



# VRF MSAN8-X

MSAN8-X 252T-615T



TECHNICAL BULLETIN





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# Part 1

## General Information

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# 1 Indoor and Outdoor Unit Capacities

## 1.1 Indoor Units

### 1.1.1 Standard indoor units

Table 1-1.1: Standard indoor unit abbreviation codes

ABBREVIATION CODE	TYPE	ABBREVIATION CODE	TYPE
Q1DN	One-way Cassette	CN	High Static Pressure Duct
Q2DN	Two-way Cassette	GWMN	Wall-mounted
Q4AN	Compact Four-way Cassette	DDLC	Ceiling & Floor
Q4DN	Four-way Cassette	DZ	Floor Standing
CNT2	Medium Static Pressure Duct		

Table 1-1.2: Standard indoor unit capacity range

Capacity		Capacity index	Q1DN	Q2DN	Q4AN	Q4DN	CNT2	CN	GWMN	DDLC	DZ
KW	HP										
1.7	0.5	17	-	-	17	-	17	-	17	-	-
1.8	0.6	18	18	-	-	-	-	-	-	-	-
2.2	0.8	22	22	22	22	-	22	-	22	-	22
2.8	1	28	28	28	28	28	28	-	28	-	28
3.6	1.25	36	36	36	36	36	36	-	36	36	36
4.5	1.6	45	45	45	45	45	45	-	45	45	45
5.2	1.9	52	-	-	52	-	-	-	-	-	-
5.6	2	56	56	56	-	56	56	-	56	56	56
7.1	2.5	71	71	71	-	71	71	71	71	71	71
8.0	3	80	-	-	-	80	80	80	80	80	80
9.0	3.2	90	-	-	-	90	90	90	90	90	-
10.0	3.6	100	-	-	-	100	-	-	-	-	-
11.2	4	112	-	-	-	112	112	112	-	112	-
14.0	5	140	-	-	-	140	140	140	-	140	-
14.0	6	160	-	-	-	-	-	160	-	-	-
20.0	7	200	-	-	-	-	-	200	-	-	-
25.0	9	250	-	-	-	-	-	250	-	-	-
28.0	10	280	-	-	-	-	-	280	-	-	-
40.0	14	400	-	-	-	-	-	400	-	-	-
45.0	16	450	-	-	-	-	-	450	-	-	-
56.0	20	560	-	-	-	-	-	560	-	-	-

### 1.1.2 Fresh air processing unit

Table 1-1.3: Fresh air processing unit capacity range

Capacity	12.5kW	14kW
Capacity index	125	140

## 1.2 Heat recovery ventilator

Table 1-1.4: Heat recovery ventilator capacity range

Capacity	200m <sup>3</sup> /h	300m <sup>3</sup> /h	400m <sup>3</sup> /h	500m <sup>3</sup> /h	800m <sup>3</sup> /h	1000m <sup>3</sup> /h	1500m <sup>3</sup> /h	2000m <sup>3</sup> /h
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### 1.3 Outdoor Units

Table 1-1.5: Outdoor unit capacity range

Capacity	Model Name	Combination Type
8HP	MSAN8-X 252T	/
10HP	MSAN8-X 280T	/
12HP	MSAN8-X 335T	/
14HP	MSAN8-X 400T	/
16HP	MSAN8-X 450T	/
18HP	MSAN8-X 500T	/
20HP	MSAN8-X 560T	/
22HP	MSAN8-X 615T	/
24HP	MSAN8-X 670T	12HP+12HP
26HP	MSAN8-X 735T	12HP+14HP
28HP	MSAN8-X 800T	14HP+14HP
30HP	MSAN8-X 850T	14HP+16HP
32HP	MSAN8-X 900T	14HP+18HP
34HP	MSAN8-X 950T	16HP+18HP
36HP	MSAN8-X 1000T	18HP+18HP
38HP	MSAN8-X 1065T	16HP+22HP
40HP	MSAN8-X 1115T	18HP+22HP
42HP	MSAN8-X 1175T	20HP+22HP
44HP	MSAN8-X 1230T	22HP+22HP
46HP	MSAN8-X 1300T	14HP+14HP+18HP
48HP	MSAN8-X 1350T	14HP+16HP+18HP
50HP	MSAN8-X 1400T	14HP+18HP+18HP
52HP	MSAN8-X 1450T	16HP+18HP+18HP
54HP	MSAN8-X 1500T	18HP+18HP+18HP
56HP	MSAN8-X 1565T	16HP+18HP+22HP
58HP	MSAN8-X 1615T	18HP+18HP+22HP
60HP	MSAN8-X 1675T	18HP+20HP+22HP
62HP	MSAN8-X 1730T	18HP+22HP+22HP
64HP	MSAN8-X 1790T	20HP+22HP+22HP
66HP	MSAN8-X 1845T	22HP+22HP+22HP
68HP	MSAN8-X 1900T	14HP+18HP+18HP+18HP
70HP	MSAN8-X 1960T	14HP+18HP+18HP+20HP
72HP	MSAN8-X 2000T	18HP+18HP+18HP+18HP
74HP	MSAN8-X 2060T	18HP+18HP+18HP+20HP
76HP	MSAN8-X 2115T	18HP+18HP+18HP+22HP
78HP	MSAN8-X 2175T	18HP+18HP+20HP+22HP
80HP	MSAN8-X 2230T	18HP+18HP+22HP+22HP
82HP	MSAN8-X 2290T	18HP+20HP+22HP+22HP
84HP	MSAN8-X 2345T	18HP+22HP+22HP+22HP
86HP	MSAN8-X 2405T	20HP+22HP+22HP+22HP
88HP	MSAN8-X 2460T	22HP+22HP+22HP+22HP

Notes:

1. The combinations of units shown in the table are factory-recommended. For other combinations of units please contact your local distributor or technical support engineer.

## 2 External Appearance

### 2.1 Indoor Units

#### 2.1.1 Standard indoor units

Table 1-2.1: Standard indoor unit appearance

<p>One-way Cassette</p> <p>Q1DN</p> 	<p>Two-way cassette</p> <p>Q2DN</p> 
<p>Compact Four-way Cassette</p> <p>Q4AN</p> 	<p>Four-way Cassette</p> <p>Q4DN</p> 
<p>Medium Static Pressure Duct</p> <p>CNT2</p> 	<p>High Static Pressure Duct</p> <p>CN</p> 
<p>Wall-mounted</p> <p>GWMN</p> 	<p>Ceiling &amp; Floor</p> <p>DDLC</p> 
<p>Floor Standing</p> <p>DZ</p> 	

#### 2.1.2 Fresh air processing unit

Table 1-2.2: Fresh air processing unit appearance

<p>Fresh Air Processing Unit</p> <p>CNFA</p> 
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#### 2.2 Heat Recovery Ventilator


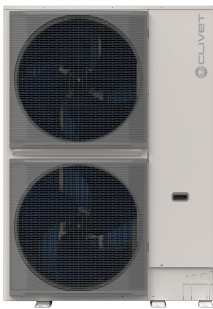
Table 1-2.3: Heat recovery ventilator appearance

<p>Heat Recovery Ventilator</p>  <p>CLIVET</p>
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## 2.3 Outdoor Units



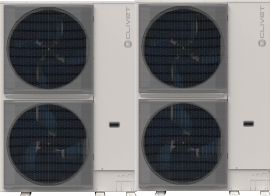
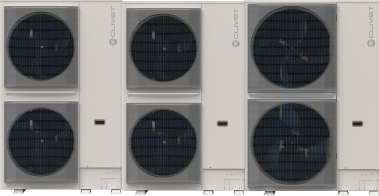


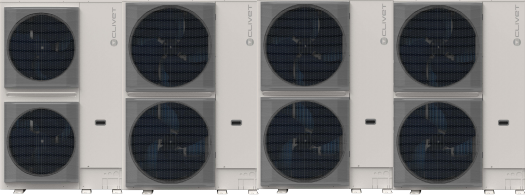
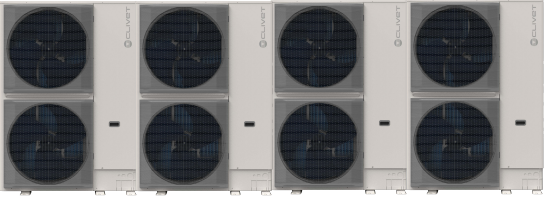
### 2.3.1 Single units

Table 1-2.4: Single outdoor unit appearance

8/10/12/14HP	16/18/20/22HP
	

### 2.3.2 Combinations of units

Table 1-2.5: Combination outdoor unit appearance

<p><b>24/26/28HP</b></p> 	<p><b>30/32HP</b></p> 
<p><b>34/36/38/40/42/44HP</b></p> 	<p><b>46HP</b></p> 
<p><b>48/50HP</b></p> 	<p><b>52/54/56/58/60/62/64/66HP</b></p> 
<p><b>68/70HP</b></p> 	<p><b>72/74/76/78/80/82/84/86/88HP</b></p> 

### 3 Outdoor Unit Combinations

Table 1-3.1: Outdoor unit combinations

System capacity		No. of units	Modules <sup>1</sup>								Outdoor branch joint kit <sup>2</sup>
kW	HP		8	10	12	14	16	18	20	22	
25.2	8	1	•								—
28.0	10	1		•							
33.5	12	1			•						
40.0	14	1				•					
45.0	16	1					•				
50.0	18	1						•			
56.0	20	1							•		
61.5	22	1								•	
67.0	24	2			••						FQZHW-02N1E
73.5	26	2			•	•					
80.0	28	2				••					
85.0	30	2				•	•				
90.0	32	2				•		•			
95.0	34	2					•	•			
100.0	36	2						••			
106.5	38	2					•			•	
111.5	40	2						•		•	
117.5	42	2							•	•	
123.0	44	2								••	FQZHW-03N1E
130.0	46	3				••		•			
135.0	48	3				•	•	•			
140.0	50	3				•		••			
145.0	52	3					•	••			
150.0	54	3						••			
156.5	56	3					•	•		•	
161.5	58	3						••		•	
167.5	60	3						•	•	•	
173.0	62	3						•		••	
179.0	64	3							•	••	
184.5	66	3								••	FQZHW-04N1G
190.0	68	4				•		•••			
196.0	70	4				•		••	•		
200.0	72	4						•••			
206.0	74	4						••	•		
211.5	76	4						••		•	
217.5	78	4						••	•	•	
223.0	80	4						••		••	
229.0	82	4						•	•	••	
234.5	84	4						•		•••	
240.5	86	4							•	•••	
246.0	88	4								•••	

- Notes:
1. The combinations of units shown in the table are factory-recommended. For other combinations of units please contact your local distributor or technical support engineer.
  2. For systems with two or more outdoor units, outdoor branch joints (sold separately) are required.

## 4 Nomenclature

### 4.1 Indoor Units

#### 4.1.1 Standard indoor units

##### V8 indoor units

**Q1DN** **-2-** **X** **M** **i** **D** **22**  
 ①            ②            ③            ④            ⑤            ⑥            ⑦

Legend		
NO.	Code	Remarks
1	<b>Q1DN</b>	Indoor unit type Q1DN: One-way Cassette Q2DN: Two-way Cassette Q4AN: Four-way Cassette Compact Q4DN: Four-way Cassette CNT2: Medium Static Pressure Duct CN: High Static Pressure Duct GWMN: Wall-mounted DDLC: Ceiling & Floor DZ: Floor Standing
2	<b>2</b>	2nd generation indoor unit
3	<b>X</b>	R410A
4	<b>M</b>	Midea
5	<b>i</b>	Inverter
6	<b>D</b>	Series category (D: DC series)
7	<b>22</b>	Capacity index (the capacity in kW multiplied by 10)

## DC Indoor Units

Fresh air processing unit

**CNFA - 2 X M i D 280**  
①      ②      ③      ④      ⑤      ⑥      ⑦

Legend		
NO.	Code	Remarks
1	<b>CNFA</b>	Fresh Air Processing Unit
2	<b>2</b>	2nd generation indoor unit
3	<b>X</b>	R410A
4	<b>M</b>	Midea
5	<b>i</b>	Inverter
6	<b>D</b>	Series category (D: DC series)
7	<b>280</b>	Capacity index (the capacity in kW multiplied by 10)



#### 4.1.2 Fresh air processing unit

**HRV - 2 - M i D 200**  
①            ②            ③    ④    ⑤    ⑥

Legend		
NO.	Code	Remarks
1	HRV	Heat recovery ventilator
2	B	2nd generation indoor unit
3	M	Midea
4	i	Inverter
5	D	Series category (D: DC series)
6	200	Airflow in m <sup>3</sup> /h

## 4.2 Outdoor Units

# M S A N 8 - X 252T



Legend		
NO.	Code	Remarks
1	M	Condensing unit
2	S	Scroll
3	A	Air-source
4	N	heat pump
5	8	The 8th generation heat pump VRF
6	X	R410A
7	252	Capacity index (The capacity in kW multiplied by 10)
8		Power supply M: 1 phase, 220-240V, 50 Hz T: 3 phase, 380-415V, 50 Hz

## 5 Combination Ratio

$$\text{Combination ratio} = \frac{\text{Sum of capacity indexes of the indoor units}}{\text{Capacity index of the outdoor units}}$$

Table 1-5.1: Indoor and outdoor unit combination ratio limitations

Type	Minimum combination ratio	Maximum combination ratio		
		Standard indoor units only	Fresh air processing units only	Fresh air processing units and standard indoor units together
V8S Series outdoor units	50%	200% <sup>1,2,3</sup> (Single ODU) 130% (Combined ODU)	100%	100% <sup>4</sup>

Notes:

- All the indoor units connected should be indoor units with ø5mm size copper tube heater exchanger. This limitation is to avoid too big indoor unit exchanger cause reliability and performance problem.
- Piping between farthest indoor unit and first indoor branch joint should less than 40m.
- Available only with V8 platform of internal units.
- When fresh air processing units are installed together with standard indoor units, the total capacity of the fresh air processing units must not exceed 30% of the total capacity of the outdoor units and the total combination ratio must not exceed 100%.
- The combinations of units shown in the table are factory-recommended. Four units combination are possible for the 8-24 HP models. For other combinations of units please contact your local distributor or technical support engineer.

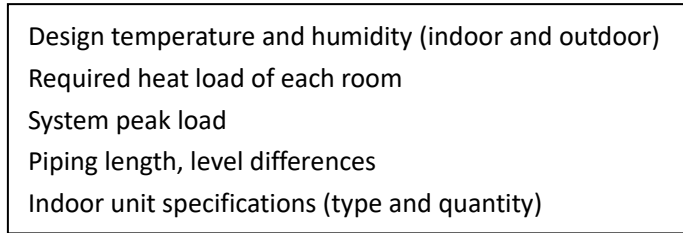
Table 1-5.2: Combinations of indoor and outdoor units

Outdoor unit capacity			Sum of capacity indexes of connected indoor units (standard indoor units only)	Sum of capacity indexes of connected indoor units (fresh air processing units and standard indoor units together)	Maximum number of connected indoor units
kW	HP	Capacity index			
25.2	8	252	126 to 327.6	126 to 252	13
28.0	10	280	140 to 364	140 to 280	16
33.5	12	335	167.5 to 435.5	167.5 to 335	19
40.0	14	400	200 to 520	200 to 400	23
45.0	16	450	225 to 585	225 to 450	26
50.0	18	500	250 to 650	250 to 500	29
56.0	20	560	280 to 728	280 to 560	33
61.5	22	615	307.5 to 799.5	307.5 to 615	36
67.0	24	670	335 to 871	335 to 670	39
73.5	26	735	367.5 to 955.5	367.5 to 735	43
80.0	28	800	400 to 1040	400 to 800	46
85.0	30	850	425 to 1105	425 to 850	50
90.0	32	900	450 to 1170	450 to 900	53
95.0	34	950	475 to 1235	475 to 950	56
100.0	36	1000	500 to 1300	500 to 1000	59
106.5	38	1065	532.5 to 1384.5	532.5 to 1065	63
111.5	40	1115	557.5 to 1449.5	557.5 to 1115	64
117.5	42	1175	587.5 to 1527.5	587.5 to 1175	
123.0	44	1230	615 to 1599	615 to 1230	
130.0	46	1300	650 to 1690	650 to 1300	
135.0	48	1350	675 to 1755	675 to 1350	
140.0	50	1400	700 to 1820	700 to 1400	
145.0	52	1450	725 to 1885	725 to 1450	
150.0	54	1500	750 to 1950	750 to 1500	
156.5	56	1565	782.5 to 2034.5	782.5 to 1565	
161.5	58	1615	807.5 to 2099.5	807.5 to 1615	
167.5	60	1675	837.5 to 2177.5	837.5 to 1675	
173.0	62	1730	865 to 2249	865 to 1730	
179.0	64	1790	895 to 2327	895 to 1790	
184.5	66	1845	922.5 to 2398.5	922.5 to 1845	
190.0	68	1900	950 to 2470	950 to 1900	
196.0	70	1960	980 to 2548	980 to 1960	
200.0	72	2000	1000 to 2600	1000 to 2000	
206.0	74	2060	1030 to 2678	1030 to 2060	
211.5	76	2115	1057.5 to 2749.5	1057.5 to 2115	
217.5	78	2175	1087.5 to 2827.5	1087.5 to 2175	
223.0	80	2230	1115 to 2899	1115 to 2230	
229.0	82	2290	1145 to 2977	1145 to 2290	
234.5	84	2345	1172.5 to 3048.5	1172.5 to 2345	
240.5	86	2405	1202.5 to 3126.5	1202.5 to 2405	
246.0	88	2460	1230 to 3198	1230 to 2460	

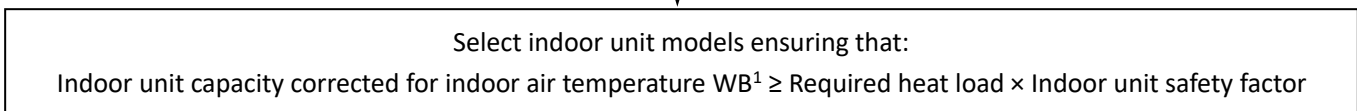
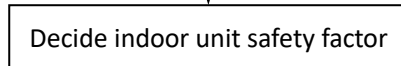
## 6 Selection Procedure

### 6.1 Procedure

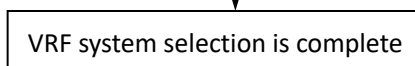
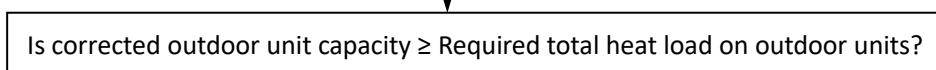
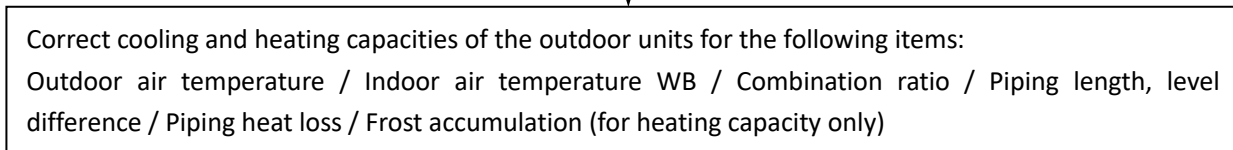
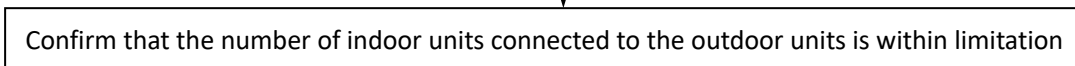
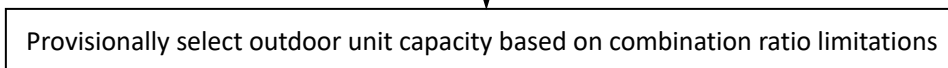
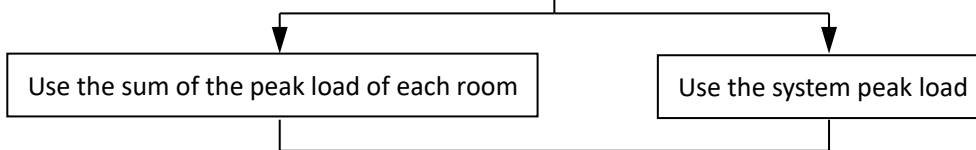
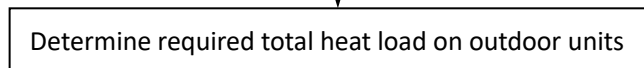
#### Step 1: Establish design conditions



#### Step 2: Select indoor units



#### Step 3: Select outdoor units

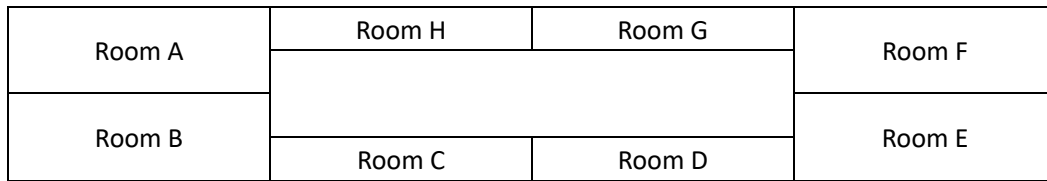


- Notes:
1. If the indoor design temperature falls between two temperatures listed in the indoor unit's capacity table, calculate the corrected capacity by interpolation. If the indoor unit selection is to be based on total heat load and sensible heat load, select indoor units which satisfy not only the total heat load requirements of each room but also the sensible heat load requirements of each room. As with total heat capacity, the sensible heat capacity of indoor units should be corrected for indoor temperature, interpolating where necessary. For the indoor unit capacity tables, refer to the indoor unit technical manuals.

## 6.2 Example

The following is a selection example based on total heat load for cooling.

Figure 1-6.1: Room plan



### Step 1: Establish design conditions

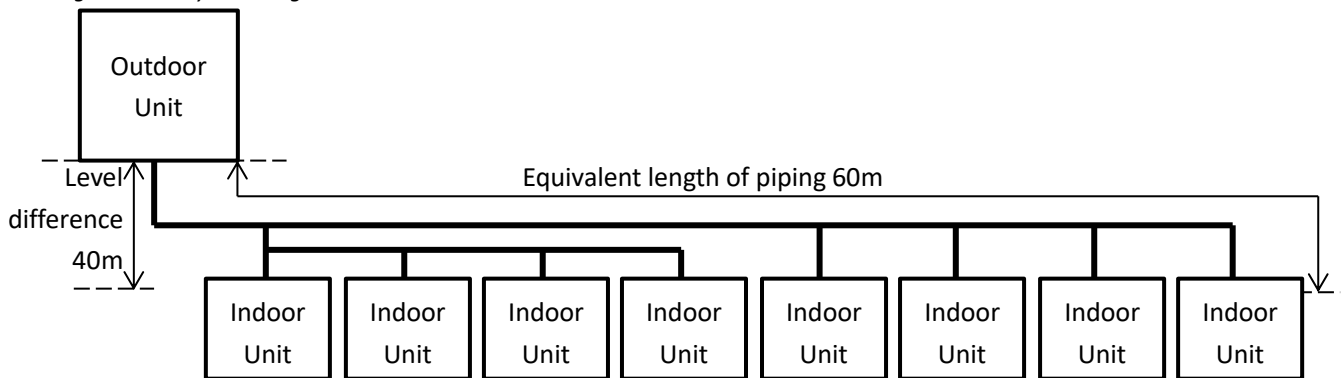
- Indoor air temperature 25.8°C DB, 18°C WB; outdoor air temperature 33°C DB.
- Determine peak load of each room and system peak load. As shown in Table 1-6.1, the system peak load is 50.7kW.

Table 1-6.1: Required heat load of each room (kW)

Time	Room A	Room B	Room C	Room D	Room E	Room F	Room G	Room H	Total
9:00	4.8	4.8	3.0	3.0	9.1	9.0	2.9	2.9	39.5
12:00	6.6	7.1	5.1	5.1	7.4	6.8	4.0	4.0	46.1
14:00	9.0	9.4	4.9	4.9	7.3	6.8	4.2	4.2	50.7
16:00	10.6	10.7	3.9	3.9	6.3	6.2	3.8	3.8	49.2

- The maximum piping lengths and level differences in this example are as given in Figure 1-6.2.

Figure 1-6.2: System diagram



- Indoor unit type for all rooms: Medium Static Pressure Duct (T2).

### Step 2: Select indoor units

- In this example, a safety factor is not used (i.e. the safety factor is 1).
- Select indoor unit models using the medium static pressure duct cooling capacity table. Each indoor unit's corrected capacity needs to be greater than or equal to the peak load of the relevant room. The selected indoor units are shown in Table 1-6.3.

Table 1-6.2: Extract from medium static pressure duct (T2) cooling capacity table

Model	Capacity index	Indoor air temperature													
		14°C WB		16°C WB		18°C WB		19°C WB		20°C WB		22°C WB		24°C WB	
		20°C DB		23°C DB		26°C DB		27°C DB		28°C DB		30°C DB		32°C DB	
		TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC	TC	SC
T2	22	1.5	1.4	1.8	1.5	2.1	1.6	2.2	1.6	2.3	1.7	2.4	1.5	2.4	1.5
	28	1.9	1.7	2.3	1.9	2.6	2.1	2.8	2.1	3.0	2.1	3.1	2.0	3.1	1.9
	36	2.5	2.1	2.9	2.3	3.4	2.5	3.6	2.6	3.8	2.7	4.2	2.8	3.9	2.3
	45	3.1	2.6	3.7	2.8	4.2	3.1	4.5	3.2	4.8	3.2	4.9	3.1	5.1	2.9
	56	3.9	3.0	4.6	3.3	5.3	3.6	5.6	3.7	5.9	3.8	6.2	3.7	6.2	3.4
	71	4.9	3.9	5.8	4.3	6.7	4.7	7.1	4.9	7.5	4.8	7.8	4.6	7.8	4.3
	80	5.5	4.4	6.6	4.9	7.5	5.3	8.0	5.5	8.4	5.5	8.8	5.2	8.8	4.8
	90	6.2	5.3	7.3	5.8	8.4	6.3	9.0	6.4	9.6	6.5	9.9	6.1	9.9	5.7
	112	7.7	6.4	9.1	7.1	10.5	7.7	11.2	7.8	11.9	8.1	12.5	7.8	12.5	7.4
	140	9.7	7.8	11.3	8.6	13.2	9.6	14.0	9.8	14.8	9.8	15.7	9.7	15.4	8.8

Abbreviations:

TC: Total capacity (kW); SC: Sensible capacity (kW)

Table 1-6.3: Selected indoor units

	Room A	Room B	Room C	Room D
Peak heat load (kW)	10.6	10.7	5.1	5.1
Selected indoor unit	CNT2-3-XY D140	CNT2-3-XY D140	CNT2-3-XY D56	CNT2-3-XY D56
Corrected TC (kW)	13.2	13.2	5.3	5.3
	Room E	Room F	Room G	Room H
Peak heat load (kW)	9.1	9.0	4.2	4.2
Selected indoor unit	CNT2-3-XY D112	CNT2-3-XY D112	CNT2-3-XY D45	CNT2-3-XY D45
Corrected TC (kW)	10.5	10.5	4.2	4.2

### Step 3: Select outdoor units

- Determine the required total heat load from the indoor units to the outdoor units based on either the sum of the peak loads of each room or the system peak load. In this example, it is determined based on the system peak load. Therefore, the required heat load is 50.7kW.
- Provisionally select outdoor units using the sum of the capacity indexes (CIs) of the selected indoor units (as shown in Table 1-6.4), ensuring that the combination ratio is between 50% and 130%. Refer to Table 1-6.5. As the sum of CIs of the indoor units is 706, outdoor units from 20HP to 50HP are potentially suitable. Start from the smallest, which is the 20HP unit.

Table 1-6.4: Sum of indoor unit capacity indexes

Model	Capacity Index	No. of units
CNT2-3-XY D140	140	2
CNT2-3-XY D112	112	2
CNT2-3-XY D56	56	2
CNT2-3-XY D45	45	2

<b>Sum of CIs</b>	<b>706</b>
-------------------	------------

Table 1-6.5: Extract from Table 1-5.2 Combinations of Indoor and outdoor units

Outdoor unit capacity			Sum of capacity indexes of connected indoor units (standard indoor units only)	Maximum number of connected indoor units
kW	HP	Capacity index		
50.0	18	500	250 to 650	29
56.0	20	560	280 to 728	33
61.5	22	615	307.5 to 799.5	36
67.0	24	670	335 to 871	39
73.5	26	735	367.5 to 955.5	43
80.0	28	800	400 to 1040	46
85.0	30	850	425 to 1105	50
90.0	32	900	450 to 1170	53
95.0	34	950	475 to 1235	56
100.0	36	1000	500 to 1300	59
106.5	38	1070	532.5 to 1384.5	63
111.5	40	1115	557.5 to 1449.5	64
117.5	42	1170	587.5 to 1527.5	
123.0	44	1230	615 to 1599	
130.0	46	1285	650 to 1690	
135.0	48	1340	675 to 1755	
140.0	50	1400	700 to 1820	
145.0	52	1470	725 to 1885	

- The number of connected indoor units is 8 and the maximum number of connected indoor units on the 20HP outdoor unit is 33, so the number of connected indoor units is within the limitation.
- Calculate the corrected capacity of the outdoor units:
  - a) The sum of the indoor unit CIs is 706 and the CI of the 20HP outdoor unit MSAN8-X 560T is 560, so the combination ratio is  $706 / 560 = 126\%$ .
  - b) Using the outdoor units' cooling capacity table, interpolate to obtain the capacity ("B") corrected for outdoor air temperature, indoor air temperature, and combination ratio. Refer to Tables 1-6.6 and 1-6.7.

Table 1-6.6: Extract from Table 2-8.7 MV8S-560WV2RN1 cooling capacity

CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
130%	31	62.05	22.66
	33	60.99	23.42
	35	59.94	24.17
120%	31	60.25	22.56
	33	59.21	23.33
	35	58.19	24.08

Table 1-6.7: Cooling capacity calculated by interpolation

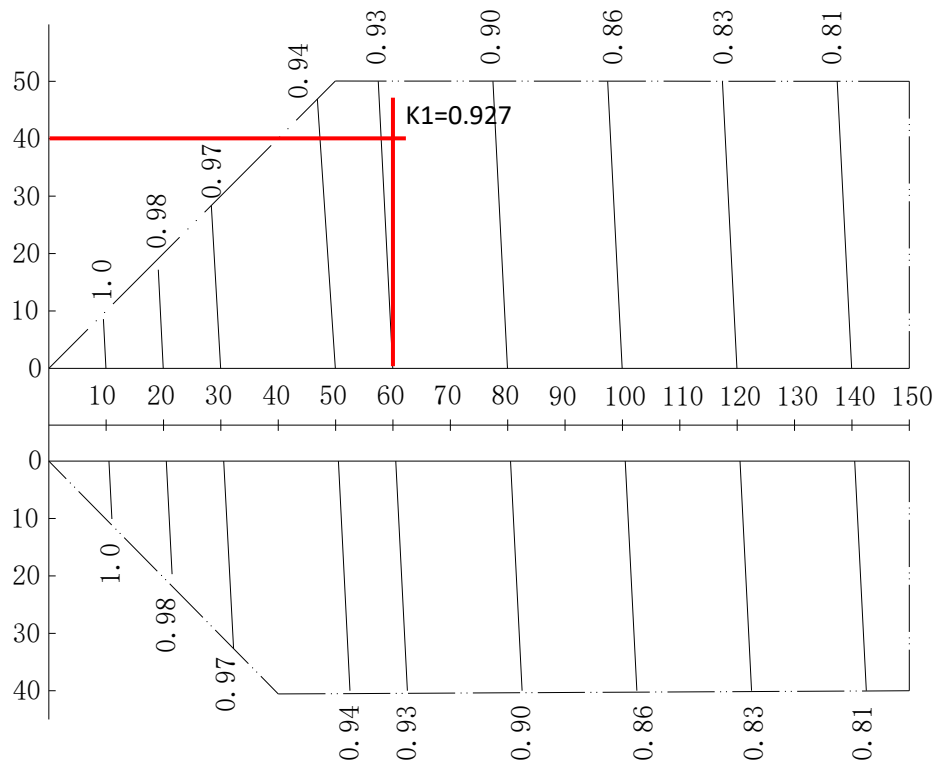
CR	Outdoor air temp. (°C DB)	Indoor air temp. (°C DB / °C WB)	
		25.8 / 18.0	
		TC	PI
		kW	kW
130%	33	60.99	23.42
		<b>B = 60.28<sup>1</sup></b>	
120%	33	59.21	23.33

Notes:

1.  $59.21 + (60.99 - 59.21) \times (126 - 120) / (130 - 120) = 60.28$

c) Find the correction factor for piping length and level difference (“K1”)

Figure 1-6.3: V8S rate of change in cooling capacity



Notes:

1. The horizontal axis shows equivalent length of piping between farthest indoor unit and first outdoor branch joint; the vertical axis shows the largest level difference between indoor unit and outdoor unit. For level differences, positive values indicate that the outdoor unit is above the indoor unit, negative values indicate that the outdoor unit is below the indoor unit.

d) Calculate the corrected capacity of MSAN8-X 560T (“C”) by using K1:

$$C = B \times K1 = 60.28 \times 0.927 = 55.88\text{kW}$$

- The corrected capacity 55.88kW is larger than required total heat load 50.7kW, so selection is complete. (In the event that the corrected capacity is lower than the required total heat load, Step 3 should be repeated from the point where the outdoor unit capacity is provisionally selected.)



