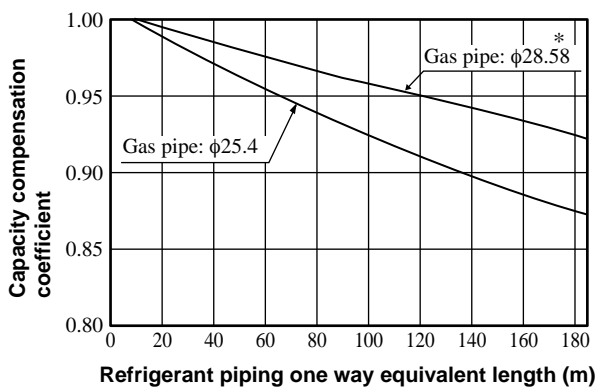
Model FDC(S)280KXZE1



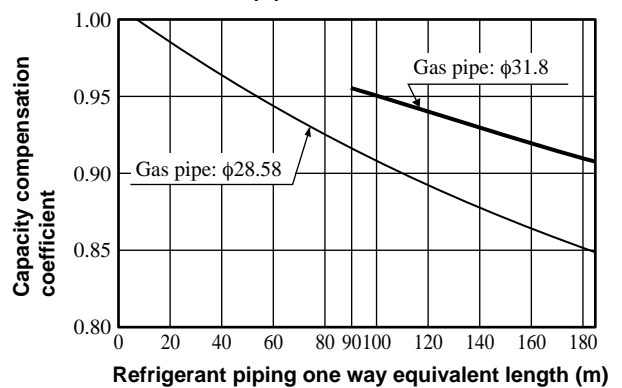
Model FDC(S)335KXZE1



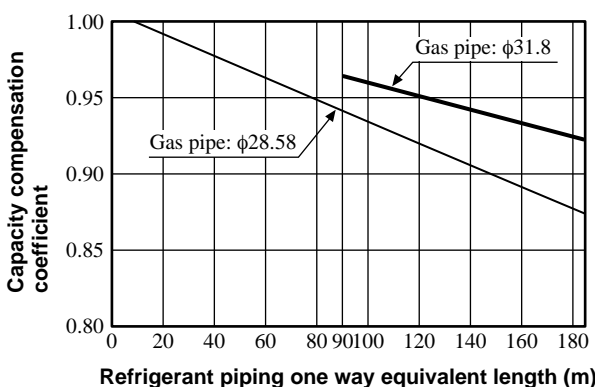
Model FDC(S)400KXZE1



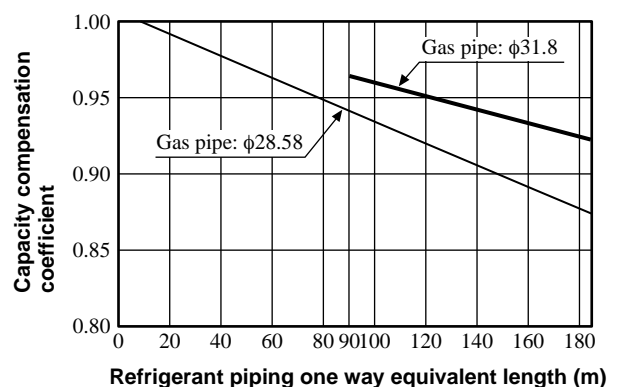
Model FDC(S)450KXZE1



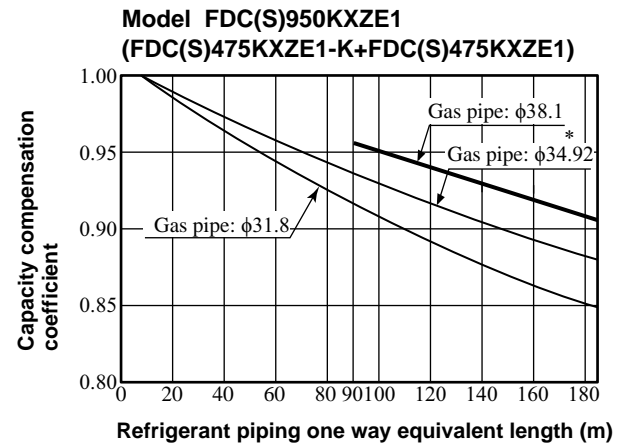
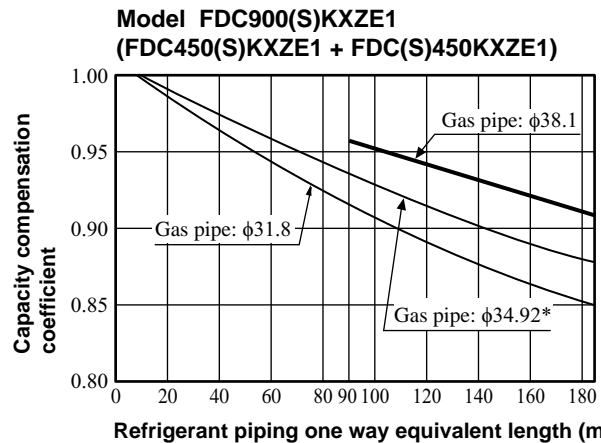
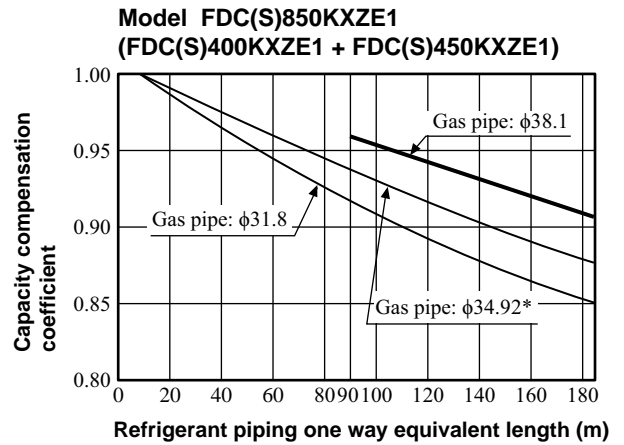
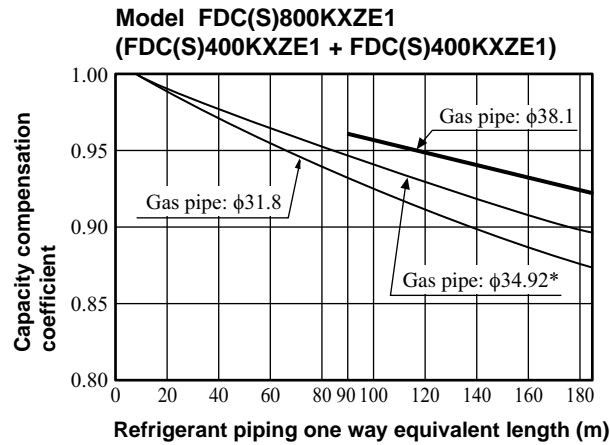
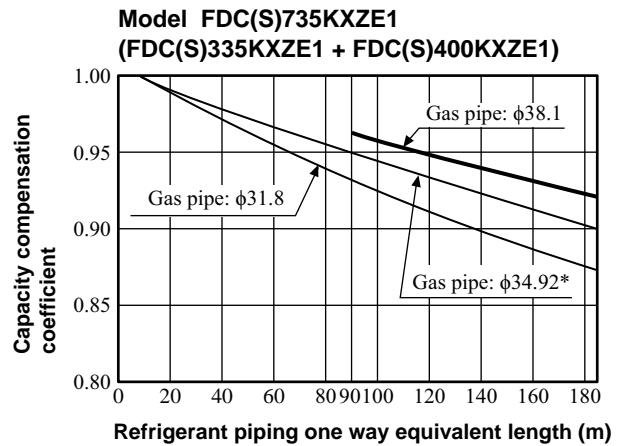
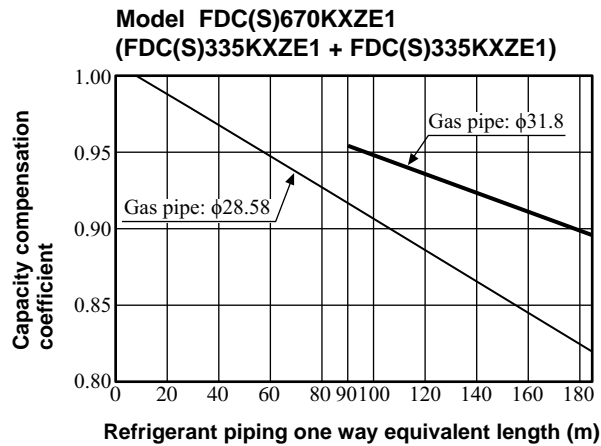
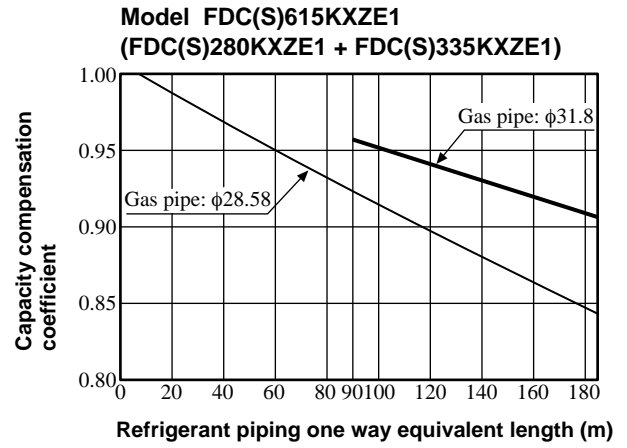
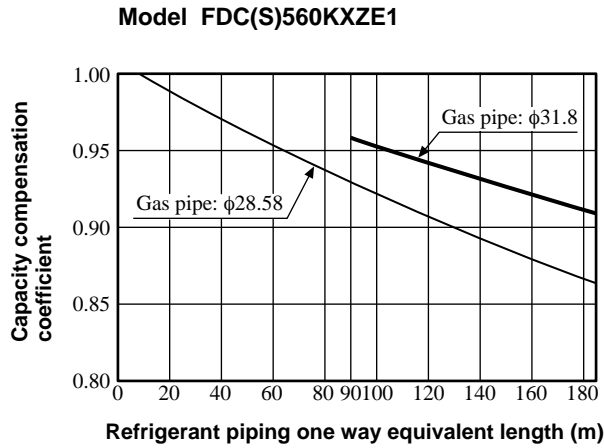
Model FDC(S)475KXZE1



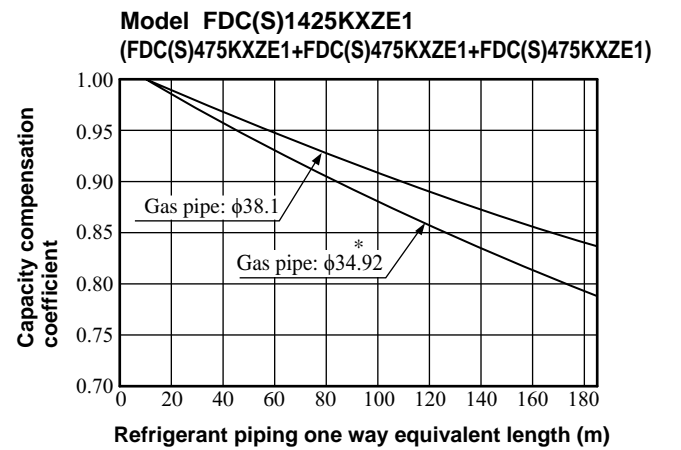
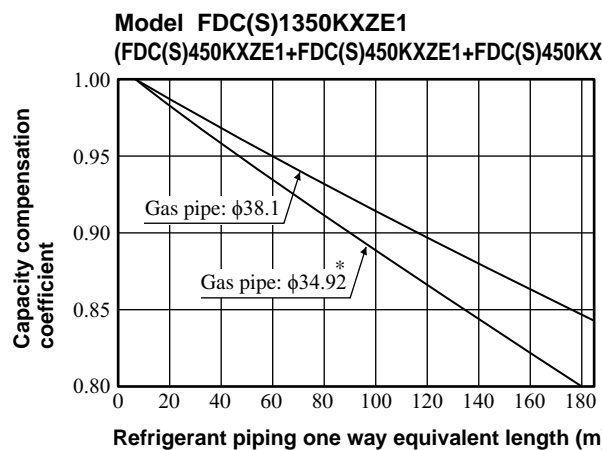
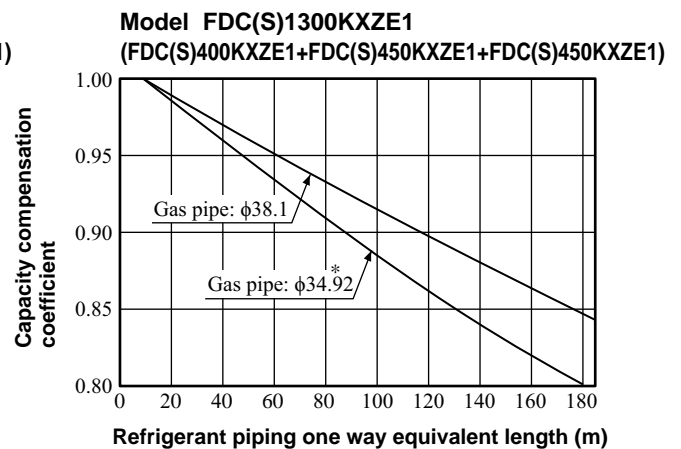
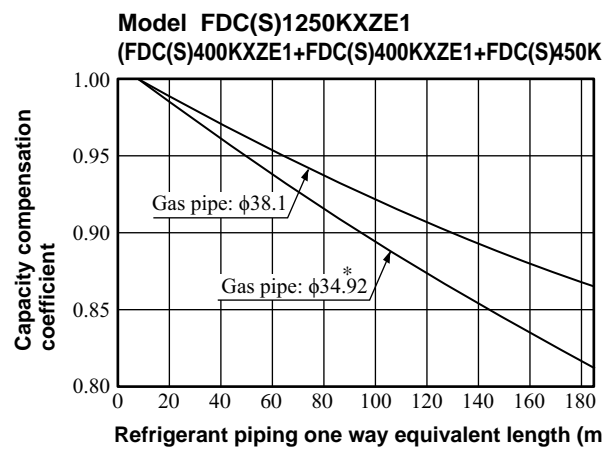
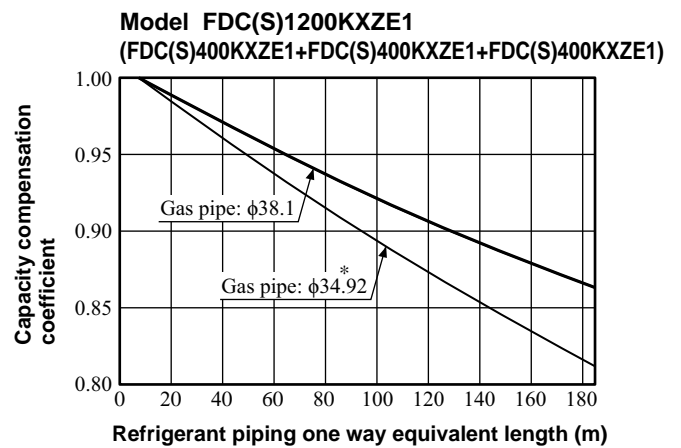
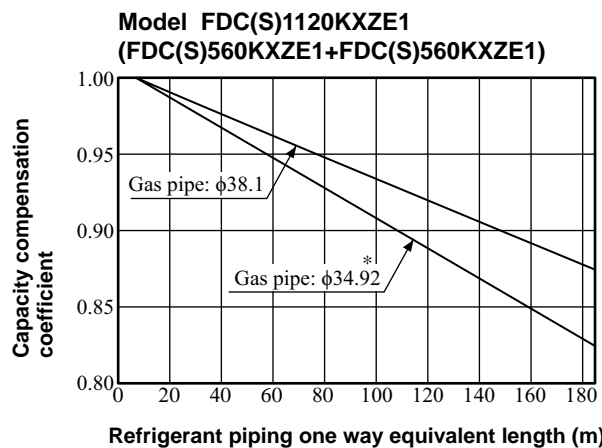
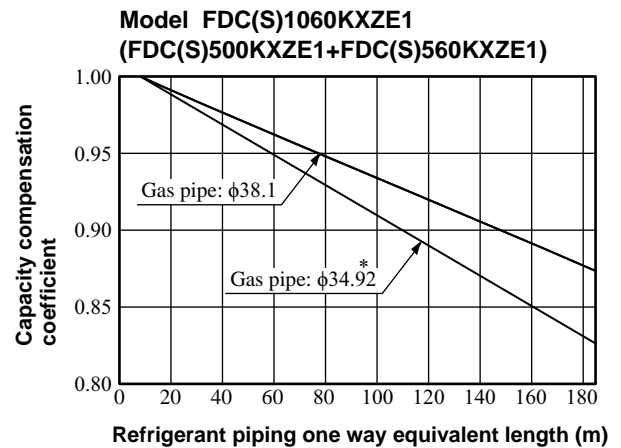
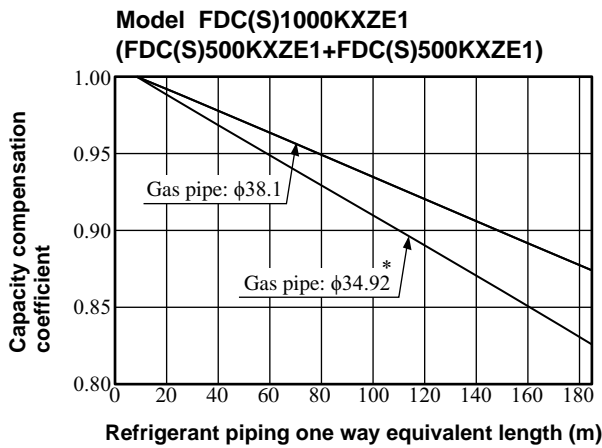
Model FDC(S)500KXZE1



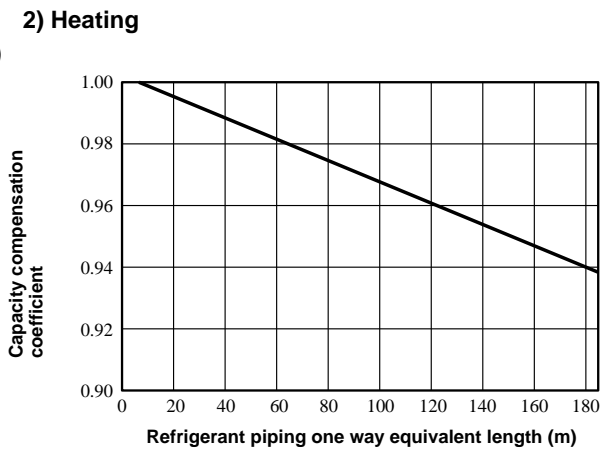
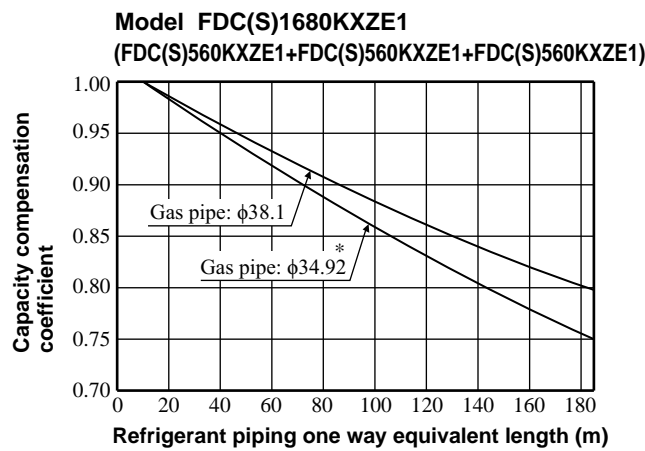
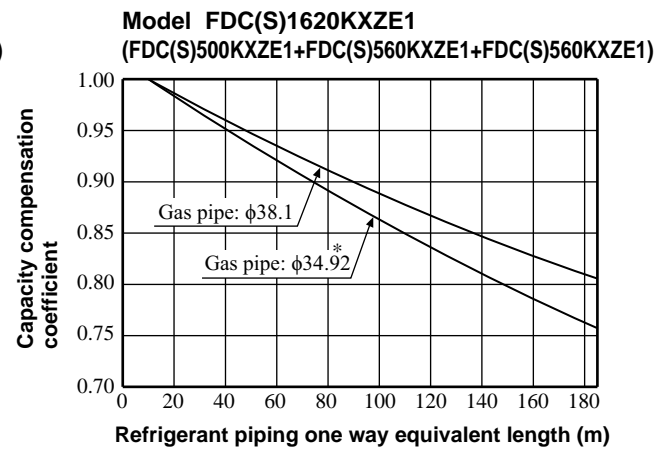
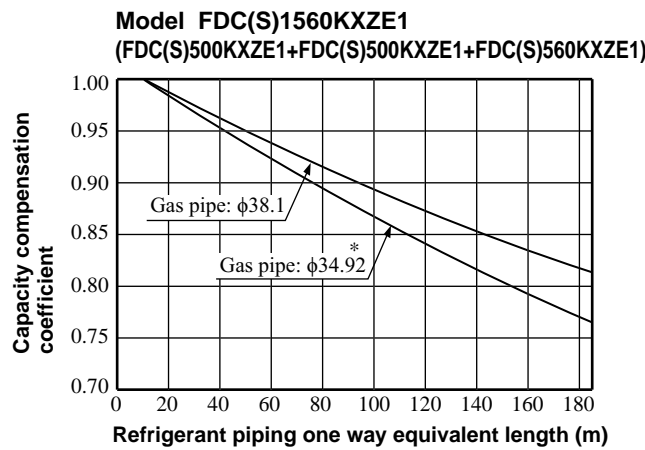
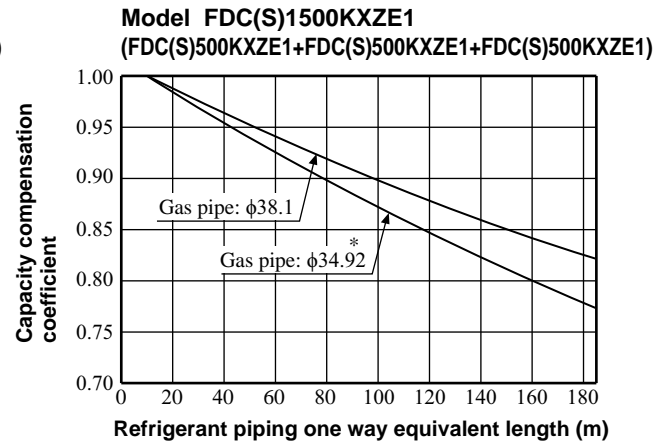
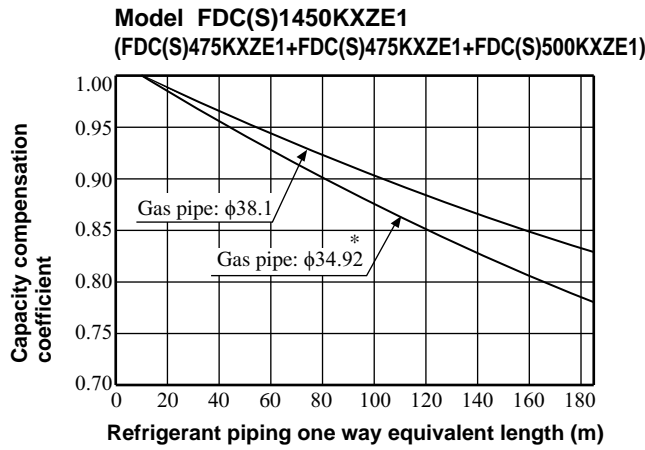
Note (1) Parts with the * mark show the piping size in case used in Europe.



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

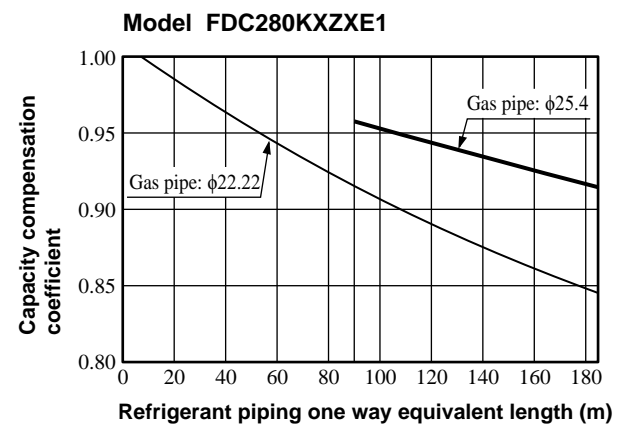
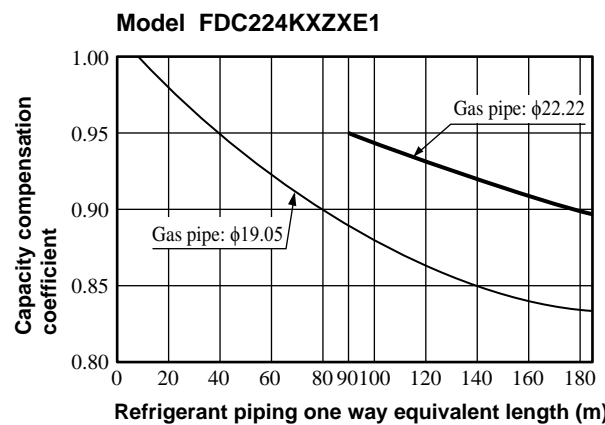


Note (1) Parts with the * mark show the piping size in case used in Europe.

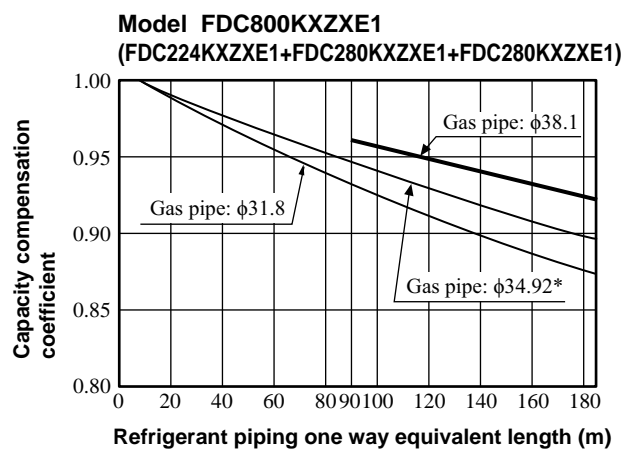
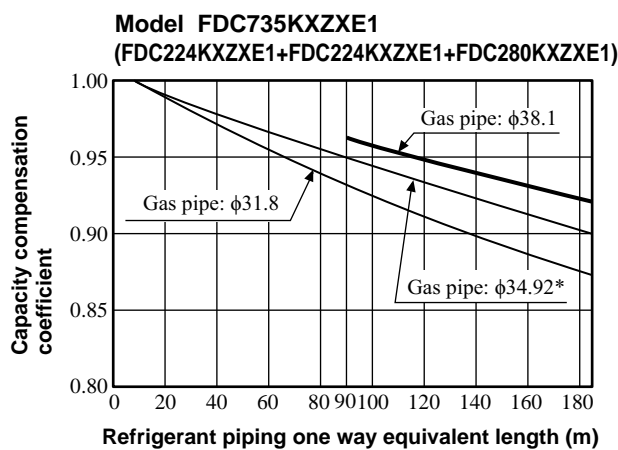
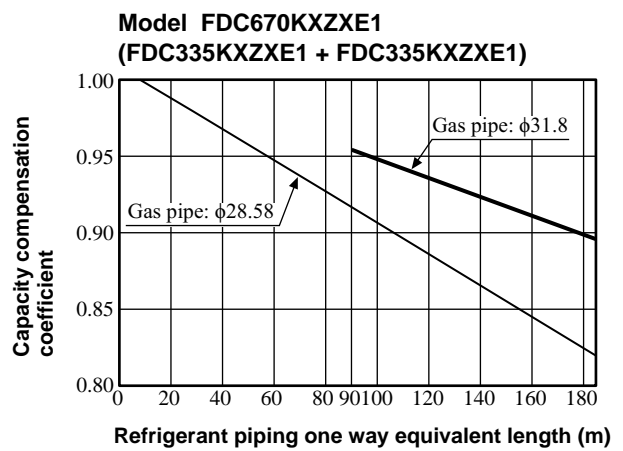
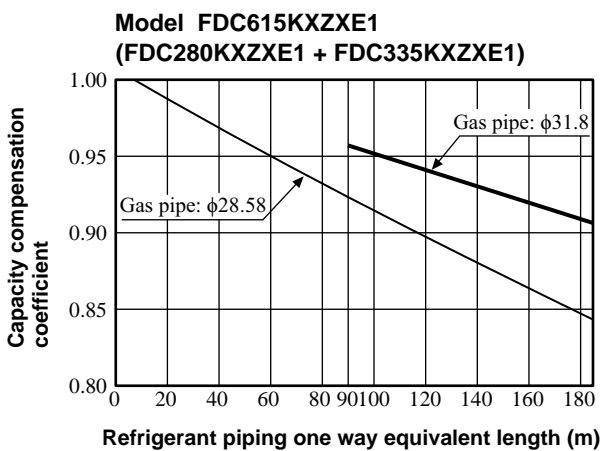
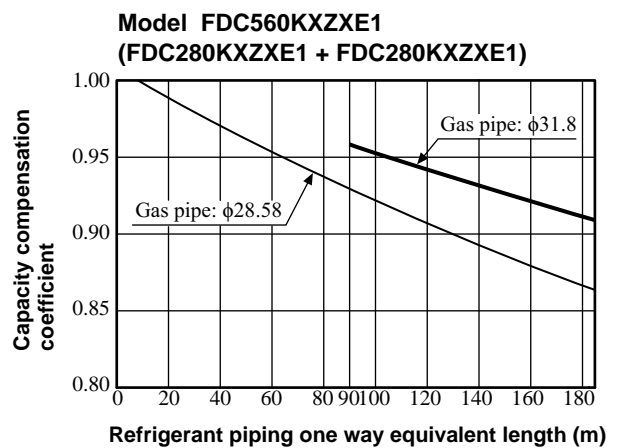
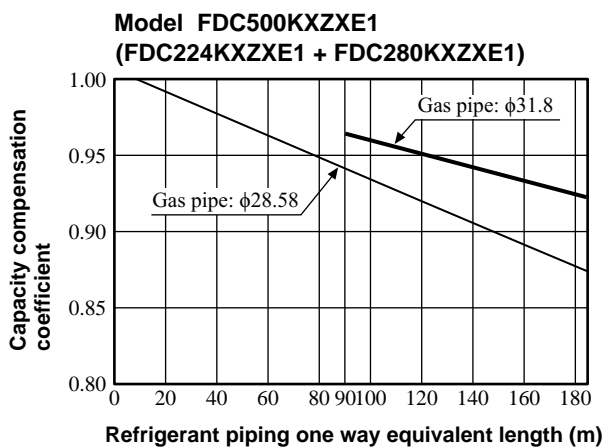
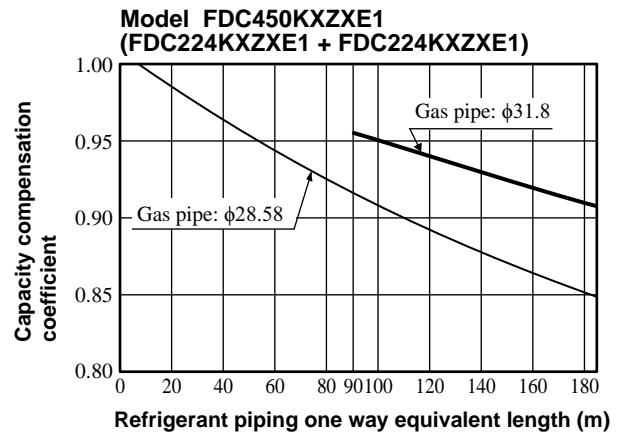
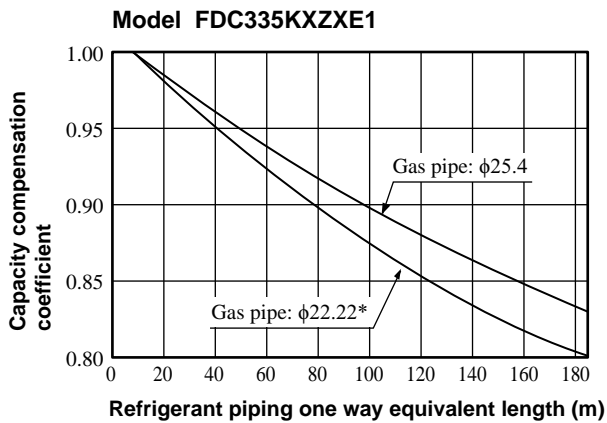


(ii) High cop model

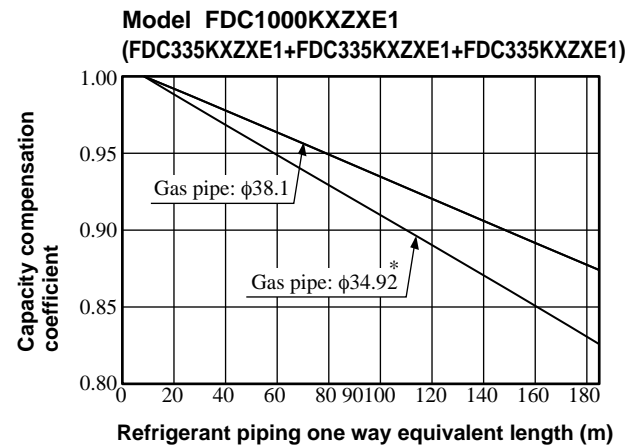
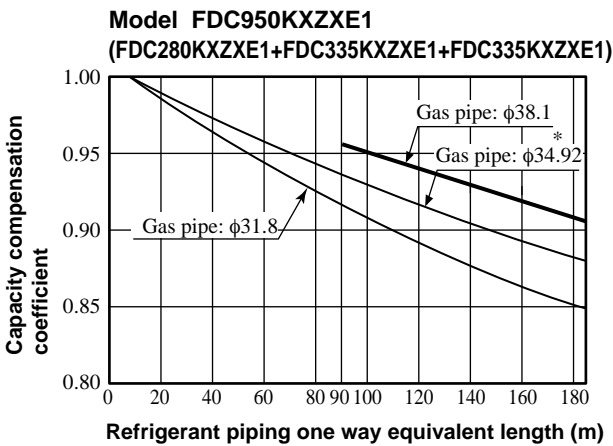
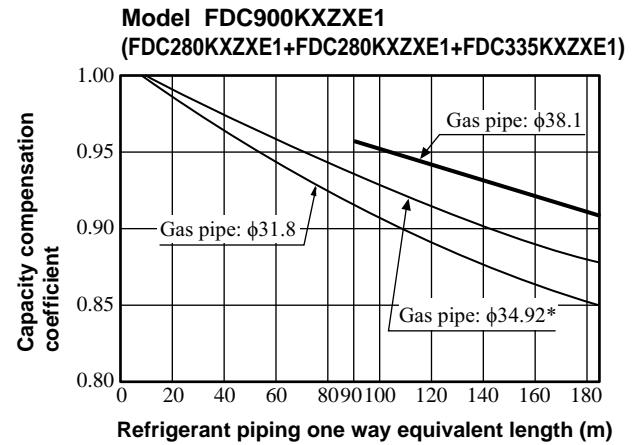
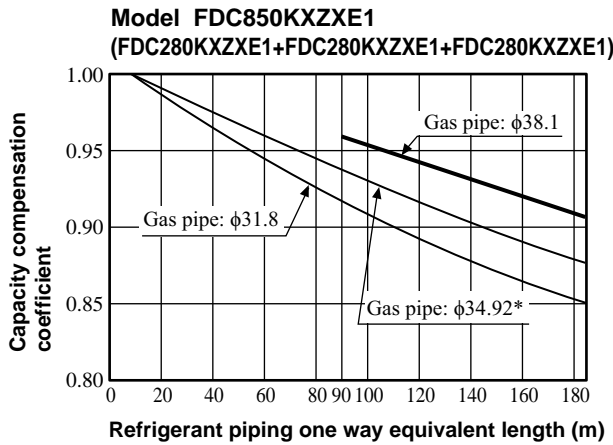
1) Cooling



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

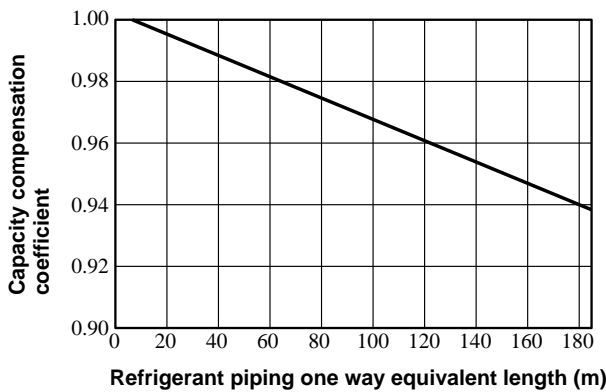


Note (1) Parts with the * mark show the piping size in case used in Europe.



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.

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

Equivalent length of each joint

Unit : m/one part

Gas piping size	φ 15.88	φ 19.05	φ 22.22	φ 25.4	φ 28.58	φ 31.8	φ 34.92	φ 38.1
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 height 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	$(B1 \times C1 + B2 \times C2) \times D \times E = \alpha$
Heating mode	$(B1 \times C1 + B2 \times C2) \times D \times E \times F = \beta$

(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 \geq Necessary rated capacity of outdoor unit → OK)
	REC / α	kW		kW	
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.

2.2 HMU-KIT specifications

2.2.1 Item list

The HMU-KIT is a combination of an EEV-SET (expansion valve set) and an HMU-CONTROL-ASSY. Prior to building your Hydro Module Unit (HMU) refer to the product technical specifications and limitations. Mitsubishi Heavy Industries (MHI) can provide technical support with the selection and the control of the parts supplied by MHI, but not for the HMU components (for water pump and valves) supplied by others. Take note that MHI cannot guarantee the safety of the HMU system and HMU components supplied by others. Always provide the necessary precautions and access safety to the HMU water pump and all electrical components in accordance with the local laws and regulations of each installation.

To receive technical support on the HMU-KIT selection, complete and submit the "HMU-KIT check sheet" to your local MHI contact.

	Power source	Max. input power	Max. current
HMU-KIT	220-240V - 50Hz, 220V - 60Hz	54.4W	0.21A

The above table ONLY shows the value for the HMU-KIT.

These values do not include the whole HMU system power supply requirements.

