

New Products Information

Distributed to √ Areas:

All Areas		Oceania	√	Europe	√
China		India	√	NA	
ASEAN and Others	√	ME	√	LA	
Taiwan		Africa	√	Brazil	
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Launching of New DX-Kit for General AHU Connection

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Summary

1. This Technical Bulletin provides information on the New DX-Kit.
2. New DX-Kit is an interface to allow connection of AHU (Air Handling Unit) and JCH VRF for cooling and heating applications.
3. The details are indicated in the description.

Description

1. Applicable Models

Product Name	Capacity	Model Name	Nominal Heat Exchanger Capacity of AHU	Model Code	Power Source	Production Site	Start of Delivery
DX-Kit	2HP	DXF-2.0A1	2HP	JKHF3400000600	1PH/220-240V/50Hz, 1PH/220V/60Hz	HAPQ	September 15th, 2019
	4HP	DXF-4.0A1	4HP	JKHF3400000700			
	6HP	DXF-6.0A1	6HP	JKHF3400000800			
	10HP	DXF-10.0A1	8HP	JKHF3400000900			
			10HP				
	20HP	DXF-20.0A1	12HP	JKHF3400001000			
			14HP				
			16HP				
			18HP				
			20HP				
	30HP	DXF-30.0A1	22HP	JKHF3400001200			
			24HP				
			26HP				
			28HP				
			30HP				

< Schedule >

- Start of Order: July 30th, 2019
- Start of Delivery: September 15th, 2019

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2. Feature

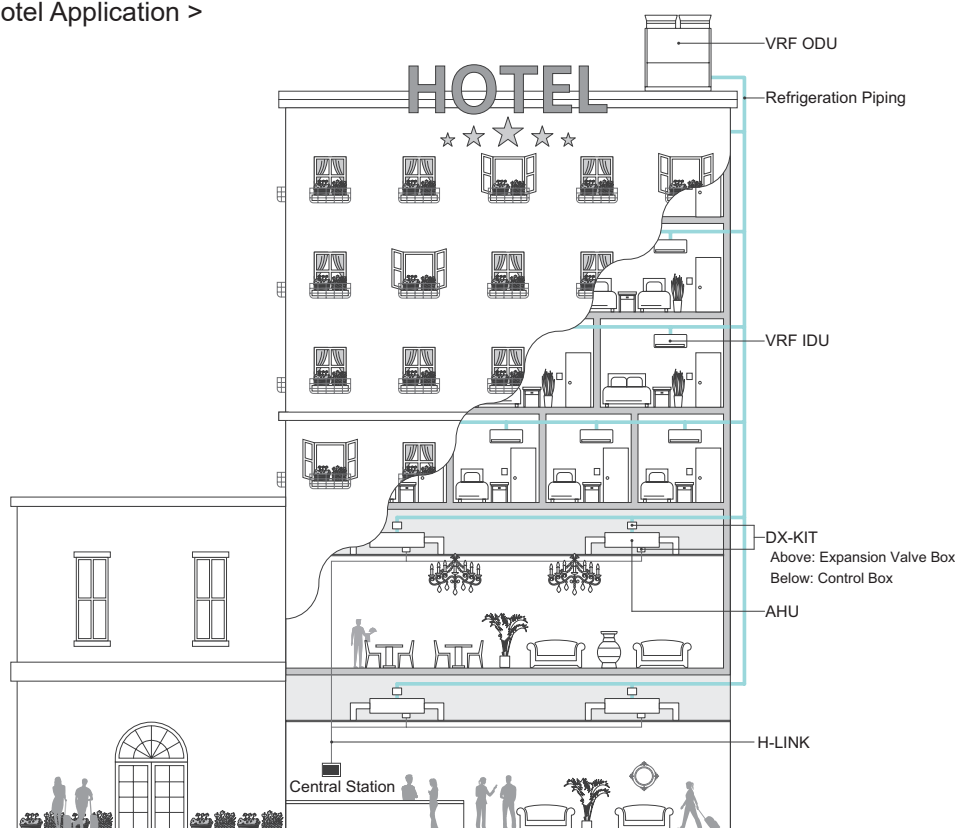
- (1) Enable combination of VRF system and large capacity AHU.
- (2) Enable to correspond to custom requirement along with customer's specific project with combination of VRF and AHU.
- (3) Connection with 2nd Generation VRF outdoor unit is available.
- (4) CE certified to EN60335-1, 60335-2-40, 62233, 55014-1, 61000-3-2, 61000-3-3 and 55014-2.
- (5) Provide outlet air temperature control, inlet air (room air) temperature control and duty control. Please refer to page 8 for the detail.
- (6) Compatible with AHU including return air type, return air/fresh air mixing type and heat recovery type.
- (7) Compatible with central controller.
- (8) The control box protection IP54 shall be installed to indoor unit or outdoor unit.
Flexible installation for expansion valve box.
- (9) Suitable for complex facility, hotel, hospital, school and etc.