# Part 2

# Outdoor Unit

# Engineering Data

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# 1 Specifications

## 8-14HP

Table 2-1.1: 8-14HP specifications

HP			8	10	12	14
Model name			MSAN8-X 252T	MSAN8-X 280T	MSAN8-X 335T	MSAN8-X 400T
Power supply			380-415V, 3N~, 50Hz			
Cooling	Capacity <sup>1,2</sup>	kW	25.2	28.0	33.5	40.0
	Power input <sup>1</sup>	kW	7.6	9.1	11.6	15.7
	EER <sup>1</sup>		3.30	3.09	2.90	2.54
	EER <sup>2</sup>		4.07	3.94	3.65	3.30
Heating (Rated)	Capacity <sup>3,4</sup>	kW	25.2	28.0	33.5	40.0
	Power input <sup>3</sup>	kBtu/h	86.0	95.5	114.3	136.5
	COP <sup>3</sup>		4.10	4.02	3.68	3.42
	COP <sup>4</sup>		4.97	4.84	4.24	3.79
Heating2(Max)	Capacity	kW	27.0	31.5	37.5	45.0
		kBtu/h	92.1	107.5	128.0	153.5
	Power input	kW	7.8	9.5	11.5	14.6
	COP		3.47	3.30	3.25	3.09
SEER			7.25	7.05	6.91	6.65
η <sub>s,c</sub>		%	287	279	273.4	263
SCOP			4.15	4.1	4.11	4
η <sub>s,h</sub>		%	163	161.4	161.4	163
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		13	16	19	22
Compressor	Type		DC inverter			
	Quantity		1			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		2			
	Motor output	kW	0.2×2			
	Static pressure	Pa	0-35 (standard)35-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	11800	12500	12500	12500
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	6.1	6.1	6.4	7.4
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ12.7			
	Gas pipe	mm	Φ25.4			
Sound pressure level <sup>6</sup>		dB(A)	56	57	58	59
Sound power level <sup>6</sup>		dB(A)	76	79	81	82
Net dimensions (W×H×D)		mm	1130×1760×580			
Packed dimensions (W×H×D)		mm	1210×1916×597			
Net weight		kg	177		180	182
Gross weight		kg	191		194	196
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

## 16-22HP

Table 2-1.2: 16-22HP specifications

HP			16	18	20	22
Model name			MSAN8-X 450T	MSAN8-X 500T	MSAN8-X 560T	MSAN8-X 615T
Power supply			380-415V, 3N~, 50Hz			
Cooling	Capacity <sup>1,2</sup>	kW	45.0	50.0	56.0	61.5
	Power input <sup>1</sup>	kW	16.0	19.5	22.9	30.8
	EER <sup>1</sup>		2.82	2.57	2.45	2.0
	EER <sup>2</sup>		3.42	3.34	3.36	3.30
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	45.0	50.0	56.0	61.5
	Power input <sup>3</sup>	kW	12.2	13.7	15.5	18.8
	COP <sup>3</sup>		3.68	3.65	3.62	3.28
	COP <sup>4</sup>		3.85	3.91	3.95	3.75
Heating <sup>2</sup> (Max)	Capacity	kW	50.0	56.5	63.0	69.0
		kBtu/h	170.6	192.8	215.0	235.4
	Power input	kW	15.7	18.1	20.3	22.5
	COP		3.19	3.12	3.10	3.07
SEER			6,77	6,47	6,3	6,15
η <sub>s,c</sub>		%	267.8	255.8	249	243
SCOP			4.1	4.15	4.07	4
η <sub>s,h</sub>		%	166.2	163.8	159.8	157
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		26	29	32	35
Compressor	Type		DC inverter			
	Quantity		1			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		2			
	Motor output	kW	0.56×2			
	Static pressure	Pa	0-35 (standard)35-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	18500	20000	18500	19000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	8	8	8.5	8.5
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ15.9			
	Gas pipe	mm	Φ28.6			
Sound pressure level <sup>6</sup>		dB(A)	60	61	61	62
Sound power level <sup>6</sup>		dB(A)	86	88	89	89
Net dimensions (W×H×D)		mm	1250×1760×580			
Packed dimensions (W×H×D)		mm	1330×1916×597			
Net weight		kg	208		228	
Gross weight		kg	223		243	
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

## 24-30HP

Table 2-1.3: 24-30HP specifications

HP			24	26	28	30
Model name (Combination unit)			MSAN8-X 670T	MSAN8-X 735T	MSAN8-X 800T	MSAN8-X 850T
Combination type			12HP+12HP	12HP+14HP	14HP+14HP	14HP+16HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	67.0	73.5	80.0	85.0
	Power input <sup>1</sup>	kW	23.1	27.3	31.5	31.7
	EER <sup>1</sup>		2.90	2.69	2.54	2.68
	EER <sup>2</sup>		3.65	3.45	3.30	3.36
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	67.0	73.5	80.0	85.0
	Power input <sup>3</sup>	kW	18.2	20.8	23.4	23.9
	COP <sup>3</sup>		3.68	3.53	3.42	3.56
	COP <sup>4</sup>		4.24	3.98	3.79	3.82
Heating <sup>2</sup> (Max)	Capacity	kW	75.0	82.5	90.0	95.0
		kBtu/h	255.9	281.5	307.1	324.1
	Power input	kW	23.1	26.1	29.1	30.2
	COP		3.25	3.16	3.09	3.15
SEER			6.95	6.81	6.67	6.73
η <sub>s,c</sub>		%	275.0	269.4	263.8	266.2
SCOP			4.11	4.13	4.15	4.19
η <sub>s,h</sub>		%	161.4	162.2	163.0	164.6
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		39	43	46	50
Compressor	Type		DC inverter			
	Quantity		2			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		4			
	Motor output	kW	0.2×4			0.2×2+0.56×2
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	25000	25000	25000	31000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	6.4×2	6.4+7.4	7.4×2	7.4+8
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ15.9	Φ19.1		
	Gas pipe	mm	Φ28.6	Φ31.8		
Sound pressure level <sup>6</sup>		dB(A)	61	61.5	62	62.5
Sound power level <sup>6</sup>		dB(A)	84	84.5	84.5	87.5
Net dimensions (W×H×D)		mm	(1130×1760×580)×2			(1130×1760×580)+(1250×1760×580)
Packed dimensions (W×H×D)		mm	(1210×1916×597)×2			(1210×1916×597)+(1330×1916×597)
Net weight		kg	180×2	180+182	182×2	182+208
Gross weight		kg	194×2	194+196	196×2	196+223
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

### Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

### 32-38HP

Table 2-1.4: 32-38HP specifications

HP			32	34	36	38
Model name (Combination unit)			MSAN8-X 900T	MSAN8-X 950T	MSAN8-X 1000T	MSAN8-X 1065T
Combination type			14HP+18HP	16HP+18HP	18HP+18HP	16HP+22HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	90.0	95.0	100.0	106.5
	Power input <sup>1</sup>	kW	35.2	35.4	38.9	46.7
	EER <sup>1</sup>		2.56	2.68	2.57	2.28
	EER <sup>2</sup>		3.32	3.38	3.34	3.35
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	90.0	95.0	100.0	106.5
	Power input <sup>3</sup>	kW	25.4	25.9	27.4	31.0
	COP <sup>3</sup>		3.54	3.67	3.65	3.44
	COP <sup>4</sup>		3.86	3.88	3.91	3.79
Heating <sup>2</sup> (Max)	Capacity	kW	101.5	106.5	113.0	119.0
		kBtu/h	346.3	363.4	385.6	406.0
	Power input	kW	32.7	33.8	36.2	38.1
	COP		3.10	3.15	3.12	3.12
SEER			6.57	6.63	6.49	6.41
η <sub>s,c</sub>	%	259.8	262.2	256.6	253.4	
SCOP			4.19	4.23	4.17	4.08
η <sub>s,h</sub>	%	164.6	166.2	163.8	160.2	
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		53	56	59	63
Compressor	Type		DC inverter			
	Quantity		2			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		4			
	Motor output	kW	0.2×2+0.56×2	0.56×4		
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	32500	38500	40000	37500
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	7.4+8	8×2	8×2	8+8.5
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ19.1		Φ19.1	
	Gas pipe	mm	Φ31.8		Φ38.1	
Sound pressure level <sup>6</sup>		dB(A)	63.1	63.5	64	64.1
Sound power level <sup>6</sup>		dB(A)	89	90.1	91	90.8
Net dimensions (W×H×D)		mm	(1130×1760×580)+(1250×1760×580)	(1250×1760×580)×2		
Packed dimensions (W×H×D)		mm	(1210×1916×597)+(1330×1916×597)	(1330×1916×597)×2		
Net weight		kg	182+208	208×2		208+228
Gross weight		kg	196+223	223×2		223+243
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

## 40-46HP

Table 2-1.5: 40-46HP specifications

HP			40	42	44	46
Model name (Combination unit)			MSAN8-X 1115T	MSAN8-X 1175T	MSAN8-X 1230T	MSAN8-X 1300T
Combination type			18HP+22HP	20HP+22HP	22HP+22HP	14HP+14HP+18HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	111.5	117.5	123.0	130.0
	Power input <sup>1</sup>	kW	50.2	53.6	61.5	51.0
	EER <sup>1</sup>		2.22	2.19	2.00	2.55
	EER <sup>2</sup>		3.32	3.33	3.30	3.32
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	111.5	117.5	123.0	130.0
	Power input <sup>3</sup>	kW	32.4	34.2	37.5	37.1
	COP <sup>3</sup>		3.44	3.44	3.28	3.50
	COP <sup>4</sup>		3.82	3.84	3.75	3.83
Heating <sup>2</sup> (Max)	Capacity	kW	125.5	132.0	138.0	146.5
		kBtu/h	428.2	450.4	470.9	499.9
	Power input	kW	40.6	42.8	45.0	47.2
	COP		3.09	3.08	3.07	3.10
SEER			6.30	6.24	6.16	6.60
η <sub>s,c</sub>		%	249.0	246.6	243.4	261.0
SCOP			4.10	4.03	4.00	4.17
η <sub>s,h</sub>		%	161.0	158.2	157.0	163.8
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		64	64	64	64
Compressor	Type		DC inverter			
	Quantity		2			3
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		4			6
	Motor output	kW	0.56×4			0.2×4+0.56×2
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	39000	37500	38000	45000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	8+8.5	8.5×2	8.5×2	7.4×2+8
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ19.1			
	Gas pipe	mm	Φ38.1			
Sound pressure level <sup>6</sup>		dB(A)	64.5	64.5	65	64.5
Sound power level <sup>6</sup>		dB(A)	91.5	92	92	89.8
Net dimensions (W×H×D)		mm	(1250×1760×580)×2			(1130×1760×580)×2 +(1250×1760×580)
Packed dimensions (W×H×D)		mm	(1330×1916×597)×2			(1210×1916×597)×2 +(1330×1916×597)
Net weight		kg	208+228	228×2		182×2+208
Gross weight		kg	223+243	243×2		196×2+223
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

### Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

# 48-54HP

Table 2-1.6: 48-54HP specifications

HP			48	50	52	54
Model name (Combination unit)			MSAN8-X 1350T	MSAN8-X 14000T	MSAN8-X 1450T	MSAN8-X 1500
Combination type			14HP+16HP+18HP	14HP+18HP+18HP	16HP+18HP+18HP	18HP+18HP+18HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	135.0	140.0	145.0	150.0
	Power input <sup>1</sup>	kW	51.2	54.7	54.9	58.4
	EER <sup>1</sup>		2.64	2.56	2.64	2.57
	EER <sup>2</sup>		3.35	3.33	3.36	3.34
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	135.0	140.0	145.0	150.0
	Power input <sup>3</sup>	kW	37.6	39.1	39.6	41.1
	COP <sup>3</sup>		3.59	3.58	3.66	3.65
	COP <sup>4</sup>		3.85	3.88	3.89	3.91
Heating <sup>2</sup> (Max)	Capacity	kW	151.5	158.0	163.0	169.5
		kBtu/h	516.9	539.1	556.2	578.3
	Power input	kW	48.3	50.8	51.9	54.3
	COP		3.14	3.11	3.14	3.12
SEER			6.64	6.54	6.58	6.49
η <sub>s,c</sub>		%	262.6	258.6	260.2	256.6
SCOP			4.20	4.20	4.22	4.17
η <sub>s,h</sub>		%	165.0	165.0	165.8	163.8
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		64	64	64	64
Compressor	Type		DC inverter			
	Quantity		3			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		6			
	Motor output	kW	0.2×2+0.56×4		0.56×6	
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	51000	52500	58500	60000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	7.4+8×2	7.4+8×2	8×3	8×3
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ19.1			
	Gas pipe	mm	Φ38.1			
Sound pressure level <sup>6</sup>		dB(A)	64.8	65.2	65.5	65.8
Sound power level <sup>6</sup>		dB(A)	90.7	91.5	92.2	92.8
Net dimensions (W×H×D)		mm	(1130×1760×580)+(1250×1760×580)×2		(1250×1760×580)×3	
Packed dimensions (W×H×D)		mm	(1210×1916×597)+(1330×1916×597)×2		(1330×1916×597)×3	
Net weight		kg	182+208×2		208×3	
Gross weight		kg	196+223×2		223×3	
Ambient temp. operation range	Cooling	°C	-15 to 55			
	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

56-62HP

Table 2-1.7: 56-62HP specifications

HP			56	58	60	62
Model name (Combination unit)			MSAN8-X 1565T	MSAN8-X 1615T	MSAN8-X 1675T	MSAN8-X 1730T
Combination type			16HP+18HP+22HP	18HP+18HP+22HP	18HP+20HP+22HP	18HP+22HP+22HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	156.5	161.5	167.5	173.0
	Power input <sup>1</sup>	kW	66.2	69.7	73.1	81.0
	EER <sup>1</sup>		2.36	2.32	2.29	2.14
	EER <sup>2</sup>		3.35	3.32	3.33	3.31
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	156.5	161.5	167.5	173.0
	Power input <sup>3</sup>	kW	44.7	46.1	47.9	51.2
	COP <sup>3</sup>		3.50	3.50	3.50	3.38
	COP <sup>4</sup>		3.83	3.85	3.86	3.80
Heating <sup>2</sup> (Max)	Capacity	kW	175.5	182.0	188.5	194.5
		kBtu/h	598.8	621.0	643.2	663.6
	Power input	kW	56.3	58.7	60.9	63.1
	COP		3.12	3.10	3.10	3.08
SEER			6.44	6.36	6.32	6.25
η <sub>s,c</sub>		%	254.6	251.4	249.8	247.0
SCOP			4.13	4.14	4.09	4.06
η <sub>s,h</sub>		%	162.2	162.6	160.6	159.4
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		64	64	64	64
Compressor	Type		DC inverter			
	Quantity		3			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		6			
	Motor output	kW	0.56×6			
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	57500	59000	57500	58000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	8×2+8.5	8×2+8.5	8+8.5×2	8+8.5×2
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ19.1			
	Gas pipe	mm	Φ41.3			
Sound pressure level <sup>6</sup>		dB(A)	65.8	66.1	66.1	66.5
Sound power level <sup>6</sup>		dB(A)	92.6	93.1	93.5	93.5
Net dimensions (W×H×D)		mm	(1250×1760×580)×3			
Packed dimensions (W×H×D)		mm	(1330×1916×597)×3			
Net weight		kg	208×2+228		208+228×2	
Gross weight		kg	223×2+243		223+243×2	
Ambient temp.	Cooling	°C	-15 to 55			
operation range	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.



## 64-70HP

Table 2-1.8: 64-70HP specifications

HP			64	66	68	70
Model name (Combination unit)			MSAN8-X 1790T	MSAN8-X 1845T	MSAN8-X 1900T	MSAN8-X 1960T
Combination type			20HP+22HP+22HP	22HP+22HP+22HP	14HP+18HP +18HP+18HP	14HP+18HP +18HP+20HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	179.0	184.5	190.0	196.0
	Power input <sup>1</sup>	kW	84.4	92.3	74.1	77.5
	EER <sup>1</sup>		2.12	2.00	2.56	2.53
	EER <sup>2</sup>		3.32	3.30	3.33	3.34
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	179.0	184.5	190.0	196.0
	Power input <sup>3</sup>	kW	53.0	56.3	52.8	54.6
	COP <sup>3</sup>		3.38	3.28	3.60	3.59
	COP <sup>4</sup>		3.81	3.75	3.89	3.90
Heating <sup>2</sup> (Max)	Capacity	kW	201.0	207.0	214.5	221.0
		kBtu/h	685.8	706.3	731.9	754.1
	Power input	kW	65.3	67.4	68.9	71.1
	COP		3.08	3.07	3.11	3.11
SEER			6.22	6.16	6.53	6.49
η <sub>s,c</sub>		%	245.8	243.4	258.2	256.6
SCOP			4.02	4.00	4.21	4.16
η <sub>s,h</sub>		%	157.8	157.0	165.4	163.4
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		64	64	64	64
Compressor	Type		DC inverter			
	Quantity		3		4	
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		6		8	
	Motor output	kW	0.56×6		0.2×2+0.56×6	
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	56500	57000	72500	71000
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	8.5×3	8.5×3	7.4+8×3	7.4+8×2+8.5
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ19.1		Φ22.2	
	Gas pipe	mm	Φ41.3		Φ44.5	
Sound pressure level <sup>6</sup>		dB(A)	66.5	66.8	66.6	66.6
Sound power level <sup>6</sup>		dB(A)	93.6	93.8	93.1	93.5
Net dimensions (W×H×D)		mm	(1250×1760×580)×3		(1130×1760×580)+(1250×1760×580)×3	
Packed dimensions (W×H×D)		mm	(1330×1916×597)×3		(1210×1916×597)+(1330×1916×597)×3	
Net weight		kg	228×3	228×3	182+208×3	182+208×2+228
Gross weight		kg	243×3	243×3	196+223×3	196+223×2+243
Ambient temp.	Cooling	°C	-15 to 55			
operation range	Heating	°C	-30 to 30			

### Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

## 72-78HP

Table 2-1.9: 72-78HP specifications

HP			72	74	76	78
Model name (Combination unit)			MSAN8-X 2000T	MSAN8-X 2060T	MSAN8-X 2115T	MSAN8-X 2175T
Combination type			18HP+18HP +18HP+18HP	18HP+18HP +18HP+20HP	18HP+18HP +18HP+22HP	18HP+18HP +20HP+22HP
Power supply			380-415V, 3N~, 50Hz			
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	200.0	206.0	211.5	217.5
	Power input <sup>1</sup>	kW	77.8	81.2	89.1	92.5
	EER <sup>1</sup>		2.57	2.54	2.37	2.35
	EER <sup>2</sup>		3.34	3.35	3.33	3.33
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	200.0	206.0	211.5	217.5
	Power input <sup>3</sup>	kW	54.8	56.6	59.8	61.6
	COP <sup>3</sup>		3.65	3.64	3.54	3.53
	COP <sup>4</sup>		3.91	3.92	3.86	3.87
Heating <sup>2</sup> (Max)	Capacity	kW	226.0	232.5	238.5	245.0
		kBtu/h	771.1	793.3	813.8	835.9
	Power input	kW	72.4	74.6	76.8	79.0
	COP		3.12	3.12	3.11	3.10
SEER			6.50	6.46	6.39	6.36
η <sub>s,c</sub>		%	257.0	255.4	252.6	251.4
SCOP			4.17	4.13	4.16	4.12
η <sub>s,h</sub>		%	163.8	162.2	163.4	161.8
Connected indoor unit	Total capacity		50-130%			
	Maximum quantity		64	64	64	64
Compressor	Type		DC inverter			
	Quantity		4			
	Oil type		FVC68D			
	Start-up method		Soft start			
Fan	Type		Propeller			
	Motor type		DC			
	Quantity		8			
	Motor output	kW	0.56×8			
	Static pressure	Pa	0-20 (standard)20-80 (customized)			
	Airflow rate	m <sup>3</sup> /h	80000	78500	79000	77500
	Drive type		Direct			
Refrigerant	Type		R410A			
	Factory charge	kg	8×4	8×3+8.5	8×3+8.5	8×2+8.5×2
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ22.2			
	Gas pipe	mm	Φ44.5			
Sound pressure level <sup>6</sup>		dB(A)	67	67	67.3	67.3
Sound power level <sup>6</sup>		dB(A)	94	94.3	94.3	94.5
Net dimensions (W×H×D)		mm	(1250×1760×580)×4			
Packed dimensions (W×H×D)		mm	(1330×1916×597)×4			
Net weight		kg	208×4	208×3+228	208×2+228×2	
Gross weight		kg	223×4	223×3+243	223×2+243×2	
Ambient temp.	Cooling	°C	-15 to 55			
operation range	Heating	°C	-30 to 30			

Notes:

- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

# 80-88HP

Table 2-1.10: 80-88HP specifications

HP			80	82	84	86	88	
Model name (Combination unit)			MSAN8-X 2230T	MSAN8-X 2290T	MSAN8-X 2345T	MSAN8-X 2405T	MSAN8-X 2460T	
Combination type			18HP+18HP +22HP+22HP	18HP+20HP +22HP+22HP	18HP+22HP +22HP+22HP	20HP+22HP +22HP+22HP	22HP+22HP +22HP+22HP	
Power supply			380-415V, 3N~, 50Hz					
Cooling <sup>1</sup>	Capacity <sup>1,2</sup>	kW	223.0	229.0	234.5	240.5	246.0	
	Power input <sup>1</sup>	kW	100.4	103.8	111.7	115.1	123.0	
	EER <sup>1</sup>		2.22	2.21	2.10	2.09	2.00	
	EER <sup>2</sup>		3.32	3.32	3.31	3.31	3.30	
Heating <sup>2</sup> (Rated)	Capacity <sup>3,4</sup>	kW	223.0	229.0	234.5	240.5	246.0	
	Power input <sup>3</sup>	kW	64.9	66.7	69.9	71.7	75.0	
	COP <sup>3</sup>		3.44	3.43	3.35	3.35	3.28	
	COP <sup>4</sup>		3.82	3.83	3.78	3.79	3.75	
Heating <sup>2</sup> (Max)	Capacity	kW	251.0	257.5	263.5	270.0	276.0	
		kBtu/h	856.4	878.6	899.1	921.2	941.7	
	Power input	kW	81.2	83.4	85.5	87.7	89.9	
	COP		3.09	3.09	3.08	3.08	3.07	
SEER			6.31	6.28	6.23	6.20	6.16	
η <sub>s,c</sub>			%	249.4	248.2	246.2	245.0	243.4
SCOP				4.10	4.06	4.05	4.02	4.00
η <sub>s,h</sub>			%	161.0	159.4	159.0	157.8	157.0
Connected indoor unit	Total capacity		50-130%					
	Maximum quantity		64	64	64	64	64	
Compressor	Type		DC inverter					
	Quantity		4					
	Oil type		FVC68D					
	Start-up method		Soft start					
Fan	Type		Propeller					
	Motor type		DC					
	Quantity		8					
	Motor output	kW	0.56×8					
	Static pressure	Pa	0-20 (standard)20-80 (customized)					
	Airflow rate	m <sup>3</sup> /h	78000	76500	77000	75500	76000	
	Drive type		Direct					
Refrigerant	Type		R410A					
	Factory charge	kg	8×2+8.5×2	8+8.5×3	8+8.5×3	8.5×4	8.5×4	
Pipe connections <sup>5</sup>	Liquid pipe	mm	Φ22.2			Φ22.2		
	Gas pipe	mm	Φ44.5			Φ50.8		
Sound pressure level <sup>6</sup>			dB(A)	67.5	67.5	67.8	67.8	68
Sound power level <sup>6</sup>			dB(A)	94.5	94.8	94.8	95	95
Net dimensions (W×H×D)			mm	(1250×1760×580)×4				
Packed dimensions (W×H×D)			mm	(1330×1916×597)×4				
Net weight			kg	208×2+228×2	208+228×3		228×4	
Gross weight			kg	223×2+243×2	223+243×3		243×4	
Ambient temp.	Cooling	°C	-15 to 55					
operation range	Heating	°C	-30 to 30					

Notes:

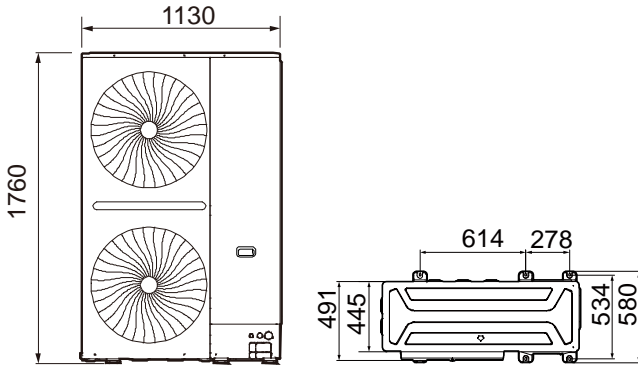
- Indoor air temperature 27°C DB, 19°C WB; outdoor air temperature 35°C DB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 27°C DB; outdoor air temperature 35°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to eurovent test conditions.
- Indoor air temperature 20°C DB; outdoor air temperature 7°C DB, 6°C WB; equivalent refrigerant piping length 5m with zero level difference; Data according to EN 14511.
- Diameters given are those of the unit's stop valve.
- Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber.

## 2 Dimensions

### 2.1 Single Units

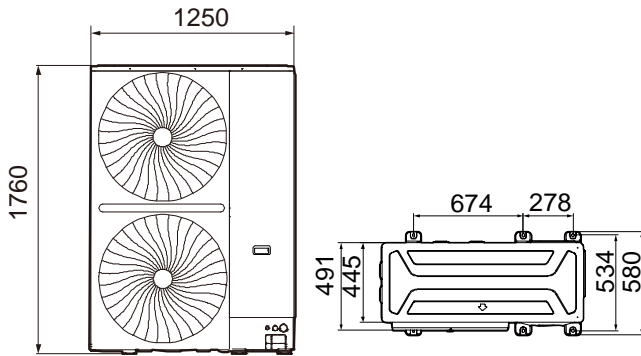
#### 8/10/12/14 HP

Figure 2-2.1: 8/10/12/14 HP dimensions (unit: mm)



#### 16/18/20/22HP

Figure 2-2.2: 16/18/20/22HP dimensions (unit: mm)



### Detail R

Figure 2-2.4: Detail R (unit: mm)

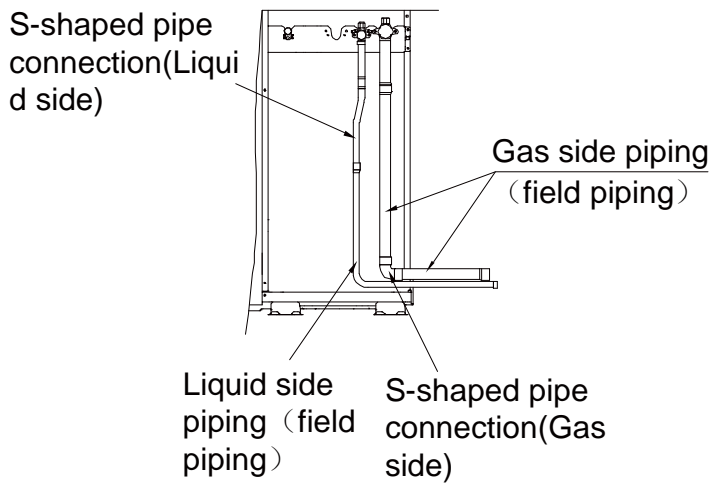


Table 2-2.1: Connection piping diameter (unit: mm)

Size	ΦA(Liquid)	ΦB(Gas)
8HP	Φ12.7	Φ25.4
10HP	Φ12.7	Φ25.4
12HP	Φ12.7	Φ25.4
14HP	Φ12.7	Φ25.4
16HP	Φ15.9	Φ28.6
18HP	Φ15.9	Φ28.6
20HP	Φ15.9	Φ28.6
22HP	Φ15.9	Φ28.6

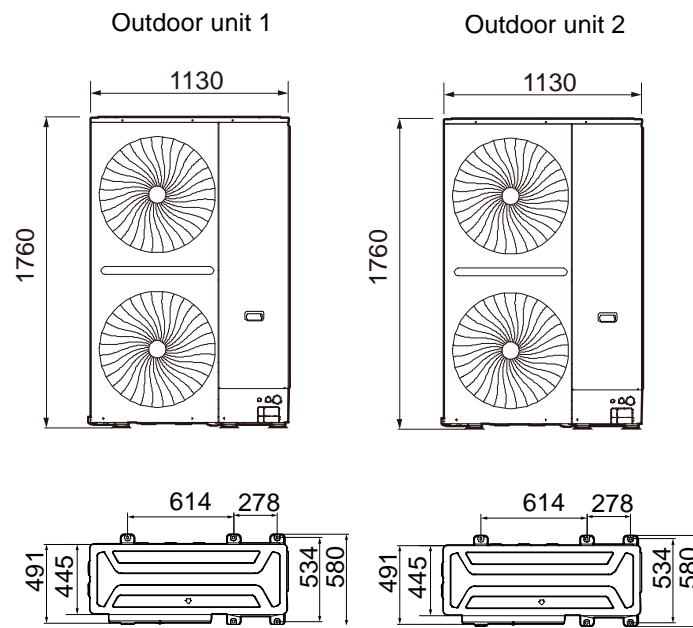
#### Notes:

1. Field piping can be connected in 4 directions, the above uses the connection method of rightward outlet pipe as an example

## 2.2 Combinations of Units

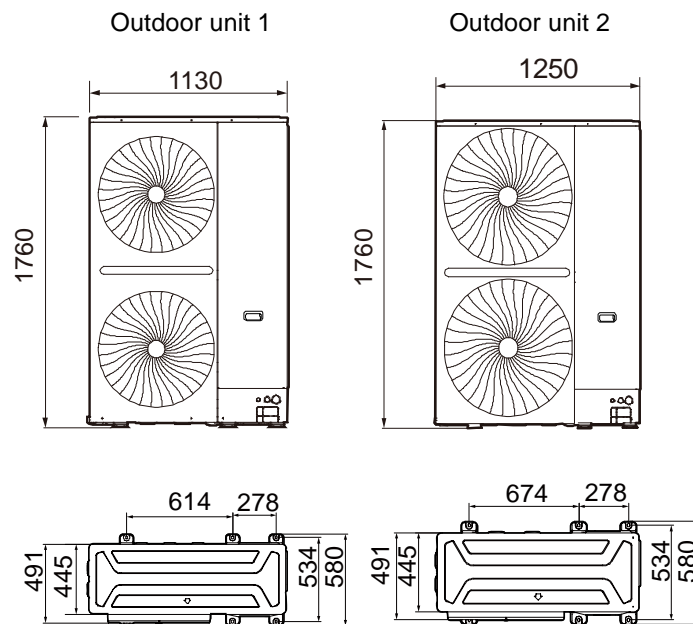
### 24/26/28HP

Figure 2-2.5: 24/26/28HP dimensions (unit: mm)



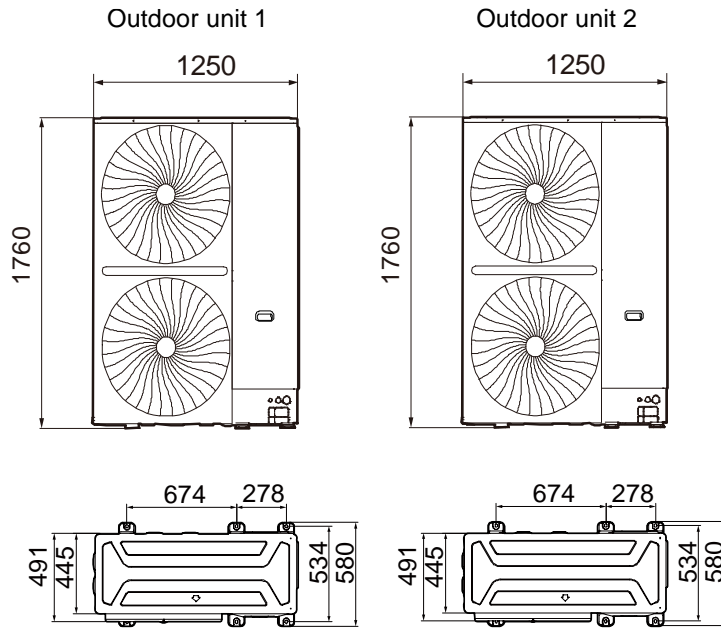
### 30/32HP

Figure 2-2.6: 30/32HP dimensions (unit: mm)