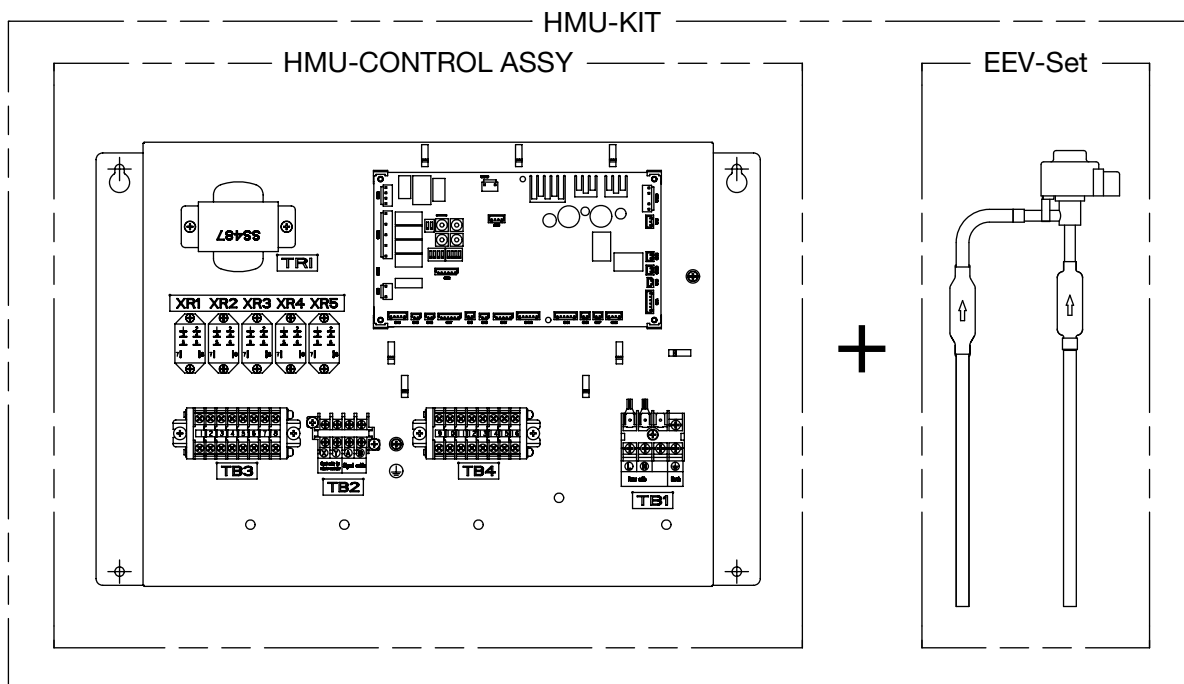
The label of whole HMU system will state its specifications.

2.2.2 Range of usage and limitations

Air temperature	0-40°CDB/90%RH or less
Power source voltage	Rating ±10%
Voltage at starting	Min. 85% of rating

HMU-KIT is the control kit for operating the locally provided HMU system in connection with KXZ system.

HMU-KIT is composed of an HMU-CONTROL ASSY and an EEV-Set.



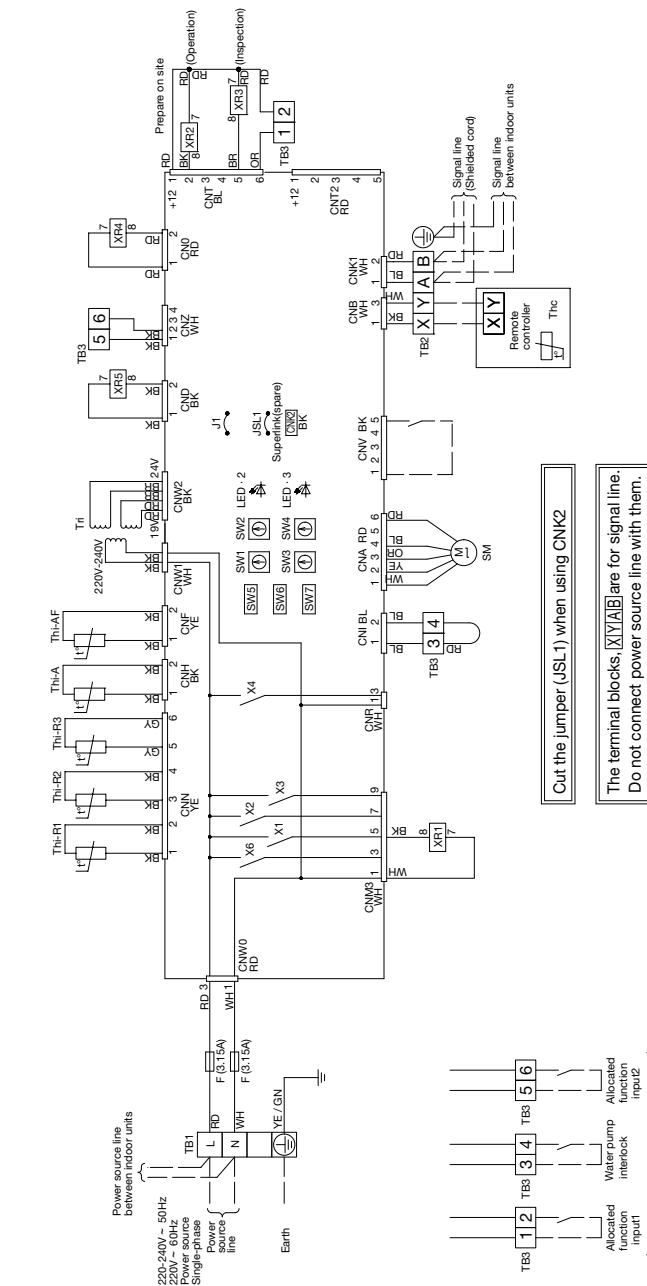
EEV-Set Select from following 2 types according to the coil capacity.

Type	EEV6-160-E	EEV6-280-E
Capacity	90-160	224-280

2.2.3 Wiring diagram

Item	Description	Note
CND	Allocated function output2 (Operation information output)	
CNK1	Water pump interlock (Remote operation input)	
CNK1K	Superlink (Signal line)	
CNK2	Superlink (Spare)	
CNM3	Water pump operation (Operation information output)	
CND	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)	
CNVZ	Allocated function input2 (Remote operation input)	
F	Fuse	
JSL1	Spare Superlink connector change	
LED-2	Indication lamp (Green-Normal operation)	
LED-3	Indication lamp (Red-Inspection)	
SW1	Stepping motor (Red-inspection valve)	
SW2	Indoor unit address : tens place	
SW3	Indoor unit address : ones 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 :	
SW7-3	Target setting of Thermostat by remote operation input :	
SW7-4	Outlet water / Inlet water (☆OFF / ON)	
SW7-5	Model setting (☆ON)	
TB1	Terminal block (Power source) (mark)	Screw : M4
TB2	Terminal block (Signal line) (mark)	Screw : M2.5
TB3	Terminal block (High power electric relay connection) (mark)	Screw : M2.5
TB4	Terminal block (Low power electric relay connection) (mark)	Screw : M2.5
ThC	Thermistor (Remote controller)	
Th-A	Thermistor (Inlet water)	
Th-AF	Thermistor (Outlet water)	
Th-R1,2,3	Thermistor (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 controller	Content
LED on (checking) (green normal)	Normal
Off	Failure in power source indoor power off or one phase down
Off	Failure in the transmission between indoor circuit board and remote control
E1	Indoor computer abnormal
E2	Excess number of remote controller (only be detected during operation)
E3	There is no corresponding outdoor unit address. Indoor unit address switch setting error
E5	Failure on outdoor-indoor transmission
E7	Indoor heat exchanger thermistor interrupted or short-circuit
E9	Return air thermistor interrupted or short-circuit
E10	Indoor unit operation check, drain pump motor check mode faulty
E11	Excess number of remote controller connections
E12	The master indoor unit is not set properly.
E14	Communication abnormal between master-slave indoor units
E15	Indoor supply air thermistor interrupted or short-circuit
E18	The address configuration fail for master-slave indoor units.
E28	Remote controller thermistor anomaly
E30	Indoor unit system connection abnormal
Over E30	Indoor 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 (Specifications of LY2F manufactured by OMRON)

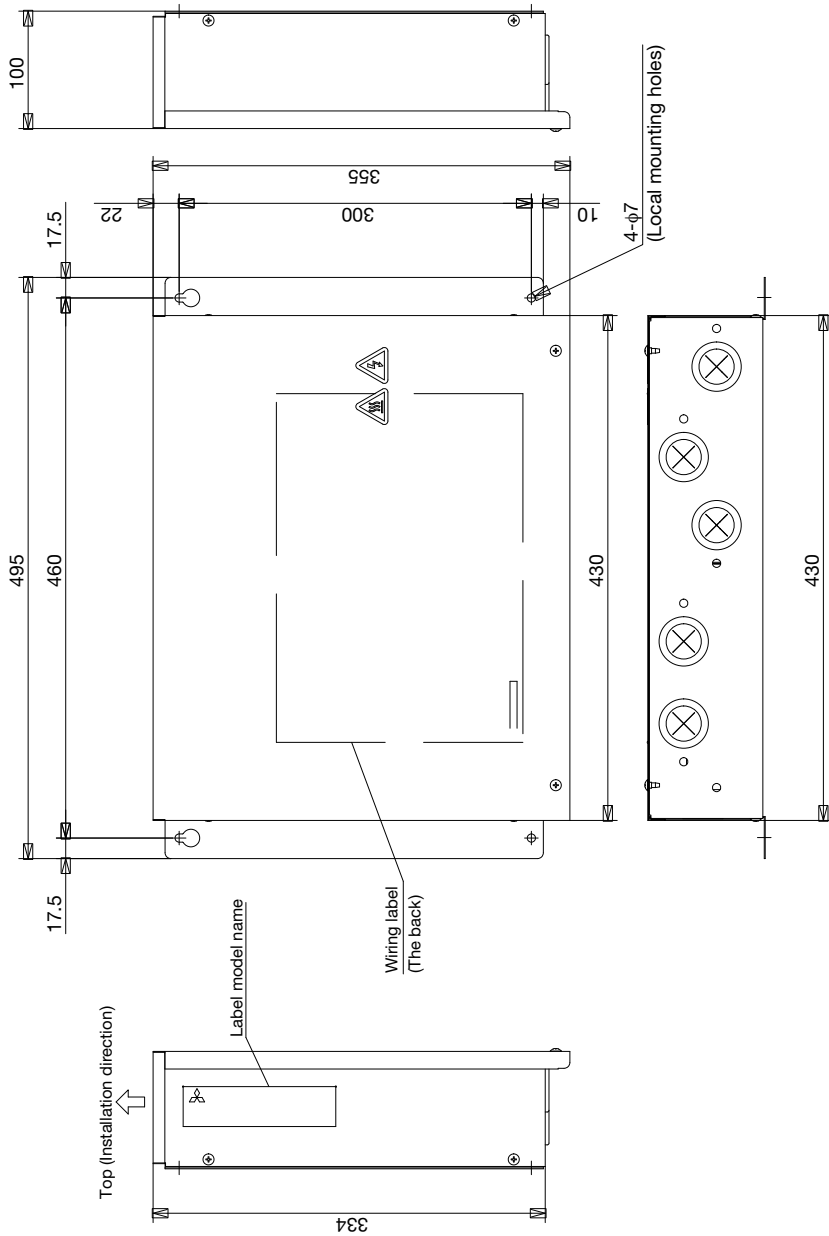
Resistive load	Inductive load
10 A at AC110V	7.5 A at AC110V
10 A at DC24V	7.5 A at DC24V
Carry current	10A
Maximum operating voltage	AC250V
Maximum operating current	DC125V
	10A

Notes 1. -- indicates wiring on site.

- Use twin core cable (0.75 - 1.25mm²) at signal line between indoor unit and outdoor unit, and signal line between indoor units.
- Terminal [A] [B] are signal terminal. (DC 5volt) of remote controller in case that the total length is more than 100m.
- Do not put signal line and remote controller line alongside power source line.

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2.2.4 External dimensions

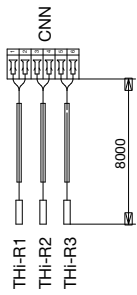


Notes

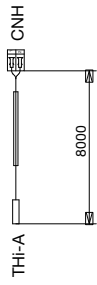
- (1) Take note that this control box is not waterproof. Do not allow water or dust to enter the control box.
- (2) Mount the control box firmly using the four holes shown in the figure and confirm that it will not come loose due to vibration.
- (3) Use the tie-wraps included in the control box to fix the wiring. Confirm that there is no tension on the wiring to the terminal blocks and that the wiring connections are fixed tight in the terminal blocks.
- (4) The label for the model name is located on the left side of the control box.
- (5) Take note that the wiring diagram is located on the back of the lid. If you do not use the lid of the control box, then use the wiring diagram that comes with the control box.
- (6) Ensure a gap of more than 15mm at the top of the control box to remove the lid of the control box. (As there is danger of electric shock or incorrect operation)
- (7) Always install this control box in a secure location inside a locked enclosure.
- (8) Provide the following clearances above, below, to the right and to the left to ensure enough space for ventilation and service work of the control box.

Bottom clearance	Min. 100mm (Recommended length of 200mm or more)	...	Space for wiring and service
Top clearance	Min. 30mm	.....	Space for cooling
Left clearance	Min. 30mm	.....	Space for cooling
Right clearance	Min. 30mm	.....	Space for cooling
Front clearance	Min. 30mm	.....	Space for cooling

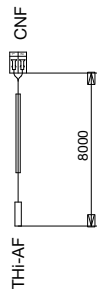
Thermistor for heat exchanger



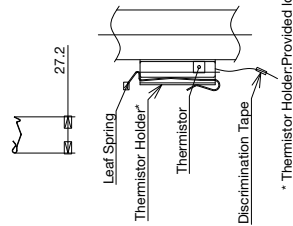
Thermistor for inlet water



Thermistor for outlet water



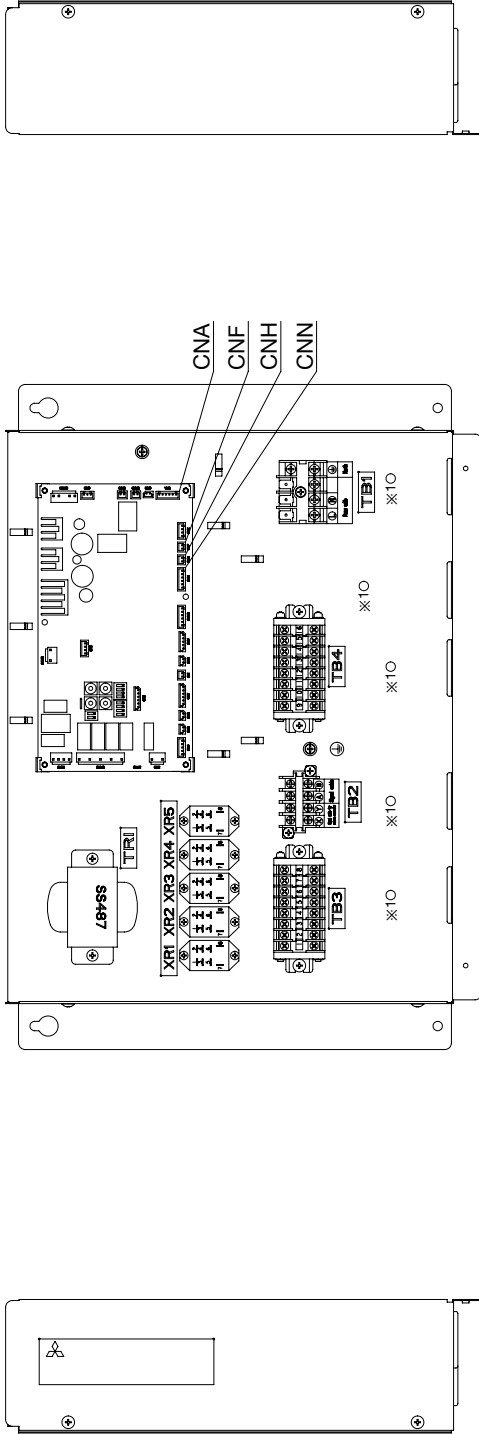
**Leaf Spring for thermistor
(Use when thermistor is installed.)**



* Thermistor Holder: Provided locally

Thermistor	φ	Material
For THI-R3	φ9.52×0.6t	Copper tube
For THI-A, AF, R1 and R2	φ8.0×0.6t	

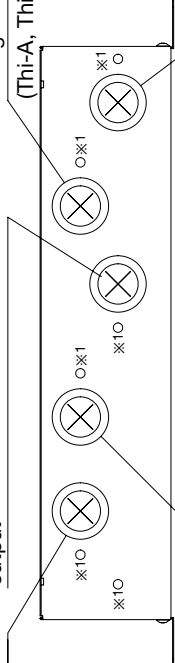
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Wiring hole for remote operation input and operation information output

Wiring hole for operation information output

Wiring hole for thermistor and stepping motor (Thi-A, Thi-AF, Thi-R1, R2, R3, SM)



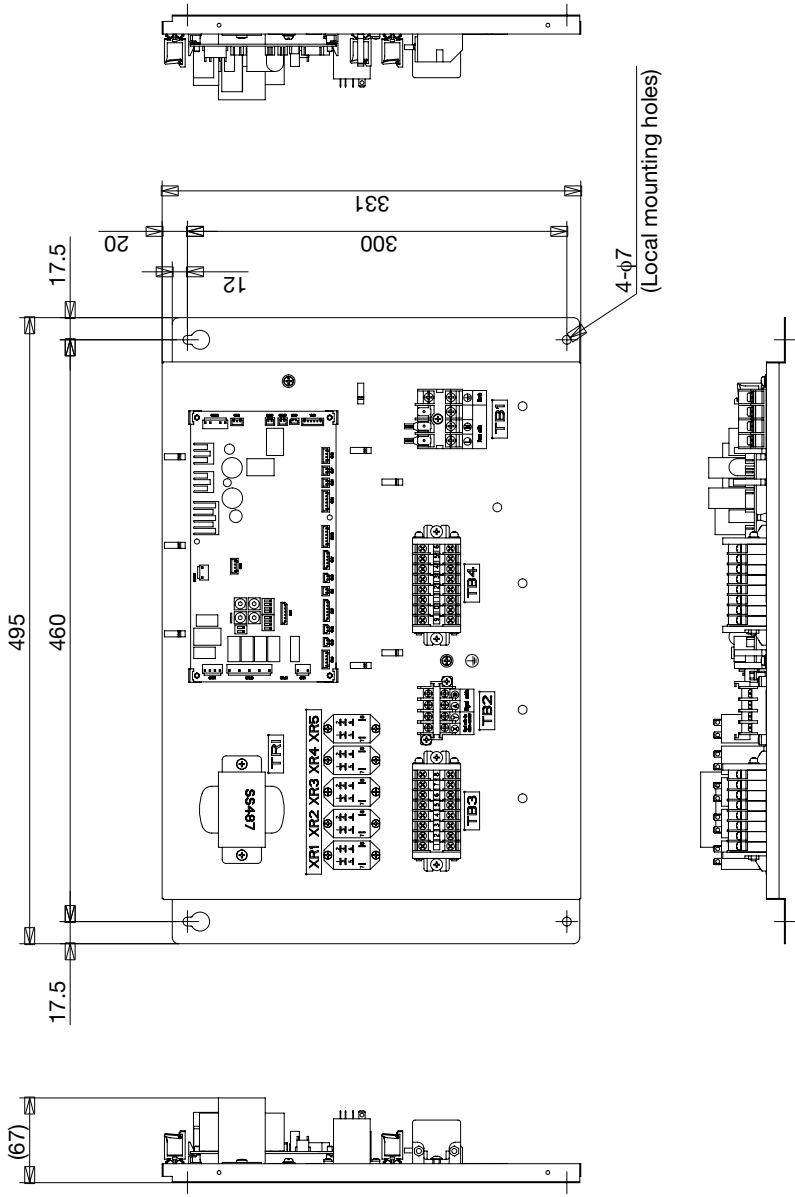
Hole for communication cables (Remote controller X and Y cable, Superlink A and B cable)

Hole for power source cable (220-240V-50Hz, 220V-60Hz)

Notes

- (1) This view is shown by removing the lid. The wiring diagram has been pasted to the back of the lid. If you do not want to use the lid, then use the wiring diagram supplied as an accessory.
- (2) ※1 are the holes for accessory cable tie bands for fixing the site wiring.
- (3) CNH is a connector to be connected to Thi-A.
- (4) CNF is a connector to be connected to Thi-AF.
- (5) CNN is a connector to be connected to Thi-R1,R2,R3.
- (6) CNA is a connector to be connected to SM.

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Notes

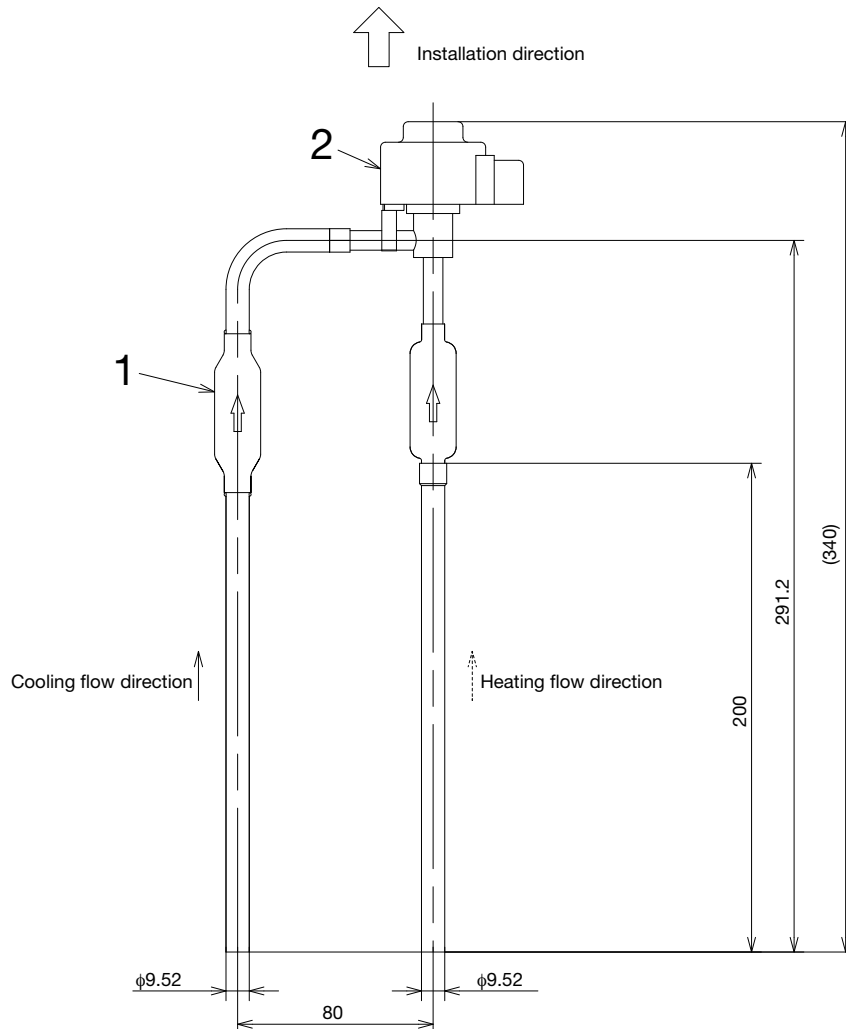
- (1) When removing the sheet metal cover take care not to damage the internal control box wiring.
- (2) After connecting the local wiring, confirm that there is no direct tension of the local wiring onto the terminal blocks or the connectors of printed circuit board (PCB).
- (3) If you are using the control box as shown in the figure, take note of the following points.
 - Ensure that the exposed high-temperature and the high-voltage parts do not come into contact with any wiring.
 - Ensure that there is an air gap of more than 90mm above the high-temperature and the high-voltage parts.

PCH000Z425

2.3 EEVSET specifications

2.3.1 Outline

(1) EEV6-160-E



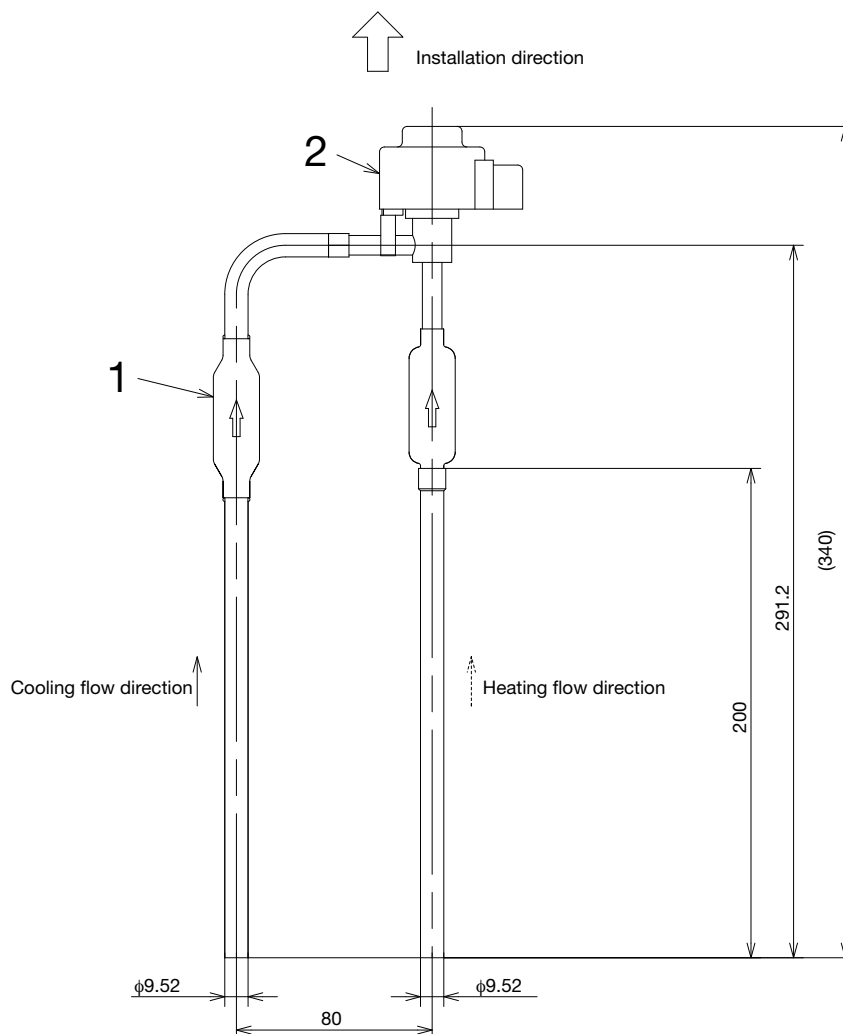
Expansion valve set

- ① Please do not a pipe connection when the expansion valve body to high temperature (Not to 120°C or more).
- ② Please do the brazing work in the state expansion valve coil is that the removed.
- ③ Please note that the mounting angle of the electronic expansion valve. The inclination angle in the above electronic expansion valve coil please be within 15 degrees. (In principle, please as a vertical direction.)
- ④ After the body connection, please insulation.

The electronic expansion valve is a function goods services subject parts. Please check whether it is possible to check the local mounted state service (accessible).

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(2) EEV6-280-E



Expansion valve set

- ① Please do not a pipe connection when the expansion valve body to high temperature (Not to 120°C or more).
- ② Please do the brazing work in the state expansion valve coil is that the removed.
- ③ Please note that the mounting angle of the electronic expansion valve. The inclination angle in the above electronic expansion valve coil please be within 15 degrees. (In principle, please as a vertical direction.)
- ④ After the body connection, please insulation.

The electronic expansion valve is a function goods services subject parts. Please check whether it is possible to check the local mounted state service (accessible).

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2.4 Outdoor unit specifications

Connecting to the KXZ Series outdoor unit, please refer to Data book '14 • KX-DB-201.

Connecting to the KXZ-X Series outdoor unit, please refer to Data book '14 • KX-DB-203.

2.5 Specifications of other parts

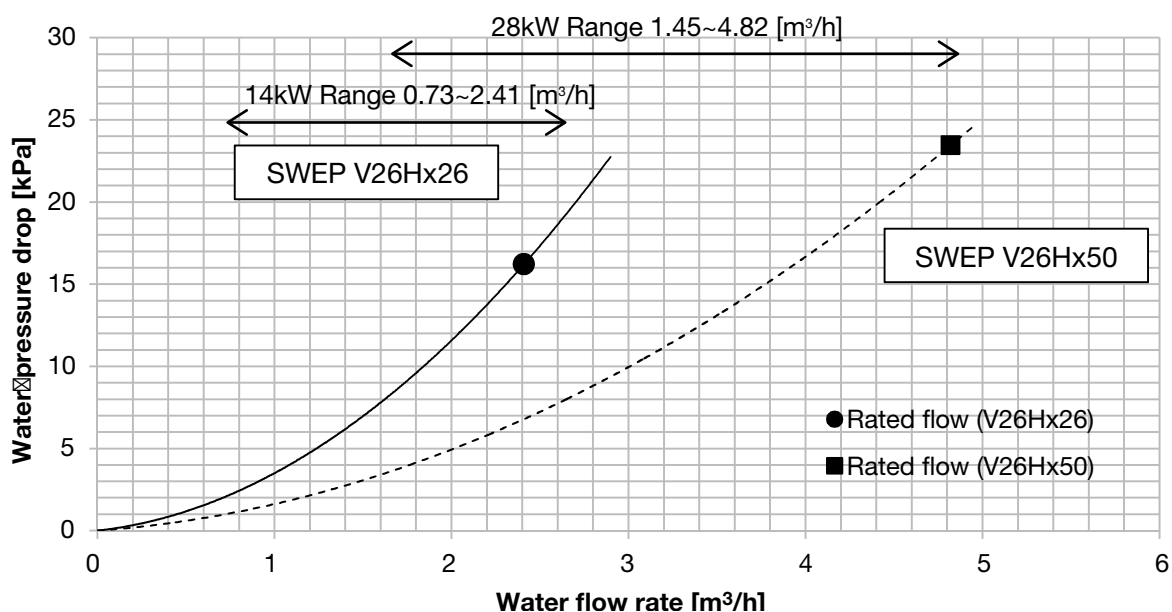
2.5.1 Water heat exchanger

Please use plate heat exchangers specified below.

Category	Manufacturer	Manufacturer type
Plate Heat Exchanger	SWEP	V26H×26 (for 14.0kW)
	SWEP	V26H×50 (for 28.0kW)

(a) Water heat exchanger specifications

Nominal HP			5 HP	10 HP
Capacity	Cooling	kW	14.0	28.0
	Heating	kW	14.0	28.0
Plate heat exchanger	Plate		SWEP V26Hx26/1P-SC-M	SWEP V26Hx50/1P-SC-M
	Fins	Pcs.	26	50
	H × W × D	mm	376 × 119 × 52.4	376 × 119 × 91.5
	Weight	kg	4.37	7.02
	Rated water volume	m ³ /h	2.41	4.82
	Refrigerant side internal volume	L	0.53	1.06
	Water side internal volume	L	0.86	1.65
Adapted EEVSET			EEV6-160-E	EEV6-280-E
Refrigerant piping	Liquid side	mm	φ9.52	φ9.52
	Gas side	mm	φ15.88	φ22.22
Water piping	Inlet side		MADA JCDA R1	MADA JCDA R1
	Outlet side		FADA JCDA RC1	FADA JCDA RC1

(b) Water pressure drop**2.5.2 Circulation pump**

Please select a circulation pump that can flow selected water flow rate.

Please select a circulation pump with pump head to achieve total pressure drop with plate heat exchanger, water pipings and valves.

Reference: Pressure loss of the pipe and joint

① Pressure loss of pipe

Typical pressure loss is shown in following table. Please select the size of water pipe in following table

Nominal diameter	Flow rate (L/min)	Rough indication of pipe friction resistance per unit length
20A	20	0.1mAq (1kPa)/m
25A	40	0.1mAq (1kPa)/m
32A	80	0.1mAq (1kPa)/m
40A	120	0.15mAq (1.5kPa)/m
50A	160	0.06mAq (0.6kPa)/m
65A	160	0.02mAq (0.2kPa)/m

② Rough indication about the equivalent pipe length corresponding to the pressure loss of joints.

Nominal diameter	Equivalent pipe length (m)			
	Elbow	Gate valve	Check valve (Swing type)	Y-type strainer
20A	0.75	0.15	1.6	2.18
25A	0.9	0.18	2.0	3.00
32A	1.2	0.24	2.5	4.62
40A	1.5	0.30	3.1	5.47
50A	2.1	0.39	4.0	8.00
65A	2.4	0.48	4.6	11.50

* 15A=DN15=15mm=1/2in
 20A=DN20=20mm=3/4in
 25A=DN25=25mm=1in
 32A=DN32=32mm=1-1/4in
 40A=DN40=40mm=1-1/2in
 50A=DN50=50mm=2in
 65A=DN65=65mm=2-1/2in

3. INSTALLATION

3.1 Installation of HMU-KIT

(1) Installation of HMU-KIT

Connecting to the KXZ Series outdoor unit, please refer to Data book '14 • KX-DB-201.

Connecting to the KXZ-X Series outdoor unit, please refer to Data book '14 • KX-DB-203.

(2) Caution for installation special to HMU-KIT

- Fill in all necessary items on HMU-KIT Check Sheet. (Refer to Appendix.)
- Fix the connecting section of terminals with care to avoid external forces such as strain by wiring.
- Improper connection or fixing could cause overheat, fume or fire.
- It is necessary to take measures to install protective fuses on the power supply circuit, prevent from touching charged sections with fingers, or other.
- Avoid installing HMU and plate heat exchanger at following places.
 - * Where the suction inlet or blow outlet is blocked by obstacles.
 - * Fragile place prone to vibration
 - * Near a device susceptible to high frequency.
- Avoid washing HMU-KIT with water or placing a flower vase on it.
- Do not place an inflammable spray bottle near the heat exchanger or spray directly over the heat exchanger.
- When refrigerant has leaked accidentally, extinguish flame of space heater, or other, and ventilate sufficiently.
- If the density exceeds the limit level, please contact the dealer and install a ventilation system.

(3) Guidelines for installation of heat exchanger sensor and water temperature sensor

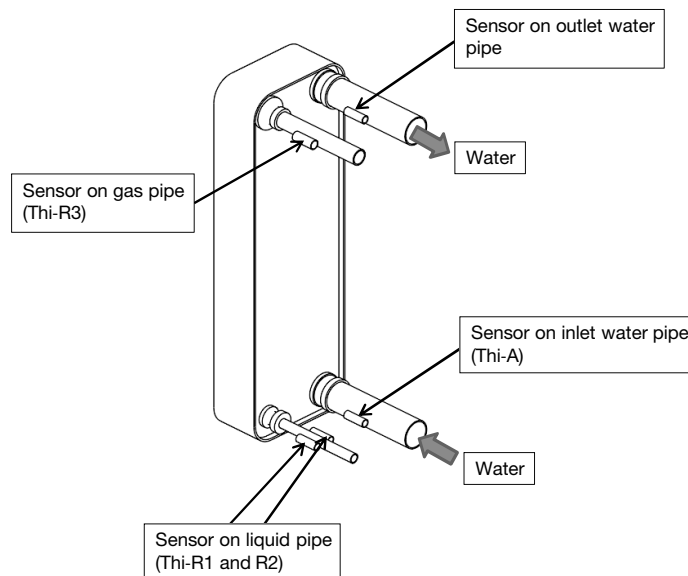
Install all sensors correctly.

3 heat exchanger temperature sensors and 2 water temperature sensors are necessary for each plate heat exchanger in indoor unit.

The sensors are attached to HMU-KIT.

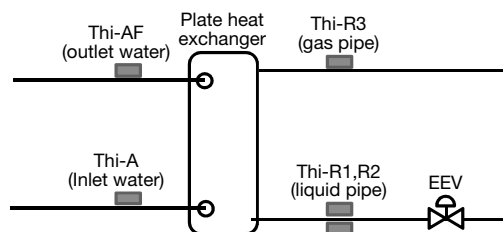
Each sensor must be fixed to correct location of heat exchanger as following table.

Sensor	Mounting position	Control range (accuracy)	Usage range
Thi-R1	On the liquid pipe of ref side	-30 - 63 (±2)	-30 - 72
Thi-R2	On the same position of Thi-R1	-30 - 63 (±2)	-30 - 72
Thi-R3	On the gas pipe of ref side	-30 - 63 (±2)	-30 - 72
Thi-A	On the inlet pipe of water side	0 - 55 (±1.2)	-10 - 55
Thi-AF	On the outlet pipe of water side	0 - 55 (±1.2)	-10 - 55



Function of each heat exchanger sensor

Sensor	Cooling	Heating	Purpose
Thi-R1	Evaporator inlet temperature	Condenser outlet temperature	Anti-freezing protection EEV-Control
Thi-R2			
Thi-R3	Evaporator outlet temperature	Condenser inlet temperature	EEV-Control
Thi-A	Inlet water temperature		Anti-freezing protection Thermo-control
Thi-AF	Outlet water temperature		Anti-freezing protection Thermo-control Compressor control



Each sensor has unique function.

It is important to fix to correct location.

If the sensors are fixed to incorrect position, the system will not be controlled correctly.

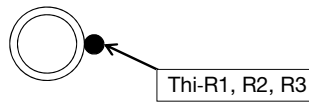
Please do double checking during the commissioning.

The Thi-R3 sensor diameter is larger than Thi-R1,R2 to avoid mistakes.

Items to be checked

1) Thi-R1,R2,R3

a) If the pipe runs horizontally, be sure to mount the sensor on the side part of the pipe.

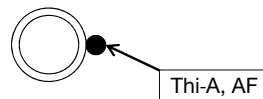


b) Wrap the sensors with insulation.

c) Confirm that the sensors do not touch incorrect piping.

2) Thi-A, AF

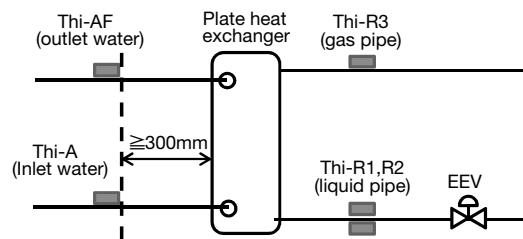
a) If the pipe runs horizontally, be sure to mount the sensor on the side part of the pipe.



b) Wrap the sensors with insulation.

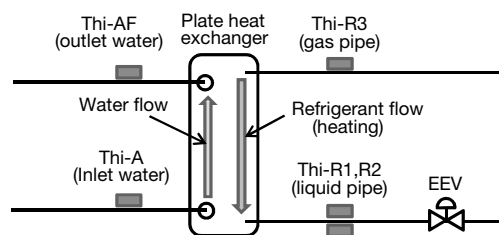
c) Confirm that the sensors do not touch incorrect piping.

d) Separate the water temperature sensor minimum 300 mm from the plate heat exchanger.



e) Install such that the water pipe at the gas pipe side will give the outlet water temperature.

