

VRF DX COIL INTERFACE

MODEL NAME

Dx-coil controller

TCB-IFDMX01UP-E

(Terminal block without relay)

TCB-IFDMR01UP-E

(Terminal block with relay)

Dx-valve kit

RBM-A101UPVA-E

RBM-A201UPVA-E



Design Guideline

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1. Application

The VRF Dx-coil Interface comes with DX-coil Controller which has 3 types of application (DDC type,TA type,TF type) . Application types can be set and enable system to response according to the application.

- TA type :(Main application target – Air conditioning by Room air temperature (TA) control)
The VRF Dx-coil Interface (TA type) enables TA control of Toshiba Outdoor units connected to a DX COIL (with a field supplied AHU).
- DDC type :(Main application target - Air conditioning and/or Ventilation with external thermostat.)
The VRF Dx-coil Interface (DDC type) enables BMS capacity demand control of Toshiba Outdoor units connected to a DX COIL (with a field supplied AHU).
- TF type :(Main application target – Ventilation with discharge air temperature (TF) control)
The VRF Dx-coil Interface (TF type) enables TF control of Toshiba Outdoor units connected to a DX COIL (with a field supplied AHU).

Settings for each type (TA, TF, DDC)

Set with the SW501 switch on the control P.C. board MCC-1777.



TA type : SW501 all Bit=OFF

TF type : SW501 Bit2=ON

DDC type (0-10V) Stepped Control : SW501 Bit3=ON

DDC type (0-10V) Linear Control : SW501 Bit3, Bit 4 = ON

SW501 : type setting

	Bit1	Bit2	Bit3	Bit4
TA type	OFF	OFF	OFF* ¹	OFF
TF type	OFF	ON	OFF* ¹	OFF
DDC type (Stepped AI)	OFF	not used	ON* ²	OFF
DDC type (Liner AI)	OFF	not used	ON* ²	ON

*1 : When Bit3 is OFF, type depends on the Bit2 setting.

*2 : When Bit3 is ON, Bit2 setting is not reflected but DDC (0-10V) Type is selected .

Product	Model name	Capacity	HP
Dx-coil controller	TCB-IFDMX01UP-E (Terminal block without relay)	22.4kW , 28.0kW , 33.5kW ,40.0kW , 45.0kW , 50.4kW , 56.0kW	8 , 10 , 12 , 14 , 16 , 18 , 20
	TCB-IFDMR01UP-E (Terminal block with relay)	61.5kW~336.0kW will be in form of combinations.	22~120 in combinations.
Dx-valve kit	RBM-A101UPVA-E	22.4kW , 28.0kW , 33.5kW	8 , 10 , 12*
	RBM-A201UPVA-E	40.0kW , 45.0kW , 50.4kW , 56.0kW	14* , 16 , 18 , 20

* 12HP , 14HP designed to connect with SMMS-u, SMMS[∞] only.

2. System compatibility, Overview

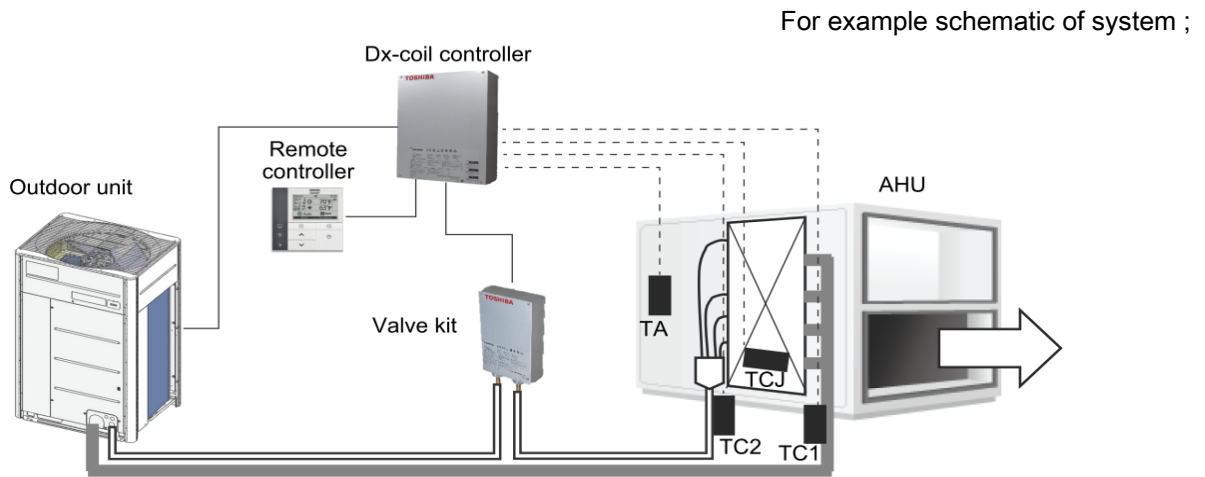
Outdoor Unit

Type	SMMS-u	SMMS ∞	SMMS-7	SMMS-e	SHRM-e
(communication)	(TU2C-LINK or TCC LINK)		(TCC-LINK)		
TA type	○60-110%				
DDC type	○75-100%				×
TF type	○80-100%		×	×	×

- SMMS-u Heat Pump Model (MMY-MUP***1HT8*P* / MMY-MUP***1HT7*P*)
- SMMS ∞ Cooling Only Model (MMY-MUP***1T8*P* / MMY-MUP***1T7*P)
- SMMS-7 Model (MMY-MAP***7T8*P* / MMY-MAP***7T7*P)
- SMMS-e Heat Pump Model (MMY-MAP***6HT8*P* / MMY-MAP***6HT7*P*)
- SMMS-e Cooling Only Model (MMY-MAP***6T8*P* / MMY-MAP***6T7*P)
- SHRM-e (MMY-MAP***6FT8*P* / MMY-MAP***6FT7*P*) (8 HP, 10 HP only)

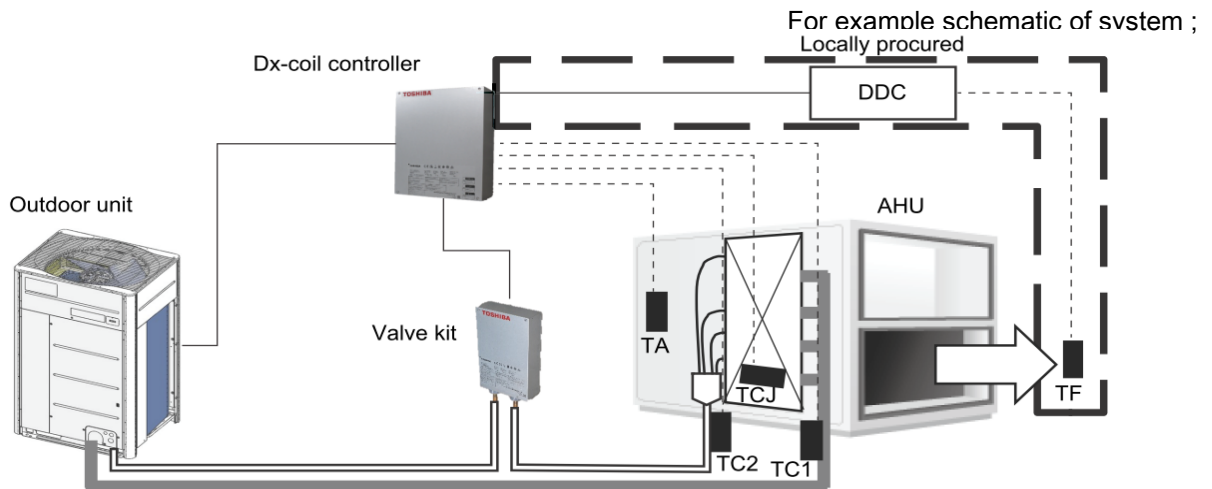
TA type

- Diversity
 - 60% - 110%
- Overview



DDC type (1 : 1 only)

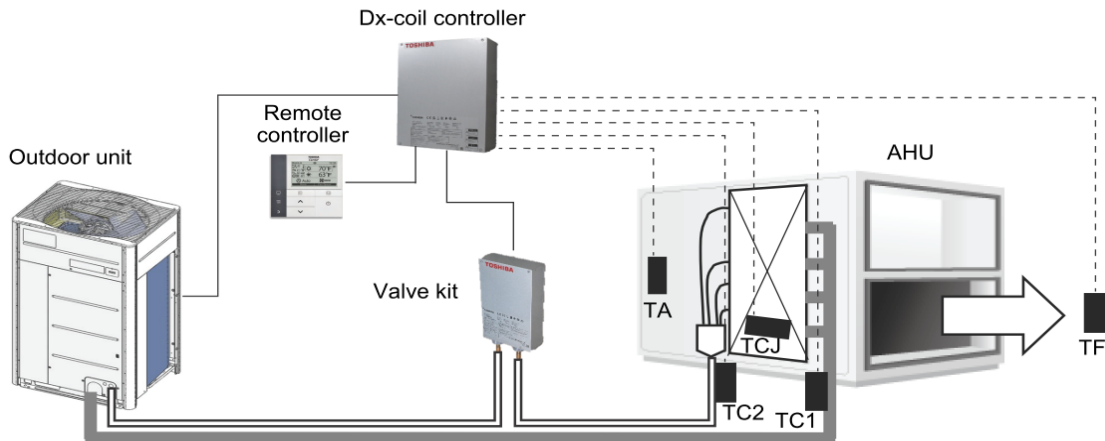
- Diversity
 - 75% - 100%
- Overview



TF type(1 : 1 only)

- Diversity
 - 80% - 100%
- Overview

For example schematic of system ;



3. Operating conditions

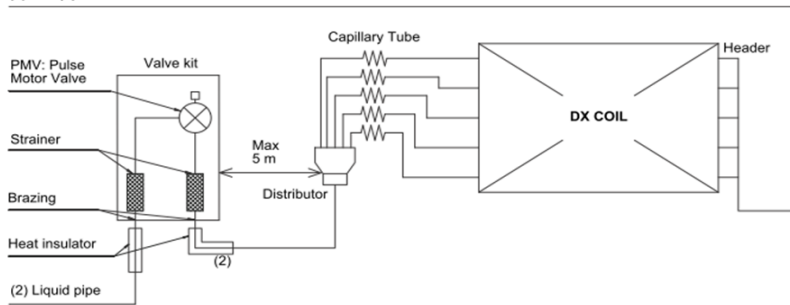
	<p>Ensure the "Coil on Air" temperature is within the range of the Dx-coil design guideline.</p> <table border="1" data-bbox="1141 974 1460 1187"> <tr> <td>OA</td> <td>Outdoor Air</td> </tr> <tr> <td>SA</td> <td>Supply Air</td> </tr> <tr> <td>CA</td> <td>Coil on Air (After Heat Recovery Exchanger)</td> </tr> <tr> <td>RA</td> <td>Return Air</td> </tr> <tr> <td>EA</td> <td>Exhaust Air</td> </tr> </table> <table border="1" data-bbox="343 1220 1348 1422"> <thead> <tr> <th rowspan="2">AHU</th> <th rowspan="2">HP (TA) (Heating & Cooling)</th> <th colspan="2">Cooling Only*</th> <th rowspan="2">HP (TF) (Heating & Cooling)</th> </tr> <tr> <th>Pattern A</th> <th>Pattern B</th> </tr> </thead> <tbody> <tr> <td>Control</td> <td></td> <td colspan="2">TA or DDC</td> <td>TF or DDC</td> </tr> <tr> <td>Cooling mode "Coil on Air" temp.</td> <td>15 - 24 °C WB (18 - 32 °C DB)</td> <td>15 - 24 °C WB (18 - 32 °C DB)</td> <td>15 - 32 °C WB (18 - 43 °C DB)</td> <td>10 - 32 °C WB (19 - 46 °C** DB)</td> </tr> <tr> <td>Heating mode "Coil on Air" temp.</td> <td>12 - 28 °C DB (Pull down to 7 °C)</td> <td>---</td> <td>---</td> <td>- 10 - 15 °C DB</td> </tr> </tbody> </table> <p>*Outdoor unit model or select cooling only mode with HP model **Outdoor/Suction air temp. 46 - 52 °C(DB) is also available but Temporarily operatable.</p> <p>Note: If intake air temperature is out of range of the specification, the damage for the system may be caused.</p>	OA	Outdoor Air	SA	Supply Air	CA	Coil on Air (After Heat Recovery Exchanger)	RA	Return Air	EA	Exhaust Air	AHU	HP (TA) (Heating & Cooling)	Cooling Only*		HP (TF) (Heating & Cooling)	Pattern A	Pattern B	Control		TA or DDC		TF or DDC	Cooling mode "Coil on Air" temp.	15 - 24 °C WB (18 - 32 °C DB)	15 - 24 °C WB (18 - 32 °C DB)	15 - 32 °C WB (18 - 43 °C DB)	10 - 32 °C WB (19 - 46 °C** DB)	Heating mode "Coil on Air" temp.	12 - 28 °C DB (Pull down to 7 °C)	---	---	- 10 - 15 °C DB
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Heating mode "Coil on Air" temp.	12 - 28 °C DB (Pull down to 7 °C)	---	---	- 10 - 15 °C DB																													
Outdoor unit	Refer to specification of outdoor unit																																

4. Pipe Size

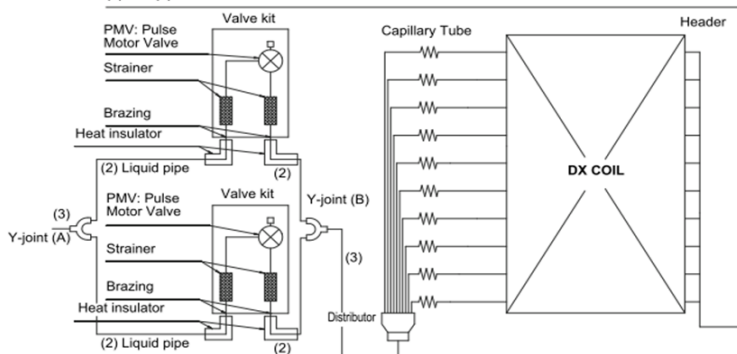
- Maximum real piping length between valve kit and Dx coil is up to 5 m.

Outdoor Unit Capacity	Pipe diameter			
	(1) Gas pipe	(2) Liquid pipe	(3) Liquid Pipe	
8	Ø 19.1	Ø 12.7	/	
10	Ø 22.2			
12	Ø 28.6			
14~18		Ø 15.9		
20				
22		Ø 19.1		
24~26	Ø 34.9			
28~34				Ø 38.1
36~42				
44~52	Ø 41.3			Ø 22.2
54				
56~60	Ø 44.5			
62~74				
76~92	Ø 54.0	Ø 25.4		
94~				

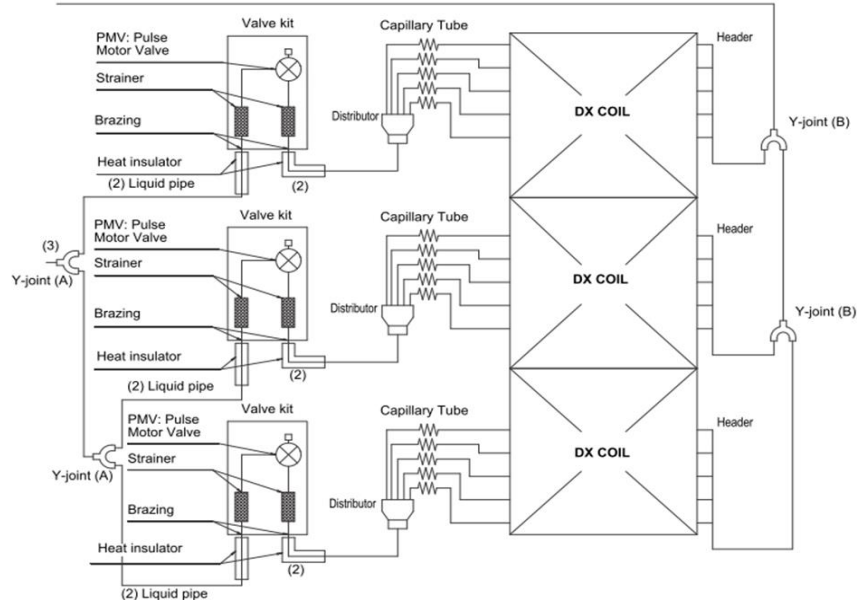
(1) Gas pipe



(1) Gas pipe



(1) Gas pipe



5. Pipe length and height difference

Item	TA type	TF, DDC type	
Main pipe equivalent length	Same as piping length restriction of outdoor unit		
Total piping length	200m	120m(100m)	
Furthest equivalent pipe length L (real length)	130m(120m)	100m	
Furthest equivalent pipe length from the 1st branch	40m	-	
Furthest equivalent pipe length between outdoor unit	Same as piping length restriction of outdoor unit	-	
Max, real length of pipes connected to indoor units	20m	-	
Maximum equivalent between branching section	30m	-	
Max. Height Difference	outdoor unit - indoor unit (Upper outdoor unit) H1	40 m or the outdoor unit spec. Whichever is shorter of outdoor unit.	40m
	outdoor unit - indoor unit (Lower outdoor unit) $\frac{H2 > 3m}{H2 \leq 3m}$		
	Indoor unit - indoor unit (Upper outdoor unit) H2	-	
	Indoor unit - indoor unit (Lower outdoor unit) H2	-	
Amount of Additional Refrigerant	Refer to specification of Outdoor unit		

6. Product Configuration

6.1 Product Configuration

• 8HP ~ 40HP

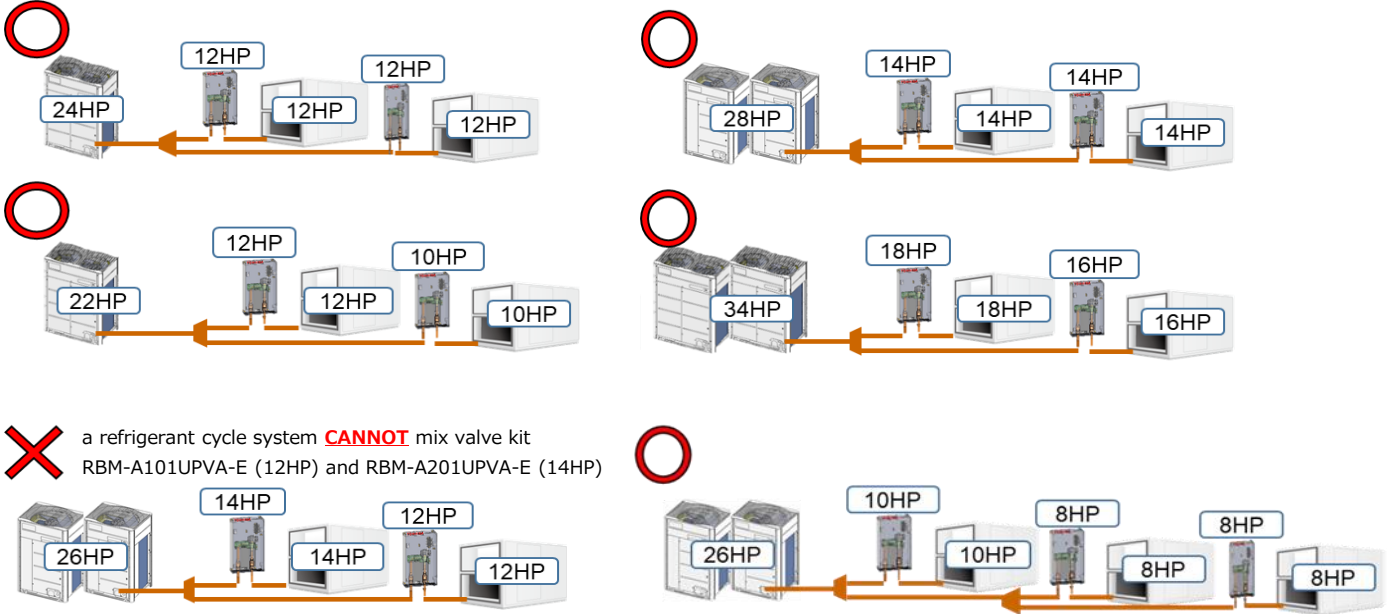
DX COIL type		Normal				Interlaced, Split face			
Type		Dx-coil controller	Dx-Valve kit		HEX number	Dx-coil controller	Dx-Valve kit		HEX number
Model name		TCB-IFDMX01UP-E TCB-IFDMR01UP-E	RBM-A101 UPVA-E	RBM-A201 UPVA-E		TCB-IFDMX01UP-E TCB-IFDMR01UP-E	RBM-A101 UPVA-E	RBM-A201 UPVA-E	
Connectable Dx-coil Capacity	8 HP	1	1	-	1				
	10 HP	1	1	-	1				
	12 HP	1	1	-	1				
	14 HP	1	-	1	1				
	16 HP	1	-	1	1	-	-	-	-
						2(8+8)	2	-	2
	18 HP	1	-	1	1	-	-	-	-
						2(8+10)	2	-	2
	20 HP	1	-	1	1	-	-	-	-
						2(10+10)	2	-	2
	22 HP	-	-	-	-	2(12+10)	2	-	2
	24 HP	1	2	-	1	2(12+12)	2	-	2
						3(8+8+8)	3	-	3
	26 HP	-	-	-	-	3(10+8+8)	3	-	3
	28 HP	1	-	2	1	2(14+14)	-	2	2
						3(10+10+8)	3	-	3
30 HP	-	-	-	-	3(10+10+10)	3	-	3	
32 HP	1	-	2	1	2(16+16)	-	2	2	
34 HP	-	-	-	-	2(18+16)	-	2	2	
36 HP	1	-	2	1	2(18+18)	-	2	2	
38 HP	-	-	-	-	2(20+18)	-	2	2	
40 HP	1	-	2	1	2(20+20)	-	2	2	