NOTE:

Duty control must be understood as a demand control, which signal is provided by an external Direct Digital Controller (DDC).

The system capacity is fixed by an external input, which can be either a free voltage signal (0~10V or 0~5V) or a current signal (4~20mA).

< Example of Hotel Application >



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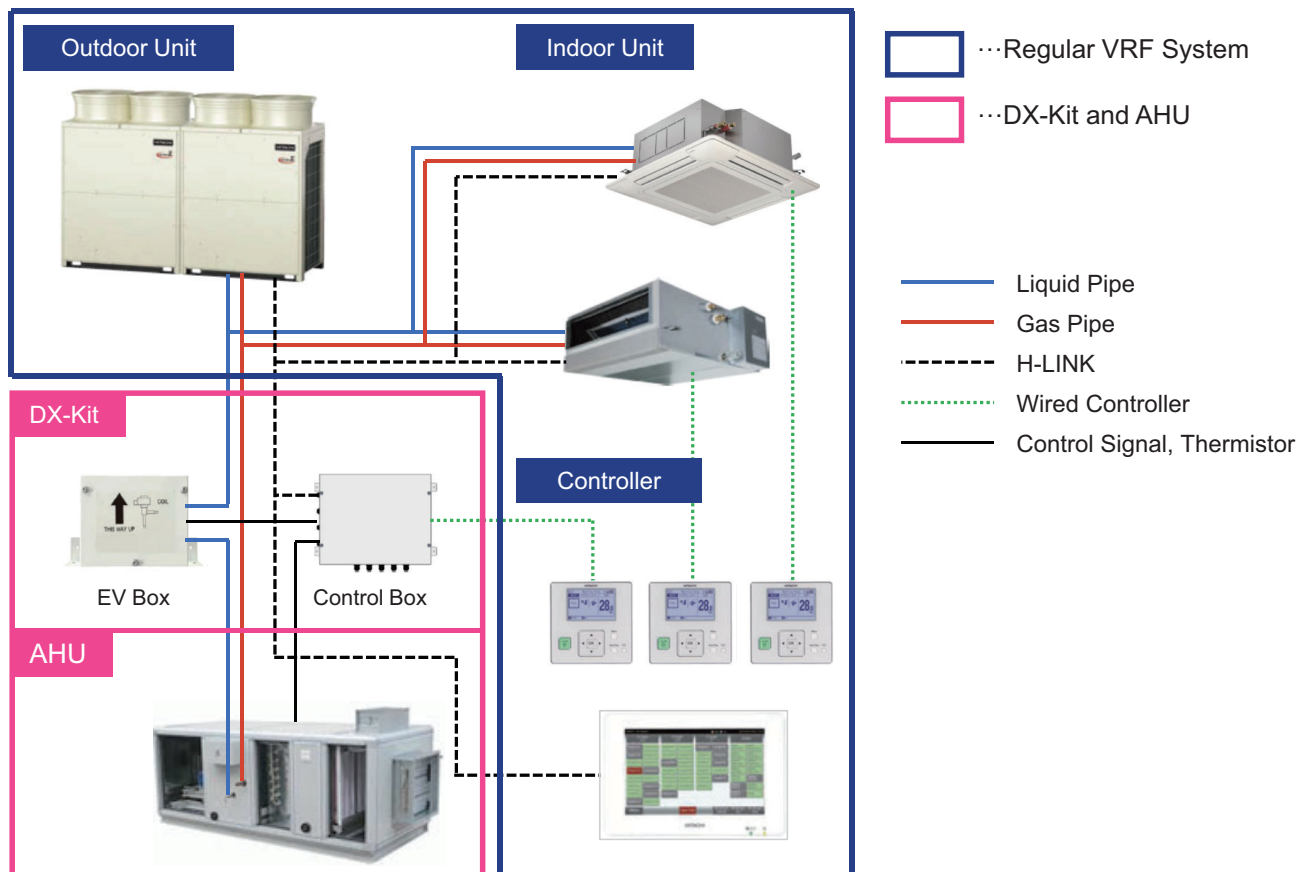
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3. System Configuration



