MINI VRF MDCI 8-45

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INTERNATIONAL AC ACADEMY
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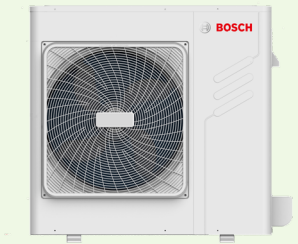
Mini VRF Line-up

BOSCH

Mini VRF MDCI

MDCI Series – Mini VRF Outdoor Units

MDCI8, MDCI10	MDCI12-14-16-18	MDCI 20-22-26
		

- Compact units for small & mid size projects
- Up to 12 indoor units can be connected (MDCI26)
- Combination ratio min %50 ~ max %130
- 380-415V, 50Hz, triphase or 220-240V, 50Hz monophase options

Mini VRF MDCI

Technical specifications (1-phase)

Feature		Unit	MDCI8-1	MDCI10-1	MDCI12-1	MDCI14-1	MDCI16-1
Nominal Capacity	Cooling	kW	7,2	9,0	12,3	14,0	15,5
	Heating		7,1	9,1	13,2	15,4	17,0
Efficiency	EER		3,95	3,91	3,78	3,54	3,43
	COP		4,09	3,97	3,80	3,70	3,56
Dimensions	Length	mm	1075		900		
	Width		396		400		
	Height		966		1327		
Weight	Net	kg	75,5		95		100
Compressor	Quantity	pcs	1				
	Type		DC inverter rotary				
Refrigerant	Type		R-410A				
Ambient Temp Working Range	Cooling	°C	-15 ~ +43				
	Heating		-15 ~ +27				
Sound Pressure Level		dB(A)	54		57		
Refrigerant Piping Connections	Liquid /Gas	mm	Ø9,52 - Ø15,9				Ø9,52 - Ø19,1
Max. IDU		pcs	4	5	6		7
Piping Lengths	Total	m	100				
	Max actual		45		60		
	Max equiv.		50		70		
	After 1st joint		20				
Level difference	Max (ODU above)		30				
	Max (ODU below)		20				
	indoor-indoor		8				

1. Cooling Capacities : indoor temperature 27ºCDB, 19ºCWB, outdoor temperature 35ºCDB, equivalent piping length 5m, level diff 0m
2. Heating Capacities : indoor temperature 20ºCDB, 15ºCWB, outdoor temperature 7ºCDB, equivalent piping length 5m, level diff 0m
3. Sound level : Anechoic chamber conversion value, measured at a point 1m in front of the unit at a height of 1,5m

MDCI-1 power supply : 220~240V 1Ph ~ 50Hz

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Mini VRF MDCI

Technical specifications (3-phase)

Feature		Unit	MDCI12-3	MDCI14-3	MDCI16-3	MDCI18-3	MDCI20-3	MDCI22-3	MDCI26-3
Nominal Capacity	Cooling	kW	12,3	14,0	15,5	17,5	20,0	22,4	26,0
	Heating		13,2	15,4	17,0	19,0	22,0	24,5	28,5
Efficiency	EER		3,78	3,54	3,43	3,30	3,28	3,29	3,42
	COP		3,80	3,70	3,56	3,80	3,61	4,15	4,19
Dimensions	Length	mm	900				1120		
	Width		400				528		
	Height		1327				1558		
Weight	Net	kg	95		102	107	137	146,5	147
Compressor	Quantity	pcs	1						
	Type		DC inverter rotary						
Refrigerant	Type		R-410A						
Ambient Temp Working Range	Cooling	°C	-15 ~ +43				-15 ~ +48		
	Heating		-15 ~ +27						
Sound Pressure Level		dB(A)	57			59			60
Refrigerant Piping Connections	Liquid /Gas	mm	Ø9,52 - Ø15,9		Ø9,52 - Ø19,1				Ø9,52 - Ø22,2
Max. IDU		pcs	6	6	7	9	10	11	12
Piping Length	Total	m	100				120		
	Max actual		45		60		60		
	Max equiv.		50		70				
	After 1st joint		20						
Level difference	Max (ODU above)		30						
	Max (ODU below)		20						
	indoor-indoor		8						

1. Cooling Capacities : indoor temperature 27°CDB, 19°CWB, outdoor temperature 35°CDB, equivalent piping length 5m, level diff 0m
2. Heating Capacities : indoor temperature 20°CDB, 15°CWB, outdoor temperature 7°CDB, equivalent piping length 5m, level diff 0m
3. Sound level : Anechoic chamber conversion value, measured at a point 1m in front of the unit at a height of 1,5m

MDCI-3 series power supply : 380~415V 3Ph ~ 50Hz

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Mini VRF MDCI

Technical specifications (3-phase)

Specifications			MDCI 40-3	MDCI 45-3
Power supply		V/Ph/Hz	380-415/3/50	380-415/3/50
Cooling	Capacity	kW	40	45
	Power input	kW	11,9	13,6
	EER		3,36	3,31
Heating	Capacity	kW	45	50
	Power input	kW	11,1	12,7
	COP		4,05	3,94
Max. Indoor Unit	Total capacity	pcs	50~130%	50~130%
	Max. quantity	pcs	14	15
Compressor	Type		DC inverter	DC inverter
	Quantity	pcs	2	2
Fan motor	Type		DC motor	DC motor
	Quantity		2	2
Refrigerant	Type		R-410A	R-410A
	Factory charge	kg	9	12
Pipe connections	Liquid pipe	mm	Φ12.7	Φ12.7
	Gas pipe	mm	Φ22.2	Φ25.4
Air flow rate		m³/h	16575	16575
Sound pressure level		dB(A)	62	62
Sound power level		dB(A)	76	76
Net dimension	W×H×D	mm	1360×1650×540	1460×1650×540
Packing size	W×H×D	mm	1450×1785×560	1550×1785×560
Net weight		kg	240	275
Gross weight		kg	260	290
Operating temperature range		°C	Cooling: -5~43; Heating: -15~24	

Cooling: Indoor temperature 27°C DB/19°C WB; Outdoor temperature 35°C DB/24°C WB;
Heating: Indoor temperature 20°C DB/15°C WB; Outdoor temperature 7°C DB/6°C WB.
Piping length: Interconnecting piping length is 7.5m, level difference is zero.
Sound values are measured in a semi-anechoic room, at a position 1 m in front of the unit and 1,3 m above the floor.