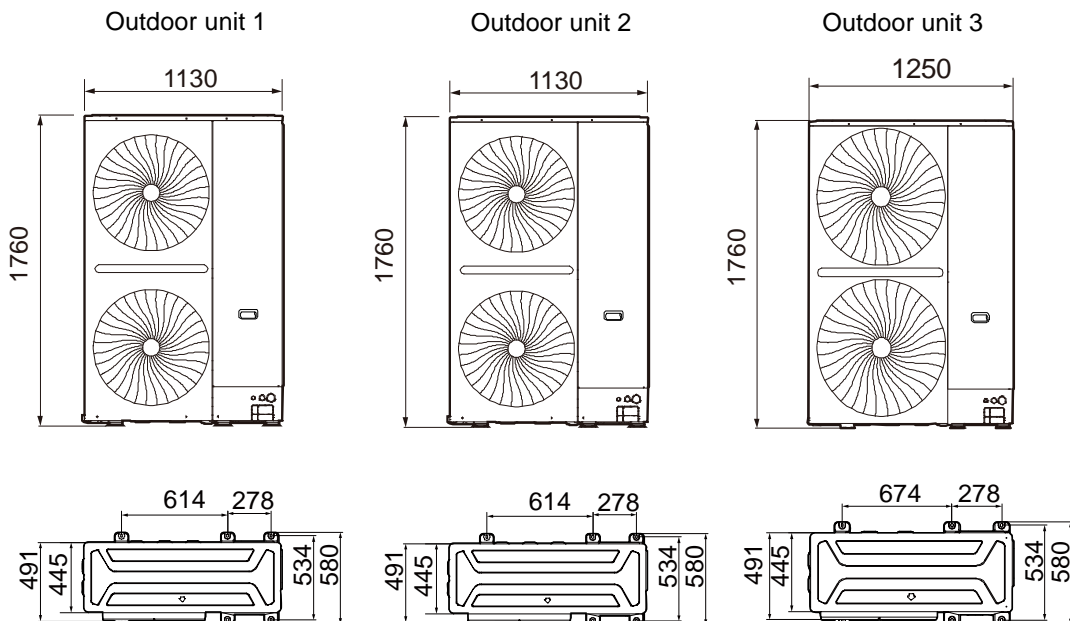
### 34/36/38/40/42/44HP

Figure 2-2.7: 34/36/38/40/42/44HP dimensions (unit: mm)



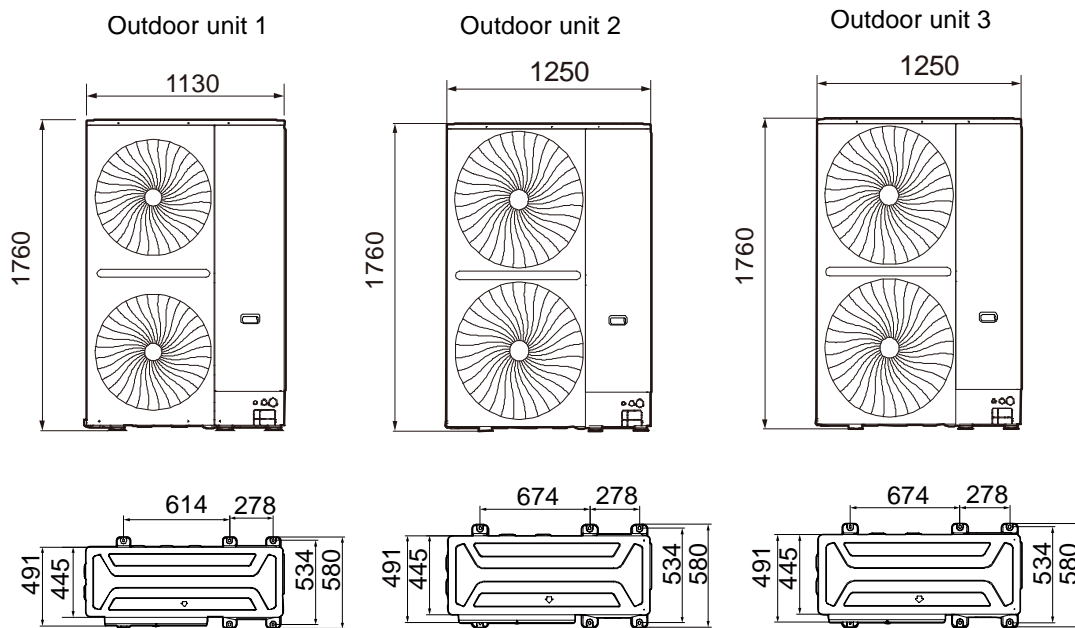
### 46HP

Figure 2-2.8: 46HP dimensions (unit: mm)



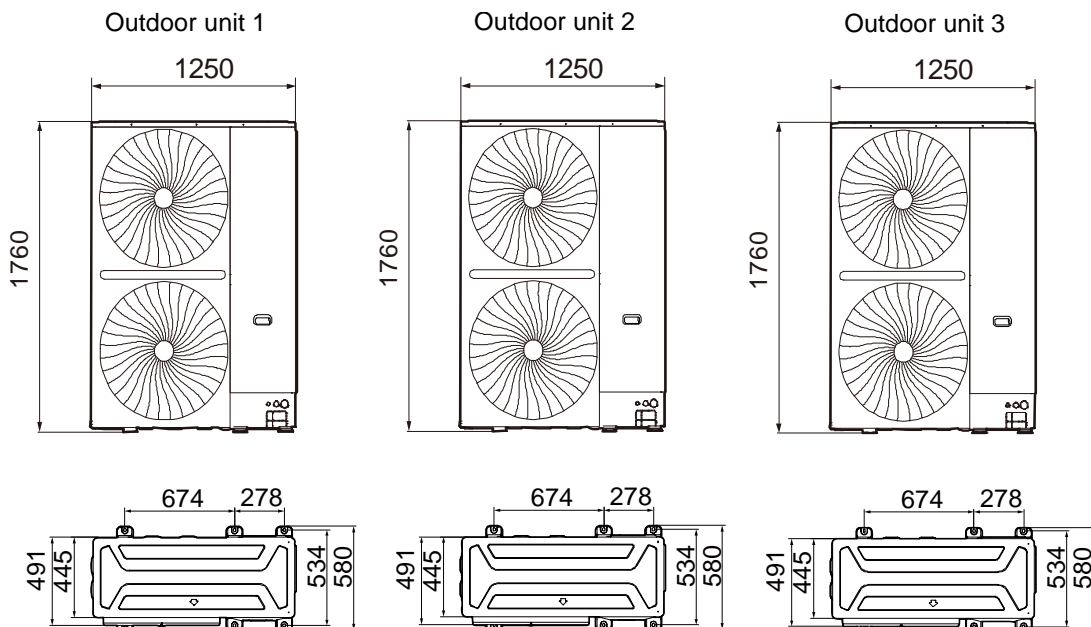
### 48/50HP

Figure 2-2.9: 48/50HP dimensions (unit: mm)



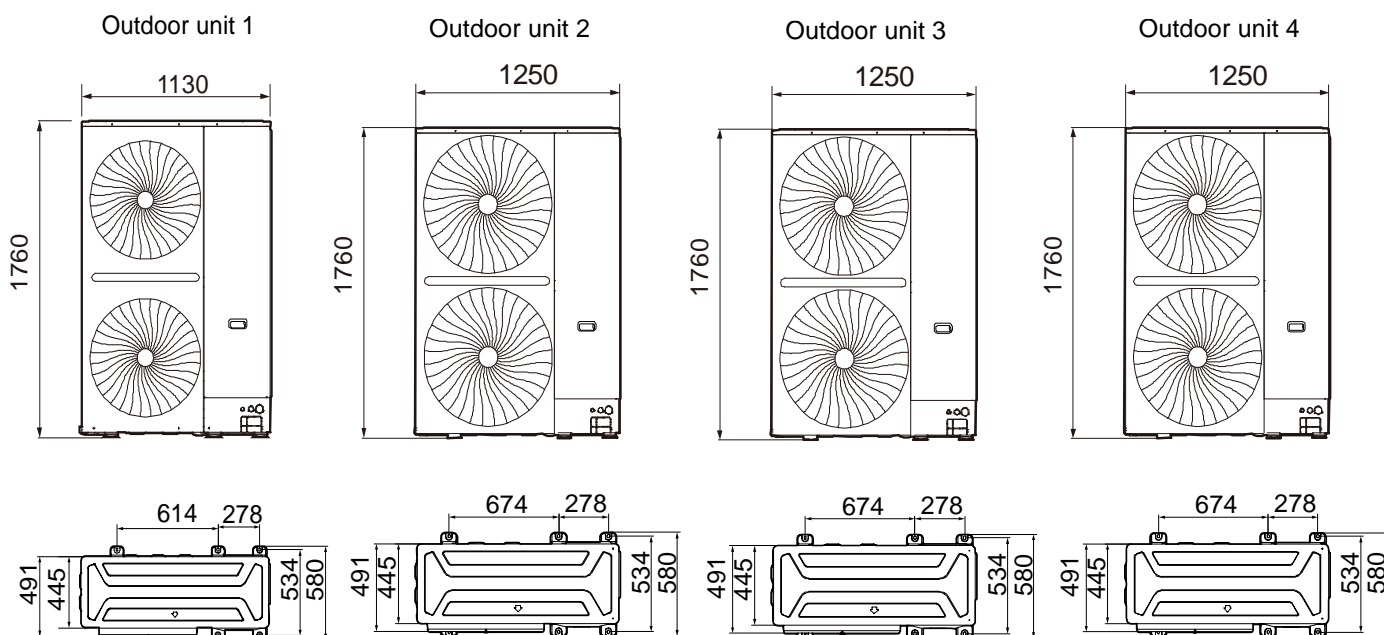
### 52/54/56/58/60/62/64/66HP

Figure 2-2.10: 52/54/56/58/60/62/64/66HP dimensions (unit: mm)



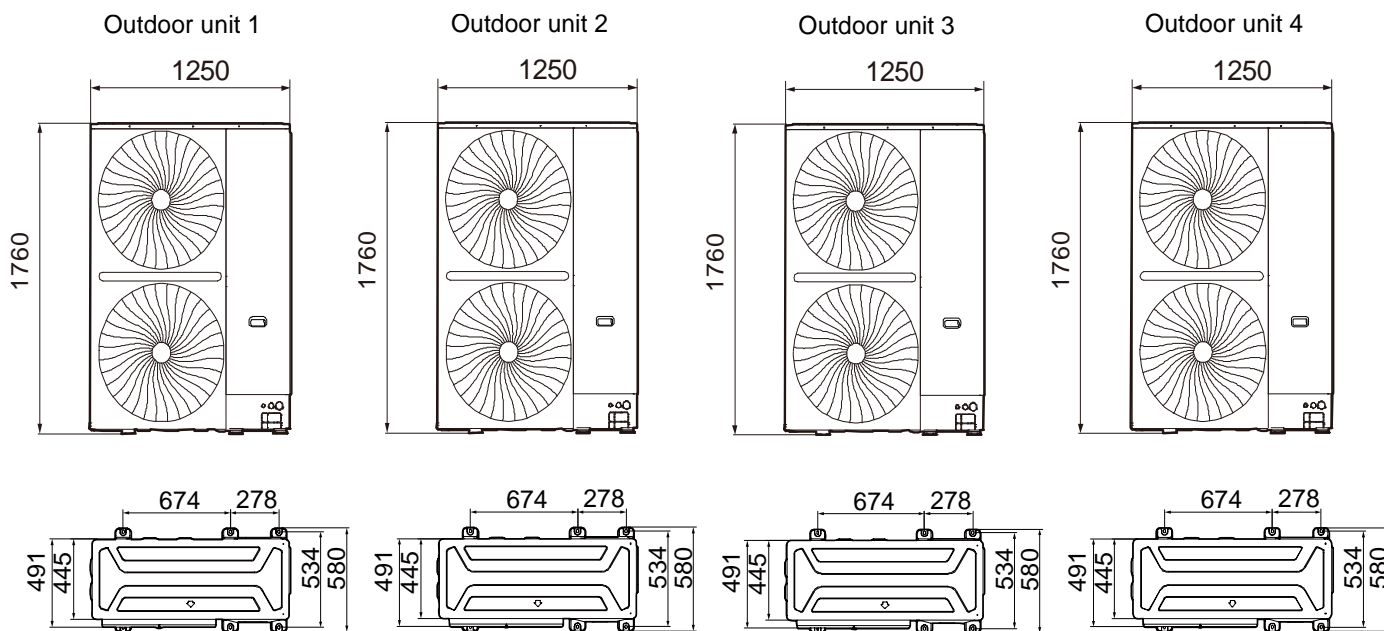
**68/70HP**

Figure 2-2.11: 68/70HP dimensions (unit: mm)



**72/74/76/78/80/82/84/86/88HP**

Figure 2-2.12: 72/74/76/78/80/82/84/86/88HP dimensions (unit: mm)





### 3 Installation Space Requirements

**There are obstacles on the air inlet side but no obstacles on the air outlet side and above the outdoor unit**

Figure 2-3.1: One outdoor unit installation (unit: mm)

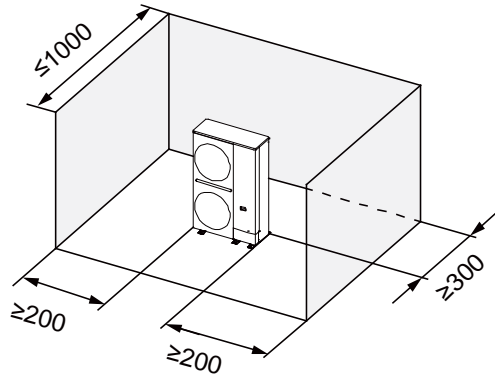
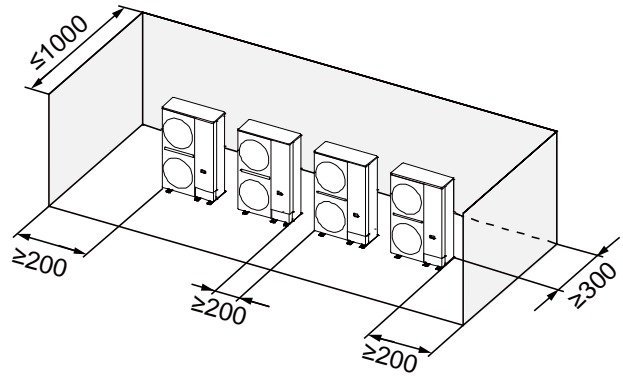


Figure 2-3.2: More than one outdoor unit installation (unit: mm)



**There are obstacles on the air inlet side and above the outdoor unit but no obstacles on the air outlet side**

Figure 2-3.3: One outdoor unit installation (unit: mm)

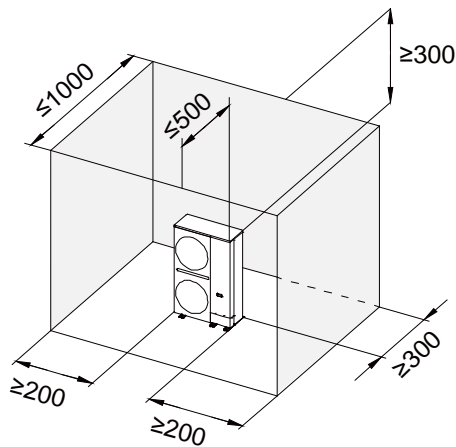
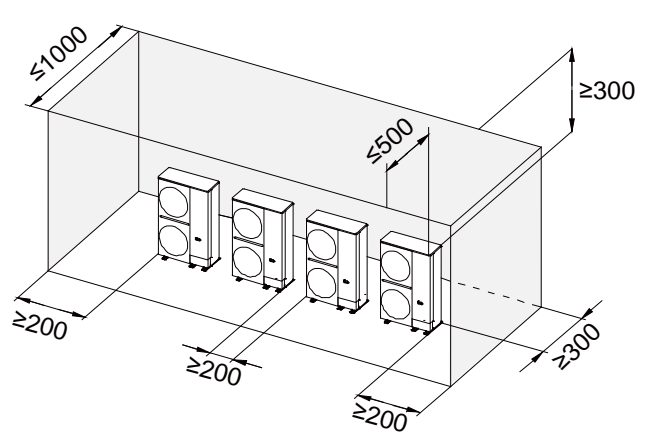


Figure 2-3.4: More than one outdoor unit installation (unit: mm)



**There are obstacles on the air outlet side but no obstacles on the air inlet side and above the outdoor unit**

Figure 2-3.5: One outdoor unit installation (unit: mm)

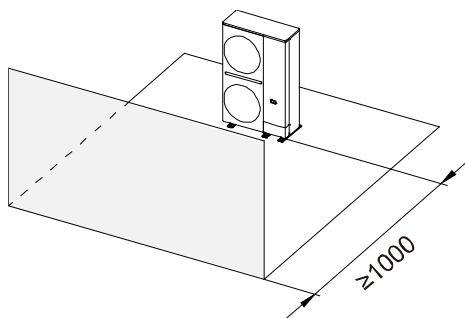
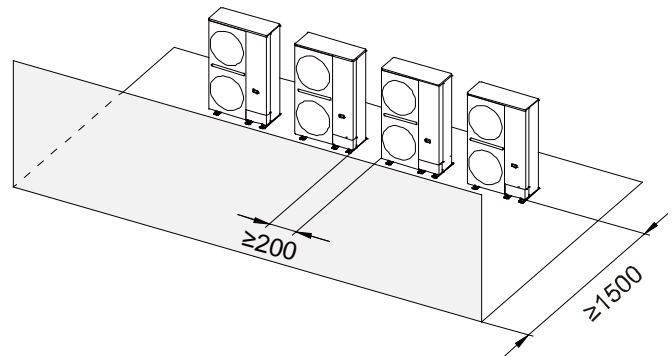


Figure 2-3.6: More than one outdoor unit installation (unit: mm)



**There are obstacles on the air outlet side and above the outdoor unit but no obstacles on the air inlet side**

Figure 2-3.7: One outdoor unit installation (unit: mm)

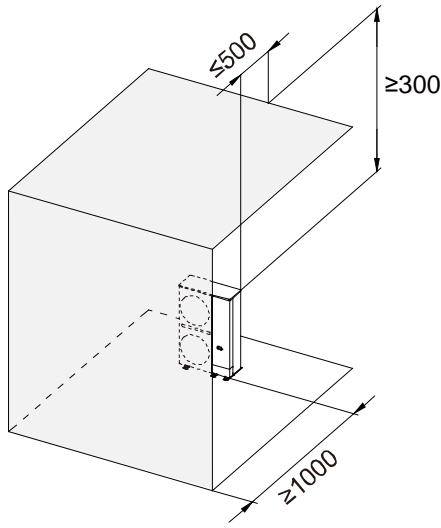
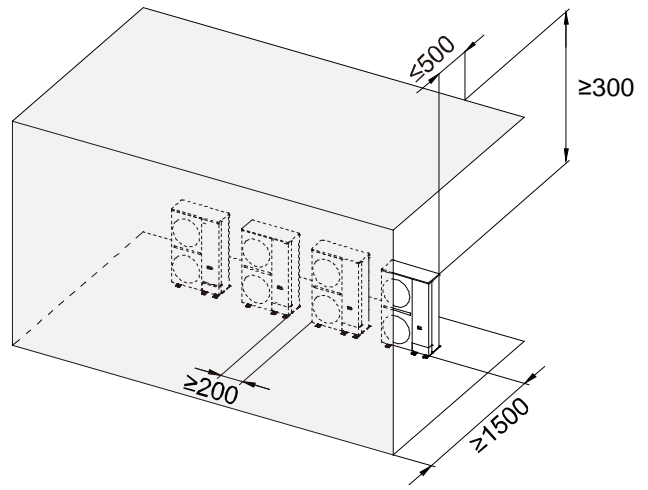


Figure 2-3.8: More than one outdoor unit installation (unit: mm)



**There are obstacles on the air outlet side and the air inlet side but no obstacles above the outdoor unit.**

Figure 2-3.9: One outdoor unit installation (unit: mm)

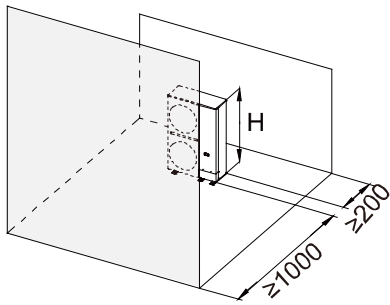
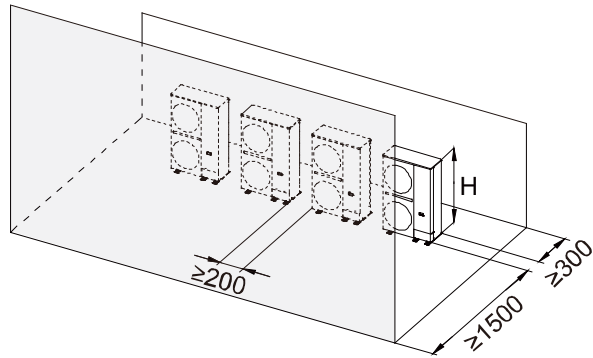


Figure 2-3.10: More than one outdoor unit installation (unit: mm)



**There are obstacles on the air inlet side, the air outlet side and above the outdoor unit**

Figure 2-3.11: One outdoor unit installation (unit: mm)

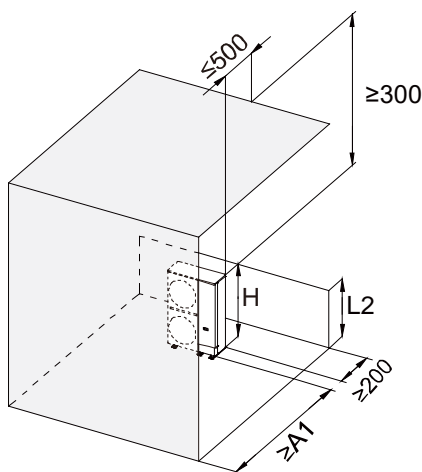
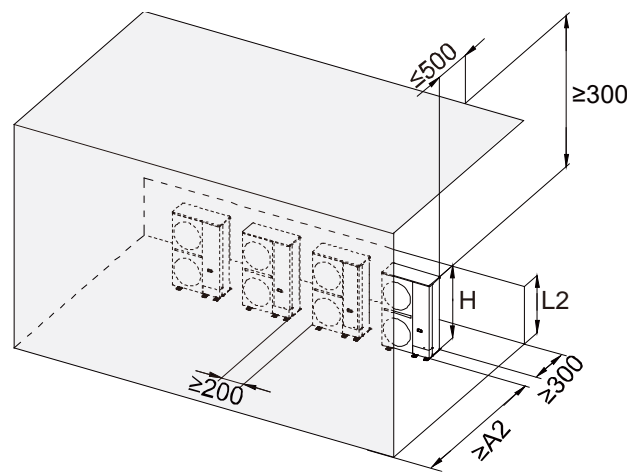


Figure 2-3.12: More than one outdoor unit installation (unit: mm)



Notes:

1. H is the height of the outdoor unit.
2. L2 is the height of the obstacle on the air inlet side.
3. Refer to Table 2-3.1 for the meanings of A1 and A2

Table 2-3.1

Condition	L2	A1	A2
L2 ≤ H	0 < L2 < 1/2H	1000	1500
	1/2H ≤ L2 ≤ H	1250	1750
L2 > H	Install air duct to exhaust the air out of the space.		

Figure 2-3.13: One outdoor unit installation (unit: mm)

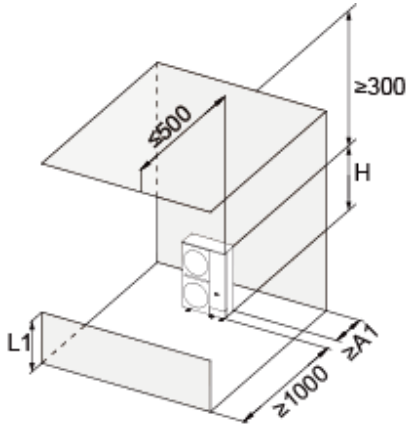
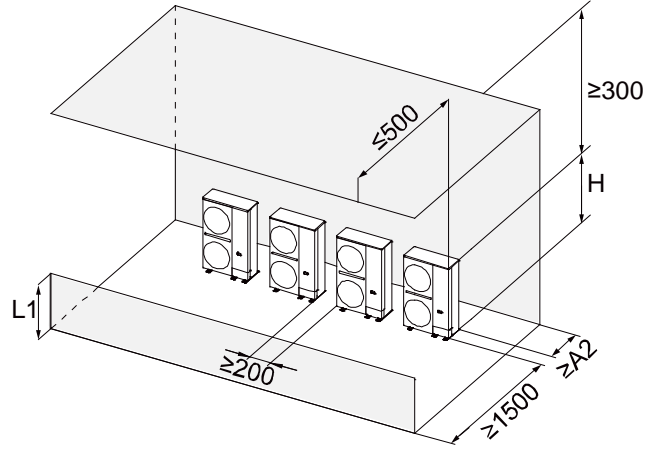


Figure 2-3.14: More than one outdoor unit installation (unit: mm)



Notes:

1. H is the height of the outdoor unit.
2. L1 is the height of the obstacle on the air outlet side.
3. Refer to Table 2-3.2 for the meanings of A1 and A2

Table 2-3.2

Condition	L2	A1	A2
L1 ≤ H	0 < L1 < 1/2H	200	300
	1/2H ≤ L1 ≤ H	300	450
L1 > H	Install air duct to exhaust the air out of the space.		

Stacking installation

Figure 2-3.15: Only the air inlet side of the outdoor unit has obstacles (unit: mm)

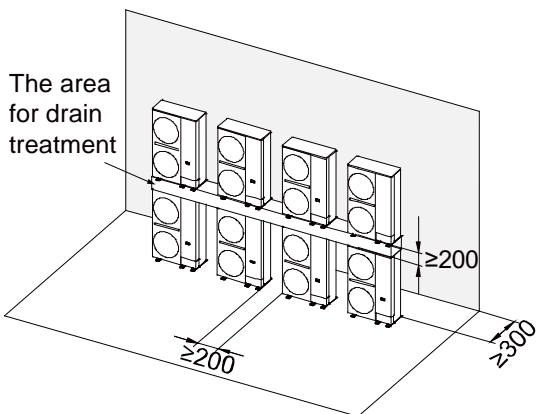
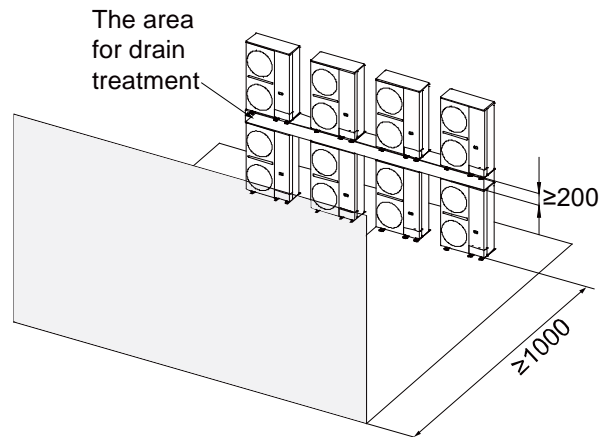


Figure 2-3.16: Only the air outlet side of the outdoor unit has obstacles (unit: mm)



Notes:

1. Only 2-layer stack installation is allowed.
2. When this installation method is adopted, the upper outdoor unit needs to be provided with centralized drainage
3. Stacking installation is prohibited in severe cold areas.

### When outdoor units are installed in different rows on a rooftop

Figure 2-3.17: One outdoor unit installation (unit: mm)

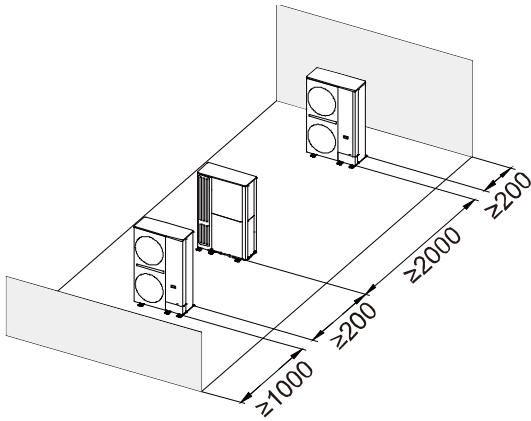
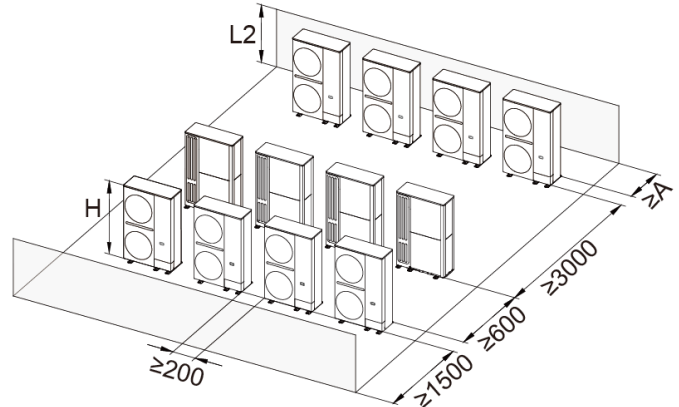


Figure 2-3.18: More than one outdoor unit are installed in each row (unit: mm)



Notes:

1. H is the height of the outdoor unit.
2. L2 is the height of the obstacle.
3. Refer to Table 2-3.3 for the meanings of A.
4. The air outlet of outdoor units facing to the air inlet of other outdoor units is forbidden.

Table 2-3.3

Condition	L2	A
$L2 \leq H$	$0 < L2 < 1/2H$	300
	$1/2H \leq L2 \leq H$	450
$L2 > H$	Install air duct to exhaust the air out of the space.	

### When outdoor units are installed in space with shutters

Figure 2-3.19: Only one outdoor is installed in each row (unit: mm)

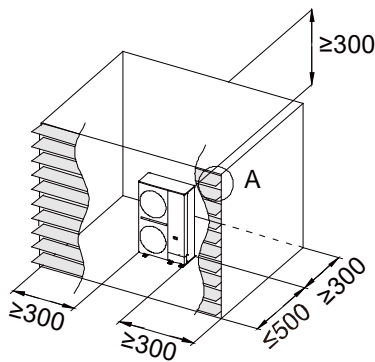
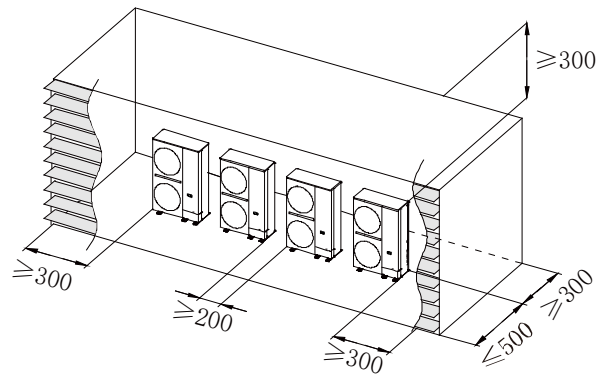
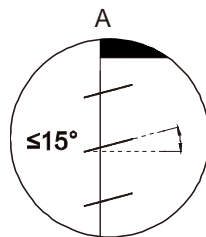


Figure 2-3.20: More than one outdoor unit installation (unit: mm)



Notes:

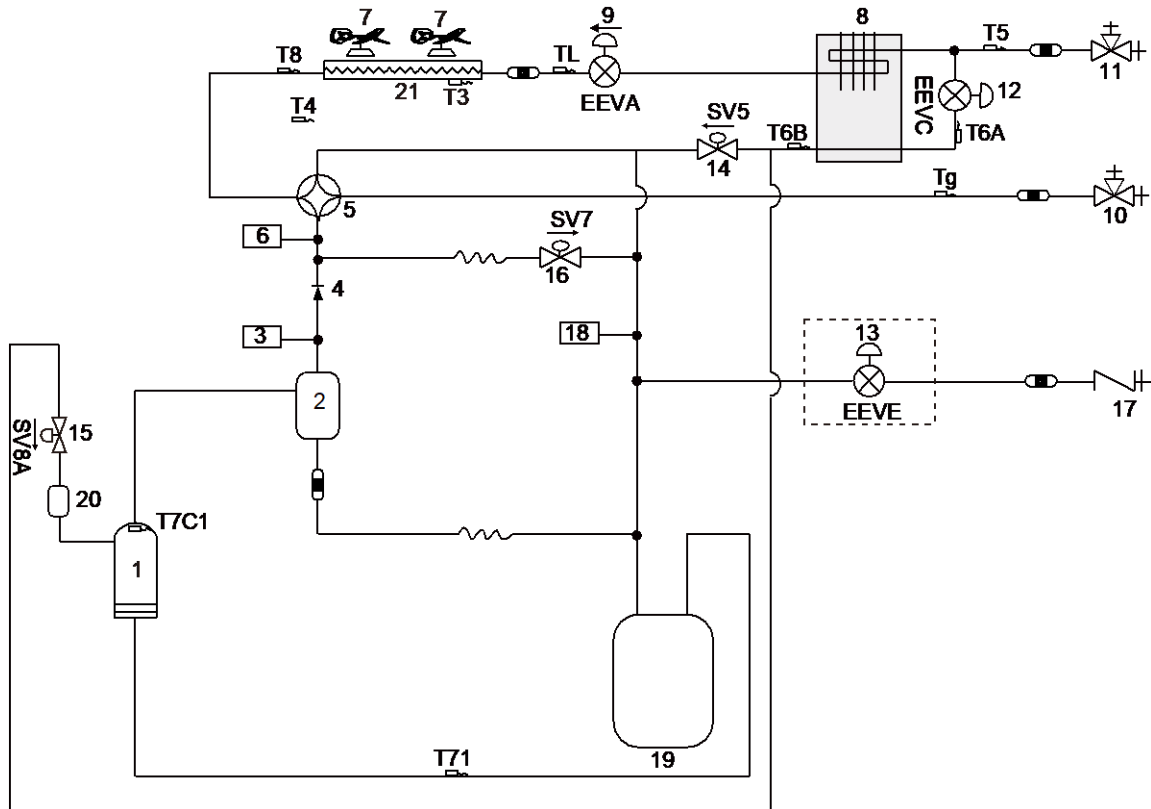
1. When the outdoor unit is installed in the space with shutters, the distance between the air outlet and the shutters must be  $\leq 0.5\text{m}$ ; When the distance between the air outlet and the shutter cannot meet the requirements, the air duct must be installed.
2. The shutter opening rate of the shutter is greater than 90%, and the shutter angle is less than  $15^\circ$ .