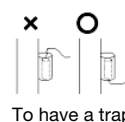
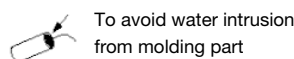
(Arrange such that refrigerant and water will flow in opposite directions each other during heating.)



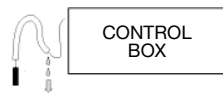
3) Be careful to mount the sensors in the correct position and by identifying the attached lead mark of each sensor.

4) Be sure to confirm whether the sensed temperature of each sensor is correct or not by actual operation testing at commissioning.

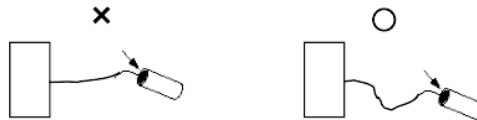
5) The sensor should be inserted into the holder from the bottom side and the wiring should have a trap. This is to avoid intrusion of drain water into the sensor through the gap between the lead wire and the resin at the connecting part of sensor.



- 6) The drain water does not intrude into the connection part of the control box through the sensor wire (protective tube). The wiring route must have a trap so that the drain water drops down just before the control box.



- 7) The sensor wiring should be loose and not tight.

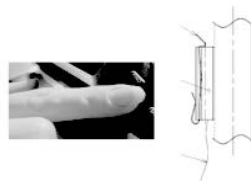


- 8) The sensors should not be inserted into the holder too deeply in order to prevent the sensor wire being damaged.



- 9) The sensors should not make contact with other parts.

- 10) The sensor wiring should not be in the place where a person can touch it.
If it can be touched, ensure it is covered by a protective tube with 1mm or more thickness.
(for safety reasons)



- 11) The sensor wiring should be covered by a protective tube or rerouted to prevent it from cut by metal edges.

3.2 Electric wiring work instruction

When HMU-KIT is contained within Superlink, however, the automatic address setting cannot be used.
For electrical wiring, please refer to KXZ series Technical Manual '17, KX-T-266.

3.3 Remote controller

3.3.1 Safety precautions

• Please read this manual carefully before starting installation work to install the unit properly.

Every one of the followings is important information to be observed strictly.

⚠ WARNING Failure to follow these instructions properly may result in serious consequences such as death, severe injury, etc.

⚠ CAUTION Failure to follow these instructions properly may cause injury or property damage.

It could have serious consequences depending on the circumstances.


• The following pictograms are used in the text.


	Never do.		Always follow the instructions given.
--	-----------	--	---------------------------------------

• 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.

⚠ WARNING	
	<ul style="list-style-type: none"> • 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.
	<ul style="list-style-type: none"> • Installation work should be performed properly according to this installation manual. Improper installation work may result in electric shocks, fire or break-down.
	<ul style="list-style-type: none"> • Be sure to use accessories and specified parts for installation work. Use of unspecified parts may result in drop, fire or electric shocks.
	<ul style="list-style-type: none"> • Install the unit properly to a place with sufficient strength to hold the weight. If the place is not strong enough, the unit may drop and cause injury.
	<ul style="list-style-type: none"> • Be sure to have the electrical wiring work done by qualified electrical installer, and use exclusive circuit. Power source with insufficient and improper work can cause electric shock and fire.
	<ul style="list-style-type: none"> • Shut OFF the main power supply before starting electrical work. Otherwise, it could result in electric shocks, break-down or malfunction.
	<ul style="list-style-type: none"> • Do not modify the unit. It could cause electric shocks, fire, or break-down.
	<ul style="list-style-type: none"> • Be sure to turn OFF the power circuit breaker before repairing/inspecting the unit. Repairing/inspecting the unit with the power circuit breaker turned ON could cause electric shocks or injury.
	<ul style="list-style-type: none"> • Do not install the unit in appropriate environment or where inflammable gas could generate, flow in, accumulate or leak. If the unit is used at places where air contains dense oil mist, steam, organic solvent vapor, corrosive gas (ammonium, sulfuric compound, acid, etc) or where acidic or alkaline solution, special spray, etc. are used, it could cause electric shocks, break-down, smoke or fire as a result of significant deterioration of its performance or corrosion.
	<ul style="list-style-type: none"> • Do not install the unit where water vapor is generated excessively or condensation occurs. It could cause electric shocks, fire, or break-down.
	<ul style="list-style-type: none"> • Do not use the unit in a place where it gets wet, such as laundry room. It could cause electric shocks, fire, or break-down.
	<ul style="list-style-type: none"> • Do not operate the unit with wet hands. It could cause electric shocks.
	<ul style="list-style-type: none"> • Do not wash the unit with water. It could cause electric shocks, fire, or break-down.
	<ul style="list-style-type: none"> • Use the specified cables for wiring, and connect them securely with care to protect electronic parts from external forces. Improper connections or fixing could cause heat generation, fire, etc.
	<ul style="list-style-type: none"> • Seal the inlet hole for remote control cable with putty. If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down. If dew or water enters the unit, it may cause screen display anomalies.


⚠ WARNING

- 

• **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.
- 

• **Do not leave the remote control with its upper case removed.**
If dew, water, insect, etc. enters through the hole, it could cause electric shocks, fire or break-down.


⚠ CAUTION

- 

• **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 controller, resulting in a display failure.

 - Place with high humidity where condensation occurs on the remote controller
 - Where the remote controller gets wet
 (3) Accurate room temperature may not be detected using the temperature sensor of the remote controller.

 - 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
- 

• **To connect to a personal computer via USB, use the dedicated software.**
Do not connect other USB devices and the remote controller at the same time.
It could cause malfunction or break-down of the remote controller/personal computer.

3.3.2. Accessories and prepare on site

Following parts are provided.

Accessories	R/C main unit, wood screw (φ3.5 x 16) 2 pcs, Quick reference
-------------	--

Following parts are arranged at site. Prepare them according to the respective installation procedures.

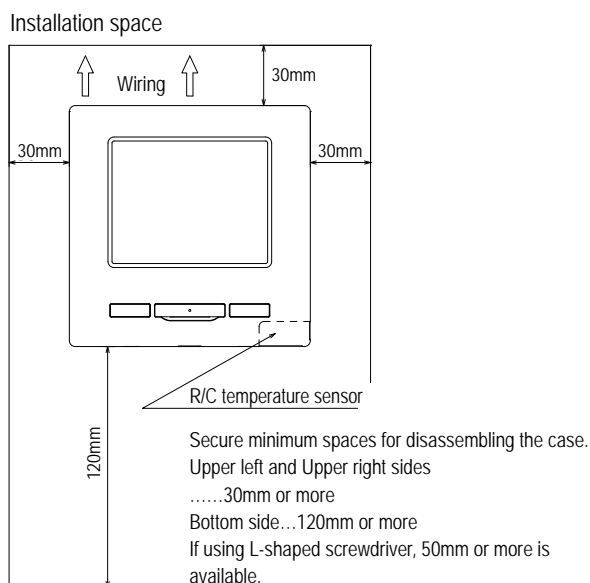
Item name	Q'ty	Remark
Switch box For 1 piece or 2 pieces (JIS C 8340 or equivalent)	1	These are not required when installing directly on a wall.
Thin wall steel pipe for electric appliance directly on a wall. (JIS C 8305 or equivalent)	As required	
Lock nut, bushing (JIS C 8330 or equivalent)	As required	
Lacing (JIS C 8425 or equivalent)	As required	Necessary to run R/C cable on the wall.
Putty	Suitably	For sealing gaps
Molly anchor	As required	
R/C cable (0.3 mm ² x 2 pcs)	As required	See right table when longer than 100 m

When the cable length is longer than 100 m, the max size for wires used in the R/C case is 0.5 mm². 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

3.3.3 Installation place

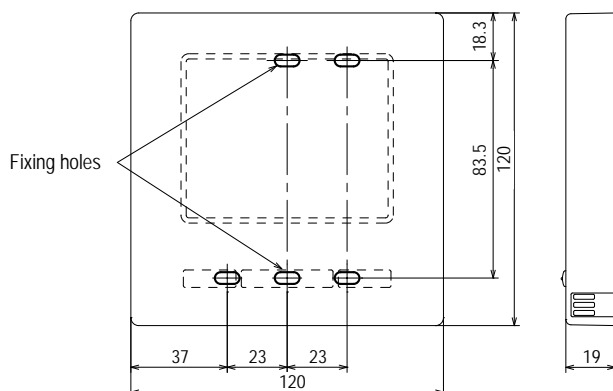
Secure the installation space shown in the figure.
 For the installation method, "embedding wiring" or "exposing wiring" can be selected.
 For the wiring direction, "Backward", "Upper center" or "Upper left" can be selected.
 Determine the installation place in consideration of the installation method and wiring direction.



3.3.4 Installation procedure

Perform installation and wiring work for the remote control according to the following procedure.

Dimensions (Viewed from front)



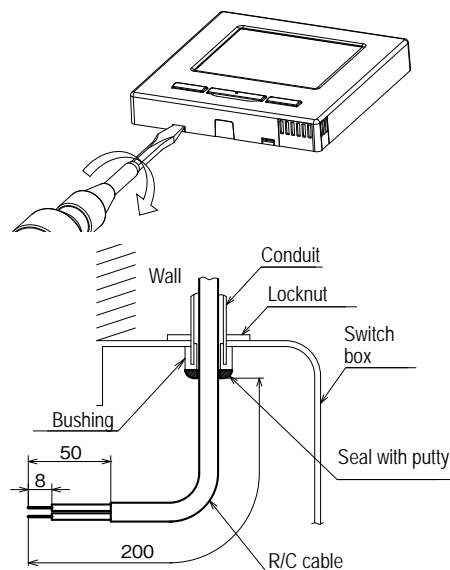
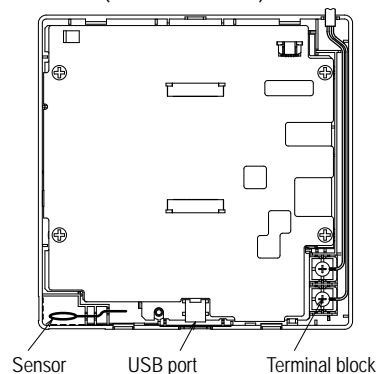
To remove the upper case from the bottom cases of R/C
 · Insert the tip of flat head screwdriver or the like in the recess at the lower part of R/C and twist it lightly to remove. It is recommended that the tip of the screwdriver be wrapped with tape to avoid damaging the case.
 Take care to protect the removed upper case from moisture or dust.

In case of embedding wiring

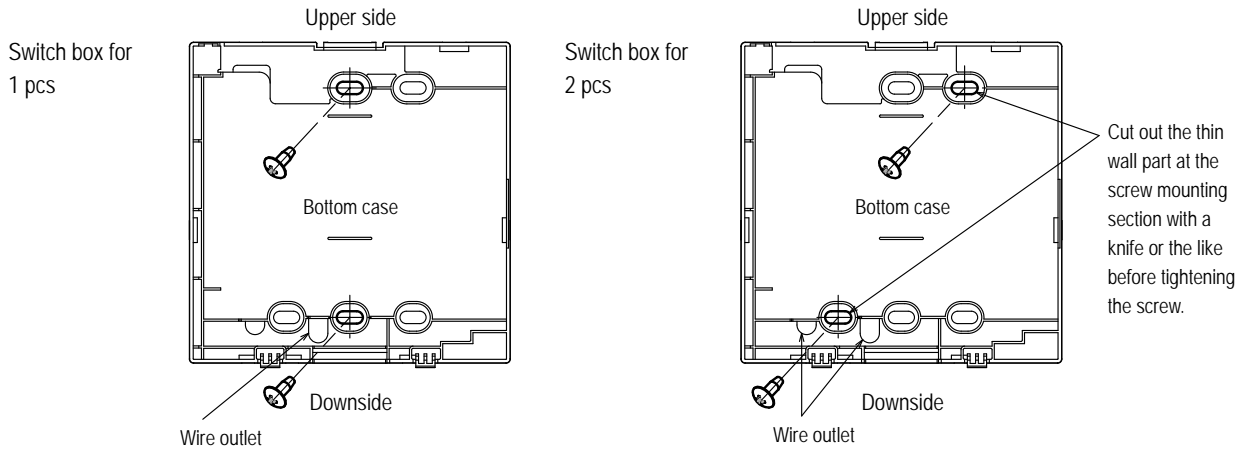
(When the wiring is retrieved "Backward")

- ① Embed the switch box and the R/C wires beforehand.
 Seal the inlet hole for the R/C wiring with putty.

PCB side (Viewed from rear)



② When wires are passed through the bottom case, fix the bottom case at 2 places on the switch box.



③ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.

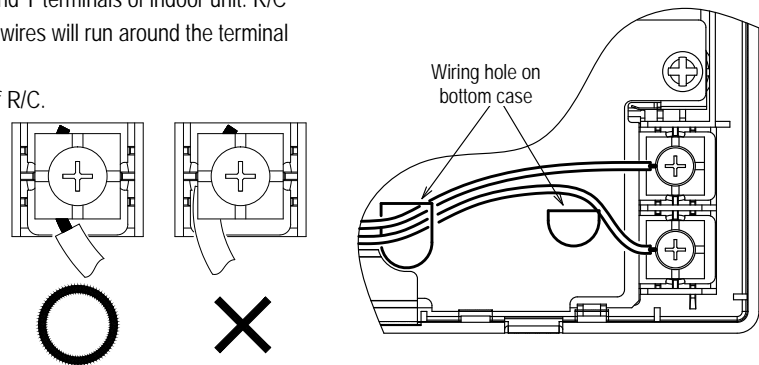
④ Install the upper case with care not to pinch wires of R/C.

Cautions for wire connection

Use wires of no larger than 0.5 mm² for wiring running through the remote control case. Take care not to pinch the sheath.

Tighten by hand (0.7 N·m or less) the wire connection.

If the wire is connected using an electric driver, it may cause failure or deformation.



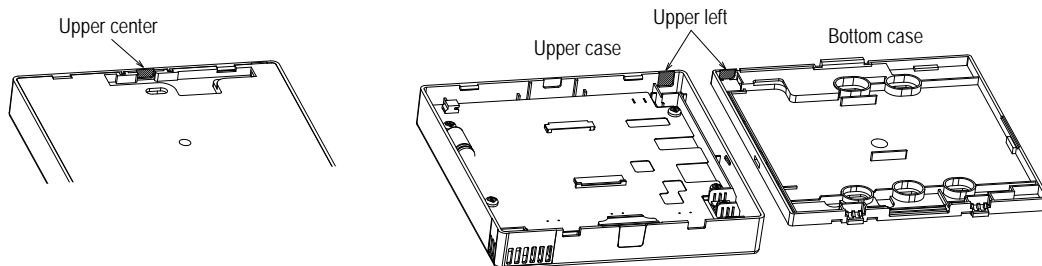
In case of exposing wiring

(When the wiring is taken out from the "upper center" or "upper left" of R/C)

① Cut out the thin wall sections on the cases for the size of wire.

When taking the wiring out from the upper center, open a hole before separating the upper and bottom cases. This will reduce risk of damaging the PCB and facilitate subsequent work.

When taking the wiring out from the upper left, take care not to damage the PCB and not to leave any chips of cut thin wall inside.



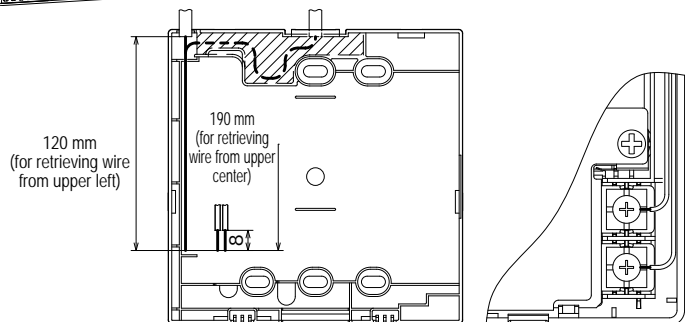
② Fix the bottom R/C case on a flat surface with two wood screws.

③ In case of the upper center, pass the wiring behind the bottom case. (Hatched section)

④ Connect wires from X and Y terminals of R/C to X and Y terminals of indoor unit. R/C wires (X, Y) have no polarity. Fix wires such that the wires will run around the terminal screws on the top case of R/C.

⑤ Install the top case with care not to pinch wires of R/C.

⑥ Seal the area cut in ① with putty.

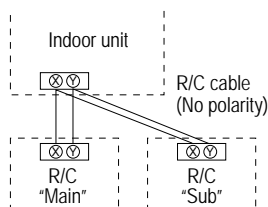


3.3.5. Main/Sub setting when more than one remote controls are used

Up to two units of R/C can be used at the maximum for 1 indoor unit or 1 group.

One is main R/C and the other is sub R/C.

Operating range is different depending on the main or sub R/C.



Set the "Main" and "Sub" as described at Section 8.

R/C operations		Main	Sub	
Run/Stop, Change set temp, Change flap direction, Auto swing, Change fan speed operations		○	○	
High power operation, Energy-saving operation		○	○	
Silent mode control		○	×	
Useful functions	Individual flap control	○	×	
	Anti draft setting	○	×	
	Timer	○	○	
	Favorite setting	○	○	
	Weekly timer	○	×	
	Home leave mode	○	×	
	External ventilation	○	○	
	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	○	○

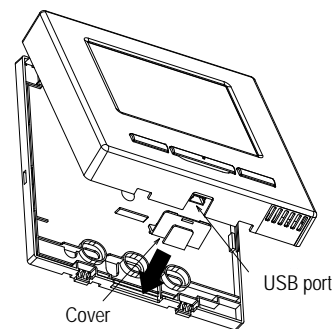
○ : operable × : not operable

R/C operations		Main	Sub		
Service setting	Installation settings	Installation date	○	×	
		Company information	○	○	
		Test run	○	×	
		Static pressure adjustment*	○	×	
		Change auto-address*	○	×	
	R/C function settings	Address setting of main IU	○	×	
		IU back-up function	○	×	
		Infrared sensor (motion sensor) setting*	○	×	
		Main/Sub of R/C	○	○	
		Return air temp*	○	×	
		R/C sensor	○	×	
		R/C sensor adjustment	○	×	
		Operation mode	○	×	
		°C / °F*	○	×	
		Fan speed*	○	×	
External input	○	×			
Upper/lower flap control*	○	×			
Left/right flap control*	○	×			
Ventilation setting*	○	×			
Auto-restart	○	×			
Auto temp setting*	○	×			
Auto fan speed*	○	×			
Remote control usage	○	×			
Heating/Cooling curve	○	×			
IU settings		○	×		
Service & Maintenance	IU address		○	○	
	Next service date		○	×	
	Operation data		○	×	
	Error display	Error history		○	○
		Display/erase anomaly data		○	×
		Reset periodical check		○	○
	Saving IU settings		○	×	
	Special settings	Erase IU address		○	×
		CPU reset		○	○
		Restore of default setting		○	×
		Touch panel calibration		○	○
	Indoor unit capacity display		○	×	
	IU settings 2		○	×	

* Invalid for this unit.

Advice: Connection to personal computer

It can be set from a personal computer via the USB port (mini-B).
 Connect after removing the cover for USB port of upper case.
 Replace the cover after use.
 Special software is necessary for the connection.
 For details, view the web site or refer to the engineering data.



Advice: Initializing of password

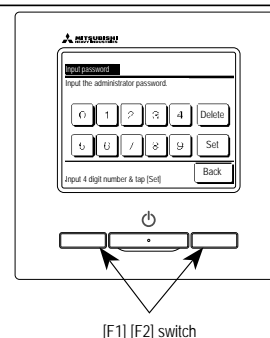
Administrator password (for daily setting items) and service password (for installation, test run and maintenance) are used.

- The administrator password at factory default is "0000". This setting can be changed (Refer to User's Manual).

If the administrator password is forgotten, it can be initialized by holding down the [F1] and [F2] switches together for five seconds on the administrator password input screen.

- Service password is "9999", which cannot be changed.

When the administrator password is input, the service password is also accepted.



3.4 Water piping work

3.4.1 Caution for water piping

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

Item	Limitation for use
Inlet water temperature	5°C-50°C
Water pressure	1.5MPa or less
Water flow rate	See section 2.6
Water quality	See the table below
Water circuit	Closed *

- * The water circuit connected to the plate heat exchanger must be closed circuit type.
Open circuit type could cause clogging or corrosion on the plate heat exchanger.

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)	mgCaCO ₃ /L	≤100	≤50	≤50	≤50		○
	Total hardness	mgCaCO ₃ /L	≤200	≤70	≤70	≤70		○
	Calcium hardness	mgCaCO ₃ /L	≤150	≤50	≤50	≤50		○
Reference items	Ionic silica	mgSiO ₂ /L	≤50	≤30	≤30	≤30		○
	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 de-aeration 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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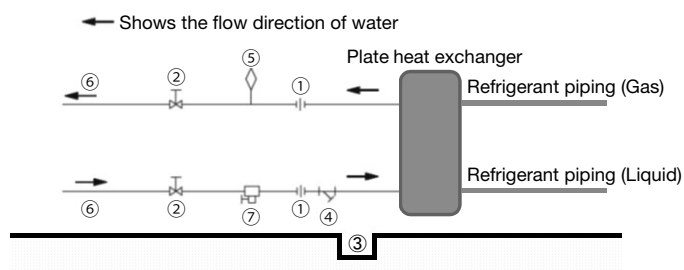
3.4.2 Outline of water piping

(1) Key consideration for water piping

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

- ① Union joint Be sure to fit it in order to enable the unit replacement easily.
- ② Valve Be sure to fit it for servicing such as cleaning heat exchanger and/or replacing unit and etc.
- ③ Drainage Be sure to take into consideration for condensing water from plate heat exchanger and water piping.
Plate heat exchanger is recommended to install in a room with existing floor drainage, most suitably in a utility room or boiler room.
- ④ Strainer Be sure to fit a strainer (50 mesh or more) at the inlet port of the unit to avoid intrusion of foreign matter into the unit.
- ⑤ Air purge valve Be sure to equip it to the place where air may accumulate in order to purge air in the water pipe.
- ⑥ Water piping Water piping work shall be done by considering to purge air in the water pipe easily. Insulation work shall be done sufficiently.

- ⑦ 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 piping.



(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 3.4.1.

(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 (50 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.

3.4.3 Water pipe connection

- Check the connecting positions at water inlet/outlet on the outline drawing of plate heat exchanger.
- Water pipe joints in plate heat exchanger are made of stainless steel. 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 plate heat exchanger side.
- To avoid from the weight of water pipes being exerted to joints of the plate heat exchanger, support the water pipes at places in the building, which are sufficiently strong.
- Be sure to tighten joints between water pipe where air is likely trapped so that air can be bled effective when filling water in pipeline.
- Be sure to provide anti-freezing means where a risk of freezing is suspected.
- When all water pipes have been connected, run the circulating water pump to confirm that there is no leakage.
- Run the circulating water pump to bleed air till water flows out from the air vent on water pipes connected at site.
- Run the circulating water pump to flush in water pipes. Clean strainers after flushing.
- Be sure to perform the piping work with care to avoid water condensation on the controls etc.

3.4.4 Drain pipe

- If you set drainage, incline the drain pipe down ward (larger than 1/100), with care to avoid air traps.
- After connecting drain pipes, confirm they are not clogged with dirt and water runs down smoothly.

3.4.5 Heat insulation

- Dress water pipes with heat insulation material to prevent dew condensation.

3.5 Installation of outdoor unit

Please refer to KXZ/KXZ Hi-COP series installation manual without the calculation of additional refrigerant charge.

For KXZ Series outdoor unit, please refer to Service Manual '14 · KX-SM-202.

For KXZ-X Series outdoor unit, please refer to the Service Manual '14 · KX-SM-204.

Regarding the calculation of additional refrigerant charge, please follow the instruction below in the refrigerant system which contains HMU-KIT.

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 Hi-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)

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

L1: φ22.22 total length (m) L2: φ19.05 total length (m) L3: φ15.88 total length (m)

L4: φ12.7 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.

$$D = \{(\text{Total indoor units capacity}) - (\text{outdoor unit capacity})\} \quad \text{<Example>}$$

When $D > 0$, calculate I using the above equation;

When you connect FDC400 to FDT140 × 3 units:

$$D = 140 \times 3 - 400 = 20 (> 0)$$

When $D \leq 0$, take it as $I = 0$.

$$I = 20 \times 0.01 = 0.2 \text{ (kg)}$$

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.

$$Do = \{(\text{Standard outdoor unit capacity}) - (\text{Total indoor units capacity})\}$$

$$O = Do \times 0.01$$

When $Do > 0$, calculate O using the above equation.

When $Do \leq 0$, take it as $O = 0$.

<KXZ 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	

<KXZ Hi-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

$$H = (\text{total hydro module unit capacity}) \times 0.03$$

<Example>

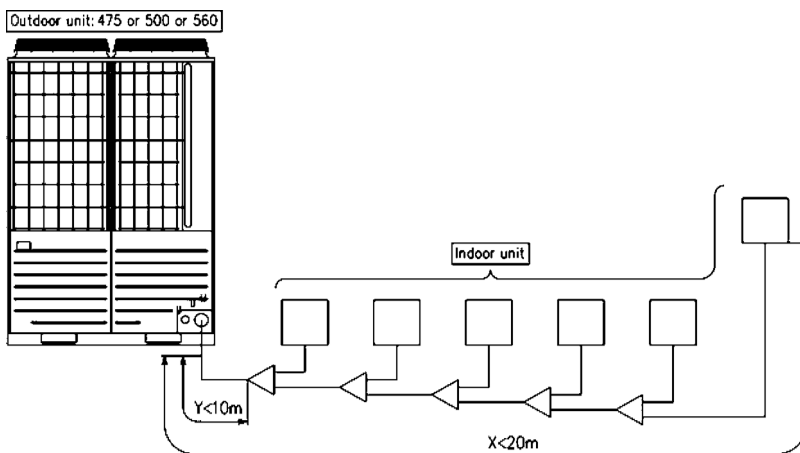
When you connect FDT90 × 2units and HMUI40 × 1unit.

$$H = 140 \times 0.003 = 0.42 \text{ kg} \approx 0.4 \text{ (kg)}$$

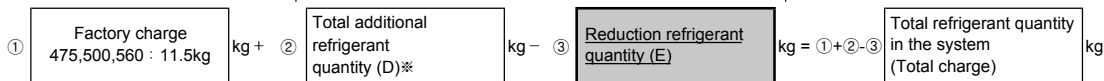
■ Refrigerant charge quantity calculation notes in case outdoor unit capacity is 475,500 and 560*

● 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



* Please calculate the additional refrigerant charge quantity (D) according 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

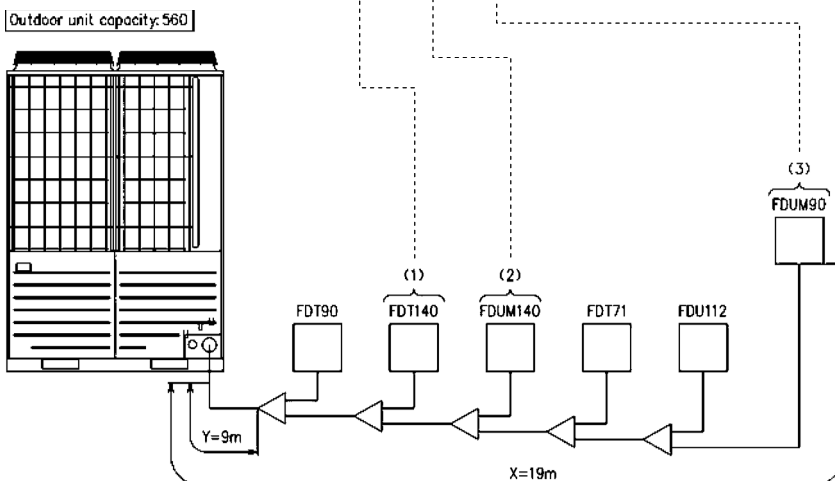
FDT140	FDTW140	FDU140	FDUM140	FDT160	FDU160	FDUM160	FDU90
--------	---------	--------	---------	--------	--------	---------	-------

< 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: 643



PCB011H021

● **FDC-KXZE1 can be connected to HMU only under any of the following conditions.**

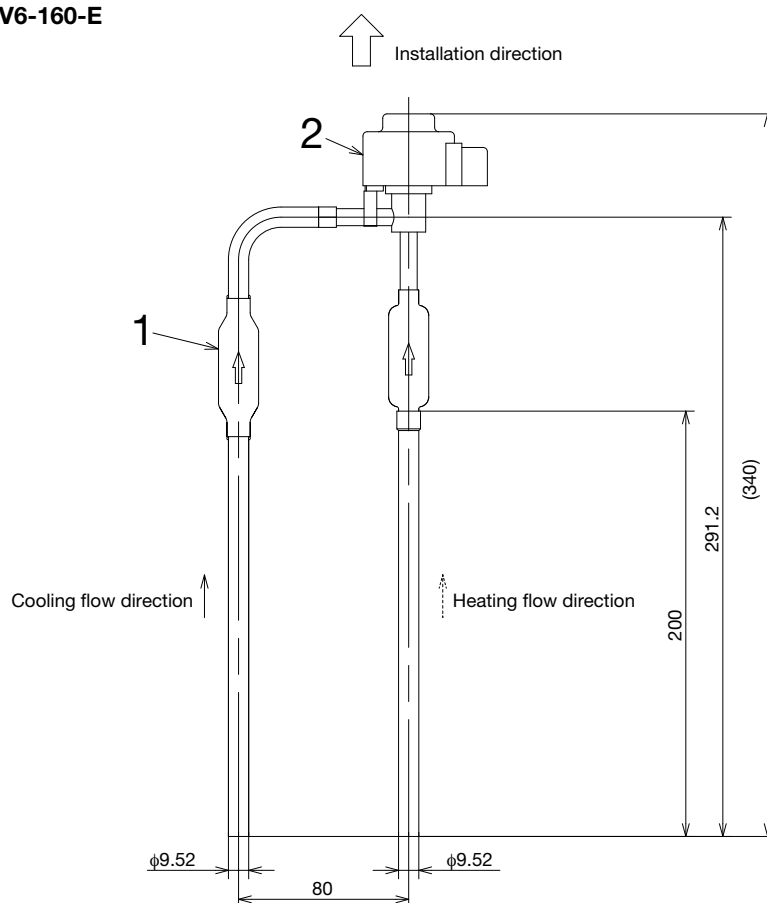
- (a) FDC280 KXZE1 and FDC335 KXZE1 can be used if additional refrigerant charge quantity at the site is 5 kg or less.
- (b) In case of cooling operation only, FDC-KXZE1 can be used with following conditions.
- Disable heating operation by remote controller.
- (c) In case of heating operation only, FDC-KXZE1 can be used with following conditions.
- Disable cooling operation by remote controller.
 - Outdoor unit should be installed higher position than indoor unit.
 - Elevation difference between indoor units is 0m.
 - The additional refrigerant charge quantity is 15kg or less.
 - Reduce the additional refrigerant charge amount according to the table below.

(Additional fill quantity (kg) = S + P + I - O - H - Hs)

Outdoor unit	Hs : Reduced refrigerant quantity
280	2 (kg)
335	
400	3 (kg)
450	
475	4 (kg)
500	
560	

3.6 Installation of EEVSET

(1) Model EEV6-160-E

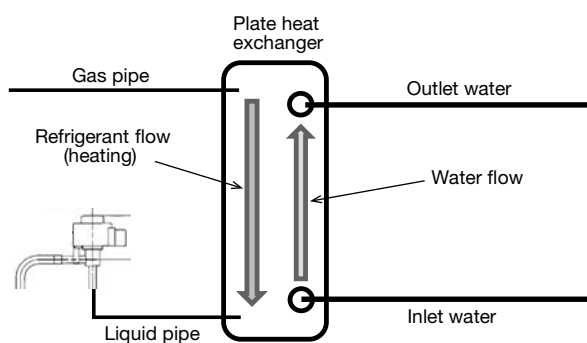


Expansion valve set

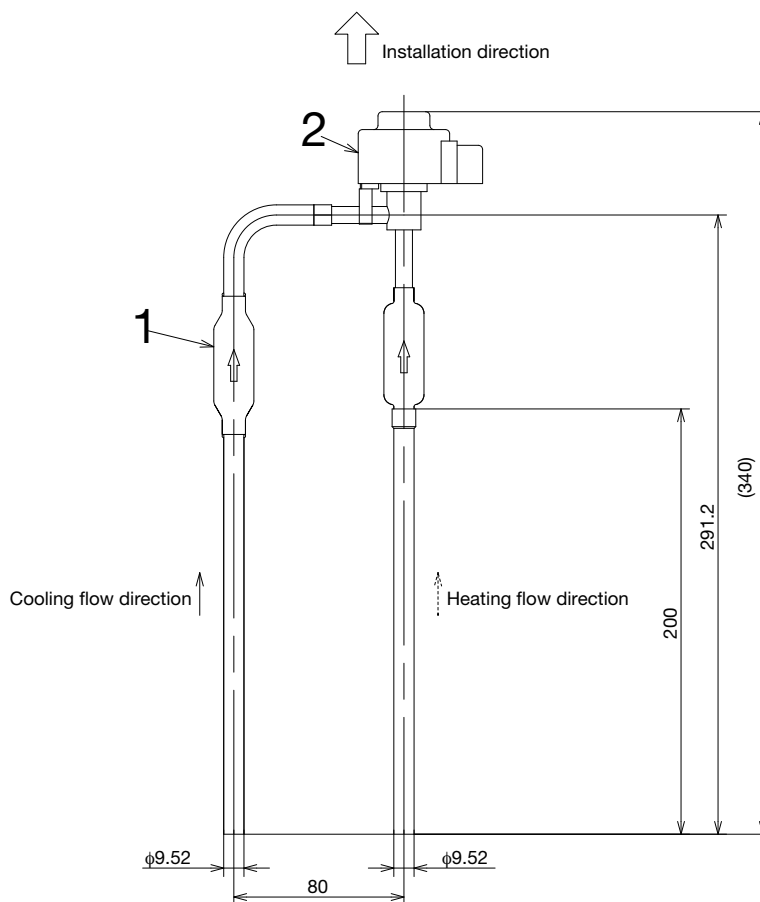
- ① Please do not a pipe connection when the expansion valve body to high temperature (Not to 120°C or more).
- ② Please do the brazing work in the state expansion valve coil is that the removed.
- ③ Braze while cooling not to heat the expansion valve body higher than 120°C.
- ④ Install the expansion valve (valve) body with the motor section at the top, and within $\pm 15^\circ$ to front/rear/right/left.
- ⑤ Be sure to install attached strainers at the outlet and inlet of expansion valve (valve) body.
- ⑥ When installing the expansion valve (coil), fit and align the expansion valve (valve) pipe and expansion valve (coil) detent securely.
- ⑦ After the body connection, please insulation.

The electronic expansion valve is a function goods services subject parts. Please check whether it is possible to check the local mounted state service (accessible).

- ⑧ Pipe length between the expansion valve (valve) and the indoor heat exchanger must be no longer than 5 m.
- ⑨ Height difference between the expansion valve (valve) and the indoor heat exchanger must be no longer than 2.5 m.
- ⑩ Install that the refrigerant flow becomes opposite to the water flow direction in heating.



(2) Model EEV6-280-E



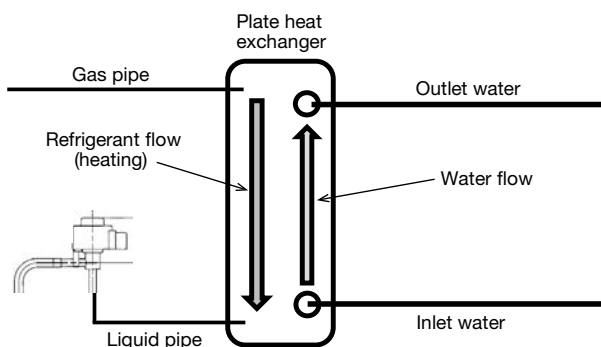
PCH000Z424

Expansion valve set

- ① Please do not a pipe connection when the expansion valve body to high temperature (Not to 120°C or more).
- ② Please do the brazing work in the state expansion valve coil is that the removed.
- ③ Braze while cooling not to heat the expansion valve body higher than 120°C.
- ④ Install the expansion valve (valve) body with the motor section at the top, and within ±15°to front/rear/right/left.
- ⑤ Be sure to install attached strainers at the outlet and inlet of expansion valve (valve) body.
- ⑥ When installing the expansion valve (coil), fit and align the expansion valve (valve) pipe and expansion valve (coil) detent securely.
- ⑦ After the body connection, please insulation.

The electronic expansion valve is a function goods services subject parts. Please check whether it is possible to check the local mounted state service (accessible).

- ⑧ Pipe length between the expansion valve (valve) and the indoor heat exchanger must be no longer than 5 m.
- ⑨ Height difference between the expansion valve (valve) and the indoor heat exchanger must be no longer than 2.5 m.
- ⑩ Install that the refrigerant flow becomes opposite to the water flow direction in heating.



4. OPERATING METHOD

4.1 Various settings

4.1.1 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)
	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

4.1.2 Model capacity setting

	Model capacity	
	P140	P280
SW6-1	OFF	ON
SW6-2	OFF	ON
SW6-3	ON	ON
SW6-4	ON	ON

4.1.3 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



4.2 Operating method of remote controller

4.2.1 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.**

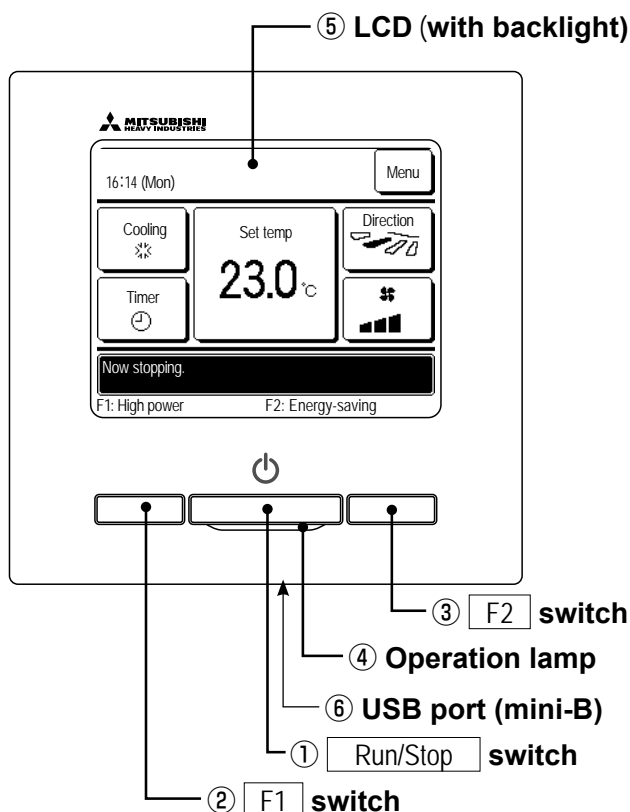
It could damage or cause break-down.

