

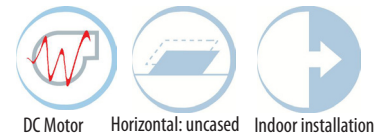
POWERDuct

Direct expansion reversible heat pump air conditioning system in two sections

S-XMi Series D71-D250

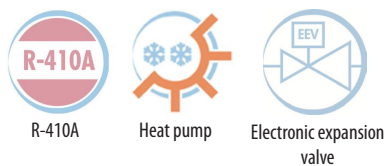
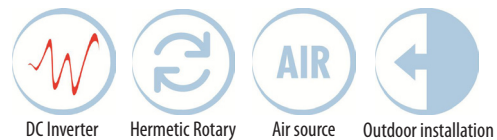
- ▶ **PRECONFIGURED AND SIMPLY SELECTABLE SYSTEM**
- ▶ **INDOOR AVAILABLE STATIC PRESSURES UP TO 200Pa**
- ▶ **EQUIVALENT PIPING LENGTH UP TO 70m**
- ▶ **DC INVERTER TECHNOLOGY FOR HIGH EFFICIENCY AT PARTIAL LOAD**
- ▶ **SIMPLE AND USER-FRIENDLY CONTROL**

Serie CN-XMi D71-A250 (indoor unit)



KJR-29-B

Serie MSAN-XMi 80M-260T (outdoor unit)



Nominal Cooling Capacities from 7kW to 25kW
Nominal Heating Capacities from 8kW to 28kW



Products designed and manufactured under a quality management system certified ISO 9001

Products compliant with European standards

Products lineup

S-XMi size (system)		D71	D90	D112	D160	D200	D250
Cooling capacity	[kW]	7,1	9,0	11,2	15,8	20,0	25,0
Heating capacity	[kW]	7,6	9,4	12,9	17,0	22,1	28,1
MAX Static pressure	[Pa]	196	196	196	196	200	200
CN-XMi size (indoor unit)		D71	D90	D112	D160	D200	D250
Appearance							
MSAN-XMi size (outdoor unit)		80M	105M	120T	160T	200T	260T
Appearance							

POWERDuct system

Wide applications

POWERDuct is a highly efficient solution for structures requiring heating and cooling of several zones with single outdoor unit. All functions necessary for filtration, cooling, heating and ventilation are fully integrated in this system, offering many advantages throughout the complete product lifecycle.

The system is available in 8 sizes with Cooling Capacities from 7kW to 25kW and Heating Capacities from 8kW to 28kW, designed to optimize performance and better match varieties of application requirement. The wide capacity range and the possibility to supply air in long ducts make this solution suitable for small and middle commercial buildings such as Business Centres, Offices, Banks, Schools, Leisure Centres, Restaurants, Hotels, Shops, Public Buildings and much more.



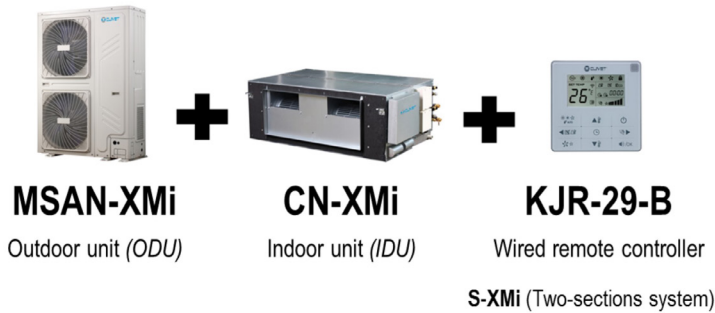
A complete system

Each POWERDuct (S-XMi) set consist in:

- Air source outdoor unit (MSAN-XMi) with high performance heat exchanger and DC inverter driven fans and compressors;
- High static pressure duct indoor unit (CN-XMi) designed for horizontal-ducted installation and be easily installed in a false ceiling;
- Wired touch-key controller (KJR-29-B).

Thanks to the high available indoor external static pressures up to 200 Pa, a distribution via duct is possible. Challenges such as high ceilings or long ducts can be easily overcome: at High speed, the maximum length for air supply is 14m at a high of 6,5m.

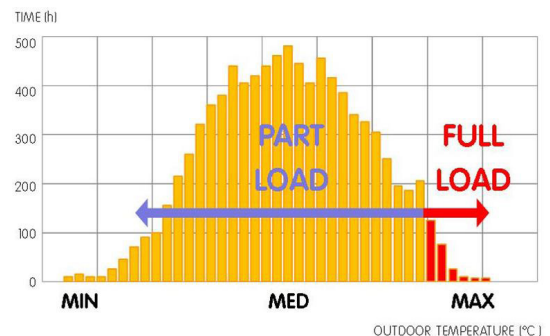
For particular applications, a standard remote ON/OFF potential-free contact is available.



Energy efficient and environment friendly

The reversible heat pump is the heart of Clivet’s specialized system solutions: main benefits are an annual energy saving up to 50% compared to traditional systems and the possibility to have only a single conditioning system for the whole annual cycle. During the year, the most frequent conditioning operations are at part load, where energy efficiencies should be as higher as possible.

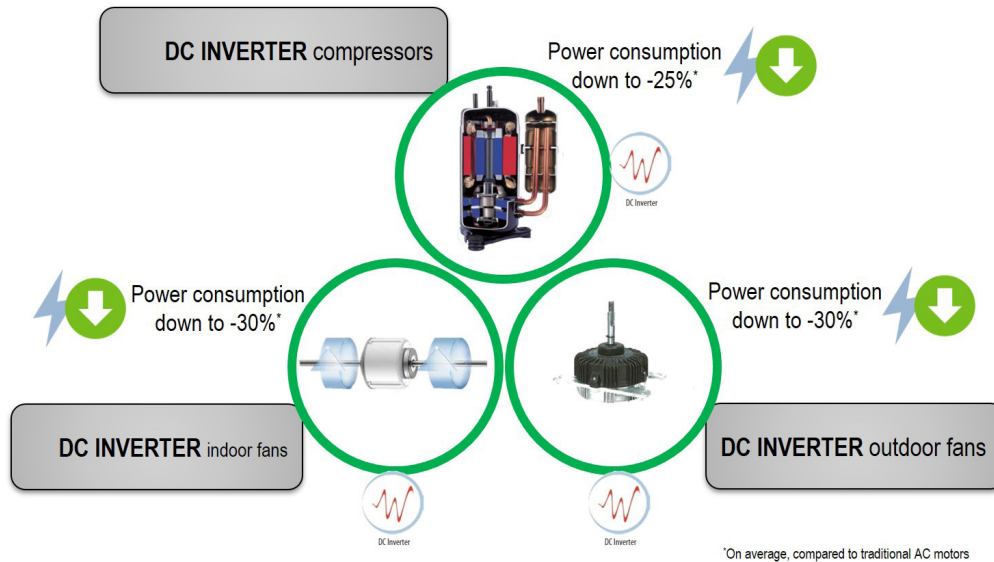
In order to reach this target, the design of POWERDuct series dues particular attention to the latest technologies developed and selects a Full DC inverter -environment friendly- system: compressors, outdoor and indoor fans are completely DC inverter driven. The system automatically adjusts its capacity in order to perfectly meet the cooling/heating load, with a result of an high energy saving in part load operations.



Main standard features

DC Brushless

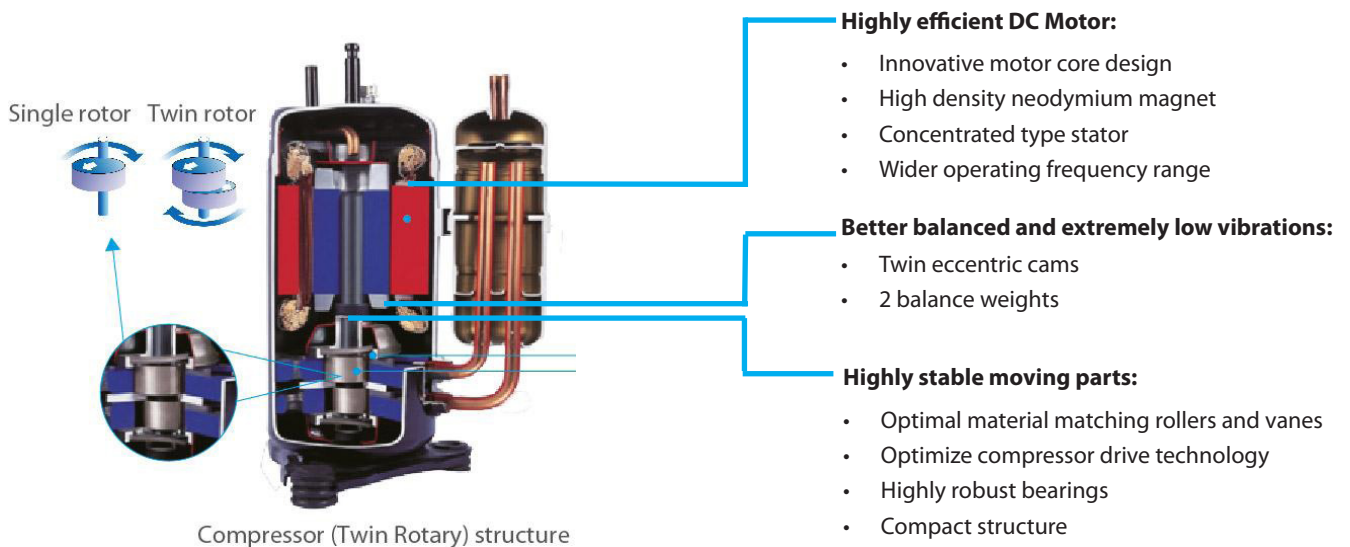
The motor is in a fully sealed structure thereby ensuring high operating efficiency and long life. The motor bearing, easy maintenance, can operate up to 80.000 hours continuously.



High efficiency DC inverter compressor

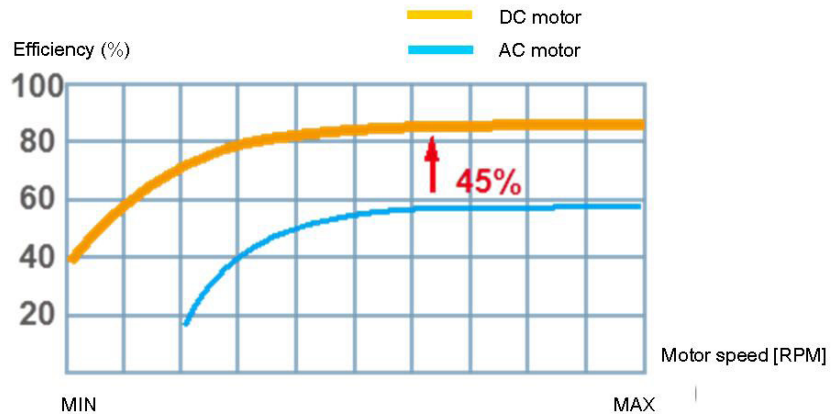
Full DC inverter outdoor unit adopts highly intelligent inverter-driven compressors: this advanced technology enables the capacity of the outdoor unit to be effectively modulated by the real heat load demands.

The indoor temperature regulation will be really precise with significant energy saving, environment friendly technology.



High efficiency DC inverter fan

According to the running load and pressure, this let the DC fan speed to be effectively managed achieving the minimum power consumption.

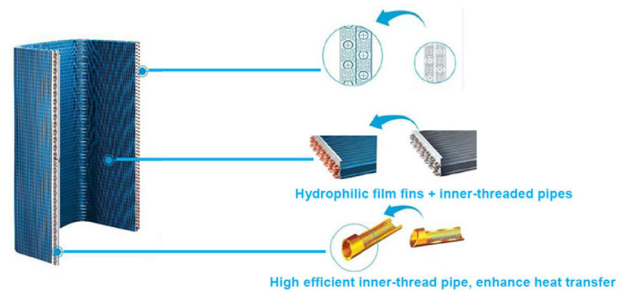


High performance heat exchange

The new window fins enlarge the heat exchange area, decreasing the air resistance, saving more energy and enhancing the heat exchange performance.

The hydrophilic film fins and the inner-threaded copper pipes optimize the heat exchange efficiency.

The electronic expansion valve guarantees a precise refrigerant regulation in the coil.

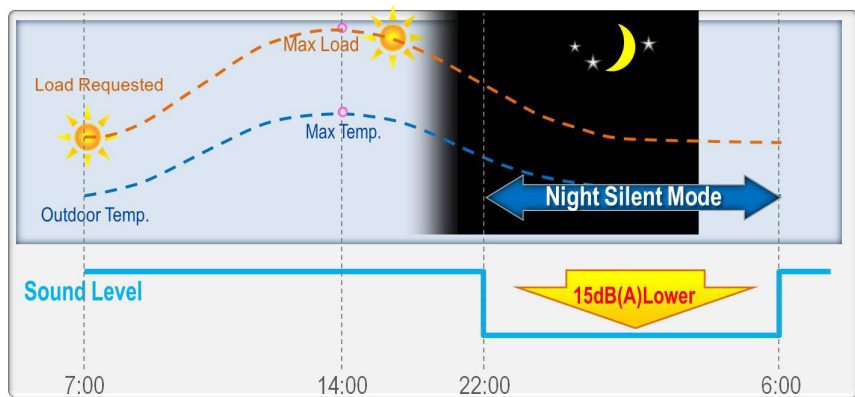


Night Silent Mode (for sizes D200-D250)

The Night Silent Mode, easily settable on the PCB board, allows the unit to operate more silently. It allows to reduce the speed of compressors and fans during Non-Peak Load operations, optimizing the unit noise output.

The system notices the daytime's peak temperature and start up the Night Silent Mode after a number of hours and with a duration preset by the user, following one of the standard models. At the end of this feature, the system will come back to its normal operations.

Standard Models		
Model #	Time delay for the Mode start up [h]	Duration [h]
1	6	10
2	8	10
3	6	12
4	8	8

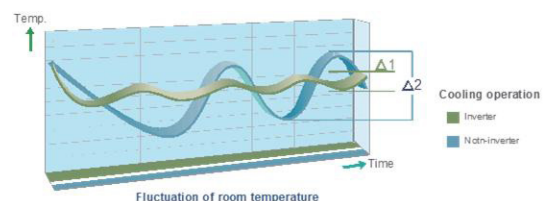


Note: This function can be set on site. Temperature and environment load curve shown in the graph is just an example.

Quick warm-up & cool-down design and more stable indoor temperature

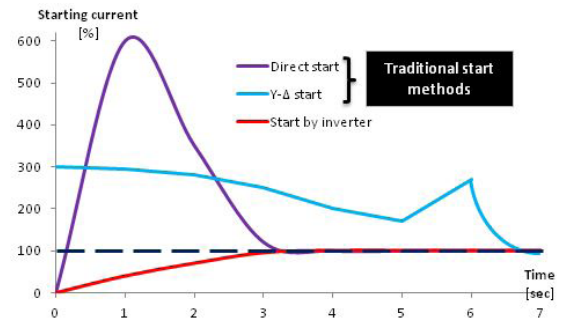
Thanks to the DC inverter compressor benefits, the system can reach full load quickly and shorten heating and cooling times for a comfortable air conditioning solution.

A more stable temperature will create a better living environment.



Intelligent soft start technology

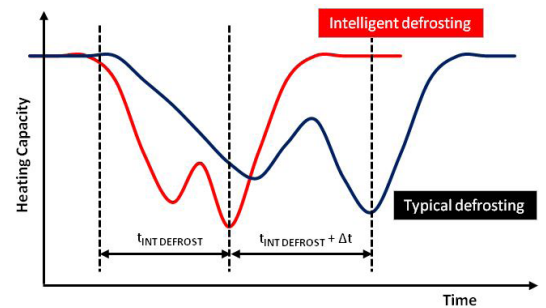
The DC inverter compressor with soft start function reduces the strike on the electric network. This kind of high-performance and silent twin rotary compressor operates at a faster rate when starting, reducing start-up time. It also helps the unit to quickly adjust the room temperature to the set-point.



Intelligent defrosting technology (for sizes D200-D250)

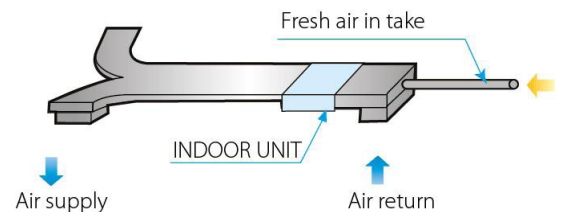
Intelligent defrosting helps to limit the energy wastes: the necessary defrosting time and frequencies are adjusted directly by the outdoor unit.

Depending on outdoor and unit temperatures, the defrosting duration is reduced to what is really necessary, down to 2 minutes. This greatly decreases heat losses and maintains effectively indoor comfort.



Primary air inlet and air distribution in adjacent rooms

- Standard flanges help to quickly install a duct distribution.
- Arrangement for primary air into the ambient through the return duct (max 10% of fresh air)



Auto restart

In case of power supply interruption (short circuit), the indoor unit will automatically restart operating at the last conditions after 3 minutes from the power supply restoration.

Space saving and attention to visual impact

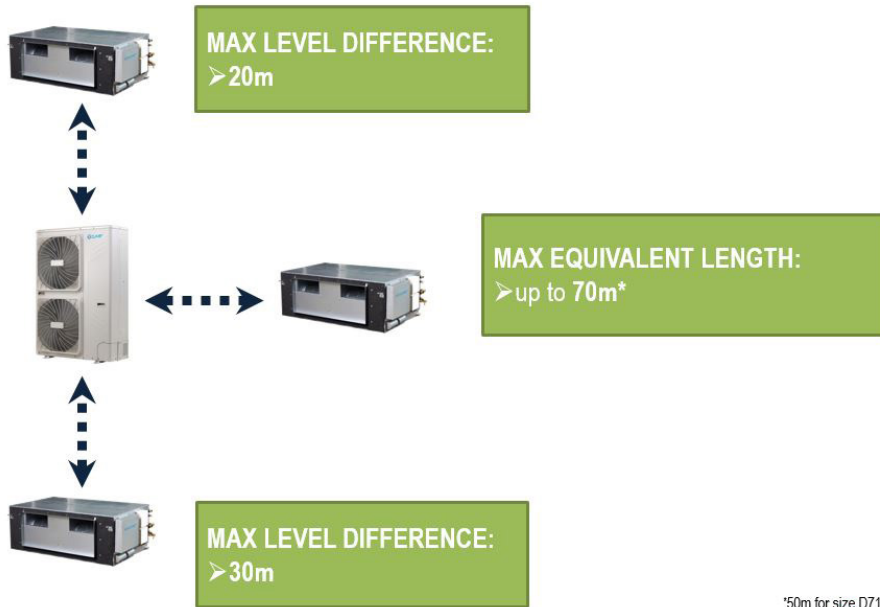
Outdoor units are slim and compact, resulting in significant savings in installation space.

This makes the system particularly suitable for applications where it is necessary to limit the visual impact on the architecture, as in historical or prestige buildings.



Easy installation, maintenance and control

Flexible applications thanks to extensive piping

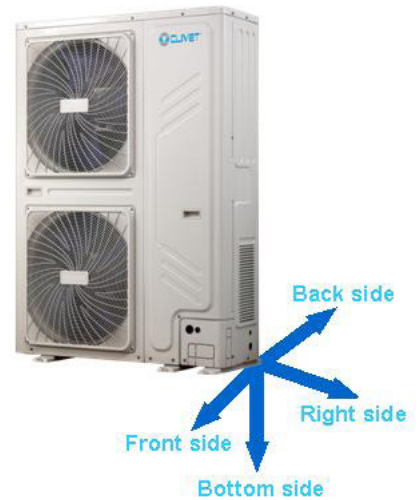


*50m for size D71/D90

Easy piping connection and maintenance

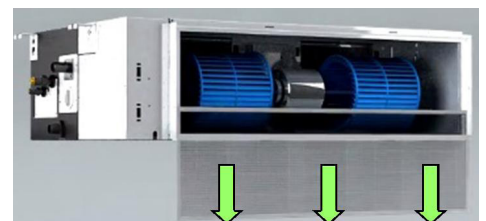
Outdoor unit:

- Four directions to connect pipes and wirings to meet various installation requests.
- Factory pre-charged refrigerant can simplify field labour.
- Display board to collect information from the control board. Malfunction codes and running state can be displayed on the board.



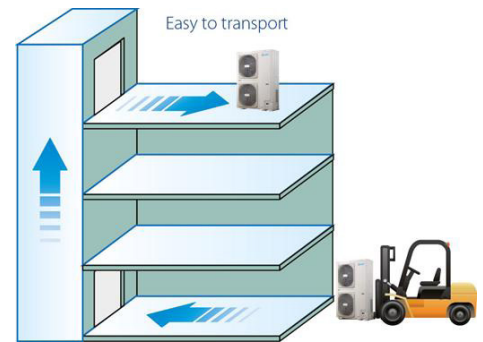
Indoor unit:

- Water washable filter class G2 is equipped as standard accessory: it can be easily removed from the bottom for the cleaning.
- All metal parts are made of commercial grade galvanized steel, providing maximum protection against corrosion.
- Flanges for duct connection are provided as standard accessory
- The fan motor is easily accessible. This let the possible replacement without removing the unit from its position.



Easy to transport

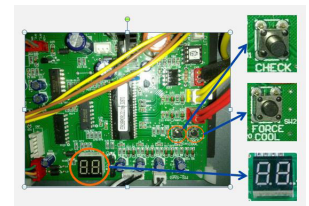
Compact size and light weight design minimize the installation footprint, reduce the installation floor load and make easy for transportation. For some projects the units can even be transported through elevators or forklifts, reducing accessing problems at the jobsite.



Easy refrigerant charge and electronic diagnosis

The button for forced cooling makes outdoor unit run in cooling mode at any condition, so it's very easy to charge refrigerant to the system when it needs to be done.

The self-diagnosis function detects malfunctions in major locations in the system and displays the type and its location. This allows service and maintenance to be performed more efficiently.



Wired touch-key standard control

The KJR-29-B wired control allows to easily manage all system's functions through its LCD display. "Follow me" function adjusts the indoor unit's set point following the temperature probe placed inside the control instead of the return air one.

Features:

- Backlit
- Touch-key
- User-friendly

Functions:

- On/Off
- Operation selection: Auto, Heating, Cooling, Dehumidification, Ventilation
- Set the fan speed (LOW - MED - HIGH or AUTO)
- Temperature setting (temperature range selectable: 17~30°C)
- Timer setting
- Follow me

* the controller has 6m wiring cable standard, maximum allowable wiring distance is 15m



Standard unit technical specifications

Outdoor Unit

Compressor

Inverter controlled rotary-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and equipped with oil charge. An oil heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

Structure

The case is assembled with painted steel sheet, that provides excellent mechanical features and great corrosion proofing.

External exchanger

Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made by aluminium with a hydrophilic treatment and a corrugated surface. They are appropriately distanced to ensure the maximum heat exchange efficiency.

Fan

Axial fans with plastic impeller directly coupled with a electric DC (Direct Current) motor. They are fitted with safety grills and equipped with electronic variable speed regulation.

