

Design Guideline

VRF Dx-coil Interface(DDC type) Design Guideline

CONTENTS

1.	Application	1
2.	System compatibility, Overview	1
3.	Operating conditions	1
4.	Pipe Size	2
5.	Pipe length and height difference	2
6.	Product Configuration	
6.1.	Product Configuration	2
6.2.	Major Specifications	3
6.3.	Control Input / Output Details	3
6-4.	Analogue Input Control Details	6
7.	AHU / DX COIL Design	
7.1.	Equipment selection procedure -Selection flow chart-	7
7.2.	Correction charts for Outdoor unit capacity calculation	8
7.3.	How to select DX COIL Design Guideline	9
7.4.	DX COIL Guideline HP	10
7.5.	DX COIL Guideline CO Pattern A	11
7.6.	DX COIL Guideline CO Pattern B	12
7.7.	DX COIL Manufacturing	13
7.8.	DX Controller Installation	13
7.9.	Sensor Connections	14
7.10.	Dx-valve KIT Installation	15
8.	Control Outline	
8.1.	Cautions regard with DDC's programing	16
8.2.	Protection Function Summary	17
9.	Cable specifications	18
10.	Interface requirements for controller	
10.1.	Indoor(DX) P.C board(MCC-1570) function	18
10.2.	DDC(0-10V) interface P.C board(TX-TOS1413) Function	20
11.	Function code (DN code)	21
12.	Dx-coil Controller , Dx-valve kit Dimensions	22
13.	Wiring Diagram	23
14.	Compatibility with R/C, BMS, Open network system	24
15.	Check Codes	25
16.	Related cautions	26
17.	Warranty	26

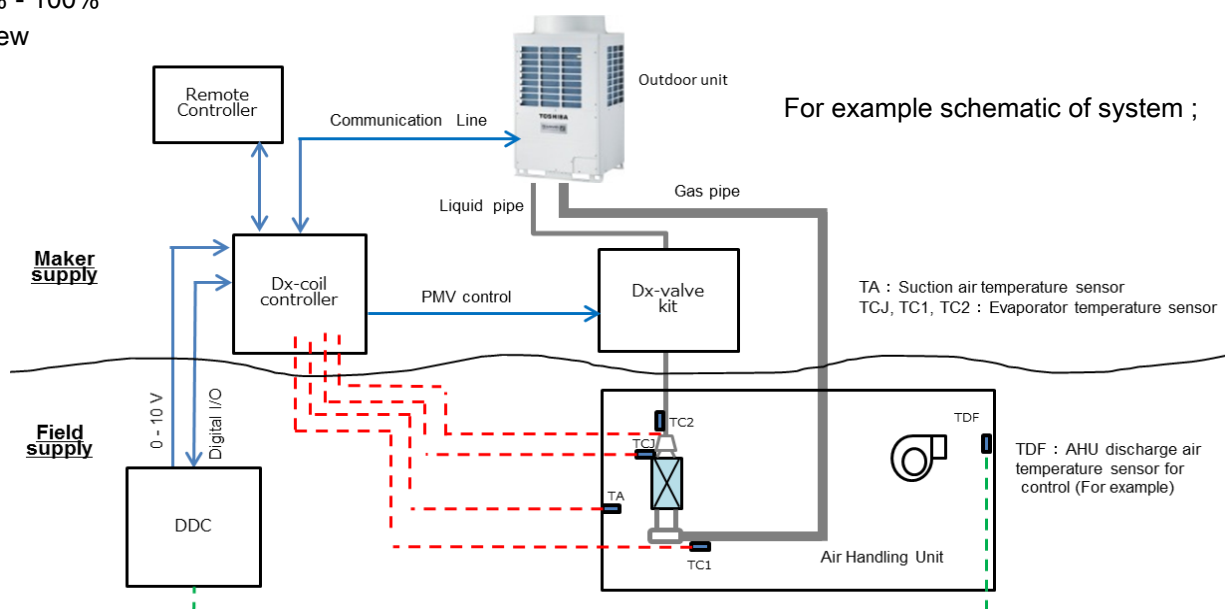
1 Application

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). It is compatible with either a Toshiba VRF system.

Product	Model name	Capacity	HP
Dx-coil controller	TCB-IFDDC201E	22.4kW , 28.0kW , 45.0kW , 50.4kW , 56.0kW 90kW, 101kW, 112kW	8 , 10 , 16 , 18 , 20 32, 36, 40
Dx-valve kit	RBM-A101VAE	22.4kW , 28.0kW	8 , 10
	RBM-A201VAE	45.0kW , 50.4kW , 56.0kW	16 , 18 , 20

2 System compatibility, Overview

- Outdoor Unit
 - SMMS-e Cooling Only Model (MMY-MAP***6T8*P* / MMY-MAP***6T7*P)
 - SMMS-7 Cooling Only Model (MMY-MAP***7T8*P* / MMY-MAP***7T7*P)
 - SMMS-e Heat Pump Model (MMY-MAP***6HT8*P* / MMY-MAP***6HT7*P*)
 - 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*) *
- * : Even if connected with SMMS ∞ , SMMS-u Heat Pump Model, the system communication type will become "TCC-Link" according to Dx-coil controller(TCB-IFD2A201E, TCC-Link type).
- Diversity
 - 75% - 100%
- Overview



3 Operating conditions

AHU	Ensure the "Coil on Air" temperature is within the range of the Dx-coil design guideline.																
	<div><table><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></div>	OA	Outdoor Air	SA	Supply Air	CA	Coil on Air (After Heat Recovery Exchanger)	RA	Return Air	EA	Exhaust Air						
	OA	Outdoor Air															
	SA	Supply Air															
CA	Coil on Air (After Heat Recovery Exchanger)																
RA	Return Air																
EA	Exhaust Air																
<table><tr><th></th><th>Guideline HP (Heating & Cooling)</th><th colspan="2">Guideline for Cooling Only</th></tr><tr><th></th><th></th><th>Pattern A</th><th>Pattern B</th></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</td><td>15 - 32 °C WB</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></tr></table>		Guideline HP (Heating & Cooling)	Guideline for Cooling Only				Pattern A	Pattern B	Cooling mode "Coil on Air" temp.	15 - 24 °C WB (18 - 32 °C DB)	15 - 24 °C WB	15 - 32 °C WB	Heating mode "Coil on Air" temp.	12 - 28 °C DB (Pull down to 7 °C)	---	---	
	Guideline HP (Heating & Cooling)	Guideline for Cooling Only															
		Pattern A	Pattern B														
Cooling mode "Coil on Air" temp.	15 - 24 °C WB (18 - 32 °C DB)	15 - 24 °C WB	15 - 32 °C WB														
Heating mode "Coil on Air" temp.	12 - 28 °C DB (Pull down to 7 °C)	---	---														
	Note: If intake air temperature is out of range of the specification, the damage for the system may be caused.																

Outdoor unit	Refer to specification of outdoor unit
--------------	--

4 Pipe Size

Outdoor Unit Capacity	Pipe diameter		
	Gas Pipe	Liquid Pipe Valve kit to AHU	Liquid Pipe Valve kit to Y-Joint
8 HP	Ø 19.1 or 22.2	Ø 12.7	-
10 HP	Ø 22.2	Ø 12.7	
16 HP	Ø 28.6	Ø 15.9	
18 HP	Ø 28.6	Ø 15.9	
20 HP	Ø 28.6	Ø 15.9	
32 HP	Ø 34.9	Ø 15.9	Ø 19.1
More than 36HP	Ø 41.3(38.1※1)	Ø 15.9	Ø 22.2

※ 1 Only SMMS-u, SMMS[∞]

5 Pipe length and height difference

Main pipe equivalent length		Same as piping length restriction of VRF ODU
Total piping length (real length)		120 m (100 m)
Furthest equivalent pipe length L (real length)		100m
Furthest equivalent pipe length between outdoor unit		-
Max. Height	outdoor unit - indoor unit(Upper outdoor unit)	40m
Difference	outdoor unit - indoor unit(Lower outdoor unit)	
Amount of Additional Refrigerant		Refer to specification of Outdoor unit

6 Product Configuration

6.1 Product Configuration

DX COIL tyoe		Normal		
Type		Dx-coil Controller	Dx-Valve kit	
Model Name		TCB- IFDDC201E	RBM- A101VAE	RBM- A201VAE
Connectable Dx-coil Capacity	8HP	1	1	-
	10HP	1	1	-
	16HP	1	-	1
	18HP	1	-	1
	20HP	1	-	1
	32HP	1	-	2
	36HP	1	-	2
	40HP	1	-	2

6.2 Major Specifications

TCB-IFDDC201E (Dx-coil Controller)

Description	Dx-coil controller in Metal Enclosure, comprising:- <ul style="list-style-type: none">• MCC-1570 (Main Indoor(DX) P.C. board)• TX-TOS1413 (DDC(0-10V) interface P.C. board)• 24VAC Transformer• TA Sensor, Length : 2.5m, Connector colour : Yellow• TC1 Sensor, Length : 2.5m, Connector colour : Brown• TC2 Sensor, Length : 2.5m, Connector colour : Black• TCJ Sensor, Length : 2.5m, Connector colour : Red• Strainers							
External Dimensions H x W x D (mm)					420 x 330 x 95			
Net Weight(kg)	6.0 kg							
Notes:								
Capacity code (DN11) needs to be setup upon installation using wired remote controller (not supplied).								
HP	8	10	16	18	20	32	36	40
DN[11]	21	23	26	27	28	35	37	39
<ul style="list-style-type: none">• Only Heating and Cooling Modes are available on the TCB-IFDDC201E (No Automatic or Fan Only).• Components supplied loose, requires brazing and local pipework.								

