

Operation Installation & Maintenance Manual

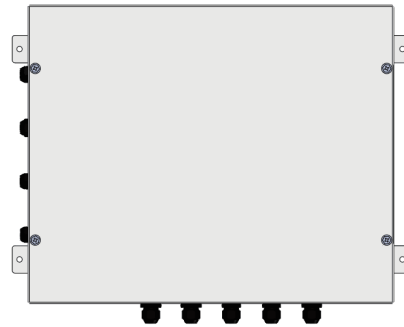
*DX-Kit (for General AHU
Connection to VRF System)*

Type	Power Supply	Model
DX-Kit (for General AHU Connection)	208/230V/1 ϕ /60Hz	DXF-015A1 DXF-030A1 DXF-048A1 DXF-096A1 DXF-192A1 DXF-288A1

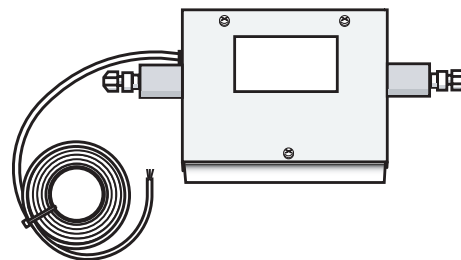
IMPORTANT:

*READ AND UNDERSTAND
THIS MANUAL BEFORE
INSTALLING THIS KIT.
KEEP THIS MANUAL FOR
FUTURE REFERENCE.*

CONTROL BOX



EXPANSION VALVE BOX



P5417153

TABLE OF CONTENTS

Important Notice	1
1. Safety Summary	3
2. System Description	5
2.1 System Overview	5
2.2 Limitation of Installation and AHU	7
2.3 Product Lineup	9
2.4 Factory-Supplied Accessories	9
3. Transportation and Handling	15
3.1 Transportation	15
3.2 Installation Location	15
3.3 Dimension Data	15
3.4 Installation Method	15
3.5 Thermistor Installation	17
4. Refrigerant Piping Work	18
4.1 Piping Materials	18
4.2 Piping Connection	18
5. Electrical Wiring	19
5.1 General Check	19
5.2 Electrical Wiring Connection	20
5.3 Control Box Terminal Block	21
5.4 Expansion Valve Box	21
5.5 Terminal Block Connection and Remarks	22
6. Optional Setting and Input/Output Setting	23
6.1 Optional Setting and Input/Output Setting on Wired Controller	23
6.2 Initialization of Optional Setting and Input/Output Setting by Wired Controller	23
6.3 Optional Setting and Input/Output Setting	23
6.4 Input Setting	26
6.4.1 Remote Control ON/OFF Function	26
6.4.2 Control by Field-Supplied Room Thermostat (Code 01/02)	29
6.4.3 Cooling or Heating Operation Mode Setting (Code 07)	30
6.5 Output Setting	31
7. Setting of DIP Switches	32
8. Test Run	33
9. Warranty Policy and Disclaimer	33

IMPORTANT NOTICE

< Signal Words >

- Signal words are used to identify levels of hazard seriousness.
Definitions for identifying hazard levels are provided below with their respective signal words.



: DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



: WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



: CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



: NOTICE is used to address practices not related to personal injury.

NOTE

: NOTE is useful information for operation and/or maintenance.

Important Notice

- Johnson Control-Hitachi Air Conditioning pursues a policy of continuing improvement in design and performance in its products.
As such, Johnson Control-Hitachi Air Conditioning reserves the right to vary specifications without notice.
- Johnson Control-Hitachi Air Conditioning cannot anticipate every possible circumstance that might involve a potential hazard.
- This product is designed for standard air conditioning applications only. Do not use this product for anything other than the purposes for which it was intended for.
- Take measures to ensure that the refrigerant limitation in ASHRAE Standard 15 (CANADA: B52), or other local codes, are followed. If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- This product shall come with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this product which you operate as well for the products other than DX-Kit.
- This product has been designed for a specific temperature range. For optimum performance and long life, operate this product within the range in the table below.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *	14°F DB (-10°C DB) *
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *	-4°F WB (-20°C WB) *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating) and any accessories to determine if they are correct.
3. The standard utilization of this product shall be explained in these instructions.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1 Safety Summary

DANGER

- This product is for specified use with incombustible refrigerant R410A. Use refrigerant R410A in the refrigerant cycle. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.
- Do not pour water into any part of the system. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply.
- If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- The installer and system specialist shall secure safety against refrigerant leakage according to local codes and requirements.
- Use an GFCI (Ground Fault Circuit Interrupter). In the event of a fault, there is danger of an electric shock or a fire if it is not used.
- This product is designed for indoor or outdoor installation. All wires should be protected from outdoor environment.
- Do not perform installation work without referring to this Installation Manual. If the instructions are not followed, it may result in water leakage, electric shock or fire.
- Do not install where generation or flowing of flammable gas may be detected. It may cause a fire.
- Do not step or put any material on the product.
- When using refrigerant, wear appropriate Personal Protective Equipment (PPE), such as leather gloves and protective goggles, as applicable. Also use electrical protection equipment and tools suited for electrical operation purpose.
- Check the refrigerant leakage. The refrigerant R410A is incombustible, non-toxic and odorless of HFC gas. However, if leakage occurs and gas fills a room, it may cause difficulty with breathing due to insufficient air.
- This system should be installed by personnel certified by Johnson Controls-Hitachi Air Conditioning. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion.
- Perform electrical work according to Installation Manual and refer to all local codes and requirement. If not, it may cause an electrical shock or fire.
- Attach the cables securely with the cord clamp. External forces on the connectors may lead to a fire.
- Insure that power supply is turned OFF before electrical wiring work or a periodical check is performed.
- Protect the wires and electrical parts from rats or other small animals. If not, rats may gnaw at the unprotected parts and at the worst, a fire may occur.
- Place the expansion valve box cable away from the power supply cable to avoid malfunction.

WARNING

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately 3.3 feet (1 meter) from the system.
- If circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Do not perform installation work, refrigerant piping work, drain piping, and electrical wiring connections without referring to our installation manual. If the instructions are not followed, it may result in water leakage, electric shock, or fire.
- Check that the ground wire is securely connected. If the unit is grounded incorrectly, it causes electric shock. Do not connect the ground wiring to gas piping, water piping, a lightning conductor, or ground wiring for telephone.
- Connect a fuse of specified capacity.
- Do not put any foreign material on the unit or inside the unit.
- Before performing any brazing work, check to ensure that there is no flammable material around.
- Protect the wires, electrical parts, etc. from rats or other small animals.
- Attach the cables securely. External forces on the terminals may cause a fire.

CAUTION

- Do not install the indoor unit, outdoor unit, wired controller, and cable within approximately 10 feet (3 meters) from strong electromagnetic wave radiators such as medical equipment.
- Supply electrical power to the system to energize the oil heater for 12 hours before start-up after a long shutdown.
- Provide a strong and correct foundation so that;
 - a. The outdoor unit is not on an incline.
 - b. Abnormal sound does not occur.
 - c. The outdoor unit will not fall down due to a strong wind or earthquake.
- Do not fasten the flare nut too tight. It may cause breakage with aged deterioration and refrigerant leakage. Use a specified flare nut torque.
- The appliance is not to be used by children or someone with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Supervise children and prevent them from playing with the appliance.
- The appliance should not be installed in the laundry room.

NOTICE

- It is recommended that the room be ventilated every 3 to 4 hours.
- Install the product at the altitude lower than 3281 feet (1,000 meters), the frequency of the product must be set within $\pm 1\%$ Hz of rated frequency, and the product must be stored under the temperature within -13°F (-25°C) to 131°F (55°C) when transport or at storage.
- All the A-weighted emission sound pressure level at workstations must be 70dB(A) or less.

2 System Description

DX-Kit is specially designed to allow connection of direct expansion coils (DX coil) in a field-supplied Air Handling Unit (AHU) to INVERTER-DRIVEN MULTI-SPLIT SYSTEM HEAT PUMP/HEAT RECOVERY outdoor units for cooling and heating applications.

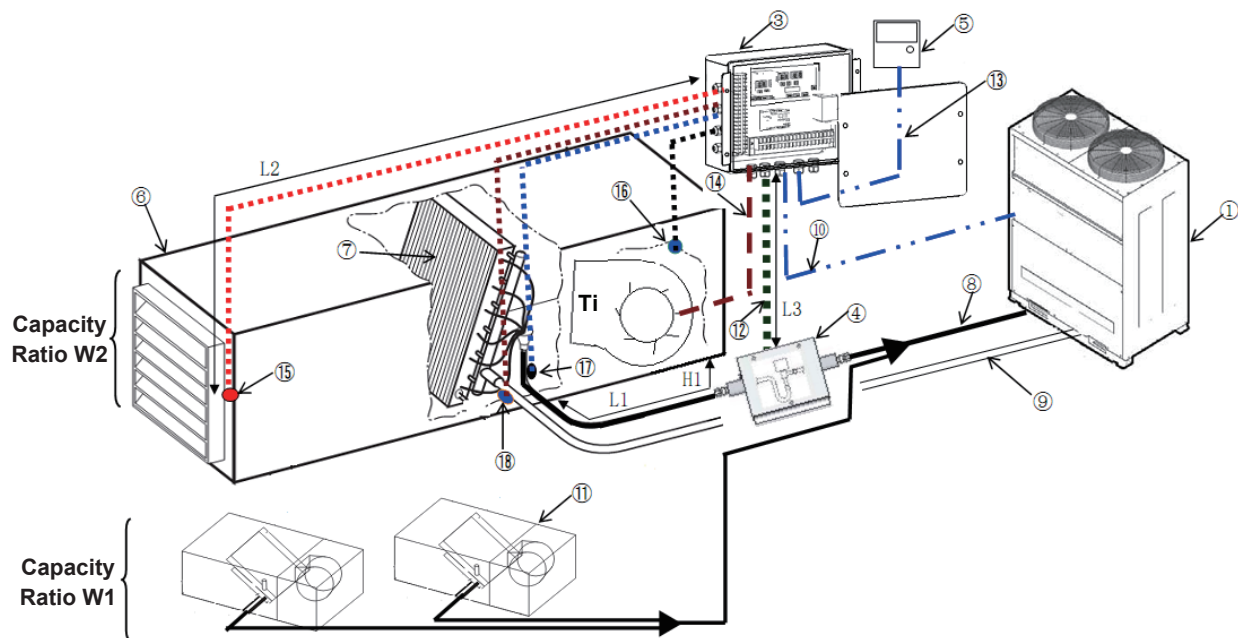
- Select an appropriate AHU with appropriate specifications and compatibility with regulations. Match with the correct DX-Kit and outdoor units. If not matched correctly, the performance, operation reliability and Lifetime of entire AHU system may be influenced.
- During cooling operation temperature of the heat exchanger inside the AHU may go down to -4°F(-20°C) and the discharge air temperature may reach 32°F(0°C). The components and materials inside the AHU must be compatible with the temperature. Dew condensation on the heat exchanger, AHU main body, and the refrigerant pipe can occur. Drain and insulate the AHU and pipe properly.
- During heating operation temperature of the heat exchanger inside the AHU may reach up to 248°F(120°C) and the discharge air temperature may reach 140°F(60°C). The components and materials inside the AHU must be compatible with the temperature.
- The performance may drop-off due to outside temperature limitation and protection for outdoor units.
- Consult engineering manual for performance at local ambient temperature.
- Interlock the AHU with the system to protect the equipment when system error occurs.

2.1 System Overview

DX-Kit is composed of Control Box for system control with PCB and all the electronic, and Expansion Valve Box for refrigerant cycle control in which an electrical expansion valve is located. The following figure shows an installation example for the system.

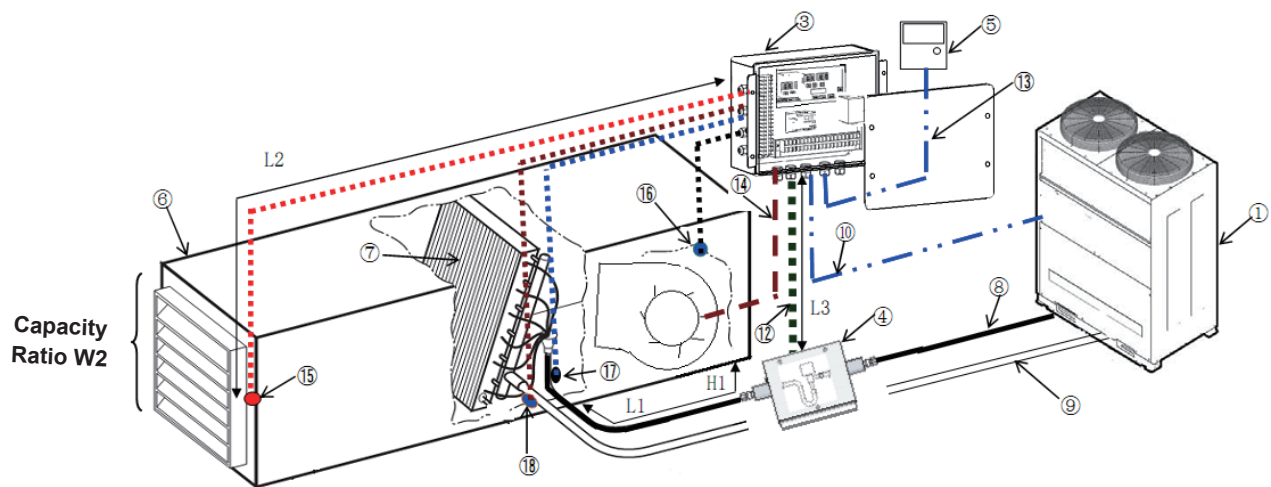
CAUTION

- The installation distance between the DX-Kit and the AHU should be as short as possible.
- The distance between the unit or device with heat exchanger and the expansion valve box for the piping length must be 16.4 ft (5m) or less. Be certain the elevation difference between the unit or device with heat exchanger and the expansion valve box does not exceed 6.6 ft (2m).
- Installation distance between the control box and the unit or device with heat exchanger must be short enough so that the thermistor sensing is not distorted.
- The thermistor cable must not be installed in the same ducting as power or control cables.