• 42HP ~ 120HP

DX COIL type		Interlaced, Split face				Interlaced, Split face			
Type		Dx-coil controller	Dx-Valve kit		HEX number	Dx-coil controller	Dx-Valve kit		HEX number
Model name		TCB-IFDMX01UP-E TCB-IFDMR01UP-E	RBM-A101 UPVA-E	RBM-A201 UPVA-E		TCB-IFDMX01UP-E TCB-IFDMR01UP-E	RBM-A101 UPVA-E	RBM-A201 UPVA-E	
	42 HP	-	-	-	-	3(14+14+14)	-	3	3
	44 HP	-	-	-	-	3(16+14+14)	-	3	3
	46 HP	-	-	-	-	3(16+16+14)	-	3	3
	48 HP	2(24+24)	4	-	2	3(16+16+16)	-	3	3
	50 HP	-	-	-	-	3(18+16+16)	-	3	3
	52 HP	-	-	-	-	3(18+18+16)	-	3	3
	54 HP	-	-	-	-	3(18+18+18)	-	3	3
	56 HP	2(28+28)	-	-	-	3(20+18+18)	-	3	3
				4	2	4(14+14+14+14)	-	4	4
	58 HP	-	-	-	-	3(20+20+18)	-	3	3
	60 HP	-	-	-	-	3(20+20+20)	-	3	3
	62 HP	-	-	-	-	4(16+16+16+14)	-	4	4
	64 HP	2(32+32)	-	4	2	4(16+16+16+16)	-	4	4
	66 HP	-	-	-	-	4(18+16+16+16)	-	4	4
	68 HP	-	-	-	-	4(18+18+16+16)	-	4	4
	70 HP	-	-	-	-	4(18+18+18+16)	-	4	4
	72 HP	2(36+36)	-	4	2	4(18+18+18+18)	-	4	4
	74 HP	-	-	-	-	4(20+18+18+18)	-	4	4
	76 HP	-	-	-	-	4(20+20+18+18)	-	4	4
	78 HP	-	-	-	-	4(20+20+20+18)	-	4	4
	80 HP	2(40+40)	-	4	2	4(20+20+20+20)	-	4	4
	82 HP	-	-	-	-	5(18+16+16+16+16)	-	5	5
						5(18+18+16+16+16)	-	6	5
	84 HP	3(28+28+28)	-	6	3	6(14+14+14+14+14+14)	-	6	6
	86 HP	-	-	-	-	5(18+18+18+16+16)	-	5	5
	88 HP	-	-	-	-	5(18+18+18+18+16)	-	5	5
	90 HP	-	-	-	-	5(18+18+18+18+18)	-	5	5
	92 HP	-	-	-	-	5(20+18+18+18+18)	-	5	5
	94 HP	-	-	-	-	5(20+20+18+18+18)	-	5	5
	96 HP	3(32+32+32)	-	-	-	5(20+20+20+18+18)	-	5	5
				6	3	6(16+16+16+16+16+16)	-	6	6
	98 HP	-	-	-	-	5(20+20+20+20+18)	-	5	5
	100 HP	-	-	-	-	5(20+20+20+20+20)	-	5	5
	102 HP	-	-	-	-	6(18+18+18+16+16+16)	-	6	6
	104 HP	-	-	-	-	6(18+18+18+18+16+16)	-	6	6
	106 HP	-	-	-	-	6(18+18+18+18+18+16)	-	6	6
	108 HP	3(36+36+36)	-	6	3	6(18+18+18+18+18+18)	-	6	6
	110 HP	-	-	-	-	6(20+18+18+18+18+18)	-	6	6
	112 HP	-	-	-	-	6(20+20+18+18+18+18)	-	6	6
	114 HP	-	-	-	-	6(20+20+20+18+18+18)	-	6	6
	116 HP	-	-	-	-	6(20+20+20+20+18+18)	-	6	6
	118 HP	-	-	-	-	6(20+20+20+20+20+18)	-	6	6
	120 HP	3(40+40+40)	-	6	3	6(20+20+20+20+20+20)	-	6	6

- Dx-coil type Interlaced, Split face : 16HP~120HP (TA type)
- Dx-coil type Interlaced, Split face : 16HP~40HP (DDC,TF type)
- Dx-coil type normal : 8HP~40HP (All type)
- RBM-A101UPVA-E and RBM-A201UPVA-E **CANNOT** combine in one refrigerant cycle system.
Therefore, two or more AHU from 12HP and below HP combination is available.
In the other way, two or more AHU over 14 HP combination is available.

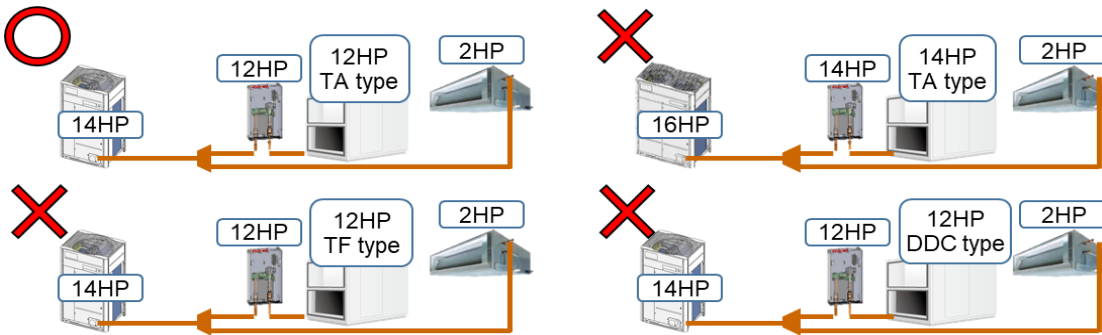
Please see examples below:



X a refrigerant cycle system **CANNOT** mix valve kit RBM-A101UPVA-E (12HP) and RBM-A201UPVA-E (14HP)

- Dx-TA type with RBMA101UPVA-E can mix AHU with normal IDUs.
Combination AHU from 12 HP and below HP with VRF FCU is available.
Combination AHU over 14 HP with VRF FCU is **prohibited**.

For example:



- For the AHU prepared on-site, please design by reference of AHU submittal.

6.2 Major Specifications

TCB-IFDMX01UP-E / TCB-IFDMR01UP-E (Dx-coil Controller)

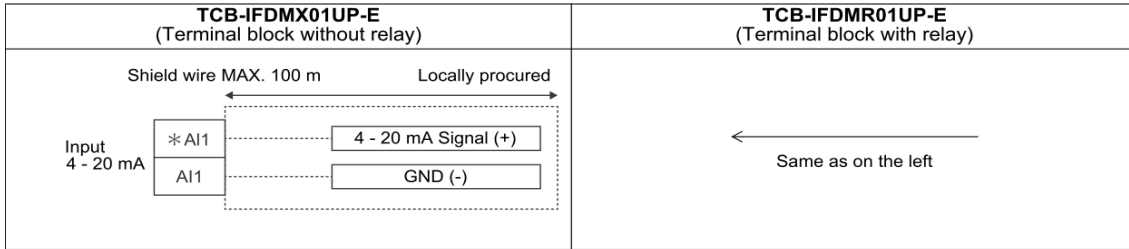
Description	Dx-coil controller in Metal Enclosure, comprising: <ul style="list-style-type: none"> • MCC-1777 (Main Indoor(DX) P.C. board) • TA sensor, Length:7.5m, Connector color : Yellow • TC1 sensor, Length:7.5m, Connector color : Brown • TC2 sensor, Length:7.5m, Connector color : Black • TCJ sensor, Length:7.5m, Connector color : Red • TF sensor, Length:7.5m, Connector color : Green • Strainers • Terminal Block without relay : TCB-IFDMX01UP-E • Terminal Block with relay : TCB-IFDMR01UP-E 							
External DimensionsH x W x D (mm)	420 x 330 x 122							
Net Weight(kg)	TCB-IFDMX01UP-E : 4.0 kg、TCB-IFDMR01UP-E : 4.1kg							
Notes:								
1.Capacity code (DN11) needs to be setup upon installation using wired remote controller (not supplied).								
HP	8	10	12*	14*	16	18	20	24*
DN[11]	0021	0023	0024	0025	0026	0027	0028	0031
HP	28*	32	34*	36	38*	40		
DN[11]	0047	0035	0048	0037	0049	0039		
<ul style="list-style-type: none"> • Only Heating and Cooling Modes are available on the DDC Type (No Automatic or Fan Only). • Components supplied in pieces, requires brazing and local pipework. * Only outdoor units that support TU2C-LINK can be set. 								
2.Valve kit type name specification (This is basically set automatically).								
Valve kit model	RBM-A101UPVA-E	RBM-A201UPVA-E						
DN[4AE]	0001	0002						
<ul style="list-style-type: none"> • In case of installation of any combinations that are not listed in standard combination in P.6 Please confirm combination of Valve kit model and DN[4AE] correctly. 								

RBM-A101UPVA-E / RBM-A201UPVA-E (Dx-valve kit)

Description	The PMV(Pulse Motor Valve, 2 models), comprising:- <ul style="list-style-type: none"> • PMV body & PMV Motor • Terminal Block
RBM-A101UPVA-E	8HP & 10HP & 12HP Size
RBM-A201UPVA-E	14HP & 16HP & 18HP & 20HP Size

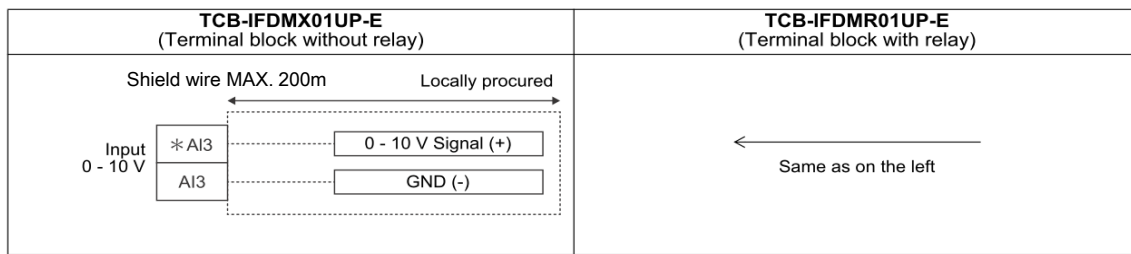
6.3 Control Input / Output Details

-Analog Input functions -



✓ :Available × : Prohibition

Input	Name	Description	TA	DDC	TF																			
AI1	FAN interlock	FAN interlocking control by external input																						
	Analog Input 1 (4 - 20 mA)	<ul style="list-style-type: none"> · FAN mode is switched by external 4 - 20 mA input. · Both FAN control with 4 - 20 mA input and FAN mode change with remote controller are valid, but boost priority is given. · The FAN priority control is switched by the DN setting of [4A0]. 0000: Default (no change in FAN mode by 4 - 20 mA input) 0001: FAN control by 4 - 20 mA input, but priority is given to FAN control from the outdoor unit 0002: FAN control 4 - 20 mA input with priority · The FAN mode switching threshold value for 4 - 20 mA input can be changed in the DN setting * The change in FAN speed with 4 - 20 mA input is also reflected in the 0 - 10 V output of AO1 / AO1. <div style="text-align: center;"> <table style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="border: none;">17</td> <td style="border: none;">[DN]</td> <td style="border: none;">Default</td> <td style="border: none;">Details</td> </tr> <tr> <td style="border: none;">↓</td> <td style="border: none;">[4A2]</td> <td style="border: none;">0004 (4 mA)</td> <td style="border: none;">[4A1] +4 mA Applicable range +1 to +11 **</td> </tr> <tr> <td style="border: none;">13</td> <td style="border: none;">[4A1]</td> <td style="border: none;">0013 (13 mA)</td> <td style="border: none;">Applicable range 7 mA to 16 mA</td> </tr> <tr> <td style="border: none;">↓</td> <td style="border: none;">[4A3]</td> <td style="border: none;">0007 (7 mA)</td> <td style="border: none;">[4A1] -7 mA Applicable range -1 to -12 **</td> </tr> <tr> <td style="border: none;">6</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> </table> <p style="font-size: small;">*1: Upper limit. DN [4A1] + DN [4A2] ≤ 18 mA *2: Lower limit. DN [4A1] - DN [4A3] ≥ 4 mA</p> </div>	17	[DN]	Default	Details	↓	[4A2]	0004 (4 mA)	[4A1] +4 mA Applicable range +1 to +11 **	13	[4A1]	0013 (13 mA)	Applicable range 7 mA to 16 mA	↓	[4A3]	0007 (7 mA)	[4A1] -7 mA Applicable range -1 to -12 **	6				✓	✓
17	[DN]	Default	Details																					
↓	[4A2]	0004 (4 mA)	[4A1] +4 mA Applicable range +1 to +11 **																					
13	[4A1]	0013 (13 mA)	Applicable range 7 mA to 16 mA																					
↓	[4A3]	0007 (7 mA)	[4A1] -7 mA Applicable range -1 to -12 **																					
6																								
AI2	Nothing Analog Input 2 (4 - 20 mA)	Cannot be used.	-	-	-																			



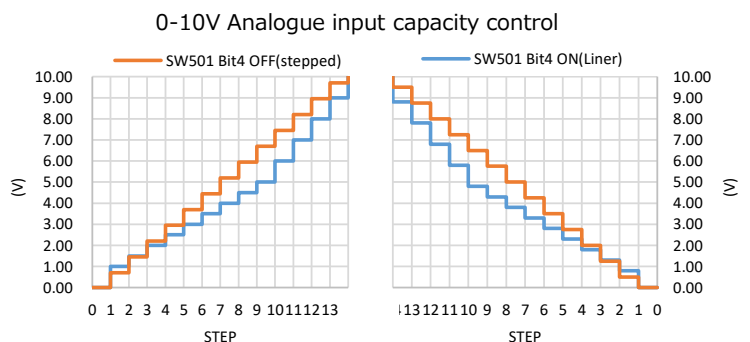
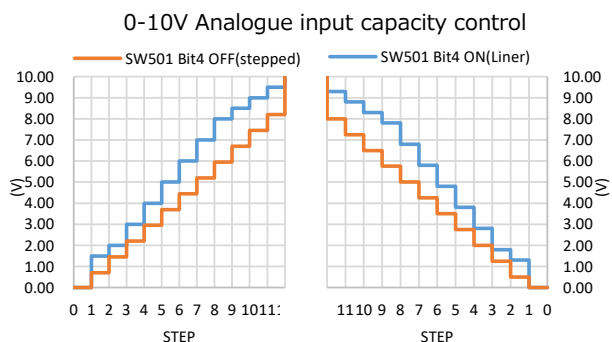
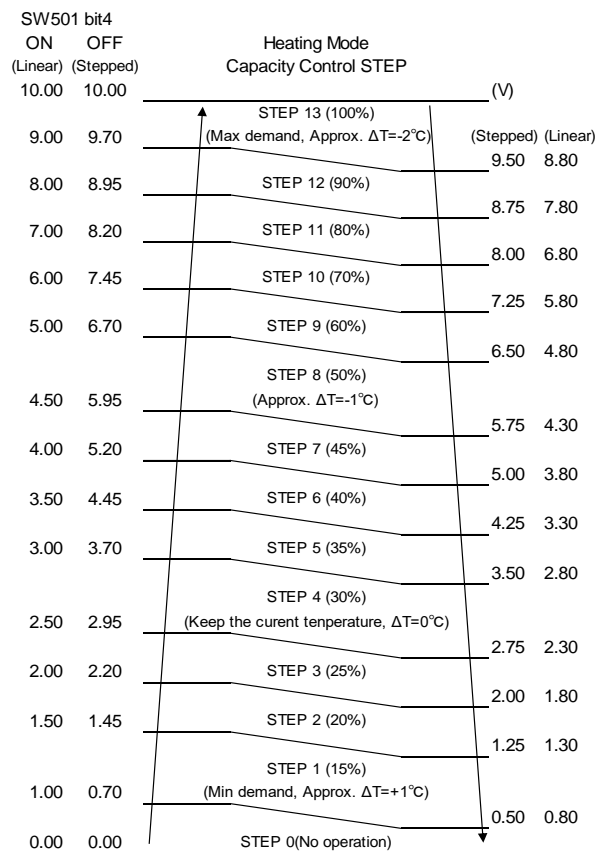
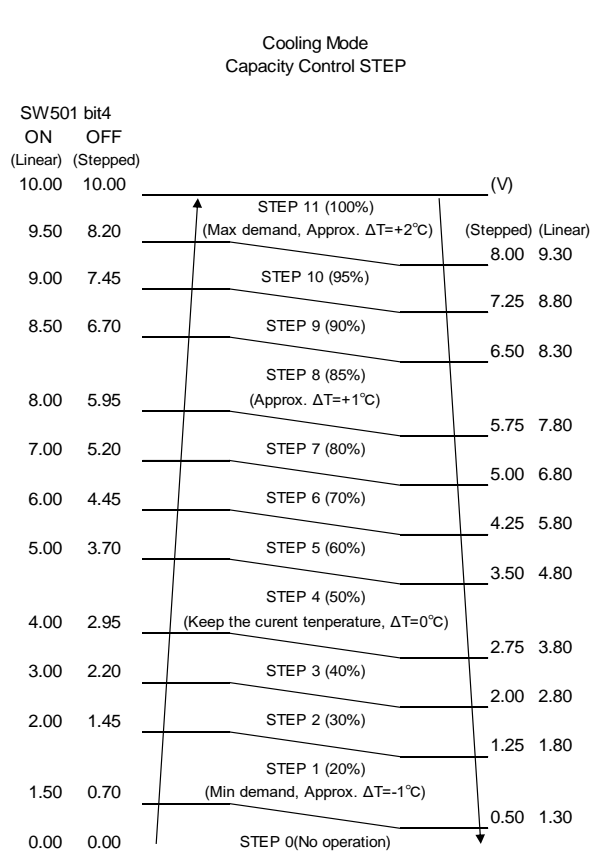
✓ : Available × : Prohibition

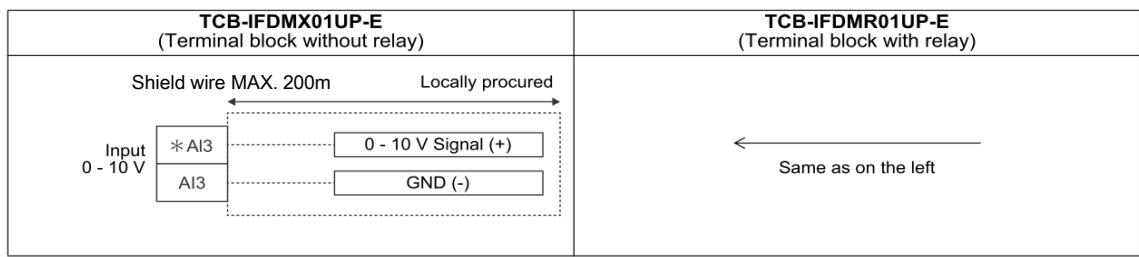
Input	Name	Description	TA	DDC	TF
AI3	Analogue Input Capacity Control Analog Input 1 (DC 0 - 10 V)	Analogue Input to Capacity control.	×	✓	×
	SW501 bit-4(MCC-1777) OFF	STEPPED response to analogue input			
	SW501 bit-4(MCC-1777) ON	LINEAR response to analogue input			
	<ul style="list-style-type: none"> To ease the integration of the Dx-coil with the DDC the capacity control is able to operate with a STEPPED or LINEAR function from the analogue input. To select either a STEPPED(default) or LINEAR response, from the analogue input, use SW501 bit4 located on the DDC(0-10V) interface P.C. board(MCC-1777) 				
AI4	Nothing Analog Input 2 (DC 0 - 10 V)	Cannot be used.	-	-	-

- Capacity control signal(analogue input voltage) will be used as the main control value for the compressor frequency.
- The control of capacity may not be able to be performed according to the state of an air-conditioner (During oil recovercontrol, defrost etc.).