RBM-A101VAE / RBM-A201VAE (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-A101VAE	8HP & 10HP Size
RBM-A201VAE	16HP & 18HP & 20HP Size

6.3 Control Input / Output Details

- Input functions -

Input	Name	Description
A1 A2	Capacity Demand	Analogue Input to control Capacity demand. (Details in section 6.4).
	Analog Input (DC 0 - 10 V)	
	SW3 bit-2(TX-TOS1413) <u>OFF</u>	STEPPED response to analogue input
	SW3 bit-2(TX-TOS1413) <u>ON</u>	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 SW03 bit2 located on the DDC(0-10V) interface P.C. board(TX-TOS1413)
C1 C2	External ON / OFF Input	Digital Input to control ON / OFF:- <ul style="list-style-type: none"> ON (Closed) / OFF (Open). External ON/OFF input signal type(pulse / static) is selectable by Jumper Wire J01 on the Indoor(DX) P.C. board - MCC-1570. <ul style="list-style-type: none"> Connect (Default) : Pulse / Cut : Static Note the unit will not operate until there is an appropriate 0-10V Capacity Control signal.
C3 C4	Demand Signal Input	When signal input, AHU is in "thermostat-off" status forcibly.
C5 C6	Safety contact.	If this contact is open for more than 1 minute, the check code " P10 " is generated and the Dx-coil controller switches off automatically.
C7 C8	Fan Motor 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 ".
C23 C24	Operation Mode Input	Digital Input to control Mode:- <ul style="list-style-type: none"> HEAT (Closed) / COOL (Open)

- Output functions -

Output	Name	Description																
D1 D2	Fan Motor 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.																
D5 D6	Alarm Active Digital Output	During Alarm operation, Alarm Active Digital Output is active.																
D7 D8	Defrost Mode Digital Output	During Defrost operation, Defrost Mode Output is active.																
D19 D20	Thermostat On Digital Output	Thermostat ON signal is output. It is usually the ON output at the time of operating.																
D31 D32	DO_1 Digital Output1 (User Defined)	Output function set using rotary switch "SW1" on the DDC(0-10V) interface P.C board(TX-TOS1413) <table><tr><td>SW1</td><td>Output function</td></tr><tr><td>0</td><td>lower than capacity demand</td></tr><tr><td>1</td><td>higher than capacity command</td></tr><tr><td>2</td><td>cooling oil recovery /heating refrigerant recovery</td></tr><tr><td>3</td><td>cooling output (operation+no error+cooling mode)</td></tr><tr><td>4</td><td>heating output (operation+no error+heating mode)</td></tr><tr><td>5</td><td>Thermostat ON</td></tr><tr><td>6 ~ F</td><td>No function (for future development)</td></tr></table>	SW1	Output function	0	lower than capacity demand	1	higher than capacity command	2	cooling oil recovery /heating refrigerant recovery	3	cooling output (operation+no error+cooling mode)	4	heating output (operation+no error+heating mode)	5	Thermostat ON	6 ~ F	No function (for future development)
SW1	Output function																	
0	lower than capacity demand																	
1	higher than capacity command																	
2	cooling oil recovery /heating refrigerant recovery																	
3	cooling output (operation+no error+cooling mode)																	
4	heating output (operation+no error+heating mode)																	
5	Thermostat ON																	
6 ~ F	No function (for future development)																	
D33 D34	DO_2 Digital Output2 (User Defined)	Output function set using rotary switch "SW2" on the DDC(0-10V) interface P.C board(TX-TOS1413) <table><tr><td>SW2</td><td>Output function</td></tr><tr><td>0</td><td>lower than capacity demand</td></tr><tr><td>1</td><td>higher than capacity command</td></tr><tr><td>2</td><td>cooling oil recovery /heating refrigerant recovery</td></tr><tr><td>3</td><td>cooling output (operation+no error+cooling mode)</td></tr><tr><td>4</td><td>heating output (operation+no error+heating mode)</td></tr><tr><td>5</td><td>Thermostat ON</td></tr><tr><td>6 ~ F</td><td>No function (for future development)</td></tr></table>	SW2	Output function	0	lower than capacity demand	1	higher than capacity command	2	cooling oil recovery /heating refrigerant recovery	3	cooling output (operation+no error+cooling mode)	4	heating output (operation+no error+heating mode)	5	Thermostat ON	6 ~ F	No function (for future development)
SW2	Output function																	
0	lower than capacity demand																	
1	higher than capacity command																	
2	cooling oil recovery /heating refrigerant recovery																	
3	cooling output (operation+no error+cooling mode)																	
4	heating output (operation+no error+heating mode)																	
5	Thermostat ON																	
6 ~ F	No function (for future development)																	

- Summary of Digital input / output function (MCC-1570) -

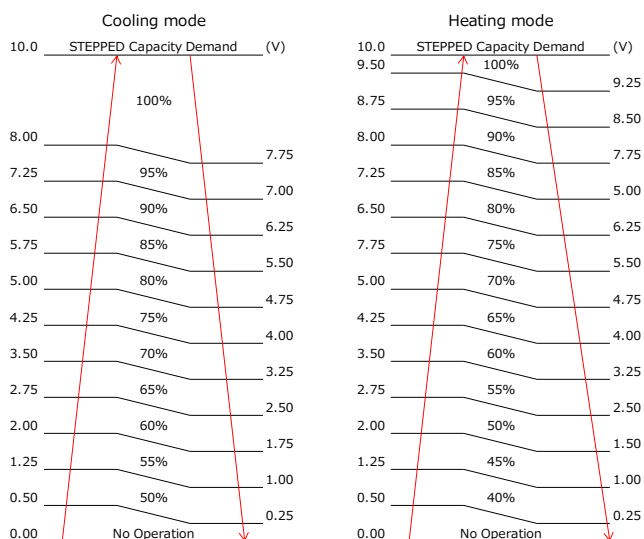
Connector	Pin	Function	Remarks	Standard / Option	Terminal blocks
CN32 (WHI)	1	COM (DC 12V)	---	---	---
	2	Output	Ventilation control (Refer to "APPLICATION CONTROL MANUAL")	Option	---
CN34 (RED)	1	Safety Contact	Check code P10, Normal close	---	C5
	2	---	---	---	---
	3	Input (DC 12V)	---	Standard	C6
CN60 (WHI)	1	COM (DC 12V)	---	---	D1 / D7
	2	Defrost mode Digital output	ON while outdoor unit defrosted	Standard	D8
	3	---	---	---	---
	4	---	---	---	---
	5	---	---	---	---
	6	Fan motor active Digital output	ON while Fan on	Standard	D2
CN61 (YEL)	1	External ON/OFF Input, Input (DC 5V)	Start/Stop input, Input signal type (pulse / static) is selectable by Jumper Wire J01	Standard	C1
	2	COM (0V) for pin 1, 3	---	---	C2
	3	---	---	---	---
	4	---	---	---	---
	5	COM (DC 12V) for pin 4, 6	---	---	D5
	6	Alarm Active Digital Output	ON while Alarm ON	Standard	D6
CN70 (WHI)	1	Option	Option error input (Refer to "APPLICATION CONTROL MANUAL")	Option	---
	2	COM (0V)	---	---	---
CN73 (RED)	1	COM (0V)	---	---	C3
	2	Demand signal Input, Input (DC 5V)	Forced thermo-OFF input	Standard	C4
CN80 (GRN)	1	Input (DC 12V)	---	---	C7
	2	---	---	---	---
	3	Fan Motor Trouble Input	Error input from outside (interlock, the check code L30)	Standard	C8
CN82 (BLU)	1	---	---	---	---
	2	---	---	---	---
	3	Thermostat On Digital Output	Signal output during thermo-ON	Standard	D19
	4	---	---	---	---
	5	---	---	---	---
	6	COM (DC 12V)	---	Standard	D20
CN510 (WHI)	1	PMV① DC12V(RED)	---	Standard	R_Dx-valve kit 1
	2	PMV① DC12V(BRN)	RBM-A201VAE does not include	Standard	BR_Dx-valve kit 1
	3	PMV①(WHI)	---	Standard	W_Dx-valve kit 1
	4	PMV②(WHI)	Only in normal Dx-coil (32, 36, 40HP)	Standard	W_Dx-valve kit 2
	5	PMV①(YEL)	---	Standard	Y_Dx-valve kit 1
	6	PMV②(YEL)	Only in normal Dx-coil (32, 36, 40HP)	Standard	Y_Dx-valve kit 2
	7	PMV①(ORN)	---	Standard	OR_Dx-valve kit 1
	8	PMV②(ORN)	Only in normal Dx-coil (32, 36, 40HP)	Standard	OR_Dx-valve kit 2
	9	PMV①(BLU)	---	Standard	BL_Dx-valve kit 1
	10	PMV②(BLU)	Only in normal Dx-coil (32, 36, 40HP)	Standard	BL_Dx-valve kit 2
	11	PMV② DC12V(RED)	Only in normal Dx-coil (32, 36, 40HP)	Standard	R_Dx-valve kit 2
	12	PMV② DC12V(BRN)	RBM-A201VAE does not include	Standard	BR_Dx-valve kit 2
	13 ~ 20	---	---	---	---

6.4 Analogue Input Control Details

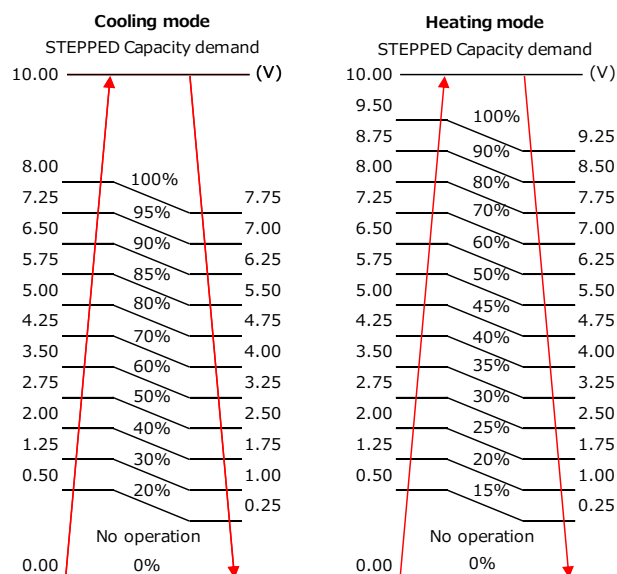
- Capacity Demand signal(analogue input voltage) will be used as the main control value for the compressor frequency.
- The control of capacity may not be able to be performed according to the state of an air-conditioner (During oil recovercontrol, defrost etc.).