~ 50Hz

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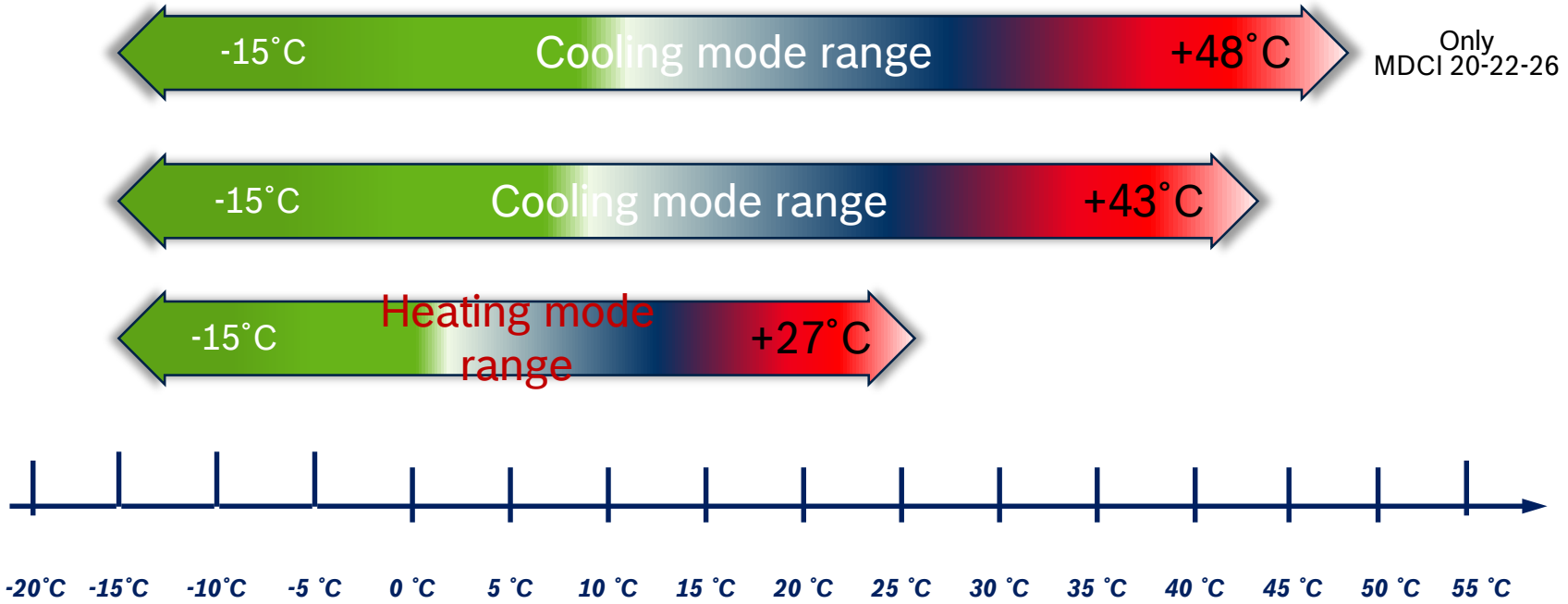
MDCI Series – Operation range

In hot summer when temperature even rises up to 48°C in cooling mode,

MDCI series ensures stable operation.



Mini VRF MDCI
Installation steps

- Refrigerant piping
- Indoor unit installation
- Outdoor unit installation
- Wiring

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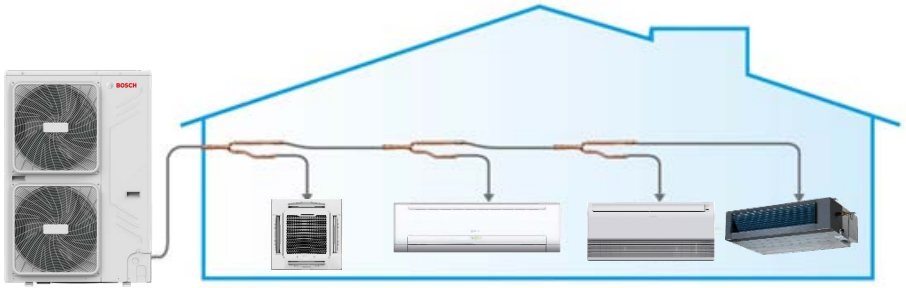
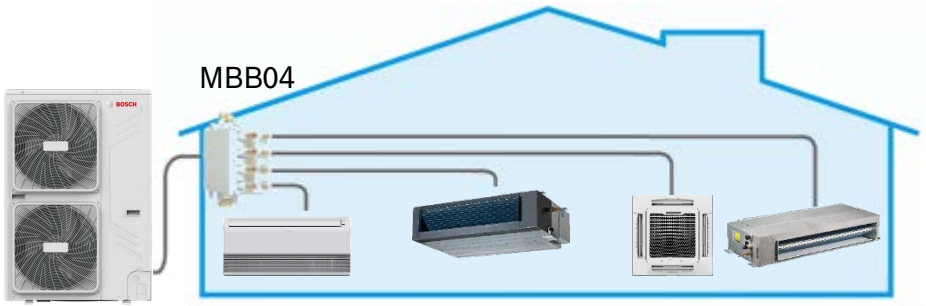
Mini VRF MDCI
Area check

Application Areas & Benefits	Customer Expectation
Residences	
 ▪ Villas, residences ▪ Each user has its own outdoor unit (energy sharing) ▪ Easy installation & service	• Side discharge outdoor unit • One line copper piping • Several VRF indoor unit models
Commercial Buildings	
 ▪ Tall Buildings ▪ High Efficiency ▪ Less space need ▪ Low sound levels	• Long piping lengths • High efficiency compressor • Less space need for outdoors • Low sound levesl

Mini VRF MDCI
Pipe connections



Installation with joints



Installation with branch box

Max. 4 indoor units can be connected to one MBB04 branch box

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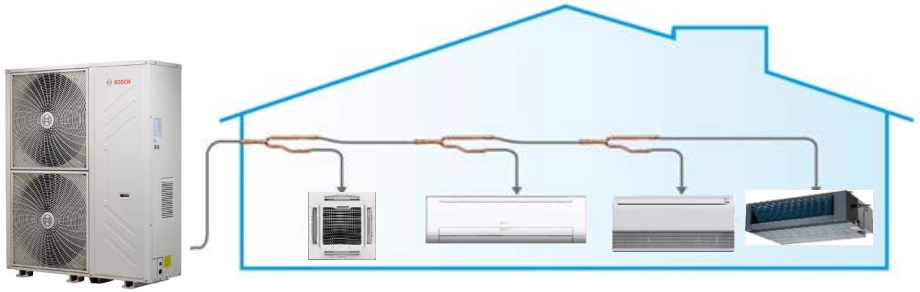
Mini VRF MDCI
Pipe connections