Refrigeration circuit

Refrigeration circuit with:

- refrigerant charge
- high pressure safety switch
- low pressure safety switch
- electronic expansion valve
- 4-way cycle inversion valve
- liquid receiver
- oil separator
- gas and liquid line shut-off valve

Indoor Unit

Structure

The unit is provided with a galvanized steel sheet.

The panels are easy to remove for complete access to the unit.

Internal exchanger

Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made by aluminium with corrugated surface. They are appropriately distanced to ensure the maximum heat exchange efficiency and hydrophilic treatment for better evacuation of condensation.

Fan

Electric centrifugal-type fan with double air intake and forward curved blades for maximum efficiency and low noise. Coupled directly to DC electric motor with three operating speeds.

Filtration

Class G2 flat filter, easy to access for maintenance, washable.

Drain pan

Condensate collecting tray in plastic material with thermal insulation, equipped with discharge sleeve.

Controller

Wired electronic controller (maximum length 15m).

The controller includes:

- backlit display with icons
- ON/OFF
- mode: Auto, Cool, Dry, Heat, Fan
- fan speed selection
- temperature Set selection
- timer and time bands scheduling
- night Silent mode
- filter maintenance reminder
- anti-tampering key lock

General technical data

POWERDuct system - S-XMi

Size			D71	D90	D112	D160	D200	D250
Cooling								
Cooling capacity (EN14511:2013)	1	[kW]	7,1 (1,5~8)	9 (2~10)	11,2 (2,5~13)	15,8 (3~17)	20 (4~22)	25 (5,5~27)
Sensible capacity	1	[kW]	5,8	6,8	8,5	12	15,1	18,9
Total power input (EN14511:2013)	1	[kW]	2,01	2,52	3,59	5,13	6,90	8,36
EER (EN14511:2013)	1	-	3,53	3,57	3,12	3,08	2,90	2,99
Heating								
Heating capacity (EN14511:2013)	2	[kW]	7,6 (1,5~8,5)	9,4 (2~10,5)	12,9 (2,5~14)	17 (3,5~18,5)	22,1 (4,5~24)	28,1 (6~31)
Total power input (EN14511:2013)	2	[kW]	2,01	2,27	3,89	5,47	6,88	7,55
COP (EN14511:2013)	2	-	3,80	4,14	3,32	3,11	3,21	3,72
Connections and pipings								
MAX equivalent piping length		[m]	50			70		
MAX level difference	Outdoor unit above	[m]				30		
	Outdoor unit below	[m]				20		

1. Data referred to the following conditions:

Indoor air temperature 27°C DB/19°C WB (80,6°F DB/66,2°F WB)

Outdoor air temperature 35°C DB/24°C WB (95°F DB / 75,2°F WB)

Equivalent refrigerant piping length: 7,5m

Level difference between outdoor and indoor units: 0m

2. Data referred to the following conditions:

Indoor air temperature 20°C DB / 15°C WB (68°F DB / 59°F WB)

Outdoor air temperature 7°C DB / 6°C WB (44,6°F DB / 42,8°F WB)

Equivalent refrigerant piping length: 7,5m

Level difference between outdoor and indoor units: 0m

General technical data

Outdoor unit - MSAN-XMi

Size	80M		105M		120T		160T		200T		260T		
Compressor													
Type of compressor		-	Twin Rotary DC										
Brand		-	MITSUBISHI										
No. of compressors/circuits		Nr	1/1										
Oil charge		[l]	0,87	0,87	1,5	1,65	2,70	3,20					
Refrigerant charge	1	[kg]	2,95	2,95	3,30	3,90	4,80	6,20					
Internal exchanger													
Type of internal exchanger		-	Copper aluminium coil										
Fin type		-	Hydrophilic aluminium										
Length x height		[mm]	880x914			1276x870			1080x756				
Air handling section fans (outdoor)													
Type of fans		-	Axial										
Number of fans		Nr	1				2						
Fan motor brand		-	Panasonic										
Type of motor		-	Brushless DC										
Standard airflow		[m³/h]	5500			6000			10999		10494		
Standard airflow		[l/s]	1530			1670			3060		2920		
Sound levels													
Sound pressure level	2	[dB(A)]	56	57	57	57	59	60					
Sound power level		[dB(A)]	67	68	70	72	73	74					
Connections and pipings													
Refrigerant piping	Liquid side	[mm]	Ø9,53										
	Gas side	[mm]	Ø15,9				Ø19,1				Ø22,2		
Power supply													
Power supply		[V/p/Hz]	230/1/50				400/3/50+N						
Dimensions													
Net (W x H x D)		[mm]	1075×966×396			900×1327×400			1120×1558×528				
Packing (W x H x D)		[mm]	1120×1100×435			1030×1456×435			1270×1720×565				
Standard unit weights													
Net weight		[mm]	75,5			95		100		137		147	
Gross weight		[mm]	85,5			105		110		153		163	

1. The factory refrigerant pre-charge is referred only to the single outdoor unit. A refrigerant integration charge must be provided in proportion to the length of the pipes

2. Sound level measured 1m in front of the unit and 1m above the floor

(*) For this size the coil is splitted in two different sections, one above and one below. Each row has different dimensions.

General technical data

Indoor unit - CN-XMi

Size			D71	D90	D112	D160	D200	D250
Internal exchanger								
Type of internal exchanger			Copper aluminium coil					
Fin type			Hydrophilic aluminium					
Length x height		[mm]	700×356			996×356	1125×512	
Air handling section fans (outdoor)								
Type of fans	1	-	CFG					
Number of fans		Nr	1					
Fan motor brand		-	PANASONIC/WELLING/SHIBAURA					
Type of motor		-	Brushless DC					
Available static pressure	2	[Pa]	0/25/196	0/37/196	0/37/196	0/50/196	40/62/200	
Standard airflow (H/M/L)	3	[m³/h]	1500/1390/1250	1780/1650/1530	2080/1930/1710	3400/2660/2400	4820/4660/4620	4870/4760/4690
Standard airflow (H/M/L)	3	[l/s]	420/390/350	500/460/430	580/540/480	950/740/670	1340/1300/1290	1360/1330/1310
Sound levels								
Sound pressure level (H/M/L)	4	[dB(A)]	46/44/42	50/47/45		54/52/50	57/53/50	
Sound power level (H/M/L)		[dB(A)]	57/56/55	61/59/58		65/64/63	68/65/63	
Connections and pipings								
Refrigerant piping	Liquid side	5	[mm]	Ø9,53			Ø9,53 (x2)	
	Gas side	5	[mm]	Ø15,9			Ø15,9 (x2)	
Condensate drainage		[mm]	Ø25			Ø32		
Power supply								
Power supply		[V/p/Hz]	230/1/50					
Dimensions								
Unit (W x H x D)		[mm]	952×420×690			1300×420×690	1440×505×925	
Packing (W x H x D)		[mm]	1090×440×768			1436×450×768	1509×550×990	
Standard unit weights								
Net weight		[mm]	41	47	63	108		
Gross weight		[mm]	47	53	71	120		

Notes:

1. CFG = Centrifugal fan
2. Available static pressure is based on High speed indoor airflow
3. Standard airflow tested for Medium available static pressure. Fan speed - H: High - M: Medium - L: Low
4. Sound level measured 1,4m below the center of the unit
5. Sizes with (x2) need to install the standard supplied branch joint kit to connect to the outdoor unit

Electrical data

Outdoor unit - MSAN-XMi

Size	Outdoor unit				Power supply			Compressor		OFM	
	Hz	Voltage [V]	Min. [V]	Max. [V]	MCA [A]	TOCA [A]	MFA [A]	MSC [kW]	RLA [A]	kW	FLA [A]
80M	50	220-240	198	264	26,25	24	32	/	9,7	0,17	1,7
105M	50	220-240	198	264	27,5	24	32	/	9,7	0,17	1,7
120T	50	380-415	342	456	15	15	25	/	9,3	2×0,1	2×0,9
160T	50	380-415	342	456	17,5	15	25	/	12	2×0,1	2×0,9
200T	50	380-415	342	456	18,75	18	25	/	12	2×0,17	2,1+1,7
260T	50	380-415	342	456	26,25	23	32	/	15,4	2×0,17	2,1+1,7

MCA: Min. Circuit Amps. [A]

TOCA: Total Over-current Amps. [A]

MFA: Max. Fuse Amps. [A]

MSC: Max. Starting Amps. [A]

RLA: Rated Locked Amps. [A]

OFM: Outdoor Fan Motor.

kW: Rated Motor Output [kW]

FLA: Full Load Amps. [A]

Note:

RLA is based on the following conditions, Indoor temp. 27°C DB/19°C WB, Outdoor temp. 35°C DB / 24°C WB

MSC means the Max. current during the starting of compressor.

Voltage range: Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.

Maximum allowable voltage variation between phases is 2%.

Selection wire size based on the value of MCA.

MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

Indoor unit - CN-XMi

Size	Indoor Unit				Power Supply		IFM	
	Hz	Voltage [V]	Min. [V]	Max. [V]	MCA [A]	MFA [A]	kW	FLA [A]
D71	50/60	220-240V	198	264	1,7	15	0,145	1,35
D90	50/60	220-240V	198	264	2,4	15	0,18	1,9
D112	50/60	220-240V	198	264	3,6	15	0,3	2,88
D160	50/60	220-240V	198	264	4,5	15	0,56	3,6
D200	50/60	220-240V	198	264	7,5	15	0,75	6
D250	50/60	220-240V	198	264	7,5	15	0,75	6

MCA: Min. Circuit Amps. [A]

MFA: Max. Fuse Amps. [A]

kW: Rated Motor Output [kW]

FLA: Full Load Amps. [A]

IFM: Indoor Fan Motor

Notes:

Voltage range: Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.

Selection wire size based on the value of MCA.

MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

Operating range

Cooling

Size		D71	D90	D112	D160	D200	D250
Min outdoor temperature	°C DB	-15	-15	-15	-15	-15	-15
Max outdoor temperature	°C DB	43	43	43	43	46	46
Min indoor temperature	°C WB	15	15	15	15	15	15
Max indoor temperature	°C WB	24 (29)*	24 (29)*	24 (29)*	24 (29)*	24 (29)*	24 (29)*

Heating

Size		D71	D90	D112	D160	D200	D250
Min outdoor temperature	°C WB	-15	-15	-15	-15	-15	-15
Max outdoor temperature	°C WB	27	27	27	27	24	24
Min indoor temperature	°C DB	15 (5)*	15 (5)*	15 (5)*	15 (5)*	15 (5)*	15 (5)*
Max indoor temperature	°C DB	28	28	28	28	28	28

Notes:

Standard controller can adjust the set point in the range 17-30°C

* Values in brackets represent the range with intermittent operations (for defrosting or compressor oil return cycles)

DB: Dry bulb ; WB: Wet bulb

Operating conditions: Equivalent piping length = 7,5 m ; Level difference = 0 m

The indoor Relative Humidity should always be lower than 80%. If the air conditioner works in an environment with Relative Humidity higher, the surface may condensate. In this case, it's recommended to set the air speed of the indoor unit to "high".

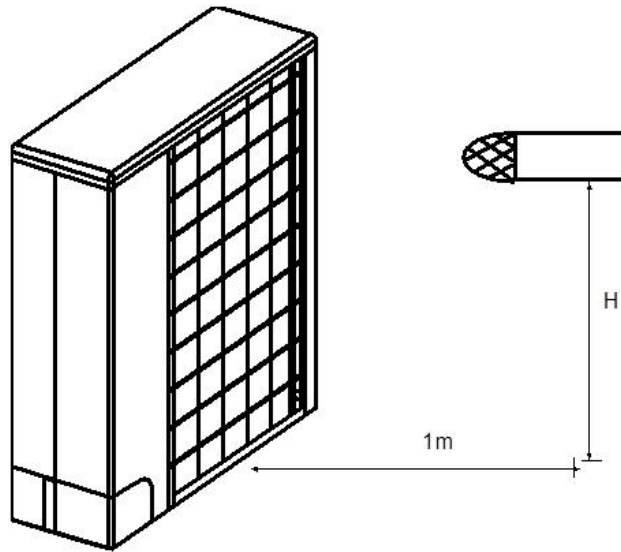
ATTENTION: IN CASE OF PREDOMINANT WINDS, WINDBREAK BARRIERS ARE NECESSARY.

In case of below zero outdoor air temperature with a long period of heat pump operating mode, it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that this will not create inconveniences to things or persons.

Sound levels

Outdoor unit - MSAN-XMi

Test conditions



Notes:
 Sound levels refer to full load units, in test nominal conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.
 Sound level can be increased in static pressure mode or used air guide.
 Semi-anechoic chamber conversion value, measured at a point 1 m in front of the unit at a height of "H" m

"H" = 1m for 80M/105M sizes, 1,2m for 120T-160T sizes and 1,3m for 200T/260T sizes.

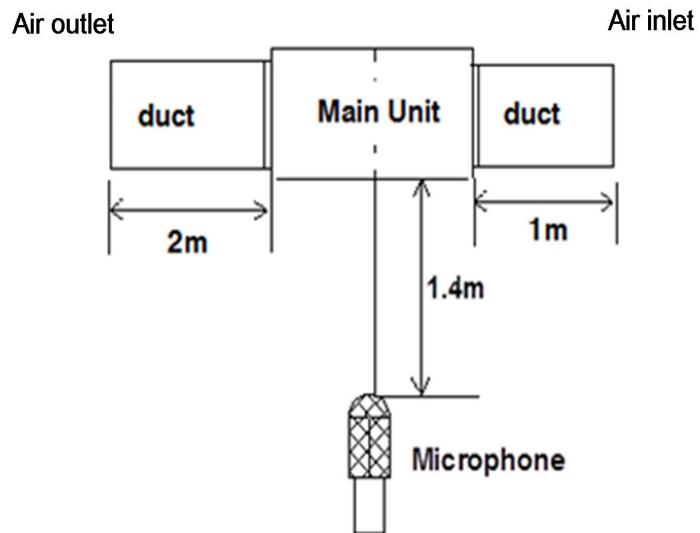
Test values

Size	Sound Pressure Level (dB)								Sound Pressure Level	Sound Power Level
	Octave Band (Hz)									
	63	125	250	500	1000	2000	4000	8000	[dB(A)]	[dB(A)]
80M	58,7	54,6	54,0	53,9	50,9	44,9	41,5	35,7	56,0	67,0
105M	60,5	55,6	54,2	54,5	52,0	45,8	43,5	40,6	57,0	68,0
120T	61,9	56,2	55,7	56,8	52,2	46,1	40,8	36,3	57,0	70,0
160T	57,9	59,2	56,5	54,6	52,4	45,1	41,1	38,5	57,0	72,0
200T	61,2	59,8	60,1	57,1	54,2	45,3	41,6	41,2	59,0	73,0
260T	67,3	63,8	60,6	59,5	55,3	51,0	45,1	41,1	60,0	74,0

Sound levels

Indoor unit - CN-XMi

Test conditions



Note:

Sound levels refer to full load units, in test nominal conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions. Semi-anechoic chamber conversion value, measured as shown in figure.

Test values

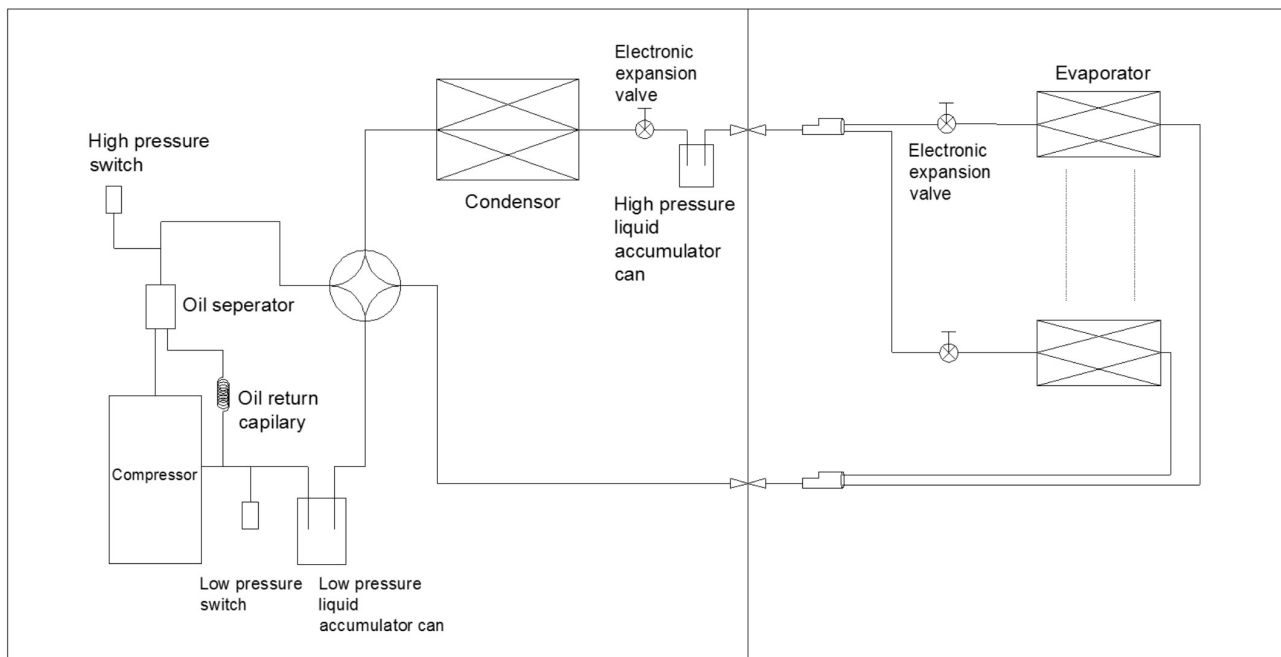
Size	High Speed								Sound Pressure Level	Sound Power Level
	Sound Pressure Level (dB)									
	Octave Band (Hz)									
	63	125	250	500	1000	2000	4000	8000	[dB(A)]	[dB(A)]
D71	46,2	49,9	46,6	41,2	39,9	36,7	30,5	20,0	46	57
D90	50,4	50,3	48,7	48,2	44,5	40,6	31,5	23,9	47	59
D112	50,4	50,3	48,7	48,2	44,5	40,6	31,5	23,9	50	61
D160	56,8	57,6	51,9	50,6	48,3	44,8	41,2	34,3	54	65
D200	59,7	60,5	55,1	51,9	50,2	47,5	43,7	34,8	57	68
D250	59,7	60,5	55,1	51,9	50,2	47,5	43,7	34,8	57	68

Size	Mid Speed								Sound Pressure Level	Sound Power Level
	Sound Pressure Level (dB)									
	Octave Band (Hz)									
	63	125	250	500	1000	2000	4000	8000	[dB(A)]	[dB(A)]
D71	44,9	48,8	45,5	40,1	38,7	34,8	29,8	19,6	44	56
D90	48,9	48,8	45,9	42,6	41,0	37,9	30,5	20,3	47	59
D112	48,9	48,8	45,9	42,6	41,0	37,9	30,5	20,3	47	59
D160	54,6	55,9	50,4	49,2	46,3	41,8	37,9	30,8	52	64
D200	55,2	55,8	51,5	49,0	45,2	41,3	32,9	30,9	53	65
D250	55,2	55,8	51,5	49,0	45,2	41,3	32,9	30,9	53	65

Size	Low Speed								Sound Pressure Level	Sound Power Level
	Sound Pressure Level (dB)									
	Octave Band (Hz)									
	63	125	250	500	1000	2000	4000	8000	[dB(A)]	[dB(A)]
D71	39,9	42,8	42,2	40,3	38,2	29,9	18,6	13,1	42	55
D90	44,9	48,8	45,5	40,1	38,7	34,8	29,8	19,6	45	58
D112	44,9	48,8	45,5	40,1	38,7	34,8	29,8	19,6	45	58
D160	50,5	51,5	49,5	47,1	45,0	40,2	34,3	22,9	50	63
D200	50,4	50,3	48,7	48,2	44,5	40,6	31,5	23,9	50	63
D250	50,4	50,3	48,7	48,2	44,5	40,6	31,5	23,9	50	63

Piping diagrams

Size D71 - D160



Key components:

Oil separator: used to separate oil from high pressure & temperature gas refrigerant, which is pumped out from compressor. It makes the oil return back to each compressor very soon.

Low pressure liquid receiver & High pressure liquid receiver: It is used to store the liquid refrigerant and oil; it can protect the compressor from liquid hammer.

4-way valve: Closed in cooling mode and open in heating mode

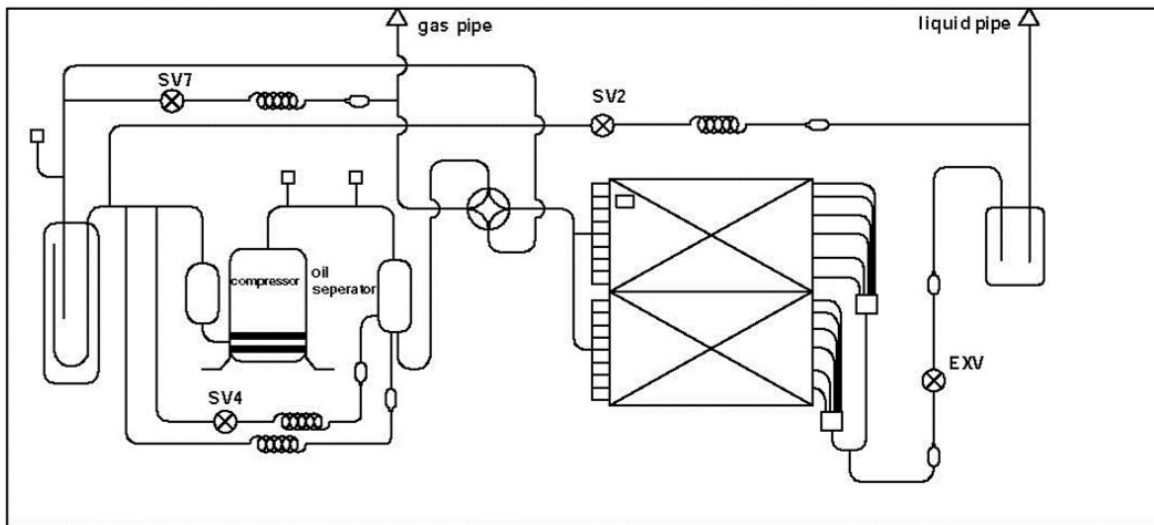
Electronic expansion valve: The opening of the valve is regulated according to the discharge air temperature of compressor, used to regulating refrigerant flow.

High Pressure Switch: When the discharge pressure of compressor is 4,2MPa or higher, the protection switch will be triggered, and if the discharge pressure is down to 3,3MPa, the protection switch will be recovered.

