PART I- OPERATION

1 GENERAL INFORMATION

No part of this publication may be reproduced, copied, filed or transmitted in any shape or form without the permission of HITACHI.

Within the policy of continuous improvement of its products, HITACH. reserves the right to make changes at any time without prior notification and without being compelled to introducing them into products subsequently sold. This document may therefore have been subject to amendments during the life of the product.

HITACHI makes every effort to offer correct, up-to-date documentation. Despite this, printing errors cannot be controlled by HITACHI and are not its responsibility.

As a result, some of the images or data used to illustrate this document may not refer to specific models. No claims will be accepted based on the data, illustrations and descriptions included in this manual.

No type of modification must be made to the equipment without prior, written authorisation from the manufacturer.

2 SAFETY

2.1 APPLIED SYMBOLS

During normal air conditioning system design work or unit installation, greater attention must be paid in certain situations requiring particular care in order to avoid damage to the unit, the installation or the building or property.

Situations that jeopardise the safety of those in the surrounding area or that put the unit itself at risk will be clearly indicated in this manual.

To indicate these situations, a series of special symbols will be used to clearly identify these situations.

Pay close attention to these symbols and to the messages following them, as your safety and that of others depends on it.

DANGER

- ***The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.***
- ***Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others in the proximities of the unit.***

In the texts following the danger symbol you can also find information on safe procedures during unit installation.

CAUTION

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to minor injuries to you and others in the proximities of the unit.*
- *Not taking these instructions into account could lead to unit damage.*

In the texts following the caution symbol you can also find information on safe procedures during unit installation.

NOTE

- *The text following this symbol contains information or instructions that may be of use or that require a more thorough explanation.*
- *Instructions regarding inspections to be made on unit parts or systems may also be included.*

2.2 ADDITIONAL INFORMATION ABOUT SAFETY

DANGER

- ***HITACHI is not able to foresee all the circumstances which may result in a potential danger.***
- ***Do not pour water in the indoor or outdoor unit. These products are fitted with electric components. If water comes into contact with electric components, this will cause a serious electric shock.***
- ***Do not handle or adjust the safety devices inside the indoor and outdoor units. The handling or adjustment of these devices may result in serious accident.***
- ***Do not open the service cover or access panel of the indoor and outdoor units without disconnecting the main supply.***
- ***In the event of fire, switch off the mains, put out the fire immediately and contact your service supplier.***
- ***Check that the earth cable is correctly connected.***
- ***Connect the unit to a circuit breaker of the specified capacity.***

CAUTION

- *Refrigerant leaks may hinder respiration as the gas displaces the air in the room.*
- *Fit the indoor unit, the outdoor unit, the remote control and the cable at a minimum of 3 metres away from sources of strong radiation from electromagnetic waves, such as medical equipment.*
- *Do not use sprays, such as insecticides, varnishes or enamels or any other inflammable gas within a metre of the system.*
- *If the circuit breaker or supply fuse of the unit comes on frequently, stop the system and contact the service suppler.*
- *Do not carry out maintenance or inspection work yourself. This work must be carried out by qualified service personnel with suitable tools and resources for the work.*
- *Do not place any foreign material (branches, sticks, etc.) in the air inlet or outlet of the unit. These units are fitted with high speed fans and contact with any object is dangerous.*
- *This appliance must be used only by adult and capable people, having received the technical information or instructions to handle this appliance properly and safely.*
- *Children should be supervised to ensure that they do not play with the appliance.*

NOTE

- *The air in the room should be renewed and the room ventilated every 3 or 4 hours.*
- *The system fitter and specialist shall provide anti-leak safety in accordance with local regulations.*

2.3 PURPOSE OF THIS MANUAL

This air conditioner has been designed for standard air conditioning for human beings. For use in other applications, please contact your HITACHI dealer or service contractor.

The air conditioning system should only be installed by qualified personnel, with the necessary resources, tools and equipment, who are familiar with the safety procedures required to successfully carry out the installation.

PLEASE READ AND FAMILIARISE YOURSELF WITH THE MANUAL BEFORE STARTING WORK ON THE INSTALLATION OF THE AIR CONDITIONING SYSTEM. Failure to observe the instructions for installation, use and operation described in this Manual may result in operating failure including potentially serious faults, or even the destruction of the air conditioning system.

It is assumed that the air conditioning system will be installed and maintained by responsible personnel trained for the purpose. If this is not the case, the customer should include all the safety, caution and operating signs in the native language of the personnel responsible.

Do not install the unit in the following places, as this may lead to a fire, deformities, rusting or faults:

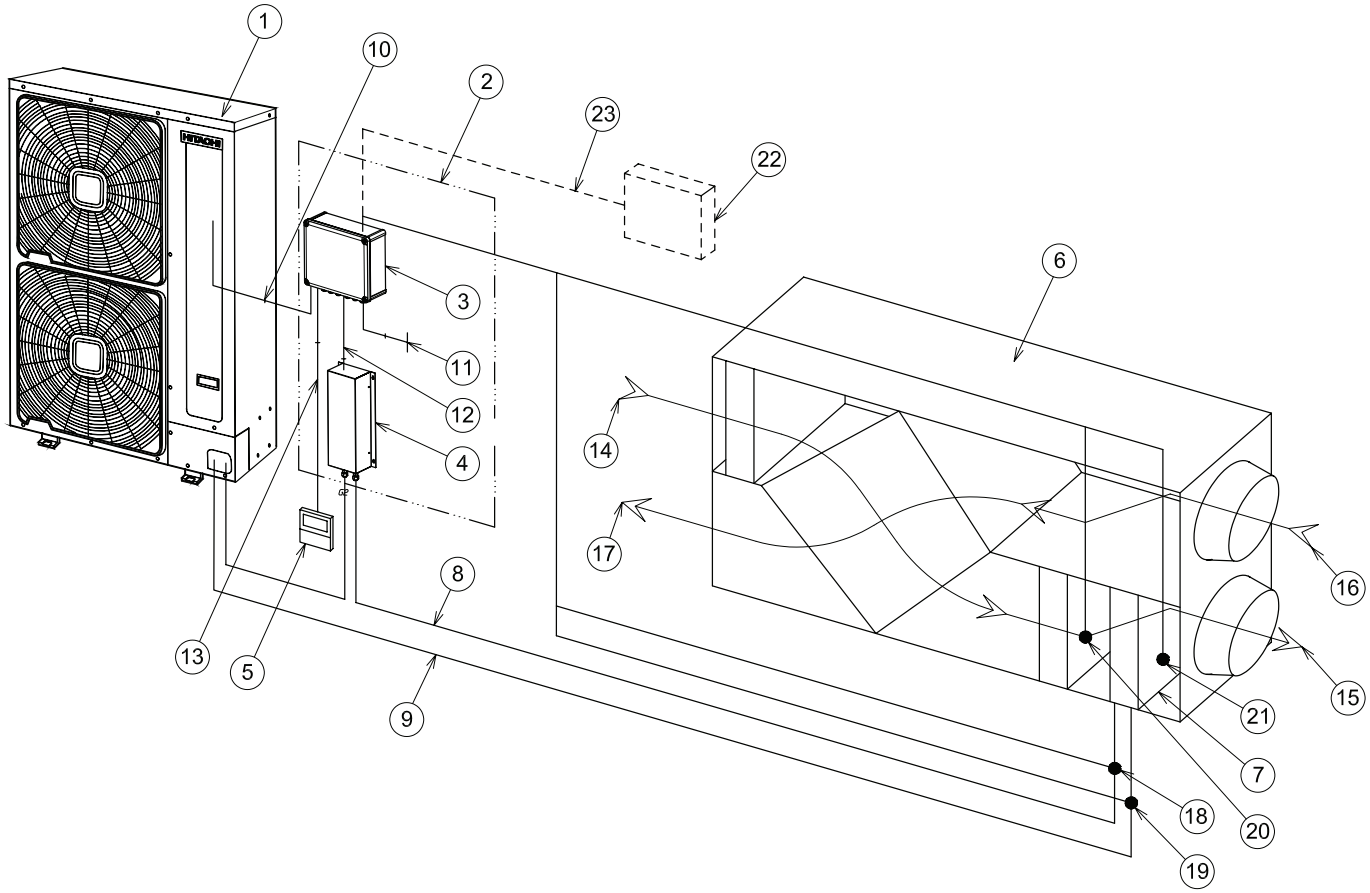
- Places where oil is present (including oil for machinery).
- Places with a high concentration of sulphurous gas, such as spas.
- Places where flammable gases may be generated or circulate.
- Places with a saline, acidic or alkaline atmosphere.