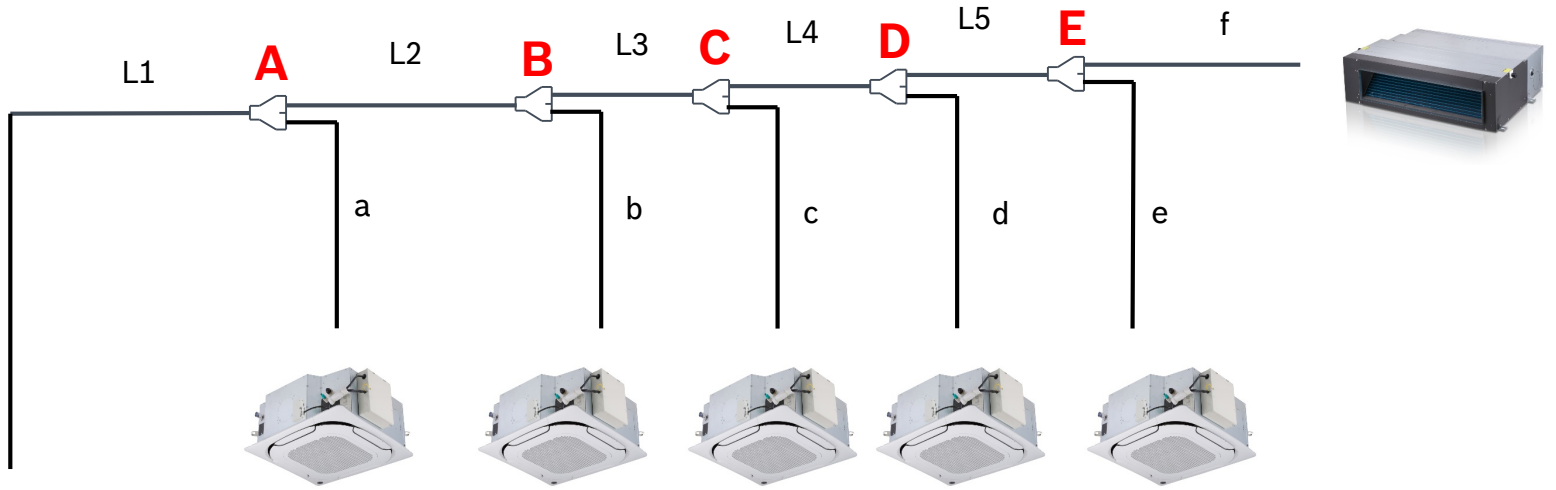


Installation with joints

MBB04 branch box **can not be** used with MDCI 40-3, MDCI 45-3

Mini VRF MDCI

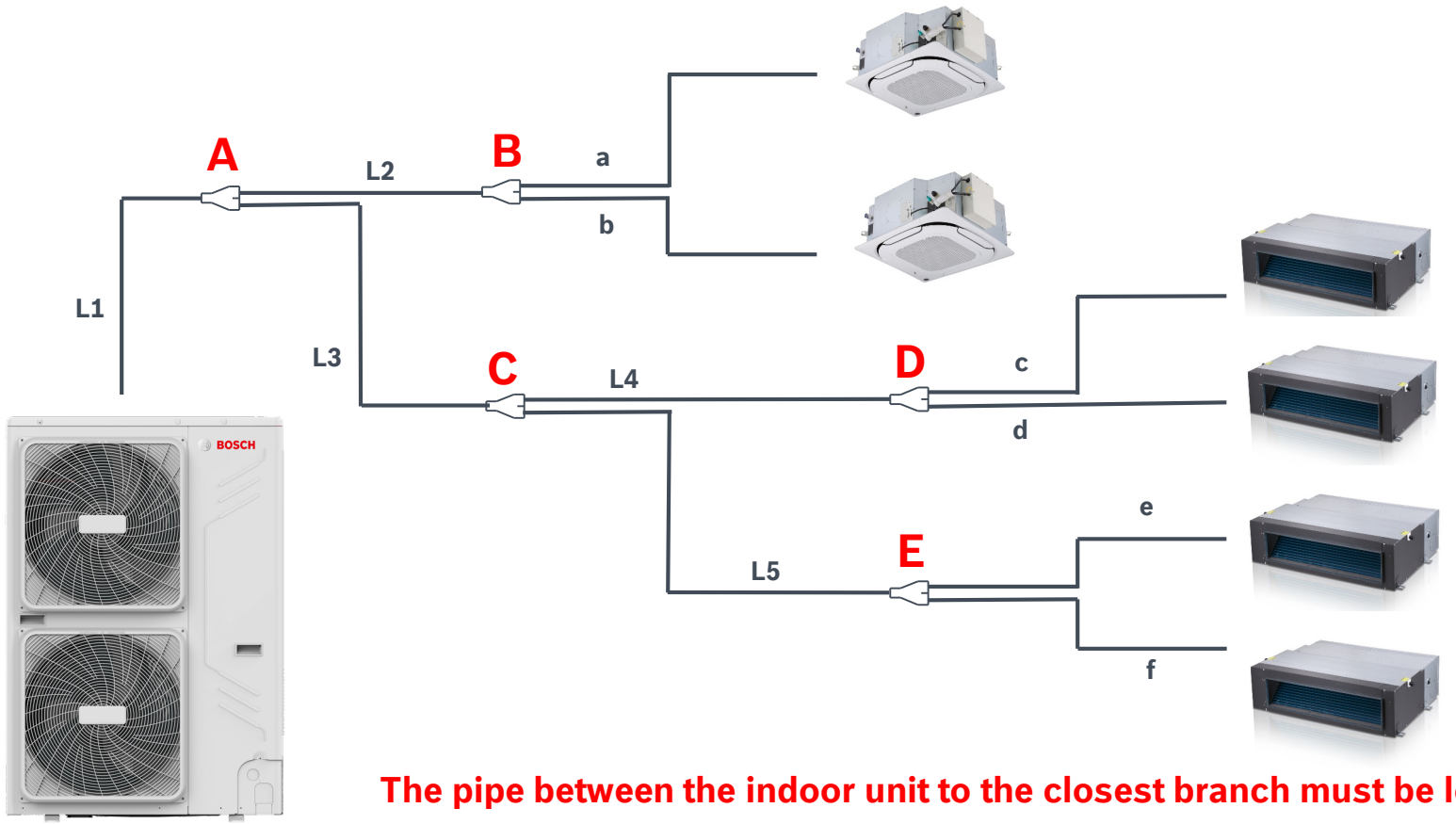
Pipe connections: Option A (A to E ≤ 15m)



Pipe	Definition	Location
L1	Main pipe	From ODU to the first branch of indoor unit
L2 – L5	The main pipes for IDU	After the first branch to the next branch
a, b, c, d, e, f	The branch pipes for IDU	Between branch and indoor unit

Mini VRF MDCI

Pipe connections: Option B (A to E > 15m)



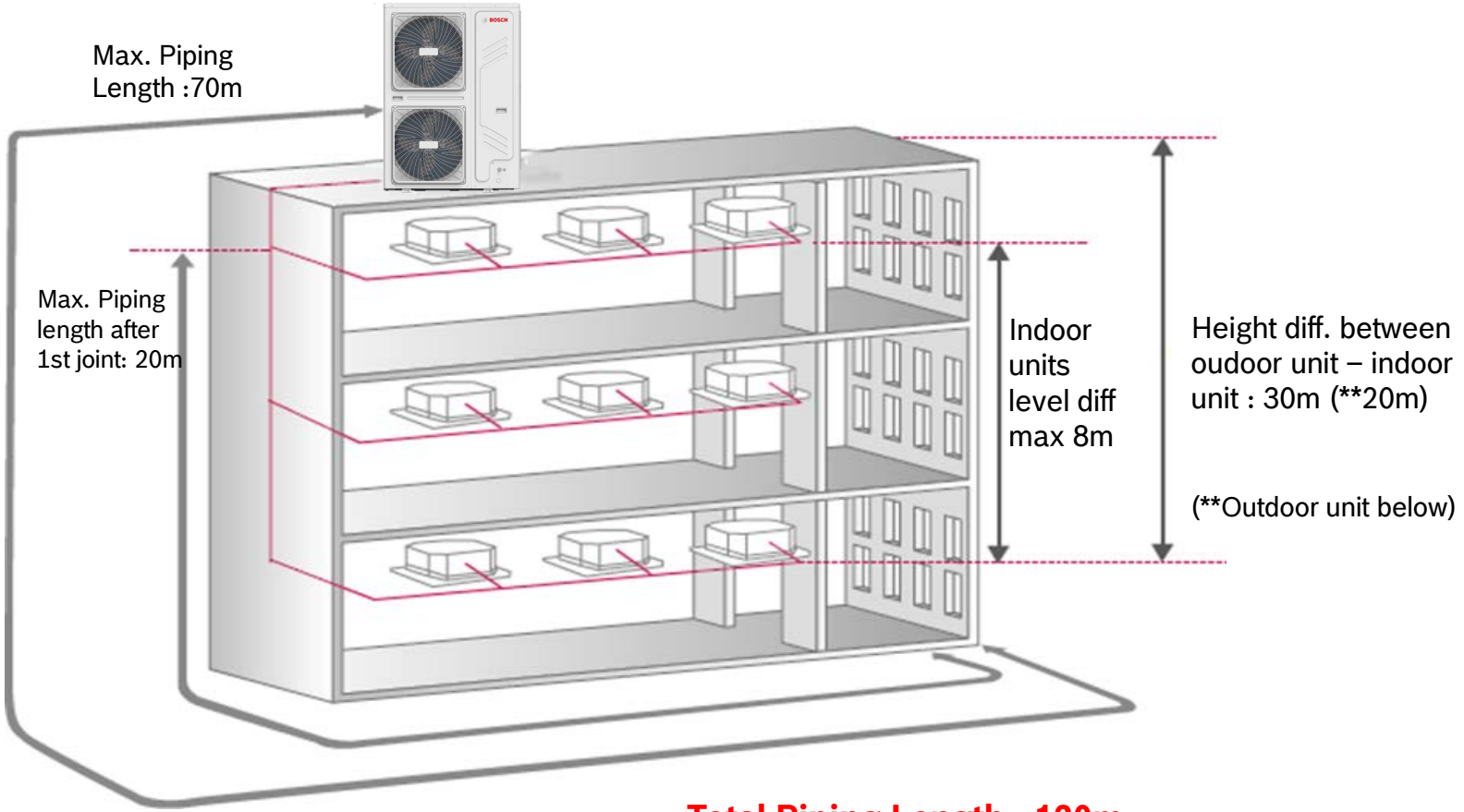
The pipe between the indoor unit to the closest branch must be less than 15m.