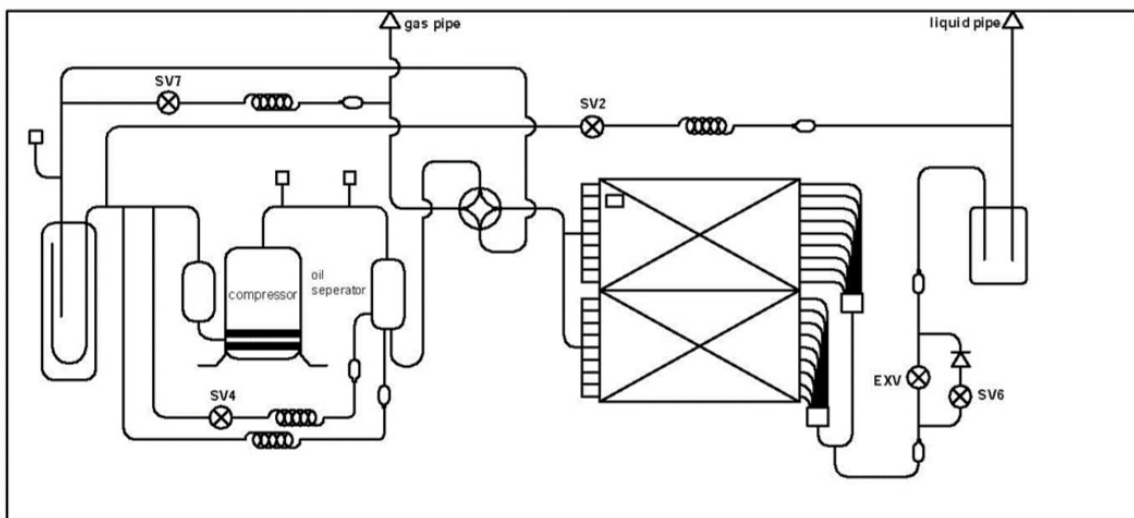
Low Pressure Switch: When the gas pressure back to compressor is 0,14MPa or lower, the protection switch will be triggered, and if the discharge pressure is down to 0,3MPa, the protection switch will be recovered.

Piping diagrams

Size D200



Size D250



Key components:

Oil separator: It is used to separate oil from high pressure and high temperature gas refrigerant, which is pumped out from compressor. The separation efficiency is up to 99%, it makes the oil return back to each compressor very soon.

Gas-liquid separator: It is used to store the liquid refrigerant and oil; it can protect the compressor from liquid hammer.

Four-way valve (ST1): It is used to change the refrigerant flow direction; it is closed in cooling mode and opened in heating mode.

EXV (Electromagnetic Expansion Valve): It is used to adjust refrigerant volume.

SV2: It is used to protect compressor. When any compressor discharge temperature is higher than 100°C, SV2 will be open to spray a little liquid refrigerant to cooling compressor, and it will be closed when the discharge temperature is lower than 90°C.

SV4: It is used to help the oil in oil separator return back to compressor, guarantee the oil balance among compressors. When the unit is initial power on, SV4 will open 120 seconds, then it will reopen after DC inverter compressor running 5 minutes and then it will close after DC inverter compressor running 15 minutes. Later, SV4 will open 3 minutes after DC inverter running 20 minutes regularly.

SV5: It is used to enlarge refrigerant volume to accelerate defrosting speed. In defrosting mode, SV5 will be open to cut the refrigerant flowing circle, so the defrosting process will take less time, in cooling mode, SV5 will always be closed.

SV6: It is used to by-pass refrigerant. It will be closed in heating and standby mode. It will be open in forced cooling and oil return mode. In cooling mode, it will be open or closed according to discharge pressure.

SV7: It is used to balance system pressure before open the unit, and it can guarantee system reliability in low temperature heating mode.

High pressure sensor: It is used to supervisor the discharge pressure of the compressor and to control the DC fan speed.

T3: Pipe temperature sensor;

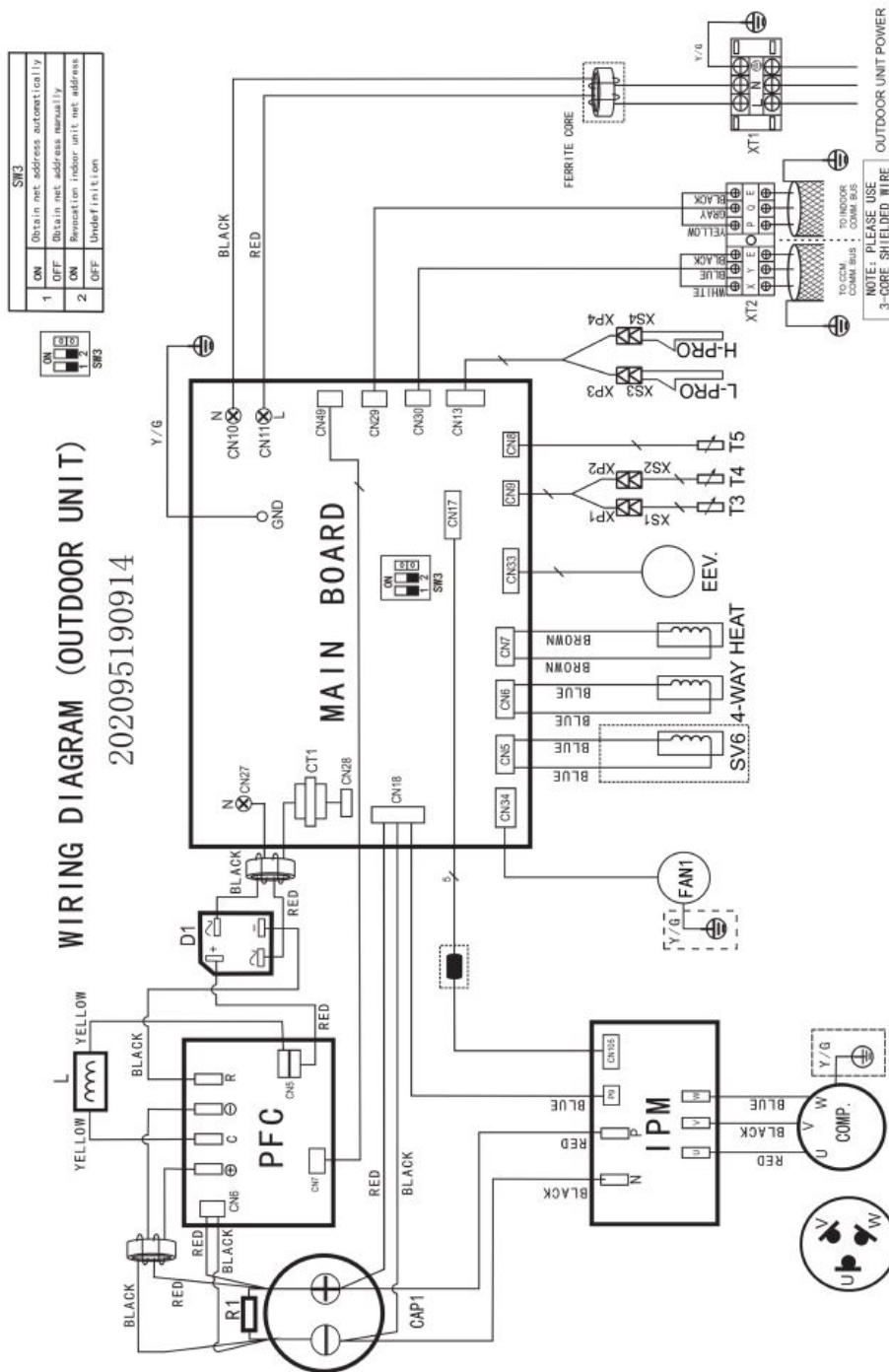
T4: Ambient temperature sensor

Wiring diagrams - Outdoor unit (MSAN-XMi)

Size 80M - 150M

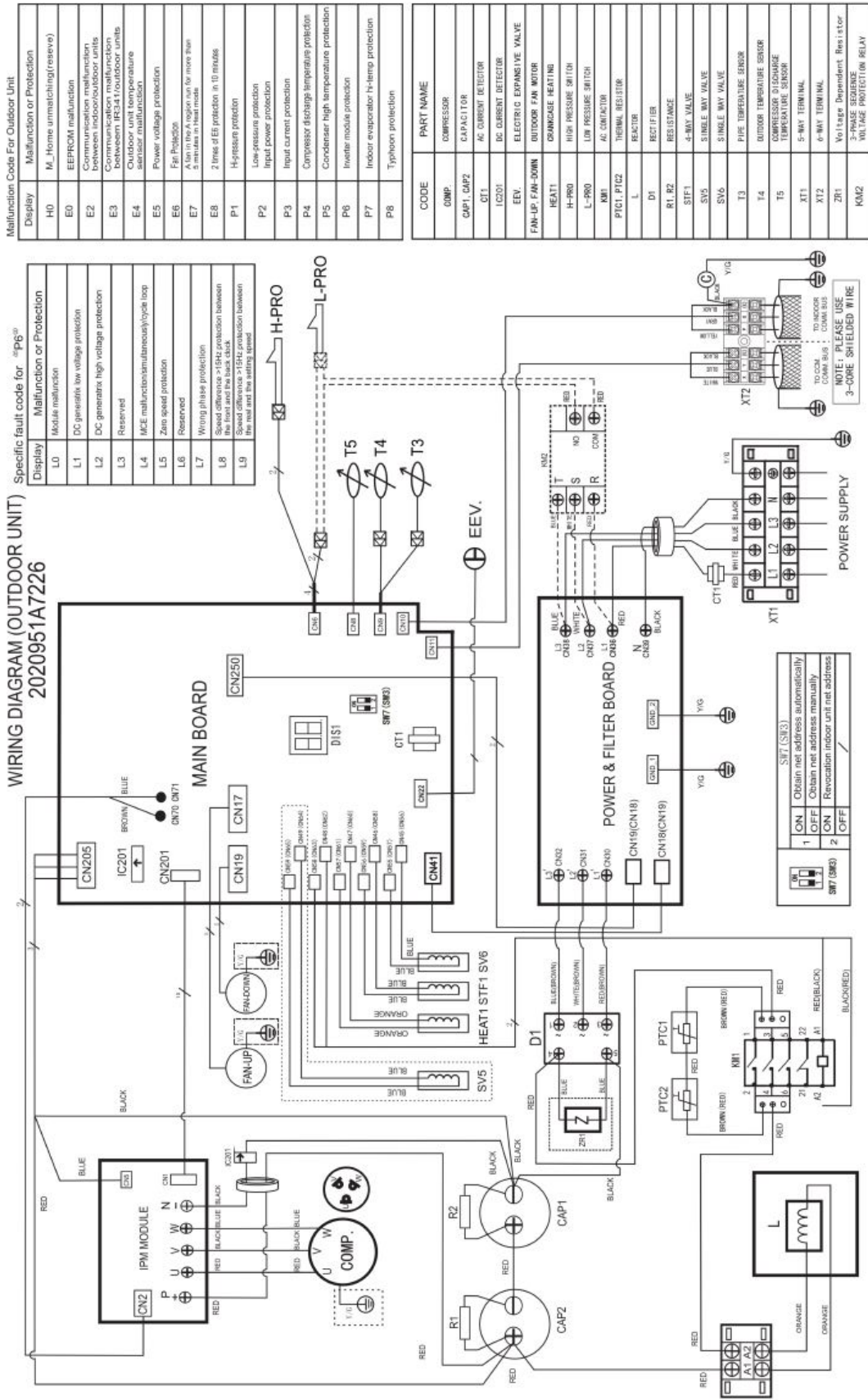
CODE	PART NAME
COMP.	COMPRESSOR
CAP1	CAPACITANCE
CT1	AC CURRENT DETECTOR
EEV.	ELECTRIC EXPANSIVE VALVE
FAN1	OUTDOOR FAN MOTOR
HEAT	GRANICASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
L	PFC INDUCTANCE
D1	RECTIFIER
R1	RESISTANCE
4-WAY	4-WAY VALVE
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
T5	COMP DISCHARGE TEMPERATURE SENSOR
XT1	3-WAY TERMINAL
XT2	6-WAY TERMINAL

Display	Malfunction or Protection
E2	Communication fault between the outdoor and indoor units.
E4	T3&T4 temperature sensor malfunction
E5	Voltage protection
E6	Dc fan motor malfunction
E7	Discharge temperature sensor fault
E9	EEPROM malfunction
Ea	4-ways valve motor run for more than 5 minutes in least 800s.
Eb	2 times of E6 protection in 10 minutes
H0	Communication fault between the r3&T4 and main chips
Hf	Wiring for the indoor and outdoor units is wrong
P1	High pressure protection
P2	Low pressure protection
P3	Outdoor input current protection
P4	Compressor discharge temperature protection
P5	Condenser high temperature protection
P6	Inverter module protection
P8	Typothon protection
PE	Evaporator high temperature protection
LO	Compressor module protection
L1	Dc bus low voltage protection
L2	Dc bus high voltage protection
L4	ME error/synchronization/clock-loop
L5	Zero-speed prction
L8	Phase sequence error
L9	Frequency changed over 15Hz one time Setting & actual Frequency: over 15Hz



Wiring diagrams - Outdoor unit (MSAN-XMi)

Size 120T - 160T



Specific fault code for "ipg"

Display	Malfunction or Protection
L0	Module malfunction
L1	DC generator low voltage protection
L2	DC generator high voltage protection
L3	Reserved
L4	MCE malfunction/simultaneous/cycle loop
L5	Zero speed protection
L6	Reserved
L7	Wiring phase protection
L8	Speed difference >15Hz protection between the front and the back stack
L9	Speed difference >15Hz protection between the front and the heating speed

Malfunction Code For Outdoor Unit

Display	Malfunction or Protection
H0	M Home unmatched (reverse)
E0	EEPROM malfunction
E2	Communication malfunction between indoor/outdoor units
E3	Communication malfunction between IR341/indoor units
E4	Outdoor unit temperature sensor malfunction
E5	Power voltage protection
E6	Fan Protection
E7	A fan in three A registers for more than 3 minutes without feedback
E8	2 times of ES protection in 10 minutes
P1	Hydrasens protection
P2	Low-pressure protection
P3	Input power protection
P4	Compressor discharge temperature protection
P5	Condenser high temperature protection
P6	Inverter module protection
P7	Indoor evaporator hi-temp protection
P8	Typhoon protection

CODE	PART NAME
COMP	COMPRESSOR
CAP1, CAP2	CAPACITOR
CT1	AC CURRENT DETECTOR
IC201	DC CURRENT DETECTOR
EEV	ELECTRIC EXPANSIVE VALVE
FAN-UP, FAN-DOWN	OUTDOOR FAN MOTOR
HEAT1	DAMAGE HEATING
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
NH1	AI CONTACTOR
PTC1, PTC2	THERMAL RESISTOR
L	REACTOR
D1	RECTIFIER
R1, R2	RESISTANCE
STF1	4-WAY VALVE
SV5	SINGLE WAY VALVE
SV6	SINGLE WAY VALVE
T3	PIPE TEMPERATURE SENSOR
T4	OUTDOOR TEMPERATURE SENSOR
T5	COMPRESSOR DISCHARGE TEMPERATURE SENSOR
XT1	5-WAY TERMINAL
XT2	6-WAY TERMINAL
ZR1	Voltage Dependent Resistor
KN2	3-PHASE SEQUENCE INFLUENCE PROTECTION RELAY

SW1 (SW3)

1	ON	Obtain net address automatically
	OFF	Obtain net address manually
2	ON	Revocation indoor unit net address
	OFF	

Wiring diagrams - Outdoor unit (MSAN-XMi)

Size 200T - 260T

WIRING DIAGRAM (OUTDOOR UNIT)

2020951A4013

Code	Name		
COMP	Inverter compressor		
HWSP/HS/HS/DM	Fan MOP		
STF1	4-way valve		
SV (2,4,6,7)	Service valve		
EEV	Electric expansion valve		
HEAT	Crackcase heating		
L-PRO	Pipe/low-pressure switch		
H-PRO	Pipe/high-pressure switch		
K1	Discharge temperature switch		
TS	Discharge temperature sensor		
T4	Piping temperature sensor		
T5	Outdoor evaporator temperature sensor		
4MB1	4MB2	4MB3	Capacitor
ET/ES	Fiber capacitor		
RT/R2	Current resistor		
PTC	Thermal resistor		
XT	By 4-phase terminal		
L-3	Reactor		
CT1, CT2	Current transformer		
BD-1	Bridge rectifier		
ZR1	Resistor		
CT1, CT2	Ferrite core		

Code	Name
HS	Compressor stall protection (not set on 0)
HT	Compressor stall protection (set on 10)
HH	3 times of P2 protection in 30 minutes
H5	2 times of P2 protection in 30 minutes
HT	The number of indoor units decreases
H8	Reserved
HF	M-AHOME for low indoor and outdoor units (200T, 260T)
E1	Reserved
E2	Reserved
E4	TS & T4 temperature sensor fault
E5	3-stage compressor fault or a leak of refrigerant
E6	DC fan motor fault
E7	Discharge temperature sensor fault
E8	A leak in the A/Pipe (not for 0)
E9	High pressure protection (high temperature protection)
P1	2 times of P2 protection in 30 minutes
P2	High pressure protection
P3	Low pressure protection
P4	Outdoor liquid current protection
P5	Compressor discharge high pressure protection
P6	Outdoor condenser high temperature protection
P8	Inverter module protection
PE	Typical protection
PE	Excessive high temperature protection

Dial-up function definition

S5 function definition

0 1 1 1	Heating priority mode (set by factory default)
0 1 1 0	Cooling priority mode
0 1 0 1	Initial-start priority mode
0 1 0 0	Heating only mode
0 0 1 1	Cooling only mode

S6 function definition:

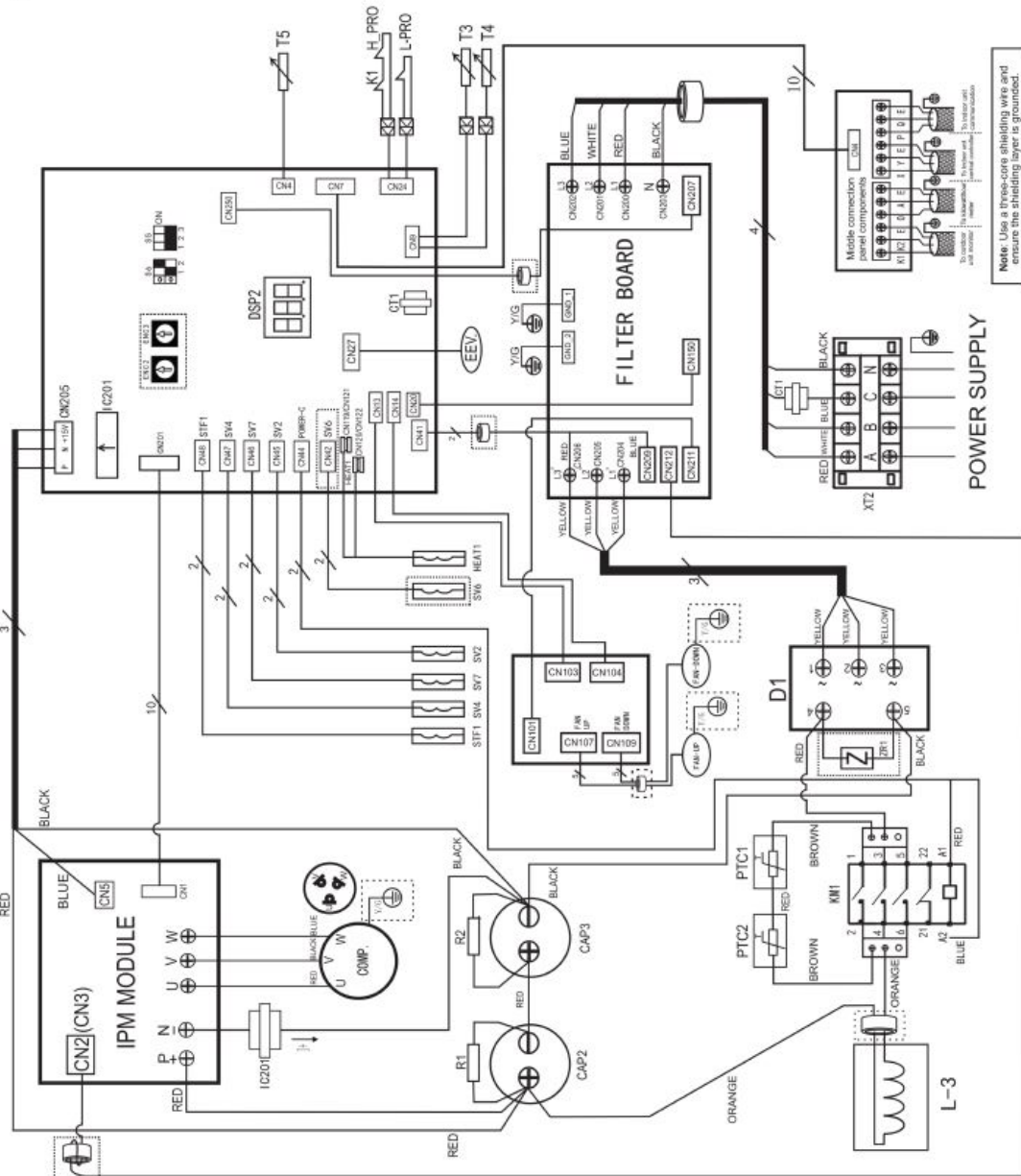
0 1 0 1	Automatic addressing
0 1 0 0	Nonautomatic addressing (set by factory default)
0 0 1 1	Clear indoor unit address

ENC2 function definition:
(Dial-up cannot be changed.)

0 1 0 1	Indoor unit capacity dial-up 0: 8HP(25.2kW/28kW) 1: 10HP(28kW) 2: 12HP(32.4kW)
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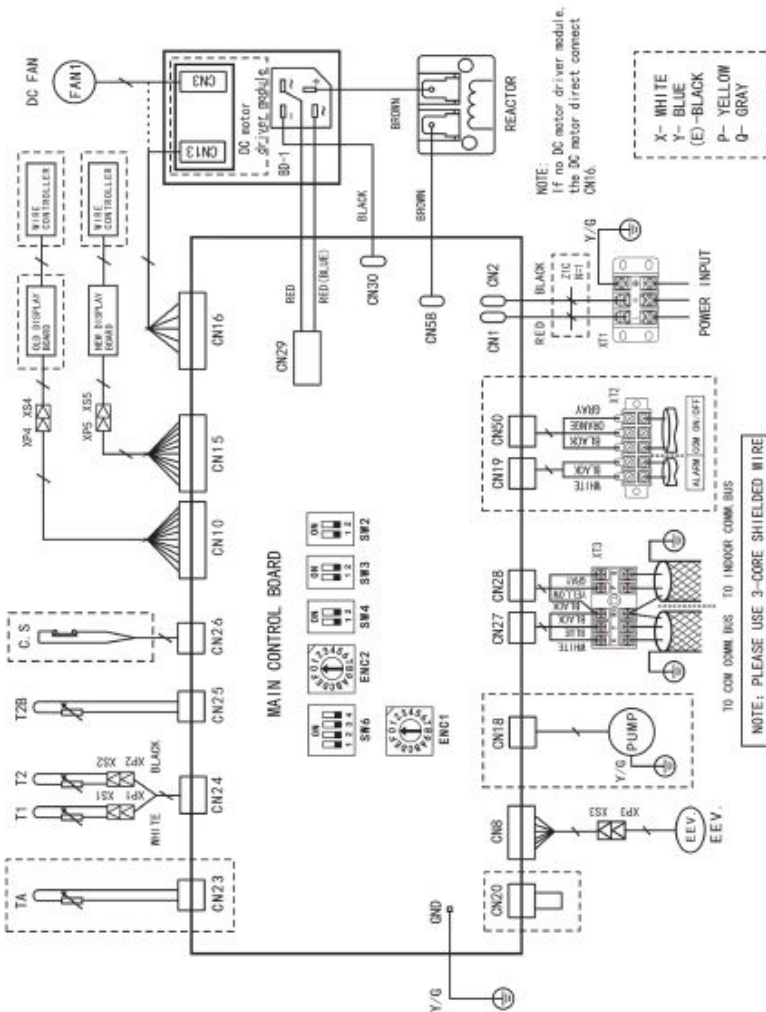
ENC3 function definition:

0 1 0 1	Outdoor unit network address dial-up 0- F: indicates 0-15.
---------	---



Wiring diagrams - Indoor unit (CN-XMi)

Size D71 - D160



NOTE: If no DC motor driver module, the DC motor direct connect CN16.