Do not install the unit in places where silicon gas is present. Any silicon gas deposited on the surface of the heat exchanger will repel water. As a result, the condensate water will splash out of the collection tray and into the electrical box. Water leaks or electrical faults may eventually be caused.

Do not install the unit in a place where the current of expelled air directly affects animals or plants as they could be adversely affected.

3 SYSTEM DESCRIPTION

The following figure shows an installation example for air handling units (AHU).



Item	Description
1	Hitachi outdoor unit
2	DX-Interface EXV-(2.0-10.0)E1
3	Control box
4	Expansion valve box
5	Remote controller (Optional)
6	Unit or device with heat exchanger
7	DX- heat exchanger
8	Liquid line
9	Gas line
10	Outdoor - Indoor communication
11	Power supply
12	Expansion valve control communication

Item	Description
13	Remote controller communication
14	Outdoor air (AHU applications)
15	Supply air (AHU applications)
16	Return air (AHU applications)
17	Exhaust air (AHU applications)
18	Liquid pipe thermistor (THM3, PCB1)
19	Gas pipe thermistor (THM5, PCB1)
20	Inlet DX-coil thermistor (THM1, PCB1)
21	Outlet DX-coil thermistor (THM2, PCB1)
22	Field supplied controller (Optional)
23	Duty signal (0~10V, 0~5V, 4~20mA) (Optional)

CAUTION

- *The installation distance between the Dx-Interface and the device with heat exchanger must be the shortest possible.*
- *Keep the distance between the unit or device with heat exchanger and the expansion valve box for the piping length up to 5m. Also the elevation difference between the unit or device with heat exchanger and the expansion valve box must be no more than 2m.*
- *Make sure that the installation distance between the control box and the unit or device with heat exchanger is short enough that the thermistors sensing are not distorted.*
- *The thermistor cable should never be installed in the same ducting as power or control cables.*

4 PRODUCT GUIDE

4.1 CLASSIFICATION OF DX-INTERFACE

DX-Interface type				
	Position-separating hyphen (fixed)			
		Capacity (HP): 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0		
			E = Made in Europe	
				New serie
EXV	–	X.X	E	1

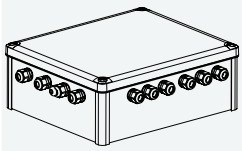
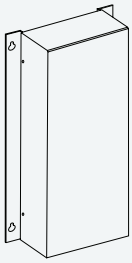
4.2 PRODUCT GUIDE CODIFICATION

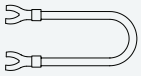
DX-Interface EXV-(2.0-10.0)E1	
Control box	Expansion valve box
	

DX-Interface	
Model	Code
EXV-2.0E1	7E610900
EXV-2.5E1	7E610901
EXV-3.0E1	7E610902
EXV-4.0E1	7E610903
EXV-5.0E1	7E610904
EXV-6.0E1	7E610905
EXV-8.0E1	7E610906
EXV-10.0E1	7E610907

4.3 FACTORY-SUPPLIED

Check the content and the number of accessories in the package. The package contains the following parts:

Name description	See in figure	Qty	Purpose
Control box		1	System control box
Expansion valve box		1	Expansion valve for refrigerant cycle control

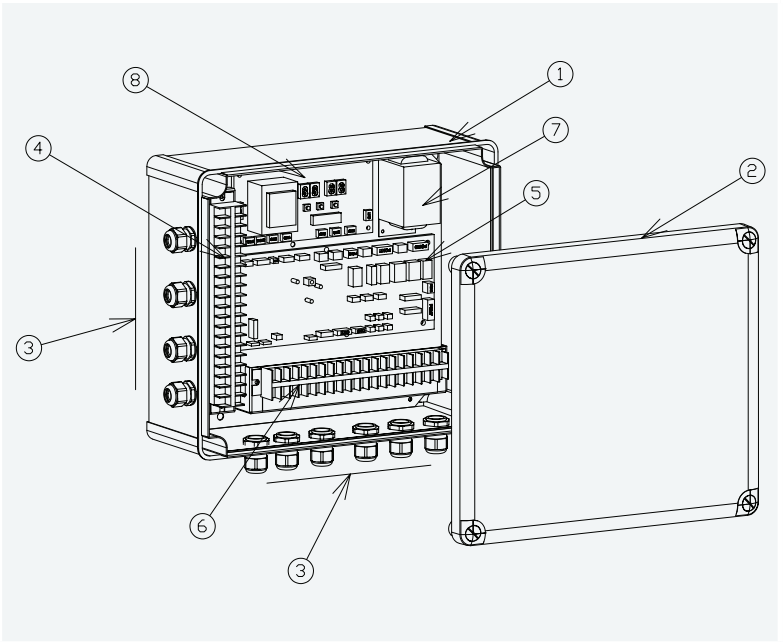
Name description	See in figure	Qty	Purpose
Thermistor		4	Temperature sensing: Inlet air (blue) outlet air (red) gas line (yellow) liquid line (black)
Installation Manual and Declaration of Conformity		1	Instructions and important notice
Control box fixing accessory		4	Control box cover lock
Harness jumper		1	Motor alarm connection jumper