Mini VRF MDCI
Pipe connections

Pipe length	MDCI 8-18	MDCI 20-26	MDCI 40-45
Total pipe length (L1+L2+L3+L4+L5+a+b+c+d+e+f)	≤100m	≤120m	≤250m
Max. equivalent pipe length (From ODU to farthest IDU)	≤50m (8/10,5kW)	≤70m	≤120m
	≤70m (12/14/16/18 kW)		
Max. equivalent pipe length (From 1st branch to farthest IDU)	≤20m	≤20m	≤40m
Length between IDU and nearest branch	≤15m		
Height drop if ODU above IDU	≤30m		
Heigt drop if ODU below IDU	≤20m		
Level between IDUs	≤8m		
Max. number of bends	10		

Mini VRF MDCI

Pipe connections for MDCI26



Total Piping Length : 120m

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Pressure test

Pressure test should be done with nitrogen at 43 bar for R410A. The high pressure/low pressure valves must be closed when applying pressured nitrogen.

Mini VRF MDCI
Installation steps

Refrigerant piping

Indoor unit installation

Outdoor unit installation

Wiring

Mini VRF MDCI
Indoor unit installation

• When installing branch joints ensure there is at least 0.5 m of straight pipe before and after the branch joint;

• The straight distance between branchpipes must be at least 0.5 m;

• The straight distance where the branch pipes connect to the indoor unit must be at least 0.5 m;

• Branch header must be connected with the indoor units directly, further branch connections are not allowed.

Mini VRF MDCI
Installation steps

- Refrigerant piping
- Indoor unit installation
- Outdoor unit installation
- Wiring

Mini VRF MDCI
Outdoor unit installation

Mini VRF MDCI
Outdoor unit installation

Do not install the outdoor unit

☹ on a location where discharge air will affect others

☹ on a location where there is insufficient ventilation

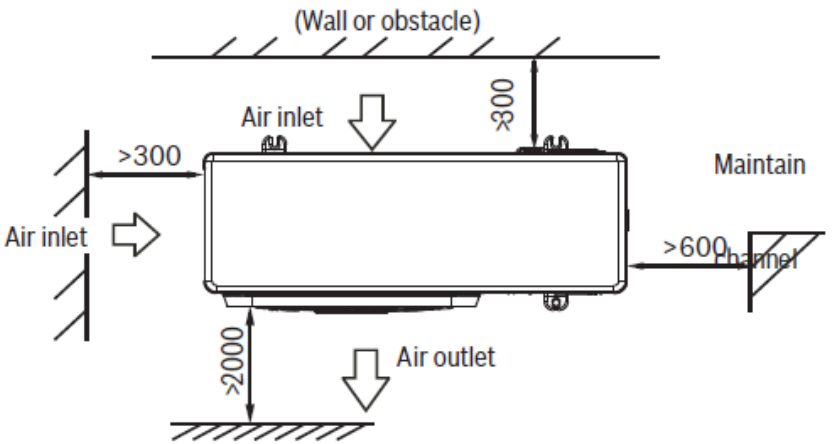
☹ on a location which is uneven

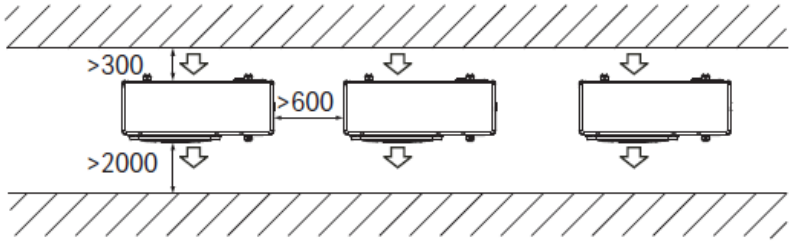
☹ on a location that is too weak to bear the weight of the unit

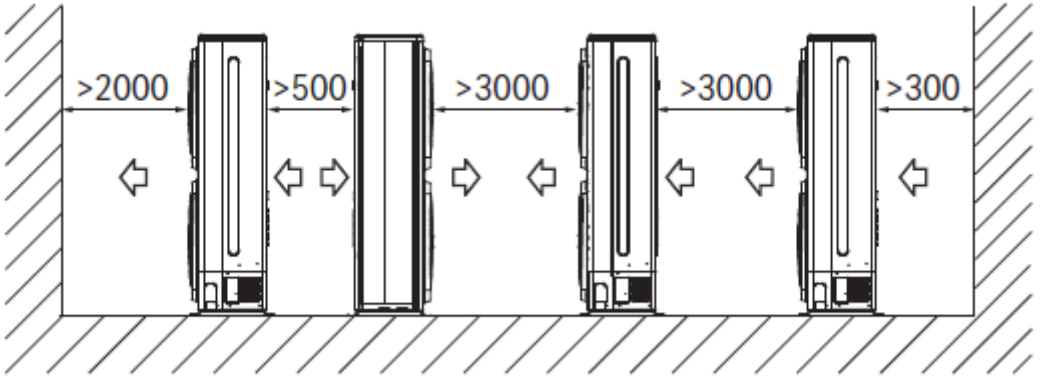
☹ close to comfort zones (f.e. in front of the neighbours bedroom)

☹ where there is insufficient maintenance access

Mini VRF MDCI
Outdoor unit installation

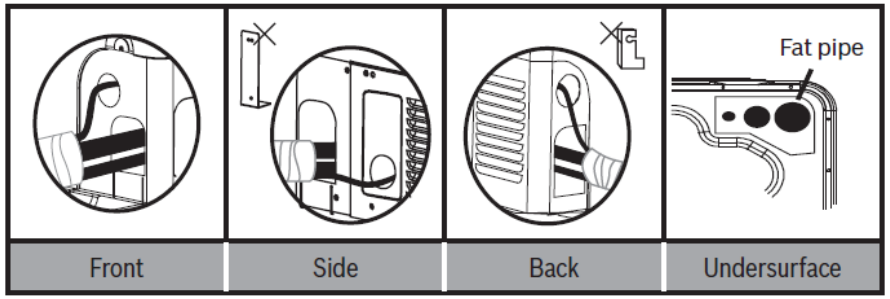






Mini VRF MDCI
Outdoor unit installation

The outdoor unit can be piped in various ways. The pipes can run from the back, front and under the unit. Remove knock outs where appropriate.