DX-Kit (Direct Expansion Kit)

- Consist of Expansion Valve Box and Controller Box utilized to connect VRF system and AHU

AHU (Air Handling Unit)

- Local Supply Unit (3rd party product)

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4. Connectivity between ODU, Controller and New DX-Kit

HP: Heat Pump, HR: Heat Recovery, CO: Cooling Only

No	Category	Manuf.	Series	Model Name
1	ODU	SMZ	2nd Generation (HP/HR, High Efficiency)	RAS-FSNP/FSXNP
2			2nd Generation (HP/HR, Standard)	RAS-FSNS/FSXNS
3			1st Generation (HP and HR, for High Ambient)	RAS-FSXNHT
4		HAPQ	1st Generation (HR)	RAS-FSXNQ
5			2nd Generation (HP, High Efficiency)	RAS-HNBQ
6			2nd Generation (HP, Standard)	RAS-HNCQ
7			2nd Generation (CO)	RAS-CNCQ
8			2nd Generation (HP, for High Ambient)	RAS-JBBQ
9			1st Generation	RAS-FSXNYWQ (change to export)
10		JCH-ES	2nd Generation (HP/HR, High Efficiency)	RAS-FSNPE/FSXNPE
11			2nd Generation (HP/HR, Standard)	RAS-FSNSE/FSXNSE
12	Controller for DX-Kit		for SMZ ODU	PC-ARF1
13			for JCH-ES ODU	PC-ARFP1E
14	Controller		for HAPQ ODU	HCWA10NEGQ
15		HAPQ	86x86 Wired	HCWA10NEGQ
16		SMZ	Advanced Wired	PC-ARF1 PC-ARFP1E
17		SMZ	Wireless	PC-AWR
18		HAPQ	Wireless	PC-LH3A
19		HAPQ	IR for Others IDU	PC-RLH11
20		SMZ		PC-ALHZ1
21		SMZ	IR for 4-Way Cassette IDU	PC-ALH3
22		HAPQ		HR4A10NEWQ
23		SMZ	IR for 2-Way Cassette IDU	PC-ALHD1
24		SMZ	IR for 1-Way Cassette IDU	PC-ALHS1
25		SMZ	IR for Ceiling Suspended IDU	PC-ALHP1
26		SMZ	IR for mini Cassette IDU	PC-ALHC1
27		SMZ	Half size	PC-ARH1 PC-ARH1E
28		SMZ	On/Off Controller	PSC-A16RS
29		SMZ	Timer	PSC-A1T
30		SMZ	Central Station	PSC-A64S
31		SMZ	Central Station Mini	PSC-A32MN
32		SMZ	Central Station EZ	PSC-A64GT
33		SMZ	Central Station EX	PSC-A128EX
34		SMZ	Central Station EX Extension adapter	PSC-AD128EX
35		SMZ	Central Station EX Calculation Software	PSC-AS01EXC
36		SMZ	BACnet *	HC-A64BNP1
37		SMZ	Lonworks	HARC70PE1
	JCH-ES	CS-NET **	HC-A64NET	

NOTE:

* Please contact distributor or installer with respect to BMS.