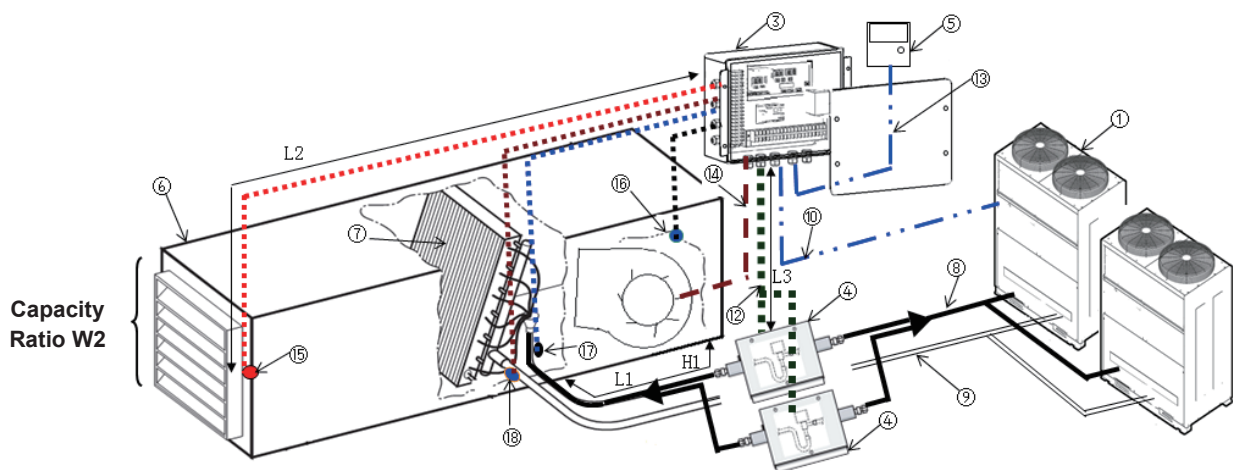


Multi combination with AHU and standard indoor unit

Fig.2.1 System Overview (1)



Single combination with AHU



Single combination with AHU, for DXF-288A1

Fig.2.2 System Overview (2)

NOTE:

Refer to Section 5.5 when connecting wires from two Expansion Valve Boxes to the same terminal of a control box.

Item	Description
1	Outdoor Unit
2	DX-Kit (consist of 3 and 4 below)
3	Control Box for DX-Kit
4	Expansion Valve Box
5	Wired Controller
6	AHU
7	Heat Exchanger
8	Liquid Line
9	Gas Line

Item	Description
10	Outdoor-Indoor Communication
11	Standard Indoor Unit
12	Control Wires For Electrical Expansion Valve
13	Wired Controller Communication
14	Control Wires For AHU
15	Outlet Air Thermistor
16	Inlet Air Thermistor
17	Liquid Pipe Thermistor
18	Gas Pipe Thermistor

2.2 Limitation of Installation and AHU

Limitation of Installation and Application

Refer to Fig. 2.1 "System Overview (1)" and Fig. 2.2 "System Overview (2)" for the following symbols.

L1: the distance*¹ between the heat exchanger of AHU and the Expansion Valve for the piping length

H1: the height difference*² (from the joint of liquid pipe of AHU) between the heat exchanger of AHU and the Expansion Valve

L2: the length*³ of thermistor for Outlet Air/Inlet Air/Liquid Pipe/Gas Pipe

L3: the length*⁴ of control wires for electrical expansion valve

Ti: the inlet air temperature*⁵ just before the DX-coil.

W2: the total AHU capacity with DX-Kit to outdoor unit capacity*⁶

W1: the total standard indoor unit capacity to outdoor unit capacity*⁶

*¹ The distance must be 16.4 ft (5m) or less.

*² The difference must be 6.6 ft (2m) or less.

*³ The length must be 33 ft (10m) or less.

*⁴ The length must be 33 ft (10m) or less.

*⁵ The temperature range must be:

Cooling: 69°FDB/59°F WB ~ 89°FDB/73°F WB

Heating: 59°FDB ~ 80°FDB

*⁶ The capacity for Multi combination with AHU and standard indoor unit must be:

< W1+W2: More than 100 to 110% >

W2: maximum 30%

Allowable AHU capacity in a system: 15 to 48MBH

< W1+W2: up to 100% >

W2: No Limitation

Allowable AHU capacity in a system: No Limitation

Minimum indoor unit capacity or AHU capacity:

Max. Capacity of Single AHU in system	Min. indoor unit capacity or Min. AHU capacity in a system
108 to 192 MBH	6MBH
204 to 288 MBH	15MBH

For Single combination with only AHU:

W2: maximum up to 100%.

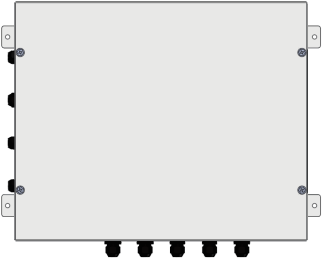
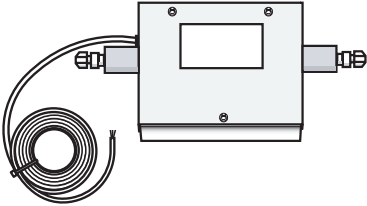
NOTE:


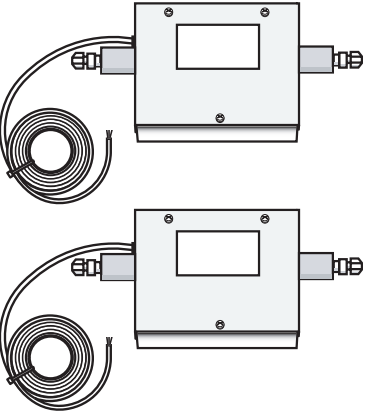
Minimum connection ratio is different based on the type of outdoor unit connected in the system.

Please refer to the technical catalog of each outdoor unit.
















2.3 Product Lineup

DX-Kit is composed of a Control Box and an Expansion Valve Box.

DX-Kit: DXF-015 to 192A1	
Control Box	Expansion Valve Box
	

DX-Kit: DXF-288A1	
Control Box	Expansion Valve Box
	

Product Lineup and Capacity


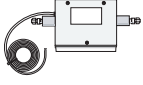


DX-Kit Model	Nominal Heat Exchanger Capacity of AHU (MBH)	Capacity Code Setting (DSW3)
DXF-015A1	015	 ON 1 2 3 4 OFF
DXF-030A1	030	 ON 1 2 3 4 OFF
DXF-048A1	048	 ON 1 2 3 4 OFF
DXF-096A1	072	 ON 1 2 3 4 OFF
	096	 ON 1 2 3 4 OFF
DXF-192A1	108	 ON 1 2 3 4 OFF
	120	 ON 1 2 3 4 OFF
	144	 ON 1 2 3 4 OFF
	168	 ON 1 2 3 4 OFF
	192	 ON 1 2 3 4 OFF
DXF-288A1	204	 ON 1 2 3 4 OFF
	216	 ON 1 2 3 4 OFF
	240	 ON 1 2 3 4 OFF
	264	 ON 1 2 3 4 OFF
	288	 ON 1 2 3 4 OFF

NOTICE

Capacity Code (DSW3) must be set corresponding to the nominal heat exchanger capacity of the AHU. DSW3 is located in the main printed circuit board in the control box.

2.4 Factory-Supplied Accessories

Check to ensure that the following accessories are in the package before beginning installation.

Accessory	Qty	Purpose
Control Box 	1	System Control Box
Expansion Valve Box 	015 to 192A1: 1 288A1: 2	Expansion Valve for Refrigerant Cycle Control (20 ft (6m) Wire)
Thermistor 	4	For Temperature Sensing of Outlet Air (red, 33 ft (10m)) Inlet Air (blue, 33 ft (10m)) Liquid Pipe (black, 33 ft (10m)) Gas Pipe (yellow, 33 ft (10m))
Installation and Operation Manual 	1	For Instructions and Important Notices

* Wired Controller is not included in the package. Please contact your distributor or dealer.

Selection and Limitation of Heat Exchanger of AHU

Select the Heat Exchanger of AHU (field-supplied) according to the technical data and limitations mentioned below. The life of the outdoor unit, operation range, or operation reliability may be affected, if these limitations are neglected.

DX-Kit Model	Nominal Heat Exchanger Capacity of AHU	Capacity Code Setting (DSW3)	Allowed Heat Exchanger Capacity [Btu/h(kW)] *				Heat Exchanger Volume (in ³)		Equivalent Indoor Unit Capacity
			Mode	Min	Nom	Max	Min	Max	
DXF-015A1	015		Cooling	13,700 (4.0)	17,100 (5.0)	19,100 (5.6)	34.8	70.7	015
			Heating	15,400 (4.5)	19,100 (5.6)	24,200 (7.1)			
DXF-030A1	030		Cooling	24,300 (7.1)	30,700 (9.0)	38,200 (11.2)	62.9	144.6	030
			Heating	27,400 (8.0)	34,100 (10.0)	42,600 (12.5)			
DXF-048A1	048		Cooling	38,300 (11.2)	47,800 (14.0)	54,600 (16.0)	117.2	178.1	048
			Heating	42,700 (12.5)	54,600 (16.0)	61,400 (18.0)			
DXF-096A1	072		Cooling	54,700 (16.0)	68,300 (20.0)	76,400 (22.4)	178.2	237.3	072
			Heating	61,100 (17.9)	76,500 (22.4)	85,300 (25.0)			
	096		Cooling	68,300 (20.0)	85,300 (25.0)	95,500 (28.0)	237.4	290.4	096
			Heating	76,500 (22.4)	95,600 (28.0)	107,500 (31.5)			
DXF-192A1	108		Cooling	95,600 (28.0)	102,400 (30.0)	114,300 (33.5)	290.5	360.6	108
			Heating	107,600 (31.5)	114,300 (33.5)	127,900 (37.5)			
	120		Cooling	114,400 (33.5)	119,500 (35.0)	136,500 (40.0)	357.0	420.4	120
			Heating	128,000 (37.5)	136,500 (40.0)	153,500 (45.0)			
	144		Cooling	136,600 (40.0)	146,800 (43.0)	153,500 (45.0)	414.4	488.1	144
DXF-288A1	168		Cooling	153,600 (45.0)	163,800 (48.0)	170,600 (50.0)	462.0	544.3	168
			Heating	170,700 (50.0)	180,900 (53.0)	191,100 (56.0)			
	192		Cooling	170,700 (50.0)	177,500 (52.0)	191,100 (56.0)	516.9	608.4	192
			Heating	191,200 (56.0)	204,800 (60.0)	215,000 (63.0)			
	204		Cooling	191,200 (56.0)	198,000 (58.0)	209,900 (61.5)	551.7	679.1	204
DXF-288A1	216		Cooling	210,000 (61.5)	221,900 (65.0)	235,500 (69.0)	579.8	753.0	216
			Heating	235,600 (69.0)	256,000 (75.0)	264,500 (77.5)			
	240		Cooling	235,600 (69.0)	242,300 (71.0)	249,100 (73.0)	634.1	786.5	240
			Heating	264,600 (77.5)	269,600 (79.0)	281,500 (82.5)			
	264		Cooling	249,200 (73.0)	259,400 (76.0)	273,000 (80.0)	695.1	845.7	264
DXF-288A1	288		Cooling	273,100 (80.0)	279,900 (82.0)	290,100 (85.0)	754.3	898.8	288
			Heating	307,200 (90.0)	314,000 (92.0)	324,200 (95.0)			

* The cooling and heating capacity data in the table is based on the following indoor and outdoor temperature conditions:

Operation conditions		Cooling ^{*1}	Heating ^{*2}
Indoor air inlet temperature	DB	81°F (27.0°C)	68°F (20.0°C)
	WB	66°F (19.0°C)	-
Outdoor air inlet temperature	DB	95°F (35.0°C)	45°F (7.0°C)
	WB	-	43°F (6.0°C)