X- WHITE
Y- BLUE
(E)- BLACK
P- YELLOW
Q- GRAY

NOTE: PLEASE USE 3-CORE SHIELDED WIRE TO COM COMM BUS TO INDOOR COMM BUS

202085690112
WIRING DIAGRAM
(INDOOR UNIT)

CODE	TITLE
FAN1	DC FAN MOTOR
TA	OUTLET AIR TEMP.
T1	ROOM TEMP.
T2	MIDDLE PIPE TEMP.
T2B	OUTER PIPE TEMP.
C.S	WATER LEVEL SWITCH
EEV	ELECTRONIC EXPANSION VALVE
JP1-JP5	CONNECTOR
XP1-XP5	CONNECTOR
X11	TERMINAL
X12	TERMINAL
X13	TERMINAL
PUMP	PUMP MOTOR
BD-1	BRIDGE RECTIFIER

ENC1	Toggle switch	For set horsepower
0		Capacity
1		2500W
2		2800W
3		3600W
4		4500W
5		5600W
6		7100W
7		9000W
8		10500/11200W
9		12500/14000W
A		16000W

NOTE:
1. The functions in the dashed rectangle are available for particular Air-conditioner.
2. SW2-SW4 SW6 must be set as this diagram.
3. ENC2 is used for Static Pressure, must be set according to the INSTALLATION MANUAL.

J1,J2 Definition

J1	J2	J3
without jumper "J1" for auto restart function	with jumper "J1" for non-auto restart function	reserved

SW2 Definition

SW2	SW2	SW2	SW2
00 means shutting down the unit to "stop cold air" at 15°C	01 means shutting down the unit to "stop cold air" at 20°C	10 means shutting down the unit to "stop cold air" at 24°C	11 means shutting down the unit to "stop cold air" at 28°C

SW3 Definition

SW3	SW3	SW3	SW3
00 means the time of stopping TERMINAL fan is 4 minutes	01 means the time of stopping TERMINAL fan is 8 minutes	10 means the time of stopping TERMINAL fan is 12 minutes	11 means the time of stopping TERMINAL fan is 16 minutes

SW4 Definition

SW4	SW4	SW4	SW4
00 means temp compensation value is 6°C under heat mode	01 means temp compensation value is 2°C under heat mode	10 means temp compensation value is 4°C under heat mode	11 means temp compensation value is 8°C under heat mode

SW6 Definition

SW6	SW6	SW6	SW6
01 means old display panel	00 means new display panel	01 means DC fan is chosen	00 means AC fan is chosen
01 means factory test mode	00 means auto addressing mode (default setting)	reserved	reserved

Error code & indication

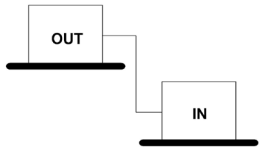
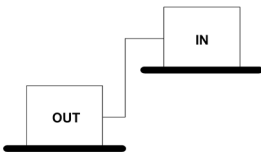
Error code	Indication
Timer LED and/or LED flash together or show "EE"	No address when first time power on
Default LED flash or show "E0"	Mode conflict
Timer LED flash or show "E1"	Communication error between indoor and outdoor unit.
Run LED flash or show "E2"	Run error (TI error (Hot Air) or E2 error (Hot Air) or E2 error (Hot Air) or E2 error (Hot Air))
Run LED flash or show "E3"	Temp sensor (T2) error
Run LED flash or show "E4"	Temp sensor (T3) error
Timer LED flash slowly or show "E5"	DC Fan error
Default LED flash slowly or show "E7"	EEPROM error
Alarm LED flash slowly or show "E8"	Outdoor unit error
Alarm LED flash or show "EE"	Water level alarm
Show "H1"	Temp. sensor (TI) error
Show "H2"	Outdoor unit low temperature protect
Show "H3"	Outdoor unit high temperature protect

NOTE: The Error code with "e" is only used for Fresh Air Handling Unit.

Refrigerating connections

Maximum length and level difference of the refrigerating connections

The equivalent length is the sum of the effective length of the piping plus a length that is equivalent to the distributed and concentrated pressure drop. In order to calculate it, refer to tables or data declared by the supplier of the piping.

Size		D71 - D90	D112 - D250	
Maximum equivalent piping length		[m]	50	70
Maximum level difference		[m]	30	30
		[m]	20	20

NOTE: When the total equivalent length of the liquid+gas piping is more than 90 m, it is necessary to increase the refrigerant gas pipe size.

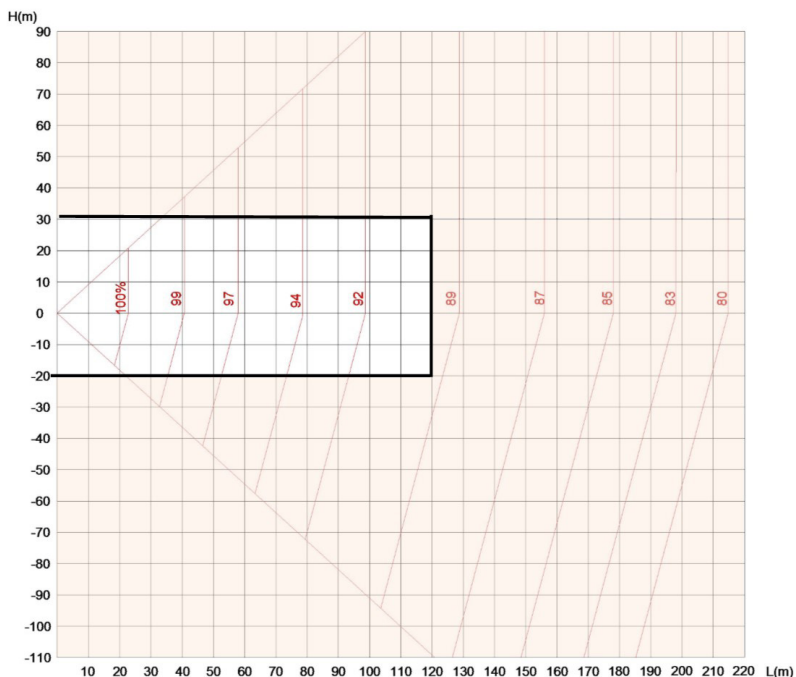
Concentrated pressure drop table

Piping diameter [mm]	Standard 90° bend	Wide radius 90° bend	90° elbow m/f	45° bend	45° elbow m/f	180° bend	Fitting direction inversion	Direct flow		
								No reduction	Reduction 1/4	Reduction 1/2
	Equivalent length [m]									
10	0,38	0,26	0,66	0,20	0,30	0,67	0,77	0,26	0,33	0,38
12	0,40	0,30	0,70	0,20	0,30	0,70	0,80	0,30	0,40	0,40
14	0,46	0,29	0,73	0,22	0,36	0,73	0,87	0,29	0,39	0,46
16	0,48	0,30	0,76	0,24	0,40	0,76	0,91	0,30	0,43	0,48
18	0,50	0,30	0,80	0,20	0,40	0,80	0,90	0,30	0,40	0,50
22	0,60	0,40	1,00	0,30	0,50	1,00	1,20	0,40	0,60	0,60
28	0,80	0,50	1,20	0,40	0,60	1,20	1,50	0,50	0,70	0,80

Correction factors for length and level difference of refrigerant pipes

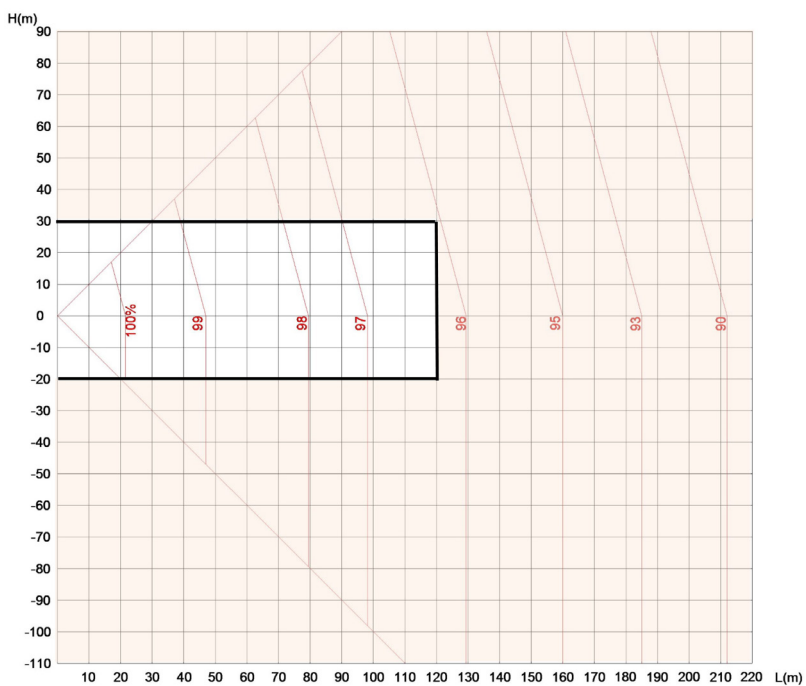
Corrected performance may be obtained multiplying rated cooling or heating capacities with correction factor from table.

Cooling



L: Refrigerant pipe equivalent length [m]
 H: Level difference between outdoor and indoor unit [m]
 Positive data means outdoor unit is higher.
 Negative data means outdoor unit is lower

Heating



L: Refrigerant pipe equivalent length [m]
 H: Level difference between outdoor and indoor unit [m]
 Positive data means outdoor unit is higher.
 Negative data means outdoor unit is lower

Refrigerant charge to be added during installation

	Size	Refrigerant to be added [kg/m]	
		D71 - D200	D250
Liquid side piping diameter [mm]	Ø6,4	0,022	0,022
	Ø9,5	0,054	0,054
	Ø12,7	0,110	0,110
	Ø15,9	0,170	0,170
	Ø19,1	0,260	0,260
	Ø22,2	0,360	0,360

Note: The factory refrigerant pre-charge is referred only to the single outdoor unit. A refrigerant integration charge must be provided in proportion to the length of the pipes.



- The liquid and gas lines should be thermally insulated to prevent heat exchanges that could compromise the proper refrigerating operation.
- The supply line must be properly insulated in case of possible contact with persons in order to avoid accidental burns.
- The lack of vibration isolation on the piping could cause breakages and refrigerant leakage.
- The unit is shipped with a pre-charge of the factory refrigerant, the addition of refrigerant according to the table has to be made during the installation phase, at the start-up and it is provided by the Customer.
- The sizing of the connection refrigerating lines is of primary importance for proper operating and reliability of the system.

Performance in Cooling

Size D71

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	4,8	0,59	5,7	0,71	6,6	0,84	7,1	0,91	7,6	0,98
	5	4,8	0,61	5,7	0,73	6,6	0,87	7,1	0,94	7,6	1,01
	10	4,8	0,63	5,7	0,76	6,6	0,91	7,1	0,98	7,6	1,05
	15	4,8	0,66	5,7	0,80	6,6	0,95	7,1	1,03	7,6	1,10
	20	4,8	0,69	5,7	0,84	6,6	1,01	7,1	1,11	7,6	1,22
	25	4,8	0,76	5,7	0,97	6,6	1,20	7,1	1,32	7,6	1,45
	30	4,8	0,89	5,7	1,14	6,6	1,41	7,1	1,56	7,5	1,68
	35	4,8	1,04	5,7	1,33	6,6	1,65	7,1	1,83	7,2	1,84
	40	4,8	1,20	5,7	1,53	6,6	1,91	6,8	1,97	6,9	1,98
	43	4,8	1,29	5,7	1,61	6,6	1,98	6,7	1,99	6,8	2,02
75%	0	3,6	0,42	4,3	0,50	5,0	0,60	5,3	0,65	5,6	0,70
	5	3,6	0,43	4,3	0,52	5,0	0,62	5,3	0,67	5,6	0,72
	10	3,6	0,45	4,3	0,54	5,0	0,64	5,3	0,70	5,6	0,75
	15	3,6	0,47	4,3	0,57	5,0	0,68	5,3	0,73	5,6	0,79
	20	3,6	0,49	4,3	0,60	5,0	0,72	5,3	0,79	5,6	0,87
	25	3,6	0,54	4,3	0,69	5,0	0,85	5,3	0,94	5,6	1,03
	30	3,6	0,64	4,3	0,81	5,0	1,00	5,3	1,11	5,6	1,19
	35	3,6	0,74	4,3	0,95	5,0	1,18	5,3	1,30	5,6	1,31
	40	3,6	0,86	4,3	1,09	5,0	1,36	5,3	1,40	5,6	1,41
	43	3,6	0,92	4,3	1,15	5,0	1,41	5,3	1,42	5,6	1,44
50%	0	2,3	0,26	2,8	0,32	3,2	0,38	3,5	0,41	3,7	0,44
	5	2,3	0,27	2,8	0,33	3,2	0,39	3,5	0,42	3,7	0,45
	10	2,3	0,28	2,8	0,34	3,2	0,40	3,5	0,44	3,7	0,47
	15	2,3	0,29	2,8	0,36	3,2	0,42	3,5	0,46	3,7	0,49
	20	2,3	0,31	2,8	0,38	3,2	0,45	3,5	0,50	3,7	0,54
	25	2,3	0,34	2,8	0,43	3,2	0,53	3,5	0,59	3,7	0,65
	30	2,3	0,40	2,8	0,51	3,2	0,63	3,5	0,70	3,7	0,75
	35	2,3	0,46	2,8	0,59	3,2	0,74	3,5	0,82	3,7	0,82
	40	2,3	0,52	2,8	0,66	3,2	0,83	3,5	0,86	3,7	0,87
	43	2,3	0,54	2,8	0,69	3,2	0,85	3,5	0,87	3,7	0,88
25%	0	1,2	0,13	1,5	0,16	1,7	0,19	1,8	0,20	1,9	0,22
	5	1,2	0,14	1,5	0,16	1,7	0,20	1,8	0,21	1,9	0,23
	10	1,2	0,16	1,5	0,18	1,7	0,20	1,8	0,22	1,9	0,24
	15	1,2	0,17	1,5	0,19	1,7	0,21	1,8	0,23	1,9	0,25
	20	1,2	0,18	1,5	0,20	1,7	0,23	1,8	0,25	1,9	0,27
	25	1,2	0,20	1,5	0,23	1,7	0,27	1,8	0,30	1,9	0,32
	30	1,2	0,23	1,5	0,27	1,7	0,32	1,8	0,35	1,9	0,38
	35	1,2	0,26	1,5	0,31	1,7	0,37	1,8	0,41	1,9	0,41
	40	1,2	0,29	1,5	0,34	1,7	0,42	1,8	0,43	1,9	0,44
	43	1,2	0,30	1,5	0,35	1,7	0,43	1,8	0,44	1,9	0,44

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Cooling

Size D90

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	6,1	0,74	7,2	0,89	8,4	1,06	9,0	1,14	9,6	1,23
	5	6,1	0,76	7,2	0,92	8,4	1,09	9,0	1,19	9,6	1,27
	10	6,1	0,79	7,2	0,96	8,4	1,14	9,0	1,23	9,6	1,32
	15	6,1	0,83	7,2	1,01	8,4	1,19	9,0	1,29	9,6	1,39
	20	6,1	0,87	7,2	1,06	8,4	1,26	9,0	1,39	9,6	1,53
	25	6,1	0,96	7,2	1,22	8,4	1,50	9,0	1,66	9,6	1,82
	30	6,1	1,12	7,2	1,43	8,4	1,77	9,0	1,96	9,5	2,11
	35	6,1	1,31	7,2	1,67	8,4	2,08	9,0	2,30	9,1	2,31
	40	6,1	1,51	7,2	1,93	8,4	2,40	8,6	2,47	8,8	2,49
	43	6,1	1,62	7,2	2,03	8,4	2,49	8,4	2,51	8,7	2,54
75%	0	4,0	0,47	4,8	0,57	5,6	0,67	6,0	0,73	6,4	0,78
	5	4,0	0,49	4,8	0,59	5,6	0,69	6,0	0,75	6,4	0,81
	10	4,0	0,50	4,8	0,61	5,6	0,72	6,0	0,78	6,4	0,84
	15	4,0	0,53	4,8	0,64	5,6	0,76	6,0	0,82	6,4	0,88
	20	4,0	0,55	4,8	0,67	5,6	0,80	6,0	0,89	6,4	0,97
	25	4,0	0,61	4,8	0,77	5,6	0,95	6,0	1,05	6,4	1,16
	30	4,0	0,71	4,8	0,91	5,6	1,13	6,0	1,24	6,4	1,34
	35	4,0	0,83	4,8	1,06	5,6	1,32	6,0	1,46	6,4	1,47
	40	4,0	0,96	4,8	1,22	5,6	1,53	6,0	1,57	6,4	1,58
	43	4,0	1,03	4,8	1,29	5,6	1,58	6,0	1,59	6,4	1,61
50%	0	2,6	0,29	3,1	0,35	3,7	0,42	3,9	0,46	4,2	0,49
	5	2,6	0,30	3,1	0,37	3,7	0,44	3,9	0,47	4,2	0,51
	10	2,6	0,32	3,1	0,38	3,7	0,45	3,9	0,49	4,2	0,53
	15	2,6	0,33	3,1	0,40	3,7	0,48	3,9	0,51	4,2	0,55
	20	2,6	0,35	3,1	0,42	3,7	0,50	3,9	0,56	4,2	0,61
	25	2,6	0,38	3,1	0,48	3,7	0,60	3,9	0,66	4,2	0,73
	30	2,6	0,45	3,1	0,57	3,7	0,71	3,9	0,78	4,2	0,84
	35	2,6	0,52	3,1	0,67	3,7	0,83	3,9	0,92	4,2	0,92
	40	2,6	0,58	3,1	0,74	3,7	0,93	3,9	0,97	4,2	0,98
	43	2,6	0,61	3,1	0,77	3,7	0,95	3,9	0,98	4,2	0,99
25%	0	1,4	0,15	1,6	0,18	1,9	0,21	2,0	0,23	2,2	0,25
	5	1,4	0,15	1,6	0,18	1,9	0,22	2,0	0,24	2,2	0,25
	10	1,4	0,18	1,6	0,20	1,9	0,23	2,0	0,25	2,2	0,26
	15	1,4	0,19	1,6	0,21	1,9	0,24	2,0	0,26	2,2	0,28
	20	1,4	0,20	1,6	0,22	1,9	0,25	2,0	0,28	2,2	0,31
	25	1,4	0,22	1,6	0,25	1,9	0,30	2,0	0,33	2,2	0,36
	30	1,4	0,25	1,6	0,30	1,9	0,35	2,0	0,39	2,2	0,42
	35	1,4	0,29	1,6	0,34	1,9	0,41	2,0	0,46	2,2	0,46
	40	1,4	0,32	1,6	0,38	1,9	0,46	2,0	0,49	2,2	0,49
	43	1,4	0,33	1,6	0,40	1,9	0,47	2,0	0,49	2,2	0,49

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Cooling

Size D112

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	7,6	1,03	9,0	1,24	10,5	1,48	11,2	1,60	11,9	1,72
	5	7,6	1,07	9,0	1,29	10,5	1,52	11,2	1,65	11,9	1,77
	10	7,6	1,11	9,0	1,34	10,5	1,59	11,2	1,72	11,9	1,85
	15	7,6	1,16	9,0	1,41	10,5	1,67	11,2	1,80	11,9	1,94
	20	7,6	1,21	9,0	1,48	10,5	1,77	11,2	1,95	11,9	2,14
	25	7,6	1,34	9,0	1,70	10,5	2,10	11,2	2,31	11,9	2,54
	30	7,6	1,57	9,0	1,99	10,5	2,47	11,2	2,73	11,8	2,94
	35	7,6	1,83	9,0	2,33	10,5	2,90	11,2	3,21	11,3	3,22
	40	7,6	2,11	9,0	2,69	10,5	3,35	10,8	3,45	10,9	3,48
	43	7,6	2,26	9,0	2,83	10,5	3,48	10,5	3,50	10,8	3,54
75%	0	5,6	0,73	6,7	0,88	7,8	1,05	8,4	1,14	8,9	1,22
	5	5,6	0,76	6,7	0,91	7,8	1,09	8,4	1,18	8,9	1,26
	10	5,6	0,79	6,7	0,95	7,8	1,13	8,4	1,22	8,9	1,31
	15	5,6	0,82	6,7	1,00	7,8	1,19	8,4	1,28	8,9	1,38
	20	5,6	0,86	6,7	1,05	7,8	1,26	8,4	1,39	8,9	1,52
	25	5,6	0,95	6,7	1,21	7,8	1,49	8,4	1,65	8,9	1,81
	30	5,6	1,12	6,7	1,42	7,8	1,76	8,4	1,94	8,9	2,09
	35	5,6	1,30	6,7	1,66	7,8	2,07	8,4	2,28	8,9	2,29
	40	5,6	1,50	6,7	1,91	7,8	2,39	8,4	2,45	8,9	2,48
	43	5,6	1,61	6,7	2,02	7,8	2,47	8,4	2,49	8,9	2,52
50%	0	3,7	0,46	4,4	0,55	5,1	0,66	5,4	0,71	5,8	0,77
	5	3,7	0,48	4,4	0,57	5,1	0,68	5,4	0,74	5,8	0,79
	10	3,7	0,49	4,4	0,60	5,1	0,71	5,4	0,77	5,8	0,82
	15	3,7	0,52	4,4	0,63	5,1	0,74	5,4	0,80	5,8	0,86
	20	3,7	0,54	4,4	0,66	5,1	0,79	5,4	0,87	5,8	0,95
	25	3,7	0,60	4,4	0,76	5,1	0,94	5,4	1,03	5,8	1,13
	30	3,7	0,70	4,4	0,89	5,1	1,10	5,4	1,22	5,8	1,31
	35	3,7	0,81	4,4	1,04	5,1	1,30	5,4	1,43	5,8	1,44
	40	3,7	0,91	4,4	1,16	5,1	1,45	5,4	1,52	5,8	1,53
	43	3,7	0,95	4,4	1,20	5,1	1,48	5,4	1,53	5,8	1,54
25%	0	1,9	0,23	2,3	0,28	2,7	0,33	2,9	0,36	3,1	0,39
	5	1,9	0,24	2,3	0,29	2,7	0,34	2,9	0,37	3,1	0,40
	10	1,9	0,28	2,3	0,32	2,7	0,36	2,9	0,39	3,1	0,41
	15	1,9	0,30	2,3	0,33	2,7	0,37	2,9	0,40	3,1	0,43
	20	1,9	0,32	2,3	0,35	2,7	0,40	2,9	0,44	3,1	0,48
	25	1,9	0,34	2,3	0,40	2,7	0,47	2,9	0,52	3,1	0,57
	30	1,9	0,40	2,3	0,46	2,7	0,55	2,9	0,61	3,1	0,66
	35	1,9	0,45	2,3	0,54	2,7	0,65	2,9	0,72	3,1	0,72
	40	1,9	0,50	2,3	0,60	2,7	0,73	2,9	0,76	3,1	0,77
	43	1,9	0,52	2,3	0,62	2,7	0,75	2,9	0,77	3,1	0,78