1) Demand 0-10V STEPPED control (SW3 bit-2 on the DDC(0-10V) interface P.C board(TX-TOS1413) "OFF")

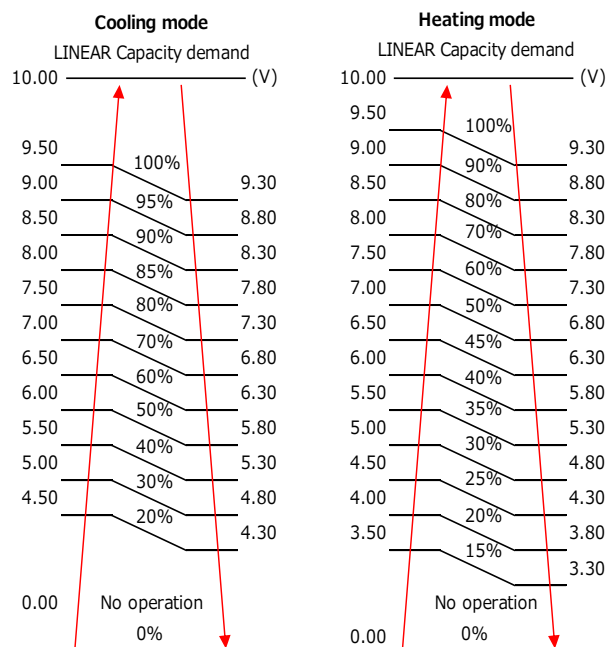
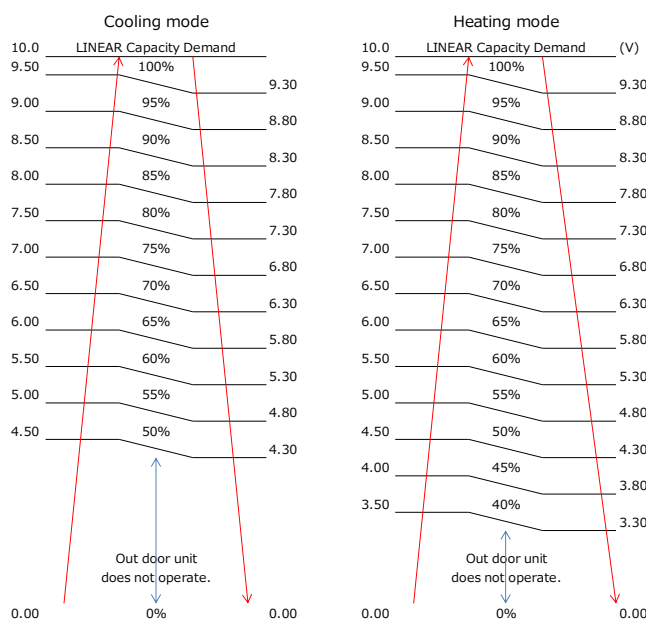
▼ When connected to SMMS-e,7



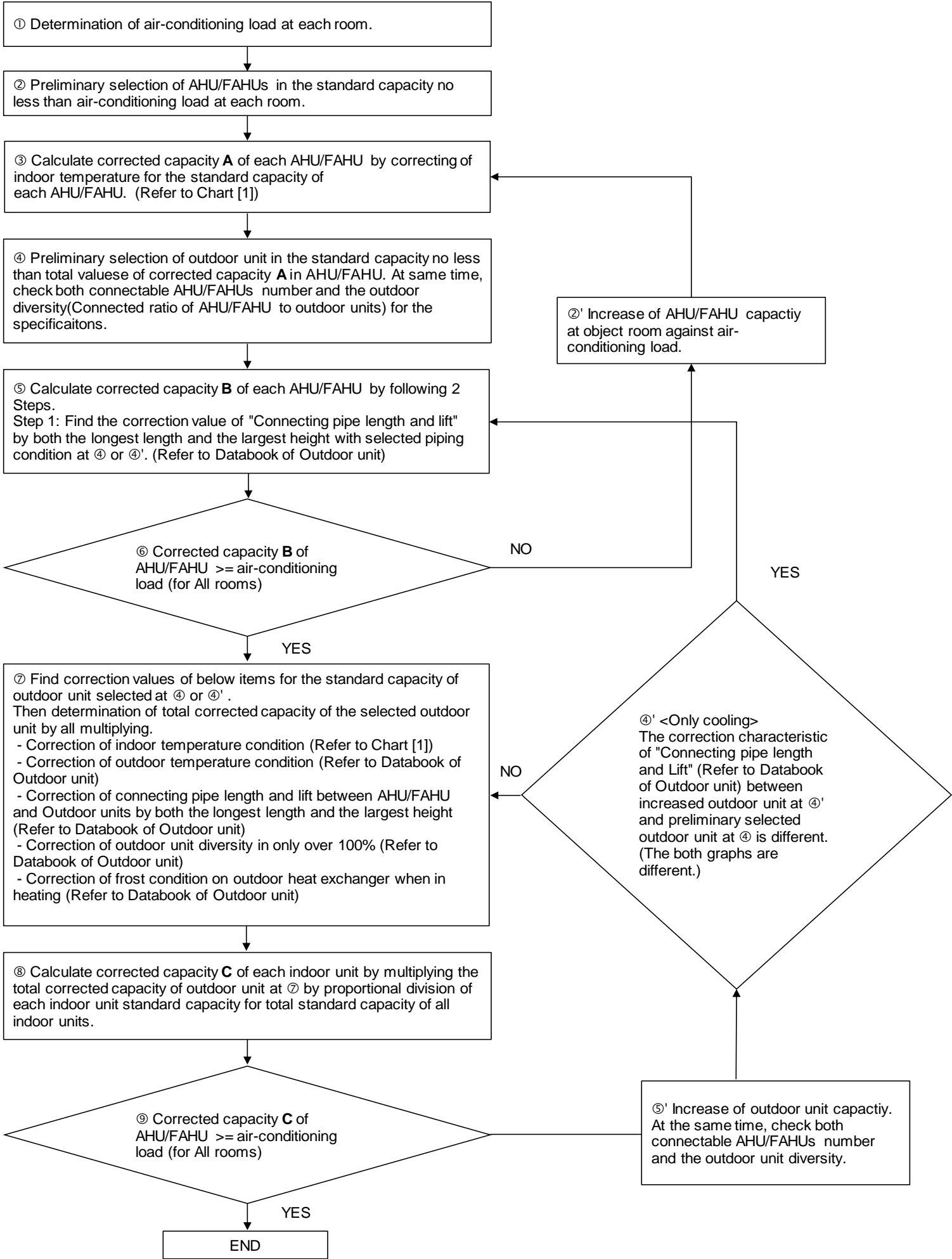
▼ When connected to SMMS-u,∞



2) Demand 0-10V LINEAR control (SW3 bit-2 on the DDC(0-10V) interface P.C board(TX-TOS1413) "ON")



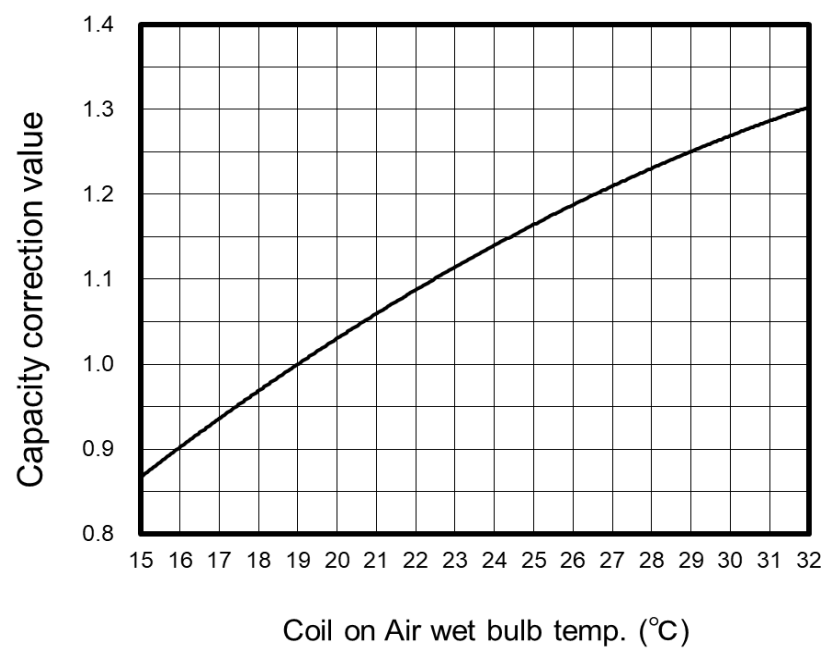
7.1 Equipment selection procedure -Selection flow chart-