DB: Dry Bulb, WB: Wet Bulb

Pipe Length: 24ft. 7-3/16 in.(7.5 m), Pipe Height: 0 ft. (0 m)

*1 Cooling:

1. Evaporation temperature: 45°F (7°C)
2. Superheat (SH): 9°F (5°C)
3. Pressure drop of the refrigerant flow in heat exchanger: Max. 21.8 psi (0.15 MPa)

*2 Heating:

1. Condensation temperature: 117°F (47°C)
2. Subcool (SC) = 27°F (15°C)
3. Pressure drop of the refrigerant flow in heat exchanger: Max. 8.7 psi (0.06 MPa)

⚠ CAUTION

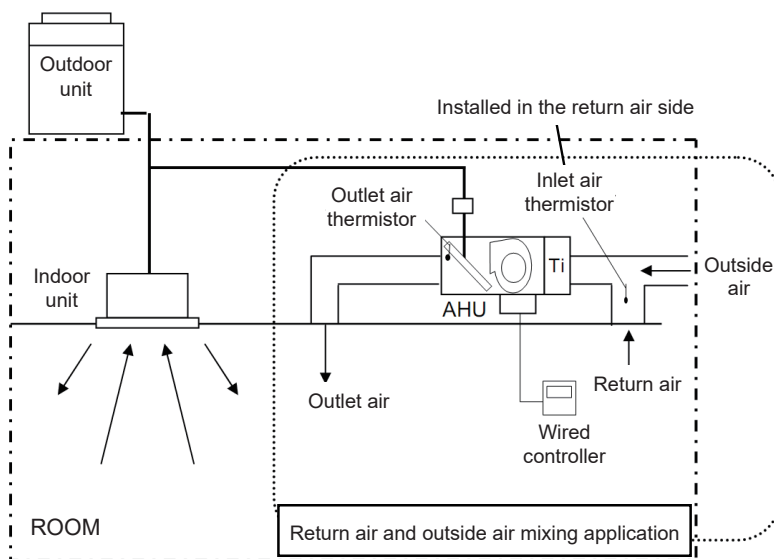
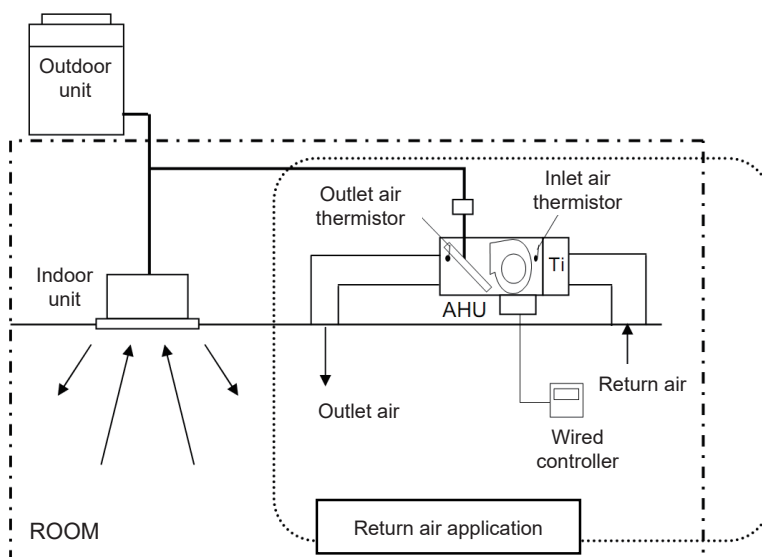
- The selected heat exchanger of AHU must be designed for R410A. The design pressure of the heat exchanger is 601 psi (4.15 MPa). The burst pressure of heat exchanger and other pipes must be more than 1806 psi (12.45MPa). Insufficient strength may cause the breakage of pipes or gas leakage.
- Keep the refrigerant leakage rate of the heat exchanger 0.18 oz (5g) or less per year.
- Keep the water content in the heat exchanger 60PPM or less and impurity content in the heat exchanger 1.54 gr (100mg) or less. Otherwise, water content and impurity content in the heat exchanger will cause blocking of refrigerant cycle and failure of compressor and valve.
- Pressure drop of the refrigerant flow in heat exchanger: Max. 4.4 psi (0.03 MPa).

2.5 Capacity Control Mode

This mode controls the capacity of the DX-Kit to adapt the system performance according to the cooling and heating load required by user.

(1) Inlet Air (Room Air) Temperature Control

- **Capacity Control:** For controlling to the inlet air (room air) temperature, capacity is adjusted so that the temperature of inlet air (room air) read at the inlet air thermistor reaches the set temperature of the wired controller.
- **Thermo-OFF Control:** When the inlet thermistor reads that the inlet air (room air) temperature has reached the set temperature of the wired controller, the operation becomes Thermo-OFF.



NOTE:

Thermistor of wired controller can be used instead of the inlet air thermistor. Set the optional function C8 to "01" or "02".

⚠ CAUTION

- For controlling inlet air (room air) temperature, the optional setting E1 must be set to "00" (factory setting) in the optional settings of the wired controller. Refer to Section 6.3 "Optional Setting and Input/Output Setting".
- The set temperatures of the wired controller
 Cooling: 66°F (19°C) to 86°F (30°C)
 Heating: 62°F (17°C) to 86°F (30°C)

(2) Outlet Air Temperature Control

- Capacity Control: For controlling to the outlet air temperature, the capacity is adjusted so that the temperature of outlet air of the AHU read at the outlet air thermistor reaches the correction temperature of the set temperature for outlet air from the wired controller.

The correction temperature of the set temperature for outlet air from the wired controller is:

Cooling: the set temperature by wired controller + bb

Heating: the set temperature by wired controller + b1

bb, b1: Compensation of outlet air temperature setting. Set by wired controller in optional setting of the unit. Refer to Section 6.3 "Optional Setting and Input/Output Setting".

bb: -11°F (-6°C) (factory setting: 00) b1: +7°F (+4°C) (factory setting: 00)

bb: -7°F (-4°C) (set by wired controller: 01) b1: 0°F (0°C) (set by wired controller: 01)

bb: -3°F (-2°C) (set by wired controller: 02) b1: +3°F (+2°C) (set by wired controller: 02)

- Thermo-OFF Control: When thermistor-detected inlet air temperature reaches the corrected set temperature on the wired controller, the operation becomes Thermo-OFF.

The corrected temperature of the set temperature for thermo-OFF by wired controller is:

Cooling: the set temperature on wired controller + bb + CF

Heating: the set temperature on wired controller + b1 - CF

CF: Compensation of Thermo-OFF temperature setting. Set by wired controller in the optional settings of the unit. Refer to Section 6.3 "Optional Setting and Input/Output Setting".

CF: 0°F (0°C) (factory setting: 00)

CF: 3°F (2°C) (set by wired controller: 01)

CF: 9°F (5°C) (set by wired controller: 02)

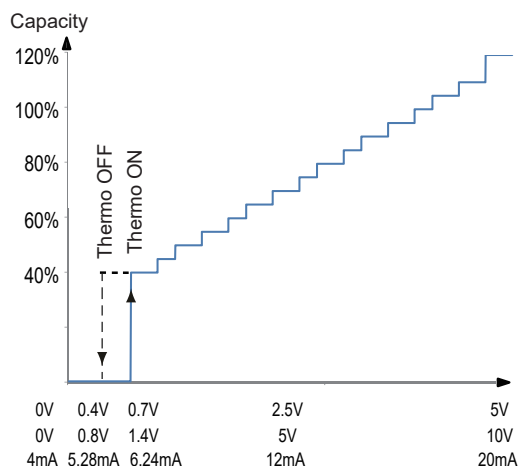
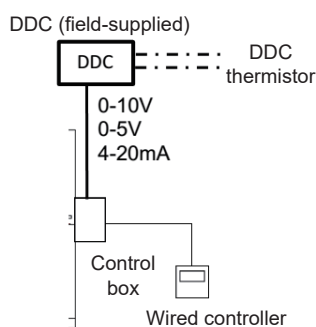
CAUTION

- Controlling outlet air temperature is available only for a single combination with AHU.
- The optional setting E1 must be set to "01" on the wired controller. Refer to Section 6.3 "Optional Setting and Input/Output Setting".
- The optional setting of outdoor unit Ff must be set to "2" on the outdoor unit PCB. Refer to OPTIONAL FUNCTION in the outdoor unit service manual.
- The set temperature on the wired controller.
Cooling: 66°F (19°C) to 86°F (30°C)
Heating: 62°F (17°C) to 86°F (30°C)
- The outlet air temperature may not reach the set value due to ambient temperature and protection for outdoor units.

(3) Duty Signal Control

- **Capacity Control:** The capacity of the outdoor unit is adjusted by an external duty signal, which can be a free-voltage signal (0 to 10V or 0 to 5V) or a current signal (4 to 20 mA). The duty signal is generated by a field-supplied DDC and supplied to the DX-Kit. The capacity of the outdoor unit depends on the signal strength.
- **Thermo-OFF Control:** If the system is controlled by a duty signal, it can be forced to Thermo-OFF by the duty signal. When the duty signal becomes lower than 8% of the full range of the signal, the system switches to Thermo-OFF. When the duty signal becomes higher than 14% of the full range, the system switches to Thermo-ON.

Duty Input	(0-5V)	< 0.4V	≥ 0.7V	0.7V	1.0V	1.2V	1.5V	1.8V	2.0V	2.3V
	(0-10V)	< 0.8V	≥ 1.4V	1.4V	2.0V	2.4V	3.0V	3.6V	4.0V	4.6V
	(4-20mA)	< 5.28mA	≥ 6.24mA	6.24mA	7.20mA	7.84mA	8.80mA	9.76mA	10.40mA	11.36mA
Capacity (% of Normal)		Thermo-OFF	Thermo-ON	40%	45%	50%	55%	60%	65%	70%
Duty Input	(0-5V)	2.6V	2.8V	3.1V	3.3V	3.6V	3.9V			
	(0-10V)	5.2V	5.6V	6.2V	6.6V	7.2V	7.8V			
	(4-20mA)	12.32mA	12.96mA	13.92mA	14.56mA	15.52mA	16.48mA			
Capacity (% of Normal)		75%	80%	85%	90%	95%	100%			



CAUTION

- Single Control duty is available only for a single combination with AHU.
 - The optional setting item E1 must be set to “02” on the wired controller.
Refer to Section 6.3 “Optional Setting and Input/Output Setting”.
 - As for the type of duty signal, set the optional setting E4 as follows.
E4: 00 (factory setting): 0 to 10V
E4: 01 (set by wired controller): 0 to 5V
E4: 02 (set by wired controller): 4 to 20mA
Refer to Section 6.3 “Optional Setting and Input/Output Setting”.
 - The optional setting of outdoor unit F_i must be set to “2” on the outdoor unit PCB.
Refer to OPTIONAL FUNCTION in the outdoor unit service manual.
 - The DX-Kit will respond to the duty signal only after the unit is turned ON by the wired controller, central controller or Remote Control ON/OFF Function (Refer to Section 6.3 “Optional Setting and Input/Output Setting”).
 - For duty signal control, the system configuration refers to System Overview (Section 2.1) except in the case of inlet air thermistor where it is not required.
 - The capacity of the outdoor unit is controlled by its own control system instead of an external duty signal during start running, defrosting, and restart running after defrosting.
-

3 Transportation and Handling

⚠ WARNING

- Do not perform installation work without referring to Installation Manual. If the instructions are not followed, water leakage, electrical shock, fire, or injury from the DX-Kit falling may result.
- Do not step or put any material on the DX-Kit.
- Do not install the DX-Kit where electromagnetics can directly radiates to the control box or expansion valve box. Install the expansion valve kit at least 10 feet (3 meters) away from the electromagnetic interference generator.
- Install a noise filter when noise is emitted from the power supply.
- Do not install the DX-Kit where there is the generation, flowing, buildup or leakage of flammable gas.
- When the false ceiling contains high humidity, dew condensation water may be formed on the outer surface of the expansion valve box during cooling operation. Apply additional insulation on the outer surface of the expansion valve box to prevent condensation.

3.1 Transportation

- (1) Transport the product to the installation location without removing any packing material.
- (2) Do not put any material on the DX-Kit when transporting.

3.2 Installation Location

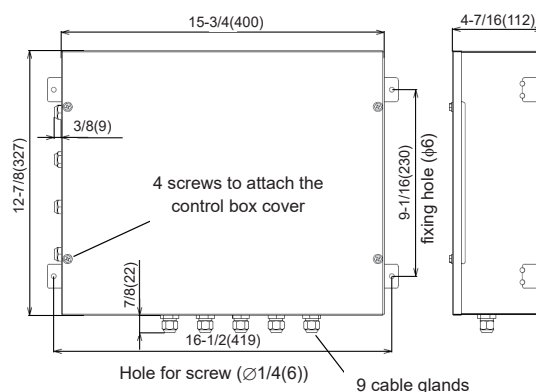
- (1) Installation methods are selectable according to the space.
- (2) Follow the arrow direction on the expansion valve box for installation.
- (3) Keep the distance between the heat exchanger of AHU and the expansion valve box for the piping length 16.4 ft. (5m) or less. Make sure the elevation difference between the heat exchanger of AHU and the expansion valve box is 6.6 ft. (2m) or less.
- (4) Check if the ceiling slab is strong enough to support the weight of the DX-Kit. If the ceiling slab is too weak, it may cause the DX-Kit to become damaged as well as cause excessive noise and vibration.
- (5) Maintain required clearance space around the DX-Kit for operation and maintenance work. Also a service access door should be prepared in order to remove the DX-Kit without getting rid of the ceiling plate.