1) Capacity control 0-10V (Overview of capacity control) *

*There are possibilities of thermodynamic and/or mechanical limitation from many factors. which may affect our system's heat pump cycle (refrigerant cycle) during operation. Hence, there is a possibility that the capacity output may be different from capacity control setting.

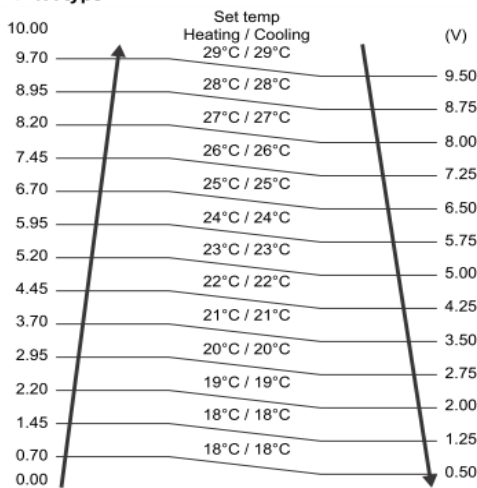




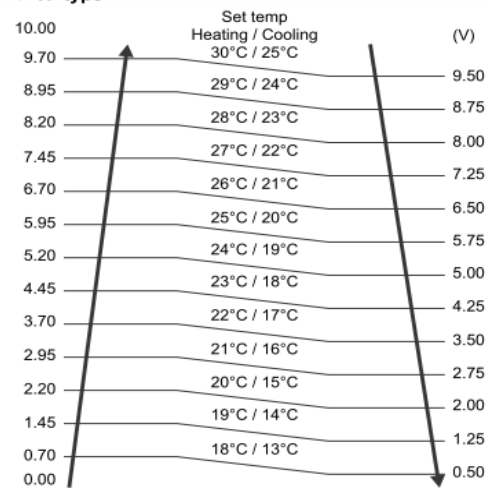
✓ :Available × : Prohibition

Input	Name	Description	TA	DDC	TF
AI3	Set temperature chang	<ul style="list-style-type: none"> • To use this control, set DN [4A9] = 1. • For TA and TF type, the set temperature can be changed according to the 0 - 10 V input of AI3. • In the set temperature with the remote controller and this control, the post-setting is prioritized. • The set temperature can be changed only for cooling and heating operations. 	✓	×	✓
AI4	Nothing Analog Input 2 (DC 0 - 10 V)	Cannot be used.	-	-	-

▼ TA type



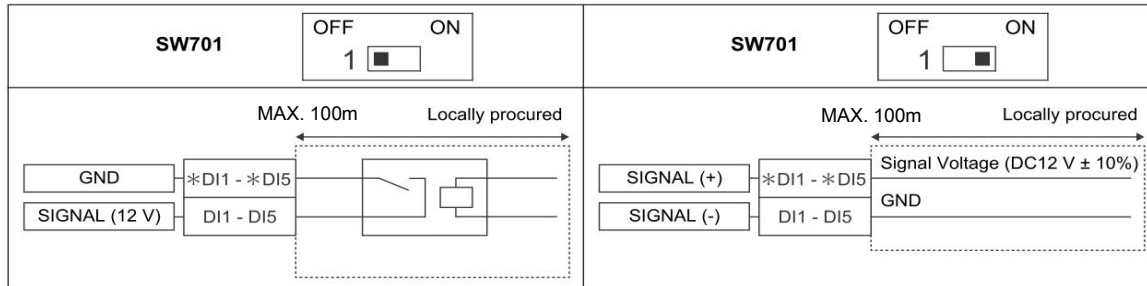
▼ TF type



-Digital Input functions -

The specifications of Terminal DI1 to DI5 are as follows.

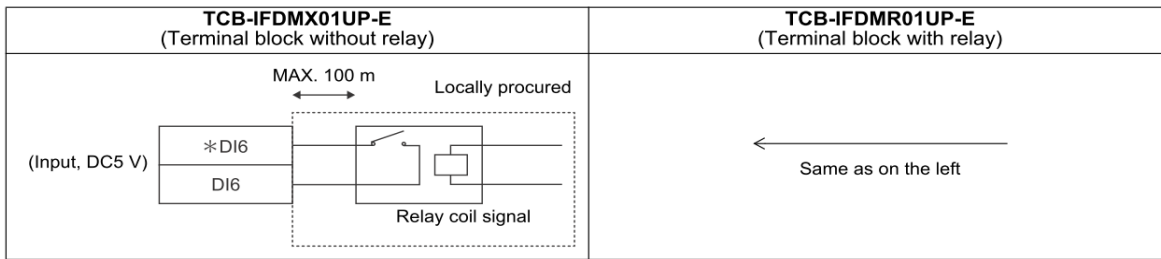
- You can switch between voltage and non-voltage with SW701.



✓ : Available × : Prohibition

Input	Name	Description	TA	DDC	TF													
DI1	Safety contact.	<ul style="list-style-type: none"> MODE 1 (Normally close, DC12 V) *When Bit1 of SW505 is OFF If this contact is open for more than 1 minute, the check code P10 is generated and the Dx-coil controller switches off automatically. MODE 2 (Normally open, DC12 V) *When Bit1 of SW505 is ON If this contact is short for more than 1 minute, the check code P10 is generated and the Dx-coil controller switches off automatically. 																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 25%;"> SW701 OFF ON 1 <input type="checkbox"/> </td> <td style="text-align: center; width: 25%;"> SW505 ON OFF Bit1: OFF 1 2 3 4 </td> <td style="text-align: center; width: 25%;"> SW701 OFF ON 1 <input type="checkbox"/> </td> <td style="text-align: center; width: 25%;"> SW505 ON OFF Bit1: OFF 1 2 3 4 </td> </tr> <tr> <td style="text-align: center;"> MAX. 100m Locally procured </td> <td style="text-align: center;"> MAX. 100m Locally procured </td> <td style="text-align: center;"> MAX. 100m Locally procured </td> <td style="text-align: center;"> MAX. 100m Locally procured </td> </tr> </table>						SW701 OFF ON 1 <input type="checkbox"/>	SW505 ON OFF Bit1: OFF 1 2 3 4	SW701 OFF ON 1 <input type="checkbox"/>	SW505 ON OFF Bit1: OFF 1 2 3 4	MAX. 100m Locally procured 	MAX. 100m Locally procured 	MAX. 100m Locally procured 	MAX. 100m Locally procured 					
SW701 OFF ON 1 <input type="checkbox"/>	SW505 ON OFF Bit1: OFF 1 2 3 4	SW701 OFF ON 1 <input type="checkbox"/>	SW505 ON OFF Bit1: OFF 1 2 3 4															
MAX. 100m Locally procured 	MAX. 100m Locally procured 	MAX. 100m Locally procured 	MAX. 100m Locally procured 															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">SW701</th> <th style="width: 10%;">SW505</th> <th style="width: 80%;">Function</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">OFF</td> <td style="text-align: center;">OFF</td> <td>The coil drive voltage is input to the relay arranged locally for DI1, and judge that the close is positive. (Default) Relay: Local arrangement</td> </tr> <tr> <td style="text-align: center;">ON</td> <td>The coil drive voltage is not input to the relay arranged locally for DI1, and judge that the open is positive. Relay: Local arrangement</td> </tr> <tr> <td rowspan="2" style="text-align: center; vertical-align: middle;">ON</td> <td style="text-align: center;">OFF</td> <td>For *DI1, short-circuit the (+) signal voltage and DI1 (-) GND with a SW or harness, and judge that the close is positive. Relay: Not required * The signal voltage is DC12 V ± 10%, and it is necessary to add a SW element to the signal line.</td> </tr> <tr> <td style="text-align: center;">ON</td> <td>For *DI1, open the (+) signal voltage and DI1 (-) GND, and judge that the open is positive. Relay: Not required * The signal voltage is DC12 V ± 10%, and it is necessary to add a SW element to the signal line.</td> </tr> </tbody> </table>						SW701	SW505	Function	OFF	OFF	The coil drive voltage is input to the relay arranged locally for DI1, and judge that the close is positive. (Default) Relay: Local arrangement	ON	The coil drive voltage is not input to the relay arranged locally for DI1, and judge that the open is positive. Relay: Local arrangement	ON	OFF	For *DI1, short-circuit the (+) signal voltage and DI1 (-) GND with a SW or harness, and judge that the close is positive. Relay: Not required * The signal voltage is DC12 V ± 10%, and it is necessary to add a SW element to the signal line.	ON	For *DI1, open the (+) signal voltage and DI1 (-) GND, and judge that the open is positive. Relay: Not required * The signal voltage is DC12 V ± 10%, and it is necessary to add a SW element to the signal line.
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	ON	For *DI1, open the (+) signal voltage and DI1 (-) GND, and judge that the open is positive. Relay: Not required * The signal voltage is DC12 V ± 10%, and it is necessary to add a SW element to the signal line.																

Input	Name	Description	TA	DDC	TF												
DI2	External trouble Input	An AHU fan operation monitor (Field supply), could be attached at this dry contact terminal (For example, the abnormality of the fan motor). A closed contact generates the check code L30.	✓	✓	✓												
DI3	Forced thermostat OFF Input	When signal input, AHU is in "thermostat-off" status forcibly.	✓	✓	✓												
DI4	Notice code Input	<ul style="list-style-type: none"> If there is input, a spanner mark will be displayed on the remote controller. The system will not stop. Check "DN settings" for the setting method. Enter the Notice code when you want to report an abnormality that does not stop the air conditioner from the outside. Used by switching functions with settings of Code No. (DN Code). Notice code is continuously issued while input signal is ON. 201 is displayed in the Notice code history when there is input in DI4. <p>* Notice code is a function dedicated to TU2C-Link communication.</p> <p>Set data corresponding to Notice code to be used to one of Code No. 180 to 189, in accordance with following table.</p> <p>In case where data other than 0000 is already set, set to other Code No. (DN Code).</p> <table border="1"> <thead> <tr> <th>Code No. (DN)</th> <th>Set data</th> <th>Notice code display</th> </tr> </thead> <tbody> <tr> <td rowspan="3">0180 ~ 189</td> <td>0000</td> <td>None (Factory default)</td> </tr> <tr> <td>0129</td> <td>201 (DI4 / *DI4 Notice input ON)</td> </tr> <tr> <td>0134</td> <td>206 (Tx sensor*1 trouble)</td> </tr> </tbody> </table> <p>*1: Refer to the Service Manual for support. * It may take up to ten minutes to be displayed on remote controller after Notice code is issued.</p>	Code No. (DN)	Set data	Notice code display	0180 ~ 189	0000	None (Factory default)	0129	201 (DI4 / *DI4 Notice input ON)	0134	206 (Tx sensor*1 trouble)	✓	✓	✓		
Code No. (DN)	Set data	Notice code display															
0180 ~ 189	0000	None (Factory default)															
	0129	201 (DI4 / *DI4 Notice input ON)															
	0134	206 (Tx sensor*1 trouble)															
DI5	Operation Mode Input (Cool / Heat)	Digital Input to control Mode:- <ul style="list-style-type: none"> Only cool mode and heat mode are available. <table border="1"> <thead> <tr> <th>Function</th> <th>Terminal</th> <th>OPEN</th> <th>SHORT</th> </tr> </thead> <tbody> <tr> <td>Mode Input Cool / Heat</td> <td>DI5 / *DI5</td> <td>COOL mode active</td> <td>HEAT mode active</td> </tr> </tbody> </table>	Function	Terminal	OPEN	SHORT	Mode Input Cool / Heat	DI5 / *DI5	COOL mode active	HEAT mode active	✓	✓	✓				
Function	Terminal	OPEN	SHORT														
Mode Input Cool / Heat	DI5 / *DI5	COOL mode active	HEAT mode active														
DI2 ~ DI4		When Bit4 of SW502 is turned on in DDC type, capacity demand can be achieved by short-circuiting Terminals DI2 to DI4. <table border="1"> <thead> <tr> <th>Short - circuit</th> <th>Cooling step</th> <th>Heating step</th> </tr> </thead> <tbody> <tr> <td>*DI2 - DI2</td> <td>2</td> <td>4</td> </tr> <tr> <td>*DI3 - DI3</td> <td>5</td> <td>9</td> </tr> <tr> <td>*DI4 - DI4</td> <td>11</td> <td>13</td> </tr> </tbody> </table> <p>* If all are short-circuited, the DI3 function has priority.</p> <p>When SW701 is ON (no voltage), apply a voltage of DC12 V ± 10% and wiring as follows.</p>	Short - circuit	Cooling step	Heating step	*DI2 - DI2	2	4	*DI3 - DI3	5	9	*DI4 - DI4	11	13	×	✓	×
Short - circuit	Cooling step	Heating step															
*DI2 - DI2	2	4															
*DI3 - DI3	5	9															
*DI4 - DI4	11	13															

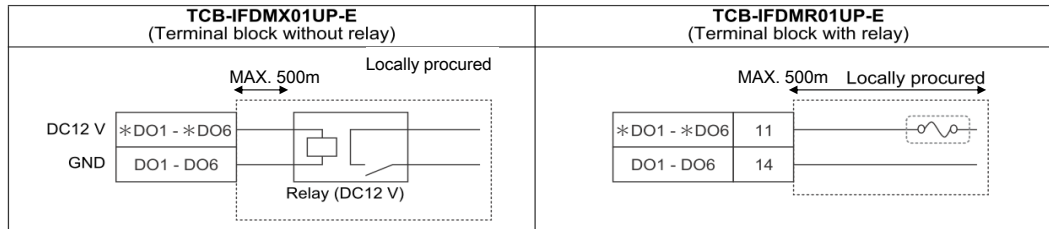


✓ :Available × : Prohibition

Input	Name	Description	TA	DDC	TF						
DI6	Operation ON/OFF Input	<p>When using with DDC, it starts by turning on this terminal.</p> <p>External trouble Input signal type(pulse / static) is selectable by Jumper Wire J01 on the Indoor(DX) P.C. board - MCC-1777</p> <ul style="list-style-type: none"> Connect (Default) : Pulse / Cut : Static <p>Note the unit will not operate until there is an appropriate 0-10V Capacity Control signal.</p> <p>The position of J01 (MCC-1777)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 15%;">J01</th> <th style="width: 85%;">Action</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Connect</td> <td> Pulse input (At factory setting) Pulse width 200 to 300 ms Pulse interval 200 ms or more </td> </tr> <tr> <td style="text-align: center;">Cut</td> <td> Static input </td> </tr> </tbody> </table>	J01	Action	Connect	Pulse input (At factory setting) Pulse width 200 to 300 ms Pulse interval 200 ms or more	Cut	Static input	✓	✓	✓
J01	Action										
Connect	Pulse input (At factory setting) Pulse width 200 to 300 ms Pulse interval 200 ms or more										
Cut	Static input										

- Digital Output functions -

The specifications of Terminal DO1 to DO6 are as follows.



• Use the contact side of the relay terminal used in TCB-IFDMR01UP-E according to the specifications shown in the table below.

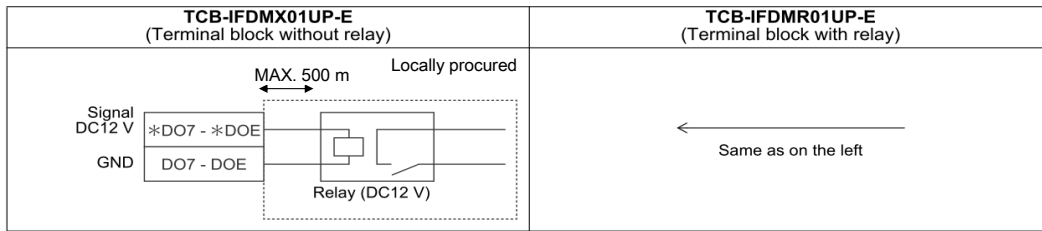
Relay model name	Contact rating	Load conditions
G2RV-SR700-12DC	250 V max / 3 A max (Minimum Current: 10 mA more)	Resistive load

✓ : Available × : Prohibition

Output	Name	Description	TA	DDC	TF																		
DO1	Operating Output	Displayed when the system starts operation (output with both thermostat ON / OFF)	✓	✓	✓																		
DO2	Alarm Active Digital Output	During Alarm operation, Alarm Active Digital Output is active.	✓	✓	✓																		
DO3	Fan Motor Active Digital Output	A fan control signal is output. It is usually the ON output at the time of operating, but it is the OFF output in defrosting.	✓	✓	✓																		
DO4	Defrost Mode Digital Output	During Defrost operation, Defrost Mode Output is active.	✓	✓	✓																		
DO5	DO_1 Digital Output1 (User Defined)	Output function set using rotary switch "SW503" on the DDC(0-10V) interface P.C board(MCC-1777)																					
		<table border="1"> <thead> <tr> <th>SW503</th> <th>Output function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Outdoor unit(s) operation level is lower than capacity command</td> </tr> <tr> <td>2</td> <td>Outdoor unit(s) operation level is higher than capacity command</td> </tr> <tr> <td>3</td> <td>Cooling oil recovery/Heating refrigerant recovery control</td> </tr> <tr> <td>4</td> <td>Cooling operation output</td> </tr> <tr> <td>5</td> <td>Heating operation output</td> </tr> <tr> <td>6</td> <td>Thermostat ON</td> </tr> <tr> <td>7 ~ 15</td> <td>Do not use</td> </tr> <tr> <td>16</td> <td>Under Hz upper limit regulation due to heat sink overheating</td> </tr> </tbody> </table>	SW503	Output function	1	Outdoor unit(s) operation level is lower than capacity command	2	Outdoor unit(s) operation level is higher than capacity command	3	Cooling oil recovery/Heating refrigerant recovery control	4	Cooling operation output	5	Heating operation output	6	Thermostat ON	7 ~ 15	Do not use	16	Under Hz upper limit regulation due to heat sink overheating	✓	✓	✓
SW503	Output function																						
1	Outdoor unit(s) operation level is lower than capacity command																						
2	Outdoor unit(s) operation level is higher than capacity command																						
3	Cooling oil recovery/Heating refrigerant recovery control																						
4	Cooling operation output																						
5	Heating operation output																						
6	Thermostat ON																						
7 ~ 15	Do not use																						
16	Under Hz upper limit regulation due to heat sink overheating																						
DO6	DO_2 Digital Output2 (User Defined)	Output function set using rotary switch "SW504" on the DDC(0-10V) interface P.C board(MCC-1777)																					
		<table border="1"> <thead> <tr> <th>SW504</th> <th>Output function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Outdoor unit(s) operation level is lower than capacity command</td> </tr> <tr> <td>2</td> <td>Outdoor unit(s) operation level is higher than capacity command</td> </tr> <tr> <td>3</td> <td>Cooling oil recovery/Heating refrigerant recovery control</td> </tr> <tr> <td>4</td> <td>Cooling operation output</td> </tr> <tr> <td>5</td> <td>Heating operation output</td> </tr> <tr> <td>6</td> <td>Thermostat ON</td> </tr> <tr> <td>7 ~ 15</td> <td>Do not use</td> </tr> <tr> <td>16</td> <td>Under Hz upper limit regulation due to heat sink overheating</td> </tr> </tbody> </table>	SW504	Output function	1	Outdoor unit(s) operation level is lower than capacity command	2	Outdoor unit(s) operation level is higher than capacity command	3	Cooling oil recovery/Heating refrigerant recovery control	4	Cooling operation output	5	Heating operation output	6	Thermostat ON	7 ~ 15	Do not use	16	Under Hz upper limit regulation due to heat sink overheating	✓	✓	✓
SW504	Output function																						
1	Outdoor unit(s) operation level is lower than capacity command																						
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3	Cooling oil recovery/Heating refrigerant recovery control																						
4	Cooling operation output																						
5	Heating operation output																						
6	Thermostat ON																						
7 ~ 15	Do not use																						
16	Under Hz upper limit regulation due to heat sink overheating																						

Set with the SW503 or SW504 switch on the control P.C. board MCC-1777.