7.2 Correction charts for Outdoor unit capacity calculation

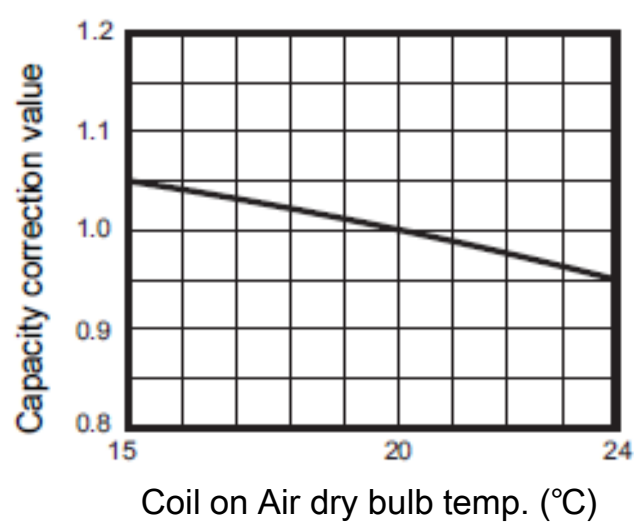
[1] Coil on Air temperature vs. capacity correction value

▼ Cooling

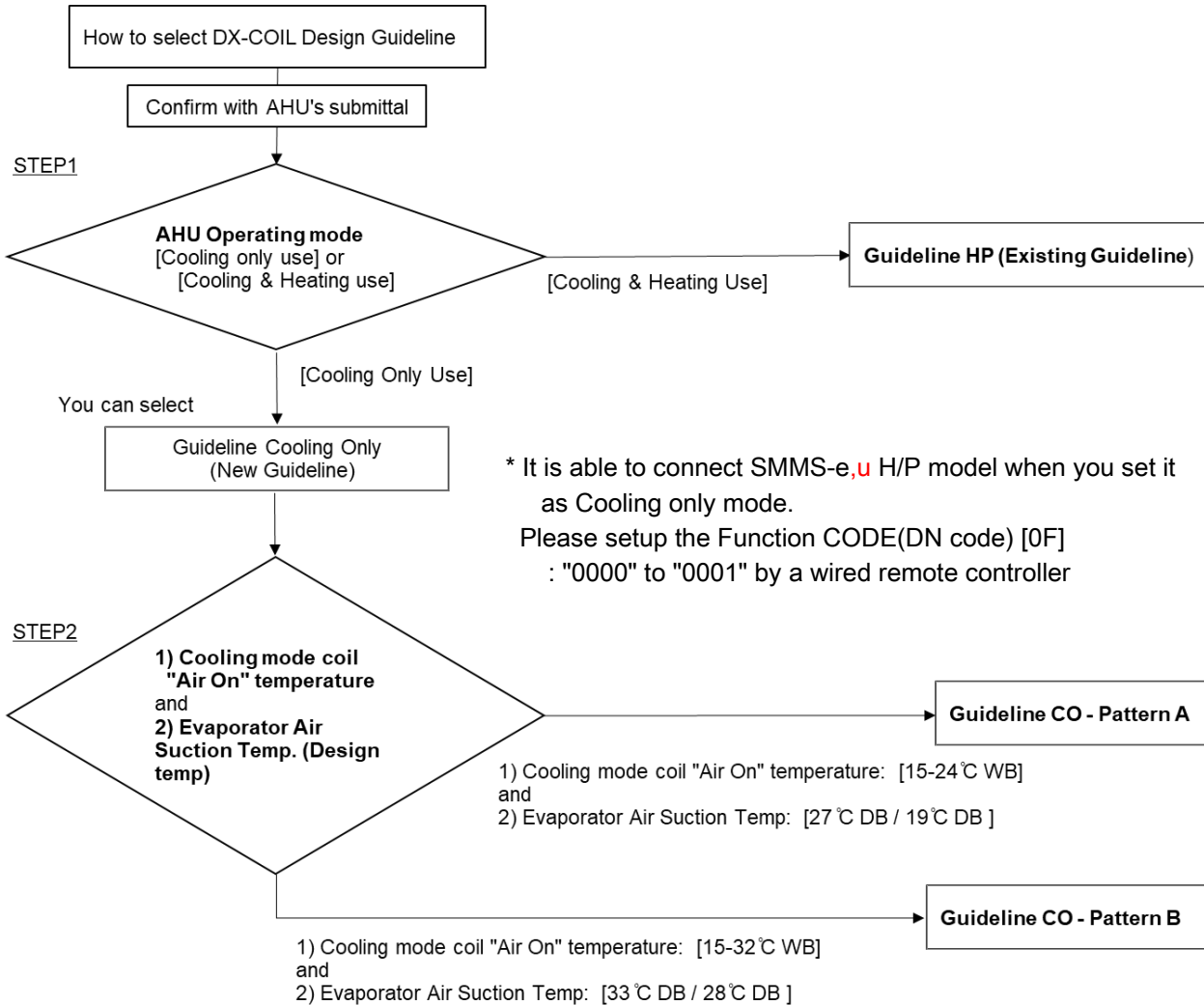


The above capacity values are generated depends on each compressor operation level.

▼ Heating



7.3 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.

7.4 DX COIL Guideline HP

- Guideline HP -

HP		8	10	16	18	20	32	36	40		
Dx-Coil type	Normal	TCB-IFDDC201E	1	1	1	1	1	1	1		
		RBM-A101VAE	8 HP	1	-	-	-	-	-	-	
			10 HP	-	1	-	-	-	-	-	
		RBM-A201VAE	16 HP	-	-	1	-	-	2	-	
			18 HP	-	-	-	1	-	-	2	-
			20 HP	-	-	-	-	1	-	-	2
AHU Air Flow rate (m3/hr)		Std.	3,600	4,200	7,200	7,800	8,400	14,400	15,600	16,800	
		Min.	2,880	3,360	5,760	6,240	6,720	11,520	12,480	13,440	
		Max.	4,320	5,040	8,640	9,360	10,080	17,280	18,720	21,160	
DX Coil Internal volume		Min.	3,400	4,250	6,800	7,650	8,500	13,600	15,300	17,000	
		Max.	4,600	5,750	9,200	10,350	11,500	18,400	20,700	23,000	
Copper Tube Dia. (mm)			Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)								
Cooling	Max. Capacity (kW)		22.4	28.0	45.0	50.4	56.0	90.0	101.0	112.0	
	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	50.0	56.0	63.0	100.0	113.0	126.0	
	Coil on Air Temp.		12 - 28°CWB								
	Condensating Temp		52°C								
	Sub Cooling		4K								
	Air Suction Temp. (Design temp)		20°CDB								

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
8HP	8	12	6	10	4	6
10HP	10	14	8	12	5	7
16HP	16	22	12	16	8	10
18HP	18	24	14	18	8	10
20HP	20	26	16	20	10	12
32HP	32	42	24	30	14	18
36HP	36	48	26	34	16	20
40HP	40	54	30	38	18	22

7.5 DX COIL Guideline CO Pattern A

- Guideline CO Pattern A -

HP		8	10	16	18	20	32	36	40
Dx-Coil type	TCB-IFDDC201B	1	1	1	1	1	1	1	1
	RBM-A101VAE	8 HP	1	-	-	-	-	-	-
		10 HP	-	1	-	-	-	-	-
	RBM-A201VAE	16 HP	-	-	1	-	2	-	-
		18 HP	-	-	-	1	-	2	-
		20 HP	-	-	-	-	1	-	2
AHU Air Flow rate (m3/hr)	Std.	3,600	4,200	7,200	7,800	8,400	14,400	15,600	16,800
	Min.	No restriction							
	Max.	No restriction							
DX Coil Internal volume (cc)	Min.	3,400	4,250	6,800	7,650	8,500	13,600	15,300	17,000
	Max.	6,400	8,000	12,800	14,400	16,000	25,600	28,800	32,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)							
Cooling	Max. Capacity (kW)	22.4	28.0	45.0	50.4	56.0	90.0	101.0	112.0
	Coil on Air Temp.	15 - 24°CWB							
	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)	-							

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
8HP	No restriction	12	No restriction	10	No restriction	6
10HP		14		12		7
16HP		22		16		10
18HP		24		18		10
20HP		26		20		12
32HP		42		30		18
36HP		48		34		20
40HP		54		38		22

* It is able to connect SMMS-e 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

7.6 DX COIL Guideline CO Pattern B

- Guideline CO Pattern B -

HP		8	10	16	18	20	32	36	40
Dx-Coil type	TCB-IFDDC201B	1	1	1	1	1	1	1	1
	RBM-A101VAE	8 HP	1	-	-	-	-	-	-
		10 HP	-	1	-	-	-	-	-
	RBM-A201VAE	16 HP	-	-	1	-	2	-	-
		18 HP	-	-	-	1	-	2	-
		20 HP	-	-	-	-	1	-	2
AHU Air Flow rate (m3/hr)	Std.	3,600	4,200	7,200	7,800	8,400	14,400	15,600	16,800
	Min.	No restriction							
	Max.	No restriction							
DX Coil Internal volume (cc)	Min.	1,800	2,250	3,600	4,050	4,500	7,200	8,100	9,000
	Max.	4,000	5,000	8,000	9,000	10,000	16,000	18,000	20,000
Copper Tube Dia. (mm)		Ø12.7, Ø9.52, Ø8.00 (Recommended Ø9.52 or Less)							
Cooling	Max. Capacity (kW)	22.4	28.0	45.0	50.4	56.0	90.0	101.0	112.0
	Coil on Air Temp.	15 - 32°CWB							
	Evaporating Temp.	6.5 - 10.0°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)	-							