- (6) Select a suitable and convenient location for the refrigerant piping connection.
- (7) Do not install the DX-Kit in a kitchen where vapor or mist flows. Dew condensation water may be formed on the expansion valve box during cooling operation. In this case, attach insulation.
- (8) Install the expansion valve box where the sound will not be heard such as in a false ceiling of a hall way.
- (9) For the ceiling, use soundproofing material such as plaster board.

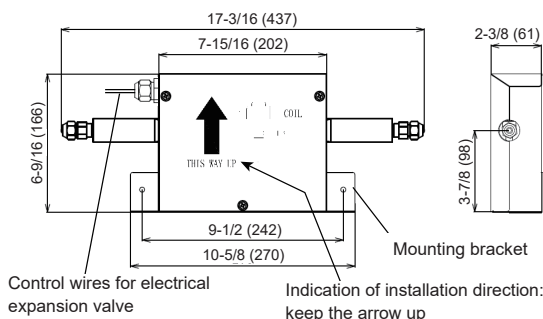
3.3 Dimension Data

Control Box

Unit: inch(mm)

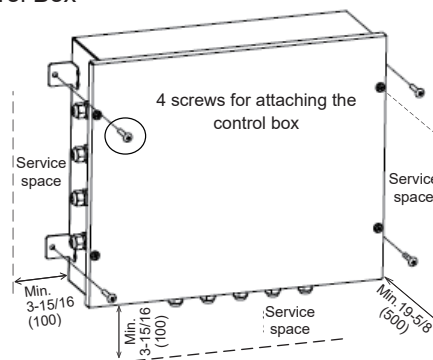


Expansion Valve Box



3.4 Installation Method

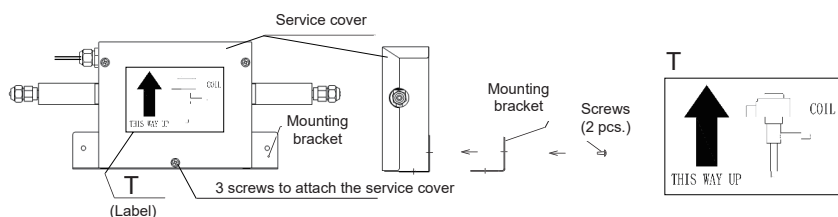
Control Box



NOTE:

Make sure that the screws and wall have sufficient strength to mount the control box.

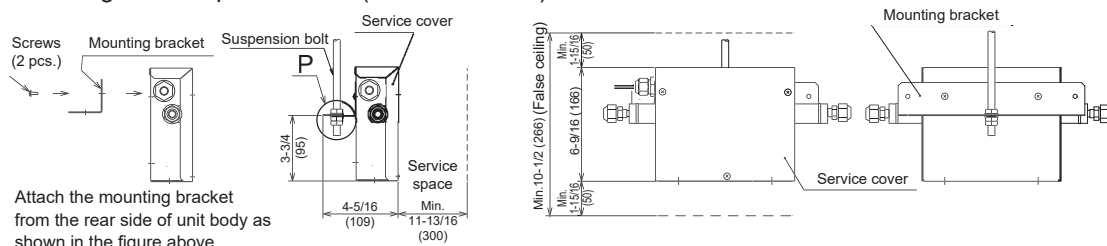
Expansion valve box



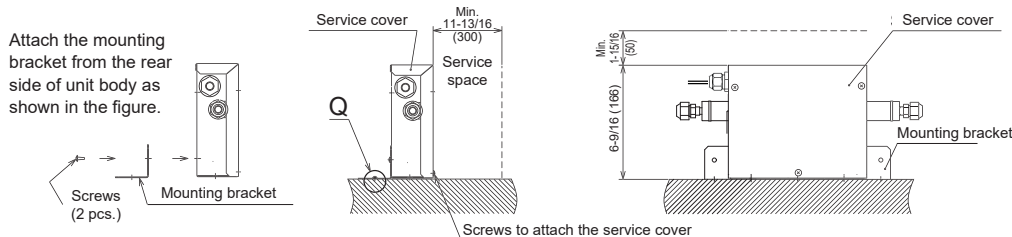
NOTE:

Install Expansion valve Box in the direction indicated by the arrow on Expansion valve Box.

(1) Attaching with Suspension Bolt (Recommended)

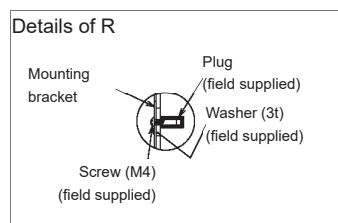
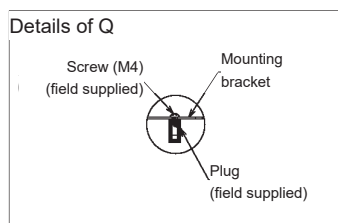
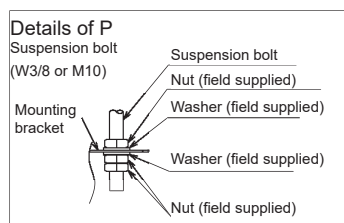
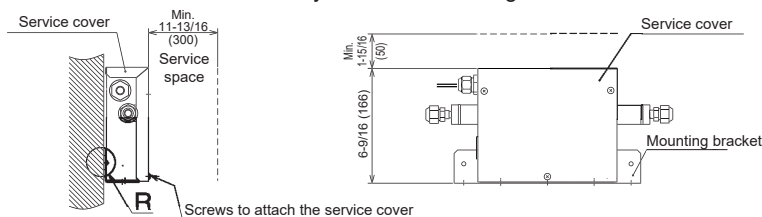


(2) Attaching to a Horizontal Surface



(3) Attaching to a Vertical Surface

Attach the unit in the same way as shown in the figure.



NOTE:

Make sure that the suspension bolt, screws, and plugs are strong enough to mount the expansion valve box.

NOTES:

1. In case a false ceiling is 10-1/2 inches (266mm) or higher, install the unit according to (1) "Attaching with Suspension Bolt".
2. Ceiling should be strong enough to prevent vibration and noise.
3. Perform piping and wiring connection work inside of the false ceiling after the unit is installed.
If a false ceiling is already in place, determine the proper pathway for piping and wiring before the unit is installed.
4. Maintain minimum service clearance and provide a service access door in order to remove the service cover.
5. When performing refrigerant piping connection work at field site, pay attention to the direction that the expansion box is connected. Install in the direction indicated by the arrow on the label as shown in the figure labeled with a T above.

3.5 Thermistor Installation

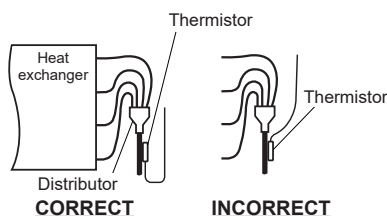
◆ Liquid and gas pipes thermistors

Two (2) types of thermistors are supplied with the control box. See below for the purpose and identification.

Item	PCB Socket / Thermistor Connector Color	PCB Socket Number	Thermistor Length [ft. (m)]
Liquid Pipe Thermistor	Black	THM3	33(10)
Gas Pipe Thermistor	Yellow	THM5	33(10)

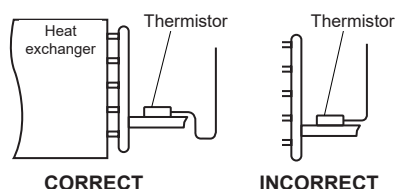
Location of Liquid Pipe Thermistor:

Install the thermistor on the coldest point of liquid line before the distributor.



Location of Gas Pipe Thermistor:

Install the thermistor on the outlet of the heat exchanger as close as possible to the heat exchanger.

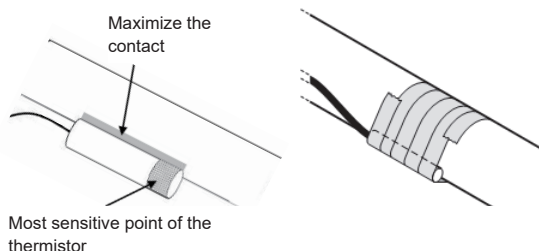


NOTES:

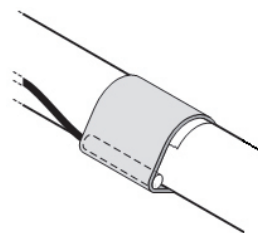
1. Put the thermistor cable slightly down to prevent water accumulation on top of the thermistor and add a pull-relief to the thermistor cable to prevent strain on the thermistor cable.
2. In case the thermistors supplied with DX-Kit are not long enough, please make sure that the length extension is properly done to prevent the sensing distortion and to ensure the joint is properly insulated and waterproofed to prevent electrical failure.

Attaching the thermistor:

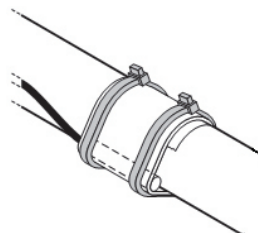
1. Attach the thermistor with insulating aluminum tape (field-supplied) to make sure the heat transfers. Make sure there is a good contact between the thermistor and pipe.



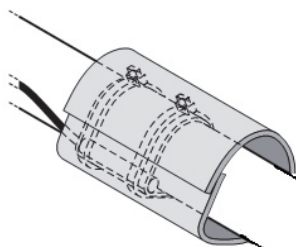
2. Put the insulating tape (field-supplied) around the thermistor in order to prevent the thermistor from becoming loose over time.



3. Fasten the thermistor with 2 plastic bands (field-supplied).



4. Insulate the thermistor with the insulation sheet (field-supplied).



◆ Air Thermistor

Two (2) air thermistors are supplied with the control box. The purpose and identification of each one is as follows:

Item	PCB Socket / Thermistor Connector Color	PCB Socket Number	Thermistor Length [ft. (m)]
Inlet Air Thermistor	Blue	THM1	33(10)
Outlet Air Thermistor	Red	THM2	33(10)

Install the thermistors as far as possible from where the effects of heat sources such as heat exchangers and heaters, etc. are minimized. Inlet/Outlet air temperature can be measured as shown in System Overview on pages 5 and 6.

NOTES:

1. In case that the thermistors supplied with the DX-Kit are not long enough, please make sure that the length extension is properly done to prevent the sensing distortion and to ensure the joint is properly insulated and waterproofed to prevent electrical failure.
2. Attach the thermistors securely with a plastic bands in the proper places.

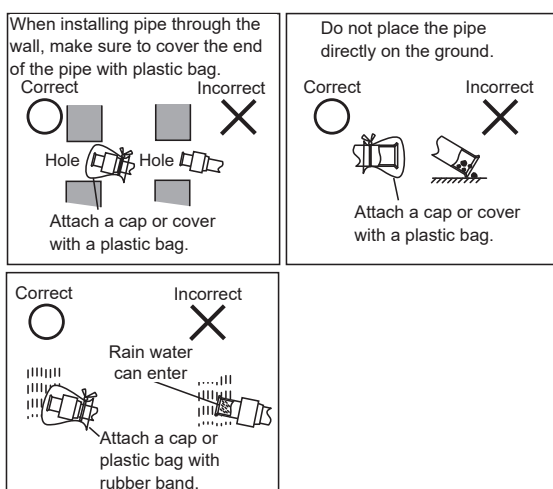
4 Refrigerant Piping Work

- ◆ Connect the Expansion Valve Box to the liquid pipe as shown in Fig. 2.1.
- ◆ Refer to Section 2.4 System Overview on page 6 for the limitations of installation.

4.1 Piping Materials

- (1) Prepare locally-supplied refrigerant pipes.
- (2) Select clean copper pipes. Make sure there is no dust or moisture inside of the pipes. Blow inside the pipes with nitrogen or dry air to remove any dust or foreign materials before connecting the pipes. Do not use any tools such as a saw or a grinder, which produce a lot of swarf.

• Cautions for Refrigerant Pipe Ends



- (3) Select pipe size from the following table.

inch(mm)	
Pipe Size Capacity(MBH)	Liquid
15	1/4 (6.35)
30 - 96	3/8 (9.52)
108 - 288	1/2 (12.7)

4.2 Piping Connection

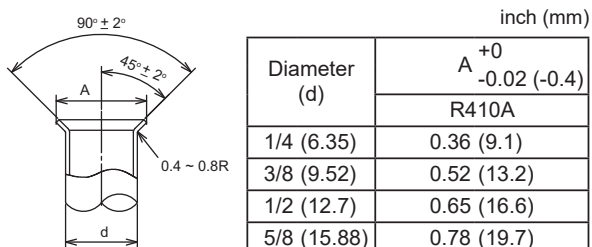
- (1) Refer to Section 3.3 for position of piping connection.
- (2) When tightening the flare nut, use 2 wrenches as shown in the figure. Ensure that no refrigerant leakage occurs.
- (3) Support the pipes with clearance towards the axis to prevent thermal stress.
- (4) Be sure the ceiling material is strong enough. Abnormal noise may be heard due to piping vibration.
- (5) After connecting the refrigerant piping, seal the refrigerant pipes by using the insulation material as shown in the figure (field-supplied).