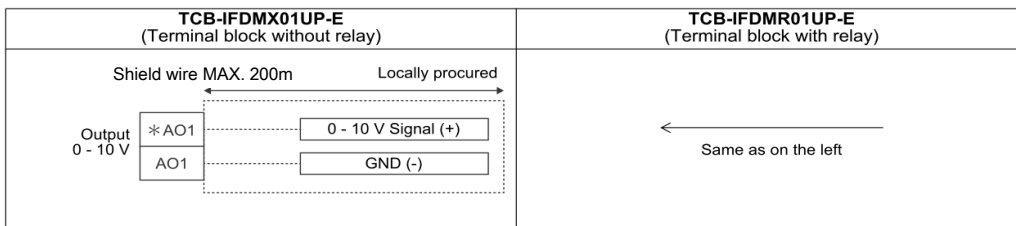




✓ : Available × : Prohibition

Output	Name	Description	TA	DDC	TF
DO7	Thermostat On Digital Output	Thermostat ON signal is output. It is usually the ON output at the time of operating.	✓	✓	✓
DO8	Cooling / heating start up control signal output	Outputs the start control signal for cooling and heating operation.	✓	✓	✓
DO9	Pre defrost signal	Outputs just before defrosting (at least 5 minutes before).	✓	✓	✓
DOA	Cooling/ heating output	Output as OPEN during cooling operation, and CLOSE during heating operation.	✓	✓	✓
DOB	Notice code Output	Output to display Notice code (if there is any at the time.) For details, see the outdoor unit Service Manual.	✓	✓	✓
DOC	FAN mode Output	Output Fan Mode : DOC = High • If select the fan output from interface, use this output. For TA and TF types, the output changes by changing the fan speed from the remote controller.	✓	✓	✓
DOD	FAN mode Output	Output Fan Mode : DOD = Mid • If select the fan output from interface, use this output. For TA and TF types, the output changes by changing the fan speed from the remote controller.	✓	✓	✓
DOE	FAN mode Output	Output Fan Mode : DOE = Low • If select the fan output from interface, use this output. For TA and TF types, the output changes by changing the fan speed from the remote controller.	✓	✓	✓

- Analog Output functions -



✓ : Available × : Prohibition

Output	Name	Description	TA	DDC	TF																				
AO1	FAN speed 0 - 10 V output Analog Output 1 (0 - 10 V)	<ul style="list-style-type: none"> Each FAN speed is output at 0 - 10 V. The output voltage can be changed by DN setting [4A4] to [4A6]. <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th>FAN speed</th> <th>Output (Def)</th> <th>Initial (Def)</th> <th>Applicable range</th> </tr> </thead> <tbody> <tr> <td>HH</td> <td>9 V</td> <td>4A4 (0009)</td> <td>8 V (0008) - 10 V (0010)</td> </tr> <tr> <td>H</td> <td>6 V</td> <td>4A5 (0006)</td> <td>4 V (0004) - 7 V (0007)</td> </tr> <tr> <td>L</td> <td>2 V</td> <td>4A6 (0002)</td> <td>1 V (0001) - 3 V (0003)</td> </tr> <tr> <td>STOP</td> <td>0 V</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	FAN speed	Output (Def)	Initial (Def)	Applicable range	HH	9 V	4A4 (0009)	8 V (0008) - 10 V (0010)	H	6 V	4A5 (0006)	4 V (0004) - 7 V (0007)	L	2 V	4A6 (0002)	1 V (0001) - 3 V (0003)	STOP	0 V	-	-	✓	✓	✓
FAN speed	Output (Def)	Initial (Def)	Applicable range																						
HH	9 V	4A4 (0009)	8 V (0008) - 10 V (0010)																						
H	6 V	4A5 (0006)	4 V (0004) - 7 V (0007)																						
L	2 V	4A6 (0002)	1 V (0001) - 3 V (0003)																						
STOP	0 V	-	-																						
AO2	Nothing Analog Output 2 (0 - 10 V)	Cannot be used.	-	-	-																				

- Summary of Digital input / output function (MCC-1777) -

Function	Connector No. CN	Connector collar	Pin No.	Wire collar	Specification
PMV1	82	(BLU)	1	(WHI)	-
			2	(YEL)	-
			3	(ORN)	-
			4	(BLU)	-
			5	-	-
			6	(RED)	DC12V
PMV2	84	(BLK)	1	(WHI)	-
			2	(YEL)	-
			3	(ORN)	-
			4	(BLU)	-
			5	-	-
			6	(RED)	DC12V
TC1	100	(BRN)	1	(BLU)	-
			3		
TCJ	102	(RED)	1	(RED)	-
			2		
TC2	101	(BLK)	1	(BLK)	-
			2		
TA	104	(YEL)	1	(BLK)	-
			2		
TF	103	(GRN)	1	(RED)	-
			2		
TX*1	105	(WHI)	1	-	-
			2		
Defrost mode Digital output	60	(WHI)	2	(BLU)	Output
Thermostat on Digital output	60	(WHI)	3	(ORN)	Output
	62	(BLU)	1	(RED)	12V
Fan motor active Digital output	60	(WHI)	6	(BLK)	Output
Output1(0-10V)	602	(BLU)	1	(BLU)	Output
			2	(BLK)	GND
Output2(0-10V) (No function)		(BLU)	3	(BLU)	Output
			4	(BLK)	GND
Input1(0-10V)	601	(WHI)	1	(WHI)	Input
			2	(BLK)	GND
Input2(0-10V) (No function)		(WHI)	3	(WHI)	Input
			4	(BLK)	GND
Input1(4-20mA)	600	(WHI)	3	(BLU)	Input
			4	(BLK)	GND
Input1(4-20mA) (No function)		(WHI)	5	(YEL)	Input
			6	(BLK)	GND

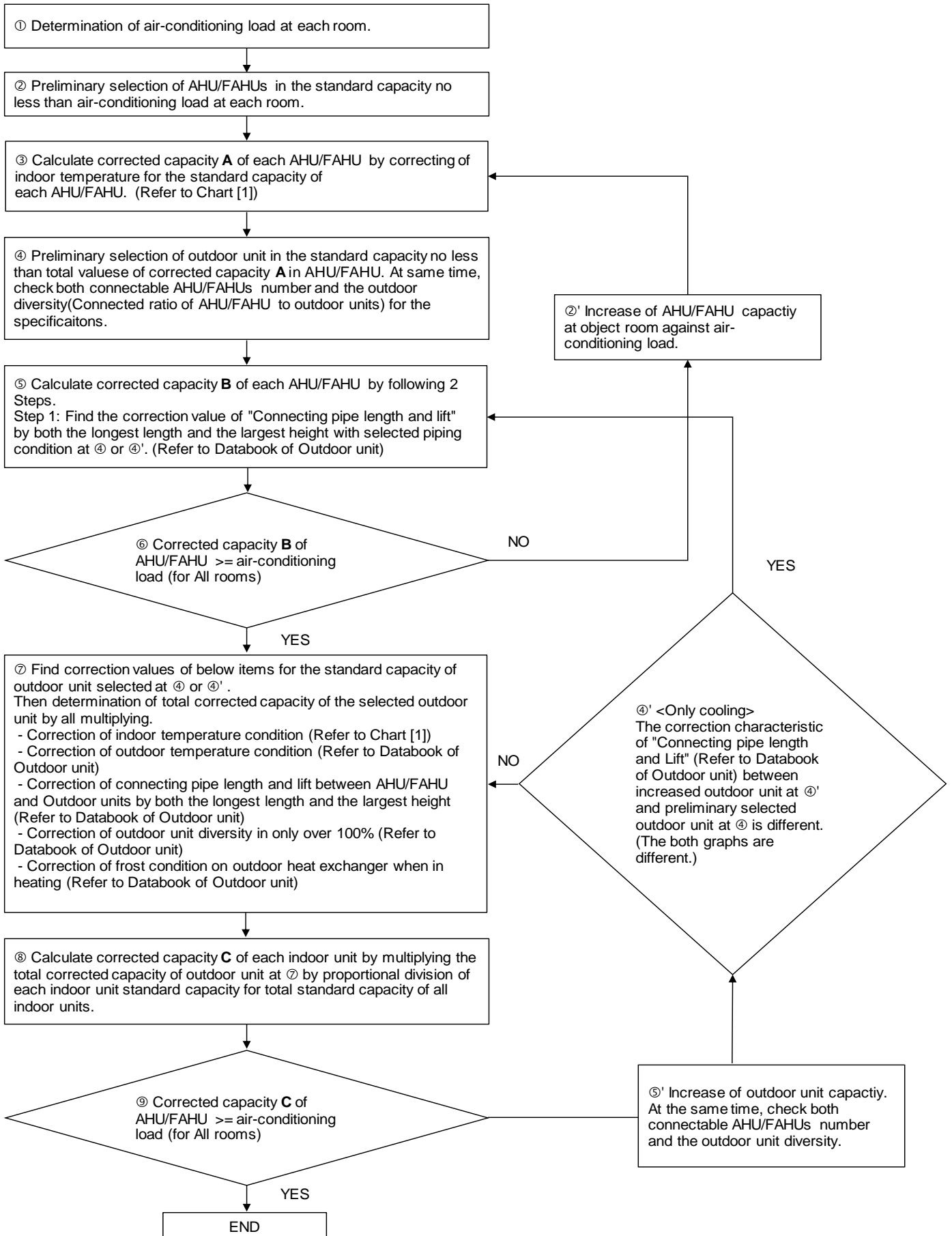
*1 : TX temperature sensor is an option accessory part. TX can be used with application TA type or TF type.

Function	Connector No. CN	Connector collar	Pin No.	Wire collar	Specification
External ON/OFF input	61	(YEL)	1	(BLU)	5V
			2	(BLK)	GND
Operating output		(YEL)	4	(WHI)	Output
			5	(RED)	12V
Alarm active Digital output		(YEL)	6	(BRN)	Output
FAN speed HH		63	(RED)	2	(YEL)
FAN speed H	(RED)		3	(GRN)	Output
FAN speed L	(RED)		4	(BLU)	Output
Cooling oil recovery/Heating refrigerant recovery control	62	(BLU)	3	(WHI)	Output
Pre defrost signal output		(BLU)	4	(BRN)	Output
Cool(open)/Heat(close)output		(BLU)	5	(BLU)	Output
Notice output		(BLU)	6	(GRN)	Output
Safety (Normal close)	90	(GRN)	1	(RED)	GND ^{*2}
External error input			2	(WHI)	Input
		Forced thermostat OFF Input	(GRN)	3	(BLU)
Notice Input		(GRN)	4	(ORN)	Input
Operation Mode Input (Cool/Heat)		(GRN)	5	(GRN)	Input
Modbus A		45	(WHI)	5	(YEL)
Modbus B	(WHI)		4	(ORN)	-
Digital output1 (user defined)	64	(RED)	2	(RED)	Output
Digital output2 (user defined)		(RED)	3	(WHI)	Output

*2 : Safety (SW701) output will depend on combinations. For more detail, please refer to Terminal DI1/ * D11.

7. AHU / DX COIL Design

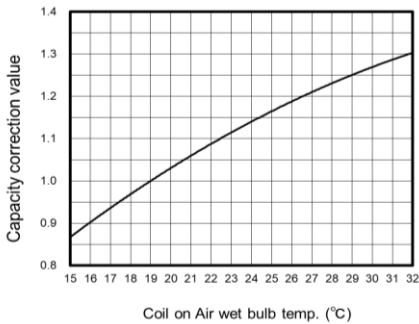
7.1 Equipment selection procedure -Selection flow chart-



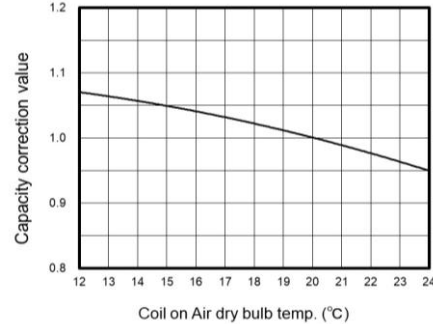
7.2 Correction charts for AHU/FAHU capacity calculation

[1] Coil on Air temperature vs. capacity correction value
 < TA, DDC (TA) type >

▼ Cooling



▼ Heating



The above capacity values are generated depends on each compressor operation level.

< TF, DDC (TF) type >

▼ Cooling

Outdoor temperature °CDB	°CWB									
	15.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	
19.0	0.290	0.398								
23.0	0.290	0.390	0.460	0.520						
27.0		0.390	0.455	0.513	0.648					
29.0			0.455	0.513	0.640	0.826	1.022			
33.0			0.451	0.505	0.624	0.799	1.000	1.196	1.410	
38.0					0.604	0.777	0.987	1.156	1.313	
43.0							0.951	1.121	1.170	
46.0								1.004	0.942	

▼ Heating

Outdoor temperature °CDB	°CWB										
	-12.0	-9.0	-7.0	-5.0	-2.9	0.0	2.0	4.0	6.0	10.0	14.0
-10.0	1.058										
-8.0	1.087										
-6.0		1.155									
-5.0			1.209								
-2.0				1.086							
0.0					1.000						
2.0					0.923	0.923	0.923				
5.0					0.806	0.806	0.806				
7.0							0.727	0.727	0.727		
10.0							0.603	0.603	0.603		
12.0								0.522	0.522	0.522	
15.0									0.403	0.403	0.403

【NOTE】

TOSHIBA Selection Tool allows users to select [add] or [not add] the Capacity correction value.

For more information, please check with TOSHIBA Selection Tool* or ask our authorized dealer.

* : Please confirm Version Information by TOSHIBA HVAC Global Portal (THGP).

7.3 Charging requirement with additional refrigerant

Additional refrigerant charge amount (case of SMMS-u)

This item describes the refrigerant correction amount of the Dx coil Interface system when connects with SMMS-u.

For more information please refer to Engineering Databook of SMMS-u.

Additional refrigerant charge amount at site = [1] + [2] + [3] + [4]

[1]. Compensation by system HP.

[2]. Real length of liquid pipe × Additional refrigerant charge amount per liquid pipe 1m.

[3]. Corrective amount of refrigerant depending on the indoor units(Dx-coil Interface capacity).

For Guideline TF, Dx-coil volume is relatively small. Hence, the additional refrigerant correction amount shall be 0 kg for all cases.

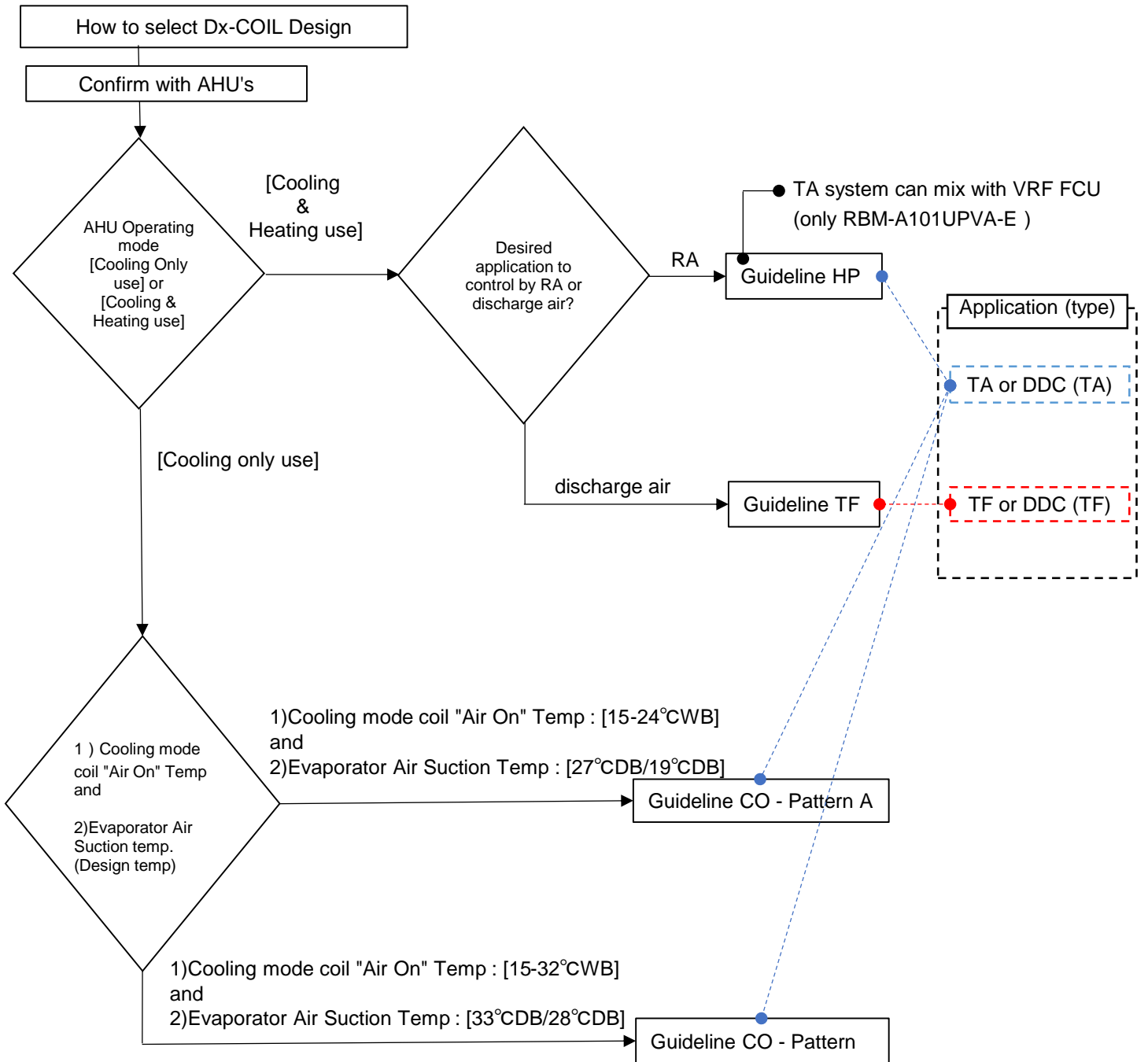
* yellow highlight zone in the table below applicable only for SMMS-u and SMMS∞.

[4]. Corrective amount of refrigerant depending on the outdoor unit diversity (Connected ratio of indoor units to outdoor units).

Corrective amount of refrigerant depending on the Dx coil Interface Capacity(HP).Guideline HP , cooling only pattern A and B.

HP	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
kg	1.4	1.8	2.1	2.5	2.9	3.2	3.6	3.9	4.3	4.6	5.0	5.3	5.8	6.1	6.5	6.8	7.2	7.5	7.9	8.2	8.6	8.9	9.3	9.7	10.0	10.4	10.8
HP	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112	114
kg	11.1	11.5	11.8	12.2	12.5	12.9	13.3	13.6	14.0	14.3	14.7	15.1	15.4	15.8	16.1	16.5	16.9	17.2	17.6	17.9	18.3	18.7	19.0	19.4	19.7	20.1	20.5
HP	116	118	120																								
kg	20.8	21.2	21.5																								

7.4 How to select DX COIL Design Guideline



AHU / DX COIL Design Notes:

Cooling & Heating output figures are based on calculations and 'general' test data. All figures are to be taken as approximations. The properties of the 3rd Party DX COIL will have an effect on the performance of Outdoor units.