## 4 Piping Diagrams

### 8-14HP

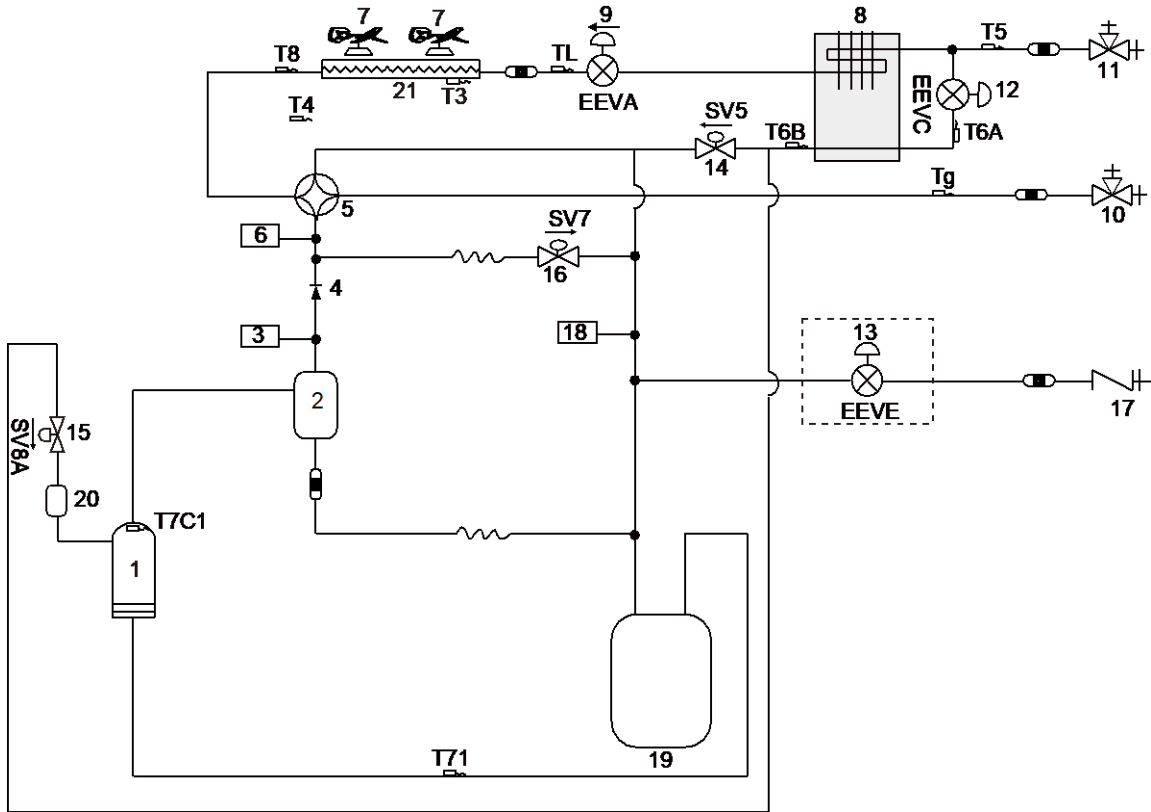
Figure 2-4.1: 8-14HP piping diagram



Legend	
No.	Parts name
1	Inverter Compressor
2	Oil separator
3	High pressure switch
4	Check valve
5	Four-way valve
6	High pressure sensor
7	Inverter Fan
8	Microchannel heat exchanger
9	Electronic expansion valve (EEVA)
10	Stop valve (gas side)
11	Stop valve (liquid side)
12	Electronic expansion valve (EEVC)
13	Electronic expansion valve (Optional EEVE)
14	Injection bypass solenoid valve (SV5)
15	Compressor vapor injection valve (SV8A)
16	Hot gas bypass solenoid valve (SV7)
17	Charge port
18	Low pressure sensor
19	Gas-liquid separator
20	Muffler
21	Heat exchanger
Sensor Code	Description
T3	Main exchanger pipe temperature sensor
T4	Outdoor ambient temperature sensor
T5	Liquid pipe temperature sensor
T6A	Microchannel heat exchanger inlet pipe temperature sensor
T6B	Microchannel heat exchanger outlet pipe temperature sensor
T71	Suction temperature sensor
T8	Heat exchanger gas temperature sensor
Tg	Gas pipe temperature sensor
TL	Heat exchanger liquid temperature sensor
T7C1	Compressor discharge temperature sensor

# 16-22HP

Figure 2-4.2: 16-22HP piping diagram



Legend			
No.	Parts name	No.	Parts name
1	Inverter Compressor	17	Charge port
2	Oil separator	18	Low pressure sensor
3	High pressure switch	19	Gas-liquid separator
4	Check value	20	Muffler
5	Four-way valve	21	Heat exchanger
6	High pressure sensor		
7	Inverter Fan	<b>Sensor Code</b>	<b>Description</b>
8	Microchannel heat exchanger	T3	Main exchanger pipe temperature sensor
9	Electronic expansion valve (EEVA)	T4	Outdoor ambient temperature sensor
10	Stop valve (gas side)	T5	Liquid pipe temperature sensor
11	Stop valve (liquid side)	T6A	Microchannel heat exchanger inlet pipe temperature sensor
12	Electronic expansion valve (EEVC)	T6B	Microchannel heat exchanger outlet pipe temperature sensor
13	Electronic expansion valve (Optional EEVE)	T71	Suction temperature sensor
14	Injection bypass solenoid valve (SV5)	T8	Heat exchanger gas temperature sensor
15	Compressor vapor injection valve (SV8A)	Tg	Gas pipe temperature sensor
16	Hot gas bypass solenoid valve (SV7)	TL	Heat exchanger liquid temperature sensor
		T7C1	Compressor discharge temperature sensor

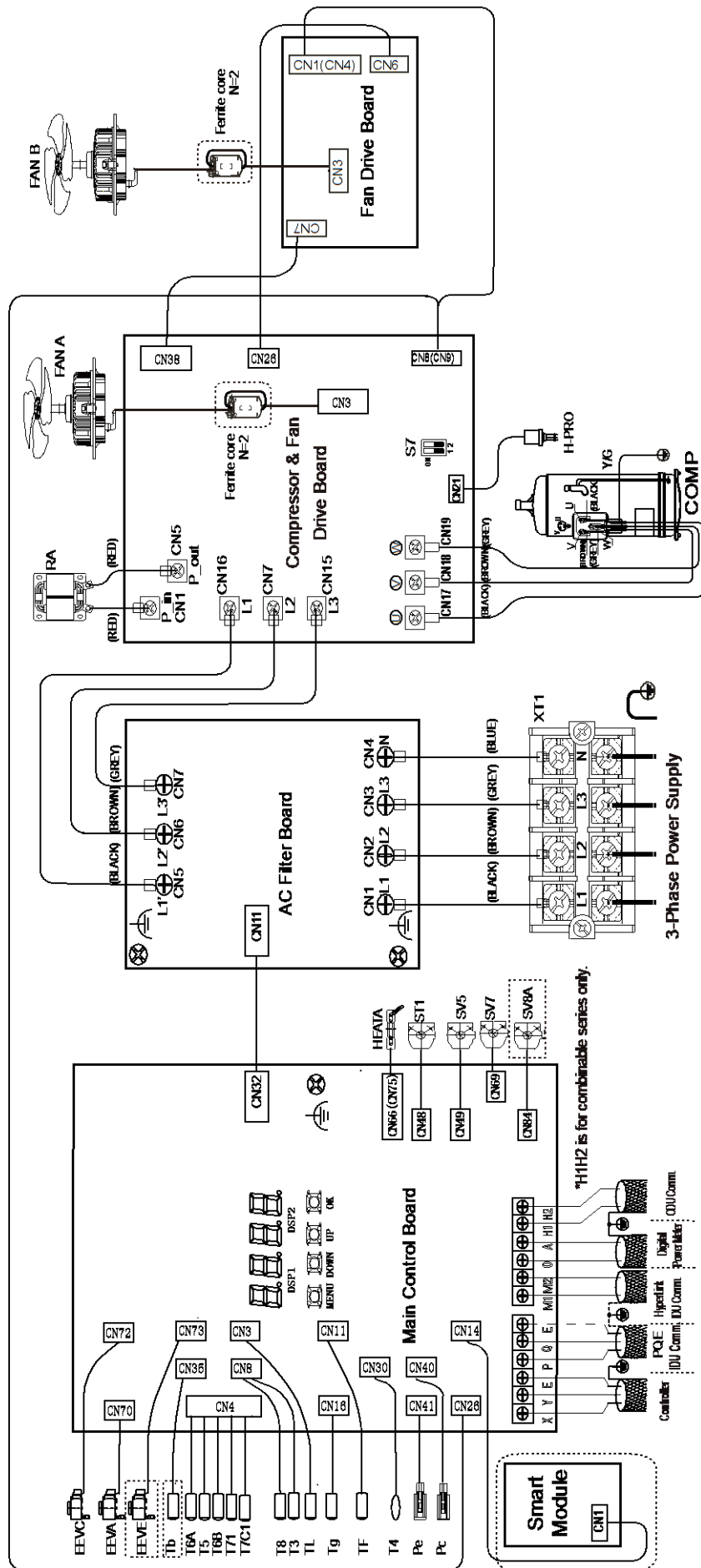
Note:

1. There is no SV8A for 20/22HP outdoor units.

**Key components:**

1. **Oil separator:**  
Separates oil from gas refrigerant pumped out of the compressor and quickly returns it to the compressor. Separation efficiency is up to 99%.
2. **Gas-liquid separator:**  
Separates liquid refrigerant from gas refrigerant, stores liquid refrigerant and oil to protect compressor from liquid hammering.
3. **Electronic expansion valve (EEVA):**  
Controls refrigerant flow and reduces refrigerant pressure.
4. **Four-way valve:**  
Controls heat exchanger function. When open, the heat exchanger functions as an evaporator; when closed, the heat exchanger functions as a condenser.
5. **Microchannel heat exchanger:**  
In cooling mode, it can improve super-cooling degree and the super-cooled refrigerant can achieve better heat exchange in indoor side. In heating mode, the refrigerant comes from the microchannel heat exchanger going to the compressor can increase the refrigerant volume and improve the heating capacity in low ambient temperature. Refrigerant volume in microchannel heat exchanger is controlled according to temperature different between microchannel heat exchanger inlet and outlet or the temperature different between discharge temperature and target discharge temperature.
6. **Solenoid valve SV5:**  
Controls the refrigerant from microchannel heat exchanger to gas-liquid separator.
7. **Solenoid valve SV7:**  
Bypass pressure at start-up stage and control capacity at low load condition; High-pressure-rise prevention; Discharge superheat protection.
8. **Solenoid valve SV8A:**  
Allows refrigerant from microchannel heat exchanger inject directly to the compressor. SV8A opens when compressor startup and closes when compressor stop.
9. **High pressure switch:**  
Regulate system pressure. When system pressure rises above the upper limit, the high pressure switch turn off, stopping the compressor. When the high pressure protection recovers, the compressor restarts.
10. **High/Low pressure sensor**  
Used to detect the system high/low pressure.

# 5 Wiring Diagrams





Legend			
Code	Name	Code	Name
COMP	Compressor	T3	Main exchanger pipe temperature sensor
EEVA/EEVC	Electronic expansion valve	T4	Outdoor ambient temperature sensor
FAN A/ FAN B	DC Fan	T5	Liquid pipe temperature sensor
HEAT A	Crankcase heater	T6A	Microchannel heat exchanger inlet pipe temperature sensor
RA	Reactance	T6B	Microchannel heat exchanger outlet pipe temperature sensor
ST1	Four-way valve	T71	Suction temperature sensor
SV5-SV8A	Solenoid valve	T8	Heat exchanger gas temperature sensor
H-PRO A	High pressure switch	Tg	Gas pipe temperature sensor
Pc	High pressure sensor	TL	Heat exchanger liquid temperature sensor
Pe	Low pressure sensor	T7C1	Compressor discharge temperature sensor
XT1	Terminal block	Tb	Electric control box chamber temperature sensor
EEVE	Electronic expansion valve	TF	Inverter-module heatsink temperature sensor

Note:

1. This wiring diagram is for reference only, actual product may vary.
2. The shield layer at both ends of all shielded wires should be connected to the electric control box sheet metal “ ⊕ ”
3. It is forbidden to connect the power cable to the communication terminal, otherwise the main control board will be damaged.
4. It is forbidden to connect both the M1M2 communication line and the PQ communication line in one system, refer to the communication wiring configuration section of the manual.

## 6 Electrical Characteristics

Table 2-6.1: Outdoor unit electrical characteristics

Model				Power Supply <sup>1</sup>						Compressor		OFM		
Capacity	Modules			Hz	Volts	Min.	Max.	MCA <sup>2</sup>	TOCA <sup>3</sup>	MFA <sup>4</sup>	MSC <sup>5</sup>	RLA <sup>6</sup> (A)	Power(kW)	FLA (A)
						volts	volts	(A)	(A)	(A)				
8HP	-	-	-	50	380~415	342		17	17	20	-	23.5	0.2×2	0.65×2
10HP	-	-	-	50	380~415	342		21	21	25	-	23.5	0.2×2	0.65×2
12HP	-	-	-	50	380~415	342		23	23	32	-	25.2	0.2×2	0.65×2
14HP	-	-	-	50	380~415	342		28	28	32	-	27.2	0.2×2	0.65×2
16HP	-	-	-	50	380~415	342		30	30	40	-	30.5	0.56×2	2.0×2
18HP	-	-	-	50	380~415	342		33	33	40	-	30.5	0.56×2	2.0×2
20HP	-	-	-	50	380~415	342		40	40	50	-	37.5	0.56×2	2.0×2
22HP	-	-	-	50	380~415	342		45	45	50	-	38.5	0.56×2	2.0×2
24HP	12HP	12HP	-	50	380~415	342		46	46	32+32	-	(25.2)+(25.2)	(0.2×2)+(0.2×2)	(0.65×2)+(0.65×2)
26HP	12HP	14HP	-	50	380~415	342		51	51	32+32	-	(25.2)+(27.2)	(0.2×2)+(0.2×2)	(0.65×2)+(0.65×2)
28HP	14HP	14HP	-	50	380~415	342		56	56	32+32	-	(27.2)+(27.2)	(0.2×2)+(0.2×2)	(0.65×2)+(0.65×2)
30HP	14HP	16HP	-	50	380~415	342		58	58	32+40	-	(27.2)+(30.5)	(0.2×2)+(0.56×2)	(0.65×2)+(2.0×2)
32HP	14HP	18HP	-	50	380~415	342		61	61	32+40	-	(27.2)+(30.5)	(0.2×2)+(0.56×2)	(0.65×2)+(2.0×2)
34HP	16HP	18HP	-	50	380~415	342		63	63	40+40	-	(30.5)+(30.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
36HP	18HP	18HP	-	50	380~415	342		66	66	40+40	-	(30.5)+(30.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
38HP	16HP	22HP	-	50	380~415	342		75	75	40+50	-	(30.5)+(38.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
40HP	18HP	22HP	-	50	380~415	342		78	78	40+50	-	(30.5)+(38.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
42HP	20HP	22HP	-	50	380~415	342		85	85	50+50	-	(37.5)+(38.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
44HP	22HP	22HP	-	50	380~415	342		90	90	50+50	-	(38.5)+(38.5)	(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2)
46HP	14HP	14HP	18HP	50	380~415	342		89	89	32+32+40	-	(27.2)+(27.2)+(30.5)	(0.2×2)+(0.2×2) +(0.56×2)	(0.65×2)+(0.65×2) +(2.0×2)
48HP	14HP	16HP	18HP	50	380~415	342		91	91	32+40+40	-	(27.2)+(30.5)+(30.5)	(0.2×2)+(0.56×2) +(0.56×2)	(0.65×2)+(2.0×2) +(2.0×2)
50HP	14HP	18HP	18HP	50	380~415	342		94	94	32+40+40	-	(27.2)+(30.5)+(30.5)	(0.2×2)+(0.56×2) +(0.56×2)	(0.65×2)+(2.0×2) +(2.0×2)
52HP	16HP	18HP	18HP	50	380~415	342		96	96	40+40+40	-	(30.5)+(30.5)+(30.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
54HP	18HP	18HP	18HP	50	380~415	342		99	99	40+40+40	-	(30.5)+(30.5)+(30.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
56HP	16HP	18HP	22HP	50	380~415	342		108	108	40+40+50	-	(30.5)+(30.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
58HP	18HP	18HP	22HP	50	380~415	342		111	111	40+40+50	-	(30.5)+(30.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
60HP	18HP	20HP	20HP	50	380~415	342		113	113	40+50+50	-	(30.5)+(37.5)+(37.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
62HP	18HP	22HP	22HP	50	380~415	342		123	123	40+50+50	-	(30.5)+(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
64HP	20HP	22HP	22HP	50	380~415	342		130	130	50+50+50	-	(37.5)+(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)
66HP	22HP	22HP	22HP	50	380~415	342		135	135	50+50+50	-	(38.5)+(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)

Abbreviations:

MCA: Minimum Circuit Amps; TOCA: Total Over-current Amps; MFA: Maximum Fuse Amps; MSC: Maximum Starting Current (A); RLA: Rated Load Amps; FLA: Full Load Amps

Notes:

- 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%.
- Select wire size based on the value of MCA.
- TOCA indicates the total overcurrent amps value of each OC set.
- MFA is used to select overcurrent circuit breakers and residual-current circuit breakers.
- MSC indicates the maximum current on compressor start-up in amps.
- RLA is based on the following conditions: indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB

Table 2-6.1: Outdoor unit electrical characteristics (continues)

Model					Power Supply <sup>1</sup>						Compressor		OFM		
Capacity	Modules				Hz	Volts	Min.	Max.	MCA <sup>2</sup>	TOCA <sup>3</sup>	MFA <sup>4</sup>	MSC <sup>5</sup>	RLA <sup>6</sup>	Power(kW)	FLA
							volts	volts							
68HP	14HP	18HP	18HP	18HP	50	380~415	342		127	127	28+40+40 +40	-	(27.2)+(30.5) +(30.5)+(30.5)	(0.2×2)+(0.56×2) +(0.56×2)+(0.56×2)	(0.65×2)+(2.0×2) +(2.0×2)+(2.0×2)
70HP	14HP	18HP	18HP	20HP	50	380~415	342		134	134	28+40+40 +50	-	(27.2)+(30.5) +(30.5)+(37.5)	(0.2×2)+(0.56×2) +(0.56×2)+(0.56×2)	(0.65×2)+(2.0×2) +(2.0×2)+(2.0×2)
72HP	18HP	18HP	18HP	18HP	50	380~415	342		132	132	33+40+40 +40	-	(30.5)+(30.5) +(30.5)+(30.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
74HP	18HP	18HP	18HP	20HP	50	380~415	342		139	139	33+40+40 +50	-	(30.5)+(30.5) +(30.5)+(37.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
76HP	18HP	18HP	18HP	22HP	50	380~415	342		144	144	33+40+40 +50	-	(30.5)+(30.5) +(30.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
78HP	18HP	18HP	20HP	22HP	50	380~415	342		151	151	33+40+50 +50	-	(30.5)+(30.5) +(37.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
80HP	18HP	18HP	22HP	22HP	50	380~415	342		156	156	33+40+50 +50	-	(30.5)+(30.5) +(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
82HP	18HP	20HP	22HP	22HP	50	380~415	342		163	163	33+50+50 +50	-	(30.5)+(37.5) +(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
84HP	18HP	22HP	22HP	22HP	50	380~415	342		168	168	33+50+50 +50	-	(30.5)+(38.5) +(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
86HP	20HP	22HP	22HP	22HP	50	380~415	342		175	175	40+50+50 +50	-	(37.5)+(38.5) +(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)
88HP	22HP	22HP	22HP	22HP	50	380~415	342		180	180	45+50+50 +50	-	(38.5)+(38.5) +(38.5)+(38.5)	(0.56×2)+(0.56×2) +(0.56×2)+(0.56×2)	(2.0×2)+(2.0×2) +(2.0×2)+(2.0×2)

Abbreviations:

MCA: Minimum Circuit Amps; TOCA: Total Over-current Amps; MFA: Maximum Fuse Amps; MSC: Maximum Starting Current (A); RLA: Rated Load Amps; FLA: Full Load Amps

Notes:

- 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%.
- Select wire size based on the value of MCA.
- TOCA indicates the total overcurrent amps value of each OC set.
- MFA is used to select overcurrent circuit breakers and residual-current circuit breakers.
- MSC indicates the maximum current on compressor start-up in amps.
- RLA is based on the following conditions: indoor temperature 27°C DB, 19°C WB; outdoor temperature 35°C DB

## 7 Functional Components and Safety Devices

Table 2-7.1: 8/10/12/14/16HP functional components and safety devices

Item		8HP	10HP	12HP	14HP
Compressor	Compressor top and discharge pipe temperature sensors	115°C = 5kΩ ± 3%			
	Crankcase heater	50W			
Inverter module	Inverter module temperature sensor	90°C = 5kΩ ± 5%			
System	High pressure switch	Off: 4.2 (±0.1) MPa / On: 3.2 (±0.1) MPa			
	High pressure sensor	Output voltage (V) = 0.8696 × P + 0.5 (where P is the discharge pressure in MPa)			
	Heat exchanger temperature sensor	25°C = 10kΩ			
	Outdoor ambient temperature sensor	25°C = 10kΩ			

Table 2-7.2: 18/20/22/24HP functional components and safety devices

Item		16HP	18HP	20HP	22HP
Compressor	Compressor top and discharge pipe temperature sensors	115°C = 5kΩ ± 3%			
	Crankcase heater	50W			
Inverter module	Inverter module temperature sensor	90°C = 5kΩ ± 5%			
System	High pressure switch	Off: 4.2 (±0.1) MPa / On: 3.2 (±0.1) MPa			
	High pressure sensor	Output voltage (V) = 0.8696 × P + 0.5 (where P is the discharge pressure in MPa)			
	Heat exchanger temperature sensor	25°C = 10kΩ			
	Outdoor ambient temperature sensor	25°C = 10kΩ			