(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.

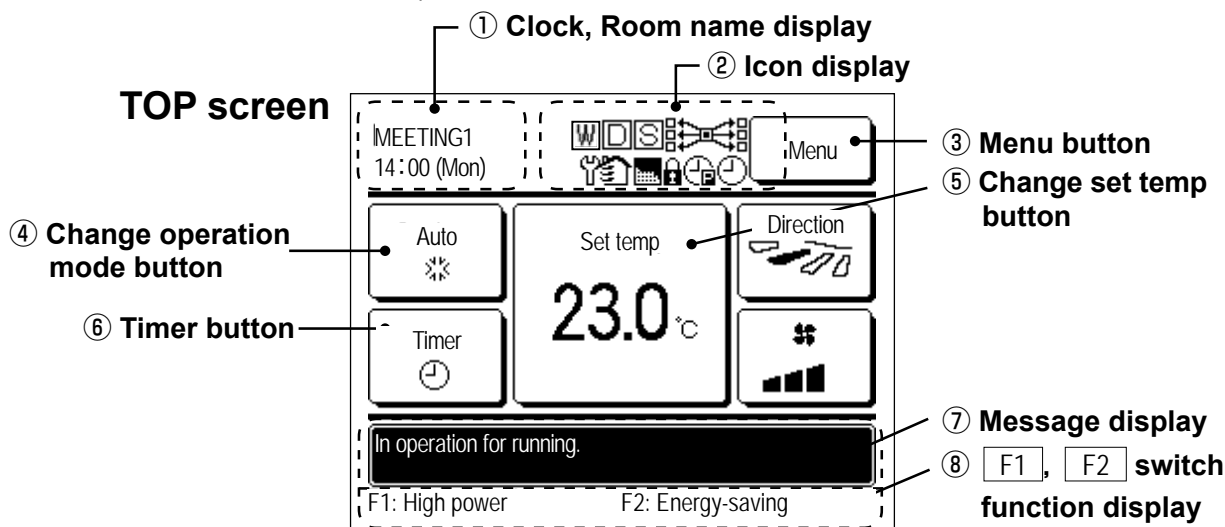
For operating methods, refer to the instruction manual attached to the software for personal computer (remote control utility software).

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.

When the demand control is effective.

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.

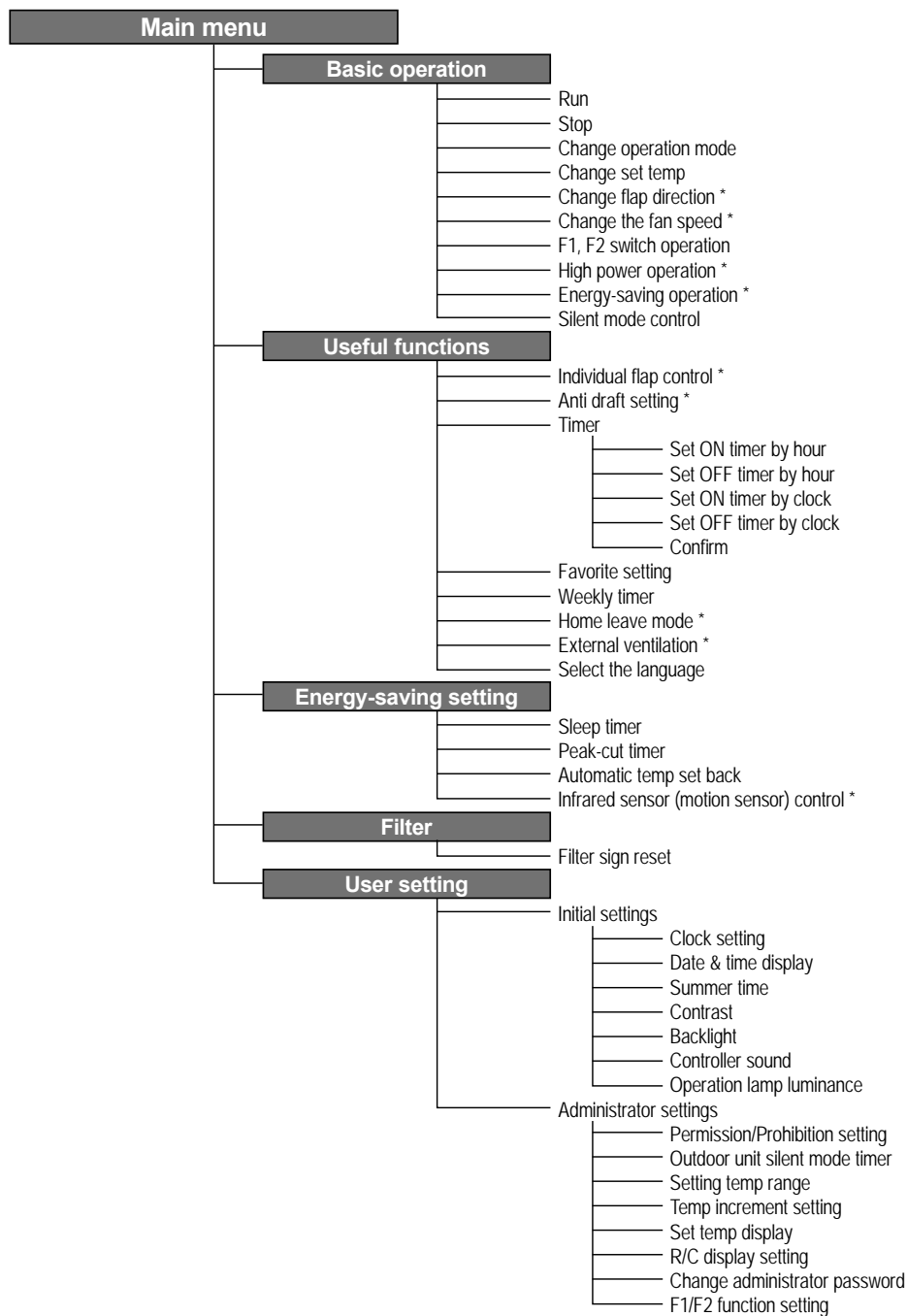
⑦ Message display

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

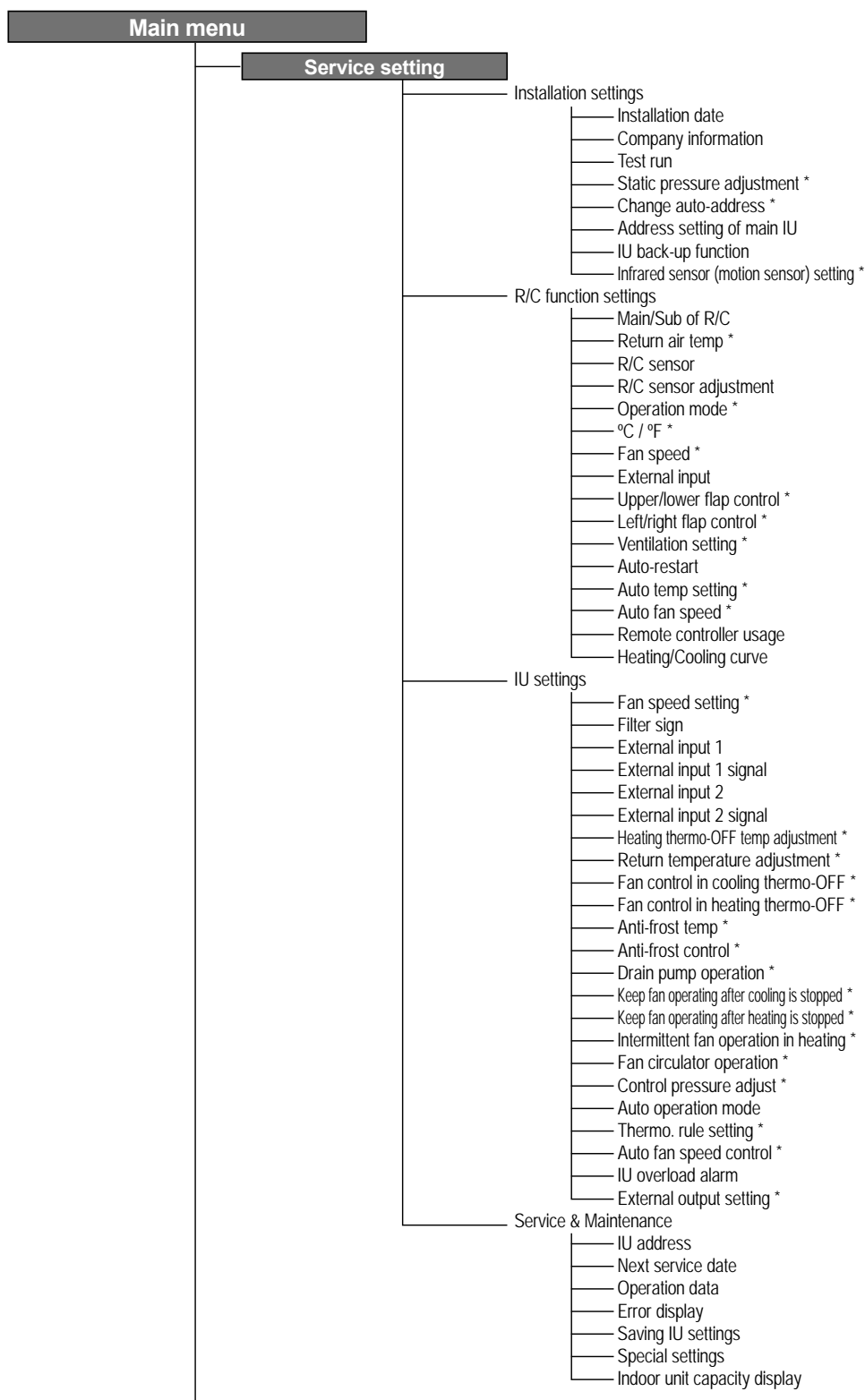
⑧ F1, F2 switch function Display

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

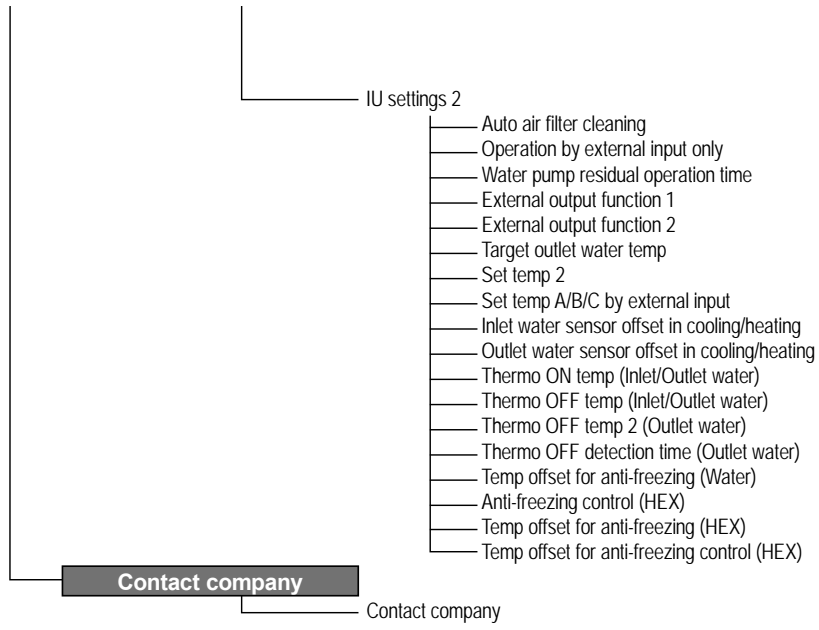
(5) Menu item



*Invalid for HMU.

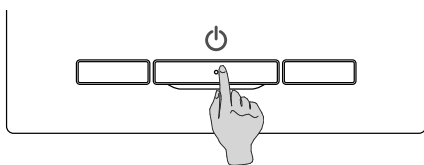


*Invalid for HMU.



4.2.2 Menu items

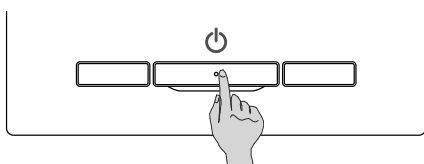
(1) Run



Push the **Run/Stop** switch.

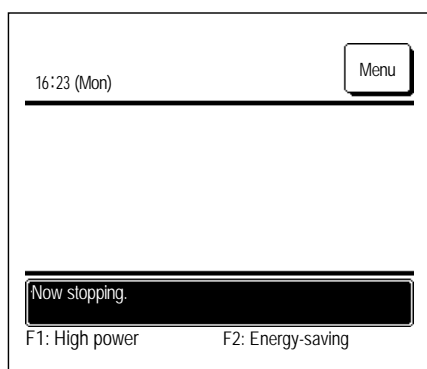
Operation lamp (green) lights and operation starts.

(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.

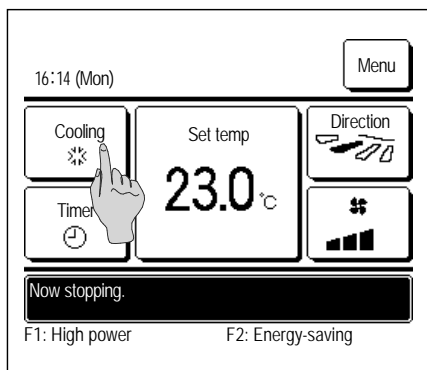
Advice

- 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.

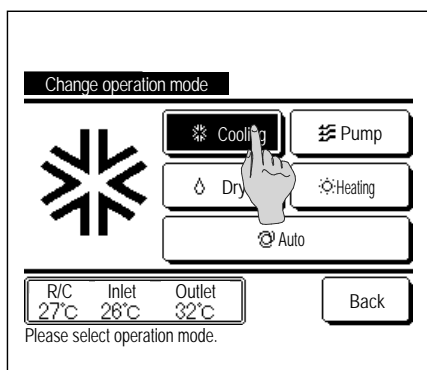
Central control	..... OFF
Operation mode	..... With auto mode: Auto cooling
	..... Without auto mode: Cooling
Set temp	..... 23.0°C
Fan speed	..... 3-speed
Flap direction	..... When cooling: position 2, when heating: position 3

*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



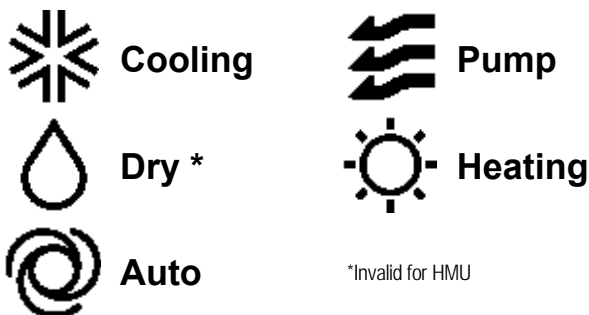
1 Tap the Change operation mode button on the TOP screen.



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.

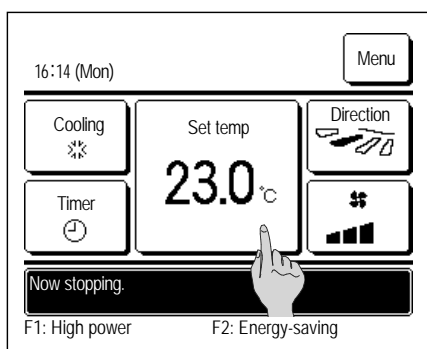
Icons displayed have the following meanings.



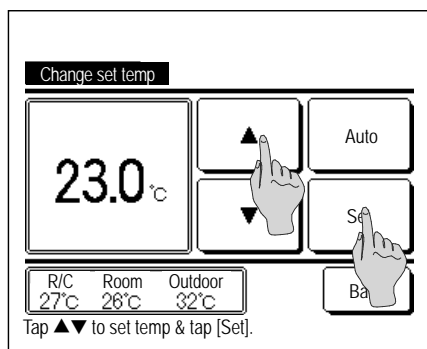
*Invalid for HMU

- 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.



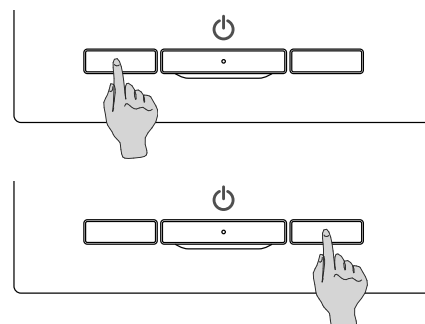
- 2 When the Change set temp screen is displayed, select the temperature as desired with using ▲ ▼ buttons.
- 3 After selecting the set temp, tap the Set button. The display returns to the TOP screen.

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

4.2.3 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 <input type="text" value="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 <input type="text" value="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).	

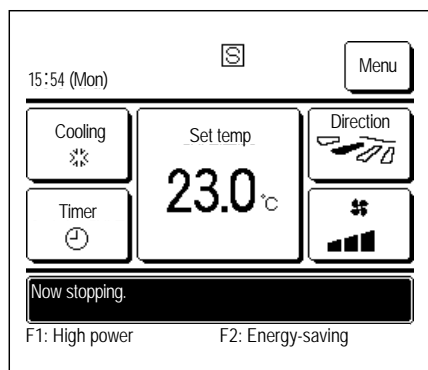
※This function is not available for HMU.

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



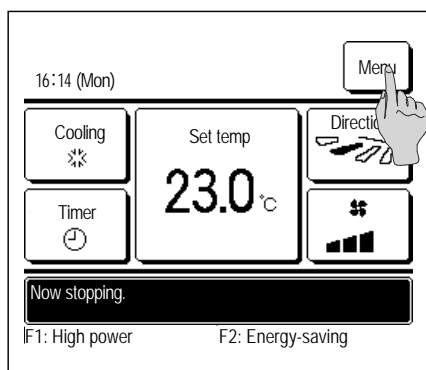
When one IU is controlled with 2 R/Cs, the following settings cannot be made on the sub R/C. It is necessary to use the main R/C.

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

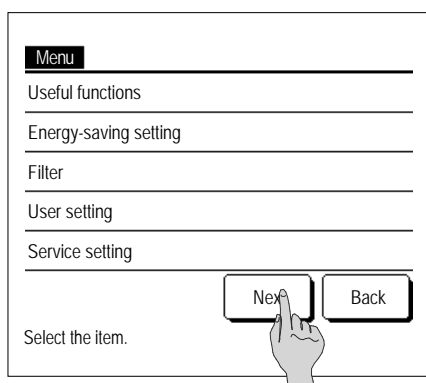


1 Tap the **Menu** button on the TOP screen.

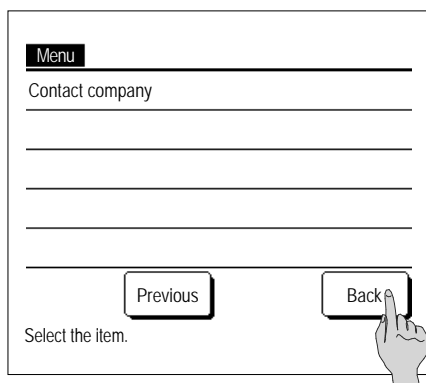
Main menu screen is displayed.

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

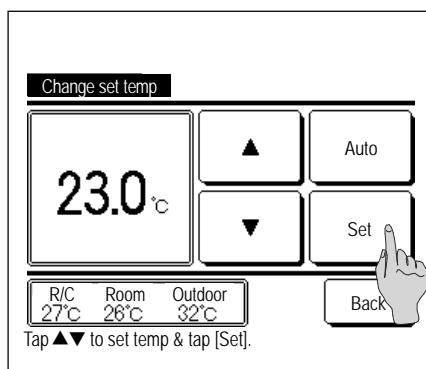
When there are two or more pages, the **Next** button is displayed at the leading page and the **Previous** button is displayed at the last page. The **Next** and **Previous** buttons are displayed on pages in between.



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

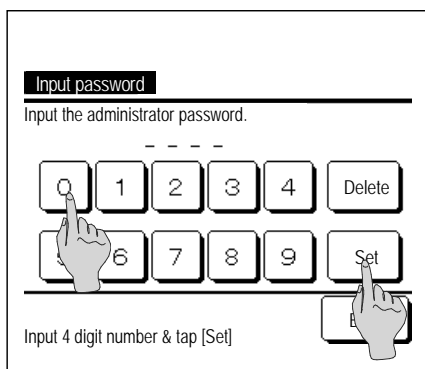


3 When the **Back** button is tapped, the display returns to the TOP screen.



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

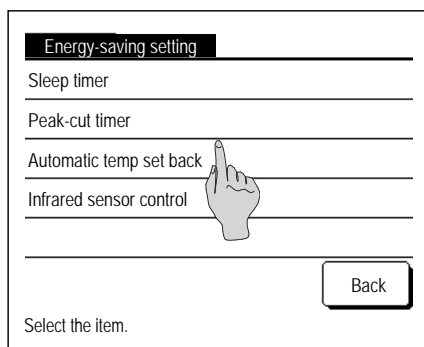
- The administrator password is provided so that these operations and settings are restricted to administrators/managers only (such as the owner of the building).
 - For the administrator password at the factory setting, refer to the Installation Manual.
- When your administrator password is forgotten,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

4.2.4 Settings and operations

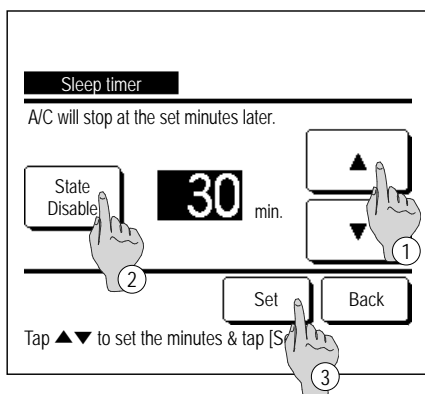
(1) Energy-saving setting [Administrator password]



- 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.

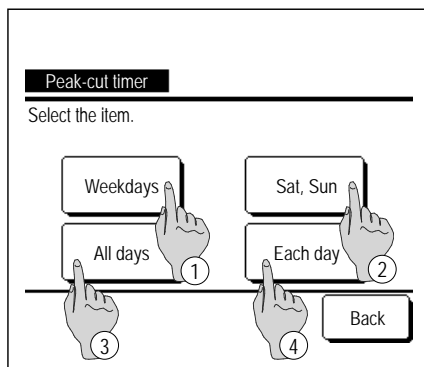
Unless the Sleep timer is used, set at the "State Disable".
- 4 After the setting, tap the ③ **Set** button. The display returns to the Energy-saving setting menu screen.

■ Peak-cut timer

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

Advice

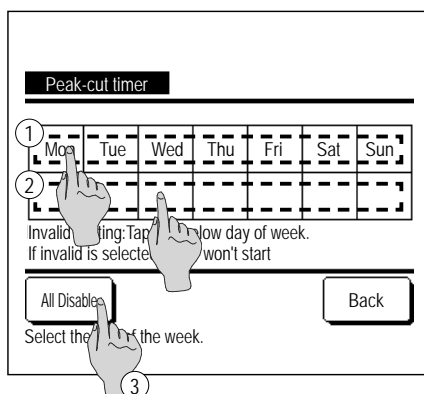
- When the peak-cut timer is used, be sure to make the Clock setting in advance.
- The peak-cut timer control may not be performed depending on combination of IU and OU.



- 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 | } (⇨4) |
| ② Sat. Sun : Saturday, Sunday | |
| ③ All days : Monday - Sunday | |
| 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).

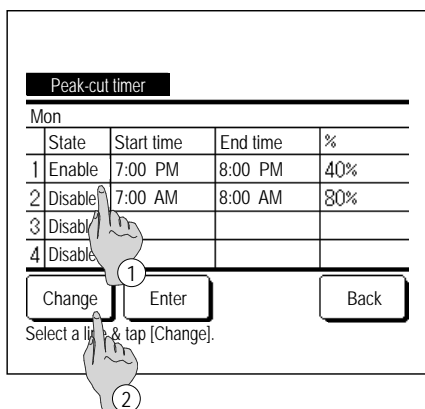
Timer does not operate on the day set as holiday.

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.

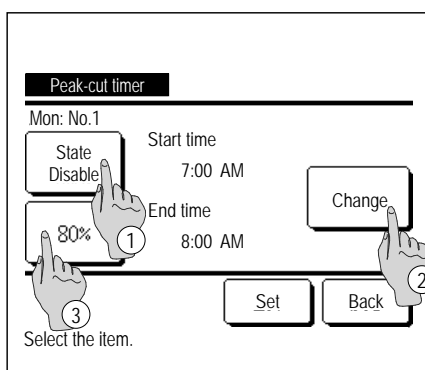
- 4 When tapping ③ "All Disable" button, the timer does not operate on all days of the week.

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



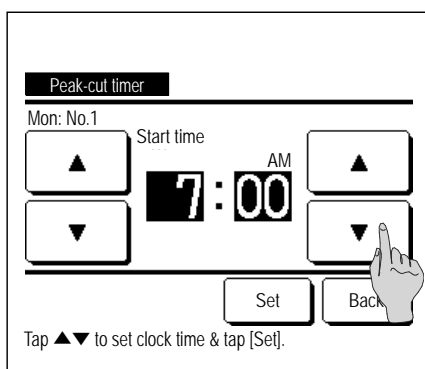
5 Screen to check contents of current setting is displayed.

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)

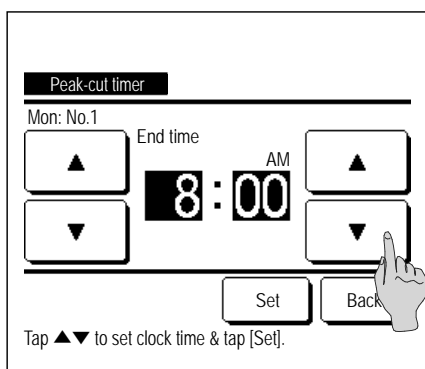


7 Set the Start time.

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)



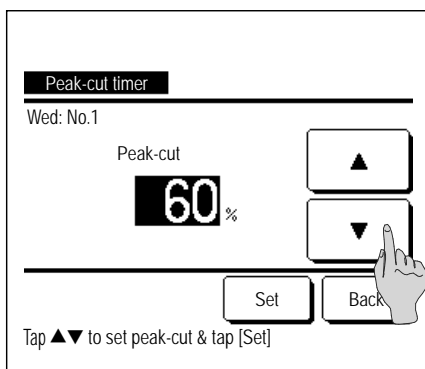
8 Set the End time.

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 %.

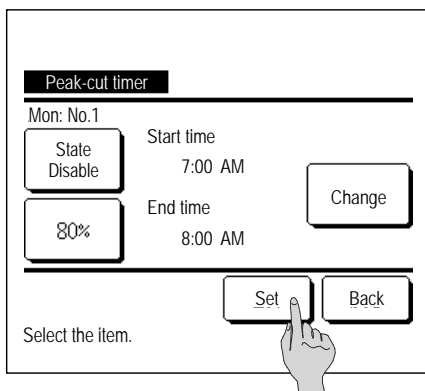
Set the peak-cut % with the buttons.

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 button after the setting.

(10)

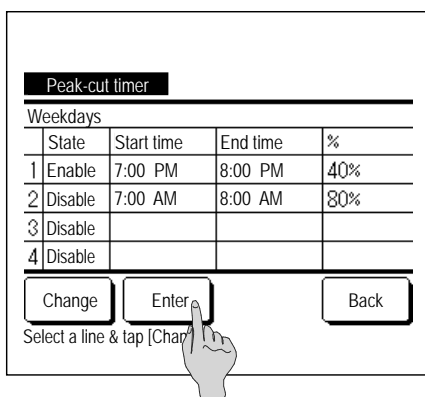


10 The setting content check screen (6) is displayed. If the

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)

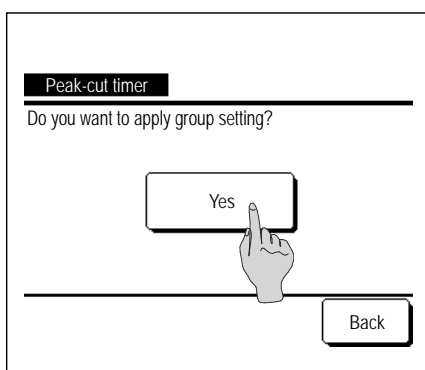
■ When contents of the setting are duplicated, the priority is given to the set contents of smaller peak-cut %.



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

a) In case of group setting: (1-① Weekdays, 1-② Sat, Sun, 1-③ All days) Move to the group setting check screen. (13)

b) In case of individual setting: (1-④ Each day) Save the setting and move to a day of the week selection screen (2)



13 Display the group setting acknowledge screen.

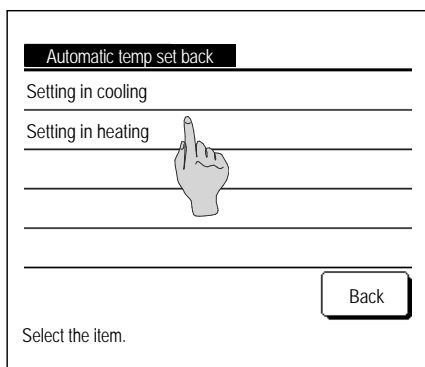
Tap the button to save the setting.

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.

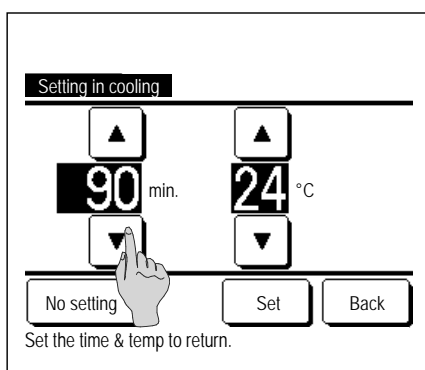
Tap **Setting in cooling** when setting for the cooling operation or **Setting in heating** when setting for the heating operation.

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

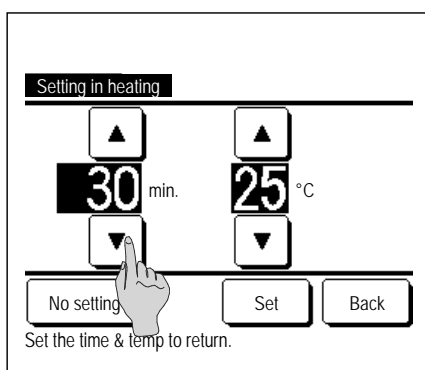
Set temp range: It can be set within the preset temp range set according to the set temp range menu.



- 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.

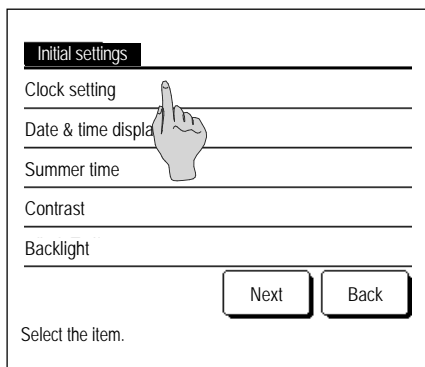
When the **No setting** button is tapped, "-- min. --°C" is displayed, and the "Automatic temp set back" is not performed.



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

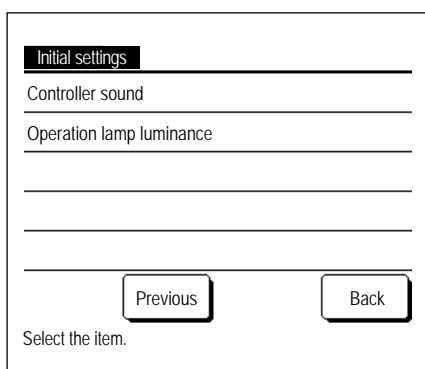
(2) Initial settings

1 Tap the button on the TOP screen and select ⇒ .



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

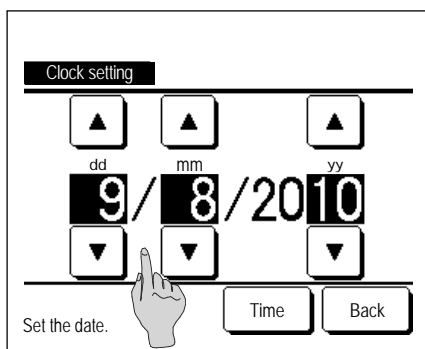
- Clock setting
- Date & time display
- Summer time
- Contrast
- Backlight
- Controller sound
- Operation lamp luminance



■ Clock setting

You can set and correct the current date and time.

1 Tap the button on the TOP screen and select ⇒ ⇒ .



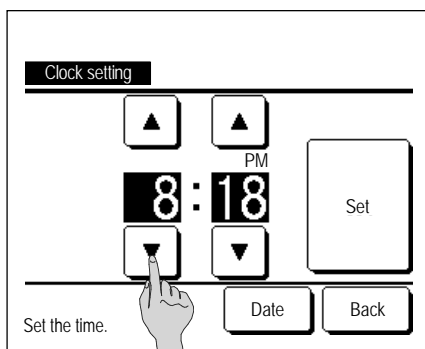
2 The "Clock setting" screen is displayed.

Set the "dd/mm/yy" with the buttons.

Tap the 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.

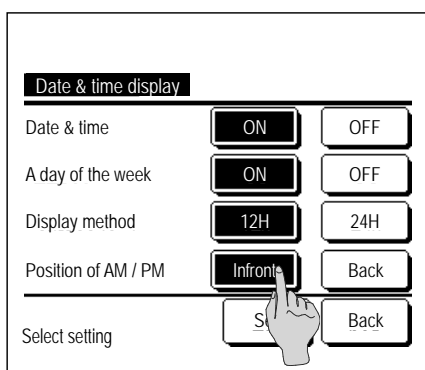
Tap the button after the setting.

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

■ Date & time display

You can set and correct the date & time display.

1 Tap the button on the TOP screen and select ⇒ ⇒ .



2 The Clock setting screen is displayed.

Tap / for the Date and time.

Tap / for A day of the week.

Tap Display method "12H or 24H".

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

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

Set the position of AM/PM.

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

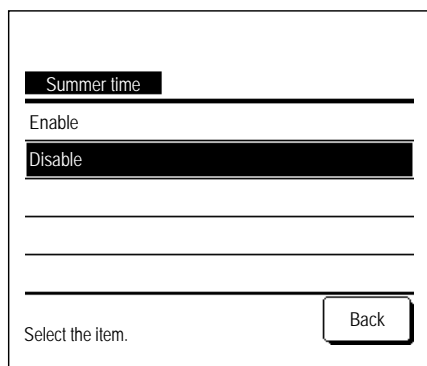
Set ... "3:50PM" is displayed.

3 Tap the 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**.

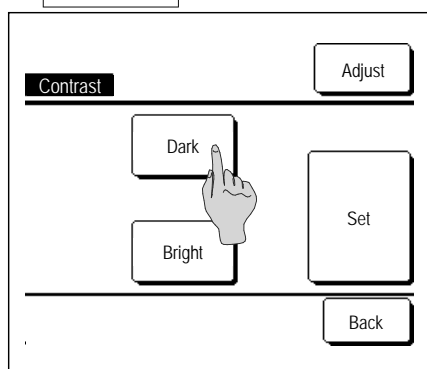


- 2 The Summer time setting screen is displayed.
 Changing from **Disable** to **Enable** ... (Current time + 1 hr) is displayed.
 Changing from **Enable** to **Disable** ... (Current time - 1 hr) is displayed.

■ Contrast

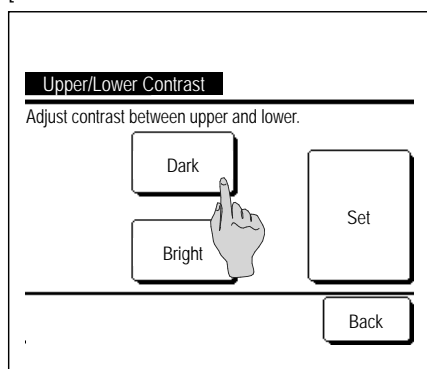
You can adjust the contrast of the LCD.

- 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]

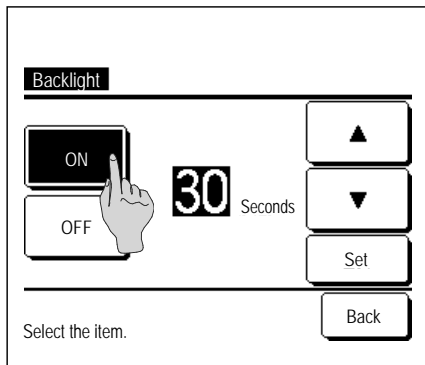


- 4 Tap the **Adjust** button to display the Upper/Lower Contrast screen.
- 5 The contrast of the lower half of the screen changes when you tap the **Dark** / **Bright** button. Adjust the contrast so that the upper and lower halves of the screen match.
- 6 After you make the settings, tap the **Set** button.

■ Backlight

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

- 1 Tap the button on the TOP screen and select ⇒ ⇒ .



- 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).

... The "Backlight" lights when the LCD is tapped.

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

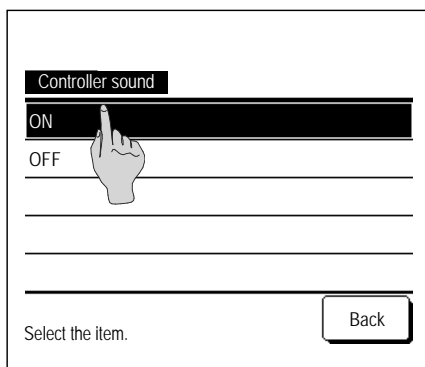
... The "backlight" does not light even if the LCD is tapped.

- 3 Tap the 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 button on the TOP screen and select ⇒ ⇒ .



- 2 The Controller sound setting screen is displayed.

Tap ON or OFF for the controller sound.

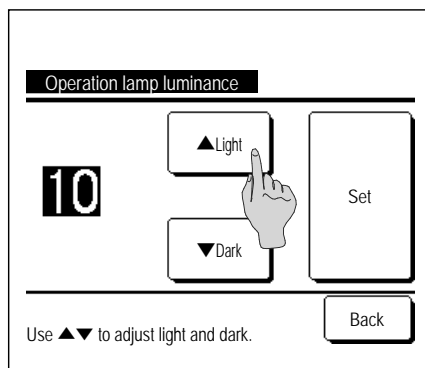
... When a button on the screen is tapped, a "beep" sounds.

... There is no beep.