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Cooling

Size D160

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	10,7	1,42	12,7	1,71	14,8	2,04	15,8	2,20	16,8	2,37
	5	10,7	1,47	12,7	1,77	14,8	2,10	15,8	2,28	16,8	2,45
	10	10,7	1,53	12,7	1,85	14,8	2,19	15,8	2,37	16,8	2,55
	15	10,7	1,60	12,7	1,94	14,8	2,30	15,8	2,48	16,8	2,67
	20	10,7	1,67	12,7	2,04	14,8	2,44	15,8	2,69	16,8	2,95
	25	10,7	1,84	12,7	2,34	14,8	2,90	15,8	3,19	16,8	3,50
	30	10,7	2,16	12,7	2,75	14,8	3,41	15,8	3,77	16,6	4,06
	35	10,7	2,52	12,7	3,22	14,8	4,01	15,8	4,43	16,0	4,45
	40	10,7	2,91	12,7	3,71	14,8	4,63	15,2	4,76	15,4	4,80
	43	10,7	3,11	12,7	3,91	14,8	4,80	14,8	4,83	15,2	4,88
75%	0	8,0	1,01	9,5	1,22	11,0	1,45	11,8	1,57	12,5	1,69
	5	8,0	1,05	9,5	1,26	11,0	1,50	11,8	1,63	12,5	1,74
	10	8,0	1,09	9,5	1,32	11,0	1,56	11,8	1,69	12,5	1,81
	15	8,0	1,14	9,5	1,38	11,0	1,64	11,8	1,77	12,5	1,90
	20	8,0	1,19	9,5	1,45	11,0	1,73	11,8	1,91	12,5	2,10
	25	8,0	1,31	9,5	1,67	11,0	2,06	11,8	2,27	12,5	2,49
	30	8,0	1,54	9,5	1,96	11,0	2,43	11,8	2,68	12,5	2,89
	35	8,0	1,79	9,5	2,29	11,0	2,85	11,8	3,15	12,5	3,17
	40	8,0	2,07	9,5	2,64	11,0	3,29	11,8	3,39	12,5	3,42
	43	8,0	2,22	9,5	2,78	11,0	3,41	11,8	3,44	12,5	3,48
50%	0	5,2	0,63	6,2	0,77	7,2	0,91	7,7	0,98	8,2	1,06
	5	5,2	0,66	6,2	0,79	7,2	0,94	7,7	1,02	8,2	1,09
	10	5,2	0,68	6,2	0,83	7,2	0,98	7,7	1,06	8,2	1,14
	15	5,2	0,71	6,2	0,87	7,2	1,03	7,7	1,11	8,2	1,19
	20	5,2	0,75	6,2	0,91	7,2	1,09	7,7	1,20	8,2	1,32
	25	5,2	0,82	6,2	1,04	7,2	1,29	7,7	1,43	8,2	1,56
	30	5,2	0,97	6,2	1,23	7,2	1,52	7,7	1,68	8,2	1,81
	35	5,2	1,12	6,2	1,44	7,2	1,79	7,7	1,98	8,2	1,99
	40	5,2	1,26	6,2	1,61	7,2	2,00	7,7	2,09	8,2	2,11
	43	5,2	1,31	6,2	1,66	7,2	2,05	7,7	2,11	8,2	2,13
25%	0	2,7	0,32	3,3	0,38	3,8	0,46	4,0	0,49	4,3	0,53
	5	2,7	0,33	3,3	0,40	3,8	0,47	4,0	0,51	4,3	0,55
	10	2,7	0,39	3,3	0,44	3,8	0,49	4,0	0,53	4,3	0,57
	15	2,7	0,42	3,3	0,46	3,8	0,52	4,0	0,56	4,3	0,60
	20	2,7	0,44	3,3	0,48	3,8	0,55	4,0	0,60	4,3	0,66
	25	2,7	0,47	3,3	0,55	3,8	0,65	4,0	0,72	4,3	0,79
	30	2,7	0,55	3,3	0,64	3,8	0,77	4,0	0,85	4,3	0,91
	35	2,7	0,63	3,3	0,75	3,8	0,90	4,0	0,99	4,3	1,00
	40	2,7	0,69	3,3	0,83	3,8	1,01	4,0	1,05	4,3	1,06
	43	2,7	0,72	3,3	0,86	3,8	1,03	4,0	1,06	4,3	1,07

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Cooling

Size D200

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	13,5	1,95	16,1	2,36	18,7	2,81	20,0	3,03	21,3	3,26
	5	13,5	2,03	16,1	2,44	18,7	2,90	20,0	3,14	21,3	3,37
	10	13,5	2,10	16,1	2,55	18,7	3,02	20,0	3,26	21,3	3,51
	15	13,5	2,20	16,1	2,67	18,7	3,17	20,0	3,42	21,3	3,68
	20	13,5	2,30	16,1	2,80	18,7	3,35	20,0	3,70	21,3	4,06
	25	13,5	2,54	16,1	3,22	18,7	3,99	20,0	4,40	21,3	4,83
	30	13,5	2,98	16,1	3,79	18,7	4,70	20,0	5,19	21,1	5,59
	35	13,5	3,47	16,1	4,43	18,7	5,52	20,0	6,10	20,2	6,12
	40	13,5	4,01	16,1	5,11	18,7	6,37	19,2	6,55	19,5	6,61
	43	13,5	4,29	16,1	5,38	18,7	6,61	18,8	6,65	19,3	6,73
75%	0	10,1	1,39	12,0	1,68	14,0	2,00	14,9	2,16	15,9	2,32
	5	10,1	1,44	12,0	1,74	14,0	2,06	14,9	2,24	15,9	2,40
	10	10,1	1,50	12,0	1,81	14,0	2,15	14,9	2,32	15,9	2,50
	15	10,1	1,56	12,0	1,90	14,0	2,25	14,9	2,43	15,9	2,62
	20	10,1	1,64	12,0	2,00	14,0	2,39	14,9	2,63	15,9	2,89
	25	10,1	1,81	12,0	2,29	14,0	2,84	14,9	3,13	15,9	3,43
	30	10,1	2,12	12,0	2,70	14,0	3,34	14,9	3,69	15,9	3,98
	35	10,1	2,47	12,0	3,15	14,0	3,93	14,9	4,34	15,9	4,36
	40	10,1	2,86	12,0	3,63	14,0	4,53	14,9	4,66	15,9	4,70
	43	10,1	3,05	12,0	3,83	14,0	4,70	14,9	4,73	15,9	4,79
50%	0	6,6	0,87	7,8	1,05	9,1	1,25	9,7	1,35	10,4	1,46
	5	6,6	0,91	7,8	1,09	9,1	1,29	9,7	1,40	10,4	1,50
	10	6,6	0,94	7,8	1,14	9,1	1,35	9,7	1,46	10,4	1,57
	15	6,6	0,98	7,8	1,19	9,1	1,41	9,7	1,53	10,4	1,64
	20	6,6	1,03	7,8	1,25	9,1	1,50	9,7	1,65	10,4	1,81
	25	6,6	1,13	7,8	1,44	9,1	1,78	9,7	1,96	10,4	2,15
	30	6,6	1,33	7,8	1,69	9,1	2,10	9,7	2,32	10,4	2,50
	35	6,6	1,55	7,8	1,98	9,1	2,46	9,7	2,72	10,4	2,73
	40	6,6	1,73	7,8	2,21	9,1	2,76	9,7	2,88	10,4	2,90
	43	6,6	1,81	7,8	2,28	9,1	2,82	9,7	2,91	10,4	2,93
25%	0	3,5	0,44	4,1	0,53	4,8	0,63	5,1	0,68	5,5	0,73
	5	3,5	0,46	4,1	0,55	4,8	0,65	5,1	0,71	5,5	0,76
	10	3,5	0,54	4,1	0,60	4,8	0,68	5,1	0,73	5,5	0,79
	15	3,5	0,57	4,1	0,63	4,8	0,71	5,1	0,77	5,5	0,83
	20	3,5	0,60	4,1	0,66	4,8	0,75	5,1	0,83	5,5	0,91
	25	3,5	0,65	4,1	0,76	4,8	0,89	5,1	0,99	5,5	1,08
	30	3,5	0,75	4,1	0,88	4,8	1,05	5,1	1,17	5,5	1,25
	35	3,5	0,86	4,1	1,03	4,8	1,24	5,1	1,37	5,5	1,37
	40	3,5	0,95	4,1	1,14	4,8	1,39	5,1	1,45	5,5	1,46
	43	3,5	0,99	4,1	1,18	4,8	1,42	5,1	1,46	5,5	1,48

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Cooling

Size D250

% load	Outdoor air Temperature D.B. (°C)	Indoor air temperature D.B./W.B. (°C)									
		20/14		23/16		26/18		27/19		28/20	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
100%	0	16,9	2,42	20,1	2,93	23,4	3,48	25,0	3,76	26,6	4,04
	5	16,9	2,51	20,1	3,03	23,4	3,59	25,0	3,90	26,6	4,17
	10	16,9	2,61	20,1	3,16	23,4	3,74	25,0	4,04	26,6	4,35
	15	16,9	2,73	20,1	3,31	23,4	3,92	25,0	4,24	26,6	4,56
	20	16,9	2,85	20,1	3,47	23,4	4,16	25,0	4,58	26,6	5,03
	25	16,9	3,15	20,1	3,99	23,4	4,94	25,0	5,45	26,6	5,98
	30	16,9	3,69	20,1	4,70	23,4	5,82	25,0	6,43	26,3	6,93
	35	16,9	4,30	20,1	5,49	23,4	6,84	25,0	7,56	25,3	7,59
	40	16,9	4,97	20,1	6,33	23,4	7,90	24,0	8,12	24,4	8,19
	43	16,9	5,31	20,1	6,67	23,4	8,19	23,4	8,24	24,1	8,34
75%	0	12,6	1,72	15,0	2,08	17,5	2,47	18,7	2,67	19,9	2,88
	5	12,6	1,79	15,0	2,15	17,5	2,56	18,7	2,77	19,9	2,97
	10	12,6	1,86	15,0	2,25	17,5	2,66	18,7	2,88	19,9	3,10
	15	12,6	1,94	15,0	2,36	17,5	2,79	18,7	3,02	19,9	3,24
	20	12,6	2,03	15,0	2,47	17,5	2,96	18,7	3,26	19,9	3,58
	25	12,6	2,24	15,0	2,84	17,5	3,52	18,7	3,88	19,9	4,26
	30	12,6	2,63	15,0	3,34	17,5	4,14	18,7	4,58	19,9	4,93
	35	12,6	3,06	15,0	3,91	17,5	4,87	18,7	5,38	19,9	5,40
	40	12,6	3,54	15,0	4,50	17,5	5,62	18,7	5,78	19,9	5,83
	43	12,6	3,78	15,0	4,75	17,5	5,83	18,7	5,86	19,9	5,93
50%	0	8,2	1,08	9,8	1,31	11,4	1,55	12,2	1,68	12,9	1,81
	5	8,2	1,12	9,8	1,35	11,4	1,60	12,2	1,74	12,9	1,86
	10	8,2	1,16	9,8	1,41	11,4	1,67	12,2	1,81	12,9	1,94
	15	8,2	1,22	9,8	1,48	11,4	1,75	12,2	1,89	12,9	2,04
	20	8,2	1,27	9,8	1,55	11,4	1,86	12,2	2,05	12,9	2,25
	25	8,2	1,41	9,8	1,78	11,4	2,21	12,2	2,43	12,9	2,67
	30	8,2	1,65	9,8	2,10	11,4	2,60	12,2	2,87	12,9	3,09
	35	8,2	1,92	9,8	2,45	11,4	3,05	12,2	3,37	12,9	3,39
	40	8,2	2,15	9,8	2,74	11,4	3,42	12,2	3,57	12,9	3,60
	43	8,2	2,24	9,8	2,83	11,4	3,49	12,2	3,60	12,9	3,64
25%	0	4,3	0,54	5,1	0,66	6,0	0,78	6,4	0,84	6,8	0,91
	5	4,3	0,56	5,1	0,68	6,0	0,81	6,4	0,87	6,8	0,94
	10	4,3	0,67	5,1	0,75	6,0	0,84	6,4	0,91	6,8	0,98
	15	4,3	0,71	5,1	0,78	6,0	0,88	6,4	0,95	6,8	1,02
	20	4,3	0,74	5,1	0,82	6,0	0,93	6,4	1,03	6,8	1,13
	25	4,3	0,81	5,1	0,94	6,0	1,11	6,4	1,22	6,8	1,34
	30	4,3	0,93	5,1	1,09	6,0	1,31	6,4	1,44	6,8	1,55
	35	4,3	1,07	5,1	1,27	6,0	1,53	6,4	1,70	6,8	1,70
	40	4,3	1,18	5,1	1,42	6,0	1,72	6,4	1,80	6,8	1,81
	43	4,3	1,23	5,1	1,46	6,0	1,76	6,4	1,81	6,8	1,83

kWf = Gross cooling capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D71

% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	5,3	1,76	5,3	1,83	5,3	1,89	5,3	1,92	5,3	1,95	5,3	2,02
	-9,5	-10	6,0	1,89	5,9	1,95	5,9	2,00	5,9	2,03	5,9	2,06	5,9	2,12
	-4,4	-5	6,7	2,01	6,7	1,99	6,7	2,11	6,7	2,14	6,7	2,16	6,6	2,17
	0,7	0	7,6	2,12	7,6	2,22	7,6	2,21	7,5	2,16	7,2	2,05	6,6	1,86
	5,9	5	8,5	2,16	8,1	2,02	7,6	1,87	7,4	1,80	7,1	1,73	6,6	1,59
	7,0	6	8,6	2,10	8,1	1,95	7,6	1,81	7,4	1,74	7,1	1,67	6,6	1,54
	11,2	10	8,6	1,84	8,1	1,72	7,6	1,60	7,4	1,54	7,1	1,48	6,6	1,36
	16,4	15	8,6	1,58	8,1	1,47	7,6	1,37	7,4	1,32	7,1	1,27	6,6	1,18
75%	-13,7	-15	5,2	2,03	5,2	2,03	5,1	2,03	5,0	2,03	5,0	2,03	4,9	2,04
	-9,5	-10	5,7	2,03	5,6	2,03	5,6	2,04	5,5	2,04	5,3	1,96	5,0	1,80
	-4,4	-5	6,3	2,04	6,1	1,97	5,7	1,82	5,5	1,76	5,3	1,69	5,0	1,55
	0,7	0	6,4	1,80	6,1	1,68	5,7	1,56	5,5	1,50	5,3	1,44	5,0	1,33
	5,9	5	6,4	1,54	6,1	1,44	5,7	1,34	5,5	1,29	5,3	1,25	5,0	1,15
	7,0	6	6,4	1,49	6,1	1,40	5,7	1,30	5,5	1,26	5,3	1,21	5,0	1,12
	11,2	10	6,4	1,33	6,1	1,24	5,7	1,16	5,5	1,12	5,3	1,08	5,0	1,00
	16,4	15	6,4	1,15	6,1	1,08	5,7	1,01	5,5	0,97	5,3	0,94	5,0	0,88
50%	-13,7	-15	4,3	1,79	4,0	1,67	3,8	1,55	3,7	1,49	3,5	1,43	3,3	1,32
	-9,5	-10	4,3	1,56	4,0	1,46	3,8	1,36	3,7	1,31	3,5	1,26	3,3	1,16
	-4,4	-5	4,3	1,35	4,0	1,26	3,8	1,18	3,7	1,14	3,5	1,09	3,3	1,01
	0,7	0	4,3	1,16	4,0	1,09	3,8	1,02	3,7	0,98	3,5	0,95	3,3	0,88
	5,9	5	4,3	1,01	4,0	0,95	3,8	0,89	3,7	0,86	3,5	0,83	3,3	0,77
	7,0	6	4,3	0,98	4,0	0,92	3,8	0,86	3,7	0,83	3,5	0,81	3,3	0,75
	11,2	10	4,3	0,88	4,0	0,83	3,8	0,78	3,7	0,75	3,5	0,73	3,3	0,68
	16,4	15	4,3	0,77	4,0	0,72	3,8	0,68	3,7	0,66	3,5	0,64	3,3	0,60
25%	-13,7	-15	2,1	0,77	2,0	0,72	1,9	0,67	1,8	0,64	1,8	0,62	1,6	0,57
	-9,5	-10	2,1	0,67	2,0	0,63	1,9	0,58	1,8	0,56	1,8	0,54	1,6	0,51
	-4,4	-5	2,1	0,58	2,0	0,54	1,9	0,51	1,8	0,50	1,8	0,47	1,6	0,44
	0,7	0	2,1	0,50	2,0	0,47	1,9	0,44	1,8	0,43	1,8	0,41	1,6	0,39
	5,9	5	2,1	0,43	2,0	0,41	1,9	0,39	1,8	0,38	1,8	0,36	1,6	0,34
	7,0	6	2,1	0,42	2,0	0,40	1,9	0,38	1,8	0,37	1,8	0,36	1,6	0,33
	11,2	10	2,1	0,38	2,0	0,35	1,9	0,33	1,8	0,33	1,8	0,32	1,6	0,30
	16,4	15	2,1	0,33	2,0	0,32	1,9	0,29	1,8	0,29	1,8	0,27	1,6	0,27

kWr = Gross heating capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D90

% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	6,6	2,00	6,6	2,07	6,5	2,14	6,5	2,18	6,5	2,21	6,5	2,28
	-9,5	-10	7,4	2,14	7,3	2,20	7,3	2,27	7,3	2,30	7,3	2,33	7,3	2,40
	-4,4	-5	8,3	2,28	8,3	2,25	8,3	2,39	8,3	2,42	8,3	2,45	8,1	2,45
	0,7	0	9,4	2,41	9,4	2,52	9,4	2,50	9,2	2,45	8,9	2,32	8,2	2,10
	5,9	5	10,6	2,44	10,0	2,28	9,4	2,12	9,1	2,04	8,8	1,96	8,2	1,80
	7,0	6	10,6	2,37	10,0	2,21	9,4	2,05	9,1	1,97	8,8	1,90	8,2	1,74
	11,2	10	10,6	2,09	10,0	1,95	9,4	1,81	9,1	1,74	8,8	1,68	8,2	1,55
	16,4	15	10,6	1,78	10,0	1,67	9,4	1,55	9,1	1,50	8,8	1,44	8,2	1,34
75%	-13,7	-15	6,5	2,30	6,4	2,30	6,3	2,30	6,2	2,30	6,2	2,30	6,1	2,31
	-9,5	-10	7,1	2,30	7,0	2,30	6,9	2,31	6,8	2,31	6,6	2,22	6,2	2,04
	-4,4	-5	7,8	2,31	7,5	2,23	7,1	2,07	6,8	1,99	6,6	1,91	6,2	1,76
	0,7	0	7,9	2,04	7,5	1,90	7,1	1,77	6,8	1,70	6,6	1,64	6,2	1,51
	5,9	5	7,9	1,74	7,5	1,63	7,1	1,52	6,8	1,47	6,6	1,41	6,2	1,31
	7,0	6	7,9	1,69	7,5	1,58	7,1	1,47	6,8	1,42	6,6	1,37	6,2	1,27
	11,2	10	7,9	1,50	7,5	1,41	7,1	1,31	6,8	1,27	6,6	1,22	6,2	1,14
	16,4	15	7,9	1,30	7,5	1,22	7,1	1,14	6,8	1,10	6,6	1,07	6,2	0,99
50%	-13,7	-15	5,3	2,03	5,0	1,89	4,7	1,75	4,5	1,69	4,4	1,62	4,1	1,50
	-9,5	-10	5,3	1,77	5,0	1,65	4,7	1,54	4,5	1,48	4,4	1,42	4,1	1,31
	-4,4	-5	5,3	1,53	5,0	1,43	4,7	1,33	4,5	1,29	4,4	1,24	4,1	1,15
	0,7	0	5,3	1,32	5,0	1,23	4,7	1,15	4,5	1,11	4,4	1,07	4,1	1,00
	5,9	5	5,3	1,14	5,0	1,07	4,7	1,00	4,5	0,97	4,4	0,94	4,1	0,87
	7,0	6	5,3	1,11	5,0	1,04	4,7	0,98	4,5	0,94	4,4	0,91	4,1	0,85
	11,2	10	5,3	0,99	5,0	0,93	4,7	0,88	4,5	0,85	4,4	0,82	4,1	0,77
	16,4	15	5,3	0,87	5,0	0,82	4,7	0,77	4,5	0,75	4,4	0,73	4,1	0,68
25%	-13,7	-15	2,6	0,87	2,5	0,81	2,4	0,75	2,3	0,73	2,2	0,70	2,0	0,65
	-9,5	-10	2,6	0,76	2,5	0,71	2,4	0,66	2,3	0,64	2,2	0,62	2,0	0,57
	-4,4	-5	2,6	0,66	2,5	0,62	2,4	0,57	2,3	0,56	2,2	0,54	2,0	0,50
	0,7	0	2,6	0,57	2,5	0,53	2,4	0,50	2,3	0,48	2,2	0,47	2,0	0,44
	5,9	5	2,6	0,49	2,5	0,46	2,4	0,44	2,3	0,43	2,2	0,41	2,0	0,38
	7,0	6	2,6	0,48	2,5	0,45	2,4	0,44	2,3	0,42	2,2	0,40	2,0	0,37
	11,2	10	2,6	0,43	2,5	0,40	2,4	0,38	2,3	0,38	2,2	0,36	2,0	0,34
	16,4	15	2,6	0,37	2,5	0,36	2,4	0,33	2,3	0,33	2,2	0,31	2,0	0,30