** Only for EU Market

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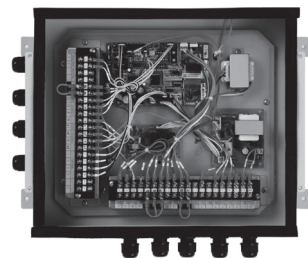
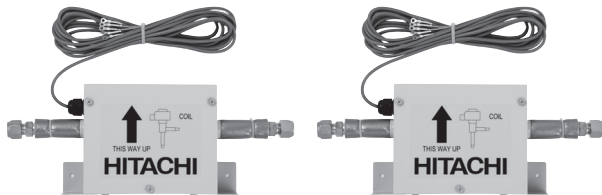
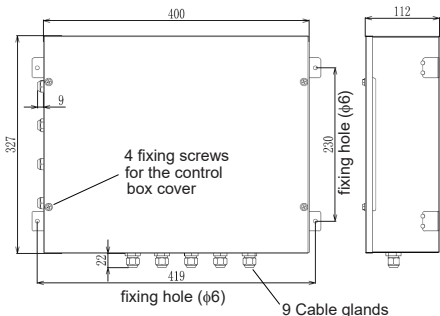
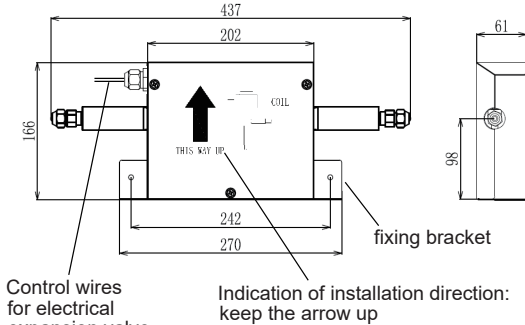
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5. Appearance and Dimensional Drawings of Control Box and Expansion Valve

	Control Box	Expansion Valve
Appearance	< for DXF-2.0~30.0A1 >   The top view is shown when removing the control box cover.	< for DXF-2.0~20.0A1 >  < for DXF-30.0A1 > 
Dimensional Drawing	Unit: mm  400, 327, 112, 200, 419, 9 Cable glands, fixing hole (φ6), 4 fixing screws for the control box cover	Unit: mm  437, 202, 61, 98, 242, 270, 166, COIL, THIS WAY UP, fixing bracket, Control wires for electrical expansion valve, Indication of installation direction: keep the arrow up

Accessory

Accessory	Qty	Purpose
Thermistor 	4	For Temperature of Sensing of Outlet Air (red, 10m) Inlet Air (blue, 10m) Liquid Pipe (black, 10m) Gas Pipe (yellow, 10m)
Installation and Operation Manual 	1	For Instructions and Important Notice

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

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6. Selection and Limitation of Heat Exchanger of AHU

DX-Kit Model	Nominal Heat Exchanger Capacity of AHU	Capacity Code Setting (DSW3)	Allowed Heat Exchanger Capacity (kW) *				Heat Exchanger Volume (dm ³)	
			Mode	Min	Nom	Max	Min	Max
DXF-2.0A1	2HP	 ON OFF	Cooling Heating	4.0 4.5	5.0 5.6	5.6 7.1	0.57	1.16
DXF-4.0A1	4HP	 ON OFF	Cooling Heating	7.1 8.0	9.0 10.0	11.2 12.5	1.03	2.37
DXF-6.0A1	6HP	 ON OFF	Cooling Heating	11.2 12.5	14.0 16.0	16.0 18.0	1.92	2.92
DXF-10.0A1	8HP	 ON OFF	Cooling Heating	16.0 17.9	20.0 22.4	22.4 25.0	2.92	3.89
	10HP	 ON OFF	Cooling Heating	20.0 22.4	25.0 28.0	28.0 31.5	3.89	4.76
DXF-20.0A1	12HP	 ON OFF	Cooling Heating	28.0 31.5	30.0 33.5	33.5 37.5	4.76	5.91
	14HP	 ON OFF	Cooling Heating	33.5 37.5	35.0 40.0	40.0 45.0	5.85	6.89
	16HP	 ON OFF	Cooling Heating	40.0 45.0	43.0 47.5	45.0 50.0	6.79	8.00
	18HP	 ON OFF	Cooling Heating	45.0 50.0	48.0 53.0	50.0 56.0	7.57	8.92
	20HP	 ON OFF	Cooling Heating	50.0 56.0	52.0 60.0	56.0 63.0	8.47	9.97
DXF-30.0A1	22HP	 ON OFF	Cooling Heating	50.0 63.0	58.0 66.0	61.5 69.0	9.04	11.13
	24HP	 ON OFF	Cooling Heating	61.5 69.0	65.0 75.0	69.0 77.5	9.50	12.34
	26HP	 ON OFF	Cooling Heating	69.0 77.5	71.0 79.0	73.0 82.5	10.39	12.89
	28HP	 ON OFF	Cooling Heating	73.0 82.5	76.0 86.0	80.0 90.0	11.39	13.86
	30HP	 ON OFF	Cooling Heating	80.0 90.0	82.0 92.0	85.0 95.0	12.36	14.73