⚠ CAUTION

Do not apply excessive force to the flare nut when tightening. Doing so may cause breakage from deterioration over time and refrigerant leakage. Use the correct torque specification.

Refer to the outdoor unit "Installation & Maintenance Manual" for refrigerant piping work, vacuum pumping work, and additional refrigerant charge.

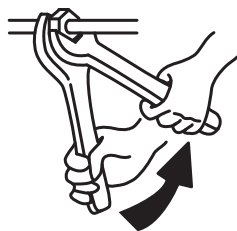
• Flare Nut Dimension



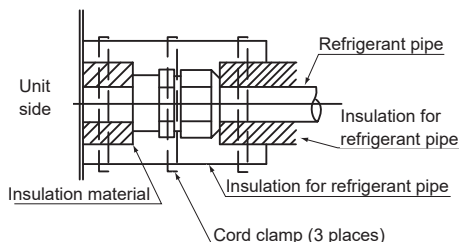
• Required Torque (JIS B 8607)

Pipe Size	Tightening Torque
1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

- 2 Wrenches Work



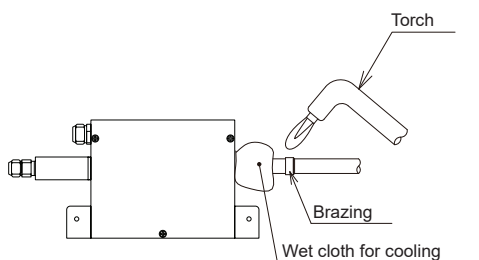
- Insulation on Pipes



⚠ WARNING

When the connections must be cut to prepare for brazing, use only a copper tube cutter, which reduces burrs and copper shavings. Remove just enough pipe to facilitate the connection and brazing. Blow nitrogen through the pipes to clear any remaining foreign material before the final fitting and brazing. Prior to brazing, temporarily remove or protect the piping insulation to prevent it from burning.

Wrap a wet cloth or use a liberal amount of heat-absorbing compound upstream of the brazing point to protect the components inside the DX-Kit Expansion Valve Box from heat damage. Ensure the integrity of the brazed joint.



⚠ DANGER

Use refrigerant R410A in the refrigerant cycle. Do not charge oxygen, acetylene, or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and may cause an explosion. Use compressed air, nitrogen, or refrigerant for these types of tests.

5 Electrical Wiring

⚠ WARNING

- Turn OFF the main power switch of the indoor unit and the outdoor unit before electrical wiring work or when a periodic check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodic check is performed.
- Protect the wires, drain pipe, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, fire can occur.
- Tighten screws according to the following torque.

M3.5: 0.9 ft·lbs (1.2 N·m)

M5: 1.5 to 1.8 ft·lbs (2.0 to 2.5 N·m)

⚠ CAUTION

- Secure all the accessories around the wires and seal the wiring connection hole with the sealant material to protect the product from any condensation or insects.
- Tightly secure the wires with the cord clamp.
- Secure the cable of the wired controller using the plastic band.

5.1 General Check

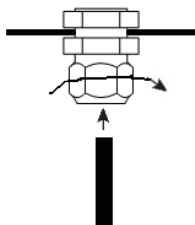
- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) are properly selected according to the electrical data given in "Technical Catalog I". Make sure that the components comply with local code and requirement.
- (2) Make sure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires. If the power supply capacity is too low, the system cannot be started due to the voltage drop.
- (4) Make sure that the ground wire is connected.
- (5) Power Supply Main Switch
Install a multi-pole main switch with a space of 1/8 inches (3.5mm) or more between each phase.

5.2 Electrical Wiring Connection

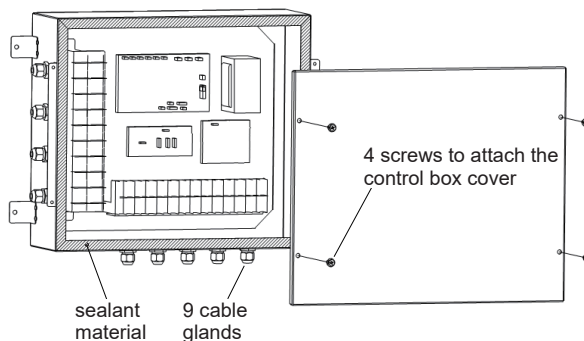
- Connect the wires to the terminal block according to the wiring diagram.
- Follow local codes and requirements when performing the electrical wiring.
- Use shielded wires for intermediate wiring to protect the units from noise interference at lengths of less than 984 ft. (300m) and whose size is in compliance with local codes and requirements.
- Run through the cables using conduit tube, and completely seal the end of conduit tube with sealant material.
- Use an GFCI (Ground Fault Circuit Interrupter). If not used, an electric shock or a fire can occur.

⚠ CAUTION

- Pay attention to the connection of the operating line. Incorrect connection may cause PCB failure.
- Use the attached waterproof cable gland to secure the wires firmly.
- Cable gland diameter specification:
1/4 inches (6.0mm) (min) to 3/8 inches (10.0mm)(max). If needed, install additional tube insulation or wind with insulation tape around the wire to make the wire thicker.
- After passing the wires through the cable gland, close the nut firmly. Pull and release the cable to make sure it remains attached .
- For unused cable gland, insert the proper short cable into the cable gland and close the opening firmly as shown in the following figure to prevent water from entering into the control box.

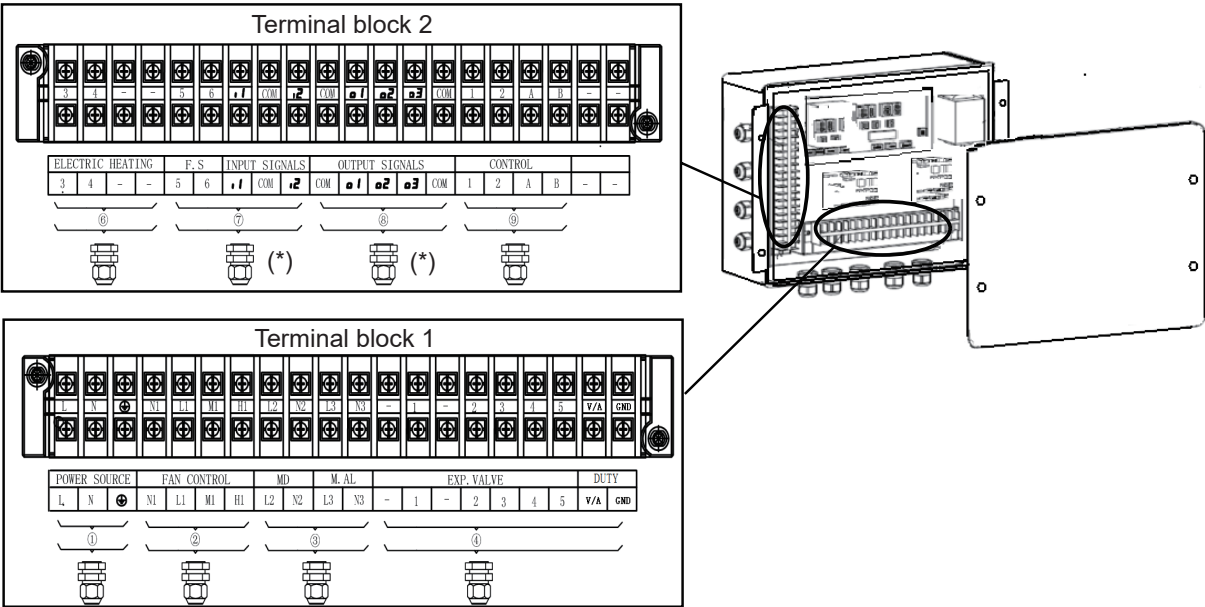


- Attach the 4 screws for the cover of the control box securely to prevent water from entering into the control box after installation.
- Do not break sealant material on the control box during operation.



5.3 Control Box Terminal Block

Fig.1



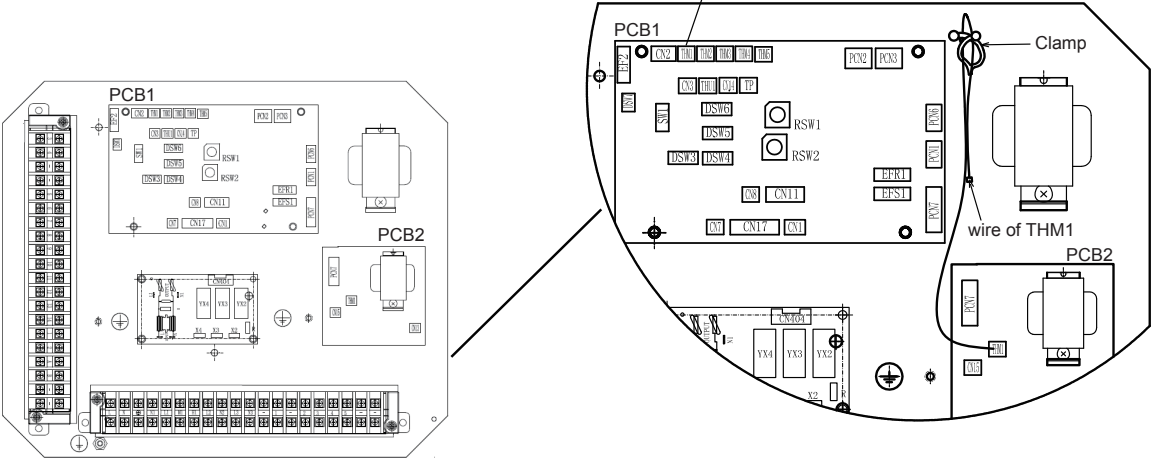
NOTE:

(*): These cable glands are also for thermistors.

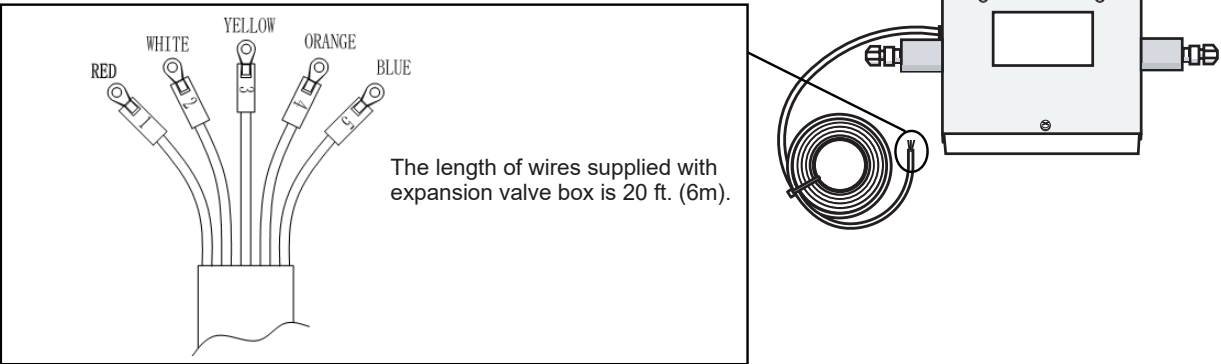
THM1 terminal on PCB1

- For inlet air (room air) temperature control and outlet air temperature control, insert the inlet air thermistor.
- For Duty Signal Control, insert the wire of THM1 from PCB2 and secure the wire with a clamp.