- For the AHU/DX COIL prepared on site, please design with referring to submittal of AHU.
- The DX COIL must be suitable for R410A.
- The design should allow operation an Evaporator and a Condenser depends on selected usage.
(Features: Multiple circuits / Liquid Capillary Distributor / Gas Header)
- The counter flow principle must be observed for the DX COIL design.
- A Drain Pan must be fitted (even if only used in Heat mode) due to defrost cycles.

7.5 DX COIL Guideline HP

- Guideline HP -

No. of Ref. Circuit by DX Coil Copper Tube Dia. and DX Coil Size (HP)

Copper Tube	Number of Circuits					
	8.0mm		9.5mm		12.7mm	
	Min	Max	Min	Max	Min	Max
Dx Coil HP						
8 HP	8.0	12.0	6.0	10.0	4.0	6.0
10 HP	10.0	14.0	8.0	12.0	4.0	6.0
12 HP	12.0	16.0	8.0	12.0	6.0	8.0
14 HP	14.0	20.0	10.0	14.0	6.0	8.0
16 HP	16.0	22.0	12.0	16.0	8.0	10.0
18 HP	18.0	24.0	14.0	18.0	8.0	10.0
20 HP	20.0	26.0	16.0	20.0	10.0	12.0
22 HP	22.0	30.0	16.0	22.0	10.0	12.0
24 HP	24.0	32.0	18.0	24.0	12.0	14.0
26 HP	26.0	34.0	20.0	26.0	12.0	14.0
28 HP	28.0	38.0	20.0	26.0	12.0	14.0
30 HP	30.0	40.0	22.0	28.0	14.0	16.0
32 HP	32.0	42.0	24.0	30.0	14.0	16.0
34 HP	34.0	46.0	26.0	32.0	14.0	18.0
36 HP	36.0	48.0	26.0	34.0	16.0	20.0
38 HP	38.0	50.0	28.0	36.0	16.0	20.0
40 HP	40.0	54.0	30.0	38.0	18.0	22.0

HP		8	10	12	14	16	18	20	22	24
AHU Air Flow rate (m3/hr)	Std.	3,600	4,200	5,300	6,140	7,200	7,800	8,400	9,520	10,370
	Min.	2,880	3,360	4,240	4,920	5,760	6,240	6,720	7,620	8,290
	Max.	4,320	5,040	6,400	7,420	8,640	9,360	10,080	11,490	12,510
DX Coil Internal volume (cc)	Min.	3,400	4,250	5,100	5,950	6,800	7,650	8,500	9,350	10,200
	Max.	4,600	5,750	6,900	8,050	9,200	10,350	11,500	12,650	13,800
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	67.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	25.0	31.5	37.5	45	50.0	56.0	63.0	69.0	75.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

7.5 DX COIL Guideline HP

- Guideline HP -

HP		26	28	30	32	34	36	38	40	42
AHU Air Flow rate (m3/hr)	Std.	11,210	12,060	12,900	14,400	14,590	15,600	16,280	16,800	17,970
	Min.	8,970	9,650	10,320	11,520	11,670	12,480	13,030	13,440	14,380
	Max.	13,530	14,550	15,570	17,280	17,610	18,720	19,650	21,160	21,690
DX Coil Internal volume (cc)	Min.	11,050	11,900	12,750	13,600	14,450	15,300	16,150	17,000	17,850
	Max.	14,950	16,100	17,250	18,400	19,550	20,700	21,850	23,000	24,150
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	72.8	80.0	84.0	90.0	95.4	101.0	106.4	112.0	120.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	81.5	90.0	94.5	100.0	106.0	113.0	119.0	126.0	135.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

HP		44	46	48	50	52	54	56	58	60
AHU Air Flow rate (m3/hr)	Std.	18,820	19,660	20,400	21,350	22,200	23,400	23,890	24,730	25,200
	Min.	15,050	15,730	16,320	17,080	17,760	18,720	19,110	19,780	20,160
	Max.	22,710	23,730	24,480	25,760	26,780	28,080	28,820	29,840	30,240
DX Coil Internal volume (cc)	Min.	18,700	19,550	20,400	21,250	22,100	22,950	23,800	24,650	25,500
	Max.	25,300	26,450	27,600	28,750	29,900	31,050	32,200	33,350	34,500
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	125.0	130.0	140.4	140.4	145.8	151.2	160.0	162.4	168.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	140.0	145.0	156.0	156.0	162.0	168.0	180.0	182.0	189.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

7.5 DX COIL Guideline HP

- Guideline HP -

HP		62	64	66	68	70	72	74	76	78
AHU Air Flow rate (m3/hr)	Std.	26,420	27,270	28,110	28,950	29,800	30,640	31,490	32,330	33,180
	Min.	21,140	21,810	22,490	23,160	23,840	24,520	25,190	25,870	26,540
	Max.	31,880	32,900	33,920	34,940	35,960	36,980	38,000	39,010	40,030
DX Coil Internal volume (cc)	Min.	26,350	27,200	28,050	28,900	29,750	30,600	31,450	32,300	33,150
	Max.	35,650	36,800	37,950	39,100	40,250	41,400	42,550	43,700	44,850
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	175.0	180.0	185.4	190.8	196.2	202.0	207.2	212.8	218.4
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	195.0	200.0	206.0	212.0	218.0	226.0	231.0	238.0	245.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

HP		80	82	84	86	88	90	92	94	96
AHU Air Flow rate (m3/hr)	Std.	34,020	34,870	35,710	36,560	37,400	38,250	39,090	39,940	40,780
	Min.	27,220	27,890	28,570	29,250	29,920	30,600	31,270	31,950	32,630
	Max.	41,050	42,070	43,090	44,110	45,130	46,150	47,170	48,190	49,210
DX Coil Internal volume (cc)	Min.	34,000	34,850	35,700	36,550	37,400	38,250	39,100	39,950	40,800
	Max.	46,000	47,150	48,300	49,450	50,600	51,750	52,900	54,050	55,200
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	224.0	230.4	240.0	241.2	246.6	252.0	257.6	263.2	270.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	252.0	256.0	270.0	268.0	274.0	280.0	287.0	294.0	300.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

7.5 DX COIL Guideline HP

- Guideline HP -

HP		98	100	102	104	106	108	110	112	114
AHU Air Flow rate (m3/hr)	Std.	41,630	42,470	43,320	44,160	45,010	45,850	46,700	47,540	48,390
	Min.	33,300	33,980	34,650	35,330	36,000	36,680	37,360	38,030	38,710
	Max.	50,230	51,250	52,270	53,280	54,300	55,320	56,340	57,360	58,380
DX Coil Internal volume (cc)	Min.	41,650	42,500	43,350	44,200	45,050	45,900	46,750	47,600	48,450
	Max.	56,350	57,500	58,650	59,800	60,950	62,100	63,250	64,400	65,550
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	274.4	280.0	286.2	291.6	297.0	303.0	308.0	313.6	319.2
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	308.0	315.0	318.0	324.0	330.0	339.0	343.0	350.0	357.0
	Coil on Air Temp.	12 - 28°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	20°CDB								

HP		116	118	120
AHU Air Flow rate (m3/hr)	Std.	49,230	50,080	50,920
	Min.	39,380	40,060	40,740
	Max.	59,400	60,420	61,440
DX Coil Internal volume (cc)	Min.	49,300	50,150	51,000
	Max.	66,700	67,850	69,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)		
Cooling	Max. Capacity (kW)	324.8	330.4	336.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)		
	Evaporating Temp.	6.5°C		
	Superheat	6K		
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB		
Heating	Max. Capacity (kW)	364.0	371.0	378.0
	Coil on Air Temp.	12 - 28°CWB		
	Condensating Temp.	52°C		
	Sub Cooling	4K		
	Air Suction Temp. (Design temp)	20°CDB		

7.6 DX COIL Guideline CO Pattern A

- Guideline Cooling Only Pattern A -

No. of Ref. Circuit by DX Coil Copper Tube Dia. and DX Coil Size (HP)

Copper Tube	Number of Circuits					
	8.0mm		9.5mm		12.7mm	
	Min	Max	Min	Max	Min	Max
Dx Coil HP						
8 HP	No restriction	12.0	No restriction	10.0	No restriction	6.0
10 HP		14.0		12.0		6.0
12 HP		16.0		12.0		8.0
14 HP		20.0		14.0		8.0
16 HP		22.0		16.0		10.0
18 HP		24.0		18.0		10.0
20 HP		26.0		20.0		12.0
22 HP		30.0		22.0		12.0
24 HP		32.0		24.0		14.0
26 HP		34.0		26.0		14.0
28 HP		38.0		26.0		14.0
30 HP		40.0		28.0		16.0
32 HP		42.0		30.0		16.0
34 HP		46.0		32.0		18.0
36 HP		48.0		34.0		20.0
38 HP		50.0		36.0		20.0
40 HP	54.0	38.0	22.0			

* It is able to connect SMMS-e,u H/P model when you set it as Cooling only mode.

Please setup the Function CODE(DN code) [0F] : "0000" to "0001" by a wired remote controller.

HP		8	10	12	14	16	18	20	22	24
AHU Air Flow rate (m3/hr)	Std.	3,600	4,200	5,300	6,140	7,200	7,800	8,400	9,520	10,370
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	3,400	4,250	5,100	5,950	6,800	7,650	8,500	9,350	10,200
	Max.	6,400	8,000	9,600	11,200	12,800	14,400	16,000	17,600	19,200
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	67.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.6 DX COIL Guideline CO Pattern A

- Guideline Cooling Only Pattern A -

HP		26	28	30	32	34	36	38	40	42
AHU Air Flow rate (m3/hr)	Std.	11,210	12,060	12,900	14,400	14,590	15,600	16,280	16,800	17,970
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	11,050	11,900	12,750	13,600	14,450	15,300	16,150	17,000	17,850
	Max.	20,800	22,400	24,000	25,600	27,200	28,800	30,400	32,000	33,600
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	72.8	80.0	84.0	90.0	95.4	101.0	106.4	112.0	120.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		44	46	48	50	52	54	56	58	60
AHU Air Flow rate (m3/hr)	Std.	18,820	19,660	20,400	21,350	22,200	23,400	23,890	24,730	25,200
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	18,700	19,550	20,400	21,250	22,100	22,950	23,800	24,650	25,500
	Max.	35,200	36,800	38,400	40,000	41,600	43,200	44,800	46,400	48,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	125.0	130.0	140.4	140.4	145.8	151.2	160.0	162.4	168.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.6 DX COIL Guideline CO Pattern A

- Guideline Cooling Only Pattern A -

HP		62	64	66	68	70	72	74	76	78
AHU Air Flow rate (m3/hr)	Std.	26,420	27,270	28,110	28,950	29,800	30,640	31,490	32,330	33,180
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	26,350	27,200	28,050	28,900	29,750	30,600	31,450	32,300	33,150
	Max.	49,600	51,200	52,800	54,400	56,000	57,600	59,200	60,800	62,400
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	175.0	180.0	185.4	190.8	196.2	202.0	207.2	212.8	218.4
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		80	82	84	86	88	90	92	94	96
AHU Air Flow rate (m3/hr)	Std.	34,020	34,870	35,710	36,560	37,400	38,250	39,090	39,940	40,780
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	34,000	34,850	35,700	36,550	37,400	38,250	39,100	39,950	40,800
	Max.	64,000	65,600	67,200	68,800	70,400	72,000	73,600	75,200	76,800
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	224.0	230.4	240.0	241.2	246.6	252.0	257.6	263.2	270.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.6 DX COIL Guideline CO Pattern A

- Guideline Cooling Only Pattern A -

HP		98	100	102	104	106	108	110	112	114
AHU Air Flow rate (m3/hr)	Std.	41,630	42,470	43,320	44,160	45,010	45,850	46,700	47,540	48,390
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	41,650	42,500	43,350	44,200	45,050	45,900	46,750	47,600	48,450
	Max.	78,400	80,000	81,600	83,200	84,800	86,400	88,000	89,600	91,200
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	274.4	280.0	286.2	291.6	297.0	303.0	308.0	313.6	319.2
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		116	118	120
AHU Air Flow rate (m3/hr)	Std.	49,230	50,080	50,920
	Min.	No restriction		
	Max.	No restriction		
DX Coil Internal volume (cc)	Min.	49,300	50,150	51,000
	Max.	92,800	94,400	96,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)		
Cooling	Max. Capacity (kW)	324.8	330.4	336.0
	Coil on Air Temp.	15 - 24°CWB (18 - 32°CDB)		
	Evaporating Temp.	6.5°C		
	Superheat	6K		
	Air Suction Temp. (Design temp)	27°CDB / 19°CWB		
Heating	Max. Capacity (kW)	-	-	-
	Coil on Air Temp.	-		
	Condensating Temp.	-		
	Sub Cooling	-		
	Air Suction Temp. (Design temp)	-		

7.7 DX COIL Guideline CO Pattern B

- Guideline Cooling Only Pattern B -

No. of Ref. Circuit by DX Coil Copper Tube Dia. and DX Coil Size (HP)

Copper Tube	Number of Circuits					
	8.0mm		9.5mm		12.7mm	
Dx Coil HP	Min	Max	Min	Max	Min	Max
8 HP	No restriction	12.0	No restriction	10.0	No restriction	6.0
10 HP		14.0		12.0		6.0
12 HP		16.0		12.0		8.0
14 HP		20.0		14.0		8.0
16 HP		22.0		16.0		10.0
18 HP		24.0		18.0		10.0
20 HP		26.0		20.0		12.0
22 HP		30.0		22.0		12.0
24 HP		32.0		24.0		14.0
26 HP		34.0		26.0		14.0
28 HP		38.0		26.0		14.0
30 HP		40.0		28.0		16.0
32 HP		42.0		30.0		16.0
34 HP		46.0		32.0		18.0
36 HP		48.0		34.0		20.0
38 HP		50.0		36.0		20.0
40 HP	54.0	38.0	22.0			

* It is able to connect SMMS-e,u H/P model when you set it as Cooling only mode.

Please setup the Function CODE(DN code) [0F] : "0000" to "0001" by a wired remote controller.

HP		8	10	12	14	16	18	20	22	24
AHU Air Flow rate (m3/hr)	Std.	3,600	4,200	5,300	6,140	7,200	7,800	8,400	9,520	10,370
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	1,800	2,250	2,700	3,150	3,600	4,050	4,500	4,950	5,400
	Max.	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000	12,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5	67.0
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.7 DX COIL Guideline CO Pattern B

- Guideline Cooling Only Pattern B -

HP		26	28	30	32	34	36	38	40	42
AHU Air Flow rate (m3/hr)	Std.	11,210	12,060	12,900	14,400	14,590	15,600	16,280	16,800	17,970
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	5,850	6,300	6,750	7,200	7,650	8,100	8,550	9,000	9,450
	Max.	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	21,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	72.8	80.0	84.0	90.0	95.4	101.0	106.4	112.0	120.0
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		44	46	48	50	52	54	56	58	60
AHU Air Flow rate (m3/hr)	Std.	18,820	19,660	20,400	21,350	22,200	23,400	23,890	24,730	25,200
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	9,900	10,350	10,800	11,250	11,700	12,150	12,600	13,050	13,500
	Max.	22,000	23,000	24,000	25,000	26,000	27,000	28,000	29,000	30,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	125.0	130.0	140.4	140.4	145.8	151.2	160.0	162.4	168.0
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.7 DX COIL Guideline CO Pattern B

- Guideline Cooling Only Pattern B -

HP		62	64	66	68	70	72	74	76	78
AHU Air Flow rate (m3/hr)	Std.	26,420	27,270	28,110	28,950	29,800	30,640	31,490	32,330	33,180
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	13,950	14,400	14,850	15,300	15,750	16,200	16,650	17,100	17,550
	Max.	31,000	32,000	33,000	34,000	35,000	36,000	37,000	38,000	39,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	175.0	180.0	185.4	190.8	196.2	202.0	207.2	212.8	218.4
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		80	82	84	86	88	90	92	94	96
AHU Air Flow rate (m3/hr)	Std.	34,020	34,870	35,710	36,560	37,400	38,250	39,090	39,940	40,780
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	18,000	18,450	18,900	19,350	19,800	20,250	20,700	21,150	21,600
	Max.	40,000	41,000	42,000	43,000	44,000	45,000	46,000	47,000	48,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	224.0	230.4	240.0	241.2	246.6	252.0	257.6	263.2	270.0
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

7.7 DX COIL Guideline CO Pattern B

- Guideline Cooling Only Pattern B -

HP		98	100	102	104	106	108	110	112	114
AHU Air Flow rate (m3/hr)	Std.	41,630	42,470	43,320	44,160	45,010	45,850	46,700	47,540	48,390
	Min.	No restriction								
	Max.	No restriction								
DX Coil Internal volume (cc)	Min.	22,050	22,500	22,950	23,400	23,850	24,300	24,750	25,200	25,650
	Max.	49,000	50,000	51,000	52,000	53,000	54,000	55,000	56,000	57,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	274.4	280.0	286.2	291.6	297.0	303.0	308.0	313.6	319.2
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	-	-	-	-	-	-	-	-	-
	Coil on Air Temp.	-								
	Condensating Temp.	-								
	Sub Cooling	-								
	Air Suction Temp. (Design temp)	-								

HP		116	118	120
AHU Air Flow rate (m3/hr)	Std.	49,230	50,080	50,920
	Min.	No restriction		
	Max.	No restriction		
DX Coil Internal volume (cc)	Min.	26,100	26,550	27,000
	Max.	58,000	59,000	60,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)		
Cooling	Max. Capacity (kW)	324.8	330.4	336.0
	Coil on Air Temp.	15 - 32°CWB (18 - 43°CDB)		
	Evaporating Temp.	6.5°C		
	Superheat	6K		
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB		
Heating	Max. Capacity (kW)	-	-	-
	Coil on Air Temp.	-		
	Condensating Temp.	-		
	Sub Cooling	-		
	Air Suction Temp. (Design temp)	-		

7.8 DX COIL Guideline TF

- Guideline TF -

No. of Ref. Circuit by DX Coil Copper Tube Dia. and DX Coil Size (HP)

Copper Tube	Number of Circuits					
	8.0mm		9.5mm		12.7mm	
	Min	Max	Min	Max	Min	Max
Dx Coil HP						
8 HP	8.0	12.0	6.0	10.0	4.0	6.0
10 HP	10.0	14.0	8.0	12.0	4.0	6.0
12 HP	12.0	16.0	8.0	12.0	6.0	8.0
14 HP	14.0	20.0	10.0	14.0	6.0	8.0
16 HP	16.0	22.0	12.0	16.0	8.0	10.0
18 HP	18.0	24.0	14.0	18.0	8.0	10.0
20 HP	20.0	26.0	16.0	20.0	10.0	12.0
24 HP	24.0	32.0	18.0	24.0	12.0	14.0
28 HP	28.0	38.0	20.0	26.0	12.0	14.0
32 HP	32.0	42.0	24.0	30.0	14.0	16.0
36 HP	36.0	48.0	26.0	34.0	16.0	20.0
40 HP	40.0	54.0	30.0	38.0	18.0	22.0

HP		8	10	12	14	16	18	20	22	24
AHU Air Flow rate (m3/hr)	Max.	1,680	2,100	2,520	3,060	3,440	3,870	4,310	-	5,170
	Mid	1,440	1,800	2,130	2,580	2,900	3,260	3,620	-	4,340
	Low	1,200	1,470	1,770	2,130	2,400	2,700	3,000	-	3,600
DX Coil Internal volume (cc)	Min.	1,720	2,150	2,580	3,010	3,440	3,870	4,300	-	5,160
	Max.	3,520	4,400	5,280	6,160	7,040	7,920	8,800	-	10,560
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)	22.4	28.0	33.5	40.0	45.0	50.4	56.0	-	67.0
	Coil on Air Temp.	10 - 32°CWB (19 - 46°CDB)**								
	Evaporating Temp.	6.5°C								
	Superheat	6K								
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB								
Heating	Max. Capacity (kW)	25.0	31.5	37.5	45	50.0	56.0	63.0	-	75.0
	Coil on Air Temp.	-10 - 15°CWB								
	Condensating Temp.	52°C								
	Sub Cooling	4K								
	Air Suction Temp. (Design temp)	0°CDB								