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

		Cooling *	Heating *
Indoor Air Inlet Temp.	DB	27.0°C	20.0°C
	WB	19.0°C	—
Outdoor Air Inlet Temp.	DB	35.0°C	7.0°C
	WB	—	6.0°C

DB: Dry Bulb, WB: Wet Bulb
Piping Length: 7.5m, Piping Height: 0m

*Cooling:

1. Evaporation Temperature: 7°C
2. Superheat (SH): 5K
3. Pressure drop of refrigerant flow in Heat Exchanger: Max. 0.15MPa

*Heating:

1. Condensation temperature: 47°C
2. Supercool (SC): 15K
3. Pressure drop of refrigerant flow in Heat Exchanger: Max. 0.06MPa

NOTE:

When select AHU, the Heat Exchanger capacity and volume shall be within the range in the table above.

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7. General Specifications

Cap+B2:l22acity		2HP	4HP	6HP	8/10HP	12~20HP	22~30HP
DX-Kit Model name		DXF-2.0A1	DXF-4.0A1	DXF-6.0A1	DXF-10.0A1	DXF-20.0A1	DXF-30.0A1
Control box	Power Supply	AC1φ, 220-240V 50Hz, 220V 60Hz					
	H(mm)	112					
	W(mm)	435					
	D(mm)	349					
	Weight(kg)	5.2					
	Material	Steel Plate + White Grey Coating					
EXV box	H(mm)	61					
	W(mm)	437					
	D(mm)	166					
	Weight(kg)	1.7					
	EXV nos.	1					2
	Material	Steel Plate + White Grey Coating					
AHU Suction Temperature Range	Cooling	21°C to 32°C (DB) / 15°C to 23°C (WB)					
	Heating	15°C to 27°C (DB)					
Connection Ratio *		• 1 ODU to 1 AHU: ≤ 100% • 1 ODU to 1 AHU (Separate Type HEX): ≤ 100% • 1 ODU to Multiple AHU: ≤ 100% • 1 ODU to AHU and VRF IDUs: ≤ 110%					
Maximum Total Pipe Length		• If the number of indoor unit connected in the system is the same or less than recommended: 1,000m • If the number of indoor unit connected in the system is more than recommended: 300m					
Height Difference between Outdoor Unit and Indoor Unit		When outdoor unit over indoor unit: 50m When outdoor unit under Indoor unit: 40m					
Maximum Pipe Length between AHU and DX-Kit		5m					
Maximum Hight Difference between AHU and DX-Kit		2m					
Thermistor Length		10m					
Temperature Control **		Inlet Air Temperature Control, Outlet Air Temperature Control, Duty Control					

* Refer to the Section 8 "Connection Ratio" for the detail.

** Refer to the Section 9 "Temperature Control" for the detail.

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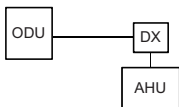
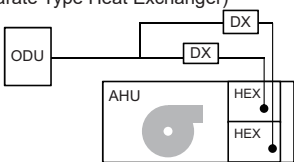
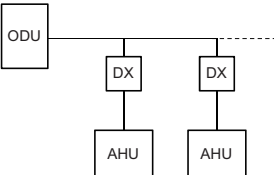
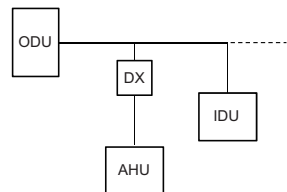
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8. Connection Ratio