# 8 Capacity Tables

## 8.1 Cooling Capacity Tables

Table 2-8.1: 8HP cooling capacity

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC KW	PI KW	TC KW	PI KW	TC KW	PI KW	TC KW	PI KW	TC KW	PI KW	TC KW	PI KW	TC KW	PI KW
130%	-15	22.68	2.53	25.20	2.78	30.24	3.25	32.76	3.49	35.28	3.74	40.32	4.20	41.51	4.96
	-10	22.68	2.53	25.20	2.78	30.24	3.25	32.76	3.50	35.28	3.74	40.32	4.28	41.24	4.98
	-5	22.68	2.54	25.20	2.79	30.24	3.26	32.76	3.50	35.28	3.85	40.32	4.33	41.07	5.58
	-2	22.68	2.54	25.20	2.79	30.24	3.26	32.76	3.60	35.28	3.85	40.32	4.43	40.91	5.74
	0	22.68	2.55	25.20	2.79	30.24	3.35	32.76	3.63	35.28	3.87	40.32	4.55	40.73	5.84
	2	22.68	2.55	25.20	2.81	30.24	3.37	32.76	3.65	35.28	3.99	40.32	4.61	40.44	6.05
	4	22.68	2.56	25.20	2.81	30.24	3.43	32.76	3.71	35.28	4.04	40.32	4.77	40.31	6.22
	6	22.68	2.56	25.20	2.85	30.24	3.48	32.76	3.82	35.28	4.18	39.21	4.99	39.95	6.52
	8	22.68	2.58	25.20	2.88	30.24	3.56	32.76	3.96	35.28	4.38	38.74	5.25	39.45	6.80
	10	22.68	2.64	25.20	3.01	30.24	3.74	32.76	4.18	35.28	4.61	38.25	5.57	39.06	7.27
	12	22.68	2.78	25.20	3.16	30.24	3.99	32.76	4.48	35.28	4.98	37.78	6.02	38.49	7.88
	14	22.68	2.97	25.20	3.39	30.24	4.35	32.76	4.88	35.28	5.48	37.35	6.44	38.07	8.54
	17	22.68	3.45	25.20	4.00	30.24	5.09	32.76	5.55	35.28	6.04	36.58	7.25	37.36	9.59
	20	22.68	4.31	25.20	4.69	30.24	5.59	32.76	6.11	34.28	6.68	35.88	8.14	36.53	10.70
	22	22.68	4.57	25.20	4.98	30.24	5.97	32.76	6.53	33.82	7.13	35.44	8.78	36.07	11.53
	25	22.68	4.99	25.20	5.47	30.24	6.57	32.76	7.20	33.11	7.89	34.64	9.83	35.37	12.87
	27	22.68	5.29	25.20	5.81	30.24	7.01	31.88	7.69	32.63	8.44	34.13	10.58	34.66	13.84
	29	22.68	5.62	25.20	6.18	30.24	7.46	31.39	8.19	32.08	9.09	33.63	11.43	34.20	14.29
	31	22.68	5.97	25.20	6.58	30.24	7.96	30.87	8.75	31.58	9.78	33.11	12.29	33.59	14.74
	33	22.68	6.33	25.20	6.99	30.24	8.49	30.36	9.33	31.08	10.53	32.49	13.24	33.11	15.21
	35	22.68	6.73	25.20	7.44	29.17	9.05	29.85	10.06	30.55	11.37	32.09	14.25	32.55	15.61
	37	22.68	7.14	25.20	7.90	28.65	9.65	29.34	10.83	30.02	12.24	31.36	15.35	32.10	15.61
39	22.68	7.59	25.20	8.42	28.13	10.28	28.82	11.67	29.45	13.17	31.02	15.58	31.31	15.63	
41	22.68	8.06	25.20	8.95	27.35	11.06	27.59	12.57	27.90	14.17	28.27	15.58	28.55	15.58	
43	22.68	8.57	25.20	9.54	25.17	11.91	25.58	13.54	25.78	15.32	25.82	14.98	26.01	14.28	
46	21.06	9.41	21.22	10.48	21.65	13.33	21.71	13.10	22.10	12.75	22.24	12.05	22.29	11.49	
48	18.64	10.01	18.75	11.17	19.34	11.43	19.34	11.18	19.27	10.87	19.94	10.41	19.81	10.07	
50	16.19	10.66	16.33	10.41	16.48	9.96	16.74	9.63	16.99	9.47	17.31	8.96	17.06	8.79	
52	13.71	9.11	13.52	8.87	14.19	8.38	13.87	8.39	14.33	8.22	14.44	7.65	14.05	7.66	
55	9.05	7.09	9.41	6.75	9.39	6.44	9.73	6.43	10.09	6.41	9.95	5.97	10.35	5.93	
120%	-15	20.94	2.39	23.26	2.61	27.91	3.08	30.24	3.29	32.57	3.52	37.22	3.93	40.18	4.51
	-10	20.94	2.39	23.26	2.62	27.91	3.08	30.24	3.29	32.57	3.53	37.22	4.05	39.67	4.72
	-5	20.94	2.40	23.26	2.63	27.91	3.08	30.24	3.30	32.57	3.54	37.22	4.05	39.54	4.78
	-2	20.94	2.40	23.26	2.63	27.91	3.08	30.24	3.33	32.57	3.63	37.22	4.14	39.45	4.98
	0	20.94	2.41	23.26	2.63	27.91	3.09	30.24	3.34	32.57	3.64	37.22	4.26	39.40	5.20
	2	20.94	2.41	23.26	2.64	27.91	3.11	30.24	3.42	32.57	3.69	37.22	4.27	39.23	5.32
	4	20.94	2.41	23.26	2.65	27.91	3.13	30.24	3.50	32.57	3.76	37.22	4.35	39.15	5.42
	6	20.94	2.43	23.26	2.68	27.91	3.24	30.24	3.56	32.57	3.83	37.22	4.53	38.72	5.65
	8	20.94	2.44	23.26	2.73	27.91	3.25	30.24	3.62	32.57	3.99	37.22	4.72	38.13	5.98
	10	20.94	2.46	23.26	2.73	27.91	3.41	30.24	3.80	32.57	4.20	37.22	5.02	37.97	6.38
	12	20.94	2.55	23.26	2.91	27.91	3.64	30.24	4.05	32.57	4.50	37.22	5.41	37.55	6.87
	14	20.94	2.72	23.26	3.12	27.91	3.94	30.24	4.41	32.57	4.91	36.14	5.88	36.80	7.45
	17	20.94	3.16	23.26	3.60	27.91	4.73	30.24	5.13	32.57	5.56	35.43	6.52	36.29	8.37
	20	20.94	4.06	23.26	4.41	27.91	5.19	30.24	5.65	32.57	6.13	34.74	7.21	35.55	9.36
	22	20.94	4.31	23.26	4.68	27.91	5.54	30.24	6.04	32.57	6.56	34.29	7.74	35.09	10.09
	25	20.94	4.70	23.26	5.13	27.91	6.10	30.24	6.64	32.57	7.23	33.50	8.67	34.12	11.32
	27	20.94	4.99	23.26	5.44	27.91	6.49	30.24	7.09	31.59	7.72	33.03	9.35	33.67	12.14
	29	20.94	5.29	23.26	5.79	27.91	6.91	30.24	7.55	31.09	8.24	32.56	10.10	33.17	13.02
	31	20.94	5.60	23.26	6.15	27.91	7.37	30.24	8.05	30.63	8.81	32.07	10.89	32.68	14.01
	33	20.94	5.95	23.26	6.53	27.91	7.85	29.49	8.59	30.14	9.41	31.54	11.72	32.03	15.09
	35	20.94	6.31	23.26	6.94	27.91	8.37	28.95	9.16	29.62	10.15	30.98	12.58	31.87	15.56
	37	20.94	6.70	23.26	7.38	27.91	8.91	28.46	9.78	29.10	10.92	30.50	13.55	30.95	15.84
39	20.94	7.11	23.26	7.84	27.27	9.50	27.93	10.46	28.60	11.75	30.01	14.61	30.38	15.83	
41	20.94	7.55	23.26	8.34	26.79	10.13	27.01	11.27	27.24	12.68	28.06	15.80	27.80	15.83	
43	20.94	8.03	23.26	8.88	24.66	10.80	24.86	12.12	25.06	13.66	25.51	15.32	25.56	14.87	
46	20.94	8.79	20.85	9.75	21.21	11.99	21.29	13.59	21.66	12.93	21.80	12.10	22.05	11.86	
48	18.29	9.35	18.45	10.38	19.00	11.61	19.01	11.33	18.97	11.12	19.20	10.58	19.29	10.24	
50	15.79	9.95	15.92	10.54	16.28	10.03	16.55	9.79	16.33	9.65	16.86	9.15	16.63	8.98	
52	13.18	9.19	13.41	8.95	13.85	8.56	13.55	8.39	13.98	8.03	14.09	7.84	14.58	7.66	
55	9.53	7.25	9.23	7.09	9.20	6.92	9.54	6.43	9.88	6.42	9.75	5.98	10.13	5.94	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.1: 8HP cooling capacity (continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
110%	-15	19.19	2.24	21.32	2.46	25.59	2.87	27.72	3.09	29.85	3.30	34.12	3.69	38.38	4.16
	-10	19.19	2.24	21.32	2.47	25.59	2.88	27.72	3.09	29.85	3.30	34.12	3.72	38.38	4.20
	-5	19.19	2.25	21.32	2.47	25.59	2.88	27.72	3.10	29.85	3.30	34.12	3.73	38.38	4.42
	-2	19.19	2.26	21.32	2.47	25.59	2.88	27.72	3.10	29.85	3.33	34.12	3.80	38.38	4.50
	0	19.19	2.26	21.32	2.48	25.59	2.94	27.72	3.12	29.85	3.34	34.12	3.84	38.38	4.52
	2	19.19	2.26	21.32	2.48	25.59	2.95	27.72	3.14	29.85	3.39	34.12	3.89	38.38	4.71
	4	19.19	2.27	21.32	2.50	25.59	2.96	27.72	3.20	29.85	3.48	34.12	3.98	38.38	4.87
	6	19.19	2.27	21.32	2.50	25.59	2.99	27.72	3.23	29.85	3.58	34.12	4.08	37.33	4.98
	8	19.19	2.27	21.32	2.51	25.59	3.01	27.72	3.24	29.85	3.61	34.12	4.25	36.95	5.24
	10	19.19	2.27	21.32	2.52	25.59	3.11	27.72	3.43	29.85	3.77	34.12	4.51	36.51	5.57
	12	19.19	2.28	21.32	2.61	25.59	3.27	27.72	3.64	29.85	4.01	34.12	4.89	36.04	6.03
	14	19.19	2.46	21.32	2.82	25.59	3.53	27.72	3.94	29.85	4.38	34.12	5.34	35.66	6.46
	17	19.19	2.83	21.32	3.22	25.59	4.19	27.72	4.74	29.85	5.10	34.12	5.90	35.02	7.24
	20	19.19	3.59	21.32	4.13	25.59	4.82	27.72	5.21	29.85	5.62	34.12	6.53	34.33	8.13
	22	19.19	4.05	21.32	4.39	25.59	5.13	27.72	5.55	29.85	6.00	33.10	6.98	33.88	8.77
	25	19.19	4.42	21.32	4.79	25.59	5.63	27.72	6.10	29.85	6.61	32.44	7.71	33.17	9.80
	27	19.19	4.68	21.32	5.09	25.59	5.99	27.72	6.50	29.85	7.05	31.92	8.24	32.72	10.57
	29	19.19	4.95	21.32	5.39	25.59	6.38	27.72	6.94	29.85	7.52	31.45	8.83	32.23	11.35
	31	19.19	5.26	21.32	5.72	25.59	6.79	27.72	7.38	29.85	8.03	30.99	9.52	31.69	12.21
	33	19.19	5.57	21.32	6.08	25.59	7.22	27.72	7.87	29.17	8.56	30.46	10.26	31.13	13.12
	35	19.19	5.90	21.32	6.45	25.59	7.69	27.72	8.39	28.69	9.14	30.00	11.04	30.83	14.15
	37	19.19	6.25	21.32	6.85	25.59	8.19	27.72	8.94	28.14	9.74	29.49	11.91	30.07	15.20
	39	19.19	6.63	21.32	7.27	25.59	8.72	27.04	9.52	27.66	10.42	28.97	12.83	29.76	16.41
	41	19.19	7.04	21.32	7.73	25.59	9.28	26.45	10.17	26.67	11.20	27.20	13.84	27.51	16.07
	43	19.19	7.47	21.32	8.22	24.16	9.89	24.35	10.83	24.54	12.07	24.94	14.95	25.19	15.23
46	19.19	8.17	20.45	9.01	20.82	10.89	20.97	12.09	21.05	13.52	21.33	12.48	21.57	12.24	
48	17.95	8.68	18.10	9.60	18.47	11.62	18.65	11.53	18.64	11.26	19.07	10.73	19.21	10.40	
50	15.56	9.24	15.68	10.21	16.06	10.19	16.32	9.96	16.14	9.62	16.42	9.32	16.91	9.17	
52	13.07	9.28	13.30	9.12	13.28	8.72	13.93	8.57	13.63	8.40	13.74	7.66	14.21	7.65	
55	9.33	7.25	9.04	6.92	9.01	6.75	9.34	6.44	9.67	6.42	9.54	5.99	9.91	5.95	
100%	-15	17.45	2.02	19.38	2.27	23.26	2.68	25.20	2.87	27.14	3.07	31.02	3.46	34.89	3.86
	-10	17.45	2.09	19.38	2.29	23.26	2.69	25.20	2.87	27.14	3.08	31.02	3.46	34.89	3.86
	-5	17.45	2.10	19.38	2.30	23.26	2.69	25.20	2.88	27.14	3.10	31.02	3.46	34.89	3.92
	-2	17.45	2.10	19.38	2.30	23.26	2.69	25.20	2.88	27.14	3.10	31.02	3.48	34.89	4.04
	0	17.45	2.11	19.38	2.30	23.26	2.70	25.20	2.89	27.14	3.10	31.02	3.54	34.89	4.10
	2	17.45	2.11	19.38	2.31	23.26	2.72	25.20	2.90	27.14	3.11	31.02	3.56	34.89	4.11
	4	17.45	2.11	19.38	2.31	23.26	2.73	25.20	2.91	27.14	3.21	31.02	3.63	34.89	4.31
	6	17.45	2.12	19.38	2.34	23.26	2.76	25.20	3.01	27.14	3.23	31.02	3.77	34.89	4.41
	8	17.45	2.13	19.38	2.34	23.26	2.76	25.20	3.02	27.14	3.34	31.02	3.80	34.89	4.63
	10	17.45	2.14	19.38	2.35	23.26	2.81	25.20	3.05	27.14	3.35	31.02	4.01	34.89	4.94
	12	17.45	2.14	19.38	2.35	23.26	2.94	25.20	3.23	27.14	3.55	31.02	4.25	34.89	5.29
	14	17.45	2.18	19.38	2.49	23.26	3.13	25.20	3.49	27.14	3.86	31.02	4.69	34.89	5.76
	17	17.45	2.40	19.38	2.89	23.26	3.69	25.20	4.15	27.14	4.65	31.02	5.33	34.89	6.37
	20	17.45	3.07	19.38	3.74	23.26	4.44	25.20	4.77	27.14	5.12	31.02	5.87	34.89	7.03
	22	17.45	3.74	19.38	4.08	23.26	4.72	25.20	5.09	27.14	5.46	31.02	6.29	34.89	7.52
	25	17.45	4.14	19.38	4.46	23.26	5.18	25.20	5.58	27.14	6.01	31.02	6.92	34.89	8.42
	27	17.45	4.38	19.38	4.73	23.26	5.50	25.20	5.94	27.14	6.41	31.02	7.40	34.89	9.05
	29	17.45	4.63	19.38	5.01	23.26	5.85	25.20	6.33	27.14	6.83	31.02	7.90	34.89	9.78
	31	17.45	4.90	19.38	5.31	23.26	6.22	25.20	6.73	27.14	7.26	31.02	8.43	34.89	10.52
	33	17.45	5.19	19.38	5.63	23.26	6.62	25.20	7.16	27.14	7.75	31.02	9.01	34.89	11.33
	35	17.45	5.49	19.38	5.97	23.26	7.04	25.20	7.63	27.14	8.26	31.02	9.61	34.89	12.18
	37	17.45	5.82	19.38	6.33	23.26	7.49	25.20	8.13	27.14	8.80	31.02	10.35	34.89	13.11
	39	17.45	6.16	19.38	6.73	23.26	7.97	25.20	8.66	27.14	9.39	31.02	11.12	34.89	14.13
	41	17.45	6.53	19.38	7.14	23.26	8.47	25.20	9.22	27.14	10.01	31.02	12.02	34.89	15.19
	43	17.45	6.93	19.38	7.57	23.26	9.02	25.20	9.81	27.14	10.68	31.02	12.95	33.94	15.78
46	17.45	7.57	19.38	8.29	23.26	9.91	24.31	10.80	27.14	11.85	29.10	12.84	29.33	12.50	
48	17.45	8.03	19.38	8.82	22.50	10.56	23.18	11.53	25.52	11.49	25.87	10.97	26.15	10.74	
50	17.45	8.53	19.38	9.38	21.82	10.35	21.95	10.11	22.12	9.88	22.31	9.30	22.95	9.34	
52	17.45	9.07	18.04	9.17	18.29	8.70	18.51	8.55	19.03	8.58	19.16	8.04	19.40	7.86	
55	12.31	7.08	12.45	6.92	13.00	6.75	12.72	6.44	13.15	6.43	14.07	6.40	13.24	5.97	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.1:8HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-15	15.70	1.62	17.45	1.97	20.94	2.43	22.68	2.61	24.42	2.79	27.91	3.14	31.40	3.49
	-10	15.70	1.81	17.45	2.03	20.94	2.43	22.68	2.61	24.42	2.79	27.91	3.14	31.40	3.49
	-5	15.70	1.89	17.45	2.08	20.94	2.44	22.68	2.61	24.42	2.80	27.91	3.14	31.40	3.52
	-2	15.70	1.90	17.45	2.08	20.94	2.46	22.68	2.62	24.42	2.81	27.91	3.15	31.40	3.54
	0	15.70	1.90	17.45	2.09	20.94	2.47	22.68	2.65	24.42	2.83	27.91	3.17	31.40	3.54
	2	15.70	1.90	17.45	2.10	20.94	2.47	22.68	2.66	24.42	2.83	27.91	3.22	31.40	3.60
	4	15.70	1.91	17.45	2.11	20.94	2.49	22.68	2.67	24.42	2.88	27.91	3.25	31.40	3.74
	6	15.70	1.91	17.45	2.11	20.94	2.50	22.68	2.67	24.42	2.91	27.91	3.30	31.40	3.76
	8	15.70	1.91	17.45	2.11	20.94	2.50	22.68	2.68	24.42	2.93	27.91	3.38	31.40	3.89
	10	15.70	1.91	17.45	2.11	20.94	2.52	22.68	2.75	24.42	2.95	27.91	3.46	31.40	4.10
	12	15.70	1.92	17.45	2.12	20.94	2.53	22.68	2.79	24.42	3.06	27.91	3.67	31.40	4.40
	14	15.70	1.93	17.45	2.13	20.94	2.65	22.68	3.01	24.42	3.32	27.91	3.97	31.40	4.82
	17	15.70	1.99	17.45	2.25	20.94	3.08	22.68	3.45	24.42	3.99	27.91	4.67	31.40	5.47
	20	15.70	2.40	17.45	2.93	20.94	3.99	22.68	4.24	24.42	4.53	27.91	5.11	31.40	6.03
	22	15.70	3.23	17.45	3.63	20.94	4.24	22.68	4.51	24.42	4.83	27.91	5.46	31.40	6.45
	25	15.70	3.74	17.45	4.05	20.94	4.63	22.68	4.96	24.42	5.30	27.91	6.02	31.40	7.11
	27	15.70	4.04	17.45	4.30	20.94	4.92	22.68	5.28	24.42	5.64	27.91	6.42	31.40	7.60
	29	15.70	4.30	17.45	4.55	20.94	5.22	22.68	5.61	24.42	6.01	27.91	6.85	31.40	8.11
	31	15.70	4.55	17.45	4.82	20.94	5.56	22.68	5.96	24.42	6.39	27.91	7.31	31.40	8.67
	33	15.70	4.79	17.45	5.10	20.94	5.90	22.68	6.33	24.42	6.81	27.91	7.80	31.40	9.24
	35	15.70	5.03	17.45	5.40	20.94	6.27	22.68	6.74	24.42	7.25	27.91	8.32	31.40	9.93
37	15.70	5.29	17.45	5.71	20.94	6.65	22.68	7.17	24.42	7.71	27.91	8.87	31.40	10.69	
39	15.70	5.59	17.45	6.06	20.94	7.08	22.68	7.62	24.42	8.22	27.91	9.46	31.40	11.50	
41	15.70	5.92	17.45	6.42	20.94	7.51	22.68	8.11	24.42	8.75	27.91	10.09	31.40	12.40	
43	15.70	6.27	17.45	6.81	20.94	7.99	22.68	8.64	24.42	9.31	27.91	10.77	31.40	13.39	
46	15.70	6.84	17.45	7.45	20.94	8.77	22.68	9.49	24.42	10.25	27.91	11.95	29.10	12.86	
48	15.70	7.25	17.45	7.91	20.94	9.33	22.68	10.11	24.42	10.93	25.68	11.16	25.82	10.88	
50	15.70	7.69	17.45	8.40	20.94	9.94	21.83	10.29	22.01	10.06	22.29	9.55	22.47	9.30	
52	15.70	8.17	17.45	8.94	18.24	8.87	18.46	8.72	18.68	8.56	19.13	8.23	19.37	8.05	
55	12.44	7.24	12.59	7.08	13.14	6.93	12.92	6.58	12.97	6.44	13.87	6.41	13.03	6.00	
80%	-15	13.96	1.43	15.51	1.62	18.61	2.17	20.16	2.34	21.71	2.49	24.81	2.81	27.91	3.10
	-10	13.96	1.63	15.51	1.79	18.61	2.20	20.16	2.35	21.71	2.49	24.81	2.83	27.91	3.10
	-5	13.96	1.68	15.51	1.86	18.61	2.20	20.16	2.35	21.71	2.52	24.81	2.84	27.91	3.15
	-2	13.96	1.70	15.51	1.87	18.61	2.20	20.16	2.36	21.71	2.53	24.81	2.87	27.91	3.16
	0	13.96	1.71	15.51	1.88	18.61	2.22	20.16	2.36	21.71	2.53	24.81	2.89	27.91	3.16
	2	13.96	1.72	15.51	1.88	18.61	2.23	20.16	2.38	21.71	2.54	24.81	2.89	27.91	3.19
	4	13.96	1.72	15.51	1.90	18.61	2.23	20.16	2.41	21.71	2.54	24.81	2.90	27.91	3.22
	6	13.96	1.72	15.51	1.90	18.61	2.23	20.16	2.41	21.71	2.57	24.81	2.95	27.91	3.32
	8	13.96	1.73	15.51	1.90	18.61	2.24	20.16	2.43	21.71	2.61	24.81	3.00	27.91	3.38
	10	13.96	1.73	15.51	1.90	18.61	2.25	20.16	2.43	21.71	2.63	24.81	3.02	27.91	3.46
	12	13.96	1.74	15.51	1.90	18.61	2.27	20.16	2.45	21.71	2.67	24.81	3.19	27.91	3.69
	14	13.96	1.75	15.51	1.91	18.61	2.33	20.16	2.54	21.71	2.81	24.81	3.41	27.91	3.98
	17	13.96	1.78	15.51	1.94	18.61	2.60	20.16	2.96	21.71	3.32	24.81	4.11	27.91	4.69
	20	13.96	1.99	15.51	2.26	18.61	3.34	20.16	3.83	21.71	4.01	24.81	4.43	27.91	5.16
	22	13.96	2.38	15.51	2.91	18.61	3.74	20.16	4.02	21.71	4.26	24.81	4.73	27.91	5.52
	25	13.96	2.99	15.51	3.60	18.61	4.14	20.16	4.40	21.71	4.67	24.81	5.22	27.91	6.07
	27	13.96	3.45	15.51	3.91	18.61	4.40	20.16	4.67	21.71	4.95	24.81	5.56	27.91	6.48
	29	13.96	3.73	15.51	4.19	18.61	4.67	20.16	4.97	21.71	5.27	24.81	5.92	27.91	6.91
	31	13.96	4.00	15.51	4.45	18.61	4.95	20.16	5.26	21.71	5.61	24.81	6.31	27.91	7.37
	33	13.96	4.25	15.51	4.70	18.61	5.24	20.16	5.59	21.71	5.96	24.81	6.72	27.91	7.85
	35	13.96	4.62	15.51	4.95	18.61	5.56	20.16	5.93	21.71	6.34	24.81	7.16	27.91	8.37
37	13.96	4.85	15.51	5.19	18.61	5.90	20.16	6.30	21.71	6.74	24.81	7.62	27.91	8.93	
39	13.96	5.10	15.51	5.45	18.61	6.26	20.16	6.71	21.71	7.16	24.81	8.13	27.91	9.53	
41	13.96	5.34	15.51	5.77	18.61	6.64	20.16	7.12	21.71	7.62	24.81	8.65	27.91	10.17	
43	13.96	5.73	15.51	6.10	18.61	7.05	20.16	7.57	21.71	8.11	24.81	9.23	27.91	10.84	
46	13.96	6.17	15.51	6.66	18.61	7.73	20.16	8.30	21.71	8.90	24.81	10.16	27.91	12.09	
48	13.96	6.52	15.51	7.06	18.61	8.21	20.16	8.83	21.71	9.49	24.81	10.84	25.73	11.24	
50	13.96	6.92	15.51	7.49	18.61	8.73	20.16	9.41	21.71	10.10	22.16	9.81	22.32	9.55	
52	13.96	7.34	15.51	7.96	18.20	9.08	18.31	8.86	18.39	8.63	18.69	8.21	19.24	8.23	
55	12.35	7.30	12.53	7.16	12.61	6.75	13.02	6.75	13.11	6.58	13.20	6.29	14.05	6.41	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.1: 8HP cooling capacity (continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-15	12.21	1.25	13.57	1.42	16.28	1.84	17.64	2.06	19.00	2.20	21.71	2.47	24.42	2.78
	-10	12.21	1.37	13.57	1.59	16.28	1.90	17.64	2.09	19.00	2.21	21.71	2.50	24.42	2.78
	-5	12.21	1.50	13.57	1.59	16.28	1.94	17.64	2.09	19.00	2.22	21.71	2.51	24.42	2.79
	-2	12.21	1.53	13.57	1.67	16.28	1.96	17.64	2.10	19.00	2.23	21.71	2.52	24.42	2.81
	0	12.21	1.53	13.57	1.68	16.28	1.96	17.64	2.11	19.00	2.24	21.71	2.53	24.42	2.84
	2	12.21	1.53	13.57	1.68	16.28	1.97	17.64	2.11	19.00	2.26	21.71	2.54	24.42	2.85
	4	12.21	1.53	13.57	1.69	16.28	1.97	17.64	2.12	19.00	2.26	21.71	2.57	24.42	2.85
	6	12.21	1.53	13.57	1.69	16.28	1.98	17.64	2.13	19.00	2.27	21.71	2.58	24.42	2.86
	8	12.21	1.53	13.57	1.70	16.28	1.98	17.64	2.14	19.00	2.29	21.71	2.59	24.42	2.92
	10	12.21	1.53	13.57	1.70	16.28	1.99	17.64	2.15	19.00	2.30	21.71	2.60	24.42	2.94
	12	12.21	1.54	13.57	1.71	16.28	1.99	17.64	2.16	19.00	2.32	21.71	2.69	24.42	3.10
	14	12.21	1.55	13.57	1.74	16.28	1.99	17.64	2.17	19.00	2.38	21.71	2.91	24.42	3.40
	17	12.21	1.56	13.57	1.74	16.28	2.00	17.64	2.37	19.00	2.81	21.71	3.46	24.42	3.95
	20	12.21	1.60	13.57	1.94	16.28	2.52	17.64	3.16	19.00	3.63	21.71	3.95	24.42	4.41
	22	12.21	1.69	13.57	2.06	16.28	3.15	17.64	3.40	19.00	3.65	21.71	4.09	24.42	4.70
	25	12.21	2.41	13.57	2.70	16.28	3.59	17.64	3.84	19.00	4.08	21.71	4.50	24.42	5.17
	27	12.21	2.83	13.57	3.16	16.28	3.91	17.64	4.13	19.00	4.34	21.71	4.80	24.42	5.50
	29	12.21	3.18	13.57	3.47	16.28	4.20	17.64	4.39	19.00	4.61	21.71	5.10	24.42	5.86
	31	12.21	3.48	13.57	3.75	16.28	4.46	17.64	4.65	19.00	4.90	21.71	5.43	24.42	6.25
	33	12.21	3.75	13.57	4.14	16.28	4.72	17.64	4.92	19.00	5.20	21.71	5.78	24.42	6.66
35	12.21	4.00	13.57	4.37	16.28	4.97	17.64	5.22	19.00	5.52	21.71	6.15	24.42	7.08	
37	12.21	4.23	13.57	4.61	16.28	5.23	17.64	5.53	19.00	5.87	21.71	6.54	24.42	7.54	
39	12.21	4.44	13.57	4.84	16.28	5.52	17.64	5.87	19.00	6.22	21.71	6.96	24.42	8.04	
41	12.21	4.67	13.57	5.09	16.28	5.85	17.64	6.23	19.00	6.62	21.71	7.41	24.42	8.56	
43	12.21	4.91	13.57	5.48	16.28	6.20	17.64	6.60	19.00	7.02	21.71	7.88	24.42	9.12	
46	12.21	5.52	13.57	6.01	16.28	6.78	17.64	7.23	19.00	7.70	21.71	8.66	24.42	10.04	
48	12.21	5.78	13.57	6.31	16.28	7.19	17.64	7.68	19.00	8.19	21.71	9.24	24.42	10.70	
50	12.21	6.30	13.57	6.65	16.28	7.64	17.64	8.17	19.00	8.70	21.71	9.83	22.17	9.89	
52	12.21	6.62	13.57	7.05	16.28	8.12	17.64	8.69	18.35	8.91	18.59	8.47	18.68	8.20	
55	12.21	7.36	12.37	7.22	12.64	6.92	12.72	6.76	13.13	6.76	13.29	6.44	13.34	6.29	
60%	-15	10.47	1.14	11.63	1.25	13.96	1.48	15.12	1.72	16.28	1.88	18.61	2.16	20.94	2.41
	-10	10.47	1.17	11.63	1.27	13.96	1.61	15.12	1.82	16.28	1.92	18.61	2.17	20.94	2.41
	-5	10.47	1.20	11.63	1.33	13.96	1.63	15.12	1.83	16.28	1.93	18.61	2.17	20.94	2.42
	-2	10.47	1.23	11.63	1.47	13.96	1.72	15.12	1.83	16.28	1.94	18.61	2.18	20.94	2.44
	0	10.47	1.34	11.63	1.47	13.96	1.72	15.12	1.83	16.28	1.97	18.61	2.22	20.94	2.47
	2	10.47	1.34	11.63	1.47	13.96	1.73	15.12	1.83	16.28	1.98	18.61	2.23	20.94	2.48
	4	10.47	1.34	11.63	1.47	13.96	1.73	15.12	1.84	16.28	1.99	18.61	2.24	20.94	2.49
	6	10.47	1.34	11.63	1.47	13.96	1.73	15.12	1.85	16.28	1.99	18.61	2.24	20.94	2.49
	8	10.47	1.35	11.63	1.48	13.96	1.74	15.12	1.85	16.28	1.99	18.61	2.25	20.94	2.50
	10	10.47	1.35	11.63	1.49	13.96	1.75	15.12	1.86	16.28	2.00	18.61	2.25	20.94	2.51
	12	10.47	1.36	11.63	1.49	13.96	1.75	15.12	1.87	16.28	2.01	18.61	2.28	20.94	2.54
	14	10.47	1.36	11.63	1.50	13.96	1.75	15.12	1.87	16.28	2.04	18.61	2.41	20.94	2.71
	17	10.47	1.36	11.63	1.52	13.96	1.76	15.12	1.88	16.28	2.10	18.61	2.72	20.94	3.19
	20	10.47	1.45	11.63	1.52	13.96	2.07	15.12	2.23	16.28	2.78	18.61	3.52	20.94	3.86
	22	10.47	1.54	11.63	1.62	13.96	2.39	15.12	2.92	16.28	3.15	18.61	3.55	20.94	3.98
	25	10.47	2.16	11.63	2.19	13.96	2.65	15.12	3.06	16.28	3.39	18.61	3.81	20.94	4.38
	27	10.47	2.50	11.63	2.57	13.96	3.04	15.12	3.45	16.28	3.75	18.61	4.11	20.94	4.66
	29	10.47	2.83	11.63	2.96	13.96	3.51	15.12	3.77	16.28	4.06	18.61	4.38	20.94	4.96
	31	10.47	3.14	11.63	3.29	13.96	3.80	15.12	4.21	16.28	4.35	18.61	4.64	20.94	5.28
	33	10.47	3.44	11.63	3.58	13.96	4.08	15.12	4.47	16.28	4.61	18.61	4.94	20.94	5.61
35	10.47	3.68	11.63	3.83	13.96	4.32	15.12	4.72	16.28	4.88	18.61	5.25	20.94	5.97	
37	10.47	3.92	11.63	4.07	13.96	4.57	15.12	4.98	16.28	5.13	18.61	5.58	20.94	6.35	
39	10.47	4.13	11.63	4.29	13.96	4.96	15.12	5.23	16.28	5.40	18.61	5.93	20.94	6.75	
41	10.47	4.34	11.63	4.51	13.96	5.19	15.12	5.49	16.28	5.70	18.61	6.30	20.94	7.18	
43	10.47	4.54	11.63	4.74	13.96	5.45	15.12	5.77	16.28	6.05	18.61	6.69	20.94	7.62	
46	10.47	4.87	11.63	5.10	13.96	6.00	15.12	6.26	16.28	6.62	18.61	7.34	20.94	8.36	
48	10.47	5.11	11.63	5.36	13.96	6.29	15.12	6.64	16.28	7.03	18.61	7.80	20.94	8.92	
50	10.47	5.82	11.63	6.08	13.96	6.64	15.12	7.04	16.28	7.47	18.61	8.30	20.94	9.50	
52	10.47	6.10	11.63	6.39	13.96	7.04	15.12	7.49	16.28	7.94	18.61	8.83	18.54	8.55	
55	10.47	6.56	11.63	6.97	12.55	7.08	12.65	6.92	12.73	6.76	13.24	6.58	13.31	6.44	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...



Table2-8.1:8HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	8.72	0.70	9.69	1.02	11.63	1.14	12.60	1.33	13.57	1.53	15.51	1.86	17.45	2.02
	-10	8.72	0.93	9.69	1.10	11.63	1.25	12.60	1.52	13.57	1.53	15.51	1.87	17.45	2.06
	-5	8.72	0.97	9.69	1.13	11.63	1.32	12.60	1.53	13.57	1.65	15.51	1.89	17.45	2.07
	-2	8.72	1.01	9.69	1.18	11.63	1.41	12.60	1.55	13.57	1.66	15.51	1.89	17.45	2.10
	0	8.72	1.10	9.69	1.26	11.63	1.47	12.60	1.57	13.57	1.67	15.51	1.89	17.45	2.10
	2	8.72	1.15	9.69	1.26	11.63	1.47	12.60	1.57	13.57	1.68	15.51	1.90	17.45	2.10
	4	8.72	1.15	9.69	1.26	11.63	1.47	12.60	1.57	13.57	1.69	15.51	1.90	17.45	2.11
	6	8.72	1.15	9.69	1.26	11.63	1.48	12.60	1.58	13.57	1.69	15.51	1.90	17.45	2.12
	8	8.72	1.15	9.69	1.27	11.63	1.48	12.60	1.59	13.57	1.69	15.51	1.91	17.45	2.14
	10	8.72	1.15	9.69	1.27	11.63	1.49	12.60	1.59	13.57	1.70	15.51	1.92	17.45	2.15
	12	8.72	1.16	9.69	1.28	11.63	1.50	12.60	1.61	13.57	1.72	15.51	1.92	17.45	2.16
	14	8.72	1.16	9.69	1.29	11.63	1.50	12.60	1.61	13.57	1.72	15.51	1.94	17.45	2.19
	17	8.72	1.18	9.69	1.31	11.63	1.53	12.60	1.62	13.57	1.73	15.51	2.01	17.45	2.45
	20	8.72	1.19	9.69	1.32	11.63	1.55	12.60	1.81	13.57	2.01	15.51	2.65	17.45	3.26
	22	8.72	1.46	9.69	1.47	11.63	1.72	12.60	2.04	13.57	2.21	15.51	2.81	17.45	3.33
	25	8.72	1.99	9.69	2.04	11.63	2.07	12.60	2.06	13.57	2.64	15.51	3.00	17.45	3.55
	27	8.72	2.27	9.69	2.35	11.63	2.43	12.60	2.50	13.57	2.69	15.51	3.23	17.45	3.89
	29	8.72	2.54	9.69	2.65	11.63	2.78	12.60	2.91	13.57	3.17	15.51	3.74	17.45	4.19
	31	8.72	2.79	9.69	2.93	11.63	3.13	12.60	3.27	13.57	3.49	15.51	4.05	17.45	4.47
	33	8.72	3.03	9.69	3.19	11.63	3.45	12.60	3.58	13.57	3.78	15.51	4.35	17.45	4.73
35	8.72	3.25	9.69	3.45	11.63	3.72	12.60	3.85	13.57	4.05	15.51	4.62	17.45	5.00	
37	8.72	3.48	9.69	3.70	11.63	3.97	12.60	4.10	13.57	4.42	15.51	4.89	17.45	5.28	
39	8.72	3.69	9.69	3.94	11.63	4.21	12.60	4.34	13.57	4.66	15.51	5.15	17.45	5.61	
41	8.72	3.91	9.69	4.16	11.63	4.43	12.60	4.58	13.57	4.91	15.51	5.42	17.45	5.96	
43	8.72	4.12	9.69	4.35	11.63	4.66	12.60	5.04	13.57	5.16	15.51	5.70	17.45	6.33	
46	8.72	4.46	9.69	4.66	11.63	5.01	12.60	5.39	13.57	5.82	15.51	6.16	17.45	6.93	
48	8.72	4.68	9.69	4.87	11.63	5.27	12.60	5.67	13.57	6.11	15.51	6.54	17.45	7.37	
50	8.72	5.11	9.69	5.59	11.63	5.99	12.60	6.20	13.57	6.41	15.51	6.95	17.45	7.83	
52	8.72	5.62	9.69	5.83	11.63	6.29	12.60	6.52	13.57	6.75	15.51	7.38	17.45	8.34	
55	8.72	5.99	9.69	6.24	11.63	6.80	12.60	7.19	12.63	7.01	12.85	6.67	13.09	6.58	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.









Table2-8.2:10HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	9.69	1.12	10.77	1.27	12.92	1.57	14.00	1.78	15.08	1.87	17.23	2.09	19.38	2.33
	-10	9.69	1.22	10.77	1.39	12.92	1.67	14.00	1.79	15.08	1.89	17.23	2.14	19.38	2.36
	-5	9.69	1.27	10.77	1.41	12.92	1.67	14.00	1.79	15.08	1.90	17.23	2.15	19.38	2.36
	-2	9.69	1.30	10.77	1.42	12.92	1.68	14.00	1.80	15.08	1.92	17.23	2.15	19.38	2.36
	0	9.69	1.30	10.77	1.42	12.92	1.68	14.00	1.81	15.08	1.92	17.23	2.16	19.38	2.41
	2	9.69	1.30	10.77	1.43	12.92	1.68	14.00	1.81	15.08	1.92	17.23	2.17	19.38	2.41
	4	9.69	1.31	10.77	1.43	12.92	1.69	14.00	1.81	15.08	1.92	17.23	2.18	19.38	2.42
	6	9.69	1.31	10.77	1.43	12.92	1.69	14.00	1.82	15.08	1.93	17.23	2.18	19.38	2.43
	8	9.69	1.31	10.77	1.43	12.92	1.69	14.00	1.82	15.08	1.95	17.23	2.18	19.38	2.44
	10	9.69	1.31	10.77	1.44	12.92	1.69	14.00	1.82	15.08	1.96	17.23	2.19	19.38	2.45
	12	9.69	1.32	10.77	1.44	12.92	1.70	14.00	1.82	15.08	1.98	17.23	2.21	19.38	2.46
	14	9.69	1.32	10.77	1.46	12.92	1.76	14.00	1.84	15.08	2.00	17.23	2.23	19.38	2.50
	17	9.69	1.35	10.77	1.49	12.92	1.88	14.00	2.00	15.08	2.06	17.23	2.58	19.38	2.91
	20	9.69	1.37	10.77	1.59	12.92	1.97	14.00	2.18	15.08	2.38	17.23	3.38	19.38	3.83
	22	9.69	1.61	10.77	1.77	12.92	2.11	14.00	2.27	15.08	2.70	17.23	3.55	19.38	3.92
	25	9.69	1.97	10.77	1.99	12.92	2.43	14.00	2.64	15.08	2.82	17.23	3.55	19.38	3.95
	27	9.69	2.32	10.77	2.36	12.92	2.54	14.00	3.06	15.08	3.28	17.23	3.58	19.38	4.29
	29	9.69	2.64	10.77	2.71	12.92	2.90	14.00	3.07	15.08	3.33	17.23	3.94	19.38	4.59
	31	9.69	2.95	10.77	3.06	12.92	3.30	14.00	3.46	15.08	3.68	17.23	4.45	19.38	4.89
	33	9.69	3.24	10.77	3.39	12.92	3.64	14.00	3.78	15.08	4.12	17.23	4.76	19.38	5.20
35	9.69	3.52	10.77	3.70	12.92	3.95	14.00	4.08	15.08	4.42	17.23	5.05	19.38	5.53	
37	9.69	3.80	10.77	3.97	12.92	4.23	14.00	4.36	15.08	4.70	17.23	5.35	19.38	5.88	
39	9.69	4.06	10.77	4.22	12.92	4.49	14.00	4.63	15.08	4.98	17.23	5.64	19.38	6.25	
41	9.69	4.32	10.77	4.45	12.92	4.75	14.00	5.14	15.08	5.26	17.23	5.94	19.38	6.64	
43	9.69	4.53	10.77	4.68	12.92	5.01	14.00	5.39	15.08	5.82	17.23	6.29	19.38	7.05	
46	9.69	4.83	10.77	5.03	12.92	5.42	14.00	5.82	15.08	6.26	17.23	6.89	19.38	7.73	
48	9.69	5.07	10.77	5.28	12.92	5.71	14.00	6.12	15.08	6.59	17.23	7.31	19.38	8.23	
50	9.69	5.55	10.77	6.03	12.92	6.62	14.00	6.85	15.08	7.11	17.23	7.78	19.38	8.76	
52	9.69	6.23	10.77	6.48	12.92	6.96	14.00	7.21	15.08	7.55	17.23	8.27	19.38	9.32	
55	9.69	6.66	10.77	6.94	12.92	7.68	14.00	8.10	14.07	7.91	14.32	7.54	14.46	7.35	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.