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
8HP	No restriction	12	No restriction	10	No restriction	6
10HP		14		12		7
16HP		22		16		10
18HP		24		18		10
20HP		26		20		12
32HP		42		30		18
36HP		48		34		20
40HP		54		38		22

* It is able to connect SMMS-e 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

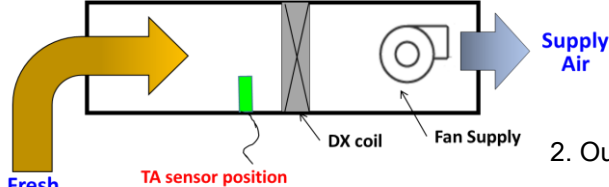
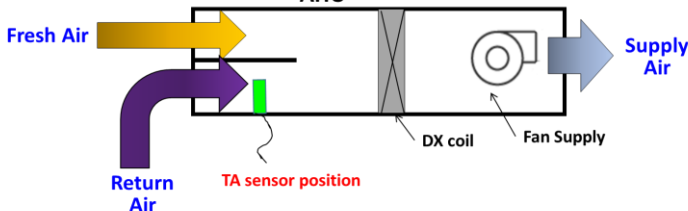
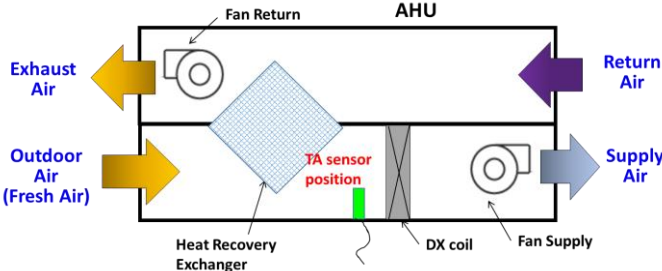
7.7 DX COIL Manufacturing

<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)							
DX COIL Contamination: <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							
DX COIL & Pipework Contamination (Allowable Limits): <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						

7.8 DX Controller Installation

Installation Site	Avoid Direct Sunlight. DO NOT install outside. 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. 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	0°C to 40°C
Ambient Humidity	Relative humidity 10 ~ 90% (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

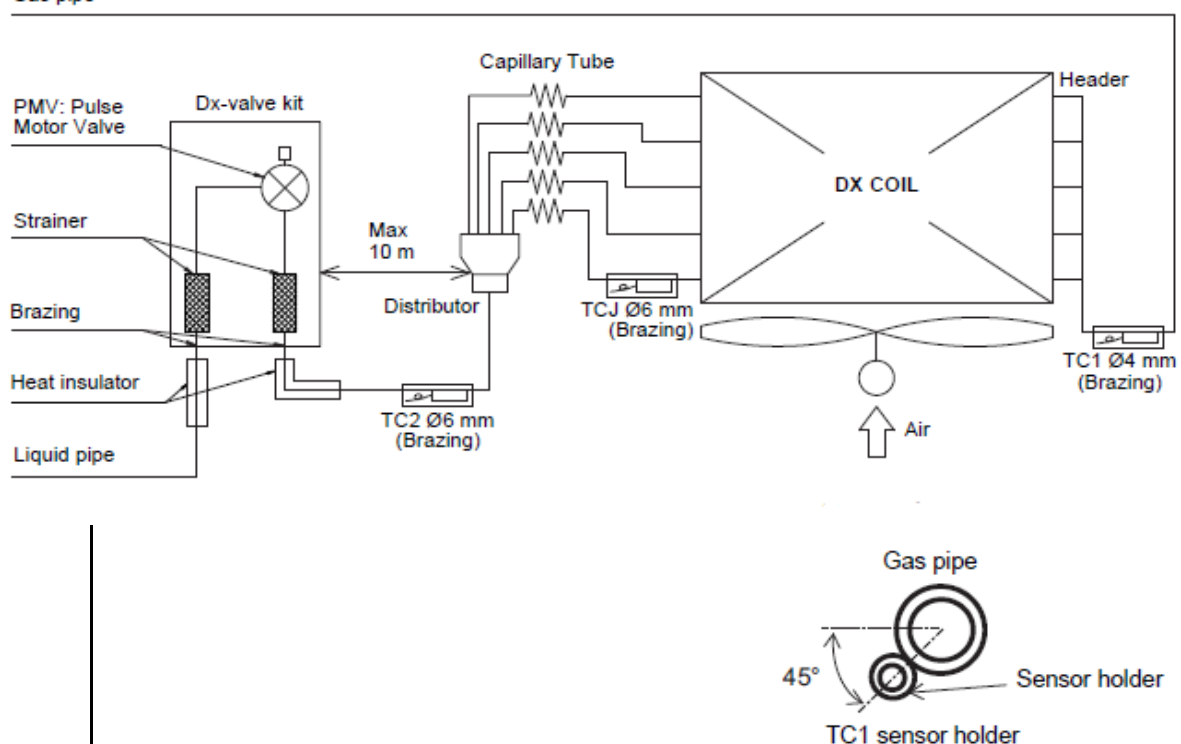
7.9 Sensor Connections

Installation	<p>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.</p>
Wire Connections	<p>TC1, TC2, TC and TA which have a 2.5m 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-1570) as shown below:</p> <ul style="list-style-type: none"> • TC1 Sensor (BRN Plug [2 Pin]) > MCC-1570 CN100 (BLOWN Socket [2 Pin]) • TC2 Sensor (BLK Plug [2 Pin]) > MCC-1570 CN101 (BLK Socket [2 Pin]) • TCJ Sensor (RED Plug [2 Pin]) > MCC-1570 CN102 (RED Socket [2 Pin]) • TA Sensor (YEL Plug[2 Pin]) > MCC-1570 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. 10m (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 Sensor position	<p>The TA 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;</p> <p>1. Fresh Air Only</p>  <p>2. Outdoor Air(Fresh Air) mixed with Return Air</p>  <p>3. Outdoor Air(Fresh Air) mixed with Return Air by Heat Recovery Exchanger</p> 

7.10 Dx-valve KIT Installation

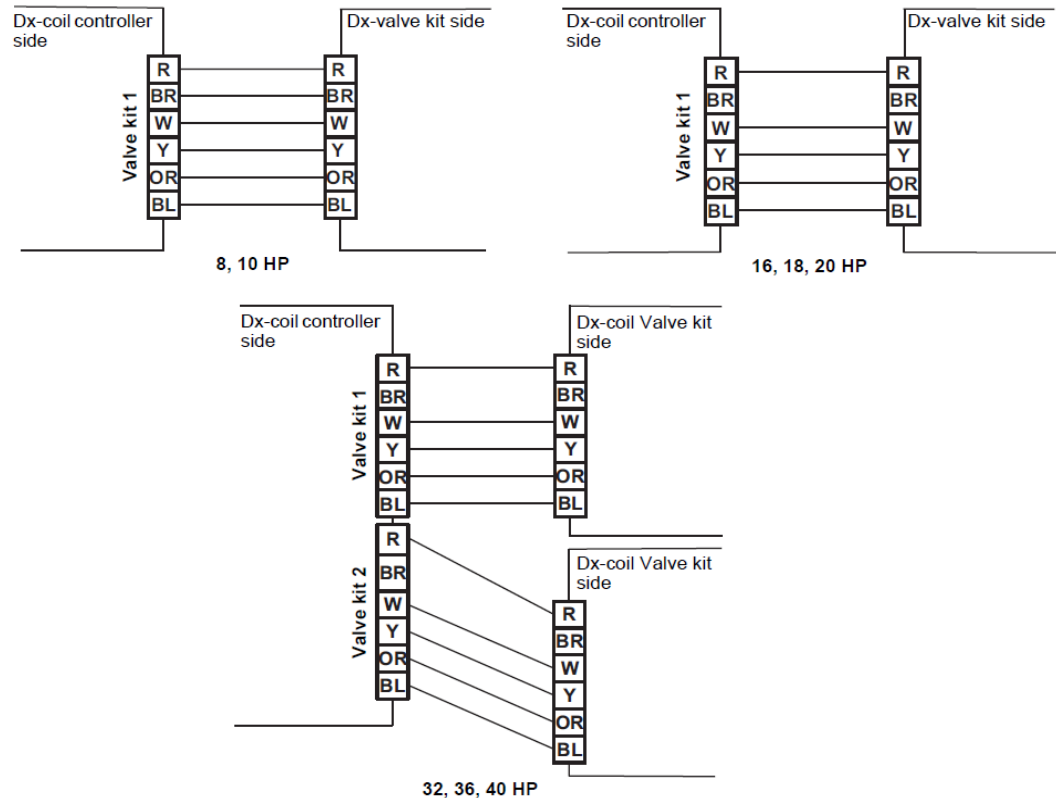
Installation	Avoid locations in direct sunlight. Standard Rating ; IP21
Environment	Insulation should be fitted to Dx-valve kit (locally sourced). Ideally the Dx-valve kit should be contained within the AHU. If installed outside, a cover (locally sourced) should be fitted to protect from wind and rain 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	<ul style="list-style-type: none"> • PMV <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 flow 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> • Sensor holders <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. Braze the TC1 sensor on the location of the lowerside 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.</p> <p>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>

Gas pipe



Wire Connections

- Connect the cable from the PMV. Match the color of the wiring of the PMV side and the controller side.
- The PMV cable is supplied at the maximum permissible length of 5m. However, if supplied following the below cable specification, it can be extended at the maximum permissible length of 12.5m.
 - Cable Specification : UL1007 AWG #26



8 Control Outline

8.1 Cautions regard with DDC's programing

(1) Operation Start

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

- Cooling oil(refrigerant) recovery operation duration is approx. 2 to 5 mins and normally takes place every 2 hrs.
- Heating refrigerant (oil) recovery operation duration is 2 to 10 mins and normally takes place every 1 hr.