Connection Pattern	AHU Inlet Temperature Range Cooling: 21°CDB/15°CWB ~ 32°CDB/23°CWB Heating: 15°CDB ~ 27°CDB												
	Inlet Temperature Control	Outlet Temperature Control	Duty Control										
1 Outdoor Unit: 1 AHU 	50% < Connection Ratio against ODU ≤ 100%	Same as Left	Same as Left										
1 Outdoor Unit: 1 AHU (Separate Type Heat Exchanger) 	50% < Connection Ratio against ODU ≤ 100% - All the AHU HEXs shall be the same capacity. - Max. number of DX-Kit connectable: 5 - Max. capacity of AHU: 96HP	Same as Left	Same as Left										
1 Outdoor Unit: Multiple AHU 	50% < Connection Ratio against ODU ≤ 100% - Different capacity AHUs can be connectable. - Min. capacity of AHU: <table><tr><th>Max. Capacity of Single AHU in system</th><th>Min. indoor unit capacity or Min. AHU capacity in a system</th></tr><tr><td>32 to 60 HP</td><td>4.0 HP</td></tr><tr><td>62 to 90 HP</td><td>6.0 HP</td></tr></table>	Max. Capacity of Single AHU in system	Min. indoor unit capacity or Min. AHU capacity in a system	32 to 60 HP	4.0 HP	62 to 90 HP	6.0 HP	N/A	N/A				
Max. Capacity of Single AHU in system	Min. indoor unit capacity or Min. AHU capacity in a system												
32 to 60 HP	4.0 HP												
62 to 90 HP	6.0 HP												
1 Outdoor Unit: AHU/IDUs 	< If max connection ratio against ODU is 50 to 100% > - AHU Capacity : No Limitation - Allowable AHU capacity in the system (if multiple AHUs are connected in a system): No Limitation - Min. Indoor Unit Capacity (If multiple Indoor Units are connected in a system): <table><tr><th>Max. Capacity of Single AHU in system</th><th>Min. indoor unit capacity or Min. AHU capacity in a system</th></tr><tr><td>12 to 20 HP</td><td>0.8 HP</td></tr><tr><td>22 to 30 HP</td><td>2.0 HP</td></tr><tr><td>32 to 60 HP</td><td>4.0 HP</td></tr><tr><td>62 to 90 HP</td><td>6.0 HP</td></tr></table> < If max. connection ratio against ODU is more than 100 to 110% > - Total AHU Capacity: 30% or low lower than ODU capacity. - Allowable AHU capacity in a system (if multiple AHUs are connected in a system): 2HP - 6HP	Max. Capacity of Single AHU in system	Min. indoor unit capacity or Min. AHU capacity in a system	12 to 20 HP	0.8 HP	22 to 30 HP	2.0 HP	32 to 60 HP	4.0 HP	62 to 90 HP	6.0 HP	N/A	N/A
Max. Capacity of Single AHU in system	Min. indoor unit capacity or Min. AHU capacity in a system												
12 to 20 HP	0.8 HP												
22 to 30 HP	2.0 HP												
32 to 60 HP	4.0 HP												
62 to 90 HP	6.0 HP												