■ Operation lamp luminance

You can adjust the operation lamp luminance.

- 1 Tap the button on the TOP screen and select ⇒ ⇒ .



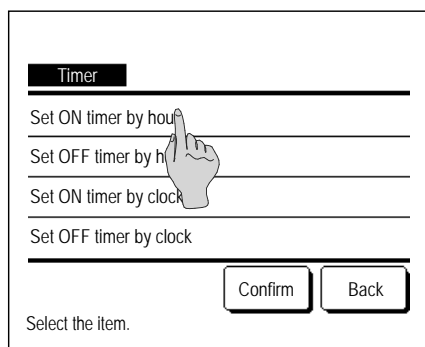
- 2 The Operation lamp luminance adjustment screen is displayed. You can adjust the luminance of the operation lamp to a desired level by tapping the / button.
- 3 After you make the settings, tap the button.

(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 button on the TOP screen and select ⇒ .



- 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 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

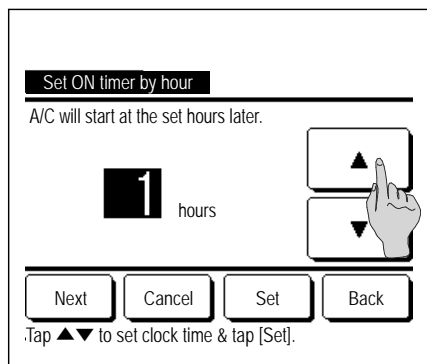
③ Set ON timer by hour/clock, weekly ON timer

■ 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**.



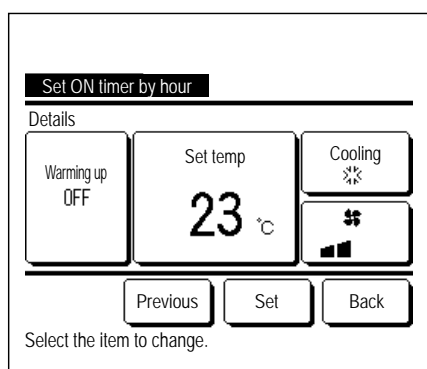
- 2 The Set ON timer by hour setting screen is displayed.

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.

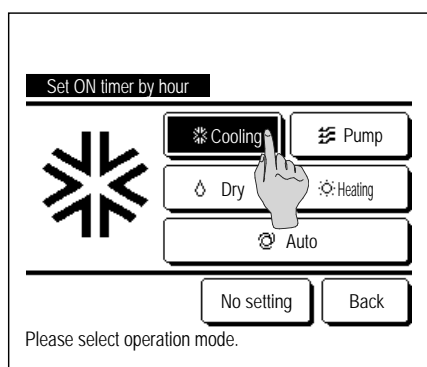
- ① Warming up ON/OFF (the Main R/C only)
- ② Operation mode ... ➡5
- ③ Set temp ... ➡6
- ④ Fan speed ... ➡7

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

■ Set the operation mode before setting the set temperature.

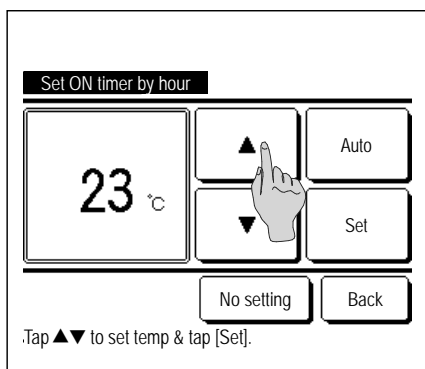
Advice **Warming up**

- 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.

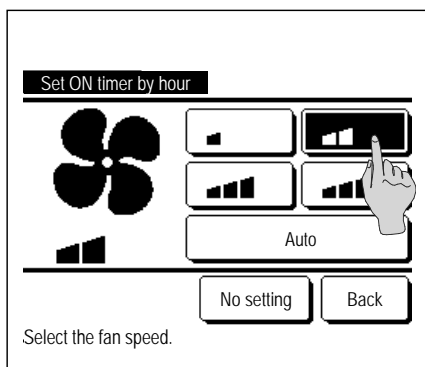
If the **No setting** button is tapped, it starts operation at the last action. (➡4)



- 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.)

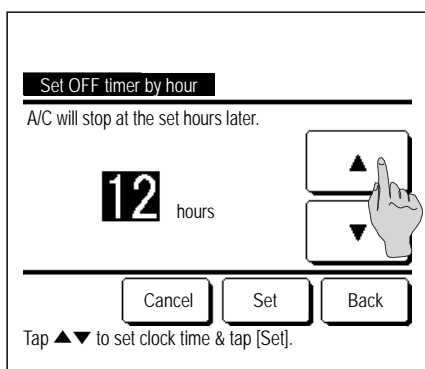
- 8 After setting the desired contents at the screen of the step 4 on the previous page, tap the Set button.

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.

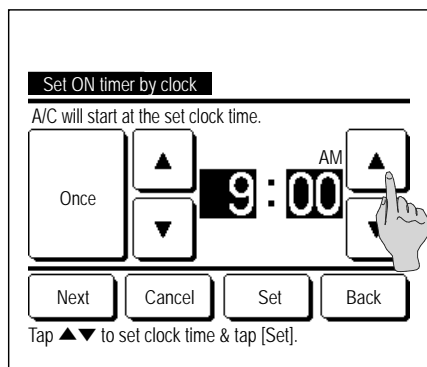
Range of setting time: 1 to 12 hours (at 1-hr intervals)

- 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 button on the TOP screen and select ⇒ ⇒ .



- 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 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 button.

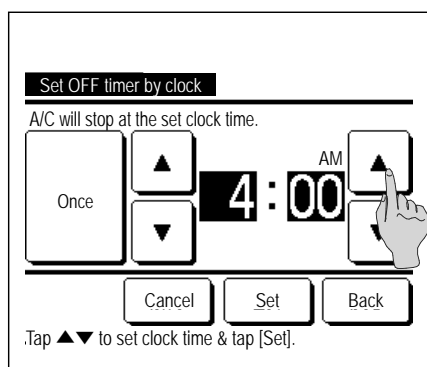
The Set ON timer by clock can be operated one day (Once) or every day.

If it is operated every day, tap the / 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 button on the TOP screen and select ⇒ ⇒ .



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

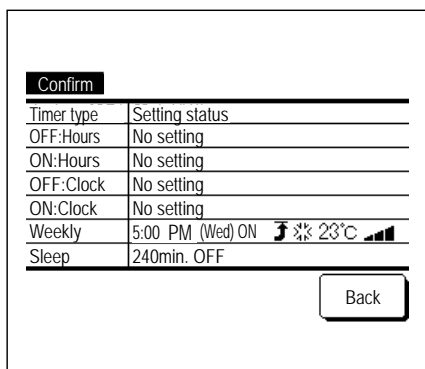
Select a desired time to stop operation (5-min intervals) with the buttons.

- 3 Tap the 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 / 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.

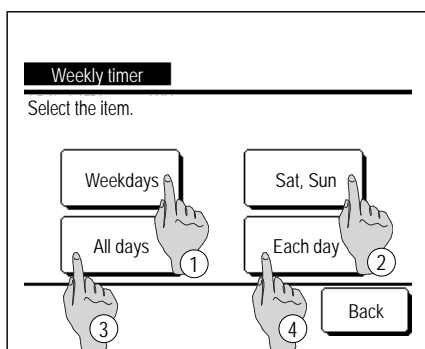
Advice

- 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**.

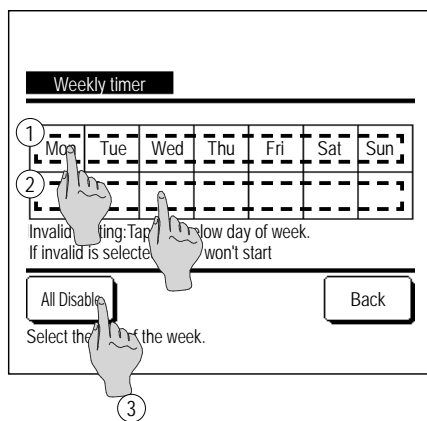
Enter the administrator password if the administrator password input screen is displayed.

■ 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
 - ④ Each day : Moves to the day of the week setting screen. (3)
- } (5)



- 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).

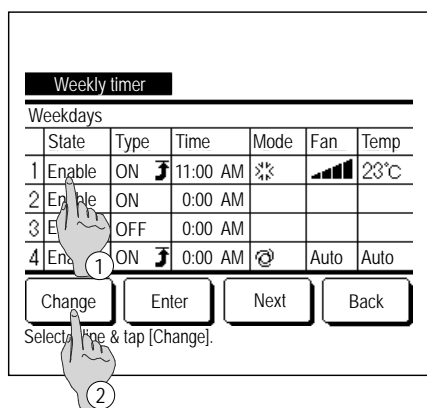
Timer does not operate on the day set as holiday.

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.

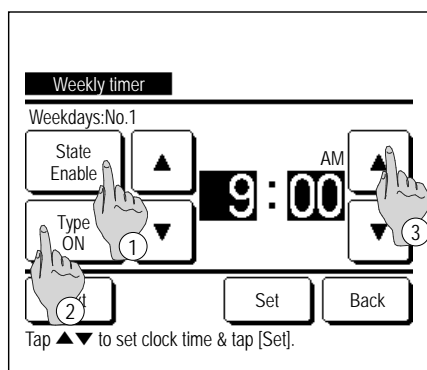
When tapping ③ "All Disable" button, the timer does not operate on all days of the week.

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.



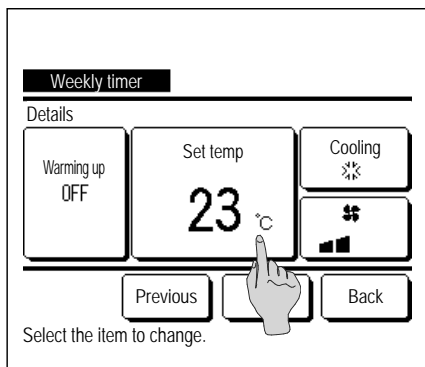
- 6 Detail setting screen for the timer setting contents is displayed.

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)



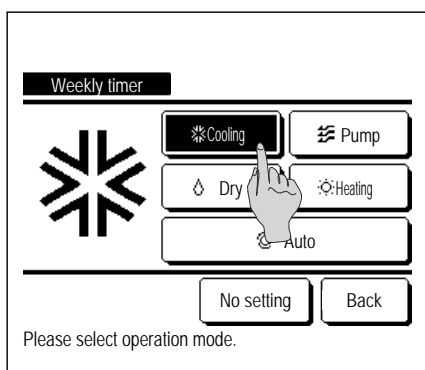
7 Set the following operating conditions.

- 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.)

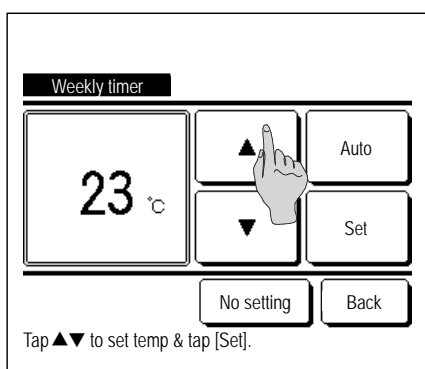
- ② Operation mode ... **8**
- ③ Set temp ... **9**
- ④ Fan speed ... **10**

■ 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**)

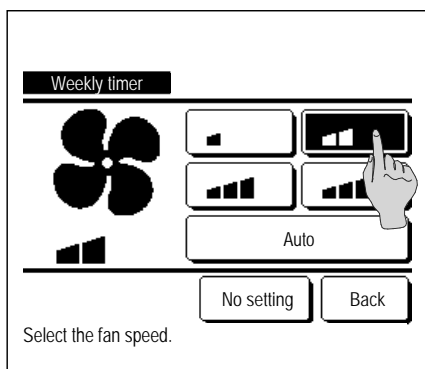


9 Select a desired temperature (at 1°C intervals) with the

▲ ▼ 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.

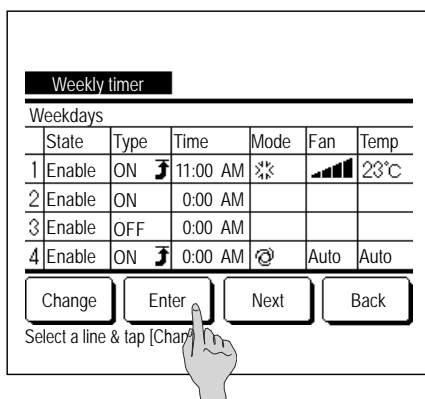


10 Tap a desired fan speed.

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.

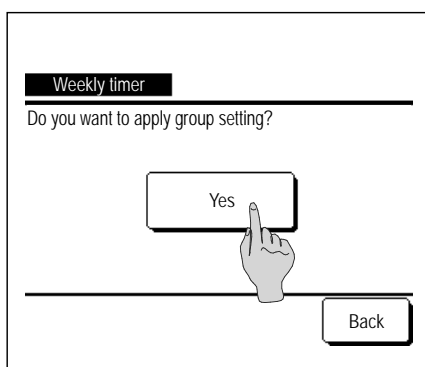
(1) In case of group setting (2-①Weekdays, 2-②Sat/Sun, 2-③All days setting), move to the group setting screen. (☞13)

(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.

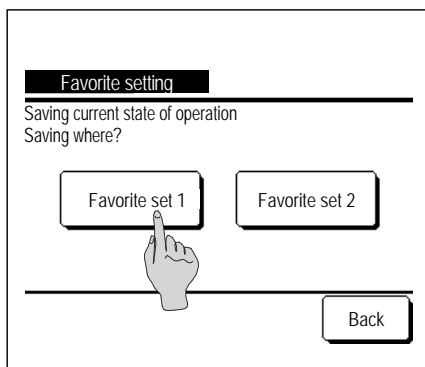


(5) Registering favorite settings

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.

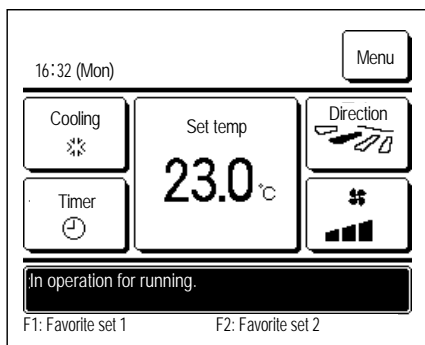
If there is any data that was previously saved, that data will be overwritten.

(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

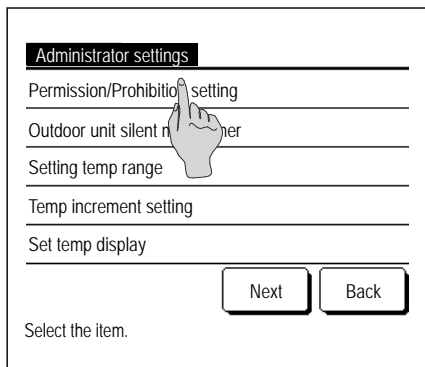
■ When Change set temp, Change operation mode, are restricted by the Permission/Prohibition setting, restricted items will not be reflected to the Favorite setting operation.

(7) Administrator settings [Administrator password]

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

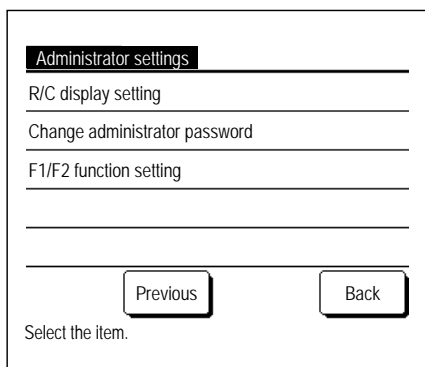
The administrator password input screen is displayed.

Enter the administrator password.



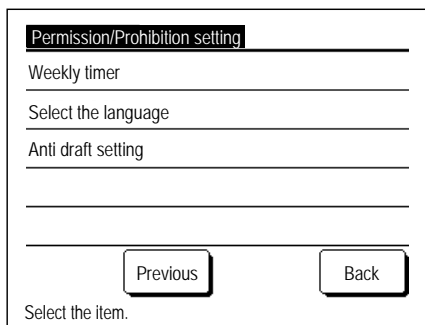
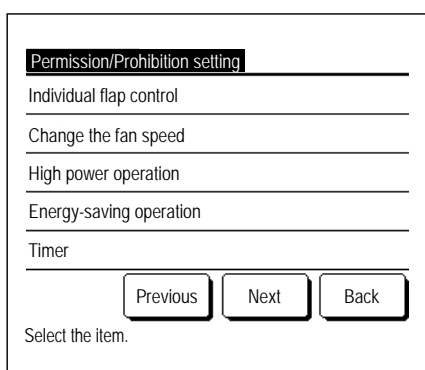
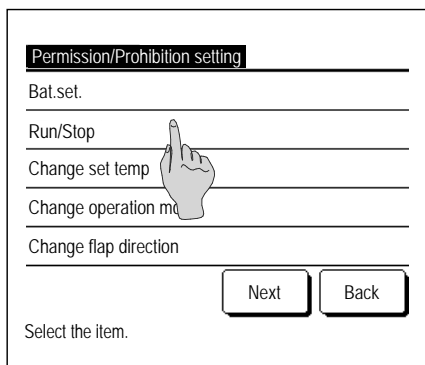
2 When the administrator setting menu is displayed, tap a desired item.

- 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.

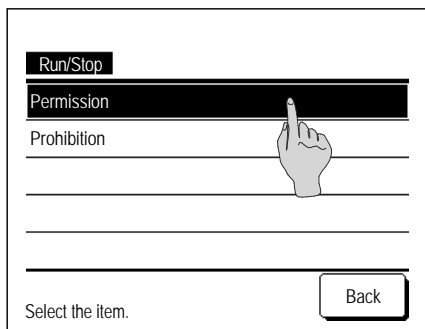
If the Permission is set, the operation is accepted.

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.

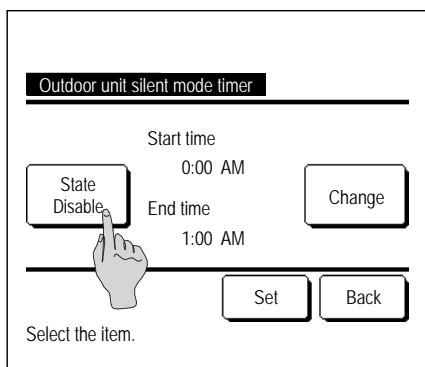
Silent mode operation can be started from an R/C operation without using the timer.

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**.



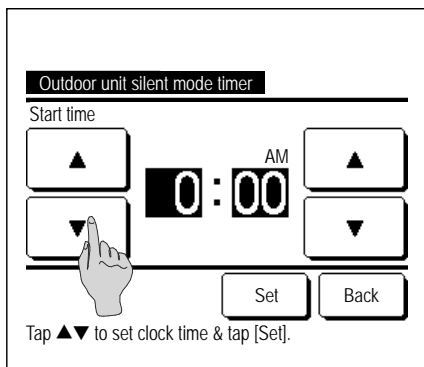
2 The Outdoor unit silent mode timer setting screen is displayed.

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.

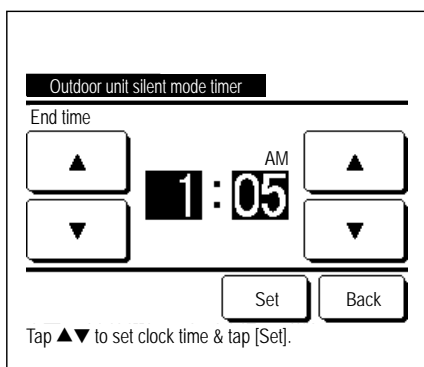
To change the start time or the end time, tap the **Change** button.



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

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

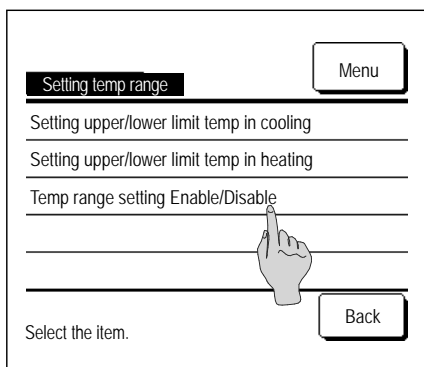
If the button is tapped after setting the start time, the display changes to the end time setting screen. Set a desired time (at 5-min intervals) for the end time and tap the button.



Setting temp range

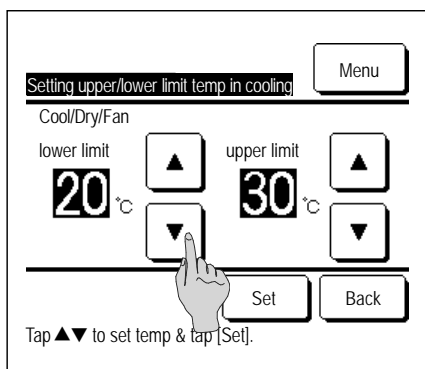
Limited range of setting temperature in the heating or the cooling operation can be selected.

- 1** Tap the button on the TOP screen and select ⇒ ⇒ .

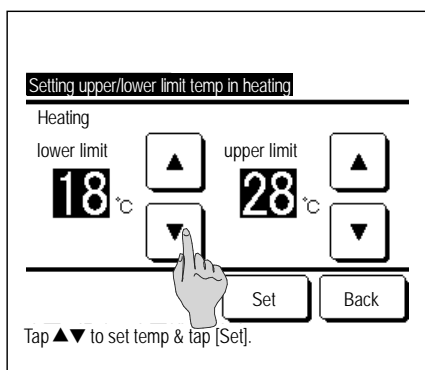


2 Setting temp range menu screen is displayed.

- 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.



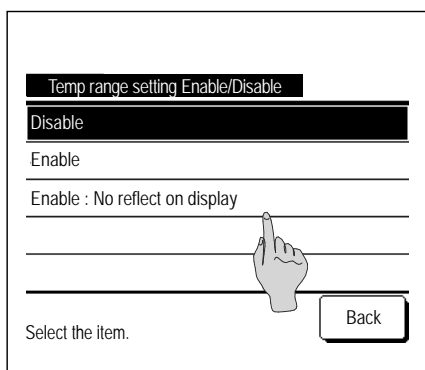
- 3** Set the range of setting temperature in the cooling operation.
 Select at desired lower and upper limit temperatures (at 1°C intervals) with the ▲ ▼ buttons.
 After Selecting the desired settings, tap the [Set] button.



- 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	5 to 28°C	28 to 30°C
Heating	15 to 22°C	22 to 55°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.

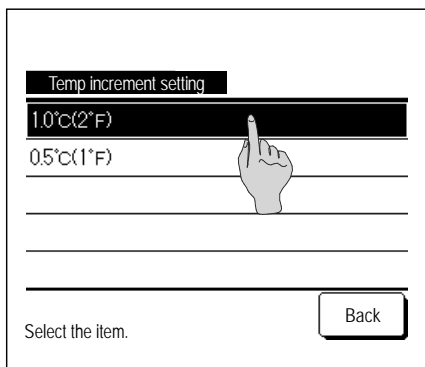
Advice

- 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.

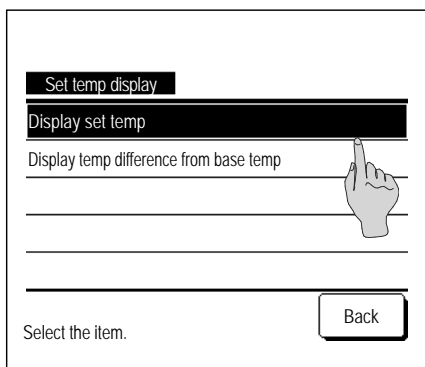
Tap a desired temperature increment.

- 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

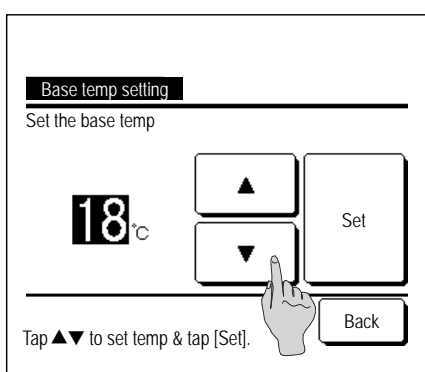
Set temp displayed on the TOP screen can be changed.

- 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).

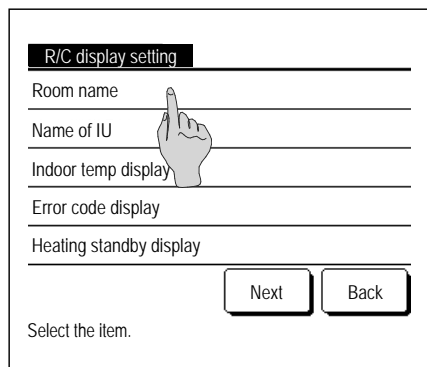


- 3 Set the base temperature.

■ R/C display setting

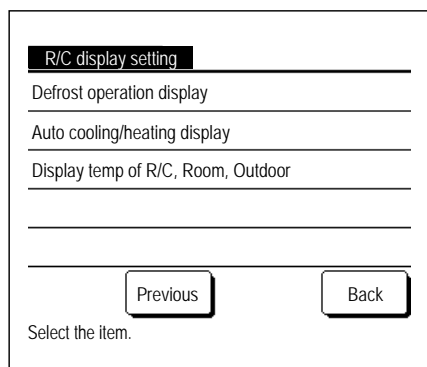
Contents of display on the R/C can be changed.

- 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.

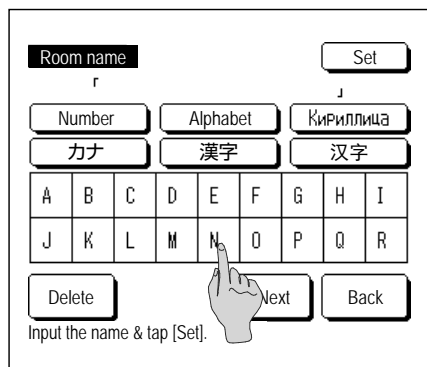
- ① Room name
- ② Name of I/U
- ③ Indoor temp display
- ④ Error code display
- ⑤ Heating standby display
- ⑥ Defrost operation display
- ⑦ Auto cooling/heating display
- ⑧ Display temp of R/C, Room, Outdoor



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.

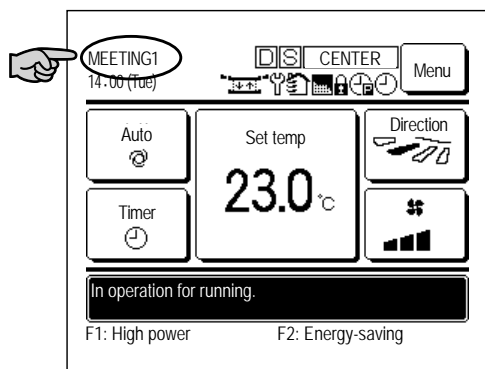
The room name can be set with up to 9 2-byte letters (18 1-byte letters).

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**.

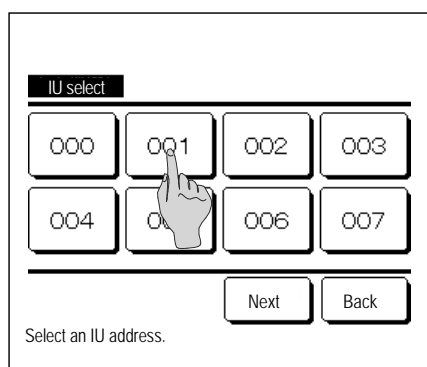
The room name is displayed on the TOP screen.



② Name of IU

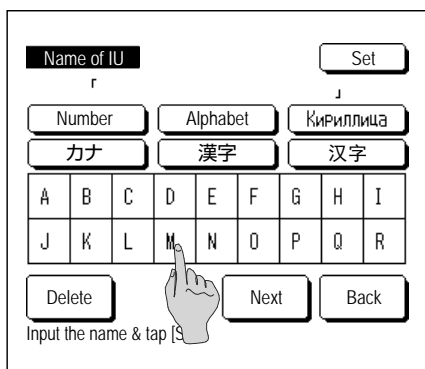
Set the name of IU to be added to the IU address button.

- 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.



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

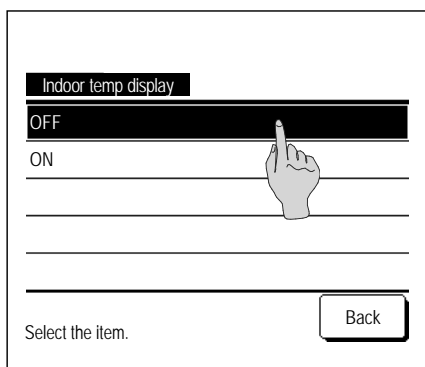
The name of IU can be entered up to 4 2-byte (8 1-byte) letters.

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.

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

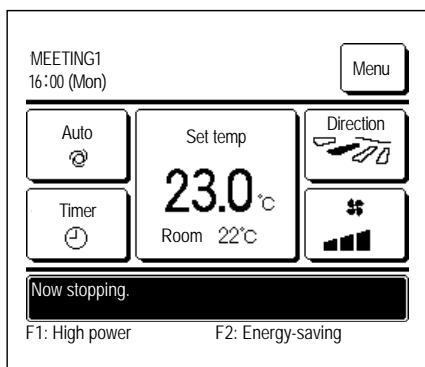


- The Indoor temp display screen is displayed.

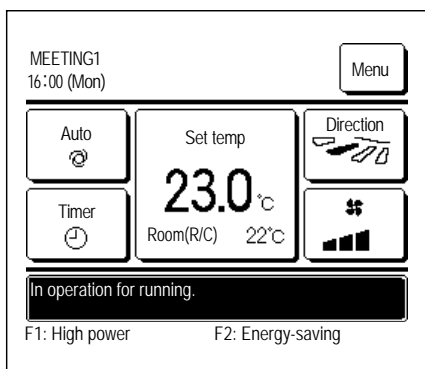
On the Indoor temp display screen, select ON/OFF of the display. When R/C sensor setting is enabled, the room temperature (R/C) is displayed (refer to the installation manual on how to make these settings).

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.

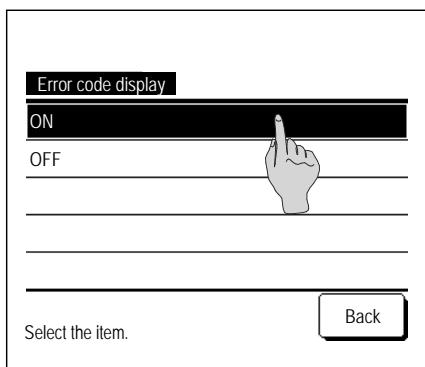


When R/C sensor setting is enabled, the room temperature (R/C) ○ °C is displayed (refer to the installation manual on how to make these settings).

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.

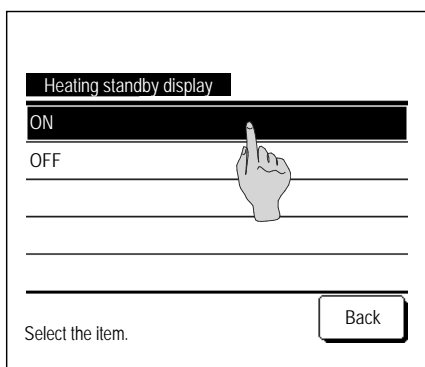
ON ... When there is any error on the unit, the message "Prot.stp.ON E○ Touch here for contact. History can be checked from Menu." is displayed on the TOP screen message display.

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.

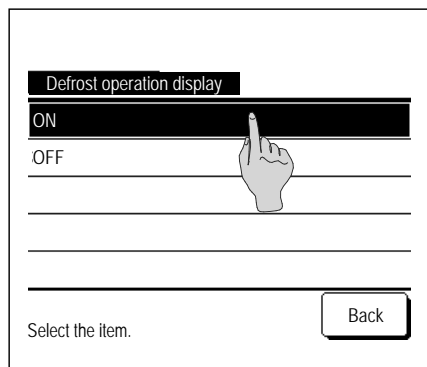
OFF ... The message "Heating standby" is not displayed.

(This function is not available for HMU.)

⑥ Defrost operation display

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

- 1 Tap the button on the TOP screen and select ⇒ ⇒ ⇒ .



- 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.

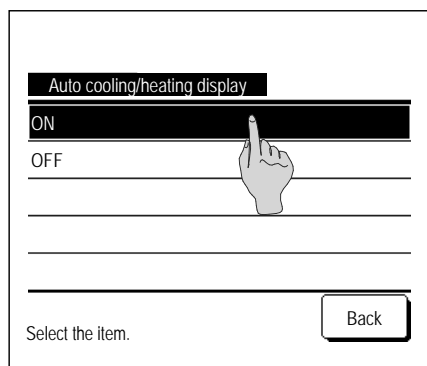
ON ... The message "Defrost operation" is displayed during the defrost operation.

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 button on the TOP screen and select ⇒ ⇒ ⇒ .



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

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

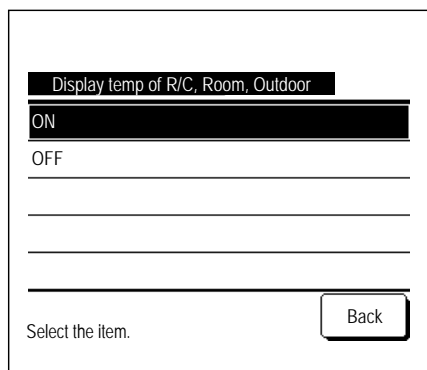
ON ... The message "Auto Cooling" or "Auto Heating" is displayed on the "Change operation mode" button at the TOP screen during the auto mode operation.

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.

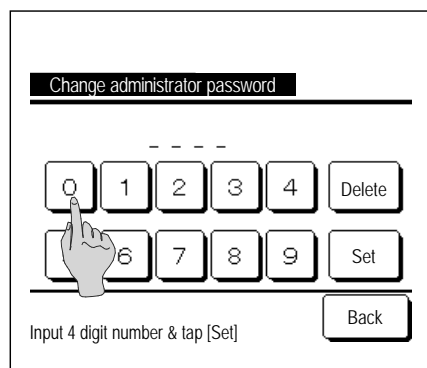
ON ... Each temperature is displayed on the TOP screen.

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

■ Change administrator password

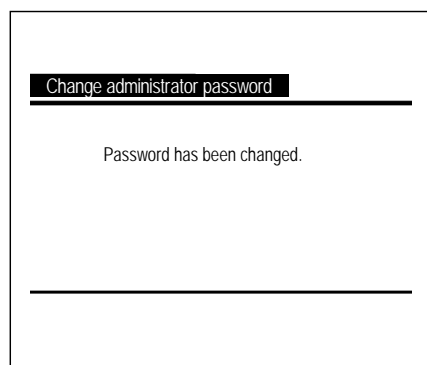
Administrator password can be changed.

- 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.

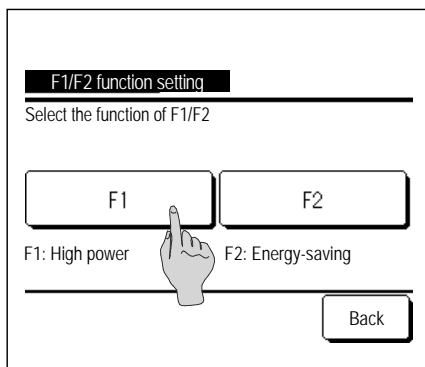


- 3 The password change confirmation screen is displayed for 3 seconds, and the display returns to the administrator settings menu screen.

■ F1/F2 function setting

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

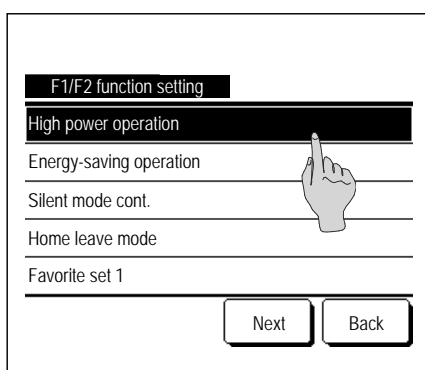
- 1 Tap the **Menu** button on the TOP screen and select **User setting** ⇒ **Administrator settings** ⇒ **F1/F2 function setting**.



- 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

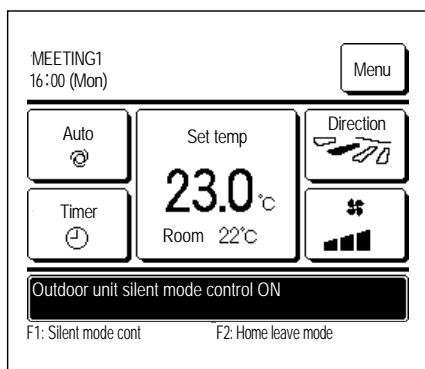
* Invalid for HMU mode

(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.

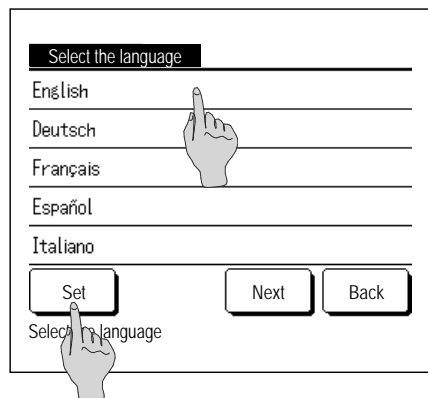
- During silent mode control, operation with maximum capacity is not allowed.

(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:

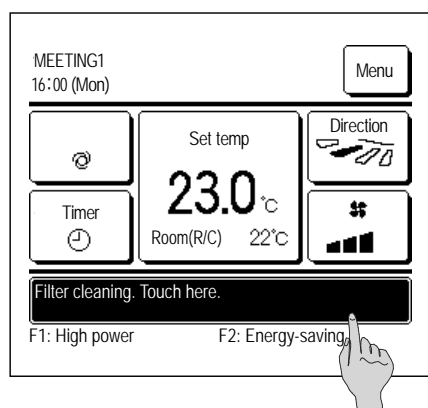
English/German/French/Spanish/Italian/

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.



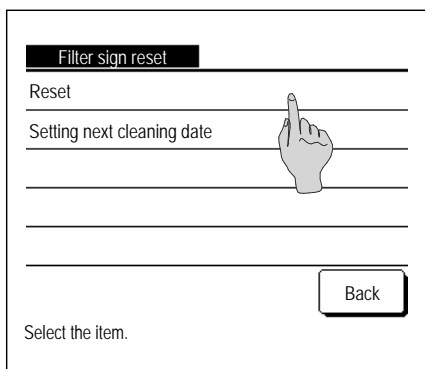
- 1 Tap the message display on the TOP screen.