PART II-INSTALLATION

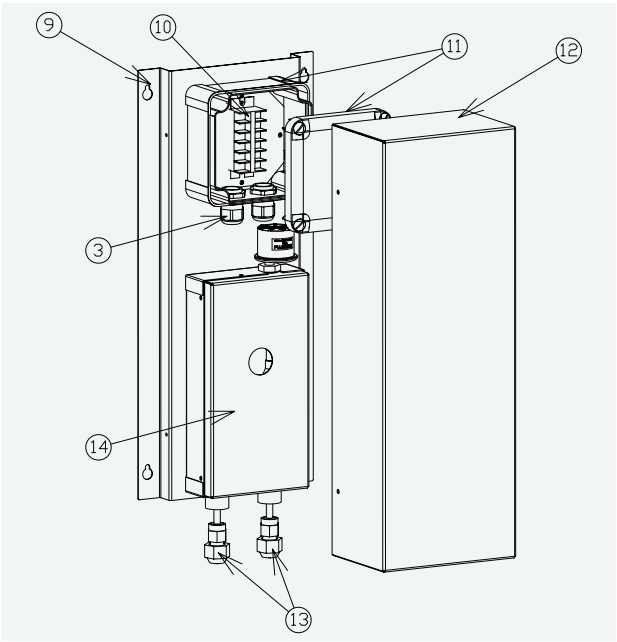
5 NAME OF PARTS

DX-Interface EXV-(2.0-10.0)E1

Control box



Expansion valve box



N°	Name	N°	Name
1	Control box	8	PCB2
2	Control box cover	9	Expansion valve box
3	Cable gland	10	Terminal board 3
4	Terminal board 1	11	Terminal board box and cover
5	PCB1	12	Expansion valve box cover
6	Terminal board 2	13	Refrigerant connections
7	Transformer	14	Expansion valve device

6 COMBINABILITY

Outdoor unit	Control mode		
	Air inlet (1*)	Air outlet	Duty
Utopia: IVX/ES and RASC series	●	● (2*)	● (2*)
Set Free: FS(V)N(Y)2E, FSXN, FSN2 and FSNM series (4*) (5*)	●	● (3*)	● (3*)

NOTE

- *(1*) In case of AHU applications, is it considered as Inlet Air the point just before the Dx-Coil*
- *(2*) Only single combination is allowed.*
- *(3*) Limited control depending on whole system working condition*
- *(4*) In case of installing Dx-Kits and Hitachi indoor units to a common Outdoor Unit, total Dx-Kit capacity can not exceed the 30% of total system capacity.*
- *(5*) If only Dx-Kits are connected to the outdoor unit, total Dx-Kit capacity can not exceed the 100% of outdoor unit capacity.*
- *DX-Interface EXV-(2.0-10.0)E1 models are only combinable with air to air systems.*

	Indoor unit connection requirements					
	Allowed heat exchanger capacity (kW) [1]				Heat exchanger volume (dm^3)	
DX -Code	Mode	Min	Nom	Max	Min	Max
EXV-2.0E1	Cooling	4.0	5.0	5.6	0.57	1.16
	Heating	4.5	5.6	7.1		
EXV-2.5E1	Cooling	4.8	6.0	6.3	0.89	1.35
	Heating	5.6	7.0	7.1		
EXV-3.0E1	Cooling	5.7	7.1	8.0	1.03	1.57
	Heating	6.4	8.0	9.0		
EXV-4.0E1	Cooling	8.0	10.0	11.2	1.51	2.37
	Heating	9.0	11.2	12.5		
EXV-5.0E1	Cooling	10.0	12.5	14.0	1.92	2.37
	Heating	11.2	14.0	16.0		
EXV-6.0E1	Cooling	11.2	14.0	16.0	1.92	2.92
	Heating	12.8	16.0	18.0		
EXV-8.0E1	Cooling	16.0	20.0	22.4	2.92	3.89
	Heating	17.9	22.4	25.0		
EXV-10.0E1	Cooling	20.0	25.0	28.0	3.89	4.76
	Heating	22.4	28.0	31.5		

[1] cooling and heating capacity data is based on the following indoor and outdoor temperature conditions, according standard EN14511

Operation conditions		Cooling	Heating
Indoor air inlet temperature	DB	27.0 °C	20.0 °C
	WB	19.0 °C	—
Outdoor air inlet temperature	DB	35.0 °C	7.0 °C
	WB	—	6.0 °C

DB: dry bulb; WB: wet bulb
Pipe length: 7.5 m; pipe height: 0 m.

NOTE

- *Check that the unit or connected device to the Dx-heat exchanger allows operating mode and use it exclusively in the proper mode.*
- *Please refer to Outdoor unit and unit or device connected Installation Manual and Technical Catalogue to ensure that the installation conditions are inside the working ranges.*

7 UNIT INSTALLATION

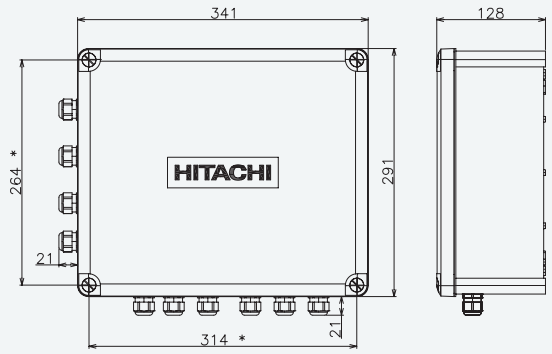
- The installation of a specific remote controller is necessary during the installation comissioning. Once the installation comissioning is finished, this remote controller can be removed if the pin 7 is switched to ON position. In this case, pay attention to all the setting details related with the remote controller because after remove it, they cannot be changed.
- Do not install the DX-Interface where electromagnetic wave is directly radiated to the control box or expansion valve box.
- Install a noise filter when noise is emitted from power supply.
- Do not install the DX-Interface where generation, flowing, staying or leakage of flammable gas may occur.
- When the false ceiling contains high humidity, dew condensation water may occur on the outer surface of the expansion valve box. Therefore utilize the insulation on the outer surface of the expansion valve box.