(4) Defrost control (Full Defrost)

- The defrost operation terminates based on TE1 & TE2, and re-occur every 55 mins.
(Just after start-up or upon changeover from cooling to heating, the target cumulative duration is 25 mins.)
- The defrost operation takes maximum 10 mins.

(5) Compressor restart prevention timer

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

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 sensor). During Defrosting the refrigerant cycle is reversed temporarily cooling the DX COIL. The defrost operation terminates based on TE1 & TE2, and can re-occur every 55 mins. 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.
High Pressure release control	This control can perform a staged shutdown of the compressors based on PD sensor value and P0 limit:- When $P_d \geq P_{01}$ compressor No. 2 (the last one of two compressors in terms of startup order in a two compressor configuration) is shut down. When $P_d \geq P_{02}$ compressor No.1 (the first compressor in terms of startup order) is shut down. The compressor(s) will automatically re-start after 2 mins 30 secs. <Heating : P01"3.45MPa" , P02"3.5MPa" > <Cooling : P01"3.85" , P02"3.9MPa">
Case Heater control	There are 2 types of case heaters: a compressor case heater and an accumulator case heater. This control function is aimed at preventing the accumulation of refrigerant in those cases, 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.
A3-IPDU control (A3-IPDU = Inverter P.C. board for compressor)	1) Current Release Control To prevent inverter input current from exceeding the specified value, output frequency is controlled with AC input current as detected by T02 mounted on the control P.C. board. 2) Heat sink temperature detection control This control function is aimed at protecting IPM from overheating via a thermistor. This control can increase outdoor fan speed and shutdown the compressors. This control can stop the compressor, which will automatically re-start after 2 mins 30 secs. If the detection is repeated 4 times the unit will not re-start (error code P07). 3) Overcurrent protection When the overcurrent protection circuit on IPDU PCB detects an abnormal current the compressor is shutdown. The compressor is re-started after 2 min 30 secs and the error count is recorded. If the compressor operates for at least 10 mins the error count is cleared. If the detection is repeated 8 times the error is confirmed as final. 4) High Pressure SW control When high pressure switch is activated the compressor is stopped, which will automatically re-start after 2 mins 30 secs. If the detection is repeated 4 times the unit will not re-start (error check code : P04).

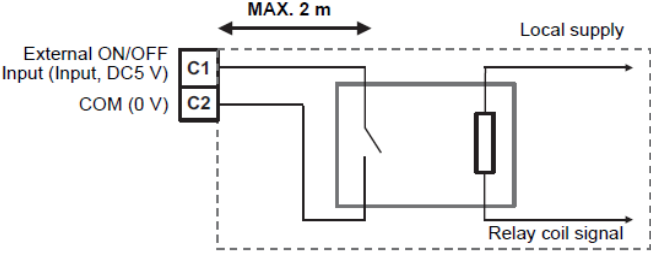
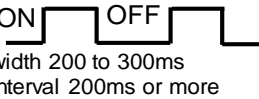
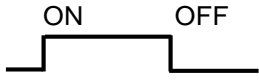
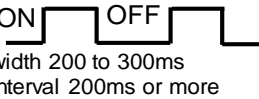
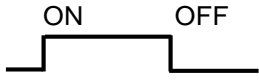
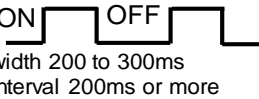
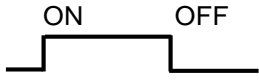
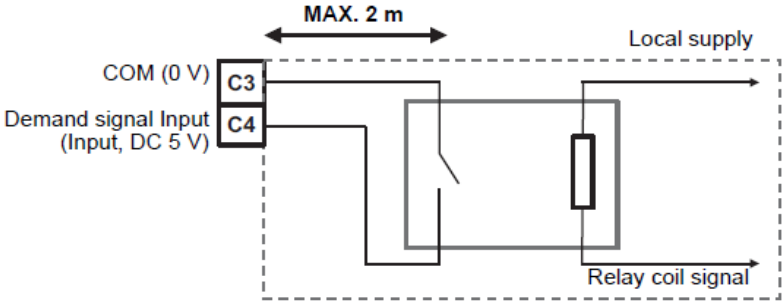
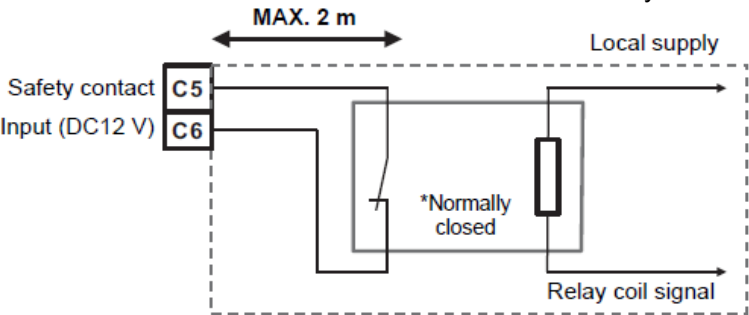
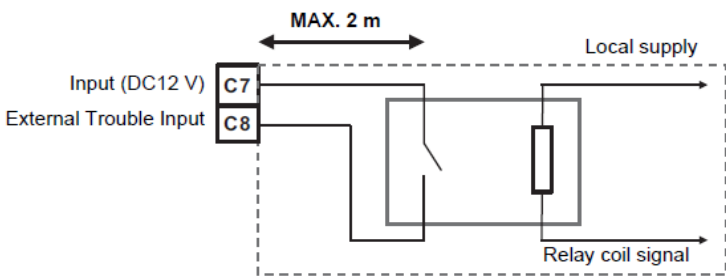
9 Cable specifications

Description	Terminal	Max. Cable Length (m)	Cable Specification
Control wiring between Dx-coil controller and outdoor unit	U1 / U2	1000	Shield wire: $\geq 1.5\text{mm}^2$
		2000	Shield wire: $\geq 2.5\text{mm}^2$
Total wire length of remote controller wiring and remote controller inter - unit wiring = L	A / B	500	Non shield wire: $0.75\sim 2.5\text{mm}^2$
Analogue Input (0 - 10V) Capacity Demand	A1 / A2	200	Shield wire: $0.5\sim 1.0\text{mm}^2$
Mode Input (Cool / Heat)	C23 / C24	100	Non shield wire: $0.5\sim 1.0\text{mm}^2$
Digital Output (DO_1, DO_2)	D31/ D32 D33 / D34	500	Non shield wire: $0.5\sim 1.0\text{mm}^2$

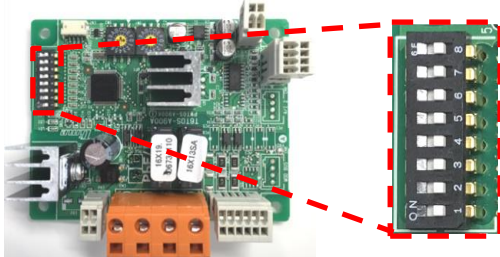
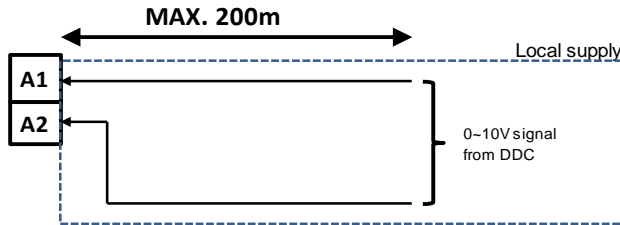
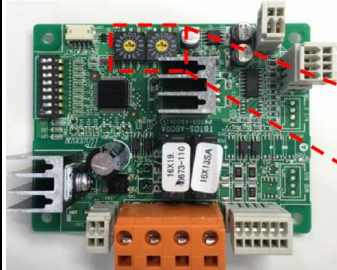
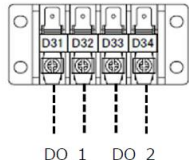
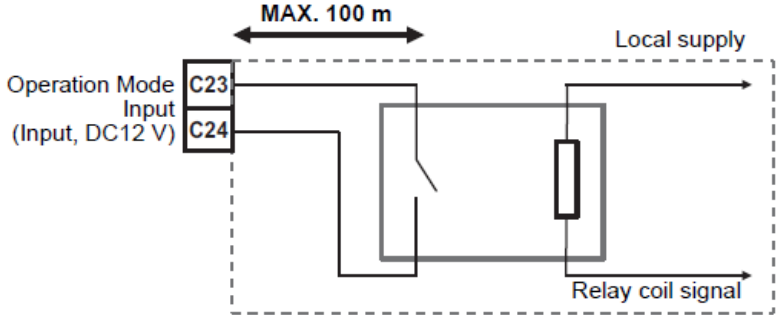
10 Interface requirements for controller

10.1 Indoor(DX) P.C board(MCC-1570) function

Function	Notes / Control Logic
Fan Motor Active Digital Output Terminal name : D1 / D2 (CN60)	<ul style="list-style-type: none"> 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.
Alarm Active Digital Output Terminal name : D5 / D6 (CN61)	<ul style="list-style-type: none"> During Alarm operation, Alarm Active Digital Output is active.
Defrost Mode Digital Output Terminal name : D7 / D8 (CN60)	<ul style="list-style-type: none"> During Defrost operation, Defrost Mode Output is active.
Thermostat On Digital Output Terminal name : D19 / D20 (CN82)	<ul style="list-style-type: none"> When the thermostat of DX-COIL is ON, a signal comes out.