**Outdoor/Suction air temp. 46 - 52 °C(DB) is also available but Temporarily operatable.

7.8 DX COIL Guideline TF

- Guideline TF -

HP		26	28	30	32	34	36	38	40
AHU Air Flow rate (m3/hr)	Max.	-	6,040	-	6,910	-	7,780	-	8,650
	Mid	-	5,070	-	5,790	-	6,510	-	7,240
	Low	-	4,200	-	4,800	-	5,400	-	6,000
DX Coil Internal volume (cc)	Min.	-	6,020	-	6,880	-	7,740	-	8,600
	Max.	-	12,320	-	14,080	-	15,840	-	17,600
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)							
Cooling	Max. Capacity (kW)	-	80.0	-	90.0	-	101.0	-	112.0
	Coil on Air Temp.	10 - 32°CWB (19 - 46°CDB)**							
	Evaporating Temp.	6.5°C							
	Superheat	6K							
	Air Suction Temp. (Design temp)	33°CDB / 28°CWB							
Heating	Max. Capacity (kW)	-	90.0	-	100.0	-	113.0	-	126.0
	Coil on Air Temp.	-10 - 15°CWB							
	Condensating Temp.	52°C							
	Sub Cooling	4K							
	Air Suction Temp. (Design temp)	0°CDB							

**Outdoor/Suction air temp. 46 - 52 °C(DB) is also available but Temporarily operatable.

7.9 DX COIL Manufacturing

<ul style="list-style-type: none"> DX COIL & Pipework Design Pressure: 4.15MPa DX COIL & Pipework Burst Pressure (withstand): 12.45MPa (more than 3 x Design Pressure) 						
<p>DX COIL Contamination:</p> <ul style="list-style-type: none"> Ensure the DX COIL is cleaned, using detergent, after manufacture to remove contaminants from the coil Do not use chlorinated detergent during the cleaning process Do not leave flux on or inside the DX COIL 						
<p>DX COIL & Pipework Contamination (Allowable Limits):</p> <table> <tr> <td>Residual water amount</td> <td>0.6 mg / m</td> </tr> <tr> <td>Residual oil amount</td> <td>0.5 mg / m</td> </tr> <tr> <td>Amount of solid contaminants</td> <td>1.8 mg / m</td> </tr> </table> <ul style="list-style-type: none"> DX COIL contaminants must be equal to or less than the values shown above. The allowable contaminant levels shown assumes Ø9.52mm copper tube has been used for the manufacture of the DX COIL 	Residual water amount	0.6 mg / m	Residual oil amount	0.5 mg / m	Amount of solid contaminants	1.8 mg / m
Residual water amount	0.6 mg / m					
Residual oil amount	0.5 mg / m					
Amount of solid contaminants	1.8 mg / m					

7.10 DX Controller Installation

Installation Site	<p>Avoid Direct Sunlight. DO NOT install outside.</p> <ul style="list-style-type: none"> Avoid locations exposed to steam or oil vapours. Avoid locations where combustible gas may leak, settle or be generated. Avoid installation near machines emitting high-frequency waves. Avoid places where acidic solutions are frequently used. Avoid places where sulphur based or other sprays are frequently used. Avoid places where vibrations may occur. When installing the Dx-valve kit and the Dx-coil controller into the Air handling unit, do not install it where it is exposed to the cooled air of the secondary side of the heat exchanger. Do not install in locations where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the Dx-coil controller, it may spontaneously combust and start a fire. Standard Rating ; IP21
Notes	To avoid damage; when making holes for cable glands, please first remove the Gland Plate from the DX Coil CONTROLLER
Ambient Temperature	52°C (or less)
Ambient Humidity	Relative humidity 80% (or less). No dew condensation allowed. If the DX-Controller is to be installed where dew condensation could form, locally sourced insulation should be fitted to avoid condensation.
Installation Angle	Vertical Installation

7.11 Sensor Connections

Installation	Sensor holders MUST be brazed to the DX COIL to ensure reliable temperature sensing. Follow the information in the Dx-coil controller Installation Manual for details.
Wire Connections	<p>TC1, TC2, TC and TA, TF which have a 7.5m cable are combined in the Dx-coil controller. If these Sensors are removed during installation ensure the sensors are reconnected to the Dx-coil Controller main PCB (MCC-1777) as shown below:</p> <ul style="list-style-type: none"> • TC1 Sensor (BRN Plug [2 Pin]) > MCC-1777 CN100 (BLOWN Socket [2 Pin]) • TC2 Sensor (BLK Plug [2 Pin]) > MCC-1777 CN101 (BLK Socket [2 Pin]) • TCJ Sensor (RED Plug [2 Pin]) > MCC-1777 CN102 (RED Socket [2 Pin]) • TF Sensor (GRN Plug[2 Pin]) > MCC-1777 CN103 (GRN Socket [2 Pin]) • TA Sensor (YEL Plug[2 Pin]) > MCC-1777 CN104 (YEL Socket [2 Pin]) <p>Take care to re-connect them correctly. The cables should be installed with a U-bend at Sensor ends to stop water dripping into components.</p> <p>The sensor cables vinyl tube can withstand up to 105°C be careful to keep clear of high temperature parts. The extension cables' connectors are not IP rated. Ensure that they are located within the AHU.</p> <p>If these Sensors needs to extend, following the below cable specification(locally sourced):</p> <ul style="list-style-type: none"> • Cable Specification : VFF, 0.3-0.5 mm2 • Available Extend Length(m) : Max. 5.0m (Total: 12.5m) <p>Take care to connect them correctly and carefully handle and prepare the extend cable to prevent getting such as electrical noise, water and dust.</p>

TA, TF Sensor position

The TA, TF sensor which is combined in the Dx-coil controller must be located right position for TOSHIBA control, not demand control. The cooling/heating demand is determined from the DDC. Following the below example picture:

*1: TF sensor can only be used with SMMS-u and SMMSoo.

	TA	DDC	TF
Return air only			
Fresh air only			
FA mixed with RA			
Heat recovery coil			

Please confirm specification of Heat Recovery Exchanger and apply within its specification.

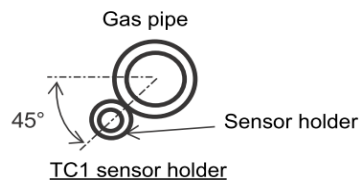
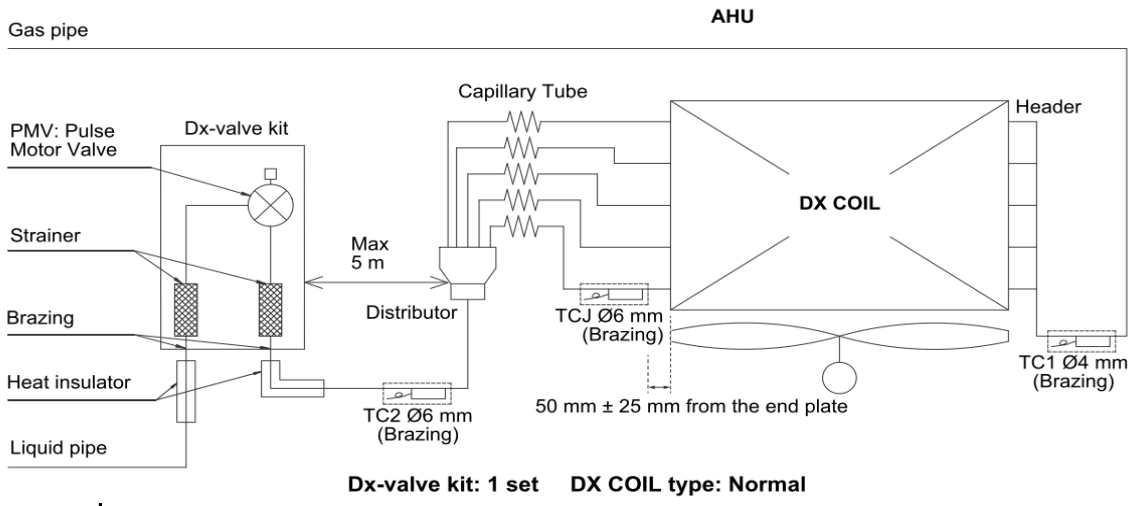
※Each Dx-Type Design **MUST** follow the specified temperature range below.

Guideline	HP(TA) (Heating & Cooling)	Cooling Only*		HP(TF) (Heating & Cooling)
		Pattern A	Pattern B	
Control		TA or DDC		TF or DDC
Cooling mode "Coil on Air" temp.	15 - 24 °C WB (18 - 32 °C DB)	15 - 24 °C WB (18 - 32 °C DB)	15 - 32 °C WB (18 - 43 °C DB)	10 - 32 °C WB (19 - 46 °C** DB)
Heating mode "Coil on Air" temp.	12 - 28 °C DB (Pull down to 7 °C)	---	---	- 10 - 15 °C DB

7.12 Dx-valve KIT Installation

Installation	Avoid locations in direct sunlight. Standard Rating ; IP21
Environment	Insulation should be fitted to Dx-valve kit (locally sourced). Ideally the Dx-valve kit should be contained within the AHU. If installed outside, a cover (locally sourced) should be fitted to protect from wind and rain in addition to Insulation.
Installation	The supplied components need to be assembled on to the DX COIL using custom locally sourced pipework. The PMV (Pulse Motor Valve) must be NOT installed upside down (PMV Motor on bottom). The connection angle between PMV body and PMV Motor is fixed at the factory (using thread lock) and should not be changed. The PMV Motor should not be removed from PMV body. Carefully handle and prepare the PMV when fitting to prevent ingress from foreign matter such as dust or water.

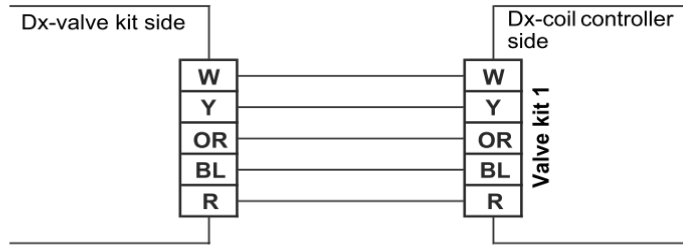
Brazing	<p>● PMV</p> <p>A) Whilst brazing, the PMV body and PMV Motor must be water cooled to keep the component's temperature does not exceed 120°C.</p> <p>B) Whilst brazing, nitrogen gas must flowed through the PMV body and pipework to prevent internal oxidization.</p> <p>C) Prevent cooling water from getting inside the PMV body and connector of the lead during brazing.</p> <p>D) Take care not to damage the PMV cables during brazing.</p> <p>● Sensor holders</p> <ul style="list-style-type: none"> · To ensure reliable operation, all Sensor holders must be fitted by brazing. · Be careful of that the brazing material does not enter into the sensor holder when attaching the TC1, TC2 and TCJ sensor holder. <p><u>TC1 Sensor</u> : Install it in the collecting part of the gas header. Brazing the TC1 sensor on the location of the lowside 45 ° to detect the stable temperature.</p> <p><u>TC2 Sensor</u> : Install it in the between the liquid pipe distributor and the PMV. (TC2 sensor is attached to the refrigerant cycle of AHU.)</p> <p><u>TCJ Sensor</u> : Install it in the pass where the temperature of the capillary tube is the lowest. If the TC1, TC2 or TCJ sensors are easy to be subjected to the surrounding thermal effect, cover them with the heat insulator material, and fix them with the fixing band</p> <p><u>TC1, TC2 and TCJ sensor position on DX COIL</u></p>
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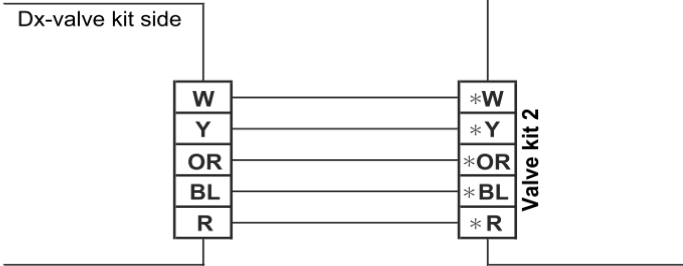
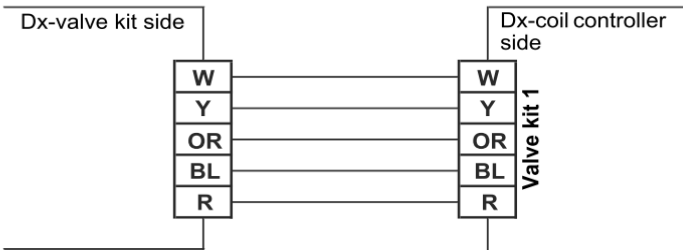
Wire Connections

- Connect the cable from the PMV. Match the color of the wiring of the PMV side and the controller side.
- For the PMV, sensor wiring, do not bundle it with the motor wiring. The wrong operation may result in.
- The PMV cable is supplied at the maximum permissible length of 5m.

Color identification	
W:	White
Y:	Yellow
OR:	Orange
BL:	Blue
R:	Red



RBM-A101UPVA-E	8, 10, 12 HP
RBM-A201UPVA-E	14, 16, 18, 20 HP



RBM-A101UPVA-E	24 HP (12 HP × 2)
RBM-A201UPVA-E	28 HP (14 HP × 2), 32 HP (16 HP × 2) 36 HP (18 HP × 2), 40 HP (20 HP × 2)

8. Control Outline

8.1 Cautions regard with DDC's programing

(1) Operation Start

- Capacity control signal(analogue input voltage) should be output after the AHU's fan operating. Then, recommend to keep more than 50%(Heating; 40%) Capacity control signal during 5mins.
- To protect the compressor, for 5 mins after operation start the compressor will continue to operate even if receives "Zero" Capacity control signal.

(2) Freeze prevention control (Low temperature release)

- When the compressor(s) stopped by Freeze prevention control, it will re-start after maximum 20 mins depends on DX-COIL condition.

(3) Recovery control

- Both refrigerant recovery and oil (lubricant) recovery control during cooling and heating operation. When RSW503,504 is set as [3], when recovery control starts output signal will be from *DO5/DO5,*DO6/DO6. Please check outdoor units' Service Manual for more detail.

(4) Defrost control (Full Defrost)

- Defrost control is designed to performed according to the amount of frost on the outdoor unit's time. heat exchanger or the accumulation of operation. When defrost control starts, output signal will come from *DO4/DO4. Please check outdoor units' Service Manual for more detail.

(5) Compressor restart prevention timer

- If the compressor(s) is stopped by Capacity control or protection function(except Freeze prevention control), normally the compressor will continue to stop for 2 mins 30 secs, even if receives Capacity control signal.

8.2 Protection Function Summary

- Protection Controls varies by Outdoor unit, please see appropriate Outdoor unit service manual for full details (Below "Protection Function Summary" is according to SMMS-u.)

Function	Summary																		
Freeze prevention control (Low temperature release)	In Cooling Mode prevents low DX-COIL temperatures by controlling compressor speed (based on TC1/TC2/TCJ sensor temperature).																		
Cooling oil (refrigerant) recovery control	This control periodically increases flow-rate to ensure refrigerant oil does not build up in inter-unit gas pipes (which can occur when operating command is inadequate, or while cooling is progressed under low ambient conditions). During this control the compressors are operated at a target speed, and Dx valve kit PMV is opened to a certain degree. Upon completion of recovery control normal Cooling operation resumes.																		
Heating refrigerant (oil) recovery control (Heating Start up Control)	This control periodically increases flow-rate to ensure liquid refrigerant trapped inside the DX COIL. It also serves the purpose of recovering DX COIL / Outdoor refrigerant after defrosting and recovering oil present in outdoor heat exchangers during heating overload operation. During this control the compressors are operated at a target speed, and Dx valve kit PMV is opened to a certain degree. Upon completion of recovery control normal Heating operation resumes. Recovery operation normally takes place after defrosting.																		
Defrost control (Full Defrost)	In Heating mode a defrost operation can be performed to reduce ice build-up on the Outdoor unit (based on TE1 & TE2, TE3 sensor). During Defrosting the refrigerant cycle is reversed temporarily cooling the DX COIL. During the heating operation, if the TE sensor detected temperature falls below the predicted TE sensor temperature by a specified amount, or if the TE sensor detected temperature falls below the frosting temperature for 300 minutes, the defrosting operation starts. (After start-up or when switching from cooling to heating, frost judgment is performed and the defrosting operation is started according to the judgment result.) While the outdoor unit is Defrosting the Dx valve kit PMV is opened to a certain degree. Heating Recovery operation normally takes place after defrosting. * In the case of the coupled system, when any of the outdoor units satisfies the defrosting start condition, all the units in the group to which the unit belongs start defrosting operation, and the other Gr units continue heating operation.																		
High Pressure release control	This control function is aimed at automatically shutting down a compressor in an outdoor unit depending on Pd. It is individuality performed by the header unit and each follower unit. <ul style="list-style-type: none"> Compressors are shut down when Pd reaches or exceeds P0 The Pd control point P0 is switched according to the start priority of the outdoor unit The compressor restart prevention timer (2 minutes 30 seconds) is set, and the control terminated. <table border="1" data-bbox="608 1256 1040 1384"> <thead> <tr> <th colspan="2">Pd control point P0</th> <th>Cooling</th> <th>Heating</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Outdoor unit priority1</td> <td>compressor1</td> <td>3.77MPa</td> <td>3.53MPa</td> </tr> <tr> <td>compressor2</td> <td>3.72MPa</td> <td>3.49MPa</td> </tr> <tr> <td rowspan="2">Except outdoor unit priority1</td> <td>compressor1</td> <td>3.72MPa</td> <td>3.45MPa</td> </tr> <tr> <td>compressor2</td> <td>3.72MPa</td> <td>3.41MPa</td> </tr> </tbody> </table>	Pd control point P0		Cooling	Heating	Outdoor unit priority1	compressor1	3.77MPa	3.53MPa	compressor2	3.72MPa	3.49MPa	Except outdoor unit priority1	compressor1	3.72MPa	3.45MPa	compressor2	3.72MPa	3.41MPa
Pd control point P0		Cooling	Heating																
Outdoor unit priority1	compressor1	3.77MPa	3.53MPa																
	compressor2	3.72MPa	3.49MPa																
Except outdoor unit priority1	compressor1	3.72MPa	3.45MPa																
	compressor2	3.72MPa	3.41MPa																
Case Heater control	There are 1 types of case heater: a compressor case heater. This control function is aimed at preventing the accumulation of refrigerant in those case, and is performed by all outdoor units. If the power supply has not been turned on for a specified period before a post-installation test run. Compressor failure may occur. Similarly, when starting compressors after a long period of no power supply, it is recommended that the power supply be turned on for a while before operation is resumed, just like a post-installation test run.																		
IPDU control (IPDU = Inverter P.C. board for compressor)	(1) Current, power release value control The purpose of this control is to prevent high pressure rise and overheating of electric parts by reducing the compressor speed when the maximum current and maximum power value set for each model are exceeded. (2) Heat sink overheat abnormality <ul style="list-style-type: none"> Stop the compressor operation when the TH sensor temperature exceeds 93°C. When the above is stopped, the abnormal count is set to 1, and it restarts after 2 minutes and 30 seconds. If you continue the operation for 10 minutes or more after restarting, the trouble count will be cleared. A trouble is confirmed with a trouble count of "4". (error code P07). (3) High pressure SW control Inverter compressor stops driving the compressor when the high pressure SW is operating. <ul style="list-style-type: none"> When the above is stopped, the abnormal count is set to 1, and it restarts after 2 minutes and 30 seconds. If you continue the operation for 10 minutes or more after restarting, the trouble count will be cleared. The trouble count becomes "4" and the trouble is confirmed. (error code P04). 																		