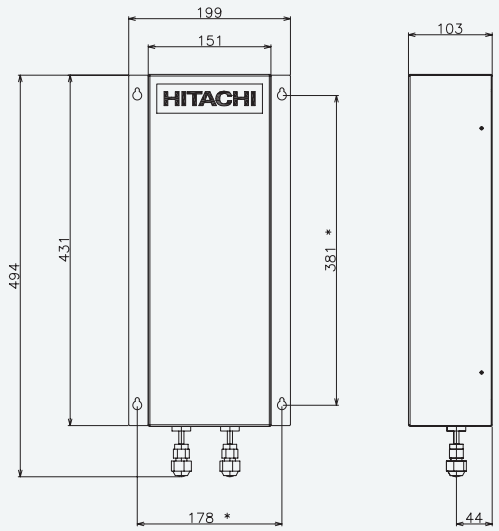
◆ Installation Location

1 Installation methods are selectable according to the dimension of the false ceiling.
2 Keep the distance between the unit or device with heat exchanger and the expansion valve box for the piping length up to 5m. Also the elevation difference between the unit or device with heat exchanger and the expansion valve box must be no more than 2m.
3 Check the ceiling slab is strong enough. If the ceiling slab is too weak to support the weight of the expansion valve box, noise and vibration may occur.
4 Secure proper space around the control box and expansion valve box for operation and maintenance work. Also a service access door should be prepared in order to remove the DX-Interface without getting rid of the ceiling plate.
5 Select a suitable and convenient location for the refrigerant piping connection.
6 Do not install the DX-Interface in a kitchen where vapor or mist flows. Dew condensation water may occur on the expansion valve box while cooling operation. In this case, utilize the insulation.
7 Do not install the DX-Interface in a organic solvent (thinner or benzine) environment. Synthetic resin parts may dissolve.
8 Do not install the DX-Interface where generation, flowing or staying of flammable gas may occur.
9 The sound of refrigerant running through from the expansion valve box may be heard. Therefore install the expansion valve box where the sound will not leak such as in the false ceiling of a hall way.
10 Use ceiling material with sound-proof such as plaster board.

7.1 DIMENSIONAL DATA

DX-Interface EXV-(2.0-10.0)E1	
Control box	Expansion valve box
(mm)	(mm)

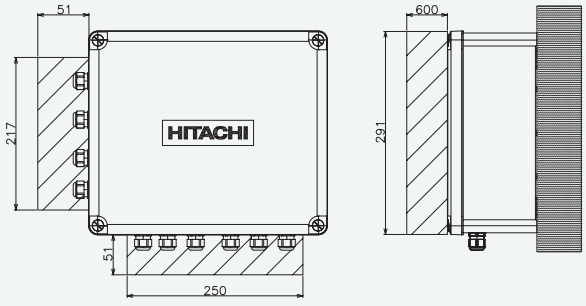


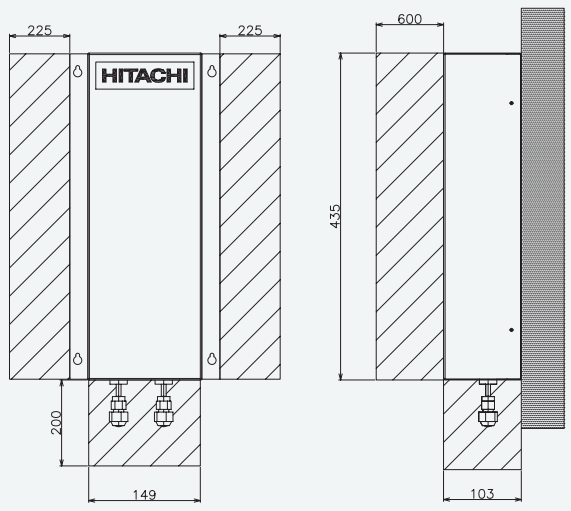


(*) For installation

7.2 SERVICE SPACE

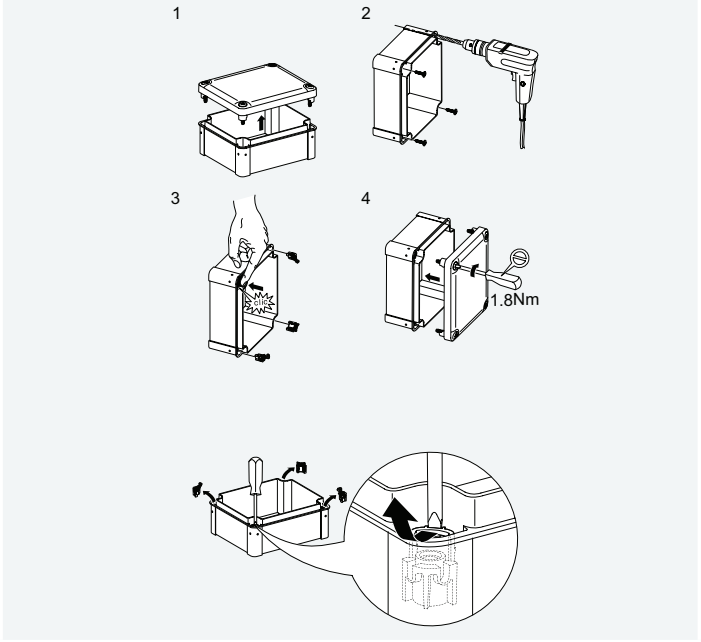
DX-Interface EXV-(2.0-10.0)E1	
Control box	Expansion valve box
(mm)	(mm)

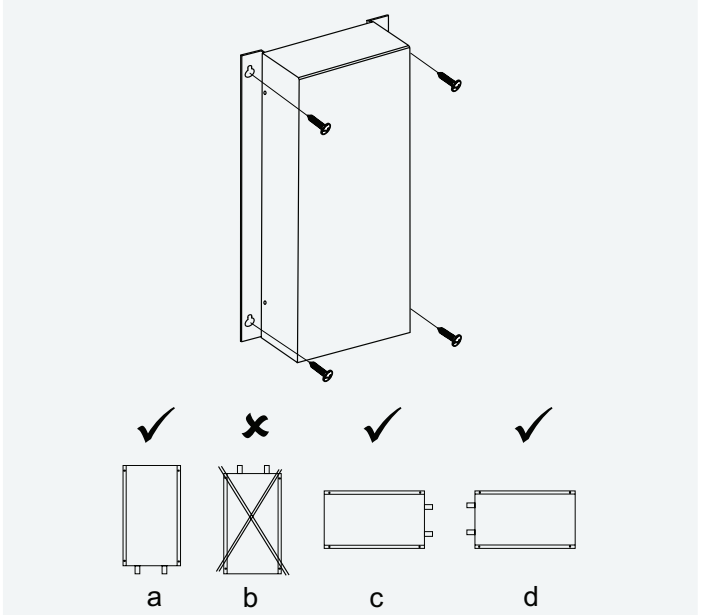




7.3 MOUNTING METHOD

DX-Interface EXV-(2.0-10.0)E1	
Control box	Expansion valve box





NOTE

- *Special nuts used for control box cover lock (step 3 in Control box mounting method) are supplied with the Dx-Interface.*
- *In case of installation positions “c” and “d”(for Expansion valve box mounting method), make sure to insulate the copper pipes inlet on the expansion valve box cover to avoid any liquid filtration and accumulation.*