Function	Notes / Control Logic						
External ON/OFF Input Terminal name : C1 / C2 (CN61)	<ul style="list-style-type: none"> · If the contact is closed, DX-COIL controller switch on. If the contact is opened, the system switch off. · External ON/OFF input signal type(pulse / static) is selectable by Jumper Wire J01 on the MCC-1570 as table below. · If the system is switched using and external contact, then switching ON/OFF using the remote controller is still possible.  <table border="1" data-bbox="694 566 1303 815"> <thead> <tr> <th>J01</th><th>Action</th></tr> </thead> <tbody> <tr> <td>Connect</td><td> Pulse input (Default)  Pulse width 200 to 300ms Pulse interval 200ms or more </td></tr> <tr> <td>Cut</td><td> Static input  </td></tr> </tbody> </table>	J01	Action	Connect	Pulse input (Default)  Pulse width 200 to 300ms Pulse interval 200ms or more	Cut	Static input 
J01	Action						
Connect	Pulse input (Default)  Pulse width 200 to 300ms Pulse interval 200ms or more						
Cut	Static input 						
Demand Signal Input Terminal name : C3 / C4 (CN73)	<ul style="list-style-type: none"> · When signal input, AHU is in "thermostat-off" status forcibly. 						
Safety contact input Terminal name : C5 / C6 (CN34)	<ul style="list-style-type: none"> · If this contact is open for more than 1 minute, the check code P10 is generated and the Dx-coil controller switches off automatically. 						
Fan motor trouble input Terminal name : C7 / C8 (CN80)	<ul style="list-style-type: none"> · 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. 						

10.2 DDC(0-10V) interface P.C board(TX-TOS1413) Function

Function	Notes / Control Logic								
Analogue Input Capacity Demand SW03_2: STEPPED / LINEAR response Terminal name : A1 / A2 (CN5)	<div></div> <table><tr><td>SW3 bit-2(TX-TOS1413) OFF</td><td>STEPPED response to analogue input</td></tr><tr><td>SW3 bit-2(TX-TOS1413) ON</td><td>LINEAR response to analogue input</td></tr></table> <ul style="list-style-type: none">Analogue input 0 to 10V from DDC on site.Be sure not input more than DC10V in analogue input terminal. <div><p>MAX. 200m</p></div>	SW3 bit-2(TX-TOS1413) OFF	STEPPED response to analogue input	SW3 bit-2(TX-TOS1413) ON	LINEAR response to analogue input				
SW3 bit-2(TX-TOS1413) OFF	STEPPED response to analogue input								
SW3 bit-2(TX-TOS1413) ON	LINEAR response to analogue input								
Digital Output 1/2 Terminal name : D31 / D32:DO_1 Digital Output1 D33 / D34:DO_2 Digital Output2 (CN3)	<ul style="list-style-type: none">Output function selected using rotary switches SW1 & SW2 on the DDC(0-10V) interface P.C board(TX-TOS1413). <div><div><p>SW2 : Digital output2 (DO_2)</p><p>SW1 : Digital output1 (DO_1)</p></div></div>								
Operation Mode Input (Cool / Heat) Terminal name : C23 / C24 (CN2)	<ul style="list-style-type: none">If the contact is short-circuited, system changes to heat mode.If the contact is open, system changes to cool modeOnly cool mode and heat mode are available. <div><p>MAX. 100 m</p></div> <table><tr><th>Function</th><th>Terminal</th><th>OPEN</th><th>SHORT</th></tr><tr><td>Mode Input Cool / Heat</td><td>C23 / C24</td><td>COOL mode active</td><td>HEAT mode active</td></tr></table>	Function	Terminal	OPEN	SHORT	Mode Input Cool / Heat	C23 / C24	COOL mode active	HEAT mode active
Function	Terminal	OPEN	SHORT						
Mode Input Cool / Heat	C23 / C24	COOL mode active	HEAT mode active						

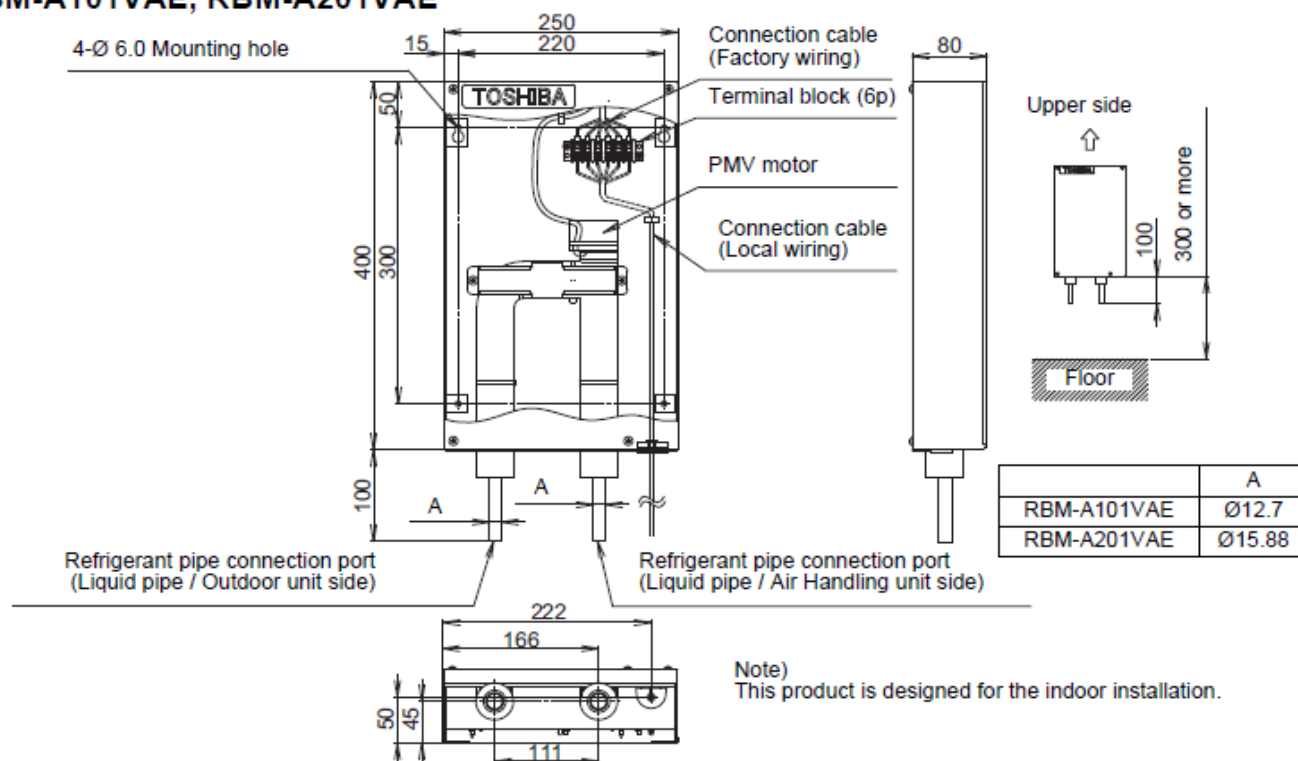
11 Function code (DN code)

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

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						0000: Unfixed	
		0021	0023	0026	0027	0028	0035	0037	0039
		8HP	10HP	16HP	18HP	20HP	32HP	36HP	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	

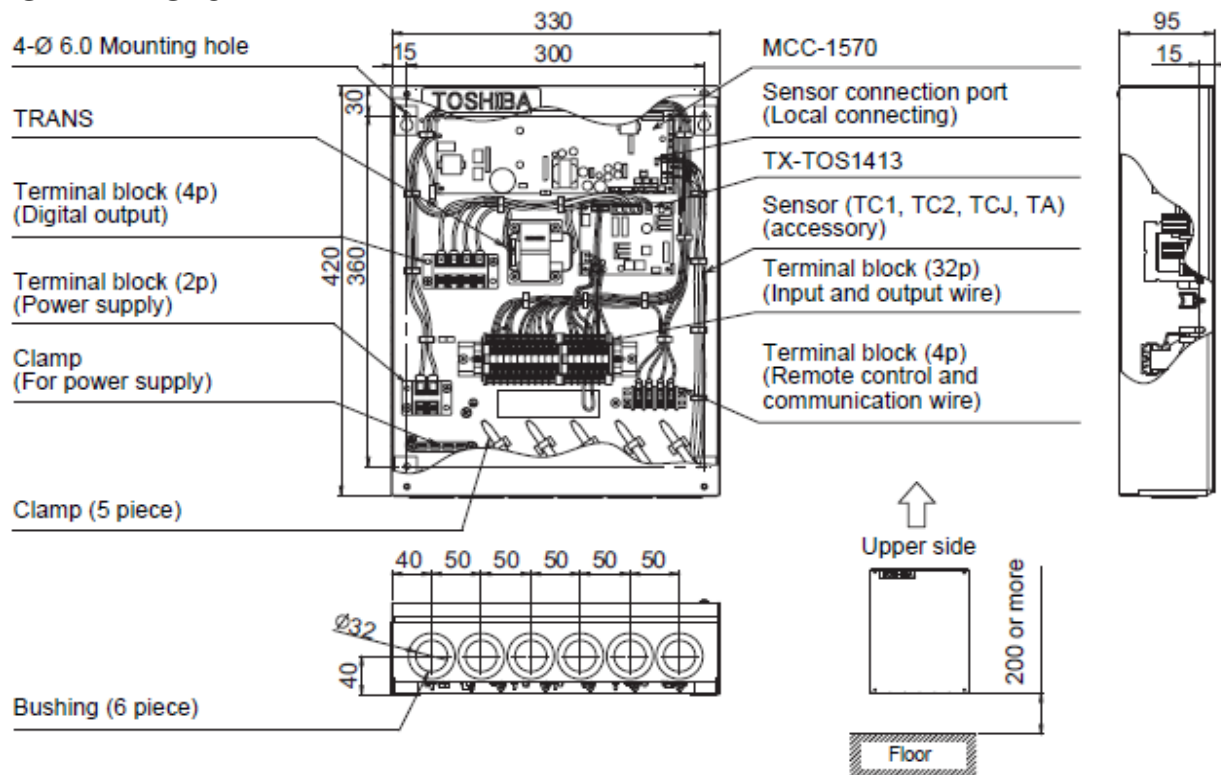
(Unit : mm)