Fig.2



5.4 Expansion Valve Box



5.5 Terminal Block Connection and Remarks

Terminal Block 1

Terminal	Description	Connect to	Type of cable	Wiring Size [AWG(mm ²)]	Maximum length [ft. (m)]	Specifications
L, N, GND	Power Supply	Power supply	H05RN-F	3 x 13(2.6)		Power supply: 208/230V 60Hz maximum current 5.0 A
(1) N1, L1, M1, H1	Fan Control Signal by Wired controller N1: N-Neutral phase terminal L1: Low fan speed signal M1: Medium fan speed signal H1: High fan speed signal	Relay for AHU fan	Sheathed PVC cable	4 x 18(0.82)		Signal output, compatible with AC power supply, maximum 2.5 A
(2) L2, N2	MD: Motor Drain Pump	Drain pump	Sheathed PVC cable	2 x 18(0.82)		Signal output, compatible with AC power supply, maximum 1.5 A
(3) L3, N3	M.AL: Fan Motor Alarm Signal	Overload (thermal) protector for fan motor	Sheathed PVC cable	2 x 18(0.82)		Signal input, Free contact between terminals L3 and N3, compatible with AC power supply, maximum 2.5 A
(4) 1 to 5	EXP. VALVE: Connecting Expansion Valve Wires	Expansion valve box	Sheathed PVC cable	5 x 20(0.52)	33(10)	Digital output, 12 V DC
(5) V/A, GND	Duty Signal	Field-supplied controller	Sheathed PVC cable	2 x 20(0.52)		Digital input, 0-10 V DC, 0-5V DC, 4-20mA

Terminal Block 2

Terminal	Description	Connect to	Type of cable	Wiring Size [AWG(mm ²)]	Maximum length [ft. (m)]	Specifications
(6) 5, 6	FS: Float Switch	Float switch	Sheathed PVC cable	2 x 20(0.52)	33(10)	Digital input, Free contact between terminals 5 and 6, 12 V DC maximum 1.2 mA
(7) 1, COM	Input Signals 1	External controller	Sheathed PVC cable	2 x 20(0.52)	164(50)	Digital input, Free contact between terminals 1 and COM, 12 V DC maximum 10 mA
(7) 2, COM	Input Signals 2					Digital input, Free contact between terminals 2 and COM, 12 V DC maximum 10 mA
(8) 3, COM	Output Signals 1	External controller	Sheathed PVC cable	2 x 20(0.52)	164(50)	Digital output, 12 V DC, maximum 33 mA
(8) 2, COM	Output Signals 2					
(8) 3, COM	Output Signals 2					
(9) 1, 2	Transmission wiring to outdoor and indoor unit	Outdoor and indoor unit	Shielded Twist Pair Cable	2 x 18(0.82)		
(9) A, B	Transmission wiring to wired controller	Wired controller				
(10) THM1	Inlet Air Thermistor (*)		Sheathed PVC cable	2 x 20(0.52)	33(10)	THM1 on PCB1
(10) THM2	Outlet Air Thermistor					THM2 on PCB1
(10) THM3	Liquid Pipe Thermistor					THM3 on PCB1
(10) THM5	Gas Pipe Thermistor					THM5 on PCB1

* For Duty signal control insert the wire of THM1 from PCB2. Refer to Fig.2 in Section 5.3 for the detail.

- (1) Short-circuit the terminals of L1, M1, H1 and connect the terminal H1 if the fan motor is one tap. Short-circuit the terminals of L1, M1 and connect the terminals H1, M1 if the fan motor is 2 taps. The terminals of L1, M1, H1 need to be short-circuited with jumpers before shipment.
- (2) Turn MD signal (L2, N2) outputs ON during cooling and drying operation.
- (3) Alarm occurs if the M.AL terminal (L3, N3) of fan motor alarm signal is activated. The terminal needs to be short-circuited with a jumper before shipment. Be careful to high voltage (over 208 V) impressed to the line.
- (4) Number links from 1 to 5 must match between the terminals of EXP. VALVE and the wires of the expansion valve box. In case that the wires supplied with expansion valve box are not long enough, please make sure that the length extension is properly done to prevent any sensing distortion and that the joint is properly insulated and waterproof to prevent any electrical failure.
- (5) Duty signal terminal (V/A, GND) needs to be connected to the field supply controller.
- (6) Alarm occurs and MD signal (L2, N2) outputs turned ON automatically if the FS terminal (5, 6) of float switch signal is activated. The terminal is short-circuited with a jumper before shipment.
- (7) Refer to Section 6.3 for the definition of input signals. Make the wires for input signals as short as possible. DO NOT install the wires along the power supply wire of AC 208 V to AC 575 V. Install the wires separately at a distance of more than 11-13/14 inches (300mm). If you install the wires along the power supply wire, insert the wires in a metal conduit tube and ground one end of the wire.
- (8) Refer to Section 6.3 for the definition of output signals. Make sure the allowable current is within the correct limitation.
- (9) Use a shielded cable for transmission circuit and connect it to ground.
- (10) Thermistor cable should be located at least 1-15/16 inches (50 mm) away from power supply wires. Otherwise, the power cable can create electrical noise that can interrupt the signal sent by the thermistor cable.

6 Optional Setting and Input/Output Setting

Follow the instructions below on the wired controller for Optional Setting and Input/Output Setting.

6.1 Optional Setting and Input/Output Setting on Wired Controller

The optional setting and input/output setting can be set from the test run menu. The setting procedure is different depending on the wired controller type. Please refer to Technical Manual for each wired controller before use.

6.2 Initialization of Optional Setting and Input/Output Setting by Wired Controller

The procedure for initialization of optional settings and input/output settings are different depending on the wired controller type. Please refer to Technical Manual for each wired controller before use.

6.3 Optional Setting and Input/Output Setting

● Table A Optional Setting Items for DX-Kit






No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	
1	b1	Heating Temperature Compensation	○	00 01 02	Standard (Set Temp. +7°F (+ 4°C)) Removal (Set Temp.) Set Temp. 3°F (+2°C) (*1)	
2	b2	Circulator Function at Heating Thermo-OFF	○	00 01	Not Available Available	
3	b3	Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Not Available Available	
4	b4	Change of Filter Cleaning Time	○	00 01 02 03 04	Standard (1,200 hours) 100 hours 1,200 hours 2,500 hours No Indication	
5	b5	Locking of Operation Mode	×	00 01	Not Available Available	
6	b6	Locking of Setting Temperature	×	00 01	Not Available Available	
7	b7	Locking of Operation as Exclusive Cooling Unit	×	00 01	Not Available Available	
8	b9	Locking of Fan Speed	×	00 01	Not Available Available	
9	bb	Cooling Temperature Compensation	○	00 01 02	E1: 00	E1: 01
					Standard (Set Temp.) Set Temp. -2°F(-1°C) Set Temp. -3°F(-2°C)	Set Temp. -11°F(-6°C) Set Temp. -7°F(-4°C) Set Temp. -3°F(-2°C)
10	C5	d7 Setting Control	○	00 01 02	Cooling and Heating Available Only Cooling Available Only Heating Available	
11	C6	Hi Speed at Heating Thermo-OFF	○	00 01	Not Available Available	
12	C8	Thermistor of Wired Controller	○	00 01 02	Control by Inlet Air Thermistor Control by Thermistor of Wired Controller Control by Average Value of Inlet Air Thermistor and Thermistor of Wired Controller	
13	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact	
14	CF	Compensation of thermostat temperature setting for Outlet air temperature control	○	00 01 02	0°F (0°C) 3°F (2°C) 9°F (5°C)	
15	d1	Power Supply ON/OFF 1	○	00 01	Not Available Running while Power supply is ON	

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
16	d3	Power Supply ON/OFF 2 Only for the unit been running before Power OFF	○	00 01	Not Available Running while Power supply is ON
17	d4	Prevention for Cooling Discharge Air Temp. Decrease	○	00 01	Not Available Available
18	d5	Prevention for Heating Discharge Air Temp. Decrease	○	00 01	Not Available Available
19	d7	Compensation of the outlet air temperature for outlet air temperature control mode	○		Cooling Heating
				00	0°F (0°C) 0°F (0°C)
				01	- 3°F (-2°C) + 3°F (+2°C)
				02	- 7°F (-4°C) + 7°F (+4°C)
				03	-11°F (-6°C) +11°F (+6°C)
				04	+ 3°F (+2°C) - 3°F (-2°C)
				05	+ 7°F (+4°C) - 7°F (-4°C)
				06	+11°F (+6°C) -11°F (-6°C)
				07	+11°F (+6°C) -11°F (-6°C)
20	E1	Capacity Control Mode	○	00 01 02	Inlet air (room air) temperature control Outlet air temperature control Duty signal control
21	E4	Type of Duty Signal	○	00 01 02	0-10V 0-5V 4-20mA
22	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.
23	Eb	Fan Operation Control at Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW
24	EC	Forced Thermo-ON Stoppage at Cooling	○	00 01	Not Available Available
25	F2	Remote Control Main-Sub Setting	✕	00 01	Main Sub

NOTES:

1. To change the optional setting, wait at least 3 minutes after turning ON the power.
2. Though the items which are not in the table are shown on the remote controller, only the functions in the table are available for the DX-Kit Function Selection.

● Table B Input and Output Number Indications/Terminals/Factory-Setting

Number	Terminals	Remarks	Setting When Shipping	Code Indicated
Input1	I_1 , COM		Remote Control ON/OFF Function 1	03
Input2	I_2 , COM		Cancellation of Commands from Wired Controller after Forced Stoppage	06
Output1	O_1 , COM		Operation Signal	01
Output2	O_2 , COM		Alarm Signal	02
Output3	O_3 , COM		Thermo-ON Signal during Heating	06

NOTE:

To change the optional setting, wait at least 3 minutes after turning ON the power.

● Table C Input and Output Settings and Indications

Code Indicated	Input	Output
00	Not Set	Not Set
01	Control by Field-Supplied Room Thermostat (Cooling)	Operation Signal
02	Control by Field-Supplied Room Thermostat (Heating)	Alarm Signal
03	Remote Control ON/OFF Function 1	Cooling Operation Signal
04	Remote Control ON/OFF Function 2 (Operation)	Thermo-ON Signal during Cooling
05	Remote Control ON/OFF Function 2 (Stop)	Heating Operation Signal
06	Cancellation of Commands from Wired Controller after Forced Stoppage	Thermo-ON Signal during Heating
07	Cooling or Heating Operation Mode Setting	(Not Available)
08	(Not Available)	Defrost Signal

6.4 Input Setting

The setting procedure will vary depending on the wired controller type. Please refer to Installation Manual for each wired controller before use.

6.4.1 Remote Control ON/OFF Function

This function provides a control to stop and start the system from a remote place. Four methods are available by using each signal from a building management system.

The factory-setting is as follows; "Remote Control 1" Signal Input to I^1 , and

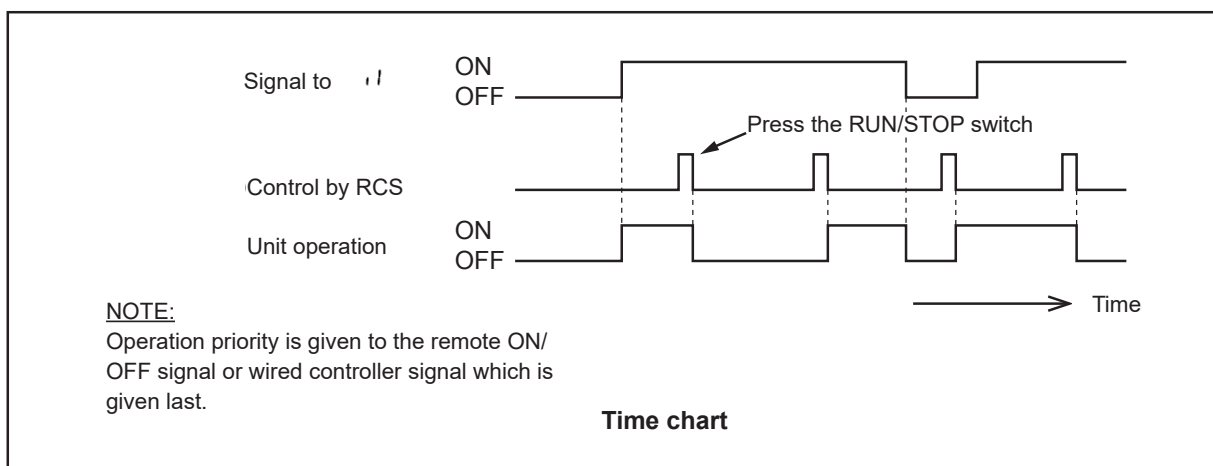
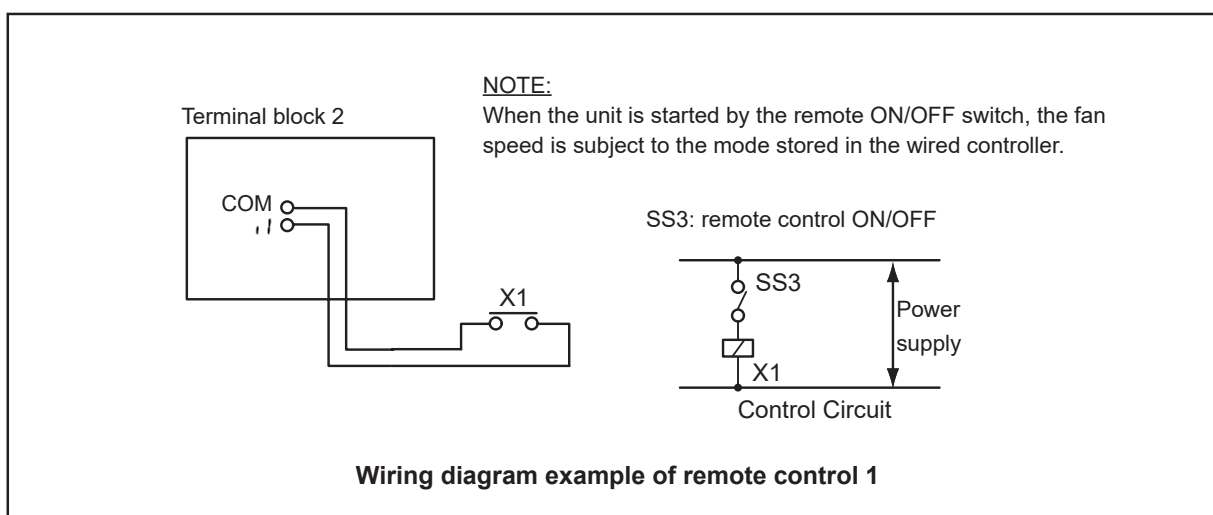
"Cancellation of Commands from Wired controller after Forced Stoppage" Signal Input to I^2 .