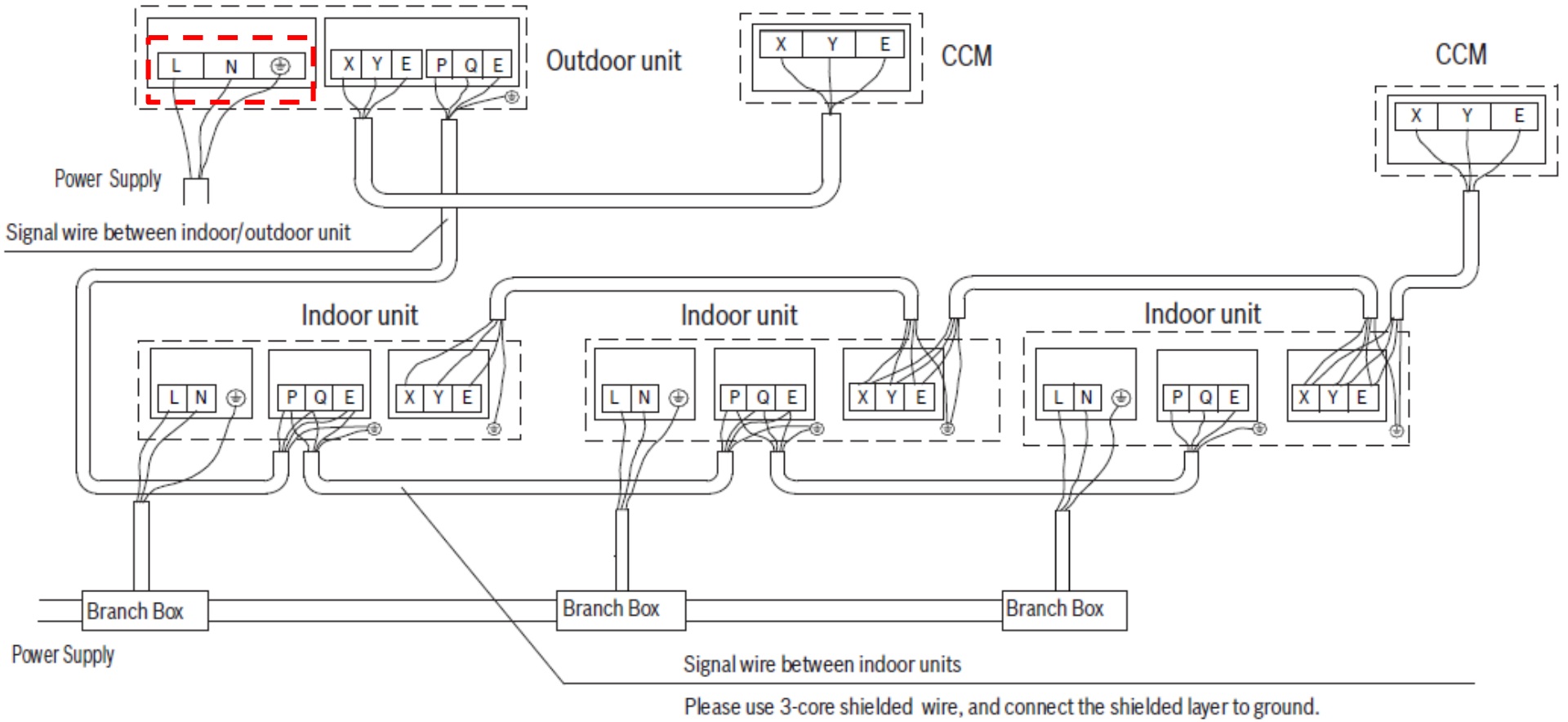


Mini VRF MDCI
Installation steps

- Refrigerant piping
- Indoor unit installation
- Outdoor unit installation
- Wiring

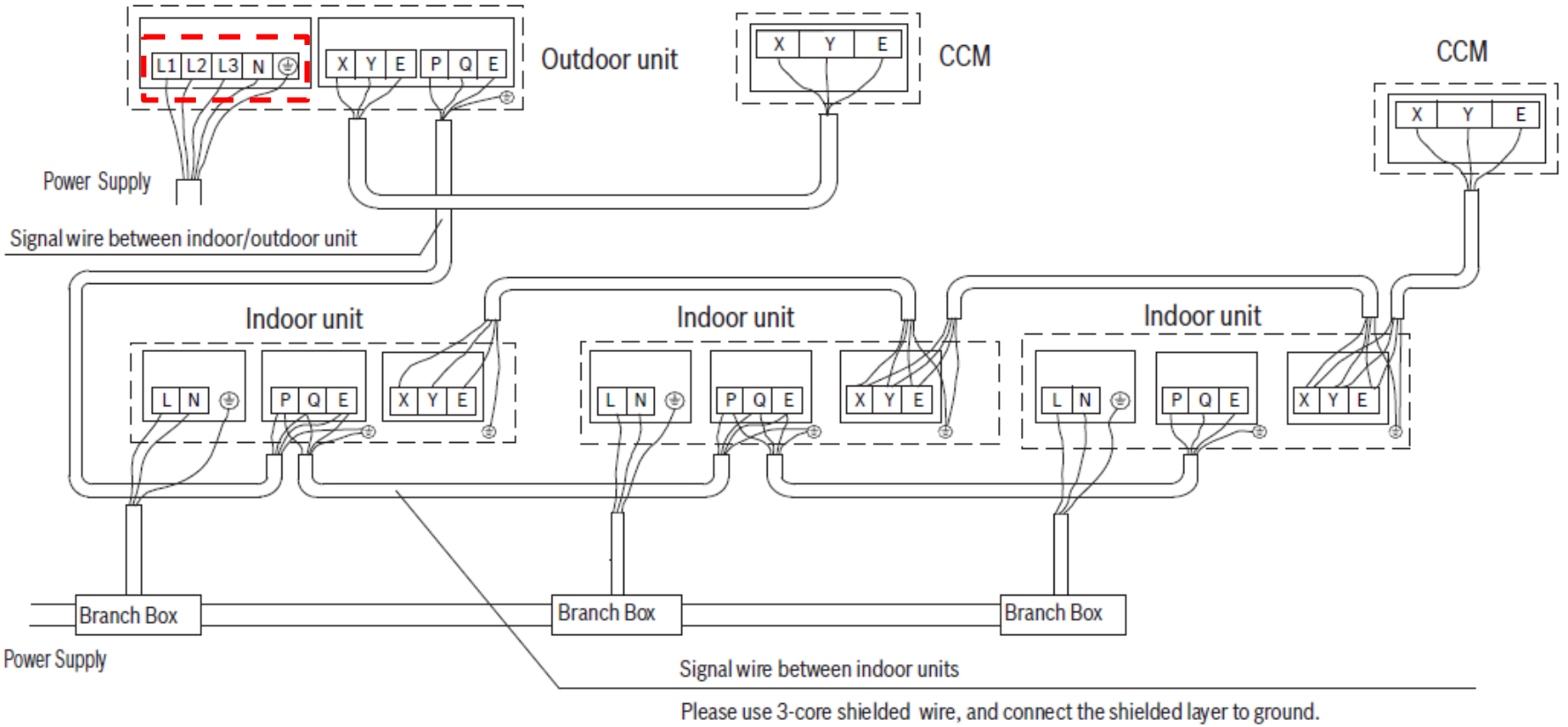
Mini VRF MDCI

Wiring: MDCI 8-18kW (1-phase)