kWr = Gross heating capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D112

% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	9,1	3,40	9,0	3,52	9,0	3,64	9,0	3,71	9,0	3,77	8,9	3,89
	-9,5	-10	10,1	3,64	10,1	3,75	10,1	3,86	10,0	3,92	10,0	3,97	10,0	4,08
	-4,4	-5	11,4	3,88	11,4	3,83	11,4	4,07	11,4	4,12	11,4	4,17	11,2	4,18
	0,7	0	13,0	4,10	13,0	4,29	12,9	4,26	12,7	4,17	12,2	3,95	11,3	3,58
	5,9	5	14,5	4,16	13,7	3,89	12,9	3,60	12,5	3,47	12,1	3,33	11,3	3,06
	7,0	6	14,5	4,04	13,7	3,76	12,9	3,49	12,5	3,36	12,1	3,23	11,3	2,97
	11,2	10	14,5	3,55	13,7	3,32	12,9	3,08	12,5	2,96	12,1	2,85	11,3	2,63
	16,4	15	14,5	3,04	13,7	2,84	12,9	2,64	12,5	2,55	12,1	2,45	11,3	2,28
75%	-13,7	-15	8,9	3,91	8,8	3,91	8,6	3,91	8,6	3,91	8,5	3,92	8,4	3,92
	-9,5	-10	9,7	3,92	9,6	3,92	9,4	3,93	9,4	3,93	9,1	3,78	8,4	3,47
	-4,4	-5	10,7	3,93	10,3	3,80	9,7	3,52	9,4	3,39	9,1	3,25	8,4	2,99
	0,7	0	10,9	3,47	10,3	3,23	9,7	3,01	9,4	2,90	9,1	2,78	8,4	2,57
	5,9	5	10,9	2,97	10,3	2,78	9,7	2,59	9,4	2,50	9,1	2,41	8,4	2,22
	7,0	6	10,9	2,88	10,3	2,69	9,7	2,51	9,4	2,42	9,1	2,34	8,4	2,16
	11,2	10	10,9	2,56	10,3	2,39	9,7	2,24	9,4	2,16	9,1	2,08	8,4	1,93
	16,4	15	10,9	2,21	10,3	2,08	9,7	1,94	9,4	1,88	9,1	1,81	8,4	1,69
50%	-13,7	-15	7,3	3,46	6,9	3,22	6,5	2,99	6,2	2,88	6,0	2,76	5,6	2,55
	-9,5	-10	7,3	3,01	6,9	2,81	6,5	2,61	6,2	2,52	6,0	2,42	5,6	2,24
	-4,4	-5	7,3	2,60	6,9	2,43	6,5	2,27	6,2	2,19	6,0	2,11	5,6	1,95
	0,7	0	7,3	2,24	6,9	2,10	6,5	1,96	6,2	1,90	6,0	1,83	5,6	1,70
	5,9	5	7,3	1,94	6,9	1,82	6,5	1,71	6,2	1,65	6,0	1,60	5,6	1,49
	7,0	6	7,3	1,89	6,9	1,77	6,5	1,66	6,2	1,61	6,0	1,56	5,6	1,45
	11,2	10	7,3	1,69	6,9	1,59	6,5	1,50	6,2	1,45	6,0	1,40	5,6	1,31
	16,4	15	7,3	1,48	6,9	1,39	6,5	1,31	6,2	1,27	6,0	1,24	5,6	1,16
25%	-13,7	-15	3,6	1,71	3,4	1,60	3,2	1,49	3,1	1,44	3,0	1,38	2,8	1,28
	-9,5	-10	3,6	1,50	3,4	1,41	3,2	1,30	3,1	1,26	3,0	1,22	2,8	1,13
	-4,4	-5	3,6	1,29	3,4	1,21	3,2	1,13	3,1	1,11	3,0	1,05	2,8	0,98
	0,7	0	3,6	1,12	3,4	1,05	3,2	0,98	3,1	0,95	3,0	0,92	2,8	0,86
	5,9	5	3,6	0,97	3,4	0,91	3,2	0,87	3,1	0,84	3,0	0,81	2,8	0,75
	7,0	6	3,6	0,94	3,4	0,88	3,2	0,86	3,1	0,83	3,0	0,80	2,8	0,74
	11,2	10	3,6	0,84	3,4	0,79	3,2	0,74	3,1	0,75	3,0	0,71	2,8	0,66
	16,4	15	3,6	0,73	3,4	0,70	3,2	0,65	3,1	0,64	3,0	0,60	2,8	0,60

kWr = Gross heating capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D160

% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	11,9	4,65	11,9	4,81	11,8	4,98	11,8	5,07	11,8	5,15	11,8	5,31
	-9,5	-10	13,3	4,98	13,3	5,13	13,3	5,28	13,2	5,35	13,2	5,43	13,2	5,58
	-4,4	-5	15,1	5,30	15,0	5,24	15,0	5,57	15,0	5,63	15,0	5,69	14,7	5,71
	0,7	0	17,1	5,60	17,1	5,86	17,0	5,83	16,7	5,70	16,0	5,39	14,8	4,89
	5,9	5	19,1	5,68	18,1	5,31	17,0	4,93	16,5	4,74	15,9	4,55	14,8	4,19
	7,0	6	19,2	5,53	18,1	5,14	17,0	4,77	16,5	4,59	15,9	4,41	14,8	4,06
	11,2	10	19,2	4,86	18,1	4,53	17,0	4,21	16,5	4,05	15,9	3,90	14,8	3,60
	16,4	15	19,2	4,15	18,1	3,88	17,0	3,61	16,5	3,49	15,9	3,35	14,8	3,11
75%	-13,7	-15	11,7	5,34	11,5	5,34	11,4	5,35	11,3	5,35	11,2	5,35	11,0	5,36
	-9,5	-10	12,8	5,36	12,6	5,36	12,4	5,37	12,3	5,38	11,9	5,16	11,1	4,74
	-4,4	-5	14,1	5,37	13,6	5,19	12,8	4,81	12,3	4,63	11,9	4,44	11,1	4,09
	0,7	0	14,4	4,74	13,6	4,42	12,8	4,11	12,3	3,96	11,9	3,81	11,1	3,51
	5,9	5	14,4	4,06	13,6	3,80	12,8	3,54	12,3	3,41	11,9	3,29	11,1	3,04
	7,0	6	14,4	3,93	13,6	3,68	12,8	3,43	12,3	3,31	11,9	3,19	11,1	2,95
	11,2	10	14,4	3,49	13,6	3,27	12,8	3,06	12,3	2,95	11,9	2,85	11,1	2,64
	16,4	15	14,4	3,02	13,6	2,84	12,8	2,66	12,3	2,57	11,9	2,48	11,1	2,31
50%	-13,7	-15	9,6	4,72	9,0	4,40	8,5	4,08	8,2	3,93	7,9	3,78	7,4	3,48
	-9,5	-10	9,6	4,11	9,0	3,84	8,5	3,57	8,2	3,44	7,9	3,31	7,4	3,06
	-4,4	-5	9,6	3,55	9,0	3,33	8,5	3,10	8,2	2,99	7,9	2,88	7,4	2,67
	0,7	0	9,6	3,06	9,0	2,87	8,5	2,68	8,2	2,59	7,9	2,50	7,4	2,32
	5,9	5	9,6	2,65	9,0	2,49	8,5	2,33	8,2	2,26	7,9	2,18	7,4	2,03
	7,0	6	9,6	2,58	9,0	2,42	8,5	2,27	8,2	2,20	7,9	2,13	7,4	1,98
	11,2	10	9,6	2,31	9,0	2,17	8,5	2,04	8,2	1,98	7,9	1,91	7,4	1,79
	16,4	15	9,6	2,02	9,0	1,91	8,5	1,80	8,2	1,74	7,9	1,69	7,4	1,58
25%	-13,7	-15	4,8	2,02	4,5	1,89	4,3	1,75	4,1	1,69	4,0	1,63	3,7	1,51
	-9,5	-10	4,8	1,77	4,5	1,66	4,3	1,54	4,1	1,49	4,0	1,44	3,7	1,33
	-4,4	-5	4,8	1,53	4,5	1,43	4,3	1,33	4,1	1,30	4,0	1,25	3,7	1,16
	0,7	0	4,8	1,32	4,5	1,24	4,3	1,16	4,1	1,12	4,0	1,08	3,7	1,02
	5,9	5	4,8	1,14	4,5	1,07	4,3	1,02	4,1	0,99	4,0	0,96	3,7	0,88
	7,0	6	4,8	1,11	4,5	1,04	4,3	1,01	4,1	0,97	4,0	0,94	3,7	0,87
	11,2	10	4,8	0,99	4,5	0,94	4,3	0,88	4,1	0,88	4,0	0,83	3,7	0,78
	16,4	15	4,8	0,86	4,5	0,83	4,3	0,77	4,1	0,76	4,0	0,72	3,7	0,70

kW_r = Gross heating capacity [kW]
 kW_e = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D200

% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	15,5	5,92	15,4	6,14	15,4	6,35	15,4	6,46	15,4	6,56	15,3	6,77
	-9,5	-10	17,3	6,35	17,3	6,54	17,3	6,73	17,2	6,82	17,2	6,92	17,1	7,11
	-4,4	-5	19,6	6,76	19,5	6,67	19,5	7,09	19,5	7,17	19,5	7,26	19,1	7,28
	0,7	0	22,2	7,13	22,2	7,47	22,1	7,43	21,7	7,26	20,8	6,88	19,3	6,24
	5,9	5	24,8	7,24	23,5	6,77	22,1	6,28	21,4	6,04	20,7	5,80	19,3	5,34
	7,0	6	24,9	7,04	23,5	6,55	22,1	6,08	21,4	5,85	20,7	5,62	19,3	5,17
	11,2	10	24,9	6,19	23,5	5,78	22,1	5,37	21,4	5,17	20,7	4,97	19,3	4,59
	16,4	15	24,9	5,29	23,5	4,95	22,1	4,61	21,4	4,44	20,7	4,28	19,3	3,96
75%	-13,7	-15	15,3	6,81	15,0	6,81	14,8	6,82	14,7	6,82	14,5	6,82	14,3	6,84
	-9,5	-10	16,6	6,83	16,4	6,84	16,2	6,84	16,0	6,85	15,5	6,58	14,5	6,04
	-4,4	-5	18,3	6,84	17,6	6,61	16,6	6,13	16,0	5,90	15,5	5,66	14,5	5,21
	0,7	0	18,7	6,04	17,6	5,63	16,6	5,24	16,0	5,05	15,5	4,85	14,5	4,48
	5,9	5	18,7	5,17	17,6	4,84	16,6	4,51	16,0	4,35	15,5	4,19	14,5	3,88
	7,0	6	18,7	5,01	17,6	4,69	16,6	4,37	16,0	4,22	15,5	4,07	14,5	3,76
	11,2	10	18,7	4,45	17,6	4,17	16,6	3,90	16,0	3,76	15,5	3,63	14,5	3,37
	16,4	15	18,7	3,85	17,6	3,62	16,6	3,39	16,0	3,27	15,5	3,16	14,5	2,95
50%	-13,7	-15	12,5	6,02	11,8	5,61	11,1	5,20	10,7	5,01	10,3	4,82	9,6	4,44
	-9,5	-10	12,5	5,24	11,8	4,89	11,1	4,55	10,7	4,39	10,3	4,22	9,6	3,90
	-4,4	-5	12,5	4,53	11,8	4,24	11,1	3,95	10,7	3,81	10,3	3,67	9,6	3,40
	0,7	0	12,5	3,90	11,8	3,66	11,1	3,42	10,7	3,30	10,3	3,19	9,6	2,96
	5,9	5	12,5	3,38	11,8	3,18	11,1	2,98	10,7	2,88	10,3	2,78	9,6	2,59
	7,0	6	12,5	3,29	11,8	3,09	11,1	2,90	10,7	2,80	10,3	2,71	9,6	2,52
	11,2	10	12,5	2,94	11,8	2,77	11,1	2,60	10,7	2,52	10,3	2,44	9,6	2,28
	16,4	15	12,5	2,58	11,8	2,43	11,1	2,29	10,7	2,22	10,3	2,15	9,6	2,01
25%	-13,7	-15	6,2	2,98	5,9	2,79	5,5	2,59	5,3	2,50	5,1	2,41	4,8	2,23
	-9,5	-10	6,2	2,61	5,9	2,45	5,5	2,27	5,3	2,19	5,1	2,12	4,8	1,97
	-4,4	-5	6,2	2,25	5,9	2,11	5,5	1,97	5,3	1,93	5,1	1,84	4,8	1,71
	0,7	0	6,2	1,94	5,9	1,82	5,5	1,71	5,3	1,65	5,1	1,60	4,8	1,50
	5,9	5	6,2	1,69	5,9	1,58	5,5	1,51	5,3	1,46	5,1	1,41	4,8	1,30
	7,0	6	6,2	1,64	5,9	1,54	5,5	1,50	5,3	1,44	5,1	1,39	4,8	1,29
	11,2	10	6,2	1,47	5,9	1,38	5,5	1,30	5,3	1,30	5,1	1,23	4,8	1,16
	16,4	15	6,2	1,27	5,9	1,23	5,5	1,14	5,3	1,12	5,1	1,05	4,8	1,04

kWr = Gross heating capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Performance in Heating

Size D250

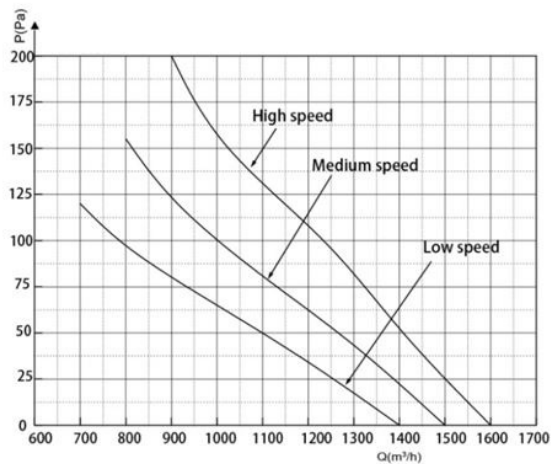
% load	Indoor air temperature D.B. (°C)													
	Outdoor air temperature (°C)		16		18		20		21		22		24	
	D.B.	W.B.	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe	kWr	kWe
100%	-13,7	-15	19,7	6,57	19,6	6,81	19,5	7,05	19,5	7,17	19,5	7,28	19,4	7,52
	-9,5	-10	22,0	7,05	21,9	7,26	21,9	7,47	21,9	7,57	21,9	7,68	21,8	7,89
	-4,4	-5	24,9	7,50	24,8	7,41	24,8	7,88	24,7	7,96	24,7	8,06	24,3	8,08
	0,7	0	28,2	7,92	28,2	8,29	28,1	8,25	27,6	8,06	26,5	7,63	24,5	6,92
	5,9	5	31,6	8,04	29,9	7,52	28,1	6,97	27,2	6,71	26,3	6,44	24,5	5,93
	7,0	6	31,7	7,82	29,9	7,28	28,1	6,75	27,2	6,50	26,3	6,24	24,5	5,74
	11,2	10	31,7	6,87	29,9	6,41	28,1	5,96	27,2	5,73	26,3	5,52	24,5	5,09
	16,4	15	31,7	5,88	29,9	5,49	28,1	5,11	27,2	4,93	26,3	4,75	24,5	4,40
75%	-13,7	-15	19,4	7,56	19,1	7,56	18,8	7,57	18,7	7,57	18,5	7,58	18,2	7,59
	-9,5	-10	21,1	7,58	20,8	7,59	20,5	7,60	20,4	7,61	19,7	7,31	18,4	6,71
	-4,4	-5	23,2	7,59	22,4	7,34	21,1	6,80	20,4	6,55	19,7	6,29	18,4	5,79
	0,7	0	23,8	6,71	22,4	6,25	21,1	5,82	20,4	5,61	19,7	5,39	18,4	4,97
	5,9	5	23,8	5,74	22,4	5,37	21,1	5,01	20,4	4,83	19,7	4,65	18,4	4,30
	7,0	6	23,8	5,57	22,4	5,21	21,1	4,86	20,4	4,69	19,7	4,52	18,4	4,18
	11,2	10	23,8	4,94	22,4	4,63	21,1	4,33	20,4	4,17	19,7	4,03	18,4	3,74
	16,4	15	23,8	4,27	22,4	4,01	21,1	3,76	20,4	3,63	19,7	3,51	18,4	3,27
50%	-13,7	-15	15,8	6,68	14,9	6,22	14,1	5,78	13,6	5,56	13,1	5,35	12,2	4,93
	-9,5	-10	15,8	5,82	14,9	5,43	14,1	5,06	13,6	4,87	13,1	4,69	12,2	4,33
	-4,4	-5	15,8	5,03	14,9	4,71	14,1	4,39	13,6	4,23	13,1	4,08	12,2	3,78
	0,7	0	15,8	4,33	14,9	4,06	14,1	3,80	13,6	3,67	13,1	3,54	12,2	3,29
	5,9	5	15,8	3,75	14,9	3,53	14,1	3,30	13,6	3,20	13,1	3,09	12,2	2,88
	7,0	6	15,8	3,65	14,9	3,43	14,1	3,21	13,6	3,11	13,1	3,01	12,2	2,80
	11,2	10	15,8	3,27	14,9	3,08	14,1	2,89	13,6	2,80	13,1	2,71	12,2	2,53
	16,4	15	15,8	2,86	14,9	2,70	14,1	2,54	13,6	2,46	13,1	2,39	12,2	2,24
25%	-13,7	-15	7,9	3,31	7,5	3,09	7,0	2,87	6,8	2,78	6,5	2,67	6,1	2,47
	-9,5	-10	7,9	2,90	7,5	2,72	7,0	2,52	6,8	2,44	6,5	2,35	6,1	2,18
	-4,4	-5	7,9	2,50	7,5	2,34	7,0	2,19	6,8	2,14	6,5	2,04	6,1	1,90
	0,7	0	7,9	2,16	7,5	2,02	7,0	1,89	6,8	1,84	6,5	1,78	6,1	1,67
	5,9	5	7,9	1,87	7,5	1,76	7,0	1,68	6,8	1,62	6,5	1,57	6,1	1,45
	7,0	6	7,9	1,82	7,5	1,71	7,0	1,66	6,7	1,60	6,5	1,54	6,1	1,43
	11,2	10	7,9	1,63	7,5	1,53	7,0	1,44	6,7	1,44	6,5	1,37	6,1	1,29
	16,4	15	7,9	1,41	7,5	1,36	7,0	1,26	6,7	1,25	6,5	1,17	6,1	1,16

kWr = Gross heating capacity [kW]
 kWe = Compressor + Outdoor fan power input [kW]
 D.B. = Dry bulb
 W.B. = Wet bulb

Supply air fans performance (indoor unit)

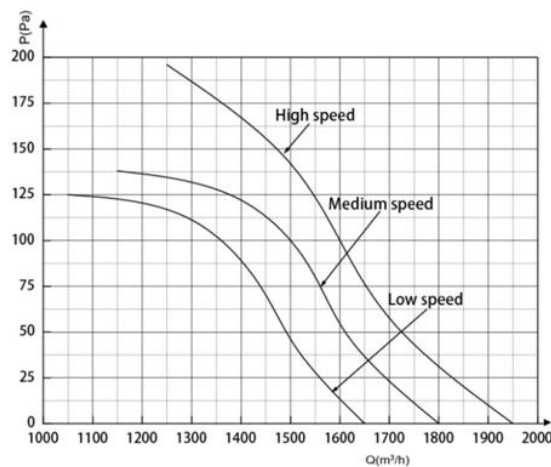
These are the available static pressure range, where the unit can stably operate. For the optimal static pressure range please refer to the Installation Manual. Selecting a unit not in the optimal range, risks of higher noise levels, lower airflows and similar should be considered.

Size D71



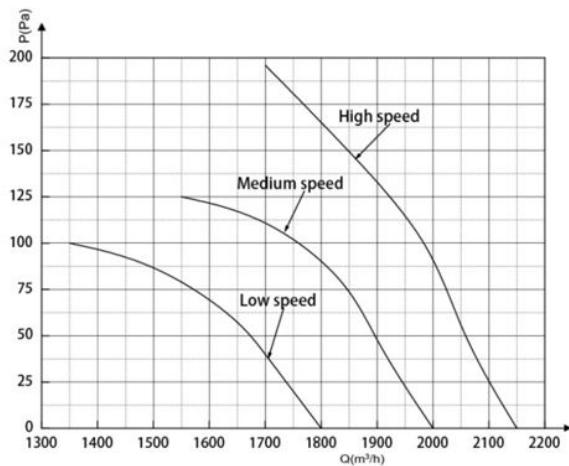
Q = Air flow [m³/h]
P = Available static pressure [Pa]

Size D90



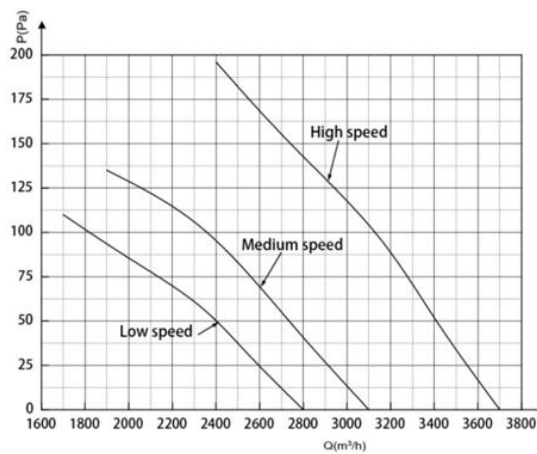
Q = Air flow [m³/h]
P = Available static pressure [Pa]

Size D112



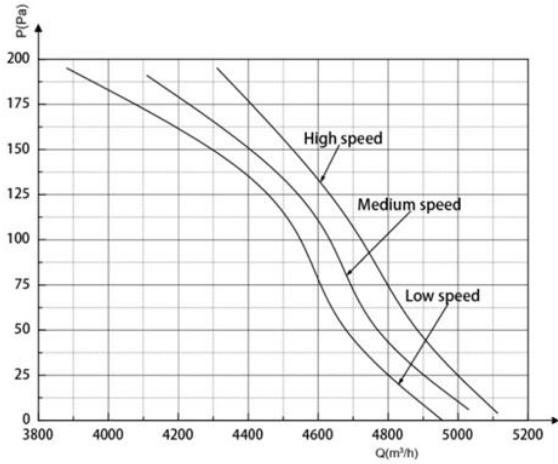
Q = Air flow [m³/h]
P = Available static pressure [Pa]

Size D160



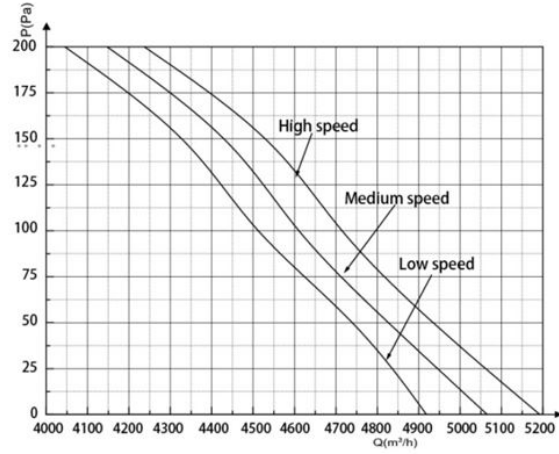
Q = Air flow [m³/h]
P = Available static pressure [Pa]

Size D200



Q = Air flow [m³/h]
P = Available static pressure [Pa]

Size D250



Q = Air flow [m³/h]
P = Available static pressure [Pa]

Notes:
If the static pressure drop is too high, for example due to extensive ducting, the air flow at each outlet could be reduced to insufficient levels. There's an airflow range for each fan speed. Operating at minimum values continuously, indoor evaporator may start safety protection by low temperature. At maximum values, it is requested to connect duct for air inlet and outlet in order to prevent damage from the high temperature of motor and evaporator.