Table2-8.3:12HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	11.60	1.64	12.88	1.80	15.46	2.22	16.75	2.39	18.04	2.57	20.62	2.87	23.19	3.19
	-10	11.60	1.65	12.88	1.89	15.46	2.26	16.75	2.43	18.04	2.58	20.62	2.91	23.19	3.21
	-5	11.60	1.74	12.88	1.91	15.46	2.26	16.75	2.44	18.04	2.60	20.62	2.91	23.19	3.24
	-2	11.60	1.74	12.88	1.92	15.46	2.26	16.75	2.45	18.04	2.60	20.62	2.92	23.19	3.26
	0	11.60	1.75	12.88	1.92	15.46	2.26	16.75	2.46	18.04	2.61	20.62	2.96	23.19	3.29
	2	11.60	1.75	12.88	1.93	15.46	2.27	16.75	2.47	18.04	2.64	20.62	2.96	23.19	3.34
	4	11.60	1.75	12.88	1.94	15.46	2.28	16.75	2.47	18.04	2.64	20.62	2.98	23.19	3.35
	6	11.60	1.76	12.88	1.94	15.46	2.29	16.75	2.49	18.04	2.65	20.62	2.98	23.19	3.36
	8	11.60	1.76	12.88	1.94	15.46	2.29	16.75	2.49	18.04	2.66	20.62	3.02	23.19	3.39
	10	11.60	1.77	12.88	1.94	15.46	2.34	16.75	2.50	18.04	2.67	20.62	3.06	23.19	3.45
	12	11.60	1.77	12.88	2.03	15.46	2.34	16.75	2.55	18.04	2.70	20.62	3.09	23.19	3.47
	14	11.60	1.80	12.88	2.03	15.46	2.36	16.75	2.56	18.04	2.77	20.62	3.28	23.19	3.76
	17	11.60	1.88	12.88	2.09	15.46	2.52	16.75	2.80	18.04	3.11	20.62	3.68	23.19	4.31
	20	11.60	1.94	12.88	2.29	15.46	2.85	16.75	3.40	18.04	3.87	20.62	4.51	23.19	4.93
	22	11.60	2.21	12.88	2.32	15.46	3.06	16.75	3.41	18.04	4.05	20.62	4.58	23.19	5.04
	25	11.60	2.33	12.88	2.40	15.46	3.41	16.75	3.87	18.04	4.22	20.62	4.74	23.19	5.25
	27	11.60	2.80	12.88	2.88	15.46	3.81	16.75	4.06	18.04	4.22	20.62	4.94	23.19	5.61
	29	11.60	3.26	12.88	3.43	15.46	3.89	16.75	4.30	18.04	4.80	20.62	5.32	23.19	5.99
	31	11.60	3.70	12.88	3.90	15.46	4.30	16.75	4.70	18.04	5.17	20.62	5.67	23.19	6.41
	33	11.60	4.12	12.88	4.30	15.46	4.78	16.75	5.07	18.04	5.52	20.62	6.06	23.19	6.82
35	11.60	4.48	12.88	4.65	15.46	5.11	16.75	5.41	18.04	5.87	20.62	6.46	23.19	7.29	
37	11.60	4.79	12.88	4.97	15.46	5.44	16.75	5.90	18.04	6.21	20.62	6.88	23.19	7.77	
39	11.60	5.09	12.88	5.27	15.46	5.77	16.75	6.22	18.04	6.75	20.62	7.32	23.19	8.28	
41	11.60	5.37	12.88	5.58	15.46	6.22	16.75	6.58	18.04	7.14	20.62	7.81	23.19	8.84	
43	11.60	5.65	12.88	5.88	15.46	6.57	16.75	6.94	18.04	7.59	20.62	8.31	23.19	9.42	
46	11.60	6.09	12.88	6.36	15.46	7.12	16.75	7.90	18.04	8.32	20.62	9.14	23.19	10.37	
48	11.60	6.39	12.88	6.70	15.46	7.53	16.75	8.40	18.04	8.84	20.62	9.73	23.19	11.04	
50	11.60	7.26	12.88	7.74	15.46	8.43	16.75	8.92	18.04	9.40	20.62	10.38	23.19	11.79	
52	11.60	7.78	12.88	8.11	15.46	8.96	16.75	9.47	18.04	10.01	20.62	11.09	22.32	12.01	
55	11.60	8.04	12.88	8.58	15.46	9.71	15.32	9.33	15.38	9.08	15.71	8.67	15.88	8.45	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.









Table2-8.4:14HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	13.85	1.68	15.38	1.89	18.46	2.34	20.00	2.52	21.54	2.68	24.62	3.01	27.69	3.34
	-10	13.85	1.83	15.38	2.01	18.46	2.34	20.00	2.52	21.54	2.70	24.62	3.03	27.69	3.38
	-5	13.85	1.84	15.38	2.02	18.46	2.36	20.00	2.55	21.54	2.70	24.62	3.05	27.69	3.40
	-2	13.85	1.84	15.38	2.02	18.46	2.39	20.00	2.55	21.54	2.72	24.62	3.06	27.69	3.41
	0	13.85	1.84	15.38	2.02	18.46	2.39	20.00	2.56	21.54	2.74	24.62	3.07	27.69	3.42
	2	13.85	1.84	15.38	2.02	18.46	2.40	20.00	2.57	21.54	2.76	24.62	3.12	27.69	3.45
	4	13.85	1.85	15.38	2.03	18.46	2.40	20.00	2.58	21.54	2.78	24.62	3.15	27.69	3.52
	6	13.85	1.85	15.38	2.04	18.46	2.40	20.00	2.59	21.54	2.78	24.62	3.18	27.69	3.52
	8	13.85	1.85	15.38	2.05	18.46	2.41	20.00	2.61	21.54	2.78	24.62	3.24	27.69	3.59
	10	13.85	1.86	15.38	2.05	18.46	2.41	20.00	2.62	21.54	2.80	24.62	3.25	27.69	3.61
	12	13.85	1.86	15.38	2.07	18.46	2.42	20.00	2.63	21.54	2.86	24.62	3.30	27.69	3.77
	14	13.85	1.89	15.38	2.08	18.46	2.43	20.00	2.68	21.54	2.96	24.62	3.46	27.69	4.03
	17	13.85	1.89	15.38	2.10	18.46	2.67	20.00	2.97	21.54	3.31	24.62	4.05	27.69	4.62
	20	13.85	2.01	15.38	2.52	18.46	3.27	20.00	3.69	21.54	4.16	24.62	4.69	27.69	5.17
	22	13.85	2.21	15.38	2.61	18.46	4.01	20.00	4.21	21.54	4.41	24.62	4.79	27.69	5.44
	25	13.85	2.76	15.38	3.08	18.46	4.10	20.00	4.53	21.54	4.77	24.62	5.23	27.69	6.00
	27	13.85	3.20	15.38	3.48	18.46	4.42	20.00	4.82	21.54	5.06	24.62	5.57	27.69	6.41
	29	13.85	3.58	15.38	3.82	18.46	4.72	20.00	5.12	21.54	5.38	24.62	5.95	27.69	6.84
	31	13.85	3.91	15.38	4.13	18.46	5.00	20.00	5.43	21.54	5.73	24.62	6.34	27.69	7.29
	33	13.85	4.21	15.38	4.51	18.46	5.45	20.00	5.76	21.54	6.10	24.62	6.76	27.69	7.77
35	13.85	4.48	15.38	4.79	18.46	5.78	20.00	6.12	21.54	6.48	24.62	7.20	27.69	8.30	
37	13.85	4.75	15.38	5.06	18.46	6.13	20.00	6.50	21.54	6.89	24.62	7.67	27.69	8.84	
39	13.85	5.01	15.38	5.35	18.46	6.50	20.00	6.90	21.54	7.32	24.62	8.18	27.69	9.43	
41	13.85	5.29	15.38	5.75	18.46	6.89	20.00	7.33	21.54	7.78	24.62	8.70	27.69	10.04	
43	13.85	5.58	15.38	6.06	18.46	7.32	20.00	7.79	21.54	8.27	24.62	9.27	27.69	10.72	
46	13.85	6.04	15.38	6.64	18.46	8.00	20.00	8.53	21.54	9.08	24.62	10.21	27.69	11.83	
48	13.85	6.39	15.38	7.06	18.46	8.50	20.00	9.08	21.54	9.66	24.62	10.88	27.69	12.62	
50	13.85	7.32	15.38	7.87	18.46	9.03	20.00	9.65	21.54	10.29	24.62	11.62	26.49	12.68	
52	13.85	7.75	15.38	8.35	18.46	9.60	20.00	10.29	21.54	10.97	22.25	10.79	22.51	10.59	
55	13.85	8.37	15.02	8.81	15.27	8.42	15.42	8.25	15.60	8.07	15.92	7.71	16.10	7.51	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.











Table2-8.5:16HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	15.58	1.80	17.31	2.00	20.77	2.30	22.50	2.47	24.23	2.69	27.69	3.02	31.15	3.39
	-10	15.58	1.81	17.31	2.00	20.77	2.36	22.50	2.53	24.23	2.69	27.69	3.05	31.15	3.42
	-5	15.58	1.85	17.31	2.04	20.77	2.39	22.50	2.55	24.23	2.72	27.69	3.07	31.15	3.43
	-2	15.58	1.86	17.31	2.05	20.77	2.40	22.50	2.59	24.23	2.73	27.69	3.09	31.15	3.45
	0	15.58	1.86	17.31	2.05	20.77	2.42	22.50	2.61	24.23	2.76	27.69	3.10	31.15	3.47
	2	15.58	1.86	17.31	2.06	20.77	2.43	22.50	2.61	24.23	2.77	27.69	3.12	31.15	3.49
	4	15.58	1.87	17.31	2.06	20.77	2.43	22.50	2.62	24.23	2.78	27.69	3.14	31.15	3.52
	6	15.58	1.87	17.31	2.07	20.77	2.45	22.50	2.64	24.23	2.80	27.69	3.21	31.15	3.52
	8	15.58	1.87	17.31	2.07	20.77	2.45	22.50	2.64	24.23	2.81	27.69	3.22	31.15	3.55
	10	15.58	1.88	17.31	2.08	20.77	2.45	22.50	2.64	24.23	2.81	27.69	3.27	31.15	3.65
	12	15.58	1.89	17.31	2.08	20.77	2.45	22.50	2.65	24.23	2.83	27.69	3.27	31.15	3.70
	14	15.58	1.90	17.31	2.08	20.77	2.46	22.50	2.66	24.23	2.85	27.69	3.27	31.15	3.76
	17	15.58	1.90	17.31	2.09	20.77	2.48	22.50	2.67	24.23	2.87	27.69	3.28	31.15	3.84
	20	15.58	1.98	17.31	2.18	20.77	2.54	22.50	2.91	24.23	3.35	27.69	3.73	31.15	4.31
	22	15.58	1.98	17.31	2.19	20.77	2.99	22.50	3.18	24.23	3.41	27.69	3.89	31.15	4.67
	25	15.58	2.48	17.31	2.70	20.77	3.35	22.50	3.60	24.23	3.87	27.69	4.41	31.15	5.27
	27	15.58	2.75	17.31	2.96	20.77	3.63	22.50	3.91	24.23	4.20	27.69	4.80	31.15	5.71
	29	15.58	3.00	17.31	3.23	20.77	3.92	22.50	4.23	24.23	4.55	27.69	5.19	31.15	6.19
	31	15.58	3.26	17.31	3.50	20.77	4.24	22.50	4.56	24.23	4.90	27.69	5.61	31.15	6.68
	33	15.58	3.52	17.31	3.78	20.77	4.57	22.50	4.94	24.23	5.29	27.69	6.05	31.15	7.21
35	15.58	3.79	17.31	4.06	20.77	4.93	22.50	5.31	24.23	5.71	27.69	6.54	31.15	7.76	
37	15.58	4.07	17.31	4.36	20.77	5.30	22.50	5.71	24.23	6.15	27.69	7.05	31.15	8.36	
39	15.58	4.36	17.31	4.67	20.77	5.70	22.50	6.14	24.23	6.62	27.69	7.59	31.15	8.98	
41	15.58	4.66	17.31	5.00	20.77	6.12	22.50	6.60	24.23	7.12	27.69	8.16	31.15	9.67	
43	15.58	4.98	17.31	5.63	20.77	6.57	22.50	7.11	24.23	7.65	27.69	8.78	31.15	10.40	
46	15.58	5.50	17.31	6.21	20.77	7.31	22.50	7.91	24.23	8.53	27.69	9.80	31.15	11.60	
48	15.58	5.89	17.31	6.66	20.77	7.85	22.50	8.49	24.23	9.16	27.69	10.52	31.15	12.50	
50	15.58	6.52	17.31	7.13	20.77	8.43	22.50	9.11	24.23	9.83	27.69	11.31	28.12	11.31	
52	15.58	6.99	17.31	7.65	20.77	9.05	22.50	9.78	23.26	10.01	23.59	9.48	23.77	9.18	
55	15.58	8.09	15.69	7.89	15.93	7.46	16.10	7.27	16.24	7.08	16.55	6.66	16.72	6.43	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.











Table 2-8.6: 18HP cooling capacity (continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	17.58	1.97	19.54	2.17	23.45	2.51	25.40	2.73	27.35	2.91	31.26	3.29	35.17	3.68
	-10	17.58	1.99	19.54	2.19	23.45	2.56	25.40	2.77	27.35	2.95	31.26	3.32	35.17	3.71
	-5	17.58	2.00	19.54	2.20	23.45	2.58	25.40	2.77	27.35	2.96	31.26	3.35	35.17	3.71
	-2	17.58	2.02	19.54	2.21	23.45	2.59	25.40	2.78	27.35	2.97	31.26	3.36	35.17	3.74
	0	17.58	2.02	19.54	2.22	23.45	2.61	25.40	2.79	27.35	3.02	31.26	3.38	35.17	3.79
	2	17.58	2.02	19.54	2.23	23.45	2.62	25.40	2.79	27.35	3.04	31.26	3.44	35.17	3.81
	4	17.58	2.03	19.54	2.24	23.45	2.63	25.40	2.81	27.35	3.07	31.26	3.45	35.17	3.84
	6	17.58	2.03	19.54	2.24	23.45	2.63	25.40	2.85	27.35	3.08	31.26	3.51	35.17	3.86
	8	17.58	2.03	19.54	2.25	23.45	2.63	25.40	2.88	27.35	3.09	31.26	3.53	35.17	3.89
	10	17.58	2.04	19.54	2.25	23.45	2.64	25.40	2.89	27.35	3.11	31.26	3.53	35.17	3.99
	12	17.58	2.05	19.54	2.26	23.45	2.65	25.40	2.90	27.35	3.15	31.26	3.56	35.17	4.06
	14	17.58	2.06	19.54	2.27	23.45	2.69	25.40	2.91	27.35	3.15	31.26	3.62	35.17	4.11
	17	17.58	2.09	19.54	2.31	23.45	2.71	25.40	2.93	27.35	3.16	31.26	3.99	35.17	4.62
	20	17.58	2.19	19.54	2.36	23.45	3.05	25.40	3.59	27.35	3.80	31.26	4.21	35.17	5.03
	22	17.58	2.30	19.54	2.83	23.45	3.45	25.40	3.71	27.35	3.98	31.26	4.54	35.17	5.44
	25	17.58	2.76	19.54	3.22	23.45	3.88	25.40	4.18	27.35	4.49	31.26	5.13	35.17	6.13
	27	17.58	3.02	19.54	3.48	23.45	4.19	25.40	4.51	27.35	4.84	31.26	5.54	35.17	6.61
	29	17.58	3.28	19.54	3.76	23.45	4.51	25.40	4.86	27.35	5.23	31.26	5.99	35.17	7.13
	31	17.58	3.55	19.54	4.21	23.45	4.86	25.40	5.24	27.35	5.64	31.26	6.46	35.17	7.70
	33	17.58	3.83	19.54	4.48	23.45	5.22	25.40	5.64	27.35	6.08	31.26	6.96	35.17	8.28
35	17.58	4.11	19.54	4.79	23.45	5.61	25.40	6.06	27.35	6.53	31.26	7.49	35.17	8.89	
37	17.58	4.41	19.54	5.13	23.45	6.02	25.40	6.51	27.35	7.02	31.26	8.05	35.17	9.58	
39	17.58	4.97	19.54	5.50	23.45	6.46	25.40	7.00	27.35	7.53	31.26	8.67	35.17	10.29	
41	17.58	5.27	19.54	5.89	23.45	6.94	25.40	7.50	27.35	8.09	31.26	9.32	35.17	11.06	
43	17.58	5.64	19.54	6.31	23.45	7.44	25.40	8.05	27.35	8.68	31.26	9.99	35.17	11.95	
46	17.58	6.25	19.54	6.99	23.45	8.26	25.40	8.94	27.35	9.65	31.26	11.11	35.17	13.47	
48	17.58	6.70	19.54	7.47	23.45	8.85	25.40	9.58	27.35	10.35	31.26	11.93	33.87	13.72	
50	17.58	7.31	19.54	8.00	23.45	9.48	25.40	10.27	27.35	11.09	29.23	11.58	29.37	11.24	
52	17.58	7.83	19.54	8.57	23.45	10.16	24.13	10.30	24.31	10.04	24.65	9.48	24.99	9.29	
55	16.24	8.18	16.40	7.97	16.60	7.51	16.76	7.32	17.29	7.32	17.22	6.67	18.24	6.86	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.









Table2-8.7:20HP cooling capacity(continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	19.38	2.14	21.54	2.33	25.85	2.75	28.00	2.97	30.15	3.20	34.46	3.63	38.77	4.10
	-10	19.38	2.20	21.54	2.40	25.85	2.80	28.00	2.98	30.15	3.24	34.46	3.66	38.77	4.10
	-5	19.38	2.20	21.54	2.43	25.85	2.85	28.00	3.01	30.15	3.26	34.46	3.66	38.77	4.11
	-2	19.38	2.21	21.54	2.46	25.85	2.88	28.00	3.05	30.15	3.27	34.46	3.67	38.77	4.12
	0	19.38	2.24	21.54	2.46	25.85	2.90	28.00	3.08	30.15	3.31	34.46	3.73	38.77	4.16
	2	19.38	2.25	21.54	2.47	25.85	2.94	28.00	3.17	30.15	3.32	34.46	3.75	38.77	4.16
	4	19.38	2.25	21.54	2.49	25.85	2.96	28.00	3.20	30.15	3.37	34.46	3.79	38.77	4.21
	6	19.38	2.25	21.54	2.49	25.85	2.98	28.00	3.22	30.15	3.43	34.46	3.85	38.77	4.24
	8	19.38	2.26	21.54	2.49	25.85	2.98	28.00	3.23	30.15	3.45	34.46	3.86	38.77	4.26
	10	19.38	2.28	21.54	2.50	25.85	2.99	28.00	3.24	30.15	3.47	34.46	3.88	38.77	4.38
	12	19.38	2.28	21.54	2.50	25.85	3.00	28.00	3.25	30.15	3.48	34.46	3.89	38.77	4.43
	14	19.38	2.30	21.54	2.51	25.85	3.03	28.00	3.26	30.15	3.50	34.46	3.96	38.77	4.54
	17	19.38	2.30	21.54	2.53	25.85	3.03	28.00	3.27	30.15	3.55	34.46	4.04	38.77	4.63
	20	19.38	2.32	21.54	2.62	25.85	3.10	28.00	3.37	30.15	3.84	34.46	4.63	38.77	5.33
	22	19.38	2.34	21.54	2.70	25.85	3.72	28.00	3.94	30.15	4.19	34.46	4.82	38.77	5.80
	25	19.38	2.79	21.54	3.08	25.85	4.09	28.00	4.41	30.15	4.74	34.46	5.43	38.77	6.57
	27	19.38	3.07	21.54	3.37	25.85	4.42	28.00	4.78	30.15	5.15	34.46	5.90	38.77	7.08
	29	19.38	3.36	21.54	3.67	25.85	4.80	28.00	5.17	30.15	5.56	34.46	6.38	38.77	7.65
	31	19.38	3.65	21.54	3.98	25.85	5.17	28.00	5.57	30.15	6.02	34.46	6.93	38.77	8.27
	33	19.38	3.97	21.54	4.33	25.85	5.58	28.00	6.03	30.15	6.48	34.46	7.45	38.77	8.90
35	19.38	4.28	21.54	4.69	25.85	5.99	28.00	6.47	30.15	6.99	34.46	8.04	38.77	9.60	
37	19.38	4.62	21.54	5.08	25.85	6.44	28.00	6.99	30.15	7.52	34.46	8.66	38.77	10.35	
39	19.38	4.97	21.54	5.49	25.85	6.92	28.00	7.52	30.15	8.09	34.46	9.34	38.77	11.16	
41	19.38	5.36	21.54	6.11	25.85	7.44	28.00	8.07	30.15	8.71	34.46	10.04	38.77	12.10	
43	19.38	5.79	21.54	6.58	25.85	8.01	28.00	8.69	30.15	9.38	34.46	10.81	38.77	13.12	
46	19.38	6.47	21.54	7.43	25.85	8.91	28.00	9.65	30.15	10.42	34.46	12.04	38.77	14.85	
48	19.38	6.98	21.54	7.95	25.85	9.55	28.00	10.37	30.15	11.20	34.46	12.98	38.77	16.10	
50	19.38	7.89	21.54	8.63	25.85	10.28	28.00	11.14	30.15	12.07	34.46	14.00	36.16	15.27	
52	19.38	8.44	21.54	9.26	25.85	11.02	28.00	11.96	30.15	12.97	30.71	12.53	30.76	12.16	
55	19.38	8.66	21.54	9.49	21.62	8.88	21.95	8.82	21.79	8.40	22.68	8.20	22.94	7.98	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.











Table 2-8.8: 22HP cooling capacity (continued)

CR	Outdoor air temp. (°CDB)	Indoor air temp. (°C DB/WD)													
		22/15		23.3/16		25.8/18		27/19		28.2/20		30.7/22		32/24	
		TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-15	21.29	2.60	23.65	2.89	28.38	3.41	30.75	3.70	33.12	3.96	37.85	4.50	42.58	5.04
	-10	21.29	2.69	23.65	2.92	28.38	3.45	30.75	3.70	33.12	3.98	37.85	4.51	42.58	5.07
	-5	21.29	2.71	23.65	2.97	28.38	3.47	30.75	3.71	33.12	4.00	37.85	4.52	42.58	5.08
	-2	21.29	2.71	23.65	2.97	28.38	3.51	30.75	3.76	33.12	4.03	37.85	4.55	42.58	5.09
	0	21.29	2.76	23.65	2.98	28.38	3.52	30.75	3.78	33.12	4.05	37.85	4.59	42.58	5.10
	2	21.29	2.76	23.65	3.01	28.38	3.56	30.75	3.80	33.12	4.11	37.85	4.61	42.58	5.14
	4	21.29	2.76	23.65	3.03	28.38	3.58	30.75	3.81	33.12	4.13	37.85	4.63	42.58	5.15
	6	21.29	2.77	23.65	3.04	28.38	3.60	30.75	3.84	33.12	4.22	37.85	4.65	42.58	5.19
	8	21.29	2.77	23.65	3.07	28.38	3.61	30.75	3.87	33.12	4.23	37.85	4.66	42.58	5.32
	10	21.29	2.78	23.65	3.08	28.38	3.63	30.75	3.89	33.12	4.26	37.85	4.67	42.58	5.37
	12	21.29	2.78	23.65	3.09	28.38	3.70	30.75	3.98	33.12	4.29	37.85	5.01	42.58	5.55
	14	21.29	2.79	23.65	3.10	28.38	3.72	30.75	3.99	33.12	4.30	37.85	5.04	42.58	5.62
	17	21.29	2.84	23.65	3.11	28.38	3.77	30.75	4.04	33.12	4.36	37.85	5.05	42.58	5.98
	20	21.29	2.86	23.65	3.18	28.38	3.92	30.75	4.55	33.12	4.99	37.85	5.57	42.58	6.59
	22	21.29	2.92	23.65	3.53	28.38	4.45	30.75	4.75	33.12	5.16	37.85	5.94	42.58	7.19
	25	21.29	3.44	23.65	3.96	28.38	4.97	30.75	5.40	33.12	5.84	37.85	6.71	42.58	8.11
	27	21.29	3.76	23.65	4.32	28.38	5.42	30.75	5.86	33.12	6.30	37.85	7.27	42.58	8.79
	29	21.29	4.11	23.65	4.69	28.38	5.84	30.75	6.32	33.12	6.86	37.85	7.90	42.58	9.47
	31	21.29	4.44	23.65	5.09	28.38	6.34	30.75	6.86	33.12	7.38	37.85	8.52	42.58	10.27
	33	21.29	4.81	23.65	5.51	28.38	6.80	30.75	7.38	33.12	7.96	37.85	9.22	42.58	11.06
35	21.29	5.23	23.65	5.95	28.38	7.33	30.75	7.95	33.12	8.59	37.85	9.96	42.58	12.04	
37	21.29	5.67	23.65	6.55	28.38	7.93	30.75	8.60	33.12	9.30	37.85	10.73	42.58	13.08	
39	21.29	6.14	23.65	7.06	28.38	8.54	30.75	9.25	33.12	9.98	37.85	11.56	42.58	14.21	
41	21.29	6.80	23.65	7.59	28.38	9.15	30.75	9.93	33.12	10.74	37.85	12.45	42.58	15.40	
43	21.29	7.29	23.65	8.14	28.38	9.83	30.75	10.68	33.12	11.59	37.85	13.41	42.58	16.74	
46	21.29	8.13	23.65	9.21	28.38	10.95	30.75	11.91	33.12	12.90	37.85	15.12	42.58	18.95	
48	21.29	8.75	23.65	9.88	28.38	11.76	30.75	12.78	33.12	13.89	37.85	16.42	42.58	20.52	
50	21.29	9.61	23.65	10.60	28.38	12.66	30.75	13.74	33.12	14.91	36.32	16.68	36.56	16.17	
52	21.29	10.27	23.65	11.35	28.38	13.61	30.75	14.81	30.50	14.21	30.81	13.43	30.88	12.95	
55	21.29	10.31	21.25	9.91	21.56	9.40	21.78	9.18	22.04	8.94	22.03	8.21	22.24	7.95	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