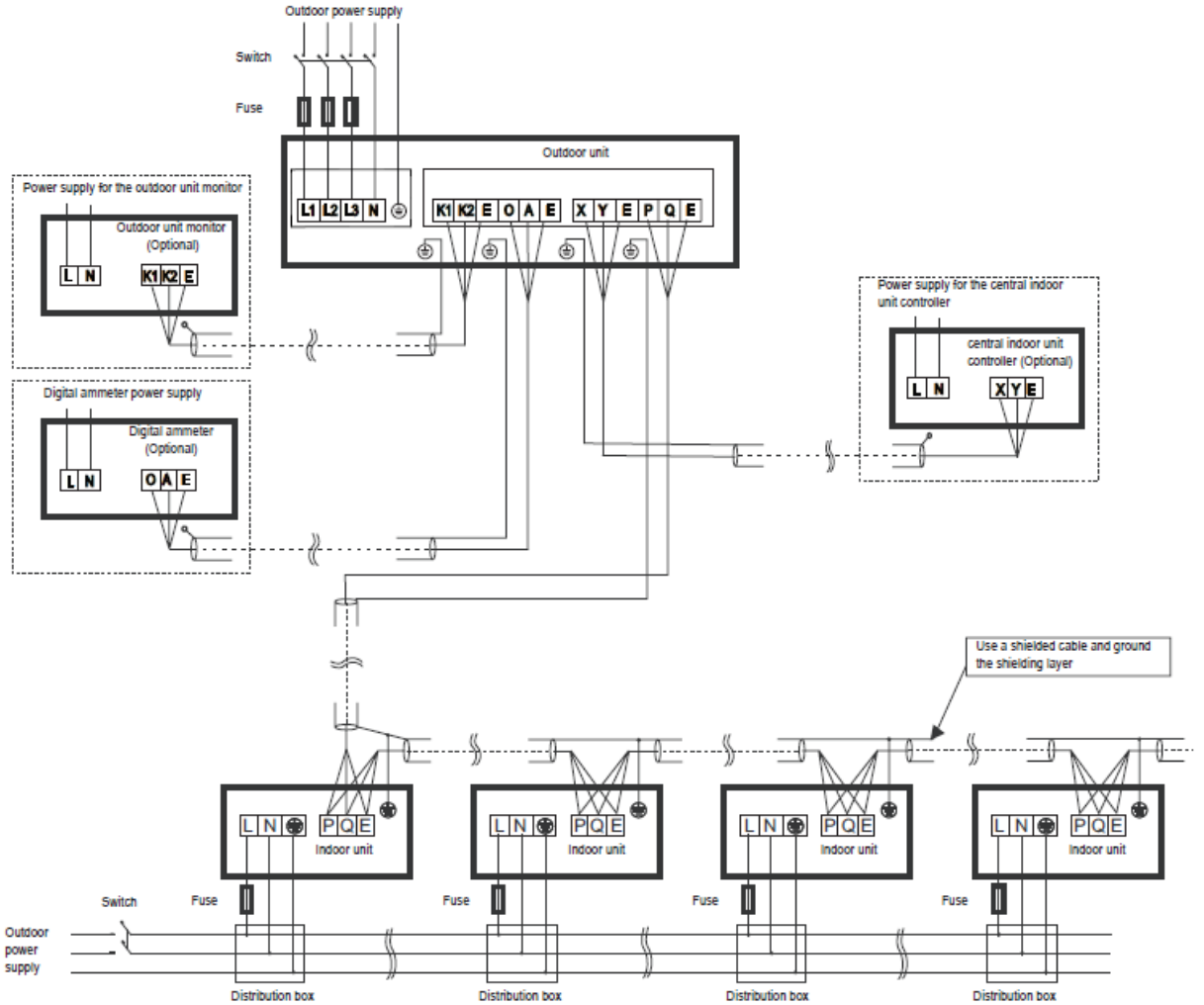
Mini VRF MDCI

Wiring: MDCI 10,5-18kW (3-phase)

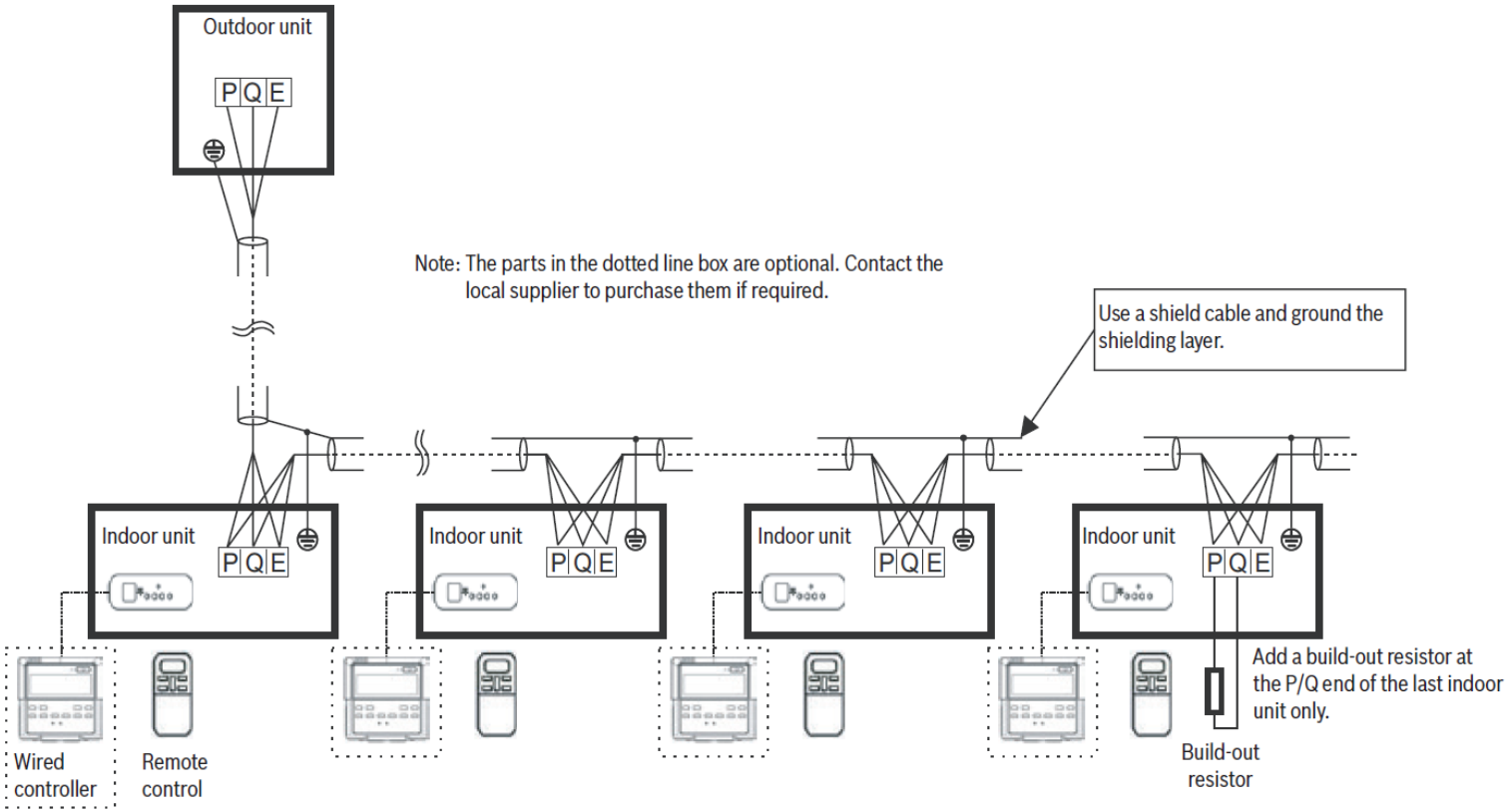


Mini VRF MDCI

Wiring: MDCI 20-26kW (3-phase)