7.4 THERMISTOR INSTALLATION

◆ Liquid and gas pipes thermistors

Two type thermistors are supplied inside the control box. The purpose and identification of each one is as follow:

Item	PCB socket / Thermistor connector color	PCB socket number	Thermistor length (mm)
Liquid pipe thermistor	Black	THM 3	650
Gas pipe thermistor	Yellow	THM 5	600

CAUTION

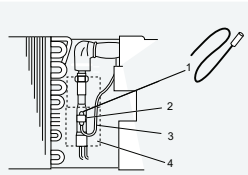
In case that the thermistors supplied with the Dx-Interface are not long enough, please make sure that the length extension is properly done avoiding the sensing distortion and that the joint is properly insulated to avoid any electrical failure.

NOTE

When fitting the thermistors, remember that they must be secured correctly by the special clamp, ensuring the perfect contact between the pipe and thermistor. Cover it completely with insulation, like cork tape or pipe insulation, depending on the location. Replace them if damaged during maintenance work.

Thermistor installation example

1	Liquid / gas pipe thermistor (factory supplied)
2	Thermistor holder (field supplied)
3	Thermistor lead wire (field supplied)
4	Insulation (field supplied)

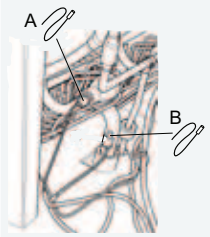


CAUTION

The thermistor must be installed properly in order to avoid water onto the thermistor.

Typical installation location

A	Liquid pipe thermistor	Must be installed in the coldest liquid line point in the heat exchanger (prior the distributor).
B	Gas pipe thermistor	Must be installed as close as possible to the heat exchanger refrigerant outlet.



◆ **Air thermistor**

Two air thermistors are supplied inside the control box. The purpose and identification of each one is as follow:

Item	PCB socket / Thermistor connector color	PCB socket number	Thermistor length (mm)
Inlet air thermistor	Blue	THM 1	1200
Outlet air thermistor	Red	THM 2	1200

CAUTION

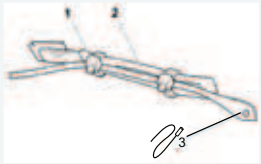
In case that the thermistors supplied with the Dx-Interface are not long enough, please make sure that the length extension is properly done avoiding the sensing distortion and that the joint is properly insulated to avoid any electrical failure.

NOTE

When fitting the air thermistor, remember that they must be secure correctly, in an adequate place to avoid external influences, like ambient conditions, and where the air temperature is significant.

Cable clamp example

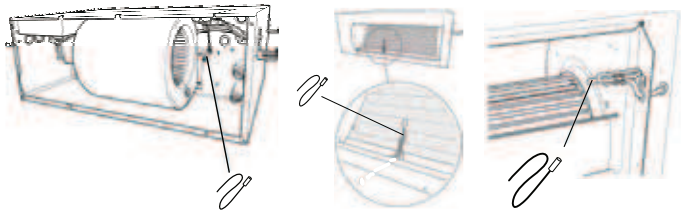
1	Tie (Field supplied)
2	Cable clamp (Field supplied)
3	Thermistor (supplied)



CAUTION

The thermistor must be installed properly in order to avoid water onto the thermistor.

Typical installation



8 REFRIGERANT PIPING

8.1 GENERAL NOTES BEFORE PERFORMING PIPE WORK

1 Prepare locally-supplied copper pipes.
2 Select the piping size with the correct thickness and correct material able to withstand sufficient pressure.
3 Select clean copper pipes. Make sure that there is no dust or moisture inside the pipes. Blow the inside of the pipes with oxygen free nitrogen to remove any dust and foreign materials before connecting them.

NOTE

A system with no moisture or oil contamination will give maximum performance and lifecycle compared to that of a poorly prepared system. Take particular care to ensure that all copper piping is clean and dry internally.

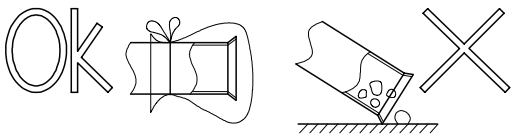
DANGER

The system design pressure is 4.15 MPa. The compression strength of the pipes must exceed 12.45 MPa (3 times the design pressure).

CAUTION

Cap the end of the pipe when pipe is to be inserted through a wall hole.

Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



If piping installation is not completed until next day or over a longer period of time, braze off the ends of the piping and charge with oxygen free nitrogen through a Schrader valve type access fitting to prevent moisture and particle contamination.

Do not use insulation material that contains NH3, as it can damage copper pipe material and become a source of future leakage.

Completely insulate both refrigerant gas piping and liquid piping between the indoor unit and the outdoor unit.

If not insulated, in cooling mode and high ambient humidity conditions, dew will appear on the piping surface.

Refrigerant circuit and Water circuit must be performed and inspected by a licensed technician and must comply with all relevant European and national regulations.

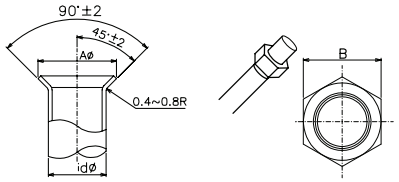
8.2 REFRIGERANT PIPE CONNECTIONS

The DX-Interface unit is set up to be connected by Flare Nut (factory supplied). Perform the indicated pipe work by maintaining the dimensions indicated in the following tables.