9. Cable specifications

Communication line (Uv(U1), Uv(U2))

Uv: Control wiring between Dx-coil controller and outdoor unit

Wiring	2-core, non-polarity
Type	Shield wire
Size / Length	1.0 mm ² to 1.5 mm ² / Up to 1000 m

Remote controller wiring (A, B)

Wiring	2-core, non-polarity
Type	Shield wire
Size	0.5 mm ² to 2.0 mm ²
Length	<ul style="list-style-type: none"> • Up to 500 m • Up to 400 m (in case of two remote controller in group control) • Up to 200 m (total length of communication line between indoor units)

Terminal information

0.5 mm² to 1.0 mm² - AWG 24 to AWG 18

Function	Terminal	Max. Cable Length (m)	Cable Specification
Analogue Input (4 - 20 mA)	AI1, 2 / *AI1, 2	100	Non shield wire: 0.5 - 1.0 mm ²
Analogue Input (0 - 10 V)	AI3, 4 / *AI3, 4	200	Shield wire: 0.5 - 1.0 mm ²
Analogue Output (0 - 10 V)	AO1, 2 / *AO1, 2	200	Shield wire: 0.5 - 1.0 mm ²
Digital Input	DI1 - 6 / *DI1 - 6	100	Non shield wire: 0.5 - 1.0 mm ²
Digital Output	DO1 - E / *DO1 - E	500	Non shield wire: 0.5 - 1.0 mm ²

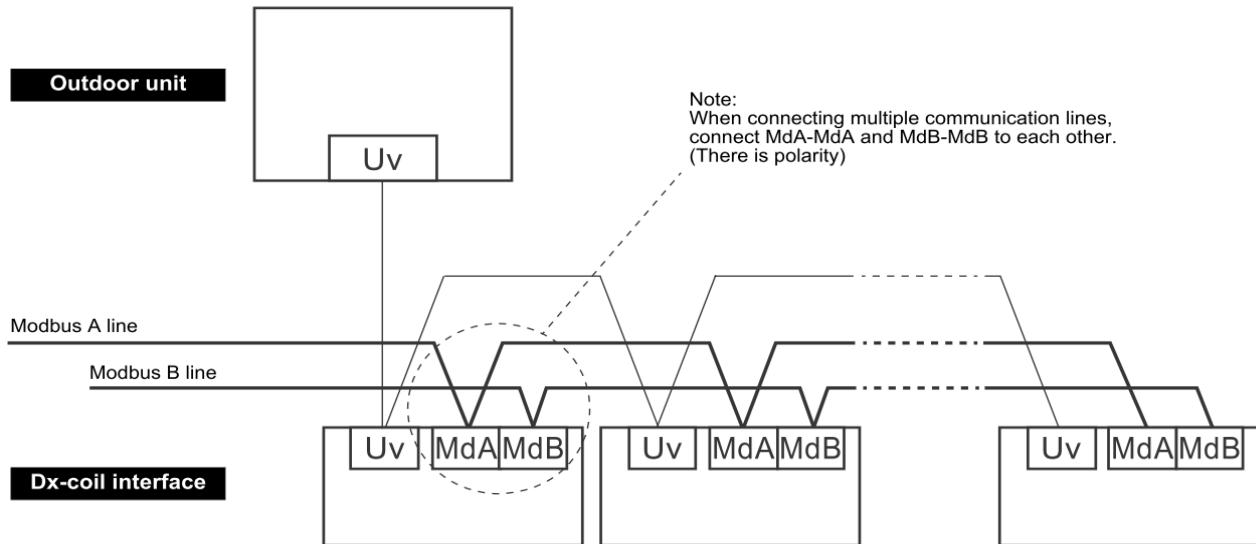
Use the following wiring materials to connect the communication cables and power cables. (locally procured)

Line	Description	
For RS-485	Type	2-core shielded wires
	Wire size	1.25 mm ² , 500 m max.
	Length	(total length)

10. Modbus setting method

Modbus communication is available on this model. Follow the procedure below to set.

1. Wiring method



Baud Rate *1	SW506	Bit1: ON / Bit2: OFF (19200)	Bit1: ON / Bit2: OFF (19200)	...	Bit1: ON / Bit2: OFF (19200)
Address *2	SW507	1	2	...	16 (Up to 16)
Termination resistor *3	SW801	Bit1: ON	Bit1: OFF	...	Bit1: OFF

*1: Set the baud rate according to the communication device.

*2: Up to 16 addresses can be set with the rotary switch.

*3: Set the terminating resistor only for the unit with the latest address.

SW	Bit	Function Name	OFF (Def)	ON	Detail															
SW506	1	Modbus baud rate	-	-	<table border="1"> <thead> <tr> <th>Bit1</th> <th>Bit2</th> <th>Baud rate</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>9600</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>19200</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>38400</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>57600</td> </tr> </tbody> </table>	Bit1	Bit2	Baud rate	OFF	OFF	9600	ON	OFF	19200	OFF	ON	38400	ON	ON	57600
	Bit1				Bit2	Baud rate														
	OFF	OFF	9600																	
	ON	OFF	19200																	
OFF	ON	38400																		
ON	ON	57600																		
2	Refer to right table																			
3	No function	-	-	-																
4	No function	-	-	-																
SW507	1	Modbus address setting (RSW)	-	-	Refer to "Modbus setting method" in this installation manual.															
SW801	1	Modbus terminating resistance setting	None	Can do (120 ohm)	Refer to "Modbus setting method" in this installation manual.															
	2	No function	-	-	-															

• RS-485 terminator resistor select switch SW801 (Bit1).

• For SW801 Bit1 (120 ohm), set only the Dx-interface with the latest address, and turn off Bit1 for other Dx-interfaces

RS-485 specifications

Character length	11bits
Data	8bits
Start bit	1 bit high
Stop bit	1 bit high
Parity Check	Even
Connector	2 terminals

Bit transmission order	LSB first(b0,b1....)	Bit data is transmitted sequentially from the LSB.
Byte transmission order	Big Endian. 0x1234_>0x12 then 0x34	Byte data is transmitted in the big endian order.

A: Non-inverted input	B: Inverted input
After receiving a packet, a response is permitted after at least 3.5 characters.	

2. Function codes

Function code	Sub function code	Function name
0×03	None	Read holding register
0×04	None	Read Input register
0×06	None	White single holding register
0×08	0×00, 01, 02, 04, 0A, 0B, 0C, 0D, 0E, 0F, 11, 12, 14	Diagnostics
0×0B	None	Get Comm. Event Counter
0×0C	None	Get Comm. Event Log
0×10	None	Write multiple holding registers

3. Address assignment table

Register	address	Read/Write	Data	Byte	Data Definition and remarks	
Holding Register	40001	R/W	Operation / stop setting	2	0: STOP 1: OPERATE	
	40002		Operation mode setting	2	1: HEATING MODE 2: COOLING MODE 3: DRY MODE	
	40003		Set temperature setting	2	10 times values	
	40004		Automatic cooling set temperature (Dual set point) setting	2	10 times values	
	40005		Automatic heating set temperature (Dual set point) setting	2	10 times values	
	40006		Fan speed setting	2	1: FAN STOP 2: FAN AUTO 3: FAN SPEED [HH] 4: FAN SPEED [H] 5: FAN SPEED [L]	
	40007		Operation prohibition setting	2	bit0: Operation STOP bit1: Operation Mode bit2: temperature setting bit4: FAN	
	40008		Analogue Input Capacity Control*	2	0 ~ 15	
	40009~40019		Reserved			
	40020		CN90 DI1(Safety contact input)	2	0: OFF 1:ON	
	40021		CN90 DI2(External error input)	2	0: OFF 1:ON	
	40022		CN90 DI3(Forced Thermo OFF input)	2	0: OFF 1:ON	
	40023		CN90 DI4(Notice input)	2	0: OFF 1:ON	

Register	address	Read/Write	Data	Byte	Data Definition and remarks
Input Register	30001	R	Operation / stop setting	2	0: STOP 1: OPERATE
	30002		Operation mode setting	2	1: HEATING MODE 2: COOLING MODE 3: DRY MODE
	30003		Set temperature setting	2	10 times values
	30004		Automatic cooling set temperature (Dual set point) setting	2	10 times values
	30005		Automatic heating set temperature (Dual set point) setting	2	10 times values
	30006		Fan speed setting	2	1: FAN STOP 2: FAN AUTO 3: FAN SPEED [HH] 4: FAN SPEED [H] 5: FAN SPEED [L]
	30007		Operation prohibition setting	2	bit0: Operation STOP bit1: Operation Mode bit2: temperature setting bit4: FAN
	30008		Analogue Input Capacity Control*	2	0 ~ 15
	30009~30019		Reserved		
	30020		CN90 DI1(Safety contact input)	2	0: OFF 1:ON
	30021		CN90 DI2(External error input)	2	0: OFF 1:ON
	30022		CN90 DI3(Forced Thermo OFF input)	2	0: OFF 1:ON
	30023		CN90 DI4(Notice input)	2	0: OFF 1:ON
	30024~30039		Reserved		
	30040		TC1	2	10 times values
	30041		TC2	2	10 times values
	30042		TCJ	2	10 times values
	30043		TA	2	10 times values
	30044		TF	2	10 times values
	30045		Tx (auxiliary temperature sensor)	2	10 times values
	30046		TO	2	10 times values
	30047~30059		Reserved		
	30060		Alarm Code	2	For example: remote controller display 「E04」 → 「0x0044」
	30061		Notice code1	2	For example: remote controller display 「201」 → 「129」
	30062		Notice code2	2	For example: remote controller display 「201」 → 「129」
	30063		Notice code3	2	For example: remote controller display 「201」 → 「129」
	30064		Notice code4	2	For example: remote controller display 「201」 → 「129」
	30065		Notice code5	2	For example: remote controller display 「201」 → 「129」
	30066		Thermostat On Digital Output	2	0: OFF 1:ON
	30067		Cooling operation signal output / secondary heating signal output	2	0: OFF 1:ON
	30068		Heating operation signal output	2	0: OFF 1:ON
	30069		Fan Moter Digital Output	2	0: OFF 1:ON
	30070		Operating output	2	0: OFF 1:ON
	30071		Outdoor unit(s) operation level is lower than capacity command	2	0: OFF 1:ON
30072	Outdoor unit(s) operation level is higher than capacity command	2	0: OFF 1:ON		

*There are possibilities of thermodynamic and/or mechanical limitation from many factors, which may affect our system's heat pump cycle (refrigerant cycle) during operation. Hence, there is a possibility that the capacity output may be different from capacity control setting.

Registor	address	Read/Write	Data	Byte	Data Definition and remarks	
Input Registor	30073~30078	R	Reserved			
	30079		Under restriction of compressor speed due to heat sink overheating in outdoor unit(s)	2	0 : OFF 1:ON	
	30080		Cooling / heating start control output	2	0 : OFF 1:ON	
	30081		Defrost Mode Digital Output	2	0 : OFF 1:ON	
	30082		Pre defrost signal output	2	0 : OFF 1:ON	
	30083		Cooling oil recovery / Heating ref recovery	2	0 : OFF 2:ON	
	30084~30099		Reserved			
	30100		Product type setting	2	FIX AT : 0	
	30101		Control type	2	0 : TA type 1 : TF type 2 : DDC type	
	30102		Operation mode range	2	bit0 : FAN MODE bit1 : COOLING bit2 : DRY MODE bit3 : HEATING bit5 : AUTO MODE	
	30103		Fan speed range	2	bit1: FAN [L] bit2 : FAN [H] bit3 : FAN [HH]	
	30104		Cooling upper limit set temperature	2	10 times values	
	30105		Cooling lower limit set temperature	2	10 times values	
	30106		Heating upper limit set temperature	2	10 times values	
	30107		Heating lower limit set temperature	2	10 times values	
	30108		Dry upper limit set temperature	2	10 times values	
	30109		Dry lower limit set temperature	2	10 times values	
	30110		Automatic mode upper limit set temperature	2	10 times values	
	30111		Automatic mode lower limit set temperature	2	10 times values	
	30112		Dual Set point Function Status	2	0 : OFF 1:ON	
	30113		Setting capacity	2	Similar setting to DN[11] setting	
	30114		Modbus band rate SW state	2	0 : 9600bps 1 : 19200bps 2 : 38400bps 3 : 57600bps	
	30115		Modbus Slave Address SW state	2	0 ~ 15 (0=slave address 1)	
	30116~30199		Reserved			
	30200		Model name	16		
	30201		Model name			
	30202		Model name			
	30203		Model name			
	30204		Model name			
	30205		Model name			
	30206		Model name			
	30207		Model name			
	30208~30249		Reserved			
	30250		Serial number	16		
	30251		Serial number			
	30252		Serial number			
	30253		Serial number			
	30254		Serial number			
	30255		Serial number			
	30256		Serial number			
30257	Serial number					
30258~30299	Reserved					
30300	Firmware Definition (Firmware control number)	4	0x2199			
30301	Firmware Definition (Firmware control number)	4	0x0001			
30302	Software Version	2				

11. Function code (DN code)

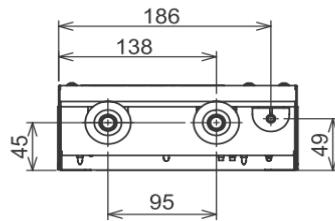
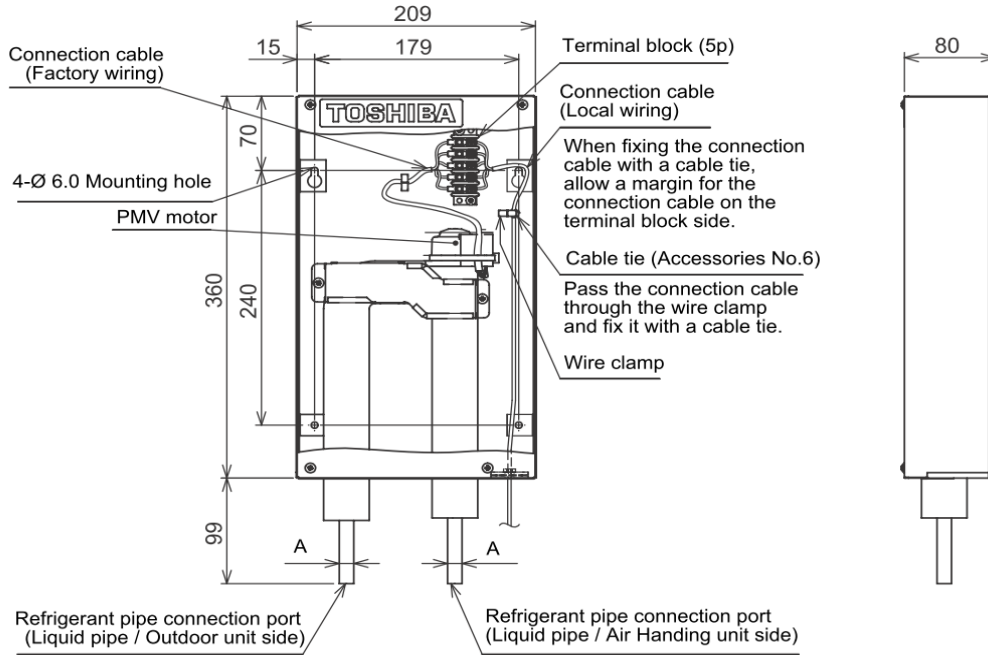
▼ Function CODE No.(DN code) table (setting by wired remote controller)

DN	Item	Description	Default(at shipment)																												
01	Filter display delay timer	0000: None 0001: 150H 0002: 2500H 0003: 5000H 0004: 10000H	0000: None																												
02	Dirty state of filter	0000: Standard 0001: High degree of dirt (Half of standard time)	0000: Standard																												
04	Specific indoor unit priority	0000: No priority 0001: Priority	0000: No priority																												
0F	Cooling only	0000: Heat Pump 0001: Cooling only (No display of [AUTO], [HEAT])	0000: Heat Pump																												
10	Type	0055: Dx-coil Interface	0055: Dx-coil Interface																												
11	Indoor unit capacity	0000: Unfixed <table border="1" style="margin-left: 40px;"> <tr> <td>0021</td><td>0023</td><td>0024</td><td>0025</td><td>0026</td><td>0027</td><td>0028</td><td>0031</td> </tr> <tr> <td>8HP</td><td>10HP</td><td>12HP</td><td>14HP</td><td>16HP</td><td>18HP</td><td>20HP</td><td>24HP</td> </tr> </table> <table border="1" style="margin-left: 40px;"> <tr> <td>0047</td><td>0035</td><td>0048</td><td>0037</td><td>0049</td><td>0039</td> </tr> <tr> <td>28HP</td><td>32HP</td><td>34HP</td><td>36HP</td><td>38HP</td><td>40HP</td> </tr> </table>	0021	0023	0024	0025	0026	0027	0028	0031	8HP	10HP	12HP	14HP	16HP	18HP	20HP	24HP	0047	0035	0048	0037	0049	0039	28HP	32HP	34HP	36HP	38HP	40HP	0000: Unfixed
0021	0023	0024	0025	0026	0027	0028	0031																								
8HP	10HP	12HP	14HP	16HP	18HP	20HP	24HP																								
0047	0035	0048	0037	0049	0039																										
28HP	32HP	34HP	36HP	38HP	40HP																										
12	Line address	0001: No.1 unit to 0030: No.30 unit	0000: Unfixed																												
13	Indoor unit address	0001: No.1 unit to 0064: No.64 unit	0099: Unfixed																												
28	Automatic restart of power failure	0000: None 0001: Restart	0000: None																												
33	Temperature unit select	0000: °C 0001: °F	0000: °C																												
60	Timer setting (by Wired remote controller)	0000: Available(can be performed) 0001: Unavailable(cannot be performed)	0000: Available																												
92	Fan trouble input release condition	0000: Operation stopped 0001: Release signal received	0000: Operation stopped																												
4AE	Dx-coil PMV kit type setting	0001: RBM-A101UPVA-E 0002: RBM-A201UPVA-E	Setting depending on HP (Horse Power)																												

12. Dx-coil Controller , Dx-valve kit Dimensions

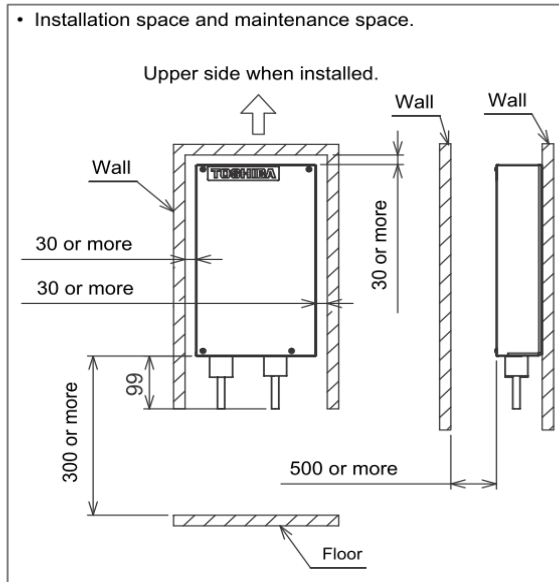
RBM-A101UPVA-E, RBM-A201UPVA-E

(Unit: mm)



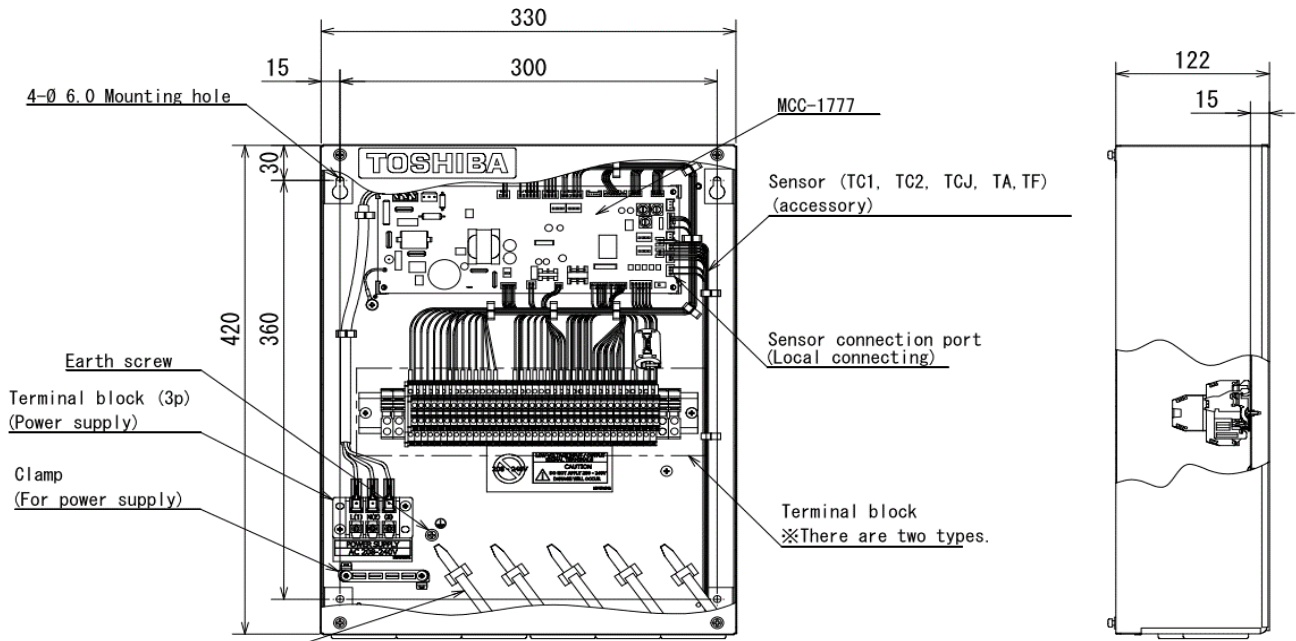
Note)
This product is designed for the indoor installation.