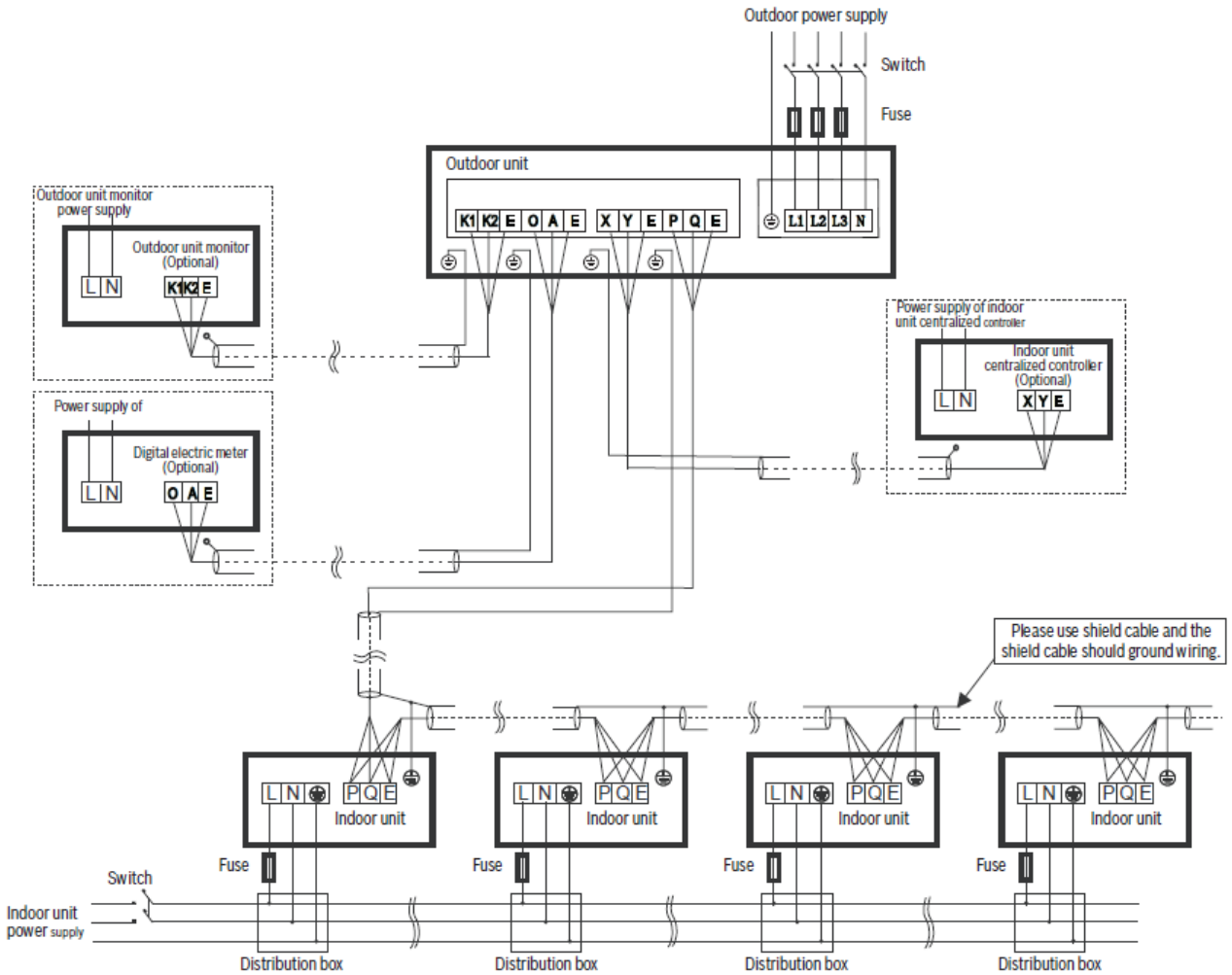


Mini VRF MDCI
Wiring: MDCI 20-26kW (3-phase)

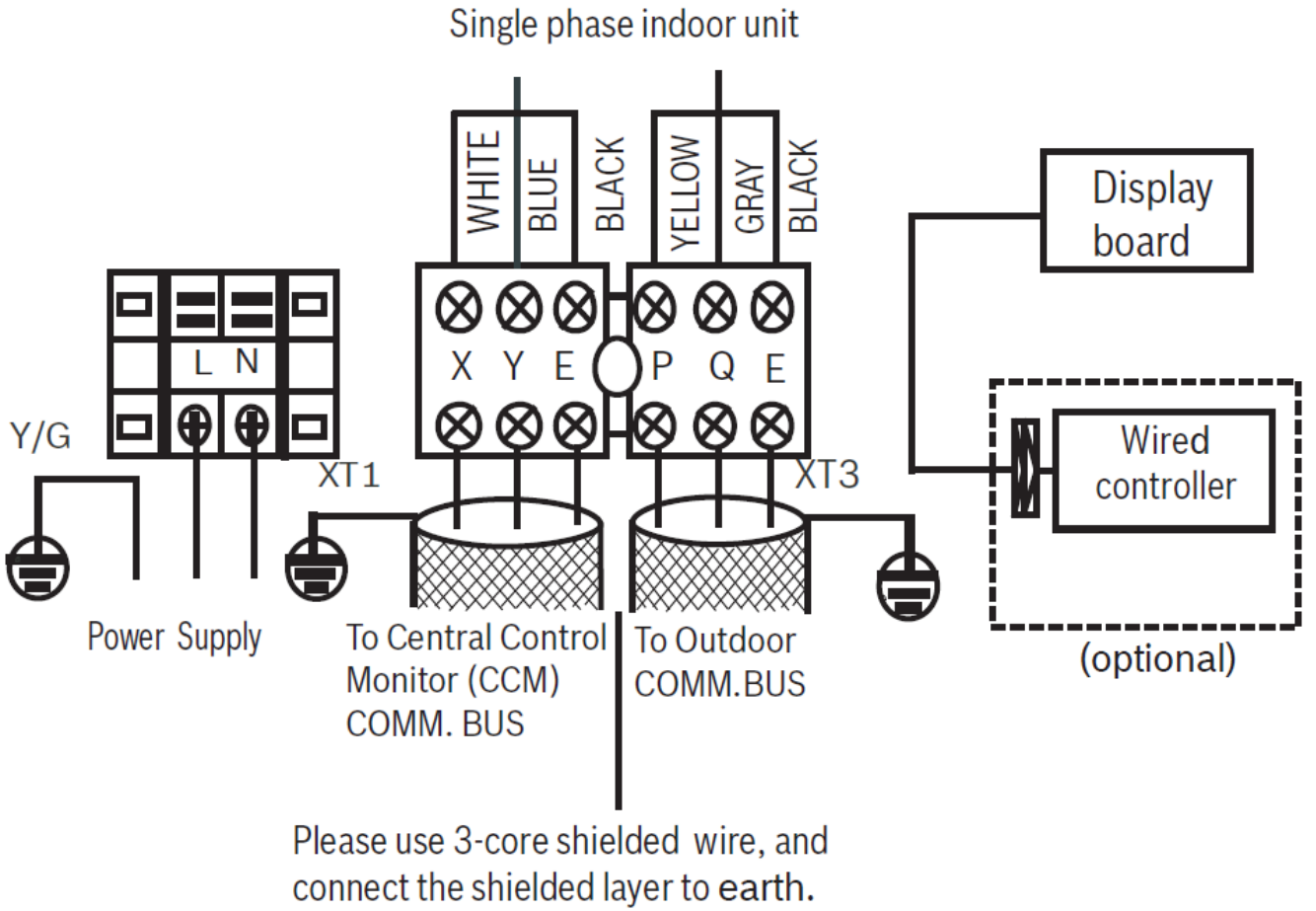


Mini VRF MDCI

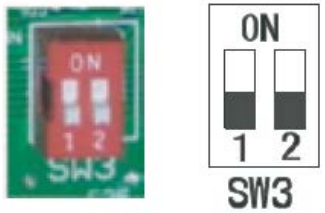
Wiring: MDCI 40-45kW (3-phase)



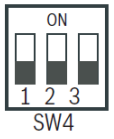
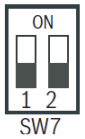
Mini VRF MDCI
Wiring: Indoor unit