RBM-A101VAE, RBM-A201VAE



TCB-IFDDC201E

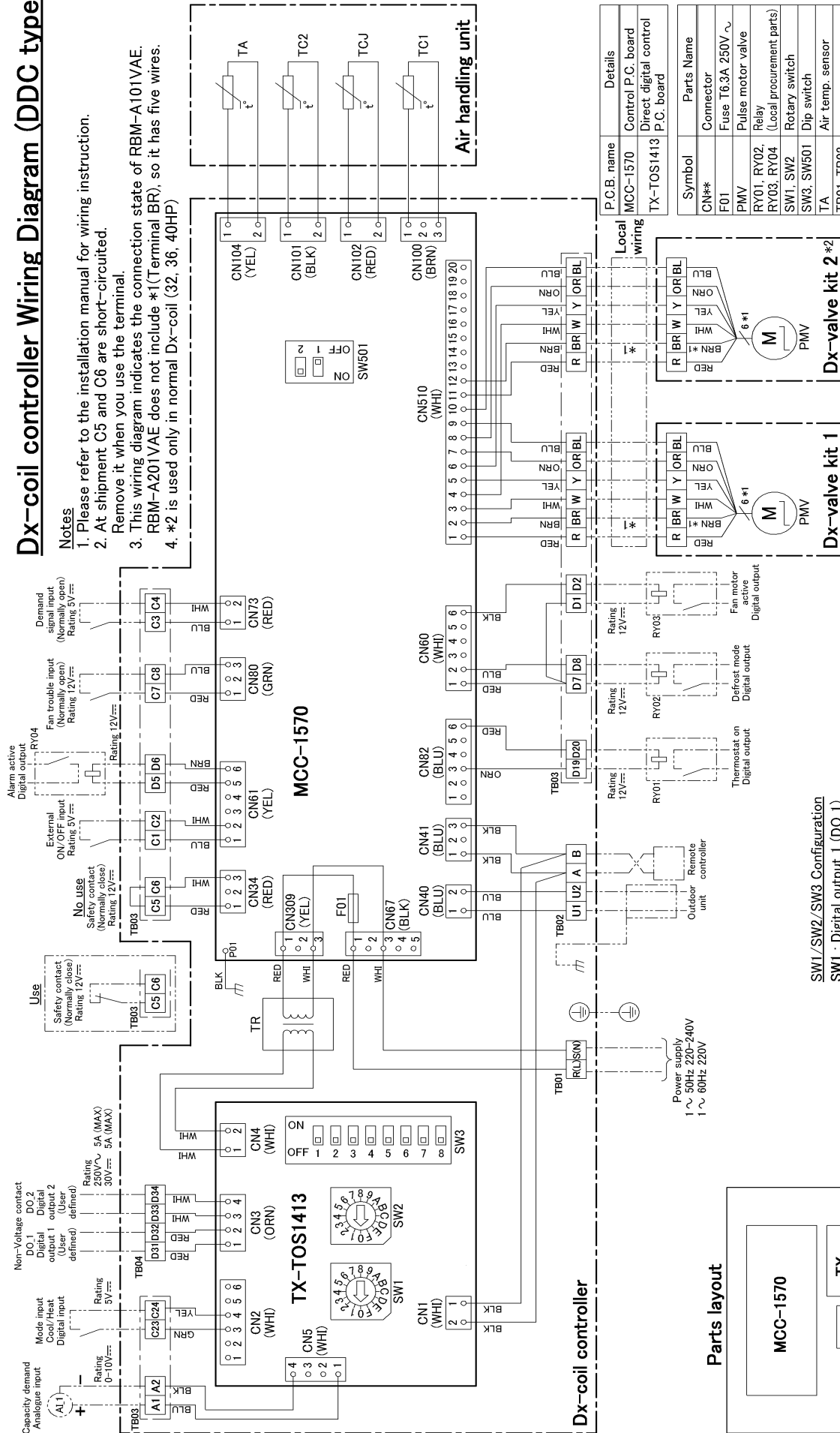
(Unit : mm)



Dx-coil controller Wiring Diagram (DDC type)

Notes

1. Please refer to the installation manual for wiring instruction.
2. At shipment C5 and C6 are short-circuited.
Remove it when you use the terminal.
3. This wiring diagram indicates the connection state of RBM-A101VAE.
RBM-A201VAE does not include *1(Terminal BR), so it has five wires.
4. *2 is used only in normal Dx-coil (32, 36, 40HP)



SW1/SW2/SW3 Configuration

SW1 : Digital output 1 (DO 1)

SW2 : Digital output 2 (DO 2)

No.	Function
0	Lower than capacity command (Default)
1	Higher than capacity command
2	Cooling oil recovery / heating refrigerant recovery control
3	Cooling output
4	Heating output
5	Thermostat ON
6~F	Do not use

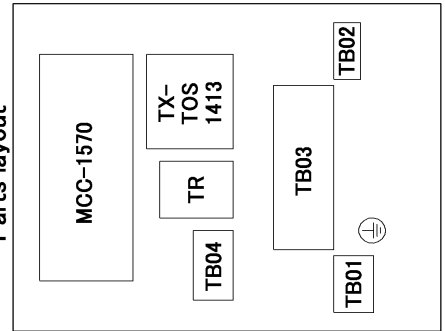
COLOR IDENTIFICATION	
RED	: RED
WHI	: WHITE
YEL	: YELLOW
BLU	: BLUE
BLK	: BLACK
ORN	: ORANGE
BRN	: BROWN
GRN	: GREEN

SW3 : Header/Follower and Demand setting













No.	Function
OFF	Header wired remote fitted (Default)
ON	No wired remote / Follower remote fit
OFF	Stepped AL1 demand input (Default)
ON	Linear AL1 demand input
3~8	Do not use (Default OFF)










Graphic symbol	Details
Boundary	Boundary
Local wiring / Local procurement parts	Local wiring / Local procurement parts
Connector	Connector
Terminal blocks	Terminal blocks
Protective earth	Protective earth
P.C. board	P.C. board

Parts layout



✓ : Available × : Prohibition

Appliance name	Model Name and appearance	
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 	×
Remonote Controller(TU2C-LINK Controls)		
Wired remote controller	RBC-AMTU31-E(TR) 	✓
	RBC-AMSU51(-EN/ES) 	✓
	RBC-ASCU11-E(TR) 	✓

Appliance name	Model Name and appearance	
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-IFKX1TLR-E 	×

(*) : Monitoring function only

15 Check Codes

Common Check Codes (Note1 : DDC(0-10V) interface 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 settings of SW3 bit1 located on the DDC(0-10V) interface P.C. board(TX-TOS1413).
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 settings of SW3 bit1 located on the DDC(0-10V) interface P.C. board(TX-TOS1413).
Check the remote controller inter-unit tie cable(A/B).
- **E13 : Indoor(DX) P.C. board(MCC-1570) - DDC(0-10V) interface P.C. board(TX-TOS1413) communication trouble
Detected at DDC(0-10V) interface P.C. board**
Check connection of tie cables(A/B) between the connector CN41(BLU) located on the Indoor(DX) P.C. board and the connector CN1(WHI) located on the DDC(0-10V) interface P.C. board.
Check for the trouble in indoor(DX) P.C. board.
- **E14 : Indoor(DX) P.C. board(MCC-1570) - DDC(0-10V) interface P.C. board(TX-TOS1413) communication trouble
Detected at Indoor(DX) P.C. board**
Check connection of tie cables(A/B) between the connector CN41(BLU) located on the Indoor(DX) P.C. board and the connector CN1(WHI) located on the DDC(0-10V) interface P.C. board.
Check DDC(0-10V) interface P.C. board power supply at CN4(WHI).
Check for the trouble in DDC(0-10V) interface P.C. board.
- **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.
- **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.
- **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 (See "DX COIL INTERFACE Configuration").
- **L22 : Incompatible group combination of indoor units**
Check indoor units model.
Check for trouble in indoor P.C. board.
- **L30 : Fan Motor operation monitor**
Check the operation monitoring of the fan at terminals C7 / C8. If this contact is "CLOSED", the check code "L30" is generated.
- **P10 : Safety contact trouble**
Check the contact at terminals C5/ C6. 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 C5/ C6.

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(DDC type) Design Guideline

DG001-05

June, 2022 5th Edition

Toshiba Carrier Corporation