## 8.2 Heating Capacity Tables

Table 2-8.9: 8HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
130%	-29.8	-30.0	17.30	7.72	17.22	8.00	17.15	8.29	17.12	8.44	17.09	8.60	17.04	8.93
	-25.0	-25.4	18.21	8.03	18.13	8.31	18.06	8.61	18.02	8.76	17.99	8.92	17.94	9.25
	-19.8	-20.0	20.23	8.32	20.14	8.61	20.06	8.91	20.03	9.07	19.99	9.23	19.93	9.57
	-18.8	-19.0	21.88	8.51	21.77	8.80	21.67	9.10	21.63	9.26	21.58	9.42	21.50	9.76
	-16.7	-17.0	23.01	8.88	22.90	9.17	22.78	9.48	22.73	9.64	22.68	9.80	22.58	10.15
	-13.7	-15.0	24.19	9.31	24.06	9.61	23.93	9.93	23.87	10.09	23.82	10.26	23.70	10.61
	-11.8	-13.0	25.41	9.68	25.26	9.98	25.12	10.30	25.06	10.47	24.99	10.64	24.87	10.99
	-9.8	-11.0	26.66	10.05	26.50	10.36	26.35	10.69	26.28	10.86	26.21	11.03	26.06	11.39
	-9.5	-10.0	27.30	10.19	27.14	10.50	26.98	10.83	26.90	11.00	26.82	11.18	26.68	11.54
	-8.5	-9.1	27.88	10.37	27.72	10.68	27.55	11.01	27.47	11.19	27.39	11.36	27.24	11.73
	-7.0	-7.6	28.87	10.65	28.69	10.97	28.52	11.31	28.43	11.49	28.35	11.66	28.18	12.04
	-5.0	-5.6	30.19	11.03	30.00	11.36	29.81	11.71	29.72	11.89	29.64	12.07	30.09	12.71
	-3.0	-3.7	31.45	11.26	31.25	11.59	31.05	11.94	30.96	12.12	30.86	12.31	30.09	12.03
	0.0	-0.7	33.49	11.61	33.27	11.95	33.05	12.31	32.94	12.49	32.59	12.26	30.09	10.96
	3.0	2.2	35.19	11.74	34.95	12.08	35.10	12.46	33.85	11.82	32.59	11.21	30.09	10.08
	5.0	4.1	35.23	11.08	34.97	11.39	35.10	11.74	33.85	11.14	32.59	10.55	30.09	9.55
	7.0	6.0	36.22	11.05	35.95	11.36	35.10	11.05	33.85	10.49	32.59	10.00	30.09	9.06
	9.0	7.9	37.56	11.24	37.61	11.53	35.10	10.42	33.85	9.94	32.59	9.48	30.09	8.58
	11.0	9.8	38.92	11.44	37.61	10.82	35.10	9.86	33.85	9.41	32.59	8.98	30.09	8.12
	13.0	11.8	40.11	11.20	37.61	10.19	35.10	9.31	33.85	8.88	32.59	8.47	30.09	7.66
15.0	13.7	40.11	10.51	37.61	9.64	35.10	8.81	33.85	8.40	32.59	8.00	30.09	7.27	
18.0	15.8	40.11	9.89	37.61	9.07	35.10	8.26	33.85	7.88	32.59	7.49	30.09	6.89	
20.0	17.6	40.11	9.37	37.61	8.58	35.10	7.81	33.85	7.44	32.59	7.13	30.09	6.59	
23.0	20.2	40.11	8.65	37.61	7.89	35.10	7.18	33.85	6.92	32.59	6.67	30.09	6.17	
26.0	22.0	40.11	8.15	37.61	7.43	35.10	6.84	33.85	6.59	32.59	6.36	30.09	5.88	
30.0	24.1	40.11	7.59	37.61	6.95	35.10	6.46	33.85	6.23	32.59	6.00	30.09	5.56	
120%	-29.8	-30.0	17.14	7.71	17.07	7.99	17.00	8.29	16.97	8.45	16.95	8.61	16.90	8.95
	-25.0	-25.4	18.04	8.05	17.96	8.34	17.90	8.64	17.87	8.80	17.84	8.97	17.79	9.31
	-19.8	-20.0	20.04	8.47	19.96	8.76	19.89	9.07	19.85	9.23	19.82	9.40	19.77	9.75
	-18.8	-19.0	21.74	8.66	21.64	8.95	21.55	9.26	21.50	9.42	21.46	9.59	21.38	9.94
	-16.7	-17.0	22.87	9.04	22.76	9.34	22.65	9.66	22.60	9.82	22.55	9.99	22.46	10.34
	-13.7	-15.0	24.04	9.48	23.92	9.79	23.80	10.11	23.74	10.28	23.68	10.46	23.58	10.82
	-11.8	-13.0	25.25	9.86	25.11	10.18	24.98	10.50	24.91	10.67	24.85	10.85	24.73	11.22
	-9.8	-11.0	26.50	10.25	26.35	10.57	26.20	10.91	26.13	11.08	26.06	11.26	25.92	11.63
	-9.5	-10.0	27.13	10.40	26.97	10.72	26.82	11.06	26.75	11.23	26.68	11.41	26.53	11.79
	-8.5	-9.1	27.69	10.58	27.53	10.90	27.37	11.25	27.30	11.42	27.22	11.60	27.08	11.98
	-7.0	-7.6	28.64	10.87	28.47	11.20	28.30	11.55	28.22	11.73	28.14	11.91	27.77	11.94
	-5.0	-5.6	29.93	11.27	29.74	11.61	29.56	11.96	29.48	12.15	29.39	12.34	27.77	11.39
	-3.0	-3.7	31.18	11.51	30.98	11.85	30.79	12.21	31.24	12.59	30.09	11.97	27.77	10.74
	0.0	-0.7	33.19	11.88	32.97	12.23	32.40	12.09	31.24	11.50	30.09	10.91	27.77	9.87
	3.0	2.2	34.86	12.02	34.71	12.18	32.40	11.03	31.24	10.49	30.09	10.02	27.77	9.11
	5.0	4.1	34.89	11.34	34.71	11.48	32.40	10.40	31.24	9.95	30.09	9.50	27.77	8.65
	7.0	6.0	35.87	11.32	34.71	10.79	32.40	9.86	31.24	9.43	30.09	9.01	27.77	8.20
	9.0	7.9	37.03	11.15	34.71	10.18	32.40	9.34	31.24	8.94	30.09	8.53	27.77	7.75
	11.0	9.8	37.03	10.47	34.71	9.65	32.40	8.84	31.24	8.45	30.09	8.08	27.77	7.35
	13.0	11.8	37.03	9.89	34.71	9.10	32.40	8.34	31.24	7.98	30.09	7.60	27.77	7.01
15.0	13.7	37.03	9.36	34.71	8.60	32.40	7.88	31.24	7.52	30.09	7.22	27.77	6.69	
18.0	15.8	37.03	8.78	34.71	8.06	32.40	7.37	31.24	7.09	30.09	6.84	27.77	6.35	
20.0	17.6	37.03	8.31	34.71	7.62	32.40	7.02	31.24	6.77	30.09	6.54	27.77	6.08	
23.0	20.2	37.03	7.63	34.71	7.02	32.40	6.56	31.24	6.34	30.09	6.11	27.77	5.69	
26.0	22.0	37.03	7.18	34.71	6.69	32.40	6.26	31.24	6.04	30.09	5.84	27.77	5.43	
30.0	24.1	37.03	6.75	34.71	6.32	32.40	5.91	31.24	5.71	30.09	5.51	27.77	5.12	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.9: 8HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	17.04	7.86	16.97	8.15	16.91	8.46	16.89	8.62	16.86	8.78	16.82	9.14
	-25.0	-25.4	17.93	8.21	17.86	8.51	17.80	8.82	17.77	8.99	17.75	9.15	17.71	9.51
	-19.8	-20.0	19.92	8.64	19.85	8.95	19.78	9.26	19.75	9.43	19.72	9.60	19.68	9.96
	-18.8	-19.0	21.62	8.84	21.52	9.14	21.43	9.46	21.39	9.63	21.35	9.80	21.28	10.17
	-16.7	-17.0	22.74	9.24	22.63	9.54	22.53	9.87	22.48	10.04	22.44	10.22	22.35	10.58
	-13.7	-15.0	23.90	9.69	23.78	10.01	23.67	10.35	23.61	10.52	23.56	10.70	23.47	11.08
	-11.8	-13.0	25.09	10.09	24.96	10.41	24.83	10.75	24.78	10.93	24.72	11.11	24.61	11.49
	-9.8	-11.0	26.29	10.49	26.14	10.82	26.01	11.17	25.94	11.35	25.88	11.53	25.46	11.51
	-9.5	-10.0	26.90	10.64	26.75	10.97	26.60	11.32	26.53	11.50	26.46	11.69	25.46	11.21
	-8.5	-9.1	27.45	10.83	27.30	11.17	27.14	11.52	27.07	11.70	27.58	12.15	25.46	10.99
	-7.0	-7.6	28.39	11.14	28.22	11.48	28.06	11.84	27.98	12.03	27.58	11.77	25.46	10.62
	-5.0	-5.6	29.66	11.55	29.48	11.90	29.70	12.37	28.64	11.79	27.58	11.23	25.46	10.15
	-3.0	-3.7	30.89	11.81	30.70	12.16	29.70	11.68	28.64	11.13	27.58	10.58	25.46	9.64
	0.0	-0.7	32.87	12.21	31.82	11.69	29.70	10.65	28.64	10.17	27.58	9.73	25.46	8.88
	3.0	2.2	33.94	11.68	31.82	10.66	29.70	9.80	28.64	9.39	27.58	8.98	25.46	8.20
	5.0	4.1	33.94	10.99	31.82	10.09	29.70	9.29	28.64	8.90	27.58	8.52	25.46	7.77
	7.0	6.0	33.94	10.34	31.82	9.56	29.70	8.81	28.64	8.43	27.58	8.07	25.46	7.37
	9.0	7.9	33.94	9.80	31.82	9.05	29.70	8.33	28.64	7.98	27.58	7.64	25.46	7.05
	11.0	9.8	33.94	9.27	31.82	8.57	29.70	7.88	28.64	7.55	27.58	7.25	25.46	6.74
	13.0	11.8	33.94	8.74	31.82	8.07	29.70	7.42	28.64	7.15	27.58	6.91	25.46	6.43
15.0	13.7	33.94	8.26	31.82	7.62	29.70	7.05	28.64	6.82	27.58	6.59	25.46	6.15	
18.0	15.8	33.94	7.73	31.82	7.14	29.70	6.70	28.64	6.48	27.58	6.26	25.46	5.84	
20.0	17.6	33.94	7.31	31.82	6.81	29.70	6.39	28.64	6.18	27.58	5.99	25.46	5.59	
23.0	20.2	33.94	6.77	31.82	6.37	29.70	5.98	28.64	5.79	27.58	5.60	25.46	5.24	
26.0	22.0	33.94	6.45	31.82	6.07	29.70	5.70	28.64	5.53	27.58	5.34	25.46	5.00	
30.0	24.1	33.94	6.09	31.82	5.73	29.70	5.38	28.64	5.22	27.58	5.04	25.46	4.71	
100%	-29.8	-30.0	16.97	8.05	16.91	8.35	16.85	8.67	16.83	8.84	16.81	9.01	16.77	9.62
	-25.0	-25.4	17.86	8.42	17.80	8.72	17.74	9.05	17.72	9.22	17.70	9.40	17.66	9.92
	-19.8	-20.0	19.85	8.86	19.77	9.17	19.71	9.51	19.69	9.68	19.66	9.86	19.62	10.24
	-18.8	-19.0	21.50	9.06	21.41	9.38	21.33	9.71	21.30	9.89	21.26	10.07	21.20	10.45
	-16.7	-17.0	22.61	9.48	22.51	9.80	22.42	10.14	22.38	10.32	22.34	10.50	22.27	10.89
	-13.7	-15.0	23.72	9.95	23.61	10.28	23.51	10.63	23.46	10.81	23.42	11.00	23.14	11.10
	-11.8	-13.0	24.87	10.36	24.75	10.70	24.63	11.05	24.58	11.24	24.53	11.43	23.14	10.64
	-9.8	-11.0	26.06	10.78	25.92	11.12	25.79	11.49	26.04	11.75	25.07	11.22	23.14	10.17
	-9.5	-10.0	26.66	10.94	26.51	11.29	26.37	11.65	26.04	11.44	25.07	10.92	23.14	9.90
	-8.5	-9.1	27.20	11.14	27.05	11.49	27.00	11.74	26.04	11.22	25.07	10.70	23.14	9.73
	-7.0	-7.6	28.13	11.47	27.97	11.82	27.00	11.35	26.04	10.84	25.07	10.34	23.14	9.46
	-5.0	-5.6	29.38	11.90	28.93	11.84	27.00	10.82	26.04	10.33	25.07	9.90	23.14	9.08
	-3.0	-3.7	30.86	12.16	28.93	11.17	27.00	10.22	26.04	9.80	25.07	9.41	23.14	8.62
	0.0	-0.7	30.86	11.08	28.93	10.18	27.00	9.42	26.04	9.04	25.07	8.67	23.14	7.94
	3.0	2.2	30.86	10.13	28.93	9.40	27.00	8.69	26.04	8.34	25.07	7.99	23.14	7.33
	5.0	4.1	30.86	9.61	28.93	8.90	27.00	8.23	26.04	7.90	25.07	7.57	23.14	7.02
	7.0	6.0	30.86	9.10	28.93	8.44	27.00	7.80	26.04	7.48	25.07	7.21	23.14	6.72
	9.0	7.9	30.86	8.61	28.93	7.98	27.00	7.37	26.04	7.12	25.07	6.89	23.14	6.32
	11.0	9.8	30.86	8.14	28.93	7.55	27.00	7.03	26.04	6.81	25.07	6.59	23.14	6.16
	13.0	11.8	30.86	7.67	28.93	7.12	27.00	6.70	26.04	6.49	25.07	6.29	23.14	5.89
15.0	13.7	30.86	7.23	28.93	6.80	27.00	6.39	26.04	6.20	25.07	6.00	23.14	5.63	
18.0	15.8	30.86	6.83	28.93	6.45	27.00	6.08	26.04	5.89	25.07	5.71	23.14	5.36	
20.0	17.6	30.86	6.53	28.93	6.16	27.00	5.80	26.04	5.63	25.07	5.47	23.14	5.14	
23.0	20.2	30.86	6.10	28.93	5.76	27.00	5.44	26.04	5.27	25.07	5.12	23.14	4.81	
26.0	22.0	30.86	5.81	28.93	5.49	27.00	5.18	26.04	5.03	25.07	4.88	23.14	4.59	
30.0	24.1	30.86	5.48	28.93	5.18	27.00	4.89	26.04	4.74	25.07	4.60	23.14	4.32	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.9: 8HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	16.89	8.29	16.84	8.60	16.79	8.94	16.71	9.15	16.70	9.85	16.70	11.32
	-25.0	-25.4	17.77	8.67	17.72	8.99	17.68	9.34	17.59	9.54	17.58	10.06	17.58	11.01
	-19.8	-20.0	19.75	9.14	19.69	9.47	19.64	9.82	19.55	10.00	19.54	10.19	19.53	10.65
	-18.8	-19.0	21.35	9.35	21.28	9.68	21.21	10.03	21.18	10.22	21.15	10.41	20.83	10.45
	-16.7	-17.0	22.42	9.78	22.33	10.12	22.25	10.47	22.21	10.66	22.56	11.03	20.83	10.07
	-13.7	-15.0	23.52	10.28	23.42	10.62	23.32	10.99	23.43	11.15	22.56	10.67	20.83	9.73
	-11.8	-13.0	24.65	10.71	24.54	11.06	24.30	11.16	23.43	10.69	22.56	10.23	20.83	9.36
	-9.8	-11.0	25.81	11.15	26.04	11.61	24.30	10.69	23.43	10.24	22.56	9.78	20.83	9.03
	-9.5	-10.0	26.40	11.33	26.04	11.31	24.30	10.41	23.43	9.95	22.56	9.55	20.83	8.82
	-8.5	-9.1	26.94	11.54	26.04	11.10	24.30	10.19	23.43	9.77	22.56	9.40	20.83	8.66
	-7.0	-7.6	27.77	11.62	26.04	10.72	24.30	9.86	23.43	9.49	22.56	9.13	20.83	8.40
	-5.0	-5.6	27.77	11.09	26.04	10.21	24.30	9.48	23.43	9.12	22.56	8.76	20.83	8.05
	-3.0	-3.7	27.77	10.46	26.04	9.70	24.30	8.99	23.43	8.65	22.56	8.32	20.83	7.64
	0.0	-0.7	27.77	9.59	26.04	8.93	24.30	8.28	23.43	7.96	22.56	7.65	20.83	7.09
	3.0	2.2	27.77	8.85	26.04	8.24	24.30	7.63	23.43	7.34	22.56	7.10	20.83	6.64
	5.0	4.1	27.77	8.38	26.04	7.80	24.30	7.24	23.43	7.02	22.56	6.80	20.83	6.37
	7.0	6.0	27.77	7.93	26.04	7.39	24.30	6.93	23.43	6.72	22.56	6.51	20.83	6.11
	9.0	7.9	27.77	7.51	26.04	7.03	24.30	6.63	23.43	6.44	22.56	6.02	20.83	5.32
	11.0	9.8	27.77	7.10	26.04	6.72	24.30	6.34	23.43	6.15	22.56	5.86	20.83	5.14
	13.0	11.8	27.77	6.76	26.04	6.40	24.30	6.04	23.43	5.87	22.56	5.59	20.83	4.97
15.0	13.7	27.77	6.45	26.04	6.11	24.30	5.78	23.43	5.62	22.56	5.46	20.83	4.81	
18.0	15.8	27.77	6.12	26.04	5.81	24.30	5.50	23.43	5.35	22.56	5.20	20.83	4.90	
20.0	17.6	27.77	5.84	26.04	5.55	24.30	5.26	23.43	5.11	22.56	4.98	20.83	4.70	
23.0	20.2	27.77	5.47	26.04	5.19	24.30	4.92	23.43	4.79	22.56	4.66	20.83	4.40	
26.0	22.0	27.77	5.21	26.04	4.94	24.30	4.69	23.43	4.56	22.56	4.44	20.83	4.23	
30.0	24.1	27.77	4.91	26.04	4.66	24.30	4.41	23.43	4.29	22.56	4.18	20.83	4.03	
80%	-29.8	-30.0	17.24	9.05	17.19	9.40	17.16	9.77	16.95	10.90	16.94	10.47	15.83	9.63
	-25.0	-25.4	18.15	9.27	18.10	9.62	18.06	9.99	17.85	10.71	17.83	10.29	16.66	9.45
	-19.8	-20.0	20.16	9.49	20.11	9.85	20.07	10.22	19.83	10.52	19.82	10.11	18.51	9.27
	-18.8	-19.0	21.18	9.72	21.12	10.07	21.06	10.45	20.83	10.34	20.06	9.92	18.51	9.09
	-16.7	-17.0	22.23	10.17	22.15	10.53	21.60	10.37	20.83	9.96	20.06	9.55	18.51	8.82
	-13.7	-15.0	23.31	10.70	23.14	10.85	21.60	10.04	20.83	9.62	20.06	9.24	18.51	8.60
	-11.8	-13.0	24.69	11.20	23.14	10.40	21.60	9.60	20.83	9.26	20.06	8.93	18.51	8.28
	-9.8	-11.0	24.69	10.73	23.14	9.95	21.60	9.25	20.83	8.92	20.06	8.60	18.51	7.96
	-9.5	-10.0	24.69	10.45	23.14	9.68	21.60	9.04	20.83	8.71	20.06	8.40	18.51	7.77
	-8.5	-9.1	24.69	10.24	23.14	9.51	21.60	8.88	20.83	8.56	20.06	8.25	18.51	7.63
	-7.0	-7.6	24.69	9.89	23.14	9.25	21.60	8.61	20.83	8.31	20.06	8.00	18.51	7.38
	-5.0	-5.6	24.69	9.49	23.14	8.87	21.60	8.26	20.83	7.96	20.06	7.65	18.51	7.09
	-3.0	-3.7	24.69	9.01	23.14	8.42	21.60	7.84	20.83	7.55	20.06	7.27	18.51	6.81
	0.0	-0.7	24.69	8.30	23.14	7.74	21.60	7.21	20.83	7.00	20.06	6.79	18.51	6.38
	3.0	2.2	24.69	7.65	23.14	7.15	21.60	6.76	20.83	6.56	20.06	6.37	18.51	5.99
	5.0	4.1	24.69	7.23	23.14	6.85	21.60	6.47	20.83	6.29	20.06	6.11	18.51	5.75
	7.0	6.0	24.69	6.91	23.14	6.55	21.60	6.20	20.83	6.03	20.06	5.74	18.51	5.10
	9.0	7.9	24.69	6.60	23.14	6.16	21.60	5.54	20.83	5.31	20.06	5.01	18.51	4.61
	11.0	9.8	24.69	6.31	23.14	6.00	21.60	5.36	20.83	5.14	20.06	4.84	18.51	4.40
	13.0	11.8	24.69	6.01	23.14	5.72	21.60	5.21	20.83	4.88	20.06	4.60	18.51	4.18
15.0	13.7	24.69	5.74	23.14	5.47	21.60	5.09	20.83	4.74	20.06	4.45	18.51	3.98	
18.0	15.8	24.69	5.46	23.14	5.20	21.60	4.96	20.83	4.83	20.06	4.71	18.51	4.35	
20.0	17.6	24.69	5.23	23.14	4.98	21.60	4.74	20.83	4.63	20.06	4.51	18.51	4.34	
23.0	20.2	24.69	4.89	23.14	4.66	21.60	4.44	20.83	4.33	20.06	4.26	18.51	4.14	
26.0	22.0	24.69	4.65	23.14	4.43	21.60	4.22	20.83	4.16	20.06	4.10	18.51	3.98	
30.0	24.1	24.69	4.37	23.14	4.17	21.60	4.02	20.83	3.95	20.06	3.88	18.51	3.52	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.9:8HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	17.07	9.83	16.74	10.63	16.16	9.86	15.58	9.39	15.01	9.04	13.85	8.54
	-25.0	-25.4	17.97	9.93	17.62	10.35	17.01	9.61	16.40	9.20	15.79	8.86	14.58	8.35
	-19.8	-20.0	19.97	9.99	19.58	10.05	18.90	9.35	18.23	8.98	17.55	8.67	16.20	8.15
	-18.8	-19.0	21.02	10.23	20.25	9.86	18.90	9.16	18.23	8.82	17.55	8.56	16.20	8.03
	-16.7	-17.0	21.60	10.19	20.25	9.50	18.90	8.85	18.23	8.59	17.55	8.32	16.20	7.78
	-13.7	-15.0	21.60	9.86	20.25	9.18	18.90	8.63	18.23	8.36	17.55	8.09	16.20	7.54
	-11.8	-13.0	21.60	9.43	20.25	8.87	18.90	8.33	18.23	8.06	17.55	7.78	16.20	7.23
	-9.8	-11.0	21.60	9.09	20.25	8.55	18.90	8.01	18.23	7.74	17.55	7.47	16.20	6.93
	-9.5	-10.0	21.60	8.88	20.25	8.35	18.90	7.81	18.23	7.54	17.55	7.28	16.20	6.76
	-8.5	-9.1	21.60	8.73	20.25	8.20	18.90	7.67	18.23	7.40	17.55	7.14	16.20	6.68
	-7.0	-7.6	21.60	8.47	20.25	7.95	18.90	7.43	18.23	7.17	17.55	6.92	16.20	6.54
	-5.0	-5.6	21.60	8.12	20.25	7.61	18.90	7.11	18.23	6.91	17.55	6.72	16.20	6.34
	-3.0	-3.7	21.60	7.70	20.25	7.22	18.90	6.82	18.23	6.64	17.55	6.45	16.20	6.09
	0.0	-0.7	21.60	7.08	20.25	6.73	18.90	6.39	18.23	6.22	17.55	6.04	16.20	5.71
	3.0	2.2	21.60	6.63	20.25	6.31	18.90	5.99	18.23	5.83	17.55	5.68	16.20	5.37
	5.0	4.1	21.60	6.35	20.25	6.05	18.90	5.74	18.23	5.60	17.55	5.45	16.20	5.16
	7.0	6.0	21.60	6.08	20.25	5.81	18.90	5.18	18.23	4.96	17.55	4.81	16.20	4.53
	9.0	7.9	21.60	5.50	20.25	5.01	18.90	4.60	18.23	4.47	17.55	4.33	16.20	4.06
	11.0	9.8	21.60	5.35	20.25	4.85	18.90	4.39	18.23	4.26	17.55	4.13	16.20	3.88
	13.0	11.8	21.60	5.10	20.25	4.61	18.90	4.17	18.23	4.05	17.55	3.93	16.20	3.69
15.0	13.7	21.60	4.98	20.25	4.47	18.90	4.03	18.23	3.80	17.55	3.60	16.20	3.38	
18.0	15.8	21.60	4.85	20.25	4.65	18.90	4.45	18.23	4.12	17.55	3.87	16.20	3.53	
20.0	17.6	21.60	4.64	20.25	4.45	18.90	4.29	18.23	4.24	17.55	3.95	16.20	3.49	
23.0	20.2	21.60	4.34	20.25	4.19	18.90	4.09	18.23	4.04	17.55	3.99	16.20	3.65	
26.0	22.0	21.60	4.13	20.25	4.02	18.90	3.92	18.23	3.87	17.55	3.82	16.20	3.71	
30.0	24.1	21.60	3.91	20.25	3.80	18.90	3.57	18.23	3.30	17.55	3.08	16.20	2.78	
60%	-29.8	-30.0	15.83	9.46	14.84	8.93	13.85	8.52	13.36	8.31	12.86	8.09	11.87	7.59
	-25.0	-25.4	16.66	9.22	15.62	8.71	14.58	8.29	14.06	8.08	13.54	7.86	12.50	7.38
	-19.8	-20.0	18.51	8.95	17.36	8.43	16.20	8.00	15.62	7.79	15.04	7.57	13.89	7.13
	-18.8	-19.0	18.51	8.78	17.36	8.32	16.20	7.89	15.62	7.67	15.04	7.45	13.89	7.00
	-16.7	-17.0	18.51	8.52	17.36	8.08	16.20	7.65	15.62	7.42	15.04	7.19	13.89	6.74
	-13.7	-15.0	18.51	8.31	17.36	7.86	16.20	7.41	15.62	7.18	15.04	6.95	13.89	6.50
	-11.8	-13.0	18.51	8.00	17.36	7.56	16.20	7.11	15.62	6.88	15.04	6.66	13.89	6.30
	-9.8	-11.0	18.51	7.69	17.36	7.25	16.20	6.81	15.62	6.61	15.04	6.45	13.89	6.13
	-9.5	-10.0	18.51	7.51	17.36	7.07	16.20	6.65	15.62	6.50	15.04	6.34	13.89	6.02
	-8.5	-9.1	18.51	7.36	17.36	6.94	16.20	6.57	15.62	6.42	15.04	6.26	13.89	5.94
	-7.0	-7.6	18.51	7.13	17.36	6.74	16.20	6.43	15.62	6.27	15.04	6.12	13.89	5.80
	-5.0	-5.6	18.51	6.85	17.36	6.54	16.20	6.23	15.62	6.08	15.04	5.92	13.89	5.61
	-3.0	-3.7	18.51	6.57	17.36	6.28	16.20	5.98	15.62	5.83	15.04	5.68	13.89	5.39
	0.0	-0.7	18.51	6.15	17.36	5.88	16.20	5.60	15.62	5.47	15.04	5.33	13.89	5.06
	3.0	2.2	18.51	5.77	17.36	5.52	16.20	5.27	15.62	5.15	15.04	5.02	13.89	4.77
	5.0	4.1	18.51	5.54	17.36	5.30	16.20	5.07	15.62	4.95	15.04	4.83	13.89	4.60
	7.0	6.0	18.51	4.90	17.36	4.67	16.20	4.44	15.62	4.32	15.04	4.21	13.89	4.01
	9.0	7.9	18.51	4.41	17.36	4.18	16.20	3.96	15.62	3.85	15.04	3.75	13.89	3.59
	11.0	9.8	18.51	4.20	17.36	3.99	16.20	3.78	15.62	3.69	15.04	3.61	13.89	3.50
	13.0	11.8	18.51	3.99	17.36	3.79	16.20	3.61	15.62	3.56	15.04	3.51	13.89	3.40
15.0	13.7	18.51	3.80	17.36	3.47	16.20	3.30	15.62	3.25	15.04	3.20	13.89	3.11	
18.0	15.8	18.51	4.16	17.36	3.76	16.20	3.45	15.62	3.27	15.04	3.13	13.89	3.00	
20.0	17.6	18.51	4.16	17.36	3.84	16.20	3.48	15.62	3.29	15.04	3.12	13.89	2.84	
23.0	20.2	18.51	3.95	17.36	3.87	16.20	3.55	15.62	3.40	15.04	3.20	13.89	2.84	
26.0	22.0	18.51	3.77	17.36	3.68	16.20	3.60	15.62	3.56	15.04	3.52	13.89	3.45	
30.0	24.1	18.51	3.29	17.36	2.95	16.20	2.65	15.62	2.51	15.04	2.40	13.89	2.31	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...