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.

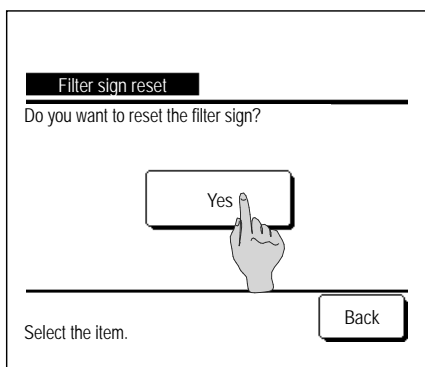
Set the filter sign reset to the **F1** (**F2**) switch using the Switch function (page 105) to perform this operation.



2 The filter sign reset menu screen is displayed.

To reset the filter sign, tap . (☞3)

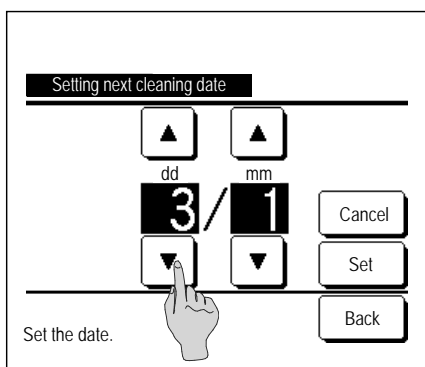
To set next cleaning date, tap Setting next cleaning date. (☞4)



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

Tap the button.

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



4 The Setting next cleaning date screen is displayed.

Select a desired date with the buttons and tap the 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.

4.2.5 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.

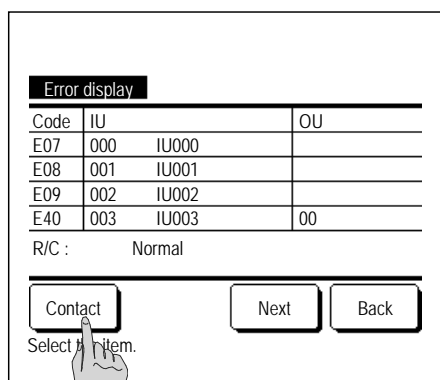
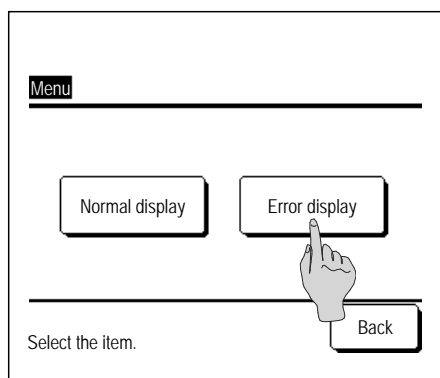
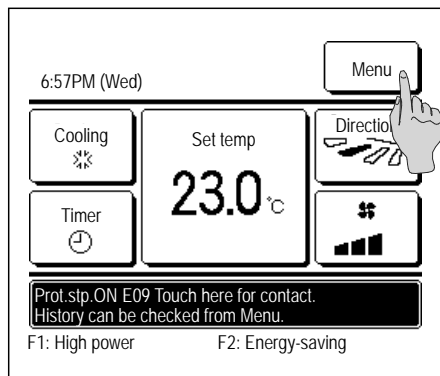
Do not clean the unit with benzene or paint thinner.

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

4.2.6 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.

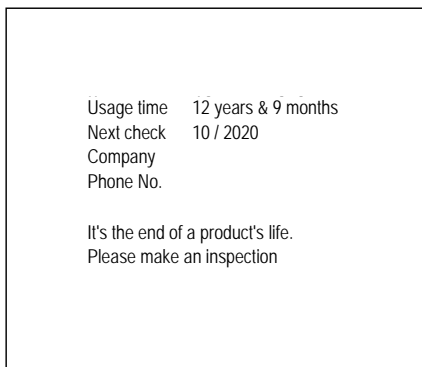
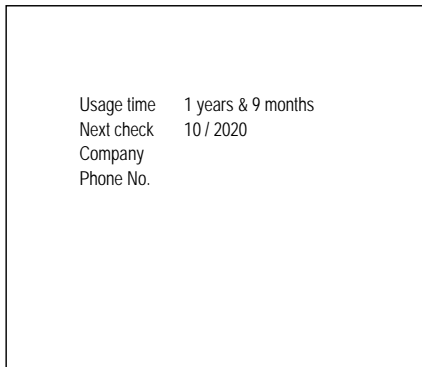
3 Company information (Name and phone No. of contact) is displayed.

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

4.2.7 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.



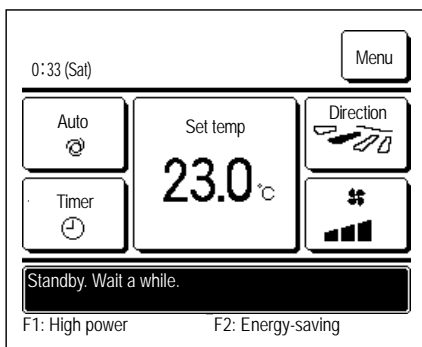
When the period of use exceeds 10 years, the screen shown at left is displayed.

When this screen is displayed, contact your dealer.

4.2.8 Message display

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

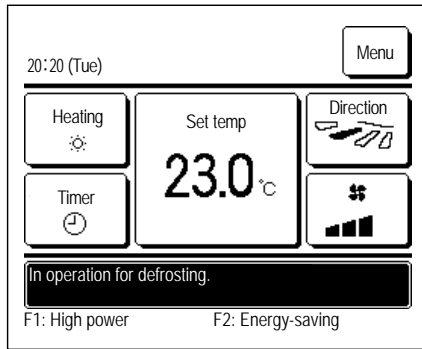
■ “Standby. Wait a while.” displayed



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.

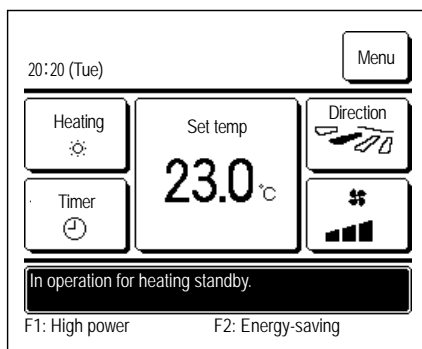
This does not indicate a failure; it is caused by the cooling machine oil protect control that is activated in order to protect the compressor. Please wait until the message “Standby. Wait a while.” disappears.

■ “In operation for defrosting.” display



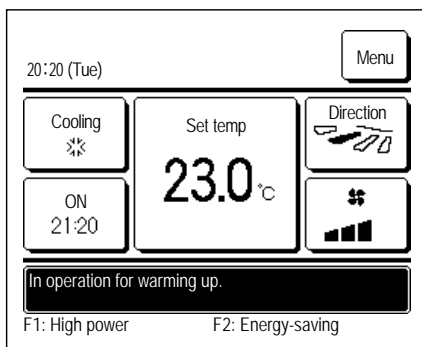
When frost forms on the OU, the heating performance will decrease. This will cause the unit to automatically switch to defrost operation, and hot air will stop blowing out from the IO. The message “In operation for defrosting.” will be displayed on the message display. After the defrost operation has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

■ “In operation for heating standby.” displayed



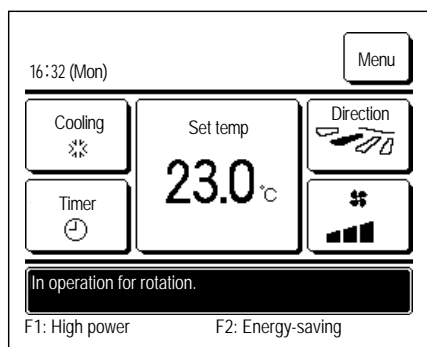
To prevent any cold air blowing out from the IO at the start of a heating operation, the unit stops the fan and displays “In operation for heating standby.” on the message display. When the unit is ready to blow out hot air, the message “In operation for heating standby.” disappears, and the unit will 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**

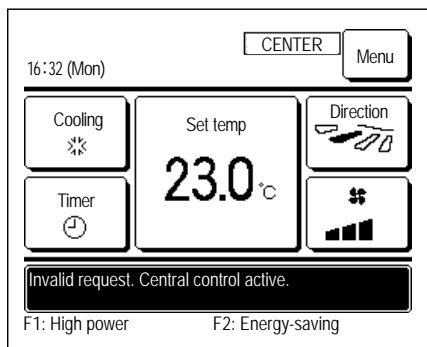


When rotation, capacity back-up, or fault back-up operation is enabled during installation, a message indicating the operation that is set and running will be displayed on the message display.

Refer to the installation manual on how to make these settings. (This function 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.

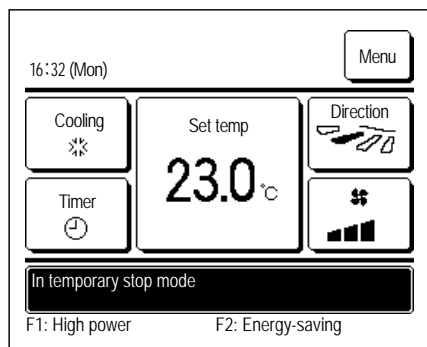


This does not indicate a failure; the message indicates that the unit is controlled through a central control device.

[Operations allowed during central control]

- Filter sign reset
- Administrator settings

■ **“In temporary stop mode”, “In forced thermostat OFF”, “In setting temperature shift” displays**

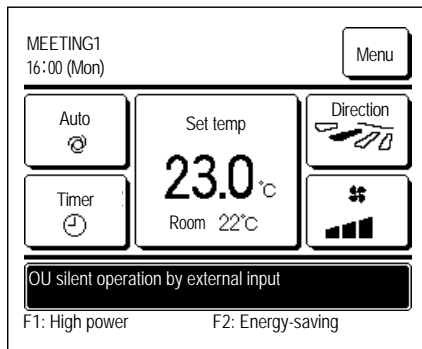


These messages will be displayed when the unit is operated through IO external input.

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

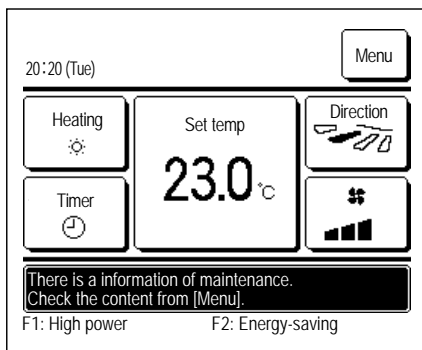
The message “OU silent operation by external input” will be displayed when silent mode control is operated through a central control device (not included) or an IO external input (not included).



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



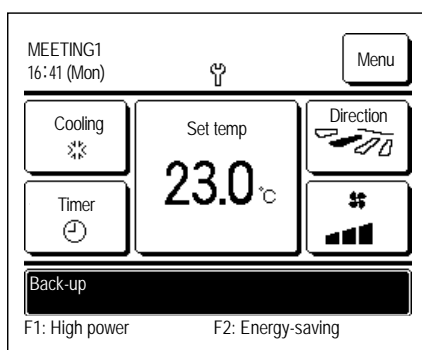
To notify any maintenance information related to the product, the message “There is a information of maintenance. Check the content from [Menu].” may be displayed in the message display.

When this message is displayed, tap the 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.

4.2.9 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.

5. MICROCOMPUTER OPERATION CONTROL FUNCTION

5.1 Remote controller

5.1.1. 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)

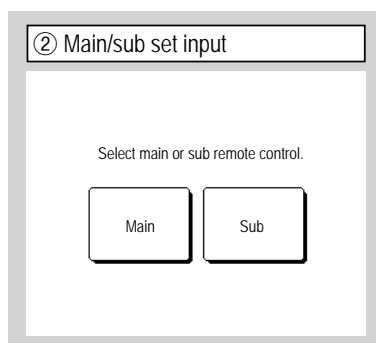
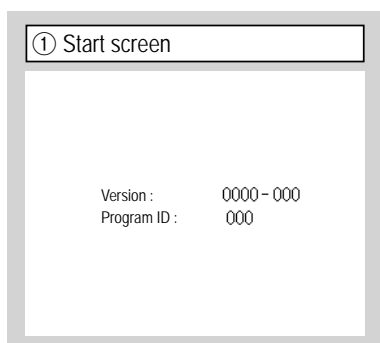
(1) **When the main and sub are not yet set,**

①⇒② Main/sub input screen is displayed.

When tapping the or 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)

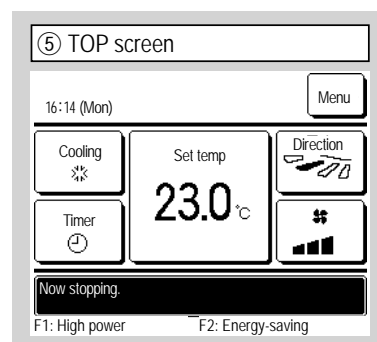
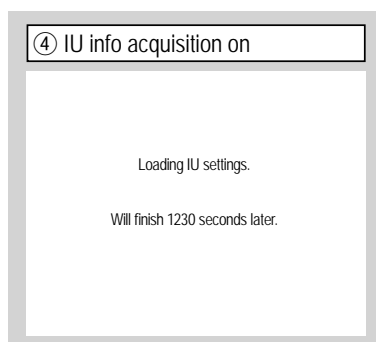
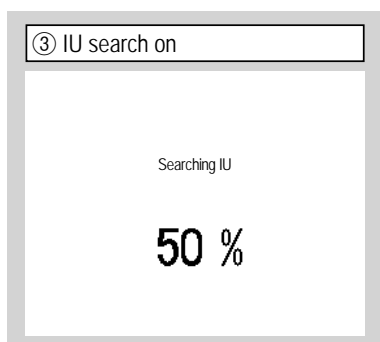
When using two remote controllers for one IU or one group, if the first one is set for the , the second is set for the automatically.



Caution

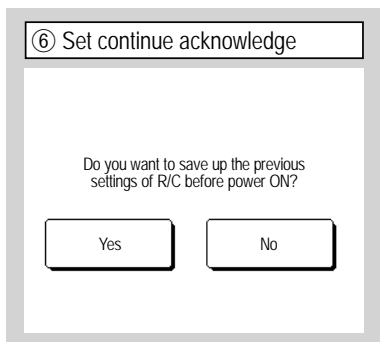
When only one unit of R/C is used, tap the button. In the state of initial setting, if either one of buttons ([Main]/[Sub]) is not tapped, it keeps the screen unchanged.

- The screen changes to ③⇒④⇒⑤.
- The screen changes to ①⇒⑧⇒⑤.



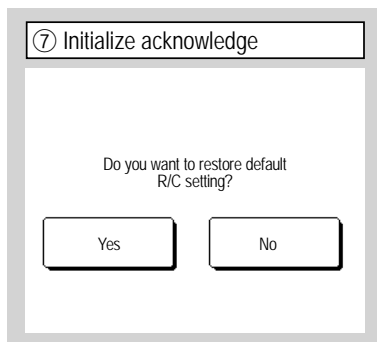
The red LED will blink if communication is not established in ten minutes.

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



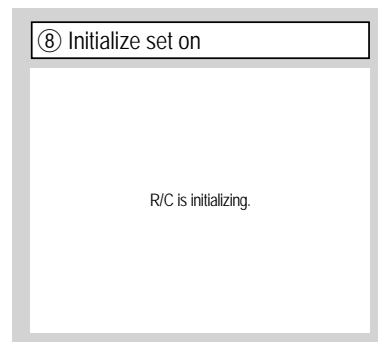
- Yes The screen changes to ⑧⇒⑤.
- No The screen changes to ⑦.

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.



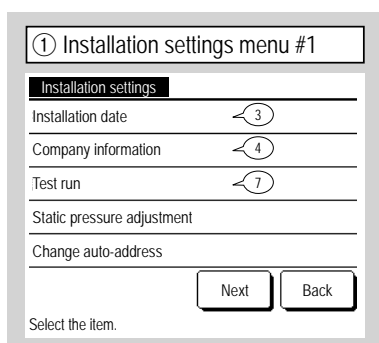
- Yes The screen changes to ①⇒②.
- No The screen changes to ⑥.

After the initializing, it returns to the default state.

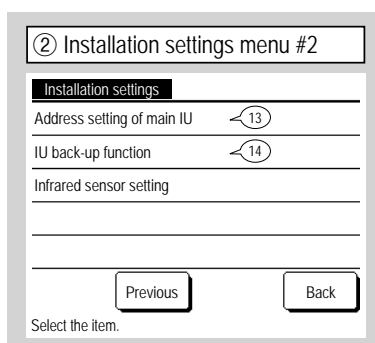


5.1.2. Installation settings and test run

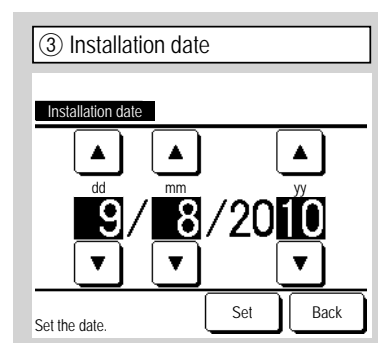
TOP screen ⇒ ⇒ ⇒



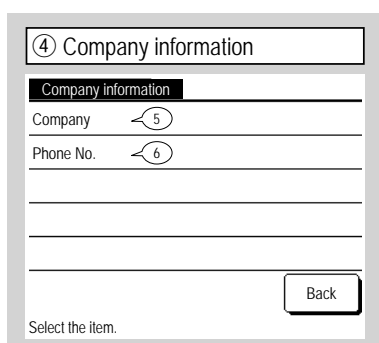
The selected screen is displayed.



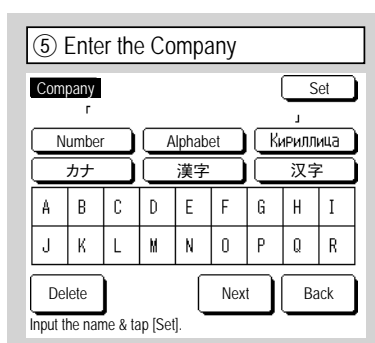
The selected screen is displayed.



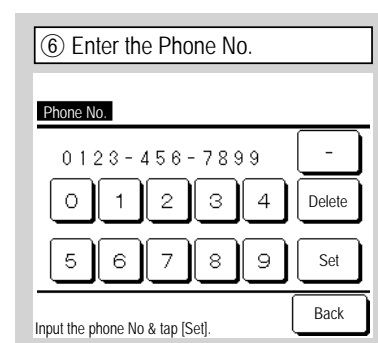
Select the date with buttons, and tap the button.



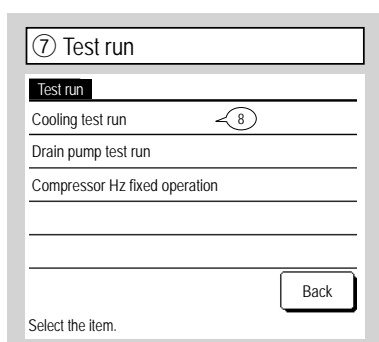
Enter the company information.



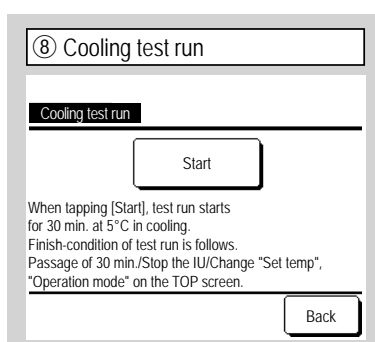
Enter the company name using up to 26 one-byte characters and then tap the button. You can enter alphanumeric, Japanese Kana, Kanji, Cyrillic, or Chinese characters.



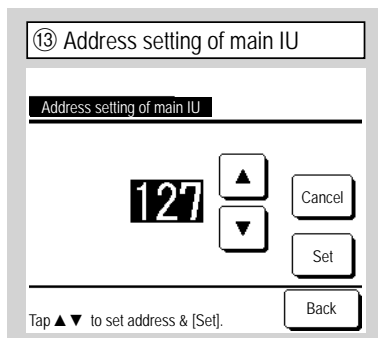
Enter the phone number of the company using up to 13 characters and then tap the button.



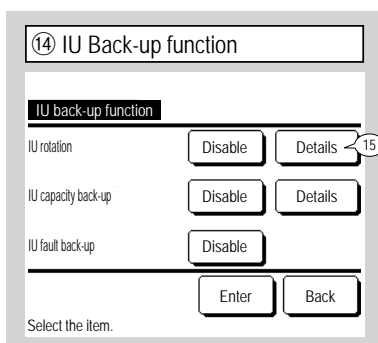
The selected screen is displayed.



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 5°C.



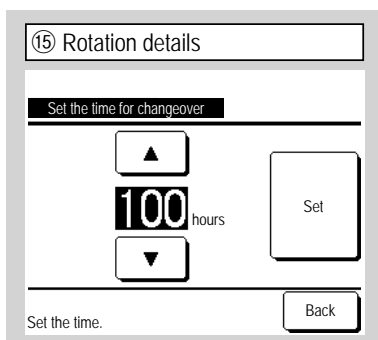
In case of Multi Series (KX) models, it is possible to let indoor units (Sub IUs) follow the operation mode (Heating, cooling) of the indoor unit (Main IU). Set the address of the Main IU to the Sub IUs. The Sub IUs to which the Main IU address is set follow the Main IU settings.



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 for temporary setting.

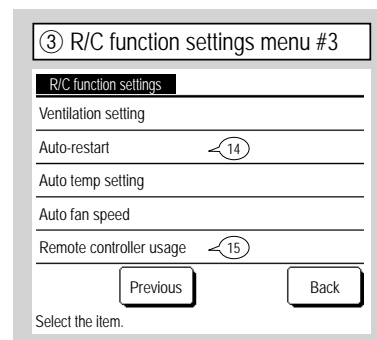
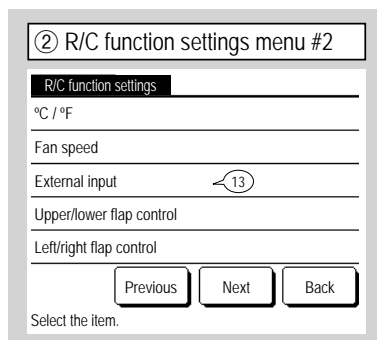
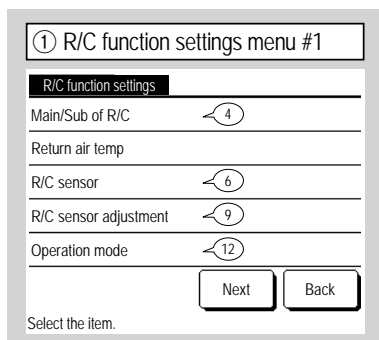
After temporary setting, return to the IU Back-up function screen and tap .

Back-up control restrictions

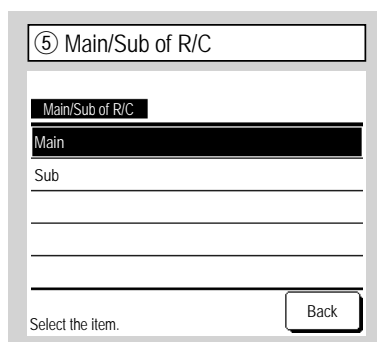
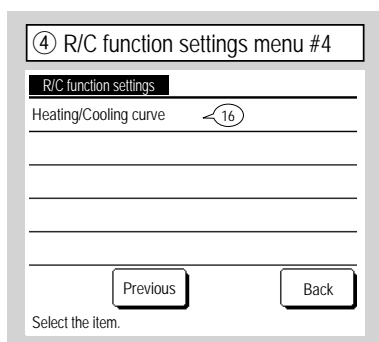
1. The back-up control is unavailable when the operation mode is "Auto". When the back-up control is set for the unit that specifies "Auto" for the operation mode, the operation mode changes to "Cooling" automatically.
2. When the rotation control is set, the fault back-up control will be enabled automatically. 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.

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

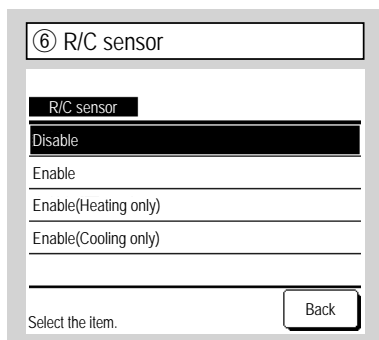
TOP screen Menu ⇒ Service setting ⇒ R/C function settings ⇒ Service password



The selected screen is displayed.



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



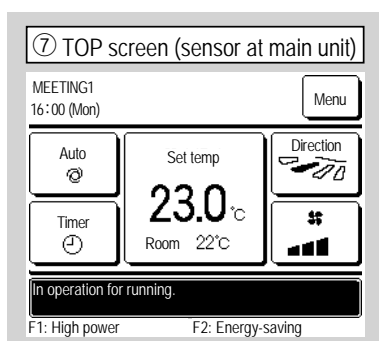
You can change IU main unit return air temperature sensor to the R/C side.

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

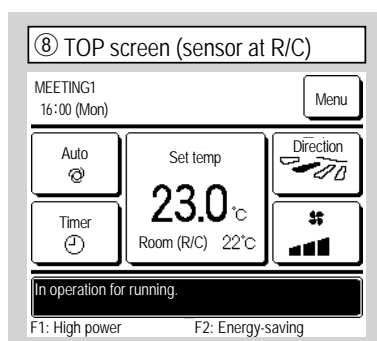
Enable The Indoor temp display changes to the temperature measured by the R/C side sensor. ⇒ ⑧

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

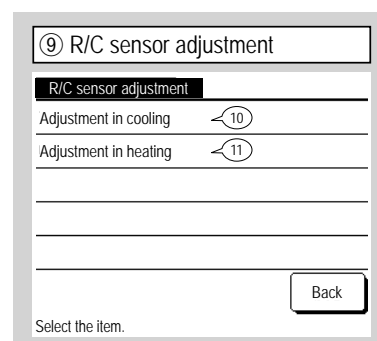
Enable(Cooling only) The Indoor temp display changes to the temperature measured by the R/C side sensor during cooling only.



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



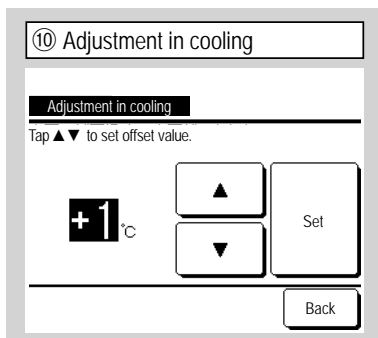
When the R/C sensor is enabled, the TOP screen displays "Room (R/C) ○ °C".



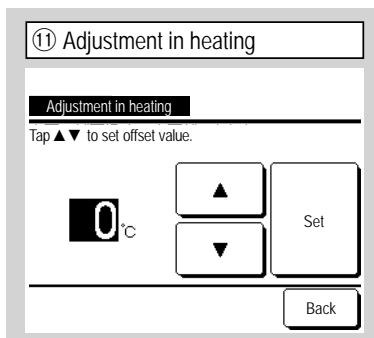
You can adjust the R/C sensor detection temperature.

Adjustment in cooling ⇒ ⑩

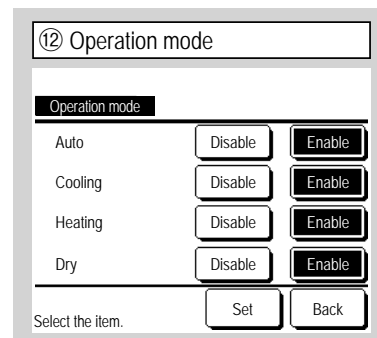
Adjustment in heating ⇒ ⑪



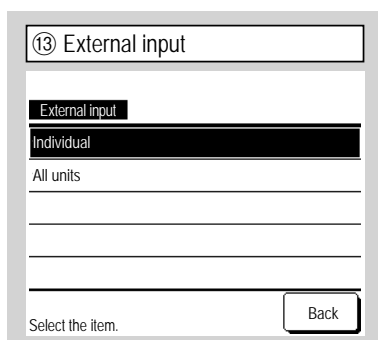
The R/C sensor detection temperature during cooling operation can be corrected. Set the value within the range of -3 to +3.



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



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



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

This is applied only to the IU receiving CNT input.

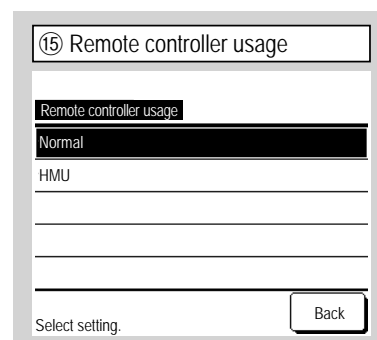
This is applied to all indoor units connected.



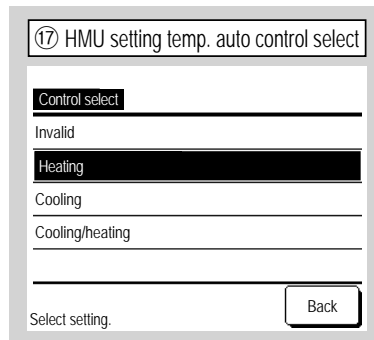
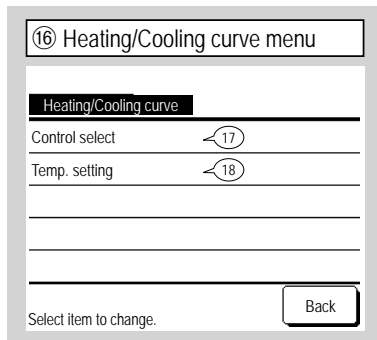
If the unit stops during operation,

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

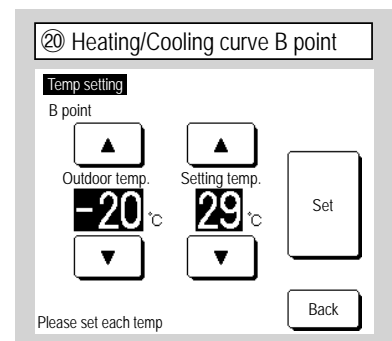
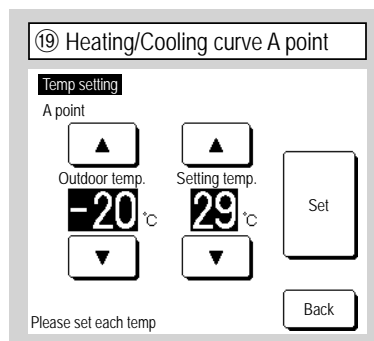
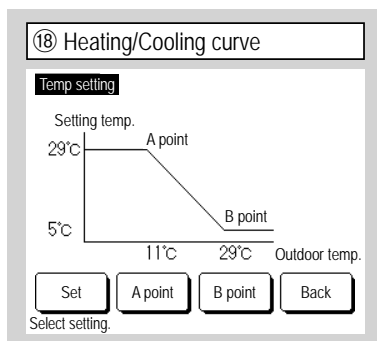
It stops after the restoration of power supply.



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



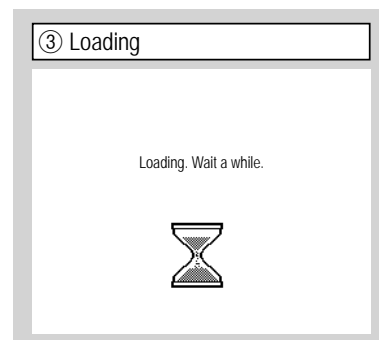
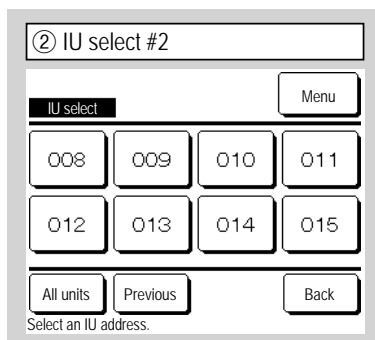
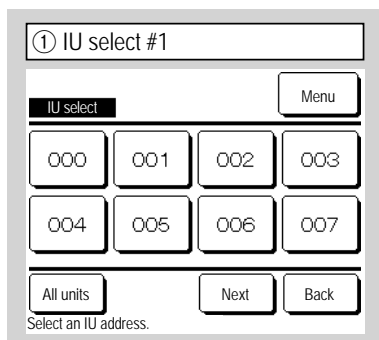
You can set whether Heating/Cooling curve is enabled.



You can define Heating/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 50°C and the set temperature 0 to 50°C.

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

TOP screen ⇒ ⇒ ⇒

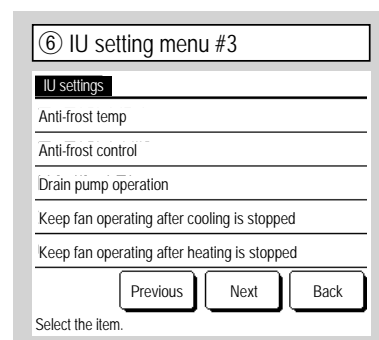
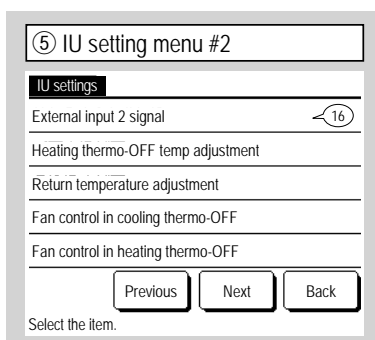
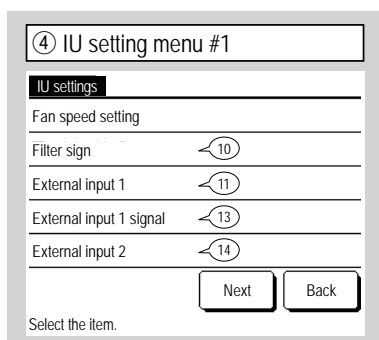


When plural indoor units are connected, they are displayed on the screen.

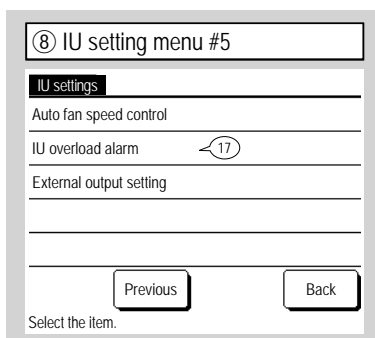
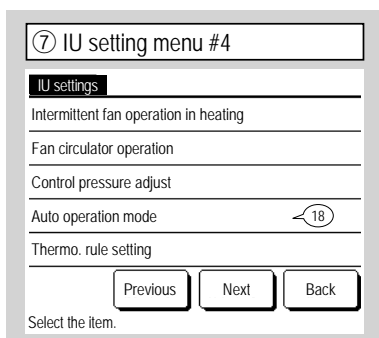
to Individual settings are performed for indoor units.

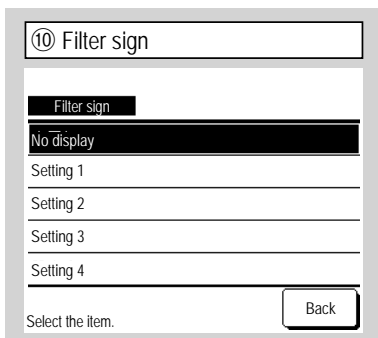
The same setting applies to all units.

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



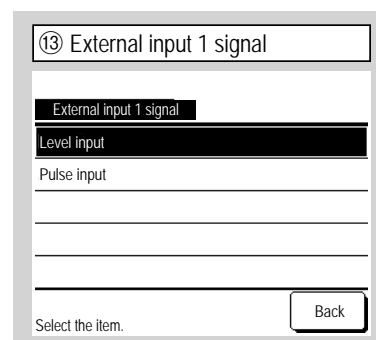
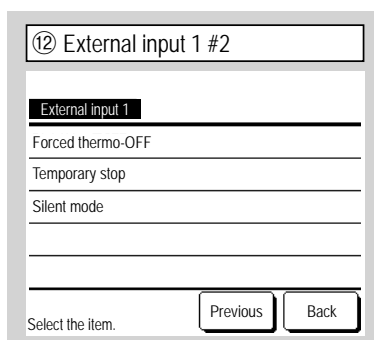
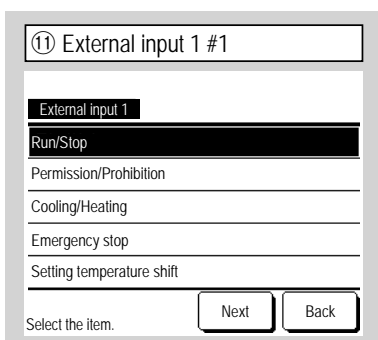
The selected screen is displayed.





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

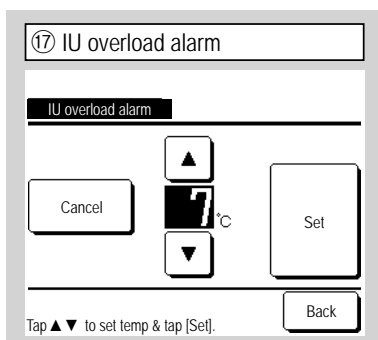
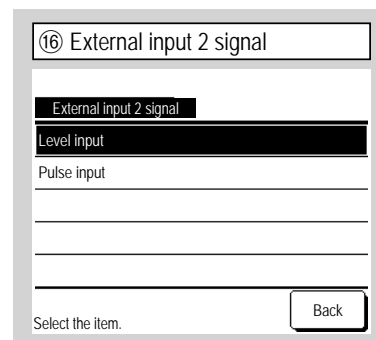
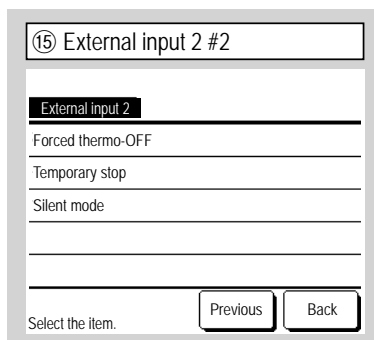
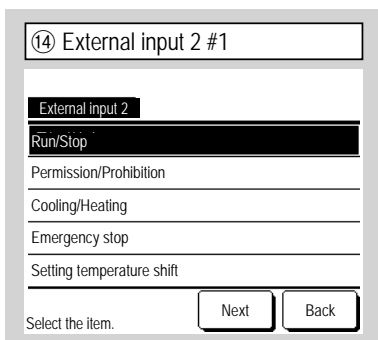
Set the time to display the filter sign.