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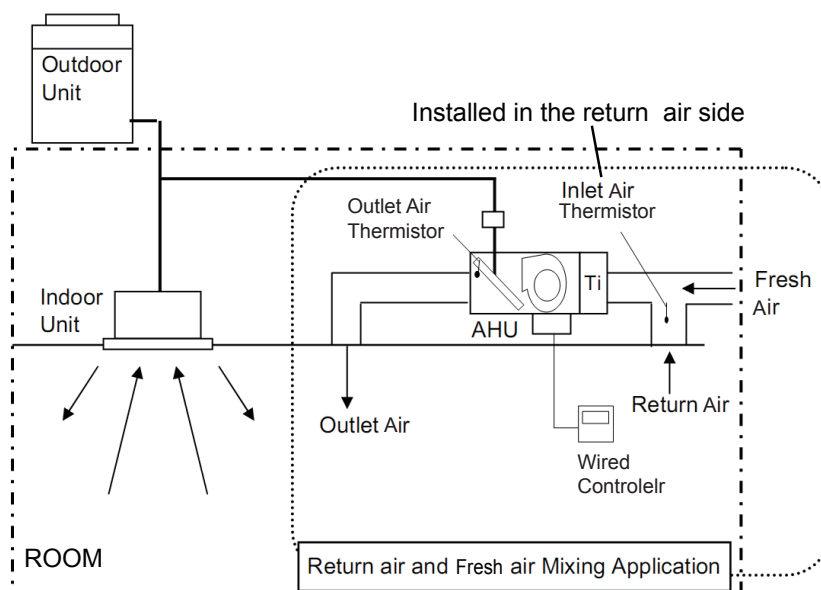
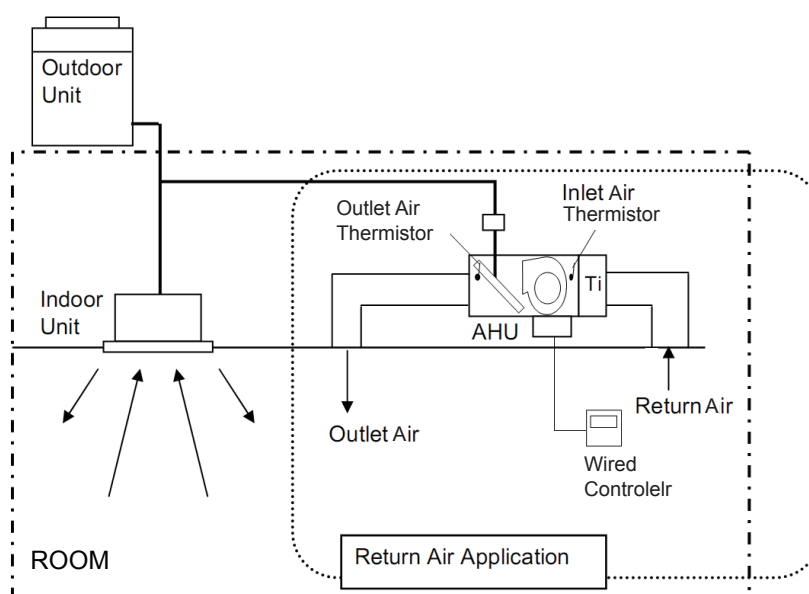
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9. Temperature Control

(1) Inlet Air (Room Air) Temperature Control

- Capacity Control: For controlling inlet air (room air) temperature, capacity is adapted so that detection temperature of inlet air (room air) reaches the set temperature by wired controller.
- Thermo-OFF Control: When thermistor detect inlet air (room air) temperature reaches the set temperature by wired controller, the operation becomes Thermo-OFF.



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(2) Outlet Air Temperature Control

- Capacity Control: For controlling the outlet air temperature, the capacity is adapted so that detection temperature of outlet air of AHU reaches the correction temperature of the set temperature for outlet air by wired controller.

The correction temperature of the set temperature for outlet air by 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: -6°C (factory setting: 00)

b1: +4°C (factory setting: 00)

bb: -4°C (set by wired controller: 01)

b1: 0°C (set by wired controller: 01)

bb: -2°C (set by wired controller: 02)

b1: +2°C (set by wired controller: 02)

- Thermo-OFF Control: When thermistor detect inlet air temperature reaches corrected set temperature on 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

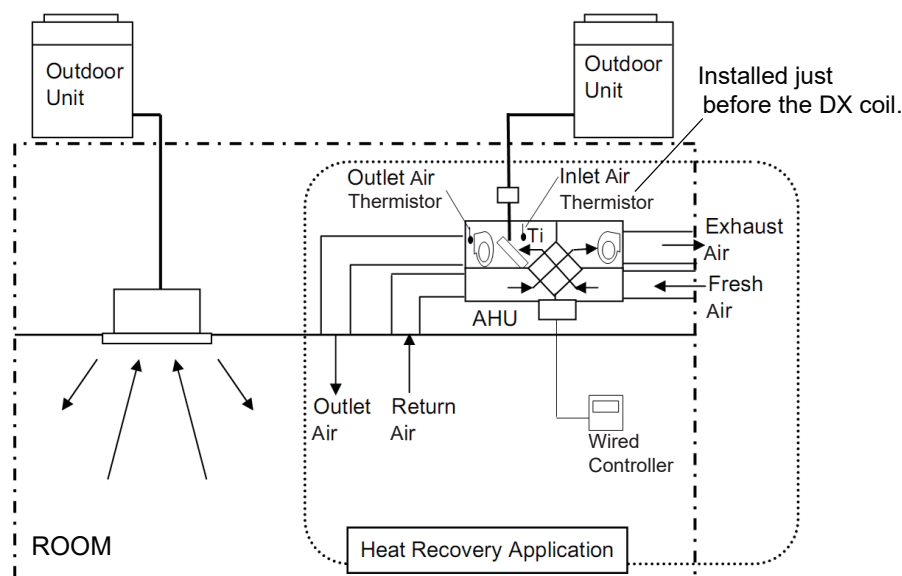
Heating: the set temperature on wired controller + b1 - CF