◆ **Size of pipes**

units: mm (inch)

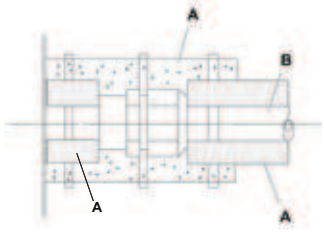
Units	Nominal diameters	Outer diameters	Flare pipe dimensions $A_{Ø\ +0/-0.4}$	Minimum thickness R410A	Flare nut dimensions B	Tightening Torque (Nm)
EXV-2.0E1	(1/4)	6.35	9.1	0.5	17	20
EXV-(2.5-10.0)E1	(3/8)	9.53	13.2	0.6	22	40



After connecting the refrigerant piping seal the open space between the knockout hole and refrigerant pipes by using insulation material as shown below:

A. Insulation.

B. Field-supplied refrigeration piping.



NOTE

- *Flare nuts tightening torque*
- *Always use two wrenches or fix spanners when tightening the flare nuts on the refrigerant pipes.*
- *If any failure occurs during this process the result could be pipe damage or refrigerant leak.*

8.3 BRAZING WORK

CAUTION

- *Use nitrogen gas for blowing during pipe brazing. If oxygen, acetylene or fluorocarbon gas is used, it will cause an explosion or poisonous gas.*
- *A rust coating will appear inside of tubes if no nitrogen gas blowing is performed during brazing work. This film will be flecked off after operation and will circulate in the circuit, resulting in clogged expansion valves, etc, and the compressor will be affected.*
- *Use a reducer valve when nitrogen gas blowing is performed during brazing. The gas pressure should be maintained within 0.03 to 0.05 Mpa. If excessively high pressure is applied to a pipe, it will cause an explosion.*

8.4 REFRIGERANT CHARGE

DANGER

- *Do not charge OXYGEN, ACETYLENE, or other flammable and poisonous gases into the refrigerant circuit, as an explosion could occur. It is recommended that oxygen free nitrogen be charged for these types of test cycles when performing a leakage test or an airtight test. These types of gases are extremely dangerous.*
- *Insulate the unions and flare-nuts at the piping connection part completely.*
- *Insulate the liquid piping completely to avoid a decreased performance; if not, it will cause sweating on the surface of the pipe.*
- *Charge refrigerant correctly. Overcharging or insufficient charging could cause a compressor failure.*
- *Check for refrigerant leakage in detail. If a large refrigerant leakage occurred, it would cause difficulty with breathing or harmful gases would occur if a fire were in the room.*
- *If the flare nut is tightened too hard, it may crack over time and cause refrigerant leakage.*

NOTE

Please refer to Outdoor unit Installation Manual and Technical Catalogue for the calculating method of additional refrigerant charge according the piping length.

9 ELECTRICAL WIRING

9.1 GENERAL CHECK

1 Ensure that the field-supplied electrical components (mains power switches, circuit breakers, wires, connectors and wire terminals) have been properly selected according to the electrical data indicated. Make sure that they comply with national and regional electrical codes.
2 Check to ensure that the power supply voltage is within +/- 10% of the rated voltage.
3 Check to ensure that the power supply has an impedance low enough to guarantee that the starting voltage is at least 85% of the rated voltage.
4 Check to ensure that the ground wire is connected.
5 Connect a fuse of specified capacity.

DANGER

Check to ensure that screws for terminal block are tightly fastened.

CAUTION

- *Protect the wires, drain pipe and electrical parts from rats or other small animals. If not protected, rats may damage unprotected parts, and in the worst case scenario a fire could break out.*
- *Wrap the accessory packing around the wires, and plug the wiring connection hole with the sealing material to protect the product from any condensed water and insects.*
- *Tightly secure the wires with the cord clamp inside the indoor unit.*
- *Lead the wires through the knockout hole in the side cover when using conduit.*
- *Electrical wiring must comply with national and local codes.*
- *Check that the ground wire is securely connected.*

DANGER

- ***Do not connect or adjust any wiring or connections unless the main power switch is OFF.***
- ***Check that the earth wire is securely connected, tagged and locked in accordance with national and local codes.***

NOTE

Please refer to Outdoor and connected device installation manual.

CAUTION

All the field wiring and electrical components must comply with local codes.

9.2 ELECTRICAL WIRING BETWEEN DX-INTERFACE AND INDOOR AND OUTDOOR UNIT

- Connect the electrical wires between the indoor unit and the outdoor unit, as shown in the next diagram.
- Follow the local codes and regulations when performing the electrical wiring.
- Use shielded wires for intermediate wiring to protect the units from noise obstacle at length of less than 300m and size in compliance with local codes.
- In the event that a conduit tube for field-wiring is not used, fix rubber bushes to the panel with adhesive.
- All the field wiring and equipment must comply with local and international codes.
- When a cable gland is not used, it must be sealed properly in order to ensure the correct control box sealing.

CAUTION

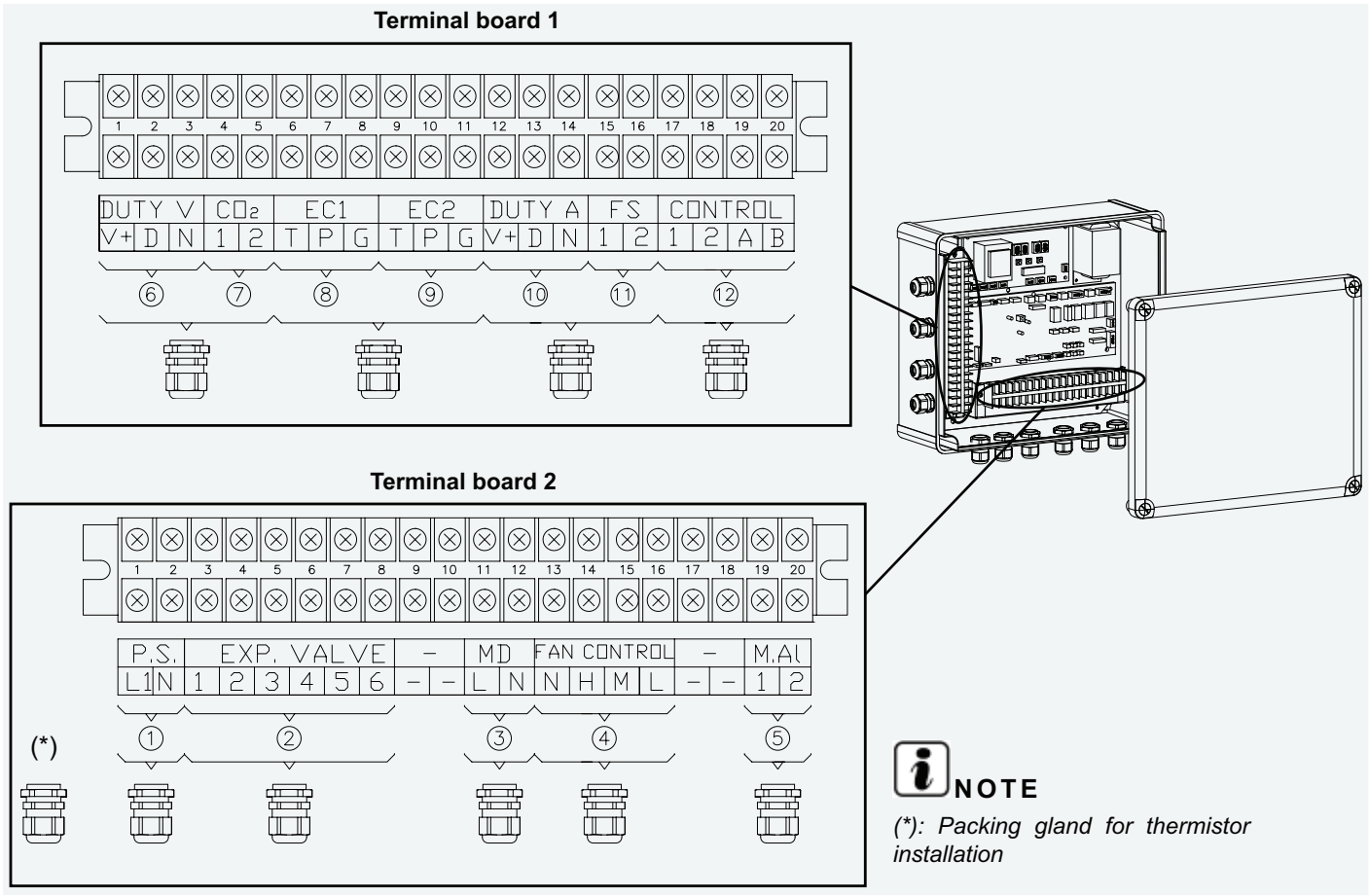
Pay attention to the connection of the operating line. Incorrect connection may cause PCB failure.