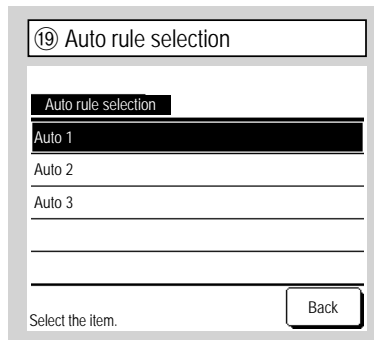
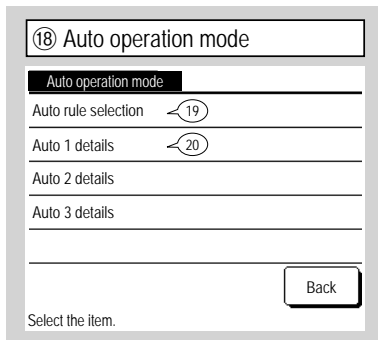
Set the control at the time when the signal is input to the external input 1 (CNT) of IU. Refer to the engineering data for details.

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.

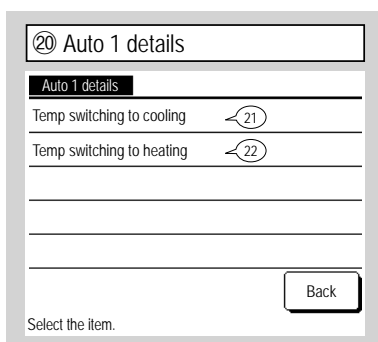


When the room temperature differs to some extent from the setting temperature at 30 minutes after the start of operation, the overload alarm signal is transmitted from the external output (CnT-5).



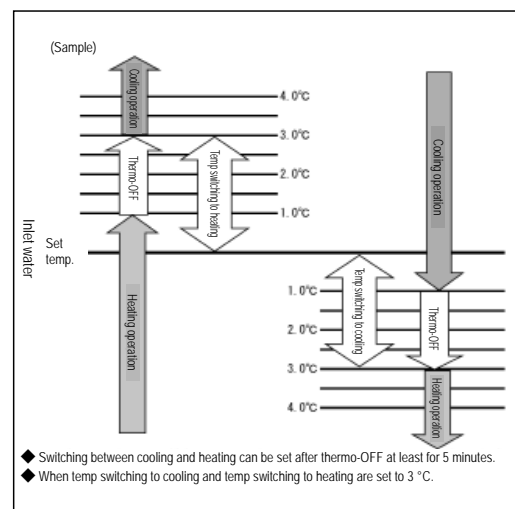
Auto 1 The temp difference between the set temp and the actual room temp switch cooling and heating.
Auto 2 **Auto 2** and **Auto 3** are the same as **Auto 1** in the case of HMU.
Auto 3

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.

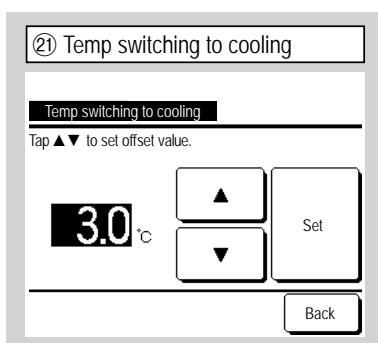


[Set temp - Temp switching to cooling] < [Inlet water temp]
 ⇒ Operation mode: Cooling

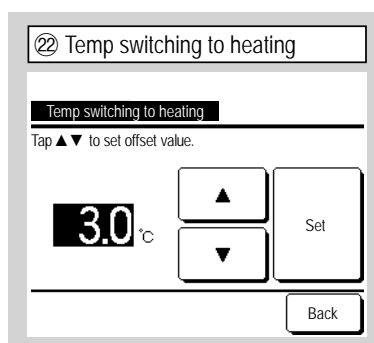
[Set temp + Temp switching to heating] > [Inlet water temp]
 ⇒ Operation mode: Heating



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



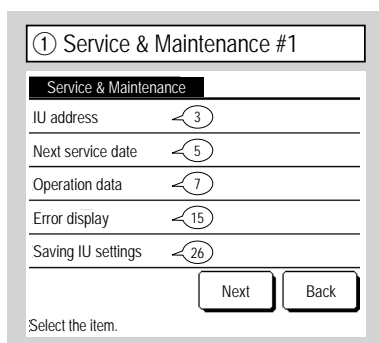
Set the temperature switching to cooling with Auto 1. The temperature can be set within the range of 1 to 4 °C.



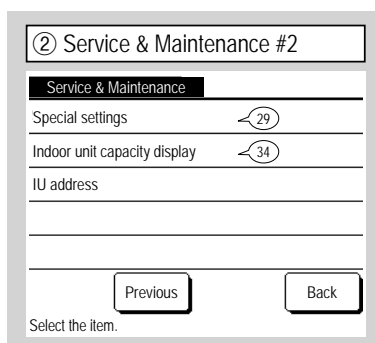
Set the temperature switching to heating with Auto 1. The temperature can be set within the range of 1 to 4 °C.

5.1.5. Service & Maintenance

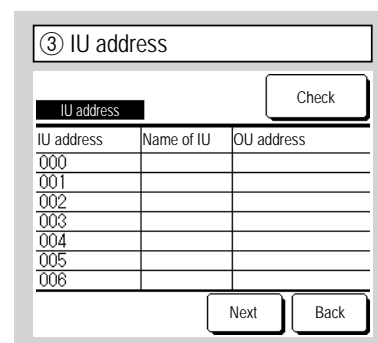
TOP screen ⇒ ⇒ ⇒



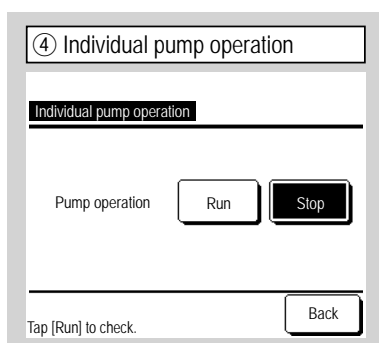
The selected screen is displayed.



The selected screen is displayed.

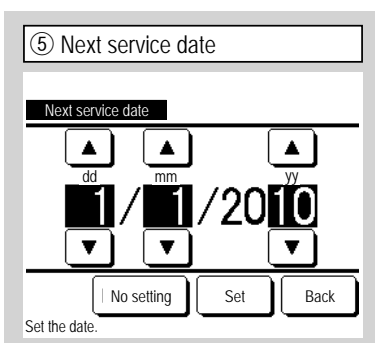


When 8 or more units are connected, further data are displayed on the next page. When the button is tapped after selecting an IU address, the pump of the selected IU can be operated. ⇒④



Tap this button to start the pump operation.

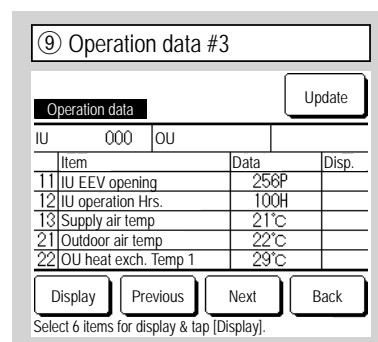
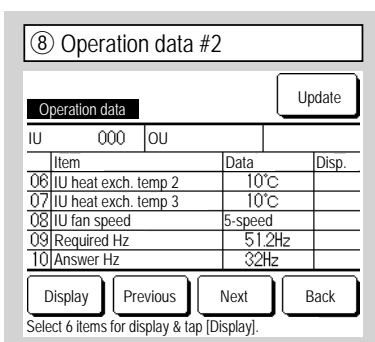
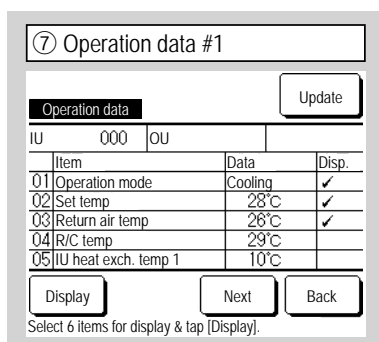
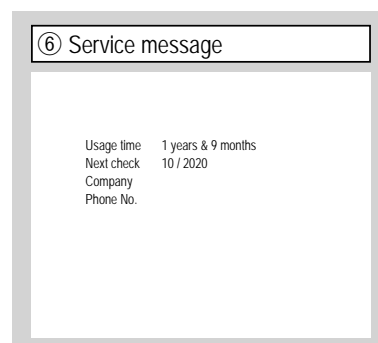
Tap this button to stop the pump operation.



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 button is tapped, messages are not displayed.



After read the indoor unit data, the operation data at the time of reading are displayed. Tapping the button to update the data. To automatically update data and display, up to six items can be selected. Tapping the button after selecting six items changes the display to ⑩ .

⑩ Operation data #4

Operation data Update

Item	Data	Disp.
23	OU heat exch. Temp 2	29°C
24	Compressor Hz	51.2Hz
25	High pressure	1.2MPa
26	Low pressure	0.20MPa
27	Discharge pipe temp	76°C

Display Previous Next Back

Select 6 items for display & tap [Display].

⑪ Operation data #5

Operation data Update

Item	Data	Disp.
28	Comp bottom temp	27°C
29	Current	8A
30	SH control	48°C
31	ISH	48°C
32	TDSH	48°C

Display Previous Next Back

Select 6 items for display & tap [Display].

⑫ Operation data #6

Operation data Update

Item	Data	Disp.
33	Protection control	No.1
34	OU fan speed	5-speed
35	63H1	ON
36	Defrost	ON
37	Comp. running Hrs	100H

Display Previous Next Back

Select 6 items for display & tap [Display].

⑬ Operation data #7

Operation data Update

Item	Data	Disp.
38	OU EEV 1 opening	512P
39	OU EEV 2 opening	512P

Display Previous Back

Select 6 items for display & tap [Display].

⑭ Individual display

Operation data

Operation mode	Cooling
Set temp	28°C
Return air temp	29°C
R/C temp	28°C
IU heat exch. temp 1	10°C
IU heat exch. temp 2	15°C

Back

⑮ Error display

Error display

Error history 16

Display anomaly data 17

Erase anomaly data 24

Reset periodical check 25

Back

Select the item.

Automatically updates and displays the six selected items.

⑯ Error history (Sample)

Error history Delete

Time	IU	ErrorCode
2011/01/19 6:57 PM	014	E16
2011/01/19 6:57 PM	015	E15
2011/01/19 6:57 PM	012	E14

Back

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

Display anomaly data

Item	Data
01	Operation mode Cooling
02	Set temp 28°C
03	Return air temp 28°C
05	IU heat exch. temp 1 10°C
06	IU heat exch. temp 2 10°C

Next Back

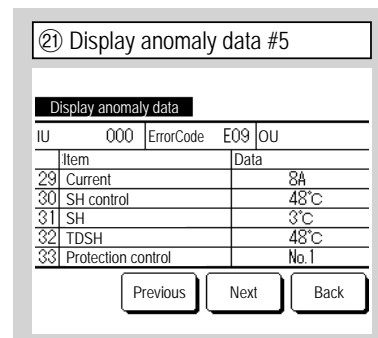
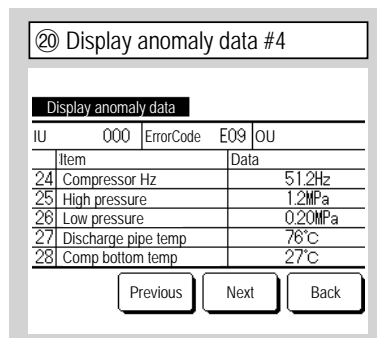
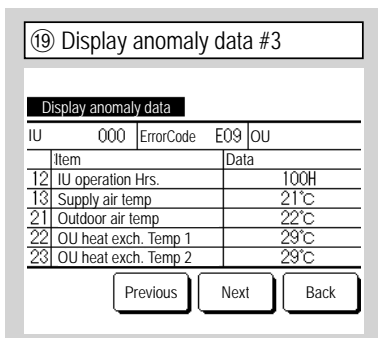
⑱ Display anomaly data #2

Display anomaly data

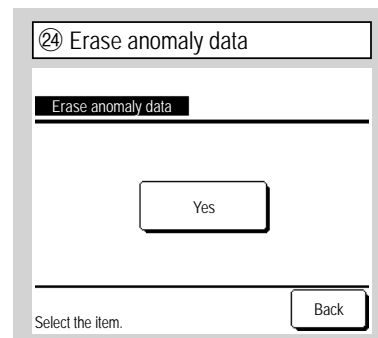
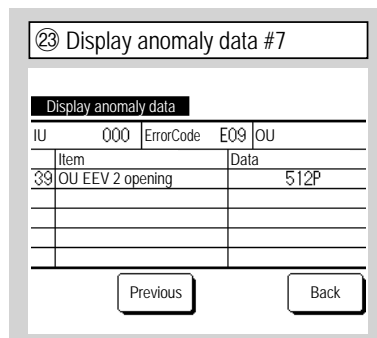
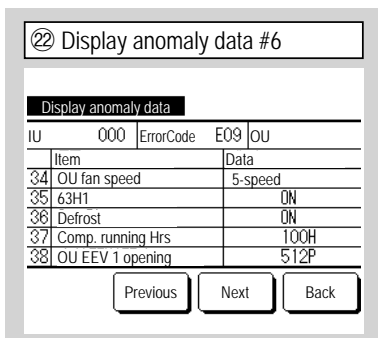
Item	Data
07	IU heat exch. temp 3 10°C
08	IU fan speed 5-speed
09	Required Hz 51.2Hz
10	Answer Hz 32Hz
11	IU EEV opening 256P

Previous Next Back

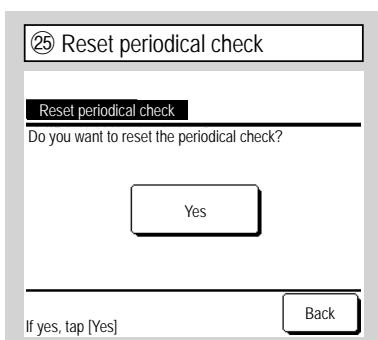
The operation data obtained just before the occurrence of an error are displayed.



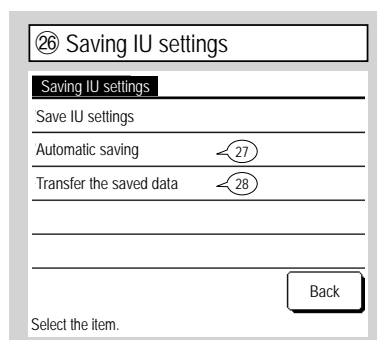
The operation data obtained just before the occurrence of an error are displayed.



The anomaly data is erased.



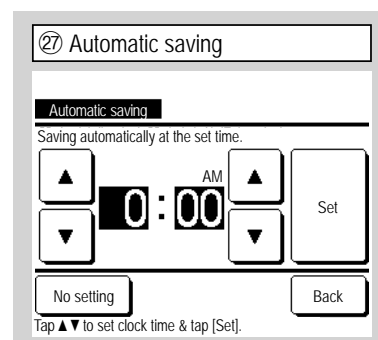
The time count is reset by resetting the periodical check.



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

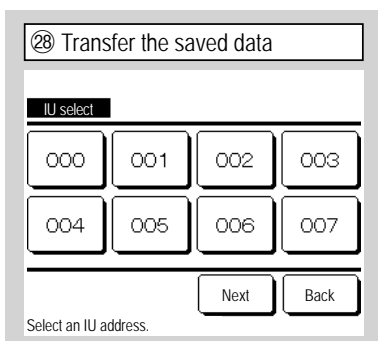
Automatic saving Set the time when the automatic saving is performed every day.

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



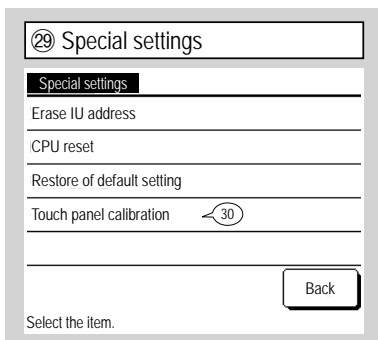
Set the time when the automatic saving is performed every day.

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



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".



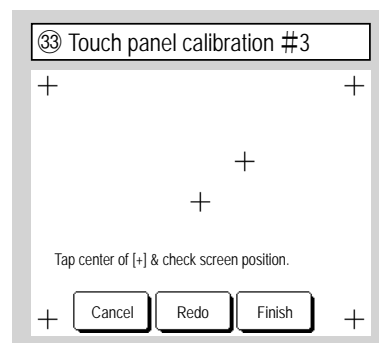
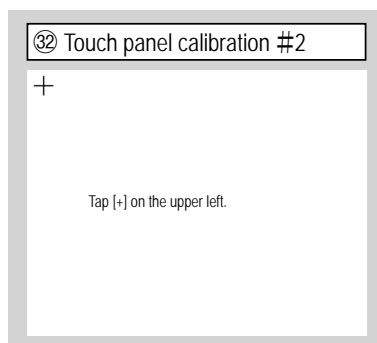
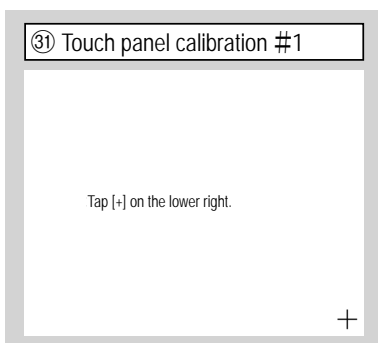
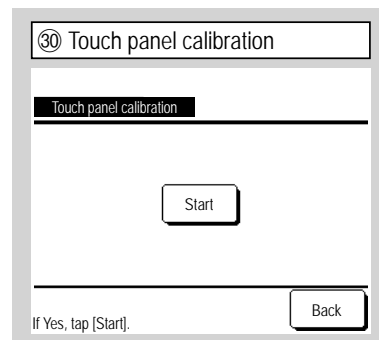
The selected screen is displayed.

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).

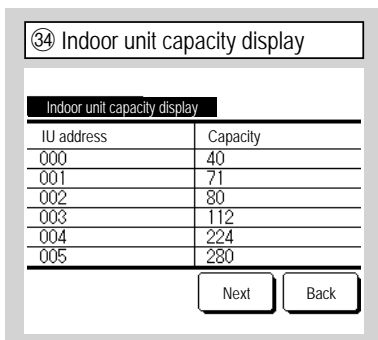
Touch panel calibration Use this to correct when the display and the touch position are not matched.



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.



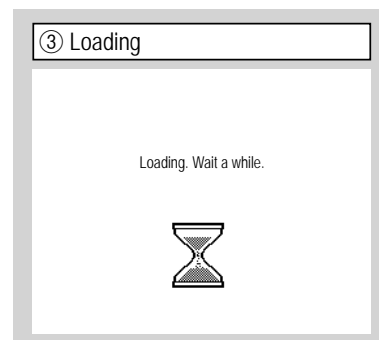
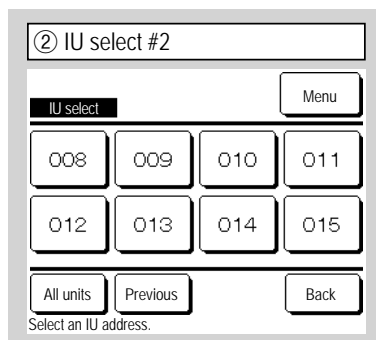
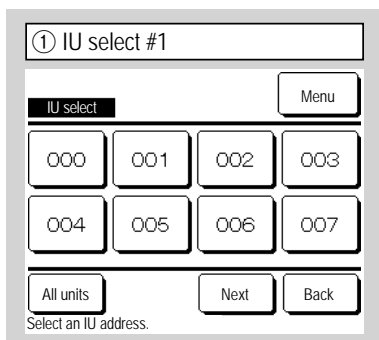
Capacities of IUs connected to the R/C are displayed.

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.

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

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

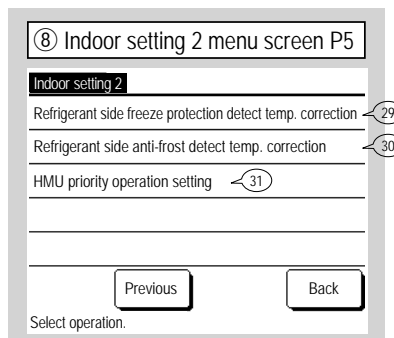
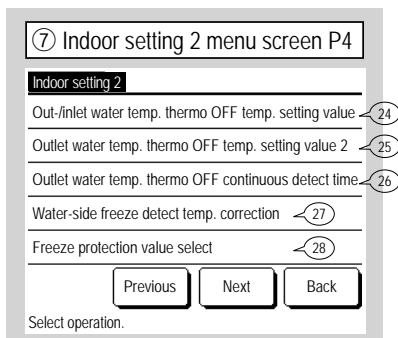
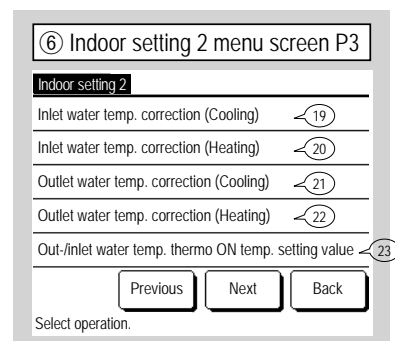
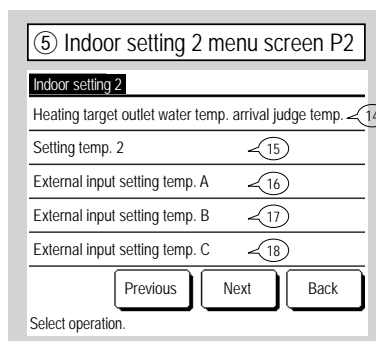
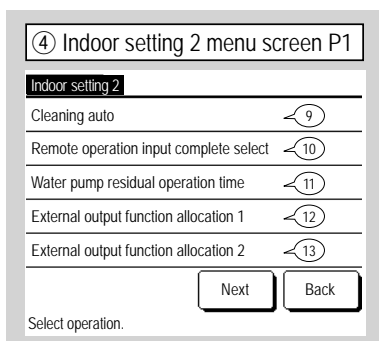


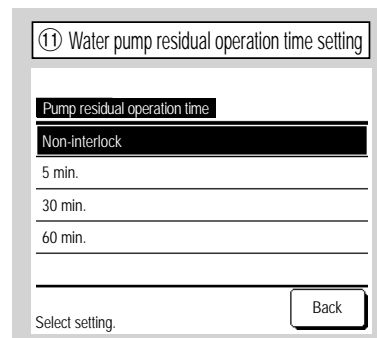
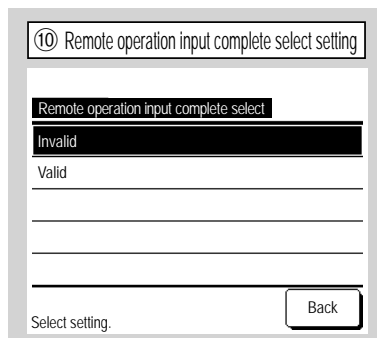
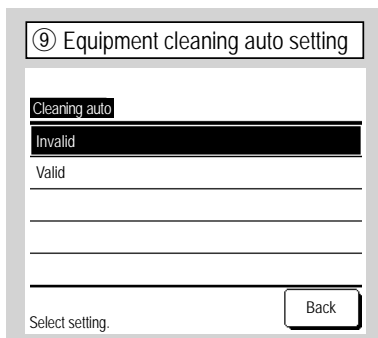
When plural indoor units are connected, they are displayed on the screen.

000 to 015 Individual settings are performed for indoor units.

All units The same setting applies to all units.

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





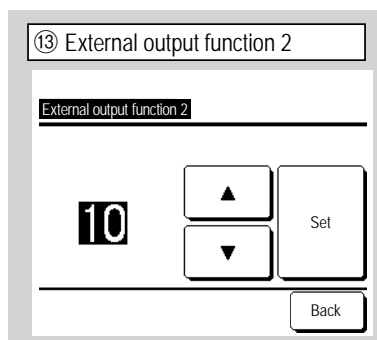
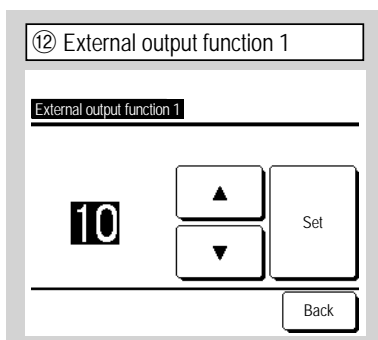
Enable

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

Disable

The unit can be switched ON/OFF by the R/C.

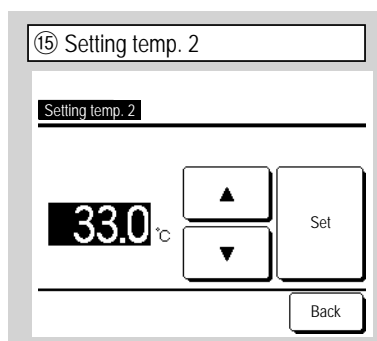
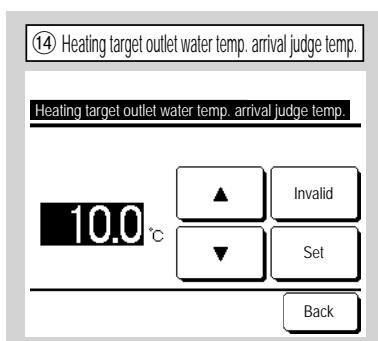
Select the time for which pump operation remains after the unit operation stops.



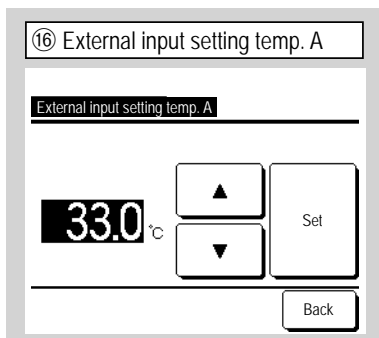
	Output function
0	Operation output
1	Heating output
2	Thermo ON output
3	Inspection (Error) output
4	Cooling output
5	Defrost output
6	Oil return output
7	Indoor unit overload alarm output
8	Heating target outlet water temp. arrival output
9	Spare
10	Spare

Select the function to be allocated for the connector CNO.

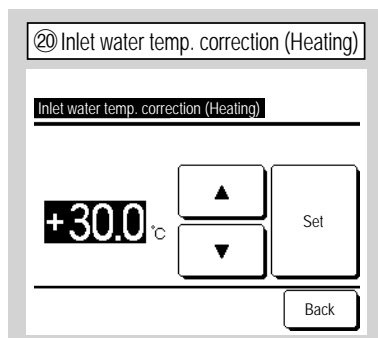
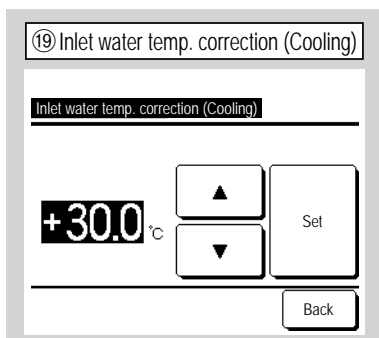
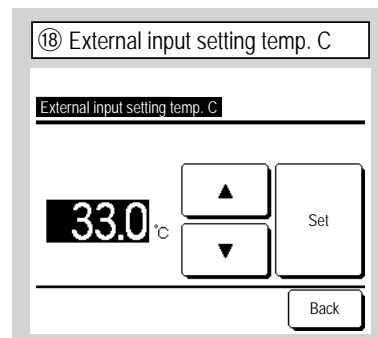
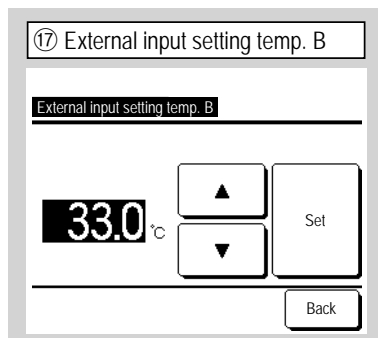
Select the function to be allocated for the connector CND.



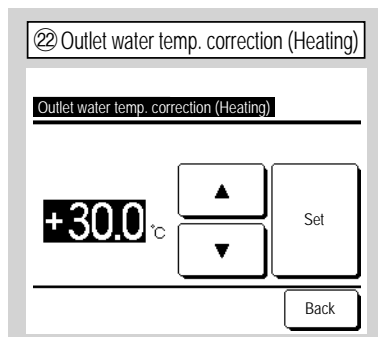
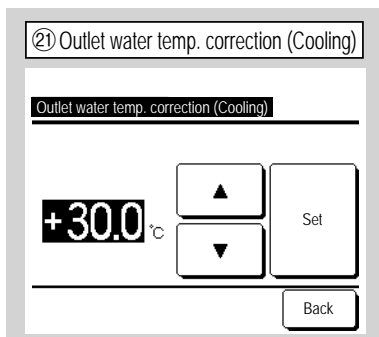
Set the target value of heating within the range of 0 to 10°C.



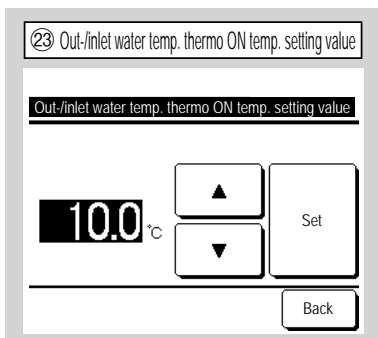
The target inlet/outlet water temperature.
Set the value within the range of 5 to 55°C.



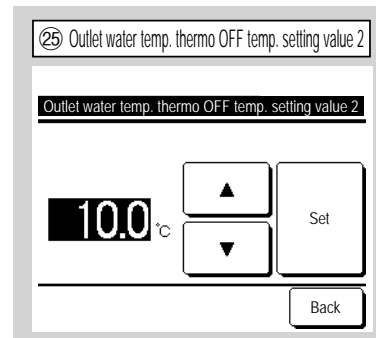
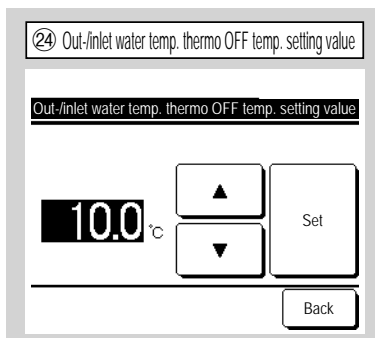
The detected inlet water temperature can be corrected.
Set the offset value within the range of -30 to +30°C.



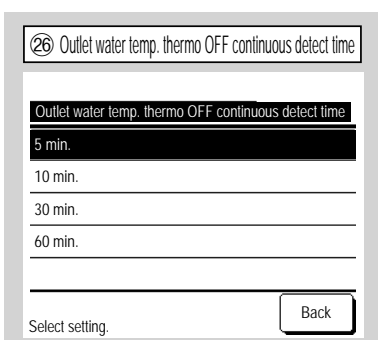
The detected outlet water temperature can be corrected.
Set the offset value within the range of -30 to +30°C.



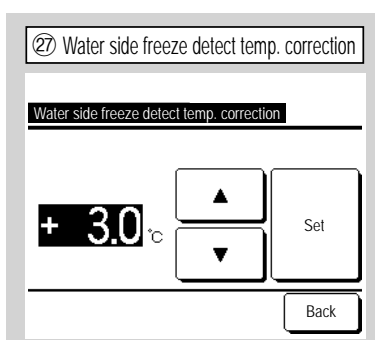
Set the gap between the present and target outlet/inlet water temperature switching to thermo-ON/OFF operation. It can be set within the range of 1 to 10°C.



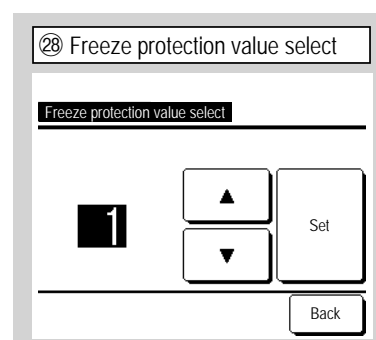
Set the gap between the present and target outlet water temperature switching to thermo-OFF operation. It can be set within the range of 5 to 10°C.



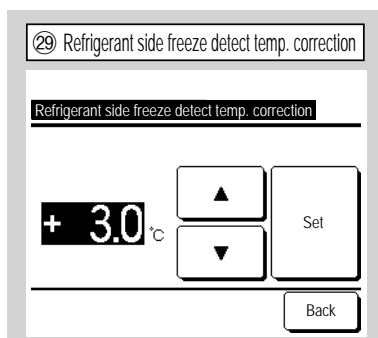
Select the time period for which the prescribed temperature is detected before thermo-OFF operation starts.



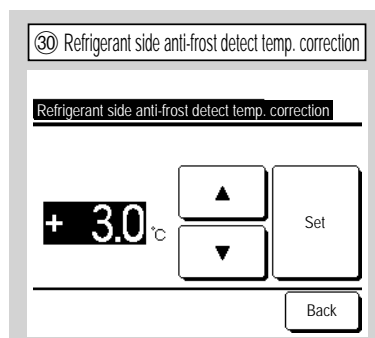
The water temperature switching to (water) can be corrected. Set the offset value within the range of -3 to +3°C.



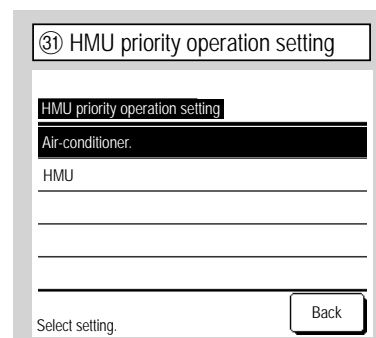
Select "0" or "1" to change the temperature switching to anti-freezing control. Refer to engineering data for details.



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 indoor units you would have priority concerning capacity. Select "Air conditioner" or "HMU".

5.2 Indoor unit

5.2.1 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-KIT 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-KIT 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-KIT 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-KIT 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-KIT 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-KIT 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 controller or via external input signals.

<Setting temperature range>

Cooling: 5 – 25°C

Heating: 15 – 55°C

(i) Individual remote controller

Set it with the setting temperature of remote controller.

(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 controller, 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 controller or via external input signal.

<Setting temperature range>

Cooling: 10 – 30°C

Heating: 10 – 50°C

(i) Individual remote controller

Set it using the setting temperature 2 of remote controller.

(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 controller, 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 temp. sensor (Thi-AF) \geq Target outlet water temp. $T_s + 1^\circ\text{C}$ (*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 temp. sensor (Thi-AF) $\leq T_s - 5^\circ\text{C}$ (*2),

Or

Target overheat degree SH = 10deg, and

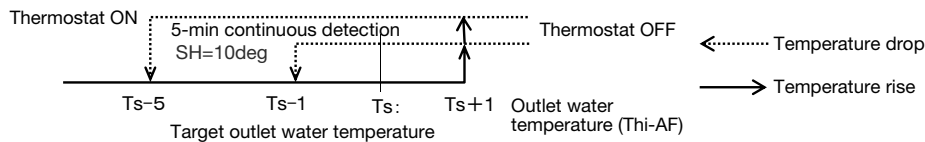
It has detected for 5 minutes (*4) continuously Outlet water temp. sensor (Thi-AF) $\leq T_s - 1^\circ\text{C}$ (*3).

(*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 temp. sensor (Thi-AF) \leq Target outlet water temp. $T_s - 1^\circ\text{C}$ (*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 $\neq 0$).
- It has detected Outlet water temp. sensor (Thi-AF) $\geq T_s + 5^\circ\text{C}$ (*2),

Or

Target outlet temp. RH = (RH - 23) $^\circ\text{C}$, and

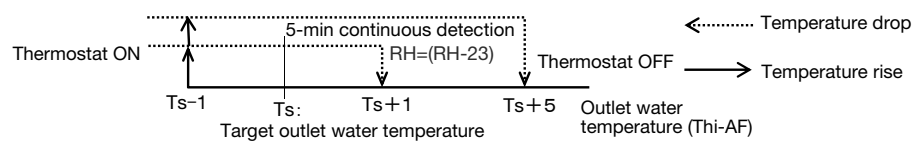
It has detected for 5 minutes (*4) continuously Outlet water temp. sensor (Thi-AF) $\geq T_s - 1^\circ\text{C}$ (*3).

(*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)”.



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

(d) Constant outlet water temperature & 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

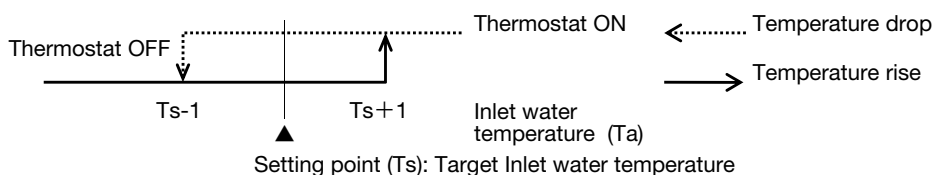
- When it has detected for 1 minute continuously Inlet water temp. sensor (T_a) \geq Target inlet water temp. $T_s + 1^\circ\text{C}$ (*1).

(ii) Thermostat OFF condition

- When it has detected for 1 minute continuously Inlet water temp. sensor (T_a) \leq Target inlet water temp. $T_s - 1^\circ\text{C}$ (*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

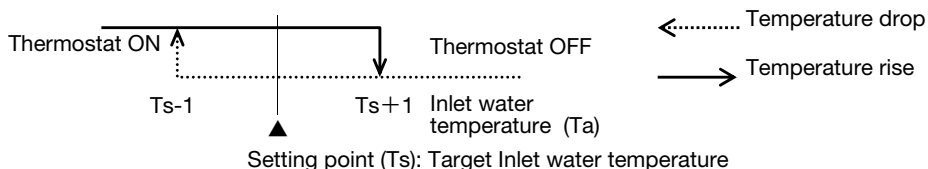
- When it has detected for 1 minute continuously Inlet water temp. (T_a) \leq Target inlet water temp. $T_s - 1^\circ\text{C}$ (*1).

(ii) Thermostat OFF condition

- When it has detected for 1 minute continuously Inlet water temp. (T_a) \geq Target inlet water temp. $T_s + 1^\circ\text{C}$ (*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 controller sensor value will agree with the target room temperature.

<Cooling>

(i) Thermostat ON condition

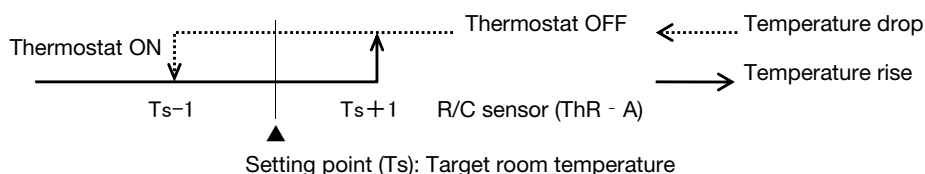
- When it has detected for 1 minute continuously R/C sensor (T_{hR-A}) \geq Target room temp. $T_s + 1^\circ\text{C}$ (*1).