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

CF: 0°C (factory setting: 00)

CF: 2°C (set by wired controller: 01)

CF: 5°C (set by wired controller: 02)



NOTE:

Wired controller HCWA10NEGQ does not support this control.

Please use another controller when using this function.

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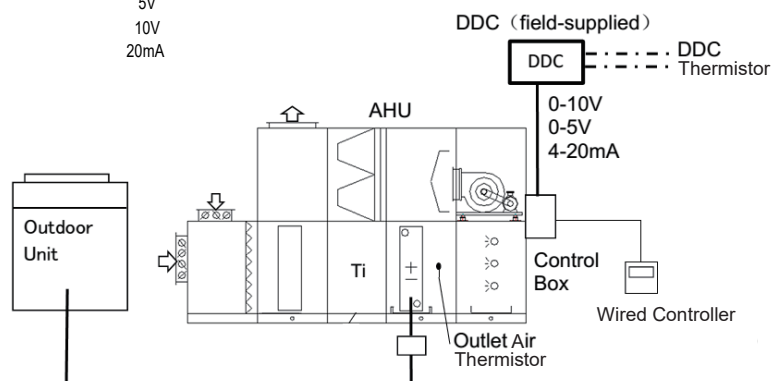
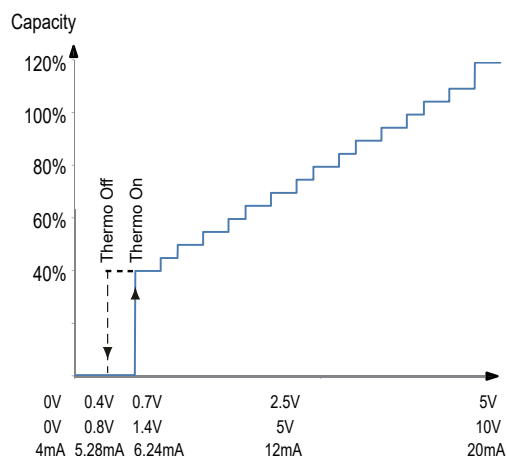
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(3) Duty Signal Control

- **Capacity Control:** The capacity of outdoor unit is fixed by 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 DX-Kit. The capacity of outdoor unit depends on the signal strength.
- **Thermo-OFF Control:** If the system is controlled by 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 will be turned to thermo-OFF. When the duty signal becomes higher than 14% of the full range, the system will be turned 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	4.1V	4.4V	4.7V
	(0-10V)	5.2V	5.6V	6.2V	6.6V	7.2V	7.8V	8.2V	8.8V	9.4V
	(4-20mA)	12.32mA	12.96mA	13.92mA	14.56mA	15.52mA	16.48mA	17.12mA	18.08mA	19.04mA
Capacity (% of Normal)		75%	80%	85%	90%	95%	100%	105%	110%	120%



NOTE:

Wired controller HCWA10NEGQ does not support this control.

Please use another controller when using this function.

New Products Information

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All Areas		Oceania	√	Europe	√
China		India	√	NA	
ASEAN and Others	√	ME	√	LA	
Taiwan		Africa	√	Brazil	
NOTE ()					

HITACHI**TECHNICAL
BULLETIN**

Launching of New DX-Kit for General AHU Connection

DATE: Jun.'19**PAGE:** 12/12**10. Installation**

- Refer to the Installation Manual of DX-Kit for the detail of DX-Kit installation, Thermister installation, other installation and Piping connection.
- Be sure to attach interlock for AHU protection.

11. Warranty and Disclaimer

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