NOTE

Packing gland diameter specification: 6.0 mm (min) to 12.0 mm (max). If needed, install additional tube insulation or wind with insulation tape around the wire to make the wire thicker.

9.2.1 Control box terminal board

DX-Interface EXV-(2.0-10.0)E1: Control box

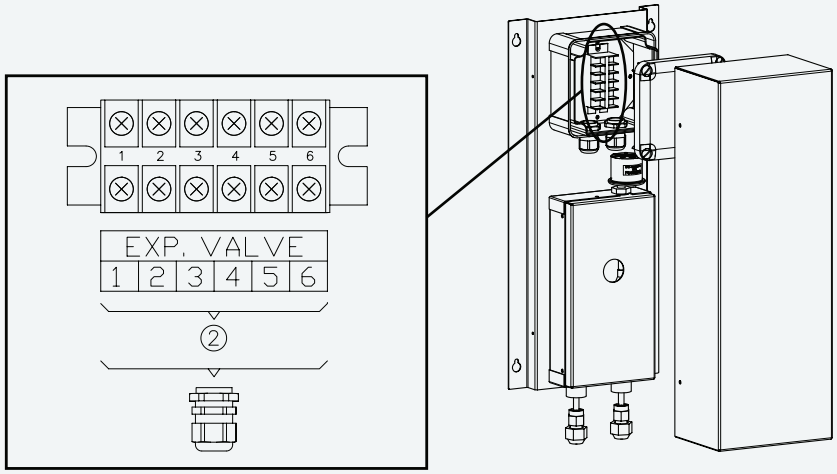


NOTE

(*): Packing gland for thermistor installation

9.2.2 Expansion valve box terminal board

DX-Interface EXV-(2.0-10.0)E1: Expansion valve box



9.2.3 Terminal board connection and remarks

◆ **Control box**

Terminal board 1

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
⑥	1	V+	**DUTY V: Duty control by voltage (0~10V) (0~5V) (optional):** V+: Output power to device (+24Vdc)	Wire section: 3x0,5mm2 Note: Maximum power by 24Vdc output: 3watts
	2	D	D: Voltage input (0~10V) (0~5V)	
	3	N	N: GND	
⑦	4	1	**CO2 signal (optional):** Free contact: By closing the signal, the fan speed is set to High mode.	Wire section: 2x0,5mm2
	5	2		
⑧	6	T	**EC1: PWM Output control for EC FAN 1 (optional):** T: Tach input signal (Hz)	Wire section: 3x0,5mm2 (*1)
	7	P	P: PWM output signal (0-100%)	
	8	G	G: GND	
⑨	9	T	**EC2: PWM Output control for EC FAN 2 (optional):** T: Tach input signal (Hz)	Wire section: 3x0,5mm2 (*1)
	10	P	P: PWM output signal (0-100%)	
	11	G	G: GND	
⑩	12	V+	**DUTY A: Duty control by current (4~20mA) (optional):** V+: Output power to device (+24Vdc)	Wire section: 3x0,5mm2 Note: Maximum power by 24Vdc output: 3watts
	13	D	D: Current input (4~20mA)	
	14	N	N: GND	
⑪	15	1	**FS: Flow switch (optional):** Free contact between terminals 1(15) and 2(16)	Wire section: 2x0,5mm2
	16	2		
⑫	17	1	**CONTROL: H-LINK and remote controller comunication (Necessary):** The H-LINK transmission between outdoor unit and indoor unit is 2 wired to terminals 1-2.	Wire section: 2x0,5mm2
	18	2		
	19	A	The Remote controller must be connected between pins A and B (non polarity)	Wire section: 2x0,5mm2
	20	B		

NOTE

*(*1): If fan wiring length is higher than 3m, use shielded wires in compliance with local codes.*

Terminal board 2

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
①	1	L1	**P.S.: Power supply (necessary):** The mains power supply connection (230 Vac) is wired to terminals L1 and N.	1~230V 50Hz, Max current. 5A Wire section: 3x0,75mm2
	2	N		
②	3	1	**EXP. VALVE: Expansion valve connection (necessary):** Link to expansion valve assembly. Number links from 1 to 6 must match in e-box terminal board and expansion valve terminal board	Wire section: 6x0,5mm2
	4	2		
	5	3		
	6	4		
	7	5		
	8	6		
-	9	-	Not used	-
	10	-		
③	11	L	**MD: Motor Drain discharge (optional):** A drain water pump (field supplied) can be connected to DX-kit interface.	1-230V 50Hz Max current: 1A (output) Wire section: 2x0,75mm2
	12	N		
④	13	N	**FAN CONTROL: Fan tap speed control by HITACHI remote controller (optional):** N-Neutral phase connection (common)	Maximum current allowed: 3,5A Wire section: 4x0,75mm2 (*1)
	14	H	H: High fan speed signal	
	15	M	M: Medium fan speed signal	
	16	L	L: Low fan speed signal	
-	17	-	Not used	-
	18	-		
⑤	19	1	**M. AL: Motor alarm signal:** Alarm input signal can be used for alarm link between the DX-Kit interface and the unit connected. If the jumper between terminal 1 (19) and 2 (20) is open, unit will be switched to alarm condition. Connect again to restart the system	Wire section: 2x0,75mm2 (*2)
	20	2		