(ii) Thermostat OFF condition

- When it has detected for 1 minute continuously R/C sensor (T_{hR-A}) \leq Target room temperature $T_s - 1^\circ\text{C}$ (*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

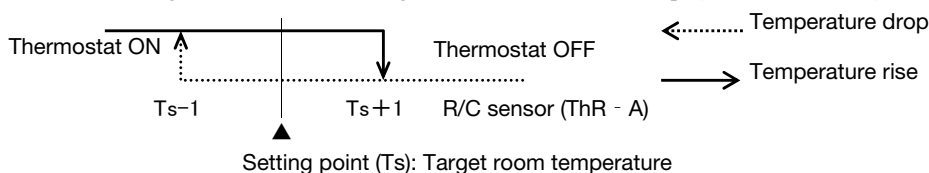
- When it has detected for 1 minute continuously R/C sensor (ThR-A) \leq Target room temperature $T_s - 1^\circ\text{C}$ (*1).

(ii) Thermostat OFF condition

- When it has detected for 1 minute continuously that R/C sensor (ThR-A) \geq Target room temperature $T_s + 1^\circ\text{C}$ (*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)”.



(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 temp. [°C]	4 (*1)
Water side freeze detection release temp. [°C]	7 (*1)

(*1) Water side freeze detection temperature and release temperature can be corrected with the remote controller 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 or Thi-R2) 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 and Thi-R2) 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-KIT, is combined with HMU-KIT, the error code [E22] occurs.

5.2.2 Optional 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 controller.

Type of function select external input signals (Level/pulse) also can be changed by the function setting from remote controller.

(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 center controller.

In case of plural unit (twin, triple, double twin), remote operation input to CnT-6 or CnTA on the slave indoor unit is invalid.

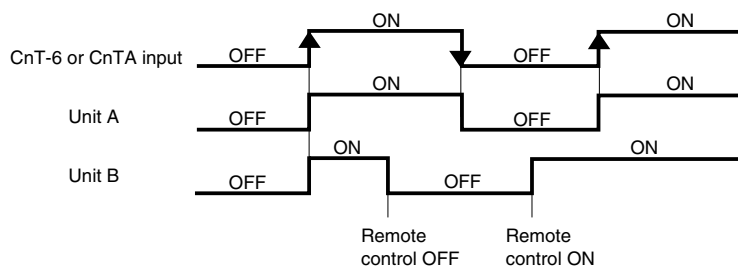
Only the “LEVEL INPUT” is acceptable for external input, however when the indoor function setting of “Level input (Factory default)” or “Pulse input” is selected by the function for “External input” of the wired remote control, operation status will be changed as follows.

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.

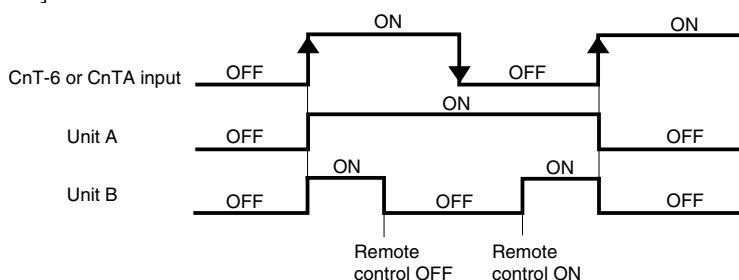


Note: The latest operation has priority

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



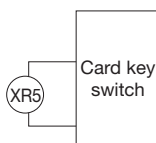
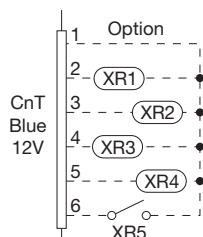
② Operation permission/prohibition

(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)	
	ON	OFF	ON	OFF
CnT-6 or CnTA	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)”;

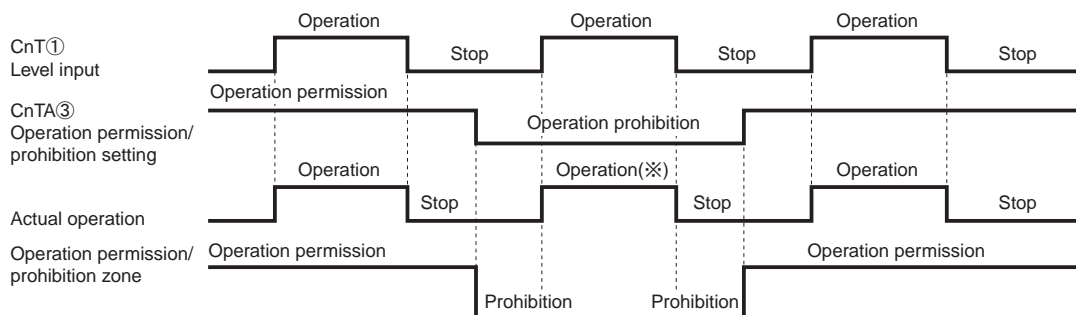
- ① When card key switch is ON (CnT-6 or CnTA ON: Operation permission), start/stop operation of the unit from the wired remote control becomes available.
- ② When card key switch is OFF (CnT-6 or CnTA OFF: Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop 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.

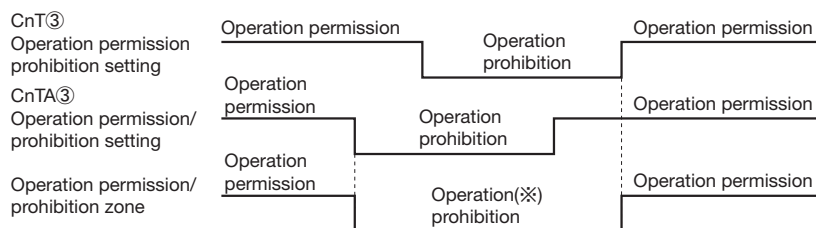
- ② When card key switch is OFF (Operation prohibition), the unit stops operation in conjunction with OFF signal, and start/stop operation of the unit from the wired remote control becomes not available.
- (3) This function is invalid only at “Center mode” setting done by central control.

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



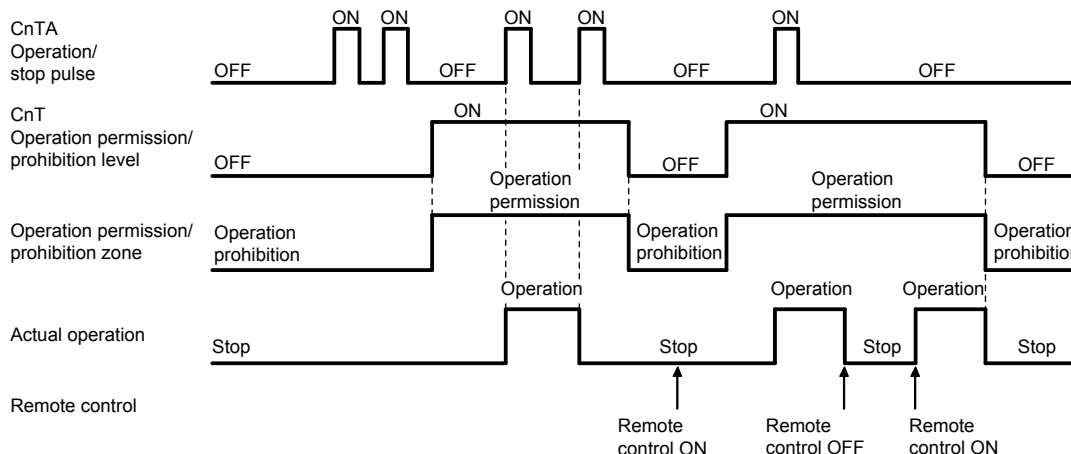
(※) CnT level input supersedes CnTA operation prohibition.

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



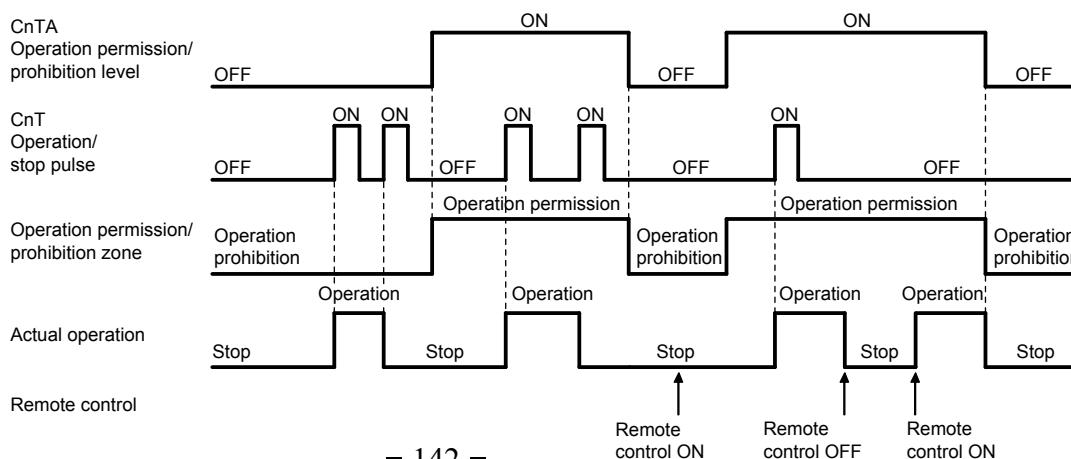
(※) Operation prohibition zone is determined by the OR judgment between CnT Operation prohibition zone and CnTA Operation prohibition zone.

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 supply 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 control
- 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 controller 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 supply 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 supply 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	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	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	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	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	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	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	CnT/CnZ	CnT/CnZ
	Emerg. stop	Level 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	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	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	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	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	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	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	CnT/CnZ	CnT/CnZ
	Set temp. select 2	Level ⑯	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	CnT	CnT
		Pulse ⑰	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	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 controller.

(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. \geq Target outlet water temp. + Alarm temp. difference

- Heating,Auto(Heating)
 - Outlet water temp. \leq Target outlet water temp. + Alarm temp. difference
 - (ii) Operation pattern C or D
 - Cooling,Auto(Cooling)
 - Inlet water temp. \geq Target inlet water temp. + Alarm temp. difference
 - Heating,Auto(Heating)
 - Inlet water temp. \leq Target inlet water temp. + Alarm temp. difference
 - (iii) Operation pattern E or F
 - Cooling,Auto(Cooling)
 - Room temp. (R/C sensor) \geq Target room temp. + Alarm temp. difference
 - Heating,Auto(Heating)
 - Room temp. (R/C sensor) \leq 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. \leq Target outlet water temp. + Alarm temp. difference – 2
 - Heating,Auto(Heating)
 - Outlet water temp. \geq Target outlet water temp. + Alarm temp. difference + 2
 - (ii) Operation pattern C or D
 - Cooling,Auto(Cooling)
 - Inlet water temp. \leq Target inlet water temp. + Alarm temp. difference -2
 - Heating,Auto(Heating)
 - Inlet water temp. \geq Target inlet water temp. + Alarm temp. difference +2
 - (iii) Operation pattern E or F
 - Cooling,Auto(Cooling)
 - Room temp. (R/C sensor) \leq Target room temp. + Alarm temp. difference - 2
 - Heating,Auto(Heating)
 - Room temp. (R/C sensor) \geq Target room temp. – Alarm temp. difference + 2
 - (c) Alarm temperature difference can be changed by remote controller.
- 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. \geq 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-KIT 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 controller.

(4) Remote controller operation Valid/Invalid selection at remote operation input (Start/Stop)

Start/Stop function can be changed by individual remote controller, centralized remote controller and the remote operation input.

Start/Stop function can be invalidated from individual remote controller or centralized remote controller according to the remote operation input (Start/stop) only if “operation by external input only” is set on the remote controller.

(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 temp. $(Thi-A') = \text{Inlet water temp. sensor } (Thi-A) + \text{Inlet water sensor offset in cooling}$
 - (ii) CNV (1-5) = ON (CLOSE)

Correction cooling inlet water temp. $(Thi-A') = \text{Inlet water temp. sensor } (Thi-A)$
 - (iii) Inlet water sensor offset in cooling can be changed by remote controller.
- (b) Heating inlet water temperature correction
 - (i) CNV (1-5) = OFF (OPEN)

Correction heating inlet water temp. $(Thi-A') = \text{Inlet water temp. sensor } (Thi-A) + \text{Inlet water sensor offset in heating.}$
 - (ii) CNV (1-5) = ON (CLOSE)

Correction heating inlet water temp. $(Thi-A') = \text{Inlet water temp. sensor } (Thi-A)$
 - (iii) Inlet water sensor offset in heating can be changed by remote controller.

(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 temp. $(Thi-AF') = \text{Outlet water temp. sensor } (Thi-AF) + \text{Outlet water sensor offset in cooling.}$
 - (ii) CNV (1-5) = ON (CLOSE)

Correction cooling outlet water temp. $(Thi-AF') = \text{Outlet water temp. sensor } (Thi-AF)$
 - (iii) Outlet water sensor offset in cooling can be changed by remote controller.
- (b) Heating outlet water temperature correction
 - (i) CNV (1-5) = OFF (OPEN)

Post correction heating outlet water temp. $(Thi-AF') = \text{Outlet water temp. sensor } (Thi-AF) + \text{Outlet water sensor offset in heating.}$
 - (ii) CNV (1-5) = ON (CLOSE)

Correction heating outlet water temp. $(Thi-AF') = \text{Outlet water temp. sensor } (Thi-AF)$
 - (iii) Outlet water sensor offset in heating can be changed by remote controller.

(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 temp. $Ts' = \text{Max. } [(\text{Target outlet water temp.}), (\text{Inlet water temp.} - 5 \text{ degrees})]$
 - 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 temp. $Ts' = \text{Target outlet water temp.}$
 - 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 controller.

<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 temp. $Ts' = \text{Min. } [(\text{Target outlet water temp.}), (\text{Inlet water temp.} + 5 \text{ degrees})]$
 - 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 temp. $Ts' = \text{Target outlet water temp.}$

→ 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 controller.

(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.

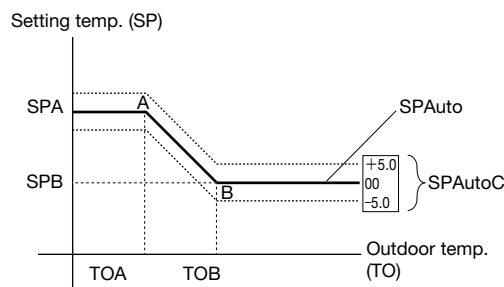
(ii) It takes 10 minutes to update SPAuto.

(iii) SPAutoC can be set from remote controller.

(iv) Determine the setting temperature (SP).

$$SP = SPAuto + SPAutoC$$

(v) TOA, TOB, SPA and SPB can be changed from the remote controller 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.

5.3 Outdoor unit

5.3.1 Common control of outdoor unit

For KXZ series outdoor unit, please refer to Service Manual '14 • KX-SM-202.

For KXZX series outdoor unit, please refer to Service Manual '14 • KX-SM-204.

5.3.2 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

5.3.3 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.

5.3.4 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	Indoor unit 1 Thi-R2	-19~71	1°C	1	Heat exchanger temp. 2	
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 frequency	0~255	1 Hz	1		
08	Indoor unit 1 Answer frequency	0~255	1 Hz	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)

6. SERVICE

Refer to technical manual '14 • KX-T-223 basically.

Regarding some difference between HMU and air-conditioner, refer to this manual.

6.1 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 Remote control: E7 7-segment display: -	LED	Green	Red	Content Indoor inlet water temperature sensor anomaly (Thi-A)
	Indoor	Keeps flashing	1-time flash	
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model
 HMU-KIT

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
<pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-A).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection</p>	<p>Replace indoor unit control PCB.</p>

Temperature-resistance characteristics of indoor inlet water temperature thermistor (Thi-A)

Temperature (°C)	Temperature sensor resistance (kΩ)
0	15
10	10
20	6
25	5
30	4
40	3
50	2

Note:

Error code Remote control: E9 7-segment display: –	LED	Green	Red	Content <h3 style="text-align: center;">Water heat exchanger freeze error</h3>
	Indoor	Keeps flashing	1-time flash	
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model
 HMU-KIT

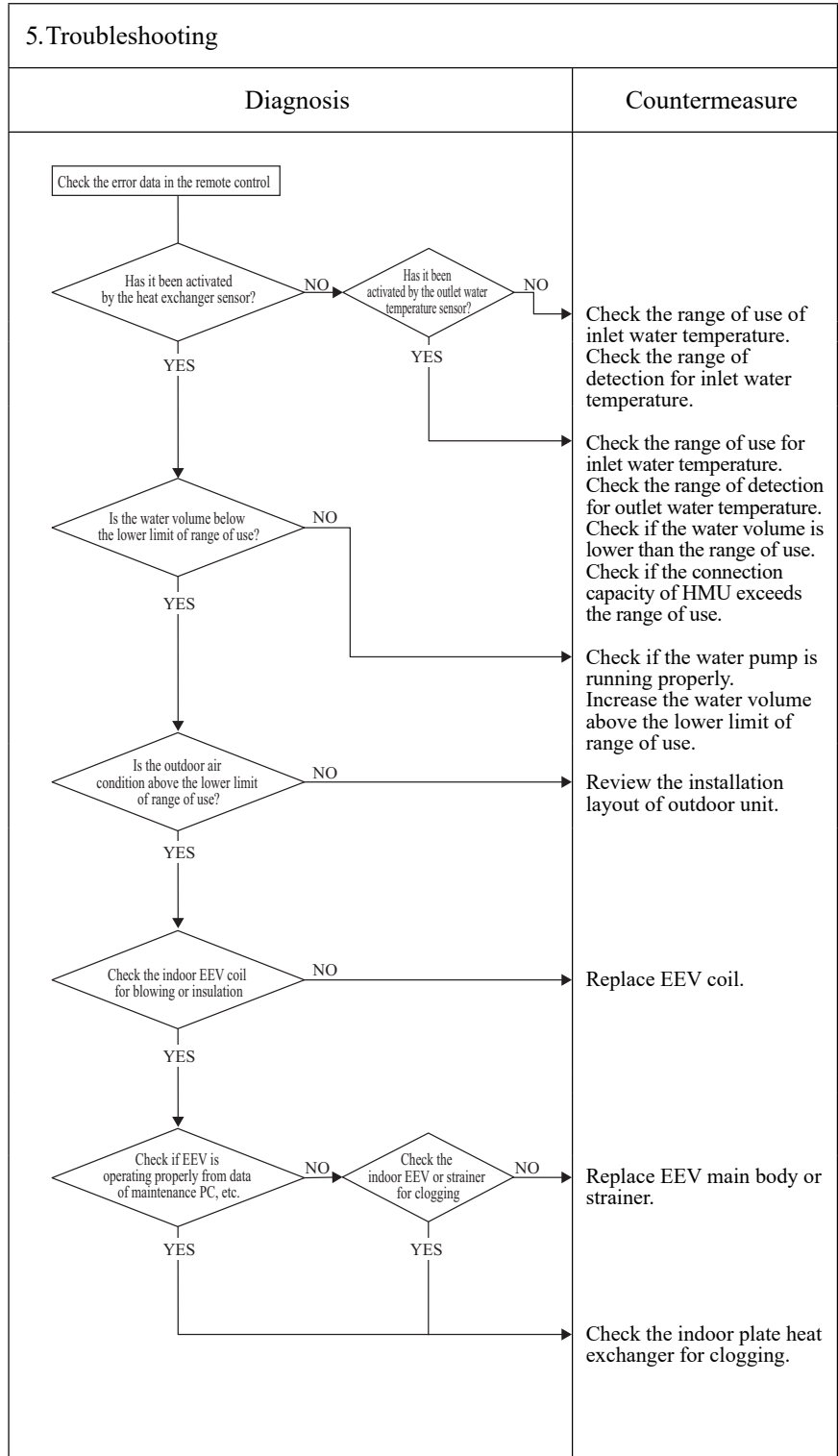
2. Error detection method
 Out-/inlet water temperature sensor (Thi-A or AF) has detected unusually low temperature.
 Indoor heat exchanger sensor (Thi-R1, R2 or R3) has detected unusually low temperature.

3. Condition of error displayed

- Outlet or inlet water sensor has detected lower than 4°C 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)



Note:

Error code Remote control: E15 7-segment display: -	LED	Green	Red	Content Indoor outlet water temperature sensor anomaly (Thi-AF)
	Indoor	Keeps flashing	1-time flash	
	Outdoor	Keeps flashing	Stays OFF	

1. Applicable model
 HMU-KIT

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
<pre> graph TD Q1{Is the connector of sensor connected properly?} -- NO --> C1[Insert the connector securely.] Q1 -- YES --> Q2{Are the characteristics of sensor OK? *1} Q2 -- NO --> C2[Replace sensor (Thi-AF).] Q2 -- YES --> C3[Replace indoor unit control PCB.] </pre> <p>*1 Check several times to prove any poor connection</p>	<p>Insert the connector securely.</p> <p>Replace sensor (Thi-AF).</p> <p>Replace indoor unit control PCB.</p>

Temperature-resistance characteristics of indoor outlet water temperature sensor (Thi-AF)

Temperature (°C)	Temperature sensor resistance (kΩ)
0	~16
10	~10
20	~6
25	5
30	~4
40	~3
50	~2

Note:

Error code Remote control: E16 7-segment display: –	LED	Green	Red	Content <h2 style="text-align: center;">Water pump interlock error</h2>
	Indoor	Keeps flashing	1-time flash	
	Outdoor	Keeps flashing	Stays OFF	

<p>1. Applicable model</p> <p>HMU-KIT</p>	<p>5. Troubleshooting</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 60%;">Diagnosis</th> <th>Countermeasure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> <pre> graph TD Q1{Is water pump interlock wired?} -- NO --> C1[Connect water pump interlock wiring.] Q1 -- YES --> Q2{Is water pump interlock wire broken?} Q2 -- NO --> C2[Replace water pump interlock wiring. Confirm that no error occurs when it is short-circuited.] Q2 -- YES --> Q3{Is water pump faulty?} Q3 -- NO --> C3[Replace water pump.] Q3 -- YES --> C4[Replace indoor control PCB.] </pre> </td> <td></td> </tr> </tbody> </table>		Diagnosis	Countermeasure	<pre> graph TD Q1{Is water pump interlock wired?} -- NO --> C1[Connect water pump interlock wiring.] Q1 -- YES --> Q2{Is water pump interlock wire broken?} Q2 -- NO --> C2[Replace water pump interlock wiring. Confirm that no error occurs when it is short-circuited.] Q2 -- YES --> Q3{Is water pump faulty?} Q3 -- NO --> C3[Replace water pump.] Q3 -- YES --> C4[Replace indoor control PCB.] </pre>	
Diagnosis	Countermeasure					
<pre> graph TD Q1{Is water pump interlock wired?} -- NO --> C1[Connect water pump interlock wiring.] Q1 -- YES --> Q2{Is water pump interlock wire broken?} Q2 -- NO --> C2[Replace water pump interlock wiring. Confirm that no error occurs when it is short-circuited.] Q2 -- YES --> Q3{Is water pump faulty?} Q3 -- NO --> C3[Replace water pump.] Q3 -- YES --> C4[Replace indoor control PCB.] </pre>						
<p>2. Error detection method</p> <p>Water pump interlock wiring</p>						
<p>3. Condition of error displayed</p> <p>When the wiring of water pump interlock has been opened for more than 3 seconds.</p>						
<p>4. Presumable cause</p> <ul style="list-style-type: none"> • Broken wire of water pump interlock • Error on water pump 						

Note:

Error code Remote control: E22 7-segment display: -	LED	Green	Red	Content HMU misconnection detection
	Indoor	Keeps flashing	1-time flash	
	Outdoor	Keeps flashing	Stays OFF	

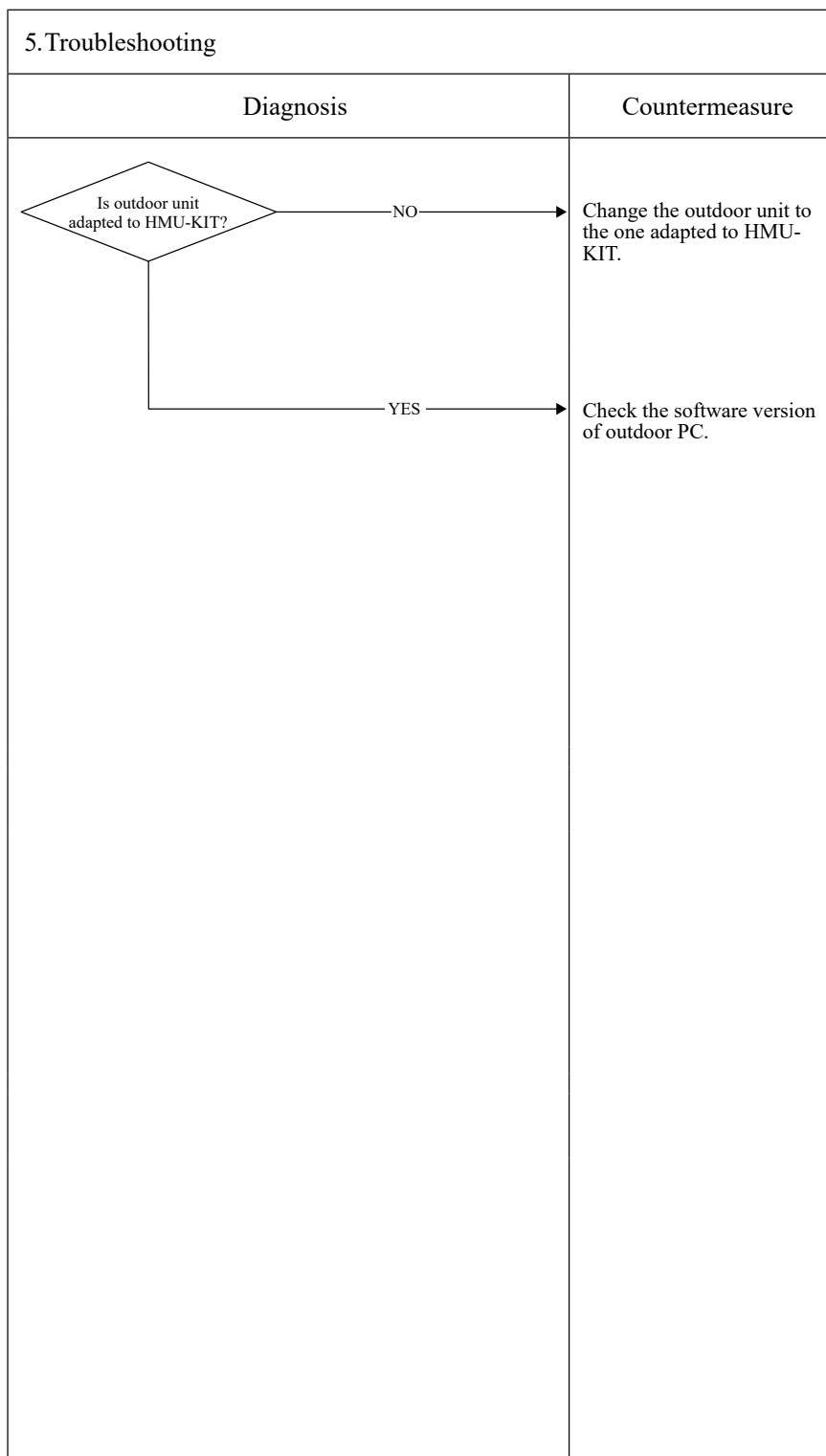
1.Applicable model
 HMU-KIT

2.Error detection method
 When the outdoor unit is not adapted to HMU-KIT.

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-KIT.

4.Presumable cause

- Outdoor unit is not adapted to HMU-KIT.
- Software version of outdoor unit is too old.



Note:

APPENDIX

HMU-KIT Check Sheet

<Caution for use of HMU-KIT>

HMU-KIT is a combination of the expansion valve set and control box ASSY.
Customers in accordance with the purpose (specification),

MTH will support customers by this check sheet, but the heat exchanger and water pump cannot be guaranteed by MTH because they are not products of MTH. Due to the same reason, it is also your responsibility to ensure safety of heat exchanger and water pump.

Please pay attention especially to safety of the electrical system and sell safe goods in each assignment destination.

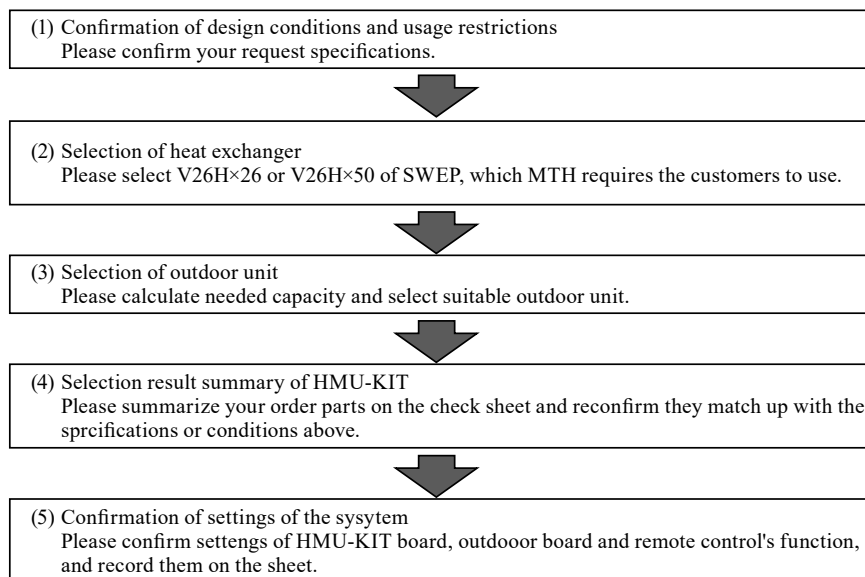
HMU-KIT selection support is provided in "HMU-KIT check sheet".

Please be sure to submit it to MTH sales contact.

If the check sheet is not submitted, HMU-KIT system cannot be guaranteed by MTH.

Please execute all items described in the check sheet.

● Work flow for HMU-KIT 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		kW
	Target blow-off temp.		°C
Winter	Heating capacity		kW
	Target blow-off temp.		°C

Design requirement capacity condition (HMU)

Summer	Cooling capacity		kW
	Inlet water temp.		°C
	Target outlet water temp.		°C
	Water volume		m ³ /h
Winter	Heating capacity		kW
	Inlet water temp.		°C
	Target outlet temp.		°C
	Water volume		m ³ /h

(b) Confirmation of range of use

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

Operation mode	Range of use	Judgment
A/C mode	14·KX-DB-201 or 203	OK · NG
HMU mode	Delivery specifications	OK · NG

(2) Result of selection of plate heat exchanger

Name	Model	MTH Dwg. No.	Q'ty
HEAT EXCH(W)	SWEP product: V26H×26	PCH312D001	
	SWEP product: V26H×50	PCH312D001A	

(3) Check of outdoor unit selection and refrigerant quantity**(a) Operation mode**

Put mark at the connection pattern of outdoor unit.

Connection pattern	Check
HUM only	
With mixed air-conditioner	

Put mark at HMU operation mode to be used.

Operation mode	Check
Special to cooling mode	
Special to heating mode	
For both cooling/heating	

(b) Correction coefficient related to the rate of outdoor unit: B1, B2

Calculate ratios of air-conditioner and HMU to total connected indoor units.

Correction coefficient B1	
Correction coefficient B2	

(c) Correction coefficient according to air and water temperature conditions

Calculate the correction coefficient C1 according to the type of outdoor unit and the operation mode (Air-conditioner).

	Correction coefficient C1	Outdoor unit type	Ref. tech. data
Cooling		Standard model	14·KX-DB-201
Heating		High COP model	14·KX-DB-203

Calculate the correction coefficient C2 according to the operation mode (HMU).

	Correction coefficient C2
Cooling	
Heating	

(d) Correction coefficient according to pipe length

Calculate the correction coefficient D according to the type of outdoor unit.

	Correction coefficient D	Outdoor unit type	Ref. tech. data
Cooling (Cool)		Standard model	14·KX-DB-201
Heating (Heat)		High COP model	14·KX-DB-203

(e) Correction coefficient according to the difference in heights of indoor and outdoor units

Calculate the correction coefficient E according to the type of outdoor unit.

	Correction coefficient E	Outdoor unit type	Ref. tech. data
Cooling (Cool)		Standard model	14·KX-DB-201
Heating (Heat)		High COP model	14·KX-DB-203

(f) Correction coefficient for frosting on outdoor heat exchanger during heating (heat) (Heating only)

Calculate the correction coefficient F according to the type of outdoor unit.

	Correction coefficient F	Outdoor unit type	Ref. tech. data
Cooling (Cool)		Standard model	14·KX-DB-201
Heating (Heat)		High COP model	14·KX-DB-203

(g) Calculation of overall correction coefficient

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

	Overall correction coefficient
Cooling (Cool)	$(B1 \times C1 + B2 \times C2) \times D \times E = \alpha$
Heating (Heat)	$(B1 \times C1 + B2 \times C2) \times D \times E \times F = \beta$

● Calculation of the 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 necessary rated capacity for cooling (cool) and heating (heat) respectively.

	Indoor unit: Necessary rated capacity		Selected outdoor unit rated capacity		Judgment (Selected outdoor unit \geq Necessary rated capacity of outdoor unit → OK)
Cooling (cool)	REC/ α	kW		kW	
Heating (heat)	RCC/ β	kW		kW	

(4) Result of MHU-KIT selection (Confirmation of order requirements)

Category	Name	MTH type	MTH Dwg. No.	Q'ty
HMU-KIT	Control kit	HMU-KIT	PCH006A021	
Indoor expansion valve set	Exp. valve set (14.0kW)	EEV6-160-E	PCH001F002A	
	Exp. valve set (28.0kW)	EEV6-280-E	PCH001F002B	
Remote controller		RC-EX3H	PJZ502A041A	
HMU-KT outdoor unit	Standard 10HP	FDC280KXZE1	PCB003F024B	
	Standard 12HP	FDC335KXZE1	PCB003F024C	
	Standard 14HP	FDC400KXZE1	PCB003F024D	
	Standard 16HP	FDC450KXZE1	PCB003F024F	
	Standard 17HP	FDC475KXZE1	PCB003F024K	
	Standard 18HP	FDC500KXZE1	PCB003F024G	
	Standard 20HP	FDC560KXZE1	PCB003F024H	
	High COP COP8HP	FDC224KXZE1	PCB003F029A	
	High COP COP10HP	FDC280KXZE1	PCB003F029B	
	High COP COP12HP	FDC335KXZE1	PCB003F029C	

(5) Settings of the system

1) HMU-KIT setting

Produce for the number of HMU-KIT units.

ROM version		←Confirm at installation.
Serial No.		

① Dip switch, jumper wire

Code	Setting	Description
SW1		Indoor address (10's place)
SW2		Indoor address (1's place)
SW3		Outdoor address (10's place)
SW4		Outdoor address (1's place)
SW5-1		Main/sib setting
SW5-2		Indoor address (100's place)
SW6-1		Model capacity setting
SW6-2		Model capacity setting
SW6-3		Model capacity setting
SW6-4		Model capacity setting
SW7-1		Op. check test run ON (valid) OFF (invalid)
SW7-2		Spare
SW7-3		Spare
SW7-4		Spare
J1		Connection to supervise PCB, Short-circuit (Normal), Open (Supervise PCB connected)

② External I/O

Type	Code	I/O signal No.		Description
Input	CnI	W	Wo	Ext. device error input, Normal (Shorted)/Error [E16] (Open)
Output	CnO	W	Wo	Heater output
Output	CnD	W	Wo	Bypass damper (Free Cooling) output
Input	CnT-6	W	Wo	
Output	CnT-2	W	Wo	Operation output
Output	CnT-3	W	Wo	Heating output
Output	CnT-4	W	Wo	Thermo ON output
Output	CnT-5	W	Wo	Inspection/error output
Output	CnT2-2	W	Wo	Cooling output
Output	CnT2-3	W	Wo	Defrost output
Output	CnT2-4	W	Wo	Cooling oil return output
Output	CnT2-5	W	Wo	Output with suction temp. below 0°C
Input	CnZ	W	Wo	

③ Remote controller setting

R/C setting item	Selection item	Setting
R/C function select	Normal/HMU	
Remote operation input complete select	Invalid/valid	
Water pump residual operation time	No interlock/5min/30min/60min	
Htg. target outlet w temp. arrive judge temp.	0 - 10°C	
Inlet water temp. correction (Cooling)	-30 - 30°C	
Inlet water temp. correction (Heating)	-30 - 30°C	
Outlet water temp. correction (Cooling)	-30 - 30°C	
Outlet water temp. correction (Heating)	-30 - 30°C	
Out-/inlet w temp. thermo ON temp. setting value	1 - 10°C	
Out-/inlet w temp. thermo OFF temp. setting value	1 - 10°C	
Outlet w temp. thermo OFF temp. setting value 2	5 - 10°C	
Outlet w temp. thermo OFF cont. detect time	5min/10min/30min/60min	
W-side freeze detect temp. correction	-3 - 3°C	
Anti-freeze protect value select	0/1	
Ref-side freeze detect temp. correction	-10 - 10°C	
Ref-side anti-frost detect temp. correction	-10 - 10°C	
HMU priority operation	Air-conditioner/HMU	

2) Outdoor unit setting

Outdoor unit type	
Serial No..	

① Dip switch, jumper wire

Code	Setting	Description
SW1		Outdoor address (10's place)
SW2		Outdoor address (1's place)
SW3-2		Auto backup operation (Valid/★Invalid)
SW3-7		Forced cooling-heating select (Forced cooling-heating/★Normal)
SW4-7		Main/Sub unit setting
SW4-8		Main/Sub unit setting
J13		External input signal type select (★Level/Pulse)
J14		Defrost reset temp. (Intensive type/★Normal)
J15		Defrost start temp. (Cold region/★Normal)

② 7-segment display setting

Enter items to be changed from default setting.

7-segment No.	Setting	Description

③ External I/O

Type	Code	I/O signal		Function allocation 7-segment No.	Function allocation No.
Input	CnS1	With	Without	[P07]	
Input	CnS2	With	Without	[P08]	
Input	CnG1	With	Without	[P09]	
Input	CnG2	With	Without	[P10]	
Output	CnH	With	Without	Operation output	
Output	CnY	With	Without	Error output	
Output	CnZ1	With	Without	[P06]	

MEMO

HYDRO MODULE UNIT



MITSUBISHI HEAVY INDUSTRIES THERMAL SYSTEMS, LTD.
2-3 Marunouchi 3-chome, Chiyoda-ku, Tokyo 100-8332, Japan
<http://www.mhi-mth.co.jp/en/>

Because of our policy of continuous improvement, we reserve the right to make changes in all specifications without notice.

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