Model	A (Pipe)
RBM-A101UPVA-E	Ø12.7
RBM-A201UPVA-E	Ø15.88



TCB-IFDMX01UP-E, TCB-IFDMR01UP-E

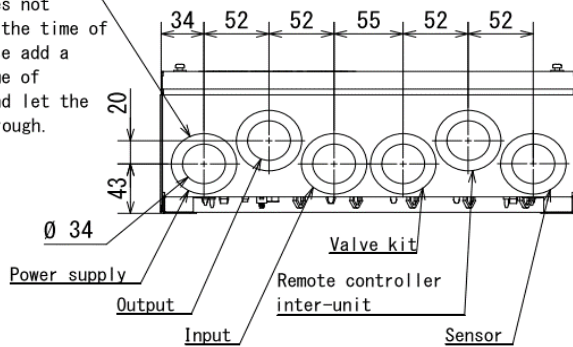
(Unit: mm)



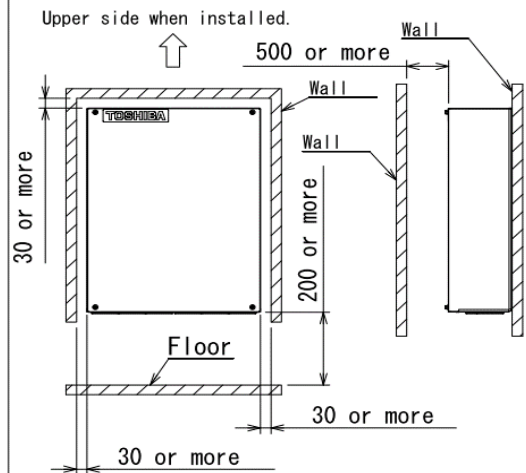
Clamp (5 piece)

Bushing (6 piece)

The bushing does not have a slit at the time of shipment. Please add a slit at the time of construction and let the wiring pass through.



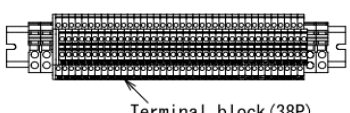
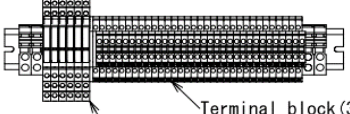
• Installation space and maintenance space.



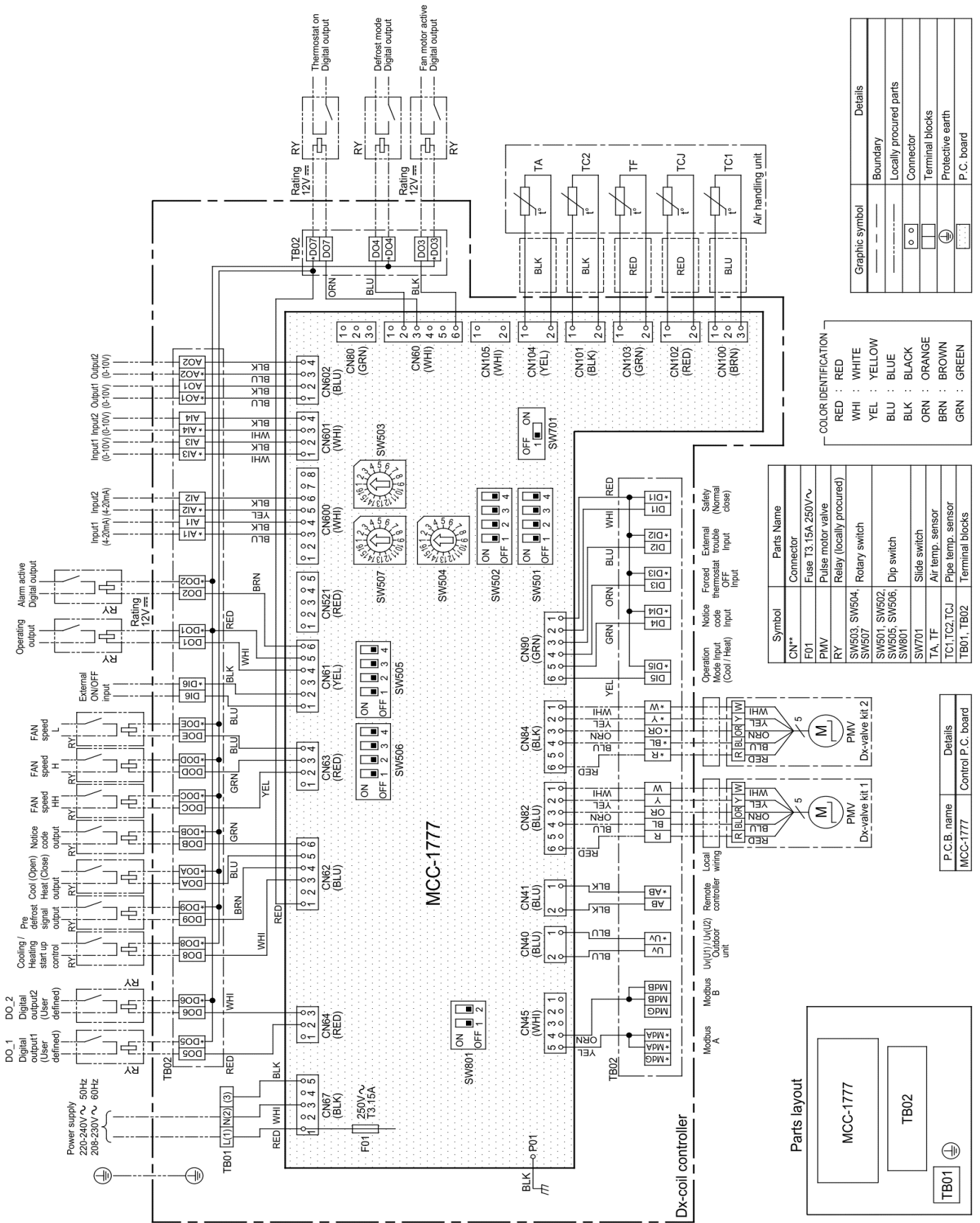
Note)

- This product is designed for the indoor installation.
- If the temperature sensor is short, use the Optional Sensor (10m cable) TCB-IFDES1001P-E.

※Terminal block type classification table.

<p>TCB-IFDMX01UP-E (Terminal block without relay)</p>	 <p>Terminal block (38P)</p>
<p>TCB-IFDMR01UP-E (Terminal block with relay)</p>	 <p>Terminal block (32P) Terminal block (6P with relay)</p>

TCB-IFDMX01UP-E



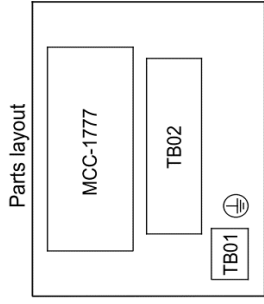
Graphic symbol	Details
---	Boundary
---	Locally procured parts
o o	Connector
□	Terminal blocks
⊕	Protective earth
⊕	P.C. board

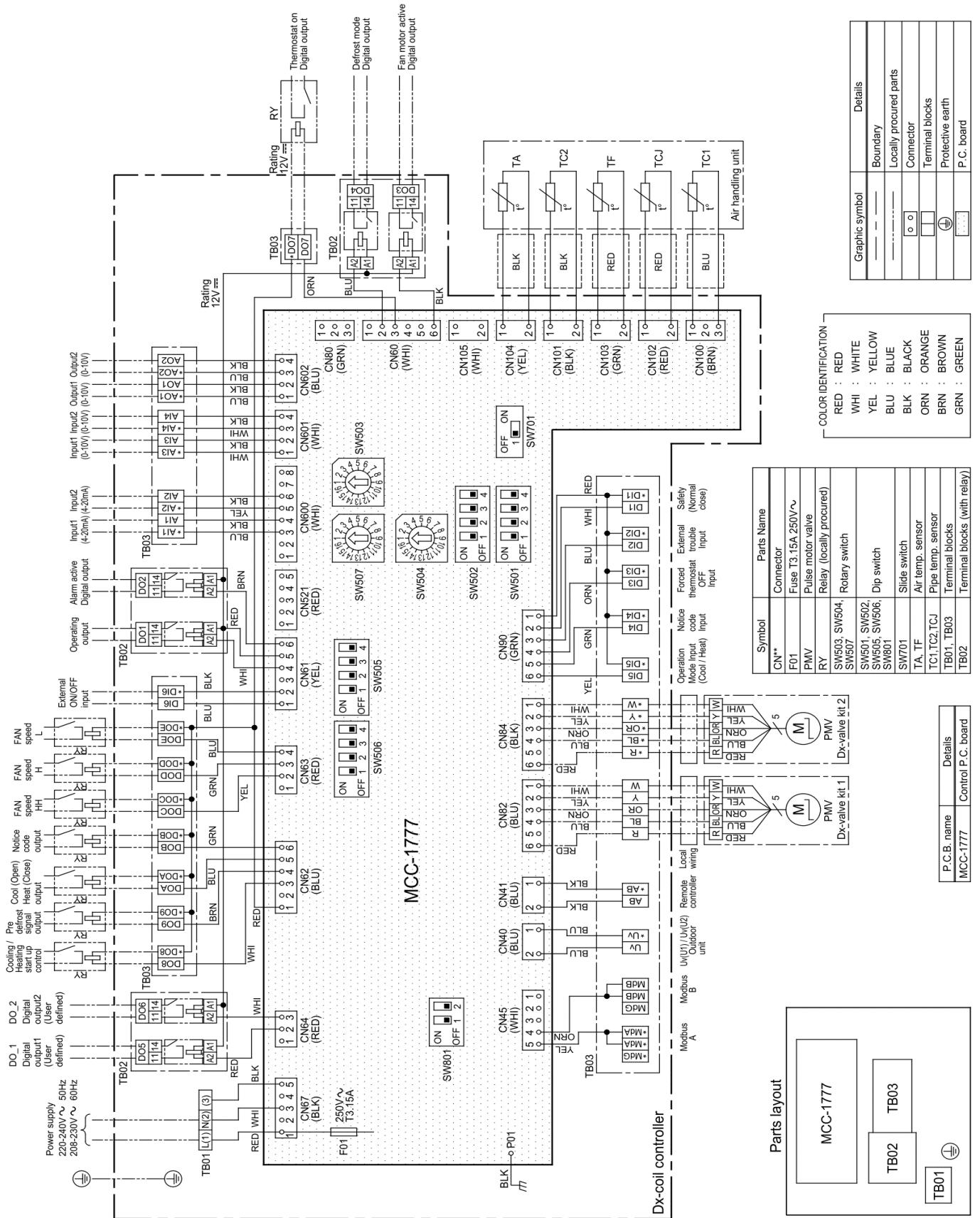
COLOR IDENTIFICATION

RED	: RED
WHI	: WHITE
YEL	: YELLOW
BLU	: BLUE
BLK	: BLACK
ORN	: ORANGE
BRN	: BROWN
GRN	: GREEN

Symbol	Parts Name
CN**	Connector
F01	Fuse T3.15A 250V~
PMV	Pulse motor valve
RY	Relay (locally procured)
SW503, SW504, SW507	Rotary switch
SW501, SW502, SW505, SW506, SW801	Dip switch
SW701	Slide switch
TA, TF	Air temp. sensor
TC1, TC2, TCJ	Pipe temp. sensor
TB01, TB02	Terminal blocks

P.C.B. name	Details
MCC-1777	Control P.C. board





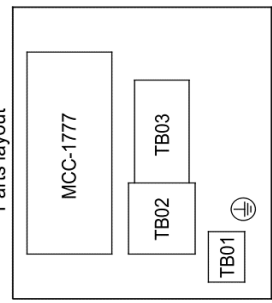
Graphic symbol	Details
---	Boundary
---	Locally procured parts
o o	Connector
□	Terminal blocks
⊕	Protective earth
PCB	P.C. board

COLOR IDENTIFICATION

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Symbol	Parts Name
CN**	Connector
F01	Fuse T3.15A 250V~/
PMV	Pulse motor valve
RY	Relay (locally procured)
SW503	Rotary switch
SW501, SW502, SW505, SW506,	Dip switch
SW801	Slide switch
TA, TF	Air temp. sensor
TC1, TC2, TCJ	Pipe temp. sensor
TB01, TB03	Terminal blocks
TB02	Terminal blocks (with relay)





P.C.B. name	Details
MCC-1777	Control P.C. board












TU2C-LINK models

✓ : Available × : Prohibition










Appliance name	Model Name and appearance	TA	DDC	TF
Remonote Controller				
Wired remote controller	RBC-AMTU31-E(TR) 	✓	✓	✓
	RBC-AMSU51(-EN/ES) 	✓	✓	✓
	RBC-ASCU11-E(TR) 	✓	✓	✓

Appliance name	Model Name and appearance	TA	DDC	TF
Open network and analog interface				
Modbus Interface	BMS-IFMB1280U-E 	✓	×	✓
BACnet IP	BMS-IFBN1280U-E 	✓	×	✓
Advanced central control				
Touch Screen Controller	BMS-CT2560U-E 	✓	×	×
Central remote controller				
Central remote controller	TCB-SC640U-E 	✓	×	×

TCC-LINK models

Appliance name	Model Name and appearance	TA	DDC	TF
Remonote Controller				
Wired remote controller	RBC-AMT32E 	✓	✓	✓
	RBC-AMS41E 	✓	✓	✓
	RBC-AMS54_55E-ES/EN 	✓	✓	✓
	RBC-AS41E 	✓	✓	✓
	NRC-01HE 	×	×	×
	RBC-ASC11E 	×	×	×
Schedule timer and central remote controller				
Schedule timer	TCB-EXS21TLE 	✓	×	✓
	Central remote controller	TCB-CC163TLE2 	✓	×
TCB-SC643TLE 		✓	×	×

✓ : Available × : Prohibition

Appliance name	Model Name and appearance	TA	DDC	TF
Open network and analog interface				
LON Interface	TCB-IFLN642TLE 	✓	×	×
Modbus Interface	TCB-IFMB641TLE 	✓	×	×
BACnet IP	BMS-IFBN640TLE 	✓	×	✓
Advanced central control				
Smart BMS Manager with data analyzer	BMS-SM1281ETLE 	×	×	×
Touch Screen Controller	BMS-CT1280E 	✓	×	×
	BMS-CT5121E 	×	×	×
Smart device control interface	BMS-IWF0320E 	✓	×	×
Individual gateway				
Modbus Interface	BMS-IFMB0TLR-E 	×	×	×
KNX Interface	BMS-IFKX0TLR-E 	×	×	×

15. Check Codes

Common Check Codes (Note1 : DDC(0-10V) type P.C. board is classified as a Remote controller)

(Note2 : Regarding outdoor units, refer to their own service manuals)

- **E01 : No master remote controller, faulty remote controller communication**
The header remote controller has not been set.
Check the remote controller inter-unit tie cable (A/B).
- **E09 : Duplicated master remote controller**
Two remote controllers have been set master remote controller.
Check the remote controller inter-unit tie cable (A/B).
- **F01 : TCJ sensor trouble**
Check connection of TCJ sensor connector and wiring.
Check resistance characteristics of TCJ sensor.
Check for trouble in indoor P.C. board.
- **F02 : TC2 Sensor trouble**
Check connection of TC2 sensor connector and wiring.
Check resistance characteristics of TC2 sensor.
Check for trouble in indoor P.C. board.
- **F03 : TC1 Sensor trouble**
Check connection of TC1 sensor connector and wiring.
Check resistance characteristics of TC1 sensor.
Check for trouble in indoor P.C. board.
Check whether the TC1 sensor is correctly installed in its place.
- **F10 : TA Sensor trouble**
Check the connection of TA sensor connector and wiring.
Check resistance characteristics of TA sensor.
Check for trouble in indoor P.C. board.
- **F11 : TF Sensor trouble**
Check connection of TF sensor connector and wiring.
Check resistance characteristics of TF sensor.
Check for trouble in indoor P.C. board.
- **L02 : Outdoor units model disagreement trouble**
Check outdoor unit model.
(Check whether the outdoor unit corresponds to Dx-coil interface or not.)
- **L09 : Indoor unit Power Code incorrect**
Check the settings of DN Code 11.
- **L22 : Incompatible group combination of indoor units**
Check indoor units model.
Check for trouble in indoor P.C. board.
- **L30 : External trouble**
Check the operation monitoring of the fan at terminals DI2 / DI2. If this contact is "CLOSED", the check code "L30" is generated.
- **P10 : Safety contact trouble**
Check the contact at terminals DI1 / DI1. If the contact is "OPEN", the check code "P10" is generated. If this contact is not used, a bridge connection should be installed on the terminals DI1 / DI1.

16. Related cautions

(1) Installation work

- Secure enough service space for replacement of the Dx-valve KIT and the thermistors. After the AHU controller is installed, address setting and unit capacity setting is necessary. Refer to the installation manual for the setting method.

- Refer to the outdoor unit installation manual or the data book for installation of the outdoor unit.

(2) Test run

- Turn on the main power of the unit at least 12 hours before test run to power the crankcase heater. Insufficient powering time may result in compressor damage.

- Ensure the analogue input is voltage is set to $\geq 4.5V$ before starting the test run.
- As the capacity setting is made at initial setting, a remote controller is necessary.

Remove the remote controller after making the initial settings if it is not used.

(Refer to the installation manual for remote controller for more details.)

(3) Operation control

- If the error display appears on the remote controller, do not reset an error by yourself. Contact the service firm or the dealer.

- Refer to the data book for system controller when using the system controller.

(4) Service

- Regular maintenance is required to prolong the life of the units.

It is recommended that the maintenance contract be concluded with a maintenance firm.

17. Warranty

- Specifications of AHU and compatibility with National / Local regulations must be confirmed by your company.
- Selection of an appropriate AHU (with appropriate specifications to match those of units connected to the AHU such as configuration, dimension, life-span, vibration, noise level, or features) must be made by your company.
- Toshiba Carrier shall not be liable for any damage to the entire system or the AHU main body caused by connected AHU with wrong specification or wrong usage of AHU.
- Toshiba Carrier shall not be liable for any damage to the outdoor units and Dx-coil interface caused by AHU damage.
- Toshiba Carrier shall not be liable for capacity, responsiveness and accuracy of system.

VRF Dx-coil interface Design Guideline

DG003-04

June, 2023 Fourth Edition

Toshiba Carrier Corporation