NOTE

- *(*1): Locked rotor amperage (LRA) must be lower than 8A.*
- *(*2): Alarm signal with high voltage (1~ 230V 50Hz): Connection in M.AL. terminals is mandatory. In case that motor alarm detection were not necessary, make sure to connect the harness jumper provided with the DX-Interface.*

◆ Expansion valve box

Mark	Item	Name	Description	Wire and maximum current specification (EN60335-1)
②	1	1	**Control connection (necessary):** Link to control assembly. Number links from 1 to 6 must match in expansion valve terminal board and control terminal board.	Wire section: 6x0,5mm2
	2	2		
	3	3		
	4	4		
	5	5		
	6	6		

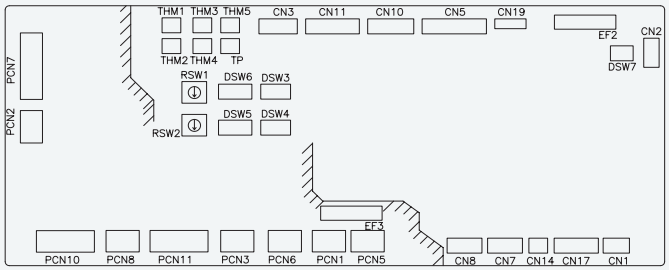
9.3 DIP SWITCH SETTINGS

9.3.1 Quantity and location of Dip Switches

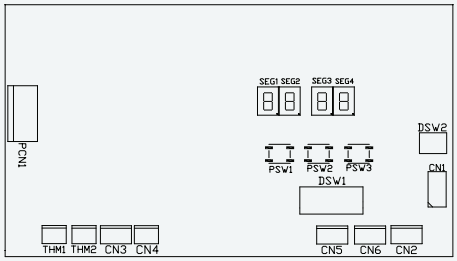
Dips switches are located in printed circuit boards of control box, as it is shown below:

DX-Interface EXV-(2.0-10.0)E1: Control box

PCB1



PCB2



CAUTION

Before setting DIP switches, firstly turn off power source and set the position of the dips switches. If the switches are set without turning off the power source, the contents of the setting are invalid.

◆ **PCB1 settings**

DSW3: Capacity code setting

No setting is required. This DIP switch is used to set the capacity code corresponding to the DX-Interface power (HP).

HP	2.0	2.5	3.0	4.0
Factory setting				
HP	**5.0**	**6.0**	**8.0**	**10.0**
Factory setting				

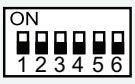
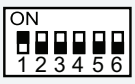
DSW4: Unit model code setting and optional setting

No setting is required.

Factory setting	
Enabled EC fan motor alarm by tach input (Set pin 4 to ON position)	

DSW5 and RSW2: Refrigerant cycle no. setting

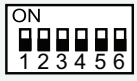
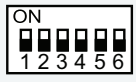
Setting is required. This switch is used to set the refrigerant cycle number.

Refrigerant cycle number example	DSW5		RSW2
00 (Factory setting)		+	
16			

DSW6 and RSW1: Unit no. setting

Set DSW6 and RSW1 to modify the indoor unit address. The setting must be made so that it does not overlap the setting of other indoor units in the same refrigerant cycle. If the setting is not made manually, the automatic address function will be enable.

Set to a value of up to 63.

Unit number example	DSW6		RSW1
00 (Factory setting)		+	
06			

DSW7 switch: Fuse recovery

No setting is required.

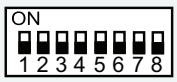
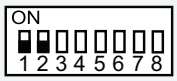
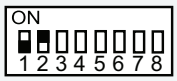
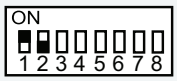
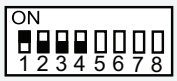
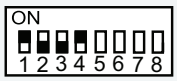
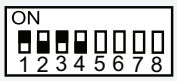
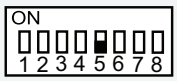
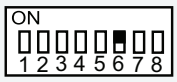
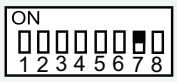
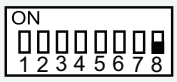
Factory setting	
Fuse recovery (*1)	

NOTE

- *(*1): In case of applying high voltage to the terminals 1 and 2 of control connection (items 17 and 18 of TB2) the fuse on the PCB1 is cut. In such a case, firstly correct the wiring to TB1 and then turn ON the pin 1.*
- *The mark ■ indicates position of dips switches. Figures show setting before shipment or after selection.*

◆ **PCB2 settings**

DSW1: Optional functions

Factory setting		
Pins 1 and 2: Capacity control setting	Discharge air control (Control by outlet temperature)	
	Indoor air control (Control by inlet temperature)	
	External duty control (*1)	
Pins 3 and 4: Duty signal setting (*1)	4~20 mA	
	0~10 V	
	0~5 V	
Pin 5: Not used		
Pin 6: Thermo ON/OFF external input enabled (*2)		
Pin 7: Common operation of remote control switch		
Pin 8: Not used		

NOTE

*(*1): If external duty control is selected (pins 1-2), check the proper selection for the duty signal (pins 3-4).*

*(*2): The thermo ON/OFF control can be driven externally by an input signal connected to the CN3 socket of the PCB1. The pin 6 of DSW1 in PCB2 must be switched on, then the input "i1" of CN3 is automatically set for thermo ON/OFF control. The setting of input "i2" is kept as set on the remote controller.*

Please refer to Hitachi Indoor units Service Manual for further information about the setting and connection of the auxiliary inputs.

CAUTION

If there is an indoor unit connected in the same RCS line as DX-Interface EXV-(2.0-10.0)E1 or KPI-(E/H/X)3E, then pin 7 must be ON to disable the power supply to RCS line. If there is no indoor unit connected to the same RCS line but there are more than one DX-Interface EXV-(2.0-10.0)E1 or KPI-(E/H/X)3E, then only one DX-Interface EXV-(2.0-10.0)E1 or KPI-(E/H/X)3E should have pin 7 OFF while all other units must have pin 7 set to ON. Failure to perform this setting correctly will result in bad communication and can even cause physical damage to the PCB.

DSW2: End resistance

No setting is required.

All units