In case of using other functions, change the contact setting.

(1) Remote Control ON/OFF Function 1 (Level signal Input) (Code 03)

This is an ON/OFF function from a remote place by using level signal (or ON/OFF). The basic wiring, time chart is shown below.

(In Case of "Remote Control 1" Signal Input to I^1)



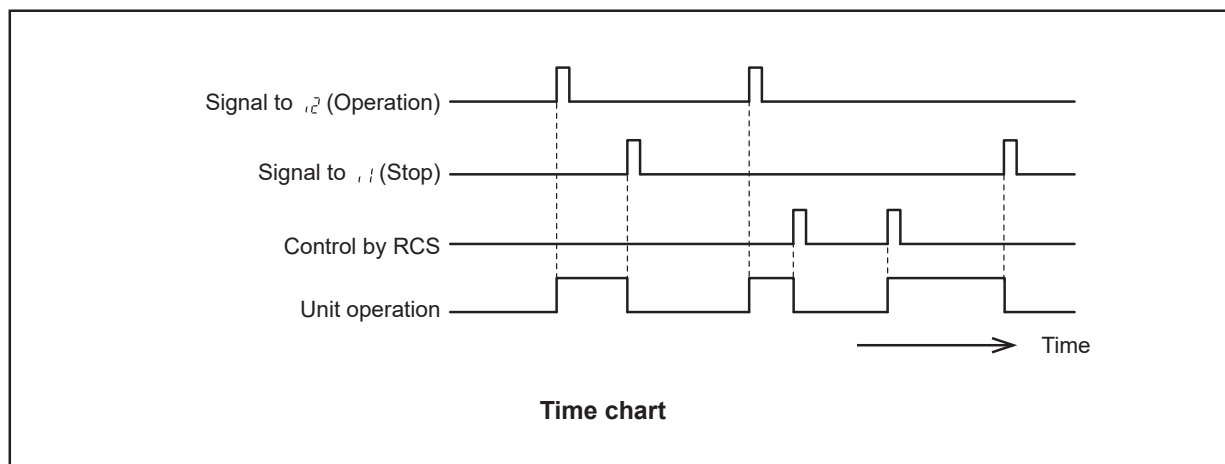
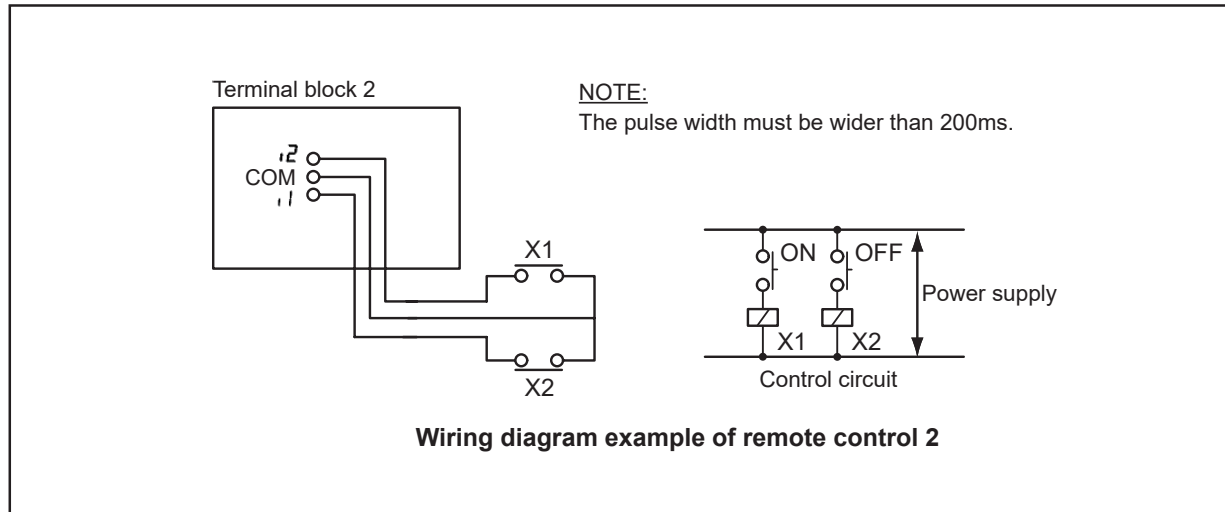
NOTES:

1. Picking up signal is not available for 10 seconds after turning ON power supply due to initialization of components.
Do not change the signal (RUN/STOP) in this period.
2. Wired controller is required for this function.

(2) Remote Control ON/OFF Function 2 (Pulse Signal Input) (Code 04/05)

This is an ON/OFF function from a remote place by using pulse signal. The basic wiring and time chart are shown below.

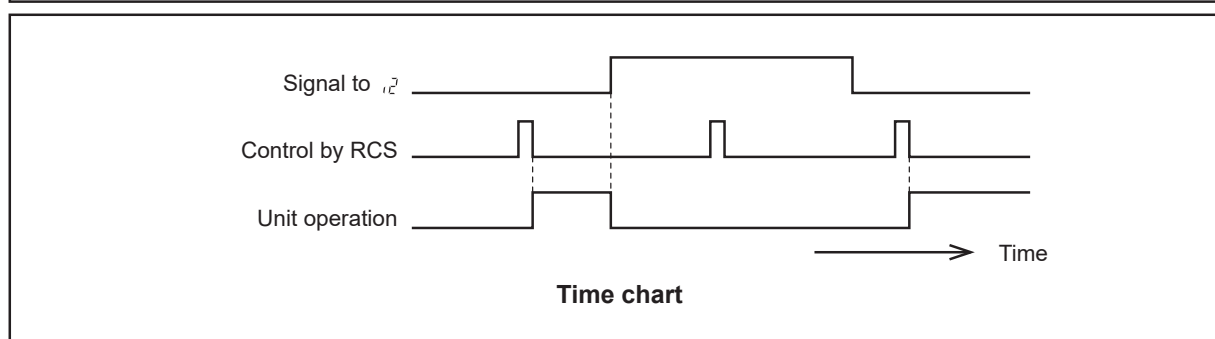
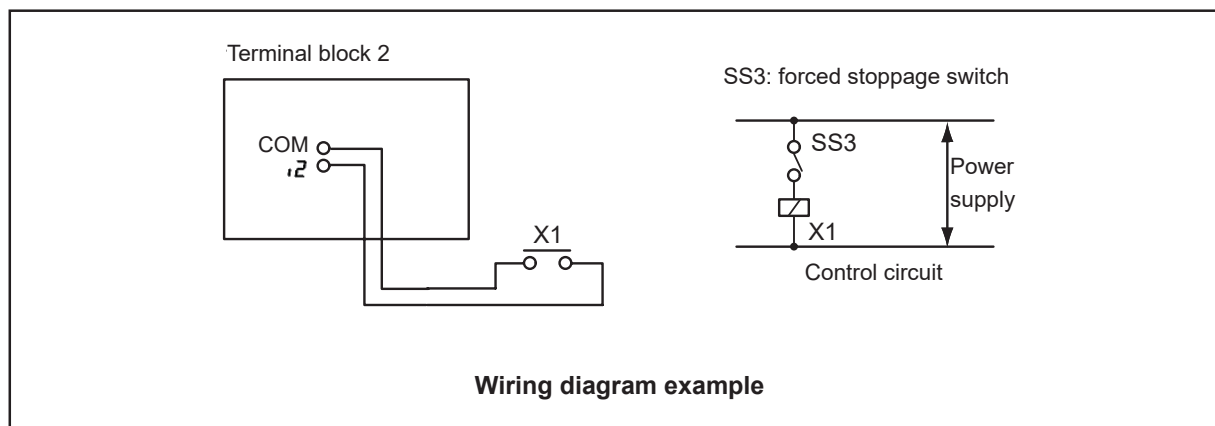
(In Case of "ON" Signal Input to r_2 , Setting indication 04 and "OFF" Signal Input to r_1 , Code 05)



NOTES:

1. Picking up signal is not available for 10 seconds after turning ON power supply due to initialization of components.
Do not change the signal (RUN/STOP) in this period.
2. Wired controller is required for this function.
3. Even if a signal is input during stoppage, the setting of the unit remains the same.

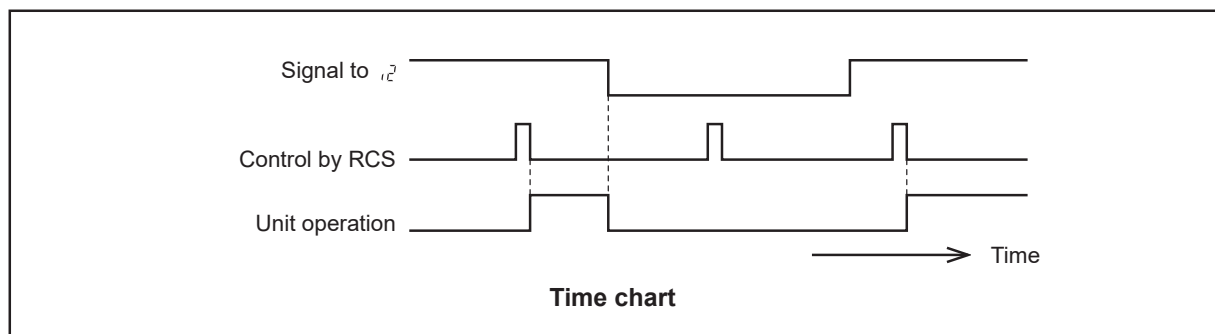
- (3) Cancellation of Commands from Wired Controller after Forced Stoppage (Code 06) by using the signal from a building management system, the air conditioners can be stopped, and the individual commands from the wired controller are canceled.
The basic wiring and time chart are shown below.
(In Case of "Cancellation of Commands from Wired Controller after Forced Stoppage" Input to $\bar{r}2$, Code 06)



NOTES:

1. Picking up signal is not available for 10 seconds after turning ON power supply due to initialization of components.
Do not change the signal (RUN/STOP) in this period.
2. Wired controller is required for this function.

At this function, the B contact can be used by the optional setting (refer to Section 6.3 Table A item Cb (13):01) on the wired controller. The time chart when using the B contact is shown below.



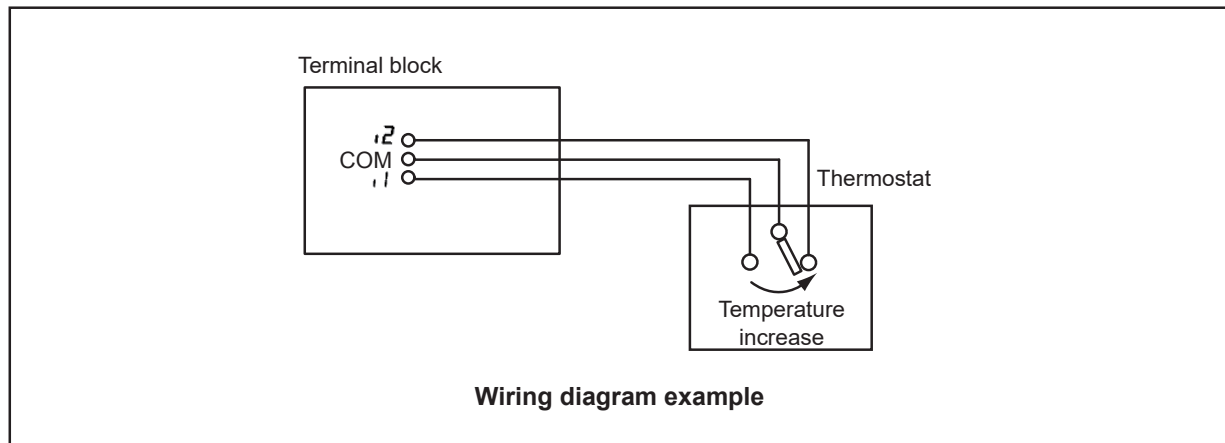
NOTES:

1. Picking up the signal is not available for 10 seconds after turning ON power supply due to initialization of components.
Do not change the signal (RUN/STOP) in this period.
2. Wired controller is required for this function.

6.4.2 Control by Field-Supplied Room Thermostat (Code 01/02)

If a field-supplied room thermostat instead of the inlet thermistor of the indoor unit is used, connect wires as shown below.

(If "Room Thermostat (Cooling)", Input to R2 , Code 01, and "Room Thermostat (Heating)" Input to R1 , Code 02).