Mini VRF MDCI
Wiring

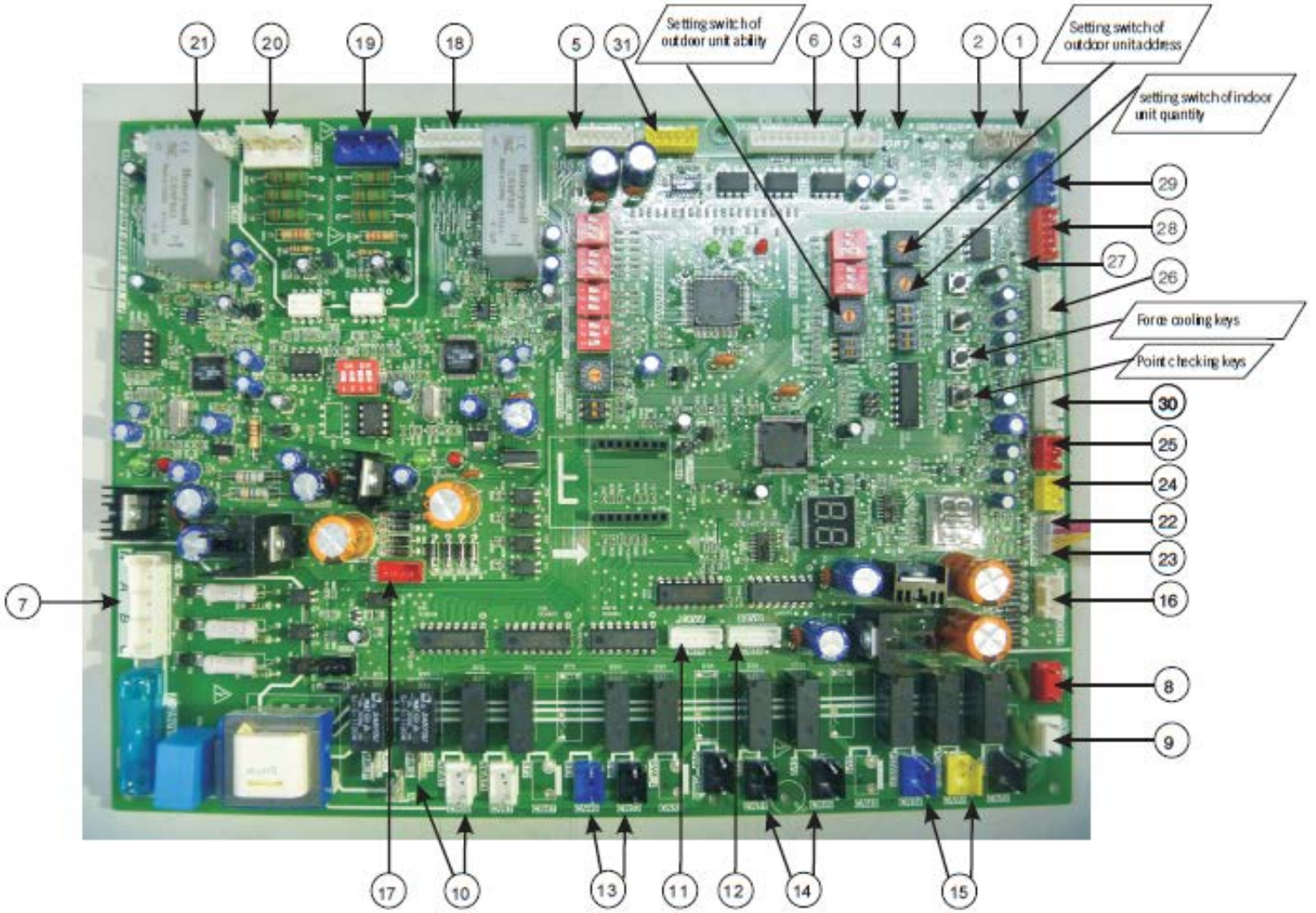


SW3 (SW-1)		
1	ON	Obtain network address automatically
	OFF	Obtain network address manually
2	ON	Delete indoor unit network address
	OFF	/

Single-Phase	Three-Phase
 	 

SW4		Single-Phase
SW7		Three-Phase
1	ON	Obtain network address automatically
	OFF	Obtain network address manually
2	ON	Delete indoor unit network address
	OFF	/

Mini VRF MDCI
Wiring



Mini VRF MDCI
Wiring

NO.	Contents	NO.	Contents
1	Discharge temp. sensed port of the inverter compressor A	17	Power output of the N transformer
2	Discharge temp. sensed port of the inverter compressor A or B	18	Activation port of inverter module B
3	Ttemp. sensed port of the inverter module radiator	19	Port for inverter module B voltage inspection
4	Reserved	20	Port for inverter module A voltage inspection
5	Reserved	21	Activation port of inverter module A
6	Wiring port for communication between indoor and out -door units, indoor unit network and network accounting	22	ON/OFF signal input port for system low pressure inspection
7	Phase inspection port	23	ON/OFF signal input port for system high pressure inspection
8	Power input of the No. 1 transformer	24	Reserved
9	Power input of the No. 2 transformer	25	Reserved
10	Loading output terminal	26	Inspection port for outdoor ambient temp. and condensator coil
11	EXV A driving port	27	Reserved
12	EXV B driving port	28	Control port of DC fan A
13	Loading output terminal	29	Control port of DC fan Be
14	Loading output terminal	30	Current inspection port of the inverter compressor A and B
15	Loading output terminal	31	Power supply connected port of the main control panel
16	Power output of the No. 1 transformer		– –

Mini VRF MDCI
Wiring

ENC3 and S12 function definition

ENC3	S12 ON	Set the number of indoor units to 0-15
ENC3	S12 ON	Set the number of indoor units to 16-31
ENC3	S12 ON	Set the number of indoor units to 32-47
ENC3	S12 ON	Set the number of indoor units to 48-63

ENC1 function definition:

ENC1	Reserved

ENC2 function definition:

ENC2	Outdoor unit capacity dial code 0-6 valid represents 6HP-18HP

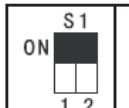
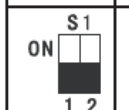
ENC4 function definition:

ENC4	Outdoor unit net address dial code 0-F valid represents 0-15

Mini VRF MDCI

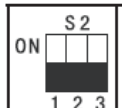
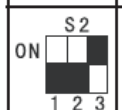
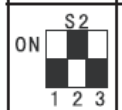
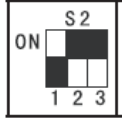
Wiring: Dial switch positions (MDCI 40-45)

S1 function definition:

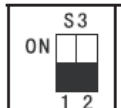
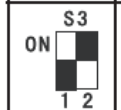
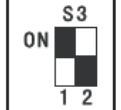
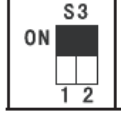
	Starting time is set about 5 minutes
	Starting time is set about 12 minutes (Default the Factory Set)

NOTE:
S1,S2 function definition only for 14HP, S8 function definition only for 16HP.

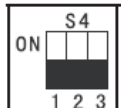
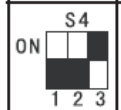
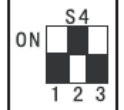
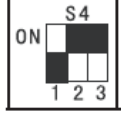
S2 function definition:

	Night time selection is 6h/10h (Default the Factory Set)
	Night time selection is 6h/12h
	Night time selection is 8h/10h
	Night time selection is 8h/12h

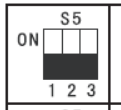
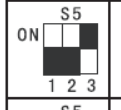
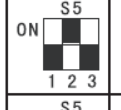
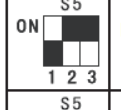
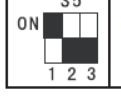
S3 function definition:

	Non-silence mode (Factory default)
	Silence mode
	Reserved
	Non-silence mode

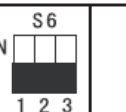
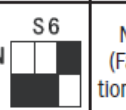
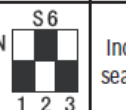
S4 function definition:

	0 static mode (Factory default)
	Low static mode (Reserved, used in customized unit)
	Middle static mode (Reserved, used in customized unit)
	High static mode (Reserved, used in customized unit)

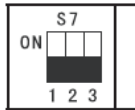
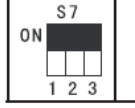
S5 function definition:

	Heating priority mode (Factory default)
	Cooling priority mode
	First-start priority mode
	Heating mode respondence only
	Cooling mode respondence only

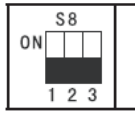
S6 function definition:

	Auto address searching
	Non-auto address searching (Factory default) (communication method with old indoor unit)
	Indoor unit address reset (Auto search for new valid indoor unit)

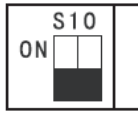
S7 function definition:

	Quantity settings of shield indoor unit
	Start quantity settings of indoor unit

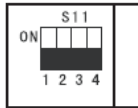
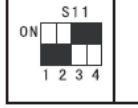
S8 function definition:

	(Factory default)

S10 function definition:

	Reserved

S11 function definition:

	6–10HP Outdoor unit settingst
	12–18HP Outdoor unit settings

THANK YOU!