Outdoor unit standard accessories

Accessory	Picture	Quantity
Installation and Owner's manual		1
Water outlet connection pipe		1
Sealing ring		1
Connection pipe (only for 260T)		1
Connection pipe (only for 260T)		1

Indoor unit standard accessories

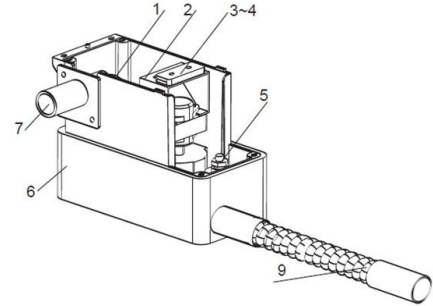
Accessory		Description	Picture	Quantity
Installation and owner's manual		-----		1
Wired controller		Wired control for the air-conditioner		1
Pipe insulation material	D71 - D160	Heat insulation		2
	D200 - D250			4
Connection pipe for drain discharge		For drainage		1
Clasp	D71 - D160	Chucking the joint which connect the drain hose and the outlet of indoor unit		1
Water connecting pipe	D200 - D250	To connect drain pipe		2
Adhesive tape		To connect drain pipe		2
Network matching wire	D71 - D160	The indoor unit which at the terminal of communication system should connect a impedance between port P and port Q		1
	D200 - D250			2
Copper nut	D71 - D160	Use for pipe connection		1
	D200 - D250			2
EXV connecting pipe ass'y	D200 - D250	To connect the throttle components.		2
Spring	D200 - D250	To fix display box	-----	1
Branch Joint kit (FQZHN-02D)	D200 - D250	To connect the AB system		2

Separately supplied accessories

SBH-04/SBH-05 - Condensate drain pump (for indoor unit)

Drain Pump Kit with 750 mm maximum pump head for indoor units. It includes a water sensor switch that start and stop the pump when necessary.

SBH-04 for size D71 to D160 and SBH-05 for size D200 to D250.



Model		SBH-04	SBH-05
Shipping weight	[kg]	1,3	5,5
Gross dimensions (W×H×D)	[mm]	300x160x200	552x247x232

RM12A - Infrared remote control

The RM12A infrared remote control allows to remotely manage the functions through a receiver placed in the wired controller. "Follow me" function adjusts the indoor unit's set point following the temperature probe placed inside the infrared control instead of the return air one.

Features:

- Backlit
- User-friendly

Functions:

- On/Off
- Operation selection: Auto, Heating, Cooling, Dehumidification, Ventilation
- Set the fan speed (LOW - MED - HIGH or AUTO)
- Temperature setting (temperature range selectable: 17~30°C)
- Timer setting
- Follow me



Model		RM12A
Shipping weight	[kg]	2,1
Gross dimensions (W×H×D)	[mm]	520x190x420

KJR-86C - Simplified control

The KJR-86C is a simplified controller specifically designed for applications where it's necessary to let end users manage only basic functions of the system. This results interesting specially in crowded applications like Business Centres, Offices, Schools, Leisure Centres and Restaurants.

Features:

- Backlit
- User-friendly
- One-key 26°C button
- Hidden mode-changing: suitable to avoid unwanted Cooling/Heating changes

Functions:

- On/Off
- Operation selection: Auto, Heating, Cooling, Dehumidification, Ventilation
- Set the fan speed (LOW - MED - HIGH or AUTO)
- Temperature setting (temperature range selectable: 17~30°C)
- Timer setting



* the controller has 6m wiring cable standard, maximum allowable wiring distance is 15m

Model		KJR-86C
Shipping weight	[kg]	0,12
Gross dimensions (W×H×D)	[mm]	110x35x110

KJR-120C - Wired control with weekly schedule

Wired controller that controls an indoor unit according to a user-defined weekly schedule. Its display shows the operating status of the indoor unit and is equipped with an LCD backlight to enable use in the dark.

Key features:

- Weekly schedule control: allows users to set up to four scheduled periods per day for frequent adjustments. The unit will operate only at the scheduled times, following the pre-set program
- Delay function: if users have to stay more time than expected in a room, they can press the delay button in order to postpone the system shutdown by 1 or 2 hours
- Error reporting: in case of a malfunction, error codes are displayed in the controller's display
- °C/°F switch: possible to switch between °F and °C by pressing the left-right and up-down buttons simultaneously for three seconds



* the controller has 6m wiring cable standard, maximum allowable wiring distance is 15m

Model		KJR-120C
Shipping weight	[kg]	0,25
Gross dimensions (W×H×D)	[mm]	152x62x152

KJR-150A - Indoor units' group controller

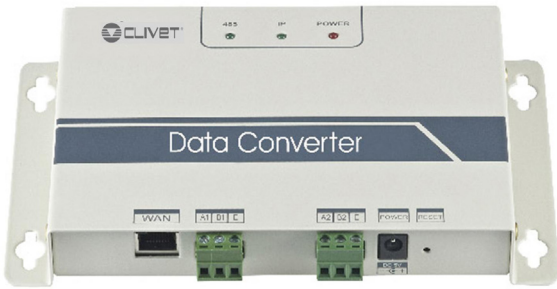
Allows the group control of up to 16 indoor units from a single remote controller like RM12A or wired controller like KJR-29-B, KJR-86C or KJR-120C.

Each unit's operating parameters can also be individually controlled using its own remote controller.



Model		KJR-150A
Shipping weight	[kg]	0,73
Gross dimensions (W×H×D)	[mm]	210x100x175

CCM15 - Data converter



The Data converter allows to remotely manage up to 64 indoor units from a PC, tablet or smartphone through internet. Thanks to the Cloud Server Access it is possible to query and control single unit or groups.

The user can check and set the following functions:

- On/Off mode
- temperature setting
- operating mode
- fan speed selection
- individual or group control
- show the status of each indoor unit and the list of error codes
- weekly timer setting
- lock the operating parameters and the remote controllers

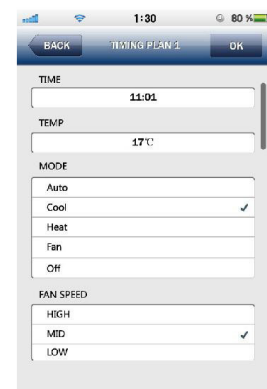
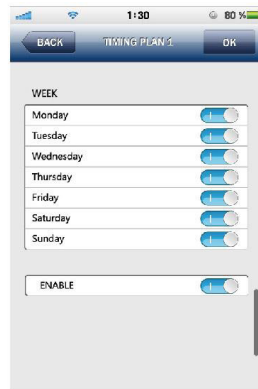
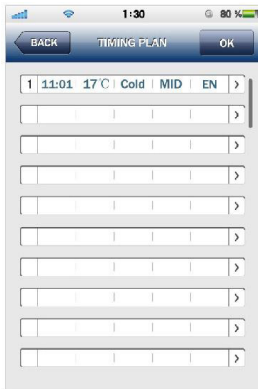
Simple control

- Software, app or cloud server control via WEB with a user-friendly "Click&Operate" interface
- Single or group control
- Full-screen display with temperature adjustment by swiping
- Data conversion between the protocols TCP/IP and RS485
- TCP/IP port for accessing WEB/HTTP/TCP/IP



Weekly schedule control

Users can set a weekly schedule either for single or groups of units: each day may be divided into multiple sections. The controller automatically controls each units' On/Off status, operating mode and temperature settings according to the schedule.



Installation schematic

The Data converter can be connected directly to a network of Indoor/Outdoor units.

Model		CCM15
Shipping weight	[kg]	1
Gross dimensions (W×H×D)	[mm]	280x55x135

Connection to BMS systems

Monitoring and control can be integrated into Building Management Systems (BMS), enabling air conditioning to be monitored alongside lightning, power, fire detection, access and security systems. Full compatibility with the four main BMS protocols via gateway devices: BACnet, Modbus, LonWorks and KNX.

CCM08 - BACnet protocol



Each gateway can be connected either to an indoor unit's XYE ports (up to 256 units) or an outdoor unit's XYE or K1K2E ports (up to 128 units), with built-in IP access.

Wide compatibility

The CCM08 is fully compatible with a wide range of leading Building Management Systems.

	Company	BMS software	Brand
1	Apogee Electronics	APOGEE	
2	Trane	Tracer Summit	
3	Honeywell	Alerton	
4	Schneider	Andover	
5	Johnson	METASYS	

Model		CCM08
Shipping weight	[kg]	5,5
Gross dimensions (W×H×D)	[mm]	415x112x350

CCM18A/CCM18ANU - Modbus protocol



Each gateway can connect up to 16 indoor units (CCM18ANU) or up to 64 indoor units (CCM18A) with BMS through either TCP/IP or RTU. Built-in IP access.

Model		CCM18A/CCM18ANU
Shipping weight	[kg]	1
Gross dimensions (W×H×D)	[mm]	280x55x135

LonGW64 - LowWorks protocol



Each gateway can connect up to 64 indoor units, directly to their XYE ports or through outdoor unit

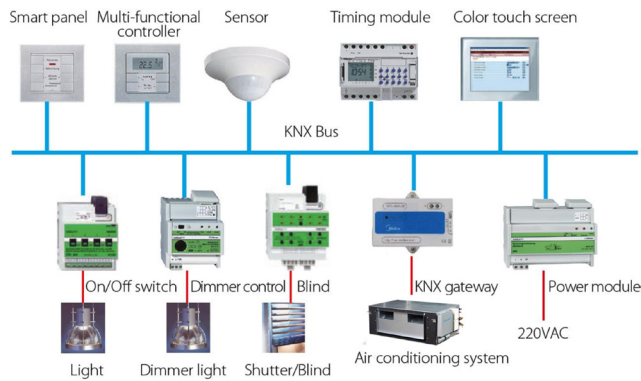
Model		LonGW64
Shipping weight	[kg]	5
Gross dimensions (W×H×D)	[mm]	415x112x350

KNX - KNX protocol



Each gateway doesn't need any external power and can be directly connected to a single indoor unit via XYE port using RS485.

Installation schematic

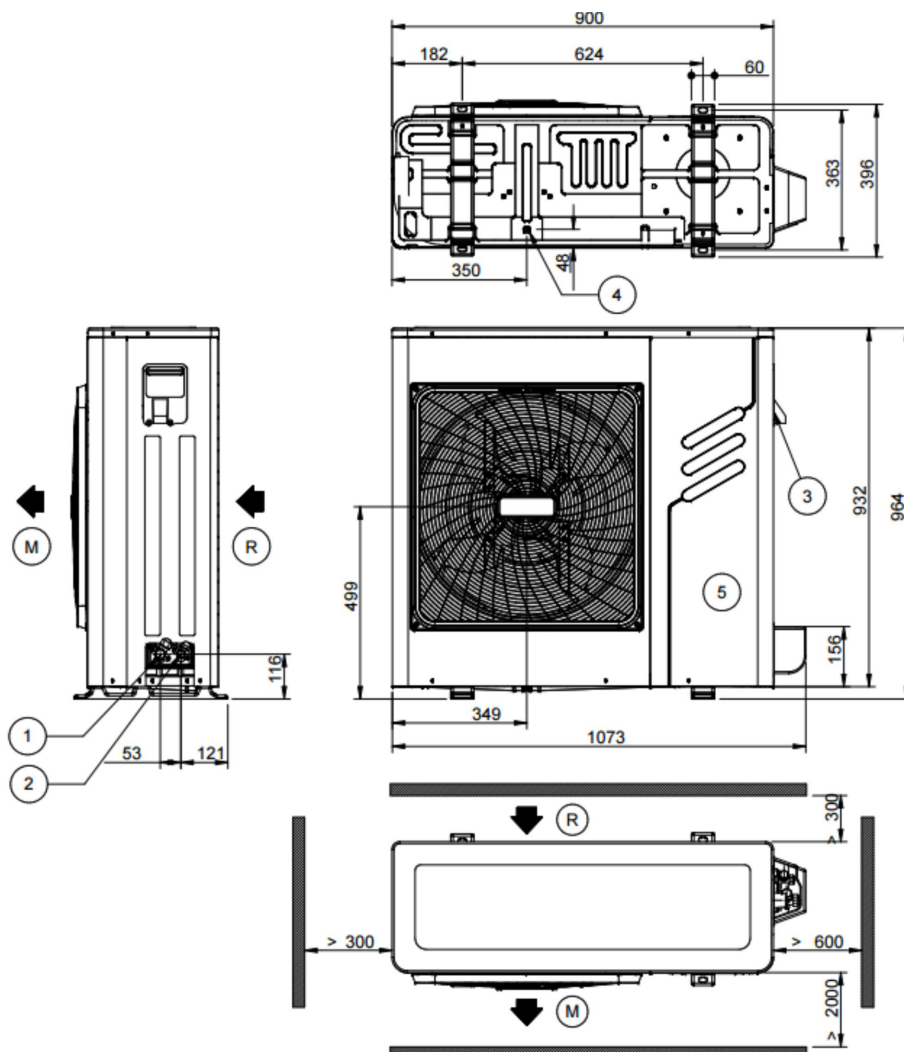


Model		KNX
Shipping weight	[kg]	0,1
Gross dimensions (W×H×D)	[mm]	180x41x145

Dimensional drawings - Outdoor unit (MSAN-XMi)

Size 80M - 105M

DAAMA80M_MSAN-XMi_80M-105M_02
DATA 05/09/2017



- 1. GAS LINE (Ø15,9 mm)
- 2. LIQUID LINE (Ø9,53 mm)
- 3. POWER INPUT
- 4. CONDENSATE DRAIN (Ø16 mm)
- 5. COMPRESSORS ENCLOSURE
- M. AIR SUPPLY
- R. AIR RETURN

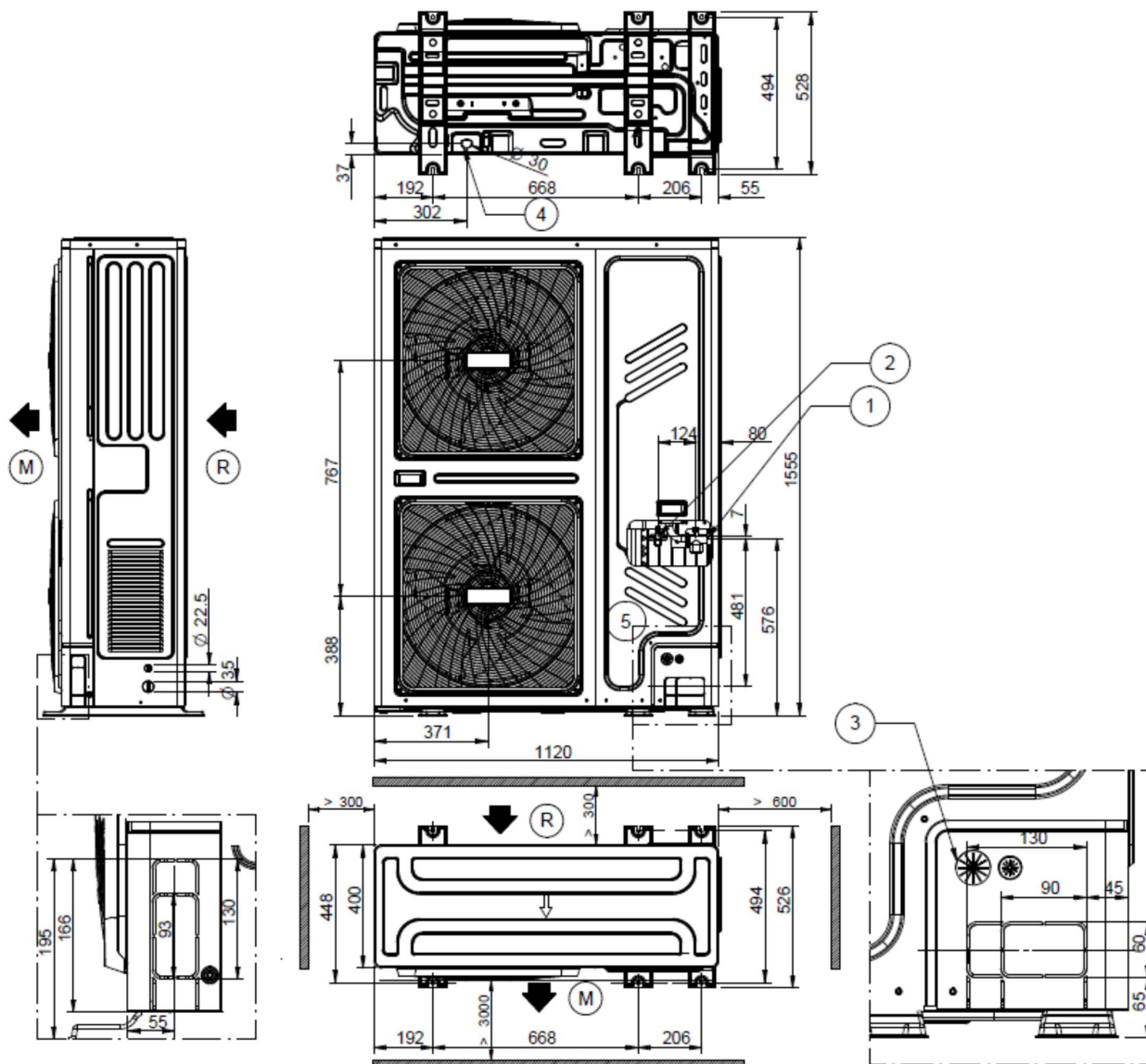
Size		80M	105M
Net weight	kg	75	75
Shipping weight	kg	85	85

Optional accessories may substantially vary the weights shown in the table.

Dimensional drawings - Outdoor unit (MSAN-XMi)

Size 200T - 260T

DAAMA200T_MSAN-XMi_200T-260M_02
DATA 05/09/2017



- 1. GAS LINE (Ø19,1 mm for size 200T; Ø22,2 mm for size 260T)
- 2. LIQUID LINE (Ø9,53 mm)
- 3. POWER INPUT
- 4. CONDENSATE DRAIN (Ø30 mm)
- 5. COMPRESSORS ENCLOSURE
- M. AIR SUPPLY
- R. AIR RETURN

Size		200T	260T
Net weight	kg	137	147
Shipping weight	kg	153	163

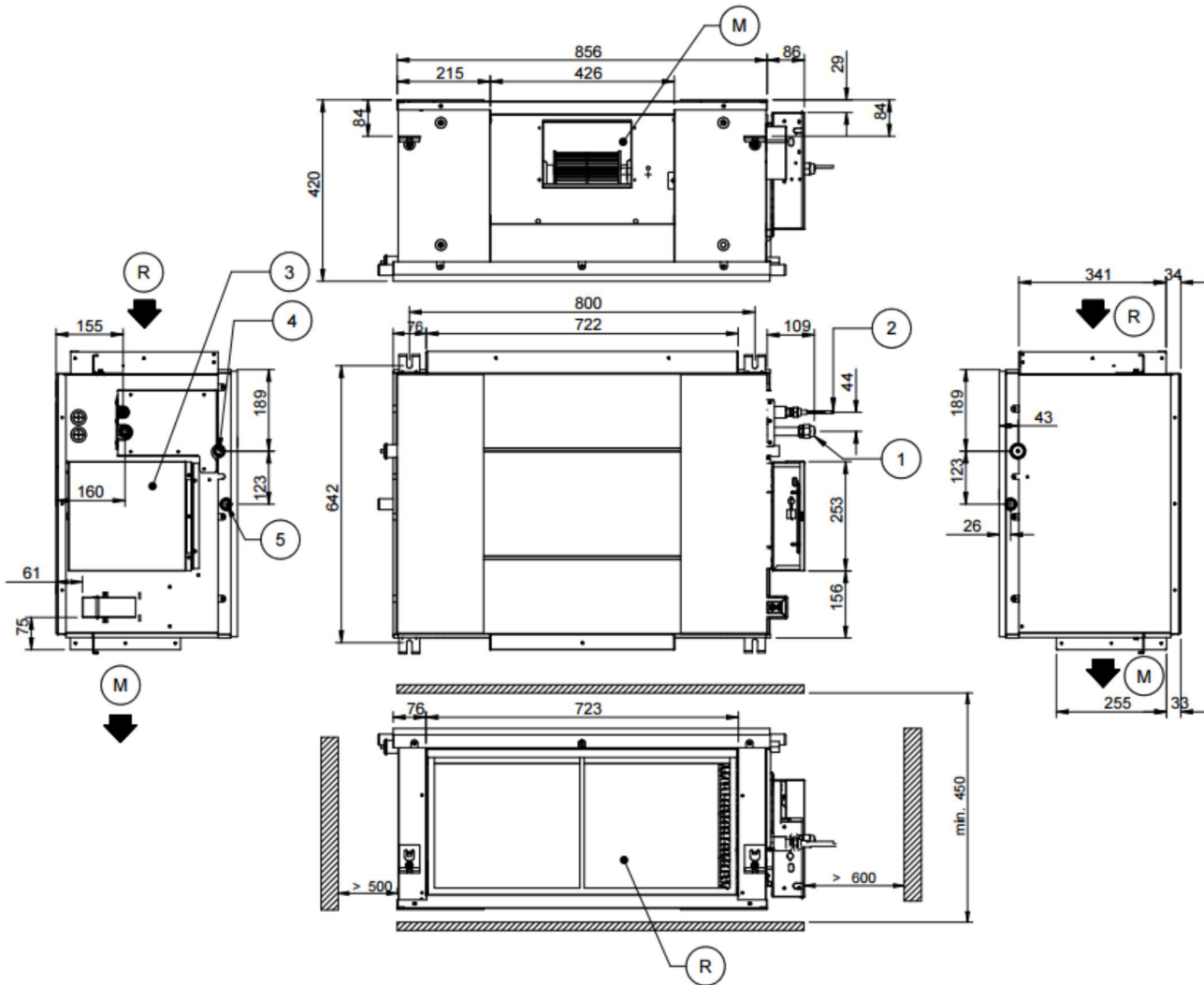
Optional accessories may substantially vary the weights shown in the table.