Operation

Cooling Operation: Compressor is ON by closing terminals R2
Compressor is OFF by opening terminals R2
Heating Operation: Compressor is ON by closing terminals R1
Compressor is OFF by opening terminals R1

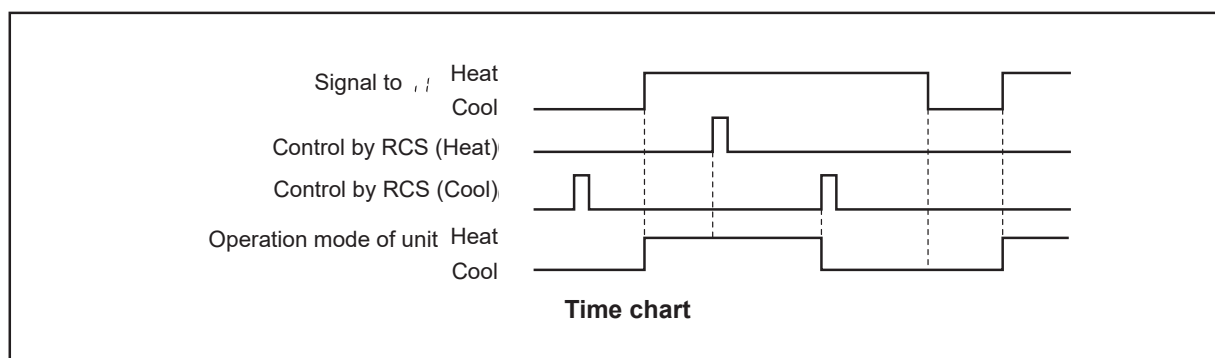
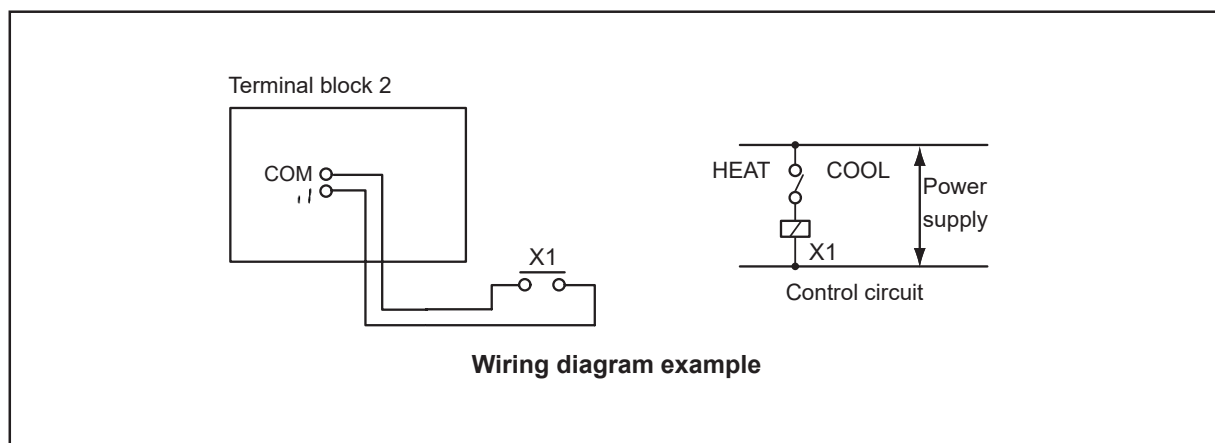
NOTES:

1. When a field-supplied room thermostat is used, select the specified thermostat as below.
Contactor Load: DC12V
Differential: more than 1.5 degree
2. Do not use a thermostat utilizing mercury.
3. This function can be used together with "6.4.1 Remote Control ON/OFF Function".
4. This function can not be used together with outlet air temperature control mode (refer to the optional setting in Section 6.3 Table A item E1 (20):01) on the wired controller.
5. This function can not be used together with duty signal control mode (refer to the optional setting in Section 6.3 Table A item E1 (20):02) on the wired controller.

6.4.3 Cooling or Heating Operation Mode Setting (Code 07)

By utilizing this function, the cooling or heating operation mode can be changed by giving a contact signal from the outside to the unit. The operation mode is followed by the field-supplied switch or the wired controller, whichever was used last.

(If “Cooling or Heating Operation Mode Setting Change by External Input” then, Signal Input to , /).



NOTES:

1. This function can not be used together with the following functions; “Remote Control ON/OFF Function 2”, and “Cancellation of Commands from Wired Controller after Forced Stoppage”.
2. Wired controller is required for this function.

6.5 Output Setting

(1) Operation Signal (Code 01)

This function is utilized to pick up the operation signal. By this function, operation signal at a remote place can be checked, or operation at the fresh air intake fan motor can be interlocked.

Connect wires as shown below. Please note that the contact of the auxiliary relay "RYa" is closed when this operation signal is given.

(2) Alarm Signal (Code 02)

This signal is utilized to pick-up activation of safety devices and is normally indicated on the wired controller. However, this function is not available under abnormal transmission conditions.

Connect the wires as shown below. Please note that the contact of auxiliary relay "RYa" is closed when one of the safety devices is activated.

(3) Cooling Operation Signal (Code 03)

This function is utilized to pick up the cooling signal. The contact of auxiliary relay "RYa" is closed when cooling operation signal is ON despite "Thermo-ON" or "Thermo-OFF".

Connect the wires as shown below.

(4) Thermo-ON Signal during Cooling Operation (Code 04)

This function is utilized to pick up the cooling "Thermo-ON" signal of compressor running.

Connect the wires as shown below.

The contact of auxiliary relay "RYa" is closed when "THERMOSTAT" is ON during cooling operation mode.

(5) Heating Operation Signal (Code 05)

This function is utilized to pick up the heating operation signal. The contact of auxiliary relay "RYa" is closed when heating operation signal is ON despite "Thermo-ON" or "Thermo-OFF".

Connect the wires as shown below.

(6) Thermo-ON Signal during Heating Operation (Code 06)

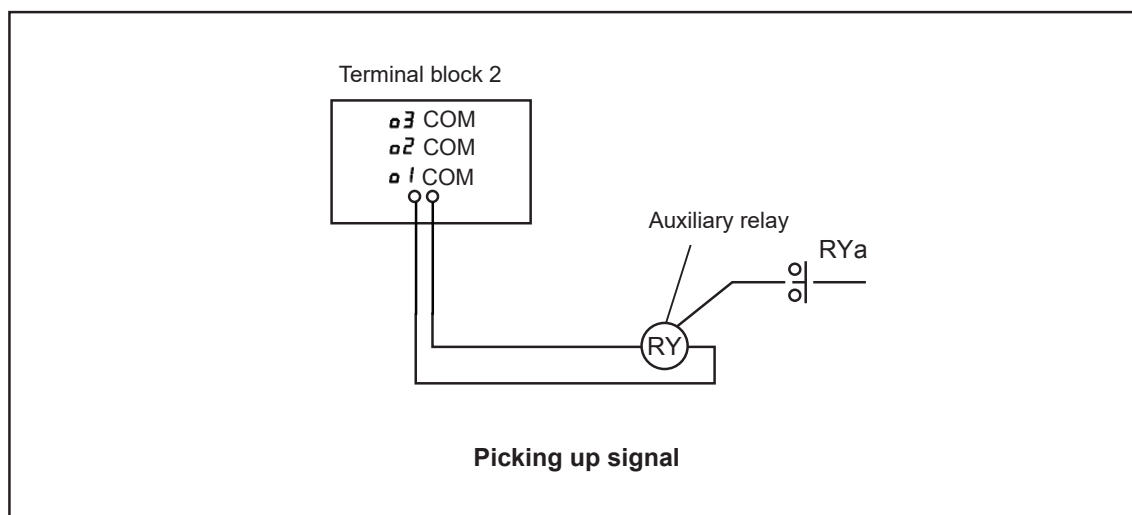
This function is utilized to pick up the heating "Thermo-ON" signal of compressor running to control a circulator or a humidifier. Connect wires as shown below. The contact of auxiliary relay "RYa" is closed when "THERMOSTAT" is ON during heating operation mode.

(7) Defrost Signal (Code 08)

This function is utilized to pick up Defrost Signal. Connect wires as shown below.

The contact of auxiliary relay "RYa" is closed when outdoor unit is under defrost mode.

This function is only set by $\square 1$ or $\square 2$.

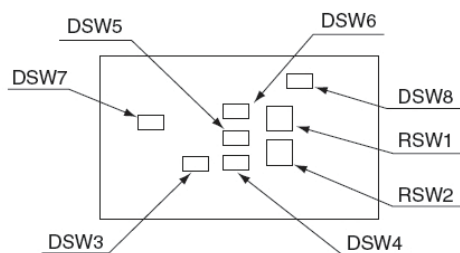


7 Setting of DIP Switches

Refer to Fig. 2 in Section 5.3 for PCB layout.

DIP Switches ON PCB1

(A) Position of DIP Switches



(B) The PCB in the control box of the DX-Kit is equipped with 2 rotary switches and 6 DIP switches. Before testing unit, set these DIP switches according to the following instructions. If these DIP switches are not set in the field, the unit can not be operated.

(1) Unit No. Setting (RSW1 & DSW6)

Setting is required. Set the unit No. of all units respectively and sequentially by following setting position shown in the table below. Numbering must start from "1" for each indoor unit.

Unit number setting

DSW6 (tens digit)	RSW1 (units digit)	Ex.) Set at unit number 16
<p>Before shipment DSW6 and RSW1 are set to "0". Max 64 units are available to set when all the equipment to be connected are corresponding to H-LINK II. Max 16 units are available when the units corresponding/non-corresponding to H-LINK II are combined.</p>		<p>Set No.1 Pin ON</p> <p>Set at "6"</p>

(2) Unit Model Code Setting (DSW4)

Do not change the setting. Otherwise, unit will not operate effectively.



(3) Capacity Code Setting (DSW3)

DSW3 must be set corresponding to the heat exchanger capacity of the AHU at field site according to Section 2.2.

(4) Refrigerant Cycle No. Setting (RSW2 & DSW5)

Setting is required. Setting positions before shipment are all OFF.

Refrigerant cycle number setting

DSW5 (tens digit)	RSW2 (units digit)	Ex.) Set at cycle number 5
<p>Before shipment DSW5 and RSW2 are set to "0". Max 64 cycles are available to set when all the equipment to be connected are corresponding to H-LINK II. Max 16 cycles are available when the units corresponding/non-corresponding to H-LINK II are combined.</p>		<p>Set all pins OFF</p> <p>Set at "5"</p>

(5) DSW7

* Factory Setting



* No.1 Pin: Fuse Recover
When fuse is cut, turn No.1 pin ON.

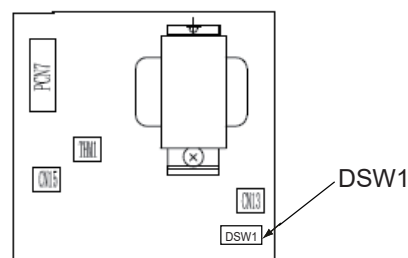


(6) Optional Function Setting (DSW8)

No setting is required.
Setting positions before shipment are all OFF.



DIP Switches ON PCB2



DSW1

* Factory Setting



No.1 and No.2 pins of DSW1 shall be turn OFF when Multi Connection is applied.



NOTE:

The "■" mark indicates position of DIP switches. Figures show setting before shipment.

CAUTION

Turn OFF the power supply before adjusting DIP switch setting. Otherwise, the setting is invalidated and does not take effect.

8 Test Run

Perform Test Run according to "Installation & Maintenance Manual" of the outdoor unit.

WARNING

- Do not operate the system until all the following conditions are resolved.
 - (A) Check to ensure that the electrical resistance is more than 1 megohm by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is detected and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - (C) Check to ensure that the switch on the main power supply has been turned ON for more than 12 hours, to warm the compressor oil by the crankcase heater.
- Pay attention to the following items while the system is running.
 - (A) Do not touch any of the parts by hand at the discharge gas side. The compressor chamber and the pipes at the discharge side are heated higher than 162°F (90°C).
 - (B) **DO NOT PRESS MAGNETIC SWITCH(ES).** It will cause a serious accident.

NOTE:

Check the operation condition during Test Run by following the "Test Run and Maintenance Record" in the service manual for outdoor unit and indoor unit applied to test run.

9 Warranty Policy and Disclaimer

- (1) Johnson Control-Hitachi Air Conditioning is responsible for the malfunction arising out of defects in equipment (units and components) provided by Johnson Control-Hitachi Air Conditioning on a stand-alone basis during commissioning.
- (2) Johnson Control-Hitachi Air Conditioning is not responsible for the performance, operation and/or control of the entire system incorporated with DX-Kit even if equipment provided by Johnson Control-Hitachi Air Conditioning is properly selected and installed in accordance with Johnson Control-Hitachi Air Conditioning guideline.
- (3) Johnson Control-Hitachi Air Conditioning is not responsible for any damage to the entire system, AHU and/or equipment provided by Johnson Control-Hitachi Air Conditioning if such damage is caused by mis-use and/or use against Johnson Control-Hitachi Air Conditioning guideline in relation to the AHU connected to the system.