Dimensional drawings - Indoor unit (CN-XMi)

Size D71 - D90 - D112

[mm]

DAANAD71_CN-XMi_D71-D90-D112_01
DATA 04/09/2017



- 1. GAS LINE (Ø15,9 mm)
- 2. LIQUID LINE (Ø9,53 mm)
- 3. ELECTRICAL PANEL
- 4. CONDENSATE DRAIN (Ø25 mm)
- 5. SAFETY CONDENSATE DRAIN
- M. AIR SUPPLY
- R. AIR RETURN

Size		D71	D90/D112
Net weight	kg	41	47
Shipping weight	kg	47	53

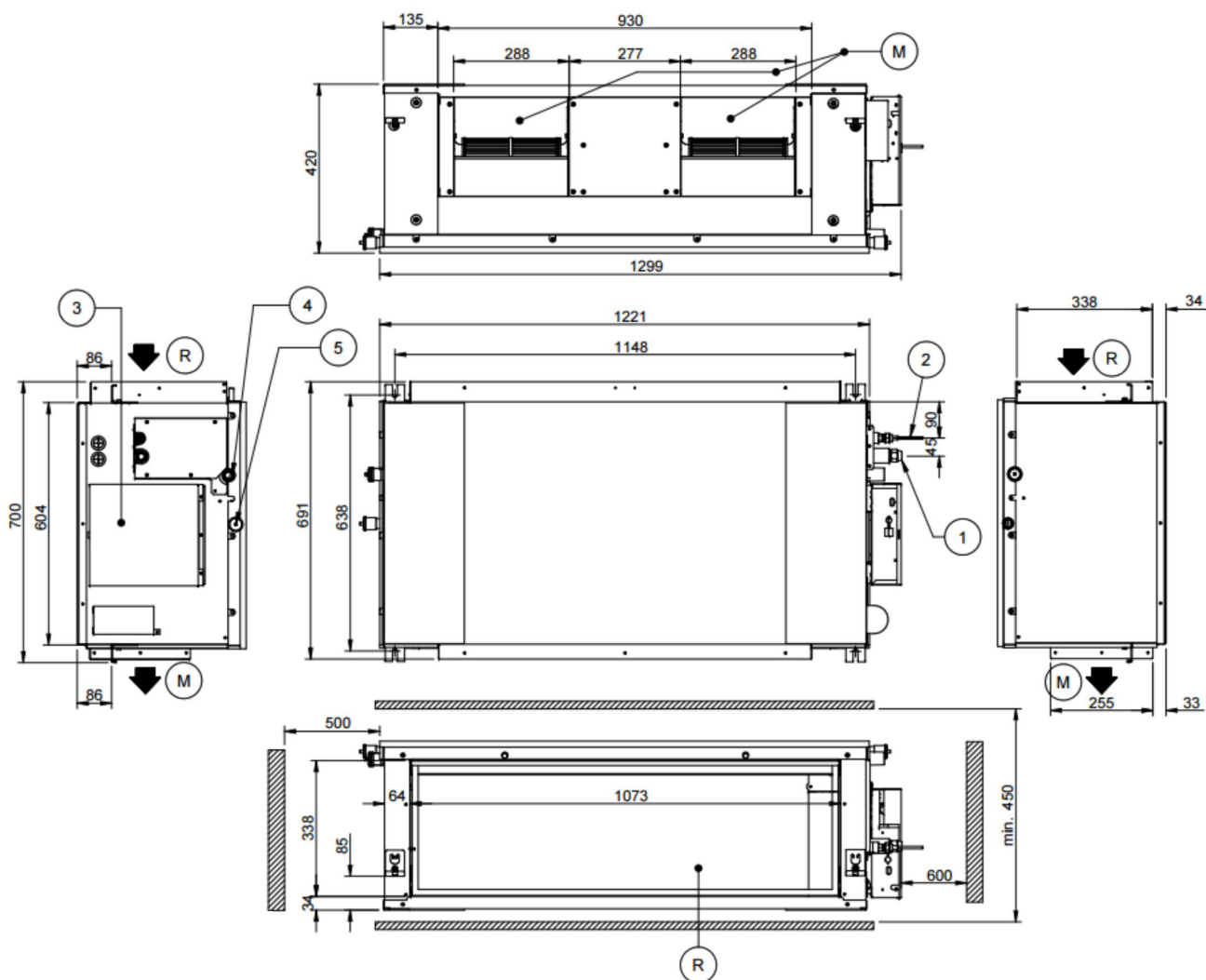
Optional accessories may substantially vary the weights shown in the table

Dimensional drawings - Indoor unit (CN-XMi)

Size D160

[mm]

DAANAD160_CN-XMi_D160_01
DATA 04/09/2017



- 1. GAS LINE (Ø15,9 mm)
- 2. LIQUID LINE (Ø9,53 mm)
- 3. ELECTRICAL PANEL
- 4. CONDENSATE DRAIN (Ø25 mm)
- 5. SAFETY CONDENSATE DRAIN
- M. AIR SUPPLY
- R. AIR RETURN

Size	D160	
Net weight	kg	68
Shipping weight	kg	70

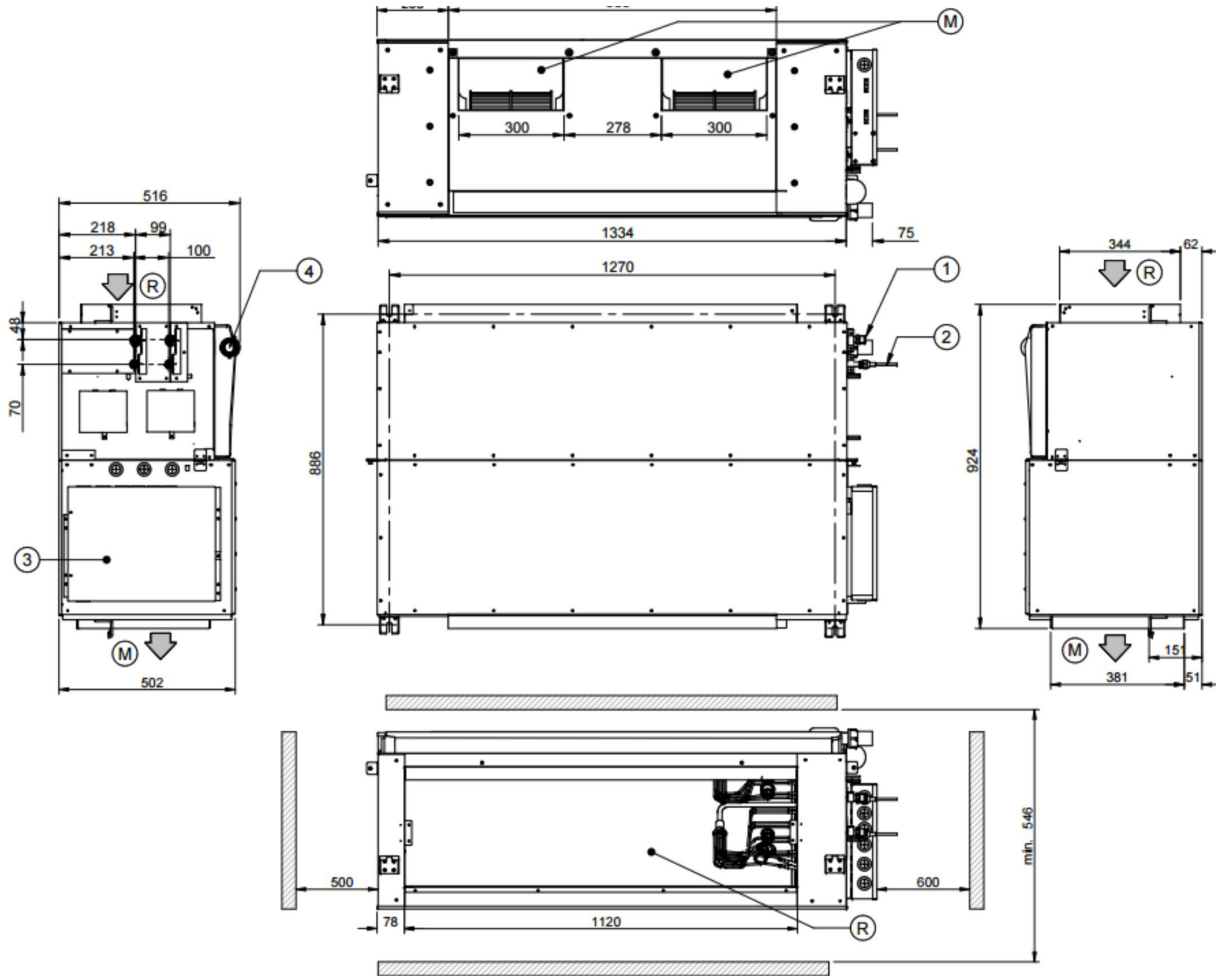
Optional accessories may substantially vary the weights shown in the table

Dimensional drawings - Indoor unit (CN-XMi)

Size D200 - D250

DAANAD200_CN-XMi_D200_D250_01
DATA 04/09/2017

[mm]

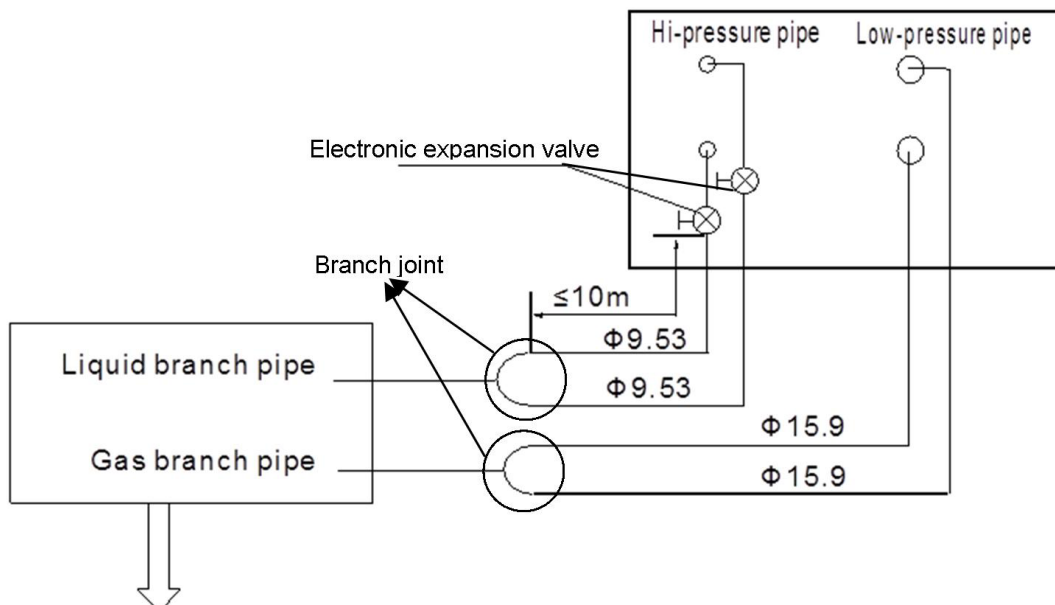


- 1. GAS LINE (nr. 2 x Ø15,9mm)
- 2. LIQUID LINE (nr. 2 x Ø9,53 mm)
- 3. ELECTRICAL PANEL
- 4. CONDENSATE DRAIN (Ø33 mm)
- M. AIR SUPPLY
- R. AIR RETURN

Size	D200/D250	
Net weight	kg	108
Shipping weight	kg	120

Optional accessories may substantially vary the weights shown in the table.

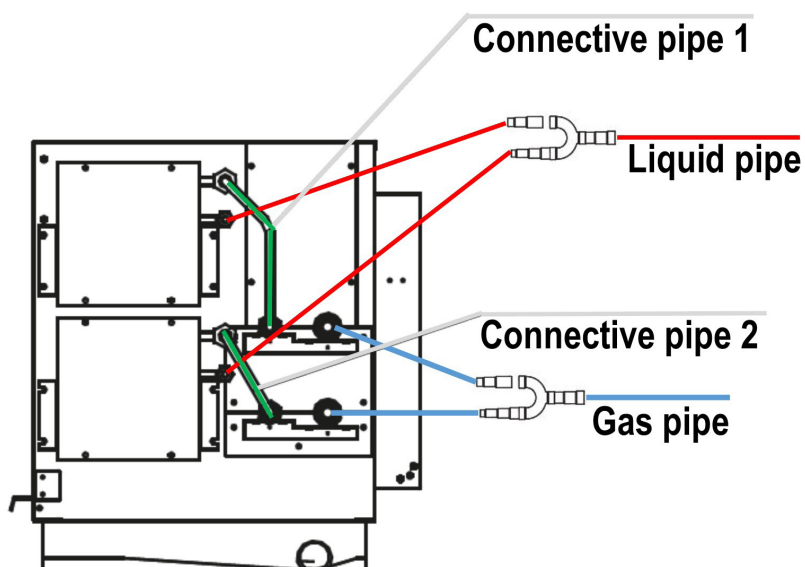
Piping connections



The piping diameter please refer to the manual of the outdoor unit you choose.

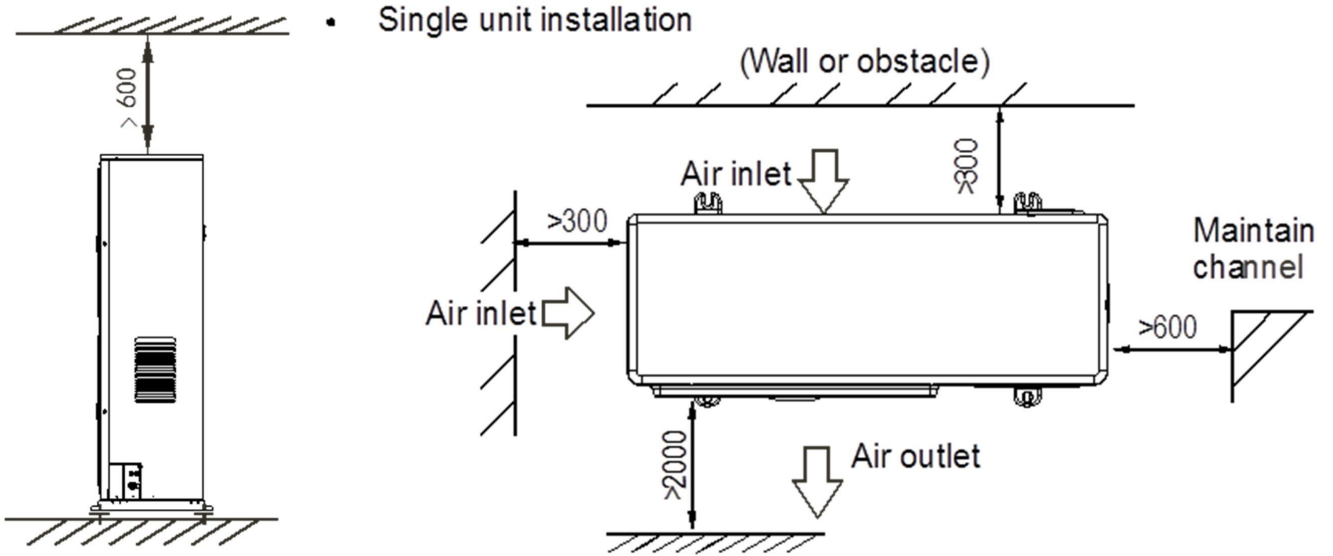
In sizes D200/D250 there are two sets of Electronic Expansion Valve (EXV) boxes and two groups of Gas/Liquid pipes: it's necessary to connect the two gas pipes together with a Branch Joint and the same for the two liquid pipes. According to the outdoor unit piping, the new single gas/liquid pipe connections could be cut to have different diameters.

A branch joint package is standard supplied with these sizes (code: FQZHN-02D): it includes two different branch joints, one for gas and one for liquid. Please check the standard accessory and follow the instruction to install the unit and the piping in the Installation and Owner's Manual.

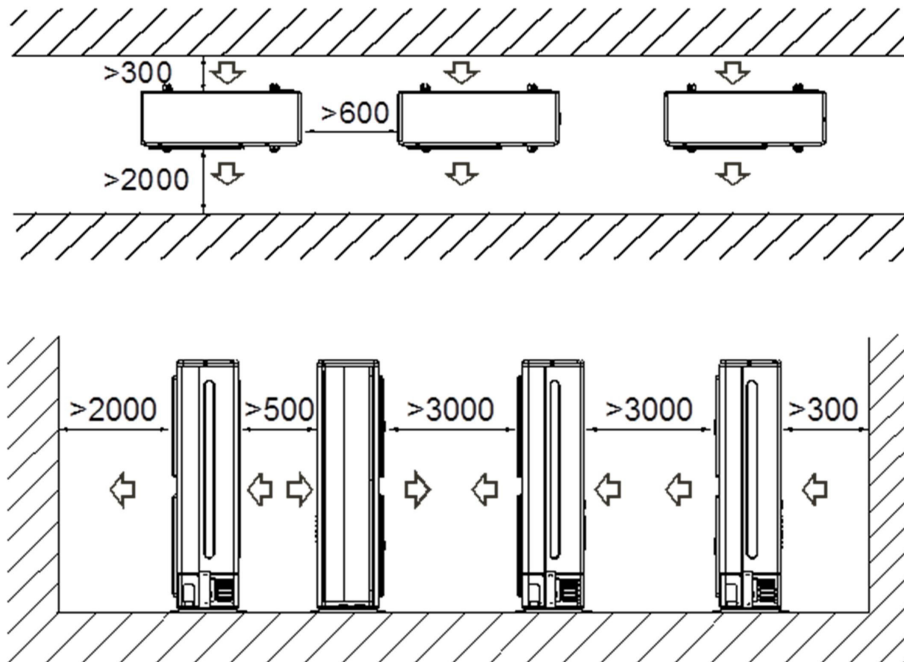


Service space - Outdoor unit (MSAN-XMi)

Single unit installation - Size 80M - 260T

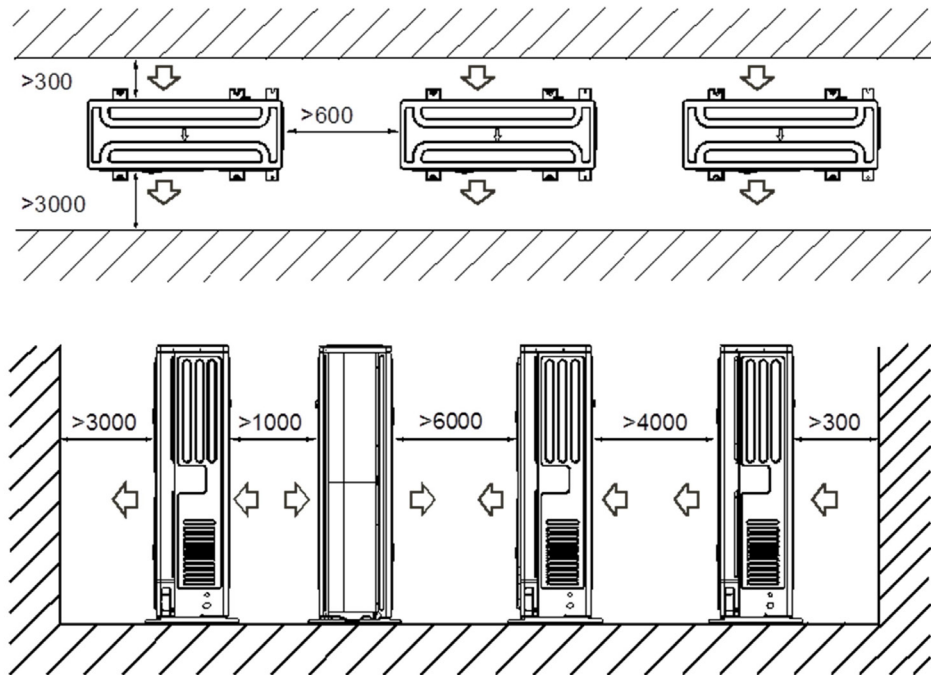


Multiple unit installation - Size 80M - 160T



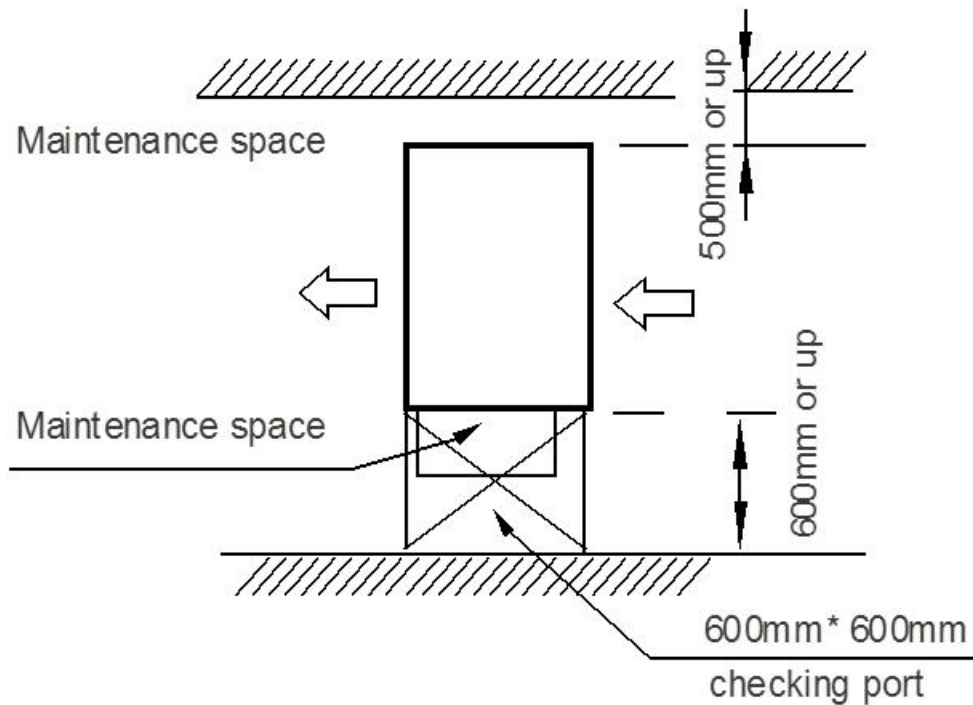
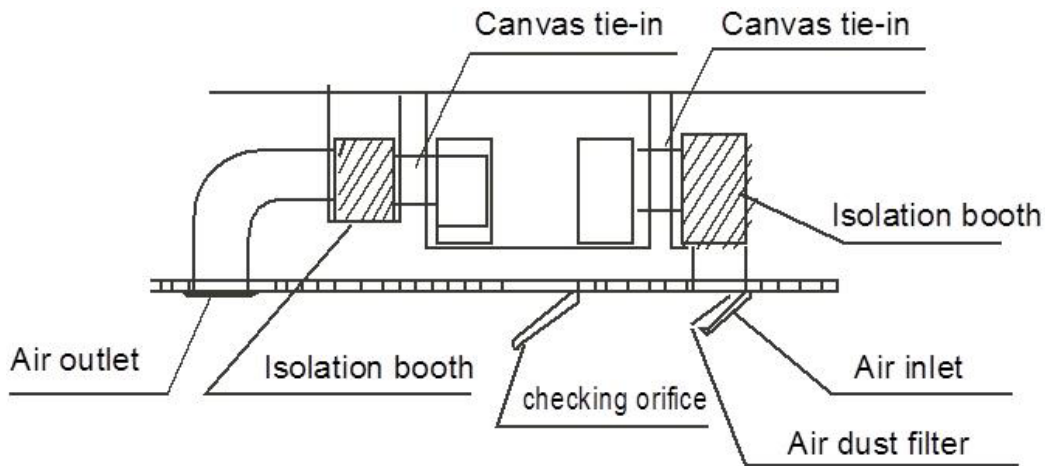
Service space - Outdoor unit (MSAN-XMi)

Multiple unit installation - Size 200T - 260T



Service space - Indoor unit (CN-XMi)

Duct installation recommended method



Note:
 Leave enough space for installation and maintenance.
 The ceiling has to be horizontal and its structure must endure the weight of the indoor unit.
 Inlet and outlet air flows must not be impeded and the fresh air influence shall be the least.
 The air flow must be able to reach throughout the room.
 The connecting pipe and drainpipe must be able to be extracted out easily.
 Ensure there is no direct radiation from heaters.

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