Table2-8.9:8HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	°C DB	°C WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
	-29.8	-30.0	13.19	7.97	12.37	7.64	11.54	7.28	11.13	7.06	10.72	6.83	9.89	6.36
	-25.0	-25.4	13.89	7.77	13.02	7.43	12.15	7.07	11.72	6.87	11.28	6.66	10.41	6.24
	-19.8	-20.0	15.43	7.53	14.46	7.18	13.50	6.83	13.02	6.66	12.54	6.48	11.57	6.12
	-18.8	-19.0	15.43	7.41	14.46	7.07	13.50	6.71	13.02	6.53	12.54	6.35	11.57	5.99
	-16.7	-17.0	15.43	7.16	14.46	6.81	13.50	6.45	13.02	6.27	12.54	6.09	11.57	5.85
	-13.7	-15.0	15.43	6.93	14.46	6.58	13.50	6.23	13.02	6.11	12.54	5.99	11.57	5.74
	-11.8	-13.0	15.43	6.64	14.46	6.32	13.50	6.08	13.02	5.95	12.54	5.83	11.57	5.57
	-9.8	-11.0	15.43	6.41	14.46	6.16	13.50	5.91	13.02	5.78	12.54	5.65	11.57	5.39
	-9.5	-10.0	15.43	6.29	14.46	6.04	13.50	5.79	13.02	5.67	12.54	5.54	11.57	5.28
	-8.5	-9.1	15.43	6.21	14.46	5.96	13.50	5.71	13.02	5.59	12.54	5.46	11.57	5.21
	-7.0	-7.6	15.43	6.07	14.46	5.83	13.50	5.58	13.02	5.45	12.54	5.33	11.57	5.08
	-5.0	-5.6	15.43	5.88	14.46	5.64	13.50	5.40	13.02	5.27	12.54	5.15	11.57	4.91
	-3.0	-3.7	15.43	5.64	14.46	5.41	13.50	5.18	13.02	5.07	12.54	4.95	11.57	4.72
	0.0	-0.7	15.43	5.28	14.46	5.08	13.50	4.86	13.02	4.76	12.54	4.65	11.57	4.46
	3.0	2.2	15.43	4.98	14.46	4.78	13.50	4.59	13.02	4.49	12.54	4.42	11.57	4.29
	5.0	4.1	15.43	4.78	14.46	4.61	13.50	4.31	13.02	4.01	12.54	3.86	11.57	3.73
	7.0	6.0	15.43	4.17	14.46	4.00	13.50	3.87	13.02	3.82	12.54	3.77	11.57	3.66
	9.0	7.9	15.43	3.70	14.46	3.56	13.50	3.46	13.02	3.42	12.54	3.37	11.57	3.27
	11.0	9.8	15.43	3.54	14.46	3.46	13.50	3.38	13.02	3.33	12.54	3.29	11.57	3.21
13.0	11.8	15.43	3.43	14.46	3.36	13.50	3.29	13.02	3.25	12.54	3.22	11.57	3.14	
15.0	13.7	15.43	3.13	14.46	3.06	13.50	2.99	13.02	2.96	12.54	2.93	11.57	2.86	
18.0	15.8	15.43	3.14	14.46	2.95	13.50	2.89	13.02	2.86	12.54	2.82	11.57	2.75	
20.0	17.6	15.43	3.16	14.46	2.92	13.50	2.69	13.02	2.62	12.54	2.59	11.57	2.54	
23.0	20.2	15.43	3.25	14.46	2.88	13.50	2.65	13.02	2.60	12.54	2.59	11.57	2.47	
26.0	22.0	15.43	3.38	14.46	3.33	13.50	3.32	13.02	3.30	12.54	3.28	11.57	3.19	
30.0	24.1	15.43	2.32	14.46	2.20	13.50	2.21	13.02	2.23	12.54	2.20	11.57	2.16	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table2-8.10:10HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	19.23	8.20	19.17	8.51	19.12	8.84	19.10	9.02	19.08	9.20	19.05	9.57
	-25.0	-25.4	20.25	8.59	20.18	8.91	20.13	9.25	20.11	9.43	20.09	9.61	20.06	9.99
	-19.8	-20.0	22.50	9.09	22.43	9.42	22.37	9.76	22.34	9.94	22.32	10.13	22.29	10.52
	-18.8	-19.0	24.51	9.30	24.42	9.62	24.33	9.97	24.30	10.15	24.26	10.34	24.20	10.73
	-16.7	-17.0	25.74	9.72	25.63	10.05	25.54	10.40	25.49	10.59	25.45	10.78	25.38	11.17
	-13.7	-15.0	27.01	10.20	26.89	10.55	26.78	10.91	26.73	11.10	26.68	11.29	26.59	11.69
	-11.8	-13.0	28.33	10.62	28.20	10.97	28.07	11.34	28.01	11.53	27.95	11.72	27.85	12.13
	-9.8	-11.0	29.67	11.05	29.53	11.40	29.39	11.78	29.33	11.97	29.26	12.17	29.14	12.59
	-9.5	-10.0	30.34	11.21	30.19	11.57	30.05	11.94	29.98	12.14	29.91	12.34	29.79	12.76
	-8.5	-9.1	30.95	11.41	30.79	11.77	30.64	12.15	30.57	12.35	30.50	12.55	30.37	12.98
	-7.0	-7.6	31.97	11.73	31.81	12.10	31.65	12.48	31.57	12.69	31.49	12.89	31.35	13.32
	-5.0	-5.6	33.36	12.17	33.18	12.54	33.01	12.94	32.92	13.14	32.84	13.36	32.68	13.80
	-3.0	-3.7	34.71	12.43	34.52	12.81	34.33	13.21	34.23	13.42	34.14	13.63	33.97	14.08
	0.0	-0.7	36.88	12.85	36.66	13.24	36.45	13.65	36.35	13.86	36.24	14.07	35.10	13.52
	3.0	2.2	38.72	13.05	38.48	13.44	38.25	13.84	38.13	14.05	38.03	13.98	35.10	12.40
	5.0	4.1	38.92	12.45	38.66	12.81	38.40	13.19	38.27	13.39	38.03	13.21	35.10	11.69
	7.0	6.0	40.02	12.47	39.74	12.83	39.46	13.21	39.49	13.23	38.03	12.46	35.10	11.02
	9.0	7.9	41.44	12.71	41.15	13.08	40.95	13.20	39.49	12.48	38.03	11.75	35.10	10.40
	11.0	9.8	42.88	12.95	42.57	13.33	40.95	12.46	39.49	11.76	38.03	11.07	35.10	9.87
	13.0	11.8	44.40	13.21	43.88	13.09	40.95	11.70	39.49	11.03	38.03	10.41	35.10	9.34
15.0	13.7	46.80	13.74	43.88	12.34	40.95	11.00	39.49	10.41	38.03	9.88	35.10	8.85	
18.0	15.8	46.80	12.89	43.88	11.55	40.95	10.34	39.49	9.82	38.03	9.31	35.10	8.34	
20.0	17.6	46.80	12.18	43.88	10.89	40.95	9.83	39.49	9.33	38.03	8.85	35.10	7.91	
23.0	20.2	46.80	11.19	43.88	10.10	40.95	9.12	39.49	8.65	38.03	8.20	35.10	7.31	
26.0	22.0	46.80	10.57	43.88	9.59	40.95	8.64	39.49	8.20	38.03	7.74	35.10	6.99	
30.0	24.1	46.80	9.95	43.88	9.01	40.95	8.10	39.49	7.66	38.03	7.24	35.10	6.62	
120%	-29.8	-30.0	19.12	8.35	19.06	8.67	19.02	9.02	19.00	9.20	18.98	9.38	18.96	9.77
	-25.0	-25.4	20.13	8.76	20.07	9.09	20.02	9.44	20.00	9.62	19.98	9.81	19.96	10.21
	-19.8	-20.0	22.36	9.27	22.30	9.61	22.24	9.97	22.22	10.15	22.20	10.35	22.18	10.75
	-18.8	-19.0	24.35	9.49	24.27	9.83	24.19	10.18	24.16	10.37	24.13	10.57	24.08	10.97
	-16.7	-17.0	25.58	9.92	25.48	10.27	25.39	10.63	25.35	10.82	25.31	11.02	25.25	11.43
	-13.7	-15.0	26.85	10.43	26.73	10.78	26.63	11.15	26.58	11.35	26.54	11.55	26.46	11.97
	-11.8	-13.0	28.12	10.85	27.99	11.21	27.88	11.59	27.83	11.79	27.78	12.00	27.68	12.43
	-9.8	-11.0	29.42	11.29	29.28	11.66	29.15	12.05	29.09	12.25	29.03	12.46	28.92	12.90
	-9.5	-10.0	30.08	11.46	29.93	11.83	29.80	12.22	29.73	12.42	29.67	12.63	29.55	13.07
	-8.5	-9.1	30.68	11.67	30.53	12.04	30.39	12.44	30.32	12.64	30.25	12.85	30.13	13.30
	-7.0	-7.6	31.70	12.01	31.53	12.39	31.38	12.79	31.30	13.00	31.23	13.21	31.10	13.66
	-5.0	-5.6	33.07	12.46	32.89	12.85	32.72	13.26	32.64	13.48	32.56	13.70	32.40	13.90
	-3.0	-3.7	34.40	12.74	34.21	13.14	34.03	13.55	33.93	13.77	33.85	13.99	32.40	13.16
	0.0	-0.7	36.54	13.19	36.33	13.59	36.12	14.02	36.45	14.29	35.10	13.53	32.40	12.04
	3.0	2.2	38.35	13.40	38.12	13.81	37.80	13.86	36.45	13.13	35.10	12.40	32.40	11.02
	5.0	4.1	38.52	12.78	38.26	13.16	37.80	13.09	36.45	12.39	35.10	11.71	32.40	10.39
	7.0	6.0	39.60	12.81	39.33	13.19	37.80	12.36	36.45	11.69	35.10	11.04	32.40	9.87
	9.0	7.9	41.00	13.07	40.50	12.98	37.80	11.65	36.45	11.00	35.10	10.41	32.40	9.38
	11.0	9.8	43.20	13.57	40.50	12.22	37.80	10.96	36.45	10.39	35.10	9.87	32.40	8.89
	13.0	11.8	43.20	12.75	40.50	11.48	37.80	10.32	36.45	9.83	35.10	9.34	32.40	8.41
15.0	13.7	43.20	12.02	40.50	10.81	37.80	9.79	36.45	9.33	35.10	8.86	32.40	7.97	
18.0	15.8	43.20	11.23	40.50	10.16	37.80	9.23	36.45	8.79	35.10	8.34	32.40	7.49	
20.0	17.6	43.20	10.60	40.50	9.66	37.80	8.76	36.45	8.34	35.10	7.91	32.40	7.15	
23.0	20.2	43.20	9.83	40.50	8.95	37.80	8.11	36.45	7.70	35.10	7.31	32.40	6.71	
26.0	22.0	43.20	9.34	40.50	8.48	37.80	7.67	36.45	7.28	35.10	6.97	32.40	6.41	
30.0	24.1	43.20	8.76	40.50	7.95	37.80	7.18	36.45	6.89	35.10	6.61	32.40	6.08	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.10: 10HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	18.94	8.51	18.90	8.84	18.86	9.20	18.85	9.38	18.84	9.57	18.83	9.98
	-25.0	-25.4	19.94	8.94	19.89	9.28	19.85	9.64	19.84	9.83	19.83	10.03	19.82	10.45
	-19.8	-20.0	22.16	9.50	22.10	9.85	22.06	10.22	22.05	10.41	22.03	10.62	22.02	11.04
	-18.8	-19.0	24.21	9.72	24.13	10.07	24.07	10.45	24.04	10.64	24.02	10.84	23.98	11.27
	-16.7	-17.0	25.41	10.17	25.32	10.53	25.24	10.91	25.21	11.11	25.18	11.31	25.13	11.75
	-13.7	-15.0	26.63	10.69	26.52	11.06	26.43	11.45	26.39	11.65	26.35	11.86	26.29	12.30
	-11.8	-13.0	27.88	11.14	27.76	11.51	27.66	11.91	27.61	12.11	27.56	12.33	27.48	12.78
	-9.8	-11.0	29.16	11.59	29.03	11.98	28.91	12.38	28.85	12.59	28.80	12.81	28.70	13.27
	-9.5	-10.0	29.82	11.77	29.68	12.16	29.55	12.56	29.49	12.78	29.43	13.00	29.70	13.55
	-8.5	-9.1	30.41	11.99	30.26	12.38	30.13	12.79	30.07	13.01	30.00	13.23	29.70	13.32
	-7.0	-7.6	31.41	12.34	31.25	12.74	31.11	13.16	31.04	13.38	30.97	13.60	29.70	12.90
	-5.0	-5.6	32.76	12.82	32.60	13.23	32.43	13.66	32.36	13.88	32.17	13.77	29.70	12.34
	-3.0	-3.7	34.07	13.12	33.89	13.54	33.71	13.97	33.41	13.75	32.17	13.05	29.70	11.67
	0.0	-0.7	36.18	13.60	35.97	14.02	34.65	13.26	33.41	12.59	32.17	11.94	29.70	10.65
	3.0	2.2	37.95	13.84	37.13	13.47	34.65	12.16	33.41	11.53	32.17	10.91	29.70	9.82
	5.0	4.1	38.10	13.19	37.13	12.72	34.65	11.47	33.41	10.87	32.17	10.29	29.70	9.32
	7.0	6.0	39.60	13.25	37.13	12.00	34.65	10.81	33.41	10.26	32.17	9.79	29.70	8.85
	9.0	7.9	39.60	12.49	37.13	11.32	34.65	10.22	33.41	9.75	32.17	9.28	29.70	8.41
	11.0	9.8	39.60	11.78	37.13	10.64	34.65	9.70	33.41	9.25	32.17	8.81	29.70	7.97
	13.0	11.8	39.60	11.06	37.13	10.05	34.65	9.17	33.41	8.75	32.17	8.33	29.70	7.54
15.0	13.7	39.60	10.41	37.13	9.53	34.65	8.69	33.41	8.28	32.17	7.89	29.70	7.17	
18.0	15.8	39.60	9.81	37.13	8.98	34.65	8.18	33.41	7.80	32.17	7.41	29.70	6.82	
20.0	17.6	39.60	9.32	37.13	8.52	34.65	7.76	33.41	7.39	32.17	7.08	29.70	6.54	
23.0	20.2	39.60	8.65	37.13	7.89	34.65	7.18	33.41	6.90	32.17	6.64	29.70	6.14	
26.0	22.0	39.60	8.18	37.13	7.45	34.65	6.86	33.41	6.60	32.17	6.34	29.70	5.86	
30.0	24.1	39.60	7.66	37.13	7.00	34.65	6.50	33.41	6.25	32.17	6.01	29.70	5.56	
100%	-29.8	-30.0	18.93	8.78	18.82	9.13	18.78	9.50	18.77	9.70	18.76	9.91	18.72	10.60
	-25.0	-25.4	19.92	9.22	19.81	9.58	19.77	9.96	19.76	10.16	19.75	10.37	19.70	10.99
	-19.8	-20.0	22.13	9.78	22.01	10.14	21.96	10.54	21.95	10.74	21.94	10.95	21.89	11.40
	-18.8	-19.0	24.04	10.01	23.97	10.38	23.92	10.77	23.90	10.98	23.88	11.19	23.86	11.64
	-16.7	-17.0	25.20	10.47	25.12	10.85	25.06	11.25	25.03	11.46	25.00	11.68	24.97	12.14
	-13.7	-15.0	26.41	11.02	26.31	11.40	26.23	11.81	26.20	12.03	26.16	12.25	26.11	12.72
	-11.8	-13.0	27.64	11.49	27.53	11.88	27.44	12.30	27.39	12.52	27.35	12.74	27.00	12.78
	-9.8	-11.0	28.91	11.97	28.78	12.37	28.67	12.80	28.62	13.03	28.58	13.26	27.00	12.28
	-9.5	-10.0	29.55	12.16	29.42	12.56	29.30	12.99	29.25	13.22	29.25	13.28	27.00	11.97
	-8.5	-9.1	30.13	12.39	30.00	12.80	29.87	13.24	30.38	13.70	29.25	13.04	27.00	11.74
	-7.0	-7.6	31.12	12.77	30.97	13.18	30.84	13.63	30.38	13.28	29.25	12.64	27.00	11.36
	-5.0	-5.6	32.45	13.28	32.29	13.70	31.50	13.36	30.38	12.71	29.25	12.08	27.00	10.84
	-3.0	-3.7	33.73	13.60	33.75	13.91	31.50	12.65	30.38	12.03	29.25	11.42	27.00	10.24
	0.0	-0.7	36.00	13.99	33.75	12.76	31.50	11.56	30.38	10.98	29.25	10.42	27.00	9.45
	3.0	2.2	36.00	12.83	33.75	11.68	31.50	10.56	30.38	10.07	29.25	9.62	27.00	8.74
	5.0	4.1	36.00	12.12	33.75	11.01	31.50	10.01	30.38	9.57	29.25	9.14	27.00	8.31
	7.0	6.0	36.00	11.41	33.75	10.36	31.50	9.50	30.38	9.09	29.25	8.67	27.00	7.89
	9.0	7.9	36.00	10.74	33.75	9.84	31.50	9.02	30.38	8.62	29.25	8.23	27.00	7.48
	11.0	9.8	36.00	10.16	33.75	9.34	31.50	8.56	30.38	8.18	29.25	7.81	27.00	7.14
	13.0	11.8	36.00	9.61	33.75	8.83	31.50	8.09	30.38	7.73	29.25	7.38	27.00	6.82
15.0	13.7	36.00	9.11	33.75	8.36	31.50	7.66	30.38	7.31	29.25	7.04	27.00	6.53	
18.0	15.8	36.00	8.58	33.75	7.87	31.50	7.21	30.38	6.95	29.25	6.70	27.00	6.21	
20.0	17.6	36.00	8.13	33.75	7.45	31.50	6.90	30.38	6.66	29.25	6.41	27.00	5.96	
23.0	20.2	36.00	7.51	33.75	6.94	31.50	6.47	30.38	6.25	29.25	6.03	27.00	5.59	
26.0	22.0	36.00	7.10	33.75	6.63	31.50	6.19	30.38	5.97	29.25	5.76	27.00	5.35	
30.0	24.1	36.00	6.73	33.75	6.28	31.50	5.86	30.38	5.66	29.25	5.46	27.00	5.07	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.10: 10HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	18.70	9.03	18.68	9.40	18.64	9.94	18.61	10.56	18.59	11.36	18.55	12.36
	-25.0	-25.4	19.68	9.51	19.66	9.89	19.62	10.39	19.59	10.89	19.57	11.51	19.53	12.17
	-19.8	-20.0	21.87	10.13	21.84	10.52	21.80	10.94	21.76	11.16	21.74	11.39	21.70	11.40
	-18.8	-19.0	23.85	10.37	23.80	10.77	23.76	11.19	23.75	11.41	23.74	11.64	23.74	12.12
	-16.7	-17.0	25.00	10.87	24.94	11.27	24.89	11.69	24.87	11.92	24.85	12.15	24.30	12.02
	-13.7	-15.0	26.19	11.44	26.11	11.85	26.04	12.29	26.01	12.52	26.33	12.86	24.30	11.67
	-11.8	-13.0	27.40	11.94	27.31	12.36	27.23	12.81	27.34	12.97	26.33	12.37	24.30	11.20
	-9.8	-11.0	28.65	12.46	28.54	12.89	28.35	13.05	27.34	12.46	26.33	11.87	24.30	10.73
	-9.5	-10.0	29.28	12.66	29.16	13.09	28.35	12.72	27.34	12.14	26.33	11.57	24.30	10.44
	-8.5	-9.1	29.85	12.91	29.73	13.35	28.35	12.49	27.34	11.92	26.33	11.35	24.30	10.24
	-7.0	-7.6	30.81	13.31	30.38	13.24	28.35	12.09	27.34	11.52	26.33	10.97	24.30	9.90
	-5.0	-5.6	32.40	13.82	30.38	12.67	28.35	11.55	27.34	11.00	26.33	10.47	24.30	9.52
	-3.0	-3.7	32.40	13.10	30.38	11.99	28.35	10.91	27.34	10.39	26.33	9.92	24.30	9.05
	0.0	-0.7	32.40	11.99	30.38	10.95	28.35	9.99	27.34	9.57	26.33	9.16	24.30	8.35
	3.0	2.2	32.40	10.96	30.38	10.03	28.35	9.24	27.34	8.85	26.33	8.47	24.30	7.72
	5.0	4.1	32.40	10.33	30.38	9.54	28.35	8.77	27.34	8.40	26.33	8.04	24.30	7.33
	7.0	6.0	32.40	9.79	30.38	9.05	28.35	8.33	27.34	7.97	26.33	7.63	24.30	7.03
	9.0	7.9	32.40	9.30	30.38	8.58	28.35	7.91	27.34	7.56	26.33	7.26	24.30	6.53
	11.0	9.8	32.40	8.83	30.38	8.15	28.35	7.49	27.34	7.20	26.33	6.95	24.30	6.35
	13.0	11.8	32.40	8.33	30.38	7.70	28.35	7.12	27.34	6.87	26.33	6.64	24.30	6.06
	15.0	13.7	32.40	7.90	30.38	7.28	28.35	6.81	27.34	6.58	26.33	6.35	24.30	5.92
18.0	15.8	32.40	7.42	30.38	6.92	28.35	6.47	27.34	6.26	26.33	6.04	24.30	5.64	
20.0	17.6	32.40	7.06	30.38	6.62	28.35	6.20	27.34	5.99	26.33	5.80	24.30	5.41	
23.0	20.2	32.40	6.61	30.38	6.20	28.35	5.82	27.34	5.63	26.33	5.45	24.30	5.09	
26.0	22.0	32.40	6.32	30.38	5.94	28.35	5.56	27.34	5.38	26.33	5.20	24.30	4.86	
30.0	24.1	32.40	5.98	30.38	5.62	28.35	5.27	27.34	5.10	26.33	4.92	24.30	4.60	
80%	-29.8	-30.0	18.67	9.65	18.61	10.97	18.58	12.32	18.56	12.60	18.55	12.40	18.00	11.54
	-25.0	-25.4	19.65	10.11	19.59	11.16	19.56	12.19	19.53	12.35	19.52	12.11	18.94	11.24
	-19.8	-20.0	21.83	10.61	21.76	11.03	21.73	11.48	21.70	11.60	21.69	11.29	21.05	10.69
	-18.8	-19.0	23.69	10.86	23.65	11.29	23.64	11.75	23.63	11.99	23.40	11.87	21.60	10.82
	-16.7	-17.0	24.82	11.39	24.77	11.83	25.20	12.51	24.30	11.99	23.40	11.46	21.60	10.43
	-13.7	-15.0	25.98	12.01	25.92	12.45	25.20	12.15	24.30	11.62	23.40	11.12	21.60	10.09
	-11.8	-13.0	27.17	12.54	27.00	12.70	25.20	11.67	24.30	11.16	23.40	10.66	21.60	9.67
	-9.8	-11.0	28.80	13.23	27.00	12.20	25.20	11.19	24.30	10.70	23.40	10.21	21.60	9.30
	-9.5	-10.0	28.80	12.91	27.00	11.89	25.20	10.91	24.30	10.41	23.40	9.92	21.60	9.10
	-8.5	-9.1	28.80	12.68	27.00	11.68	25.20	10.69	24.30	10.21	23.40	9.74	21.60	8.94
	-7.0	-7.6	28.80	12.28	27.00	11.29	25.20	10.32	24.30	9.87	23.40	9.46	21.60	8.68
	-5.0	-5.6	28.80	11.73	27.00	10.78	25.20	9.88	24.30	9.48	23.40	9.09	21.60	8.33
	-3.0	-3.7	28.80	11.08	27.00	10.17	25.20	9.40	24.30	9.02	23.40	8.65	21.60	7.92
	0.0	-0.7	28.80	10.11	27.00	9.39	25.20	8.67	24.30	8.32	23.40	7.98	21.60	7.31
	3.0	2.2	28.80	9.35	27.00	8.68	25.20	8.01	24.30	7.70	23.40	7.38	21.60	6.85
	5.0	4.1	28.80	8.88	27.00	8.24	25.20	7.61	24.30	7.31	23.40	7.06	21.60	6.57
	7.0	6.0	28.80	8.43	27.00	7.82	25.20	7.23	24.30	6.99	23.40	6.76	21.60	6.20
	9.0	7.9	28.80	7.99	27.00	7.42	25.20	6.93	24.30	6.50	23.40	6.18	21.60	5.45
	11.0	9.8	28.80	7.58	27.00	7.07	25.20	6.63	24.30	6.32	23.40	6.01	21.60	5.27
	13.0	11.8	28.80	7.17	27.00	6.75	25.20	6.34	24.30	6.15	23.40	5.73	21.60	5.02
	15.0	13.7	28.80	6.86	27.00	6.45	25.20	6.07	24.30	5.89	23.40	5.59	21.60	4.86
18.0	15.8	28.80	6.52	27.00	6.15	25.20	5.78	24.30	5.61	23.40	5.44	21.60	5.11	
20.0	17.6	28.80	6.24	27.00	5.89	25.20	5.55	24.30	5.38	23.40	5.22	21.60	4.90	
23.0	20.2	28.80	5.86	27.00	5.53	25.20	5.21	24.30	5.05	23.40	4.91	21.60	4.60	
26.0	22.0	28.80	5.60	27.00	5.28	25.20	4.98	24.30	4.83	23.40	4.69	21.60	4.40	
30.0	24.1	28.80	5.29	27.00	5.00	25.20	4.71	24.30	4.57	23.40	4.42	21.60	4.20	

Abbreviations:  
 CR: Combination ratio  
 TC: Total capacity (kW)  
 PI: Power input (compressor + outdoor fan motor) (kW)  
 Notes:  
 Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.10: 10HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	18.36	12.00	18.33	12.60	18.09	12.00	18.18	11.50	17.51	10.98	16.16	10.01
	-25.0	-25.4	19.32	11.90	19.30	12.29	19.04	11.65	19.14	11.17	18.43	10.68	17.01	9.74
	-19.8	-20.0	21.47	11.28	21.44	11.57	21.16	11.22	21.26	10.77	20.48	10.32	18.90	9.43
	-18.8	-19.0	23.55	11.55	23.63	11.92	22.05	11.02	21.26	10.57	20.48	10.14	18.90	9.26
	-16.7	-17.0	24.65	12.13	23.63	11.53	22.05	10.63	21.26	10.20	20.48	9.76	18.90	8.93
	-13.7	-15.0	25.20	12.06	23.63	11.17	22.05	10.29	21.26	9.86	20.48	9.43	18.90	8.71
	-11.8	-13.0	25.20	11.59	23.63	10.72	22.05	9.87	21.26	9.44	20.48	9.10	18.90	8.40
	-9.8	-11.0	25.20	11.12	23.63	10.26	22.05	9.46	21.26	9.11	20.48	8.76	18.90	8.08
	-9.5	-10.0	25.20	10.82	23.63	9.99	22.05	9.24	21.26	8.90	20.48	8.56	18.90	7.89
	-8.5	-9.1	25.20	10.61	23.63	9.79	22.05	9.09	21.26	8.75	20.48	8.41	18.90	7.75
	-7.0	-7.6	25.20	10.26	23.63	9.50	22.05	8.83	21.26	8.49	20.48	8.16	18.90	7.51
	-5.0	-5.6	25.20	9.81	23.63	9.13	22.05	8.47	21.26	8.15	20.48	7.83	18.90	7.20
	-3.0	-3.7	25.20	9.32	23.63	8.68	22.05	8.06	21.26	7.75	20.48	7.44	18.90	6.90
	0.0	-0.7	25.20	8.61	23.63	8.01	22.05	7.43	21.26	7.15	20.48	6.93	18.90	6.48
	3.0	2.2	25.20	7.95	23.63	7.40	22.05	6.93	21.26	6.72	20.48	6.51	18.90	6.10
	5.0	4.1	25.20	7.55	23.63	7.07	22.05	6.66	21.26	6.45	20.48	6.25	18.90	5.86
	7.0	6.0	25.20	7.17	23.63	6.77	22.05	6.38	21.26	5.97	20.48	5.68	18.90	5.13
	9.0	7.9	25.20	6.87	23.63	6.18	22.05	5.59	21.26	5.28	20.48	5.03	18.90	4.66
	11.0	9.8	25.20	6.58	23.63	6.01	22.05	5.39	21.26	5.09	20.48	4.86	18.90	4.45
	13.0	11.8	25.20	6.28	23.63	5.85	22.05	5.22	21.26	4.91	20.48	4.62	18.90	4.23
15.0	13.7	25.20	6.01	23.63	5.71	22.05	5.07	21.26	4.75	20.48	4.47	18.90	3.95	
18.0	15.8	25.20	5.73	23.63	5.43	22.05	5.15	21.26	5.00	20.48	4.87	18.90	4.26	
20.0	17.6	25.20	5.49	23.63	5.22	22.05	4.94	21.26	4.81	20.48	4.67	18.90	4.19	
23.0	20.2	25.20	5.16	23.63	4.90	22.05	4.65	21.26	4.51	20.48	4.39	18.90	4.24	
26.0	22.0	25.20	4.93	23.63	4.68	22.05	4.43	21.26	4.31	20.48	4.24	18.90	4.10	
30.0	24.1	25.20	4.66	23.63	4.41	22.05	4.20	21.26	4.13	20.48	3.94	18.90	3.48	
60%	-29.8	-30.0	18.47	11.65	17.31	10.80	16.16	9.96	15.58	9.55	15.01	9.23	13.85	8.67
	-25.0	-25.4	19.44	11.30	18.23	10.49	17.01	9.69	16.40	9.30	15.79	8.99	14.58	8.43
	-19.8	-20.0	21.60	10.86	20.25	10.12	18.90	9.37	18.23	8.99	17.55	8.66	16.20	8.10
	-18.8	-19.0	21.60	10.67	20.25	9.93	18.90	9.20	18.23	8.82	17.55	8.54	16.20	7.98
	-16.7	-17.0	21.60	10.30	20.25	9.56	18.90	8.87	18.23	8.58	17.55	8.30	16.20	7.73
	-13.7	-15.0	21.60	9.96	20.25	9.24	18.90	8.65	18.23	8.36	17.55	8.07	16.20	7.49
	-11.8	-13.0	21.60	9.53	20.25	8.92	18.90	8.34	18.23	8.06	17.55	7.77	16.20	7.20
	-9.8	-11.0	21.60	9.17	20.25	8.60	18.90	8.03	18.23	7.74	17.55	7.46	16.20	6.90
	-9.5	-10.0	21.60	8.96	20.25	8.39	18.90	7.83	18.23	7.56	17.55	7.28	16.20	6.72
	-8.5	-9.1	21.60	8.81	20.25	8.26	18.90	7.69	18.23	7.42	17.55	7.14	16.20	6.64
	-7.0	-7.6	21.60	8.56	20.25	8.00	18.90	7.46	18.23	7.19	17.55	6.92	16.20	6.51
	-5.0	-5.6	21.60	8.21	20.25	7.68	18.90	7.14	18.23	6.92	17.55	6.72	16.20	6.32
	-3.0	-3.7	21.60	7.81	20.25	7.30	18.90	6.85	18.23	6.66	17.55	6.46	16.20	6.08
	0.0	-0.7	21.60	7.20	20.25	6.80	18.90	6.44	18.23	6.25	17.55	6.07	16.20	5.71
	3.0	2.2	21.60	6.75	20.25	6.39	18.90	6.05	18.23	5.88	17.55	5.72	16.20	5.39
	5.0	4.1	21.60	6.47	20.25	6.14	18.90	5.81	18.23	5.66	17.55	5.50	16.20	5.19
	7.0	6.0	21.60	6.10	20.25	5.58	18.90	5.09	18.23	4.93	17.55	4.78	16.20	4.47
	9.0	7.9	21.60	5.34	20.25	4.92	18.90	4.61	18.23	4.46	17.55	4.31	16.20	4.02
	11.0	9.8	21.60	5.16	20.25	4.70	18.90	4.41	18.23	4.26	17.55	4.12	16.20	3.84
	13.0	11.8	21.60	4.98	20.25	4.52	18.90	4.19	18.23	4.06	17.55	3.92	16.20	3.66
15.0	13.7	21.60	4.83	20.25	4.37	18.90	3.95	18.23	3.75	17.55	3.57	16.20	3.35	
18.0	15.8	21.60	5.01	20.25	4.78	18.90	4.22	18.23	3.93	17.55	3.69	16.20	3.32	
20.0	17.6	21.60	4.80	20.25	4.58	18.90	4.26	18.23	3.97	17.55	3.73	16.20	3.32	
23.0	20.2	21.60	4.51	20.25	4.31	18.90	4.20	18.23	4.14	17.55	3.96	16.20	3.44	
26.0	22.0	21.60	4.31	20.25	4.17	18.90	4.06	18.23	4.00	17.55	3.94	16.20	3.83	
30.0	24.1	21.60	4.10	20.25	3.87	18.90	3.43	18.23	3.22	17.55	3.03	16.20	2.71	

Abbreviations:  
 CR: Combination ratio  
 TC: Total capacity (kW)  
 PI: Power input (compressor + outdoor fan motor) (kW)  
 Notes:  
 Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.10:10HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-29.8	-30.0	15.39	9.33	14.43	8.86	13.47	8.41	12.99	8.15	12.50	7.89	11.54	7.34
	-25.0	-25.4	16.20	9.09	15.19	8.61	14.18	8.16	13.67	7.92	13.16	7.67	12.15	7.14
	-19.8	-20.0	18.00	8.77	16.88	8.29	15.75	7.84	15.19	7.61	14.63	7.39	13.50	6.93
	-18.8	-19.0	18.00	8.63	16.88	8.17	15.75	7.72	15.19	7.49	14.63	7.26	13.50	6.80
	-16.7	-17.0	18.00	8.39	16.88	7.93	15.75	7.47	15.19	7.24	14.63	7.01	13.50	6.54
	-13.7	-15.0	18.00	8.17	16.88	7.70	15.75	7.24	15.19	7.00	14.63	6.77	13.50	6.30
	-11.8	-13.0	18.00	7.87	16.88	7.41	15.75	6.94	15.19	6.71	14.63	6.49	13.50	6.15
	-9.8	-11.0	18.00	7.56	16.88	7.10	15.75	6.65	15.19	6.48	14.63	6.31	13.50	5.99
	-9.5	-10.0	18.00	7.37	16.88	6.93	15.75	6.53	15.19	6.36	14.63	6.20	13.50	5.88
	-8.5	-9.1	18.00	7.24	16.88	6.80	15.75	6.45	15.19	6.29	14.63	6.13	13.50	5.80
	-7.0	-7.6	18.00	7.02	16.88	6.64	15.75	6.32	15.19	6.15	14.63	6.00	13.50	5.67
	-5.0	-5.6	18.00	6.77	16.88	6.45	15.75	6.13	15.19	5.97	14.63	5.81	13.50	5.50
	-3.0	-3.7	18.00	6.51	16.88	6.20	15.75	5.90	15.19	5.74	14.63	5.59	13.50	5.29
	0.0	-0.7	18.00	6.12	16.88	5.82	15.75	5.54	15.19	5.40	14.63	5.26	13.50	4.97
	3.0	2.2	18.00	5.75	16.88	5.49	15.75	5.22	15.19	5.09	14.63	4.96	13.50	4.71
	5.0	4.1	18.00	5.53	16.88	5.28	15.75	5.03	15.19	4.91	14.63	4.66	13.50	4.00
	7.0	6.0	18.00	4.81	16.88	4.57	15.75	4.32	15.19	4.20	14.63	4.08	13.50	3.87
	9.0	7.9	18.00	4.34	16.88	4.11	15.75	3.87	15.19	3.76	14.63	3.64	13.50	3.48
	11.0	9.8	18.00	4.14	16.88	3.92	15.75	3.70	15.19	3.60	14.63	3.53	13.50	3.39
	13.0	11.8	18.00	3.95	16.88	3.73	15.75	3.55	15.19	3.49	14.63	3.42	13.50	3.30
15.0	13.7	18.00	3.60	16.88	3.40	15.75	3.26	15.19	3.20	14.63	3.14	13.50	3.03	
18.0	15.8	18.00	3.83	16.88	3.50	15.75	3.19	15.19	3.09	14.63	3.04	13.50	2.94	
20.0	17.6	18.00	3.89	16.88	3.54	15.75	3.17	15.19	3.04	14.63	2.91	13.50	2.73	
23.0	20.2	18.00	4.06	16.88	3.63	15.75	3.27	15.19	3.09	14.63	2.92	13.50	2.64	
26.0	22.0	18.00	3.92	16.88	3.83	15.75	3.74	15.19	3.69	14.63	3.65	13.50	3.55	
30.0	24.1	18.00	3.14	16.88	2.85	15.75	2.59	15.19	2.46	14.63	2.35	13.50	2.32	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table 2-8.11: 12HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	19.53	7.57	19.42	7.86	19.33	8.16	19.28	8.32	19.24	8.48	19.16	8.82
	-25.0	-25.4	20.55	7.93	20.45	8.22	20.35	8.53	20.30	8.69	20.25	8.85	20.17	9.19
	-19.8	-20.0	22.84	8.36	22.72	8.66	22.61	8.97	22.55	9.13	22.50	9.30	22.41	9.65
	-18.8	-19.0	24.99	8.55	24.84	8.85	24.71	9.17	24.64	9.33	24.58	9.50	24.46	9.85
	-16.7	-17.0	26.28	8.95	26.12	9.25	25.97	9.57	25.89	9.74	25.82	9.91	25.68	10.26
	-13.7	-15.0	27.62	9.41	27.44	9.72	27.27	10.04	27.19	10.21	27.11	10.38	26.95	10.75
	-11.8	-13.0	29.00	9.79	28.81	10.11	28.62	10.44	28.53	10.61	28.44	10.79	28.27	11.15
	-9.8	-11.0	30.42	10.19	30.22	10.51	30.01	10.85	29.91	11.02	29.81	11.20	29.62	11.58
	-9.5	-10.0	31.15	10.34	30.93	10.67	30.72	11.00	30.62	11.18	30.51	11.36	30.31	11.73
	-8.5	-9.1	31.81	10.53	31.59	10.86	31.37	11.20	31.26	11.38	31.15	11.56	30.94	11.94
	-7.0	-7.6	32.93	10.83	32.70	11.17	32.46	11.51	32.35	11.69	32.23	11.88	32.01	12.26
	-5.0	-5.6	34.44	11.24	34.20	11.58	33.95	11.94	33.83	12.12	33.71	12.31	33.46	12.70
	-3.0	-3.7	35.87	11.49	35.61	11.83	35.35	12.19	35.22	12.38	35.09	12.57	34.85	12.97
	0.0	-0.7	38.18	11.87	37.89	12.23	37.61	12.59	37.47	12.78	37.32	12.98	37.05	13.38
	3.0	2.2	40.19	12.07	39.87	12.42	39.56	12.79	39.40	12.98	39.25	13.17	38.94	13.58
	5.0	4.1	40.57	11.59	40.24	11.92	39.91	12.26	39.74	12.44	39.58	12.63	39.25	13.00
	7.0	6.0	41.79	11.62	41.44	11.96	41.10	12.30	40.93	12.48	40.75	12.66	40.40	13.04
	9.0	7.9	43.32	11.85	42.96	12.19	42.59	12.54	42.41	12.72	42.22	12.90	41.79	12.91
	11.0	9.8	44.86	12.08	44.47	12.42	44.08	12.78	43.88	12.96	43.69	13.15	41.79	12.13
	13.0	11.8	46.50	12.32	46.09	12.67	45.69	13.03	45.48	13.22	45.27	13.03	41.79	11.36
15.0	13.7	48.07	12.56	47.64	12.91	47.22	13.28	47.01	13.09	45.27	12.25	41.79	10.65	
18.0	15.8	49.81	12.83	49.37	13.19	48.75	13.04	47.01	12.22	45.27	11.42	41.79	9.91	
20.0	17.6	51.32	13.07	50.86	13.44	48.75	12.30	47.01	11.50	45.27	10.75	41.79	9.36	
23.0	20.2	53.51	13.42	52.23	12.82	48.75	11.26	47.01	10.52	45.27	9.83	41.79	8.65	
26.0	22.0	55.03	13.65	52.23	12.06	48.75	10.59	47.01	9.90	45.27	9.29	41.79	8.19	
30.0	24.1	56.76	13.93	52.23	11.23	48.75	9.84	47.01	9.26	45.27	8.72	41.79	7.65	
120%	-29.8	-30.0	19.42	7.65	19.32	7.94	19.23	8.25	19.18	8.41	19.14	8.57	19.07	8.92
	-25.0	-25.4	20.44	8.03	20.34	8.33	20.24	8.64	20.19	8.80	20.15	8.97	20.08	9.32
	-19.8	-20.0	22.71	8.51	22.60	8.81	22.49	9.13	22.44	9.30	22.39	9.47	22.31	9.83
	-18.8	-19.0	24.81	8.71	24.67	9.01	24.54	9.33	24.47	9.50	24.41	9.67	24.30	10.03
	-16.7	-17.0	26.10	9.11	25.94	9.42	25.79	9.75	25.72	9.92	25.65	10.09	25.52	10.46
	-13.7	-15.0	27.43	9.58	27.25	9.90	27.09	10.23	27.01	10.41	26.93	10.58	26.78	10.96
	-11.8	-13.0	28.80	9.98	28.61	10.30	28.43	10.64	28.34	10.82	28.26	11.00	28.09	11.38
	-9.8	-11.0	30.21	10.39	30.01	10.72	29.81	11.07	29.71	11.25	29.62	11.43	29.44	11.82
	-9.5	-10.0	30.94	10.55	30.72	10.88	30.52	11.23	30.41	11.41	30.31	11.60	30.12	11.98
	-8.5	-9.1	31.59	10.74	31.37	11.08	31.16	11.43	31.05	11.61	30.95	11.80	30.75	12.19
	-7.0	-7.6	32.66	11.06	32.43	11.40	32.21	11.76	32.11	11.94	32.00	12.13	31.79	12.53
	-5.0	-5.6	34.12	11.48	33.88	11.83	33.64	12.19	33.52	12.39	33.40	12.58	33.18	12.99
	-3.0	-3.7	35.53	11.74	35.27	12.09	35.01	12.46	34.89	12.65	34.77	12.85	34.52	13.26
	0.0	-0.7	37.81	12.15	37.51	12.51	37.25	12.88	37.11	13.08	36.97	13.28	36.69	13.70
	3.0	2.2	39.78	12.36	39.46	12.72	39.16	13.10	39.00	13.29	38.85	13.49	38.57	13.62
	5.0	4.1	40.15	11.86	39.81	12.20	39.49	12.56	39.32	12.74	39.16	12.93	38.57	12.82
	7.0	6.0	41.35	11.91	41.00	12.25	40.66	12.60	40.48	12.78	40.31	12.97	38.57	12.05
	9.0	7.9	42.85	12.14	42.48	12.49	42.12	12.85	41.94	13.04	41.79	12.93	38.57	11.32
	11.0	9.8	44.36	12.39	43.98	12.74	43.58	13.11	43.39	12.94	41.79	12.15	38.57	10.62
	13.0	11.8	45.96	12.65	45.56	13.01	45.00	12.89	43.39	12.12	41.79	11.37	38.57	9.93
15.0	13.7	47.50	12.91	47.08	13.27	45.00	12.12	43.39	11.37	41.79	10.65	38.57	9.34	
18.0	15.8	49.21	13.20	48.21	12.78	45.00	11.30	43.39	10.60	41.79	9.92	38.57	8.77	
20.0	17.6	51.43	13.53	48.21	12.04	45.00	10.63	43.39	9.96	41.79	9.35	38.57	8.31	
23.0	20.2	51.43	12.42	48.21	11.00	45.00	9.72	43.39	9.17	41.79	8.66	38.57	7.67	
26.0	22.0	51.43	11.69	48.21	10.35	45.00	9.19	43.39	8.69	41.79	8.18	38.57	7.24	
30.0	24.1	51.43	10.87	48.21	9.64	45.00	8.62	43.39	8.12	41.79	7.66	38.57	6.74	

Abbreviations:  
 CR: Combination ratio  
 TC: Total capacity (kW)  
 PI: Power input (compressor + outdoor fan motor) (kW)  
 Notes:  
 Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.11:12HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	19.29	7.79	19.19	8.09	19.11	8.41	19.07	8.58	19.03	8.75	18.96	9.10
	-25.0	-25.4	20.30	8.19	20.20	8.49	20.11	8.82	20.07	8.98	20.03	9.16	19.96	9.52
	-19.8	-20.0	22.56	8.68	22.45	9.00	22.35	9.33	22.30	9.50	22.26	9.67	22.18	10.05
	-18.8	-19.0	24.64	8.89	24.51	9.20	24.38	9.53	24.32	9.71	24.27	9.89	24.16	10.26
	-16.7	-17.0	25.92	9.31	25.77	9.63	25.63	9.96	25.56	10.14	25.49	10.32	25.37	10.70
	-13.7	-15.0	27.24	9.79	27.08	10.12	26.92	10.46	26.84	10.64	26.77	10.83	26.63	11.22
	-11.8	-13.0	28.61	10.21	28.43	10.54	28.25	10.89	28.17	11.08	28.08	11.26	27.92	11.66
	-9.8	-11.0	29.97	10.63	29.77	10.97	29.59	11.33	29.50	11.52	29.41	11.71	29.24	12.11
	-9.5	-10.0	30.66	10.80	30.46	11.14	30.26	11.50	30.17	11.69	30.07	11.88	29.90	12.28
	-8.5	-9.1	31.28	11.00	31.08	11.34	30.87	11.71	30.77	11.90	30.68	12.09	30.49	12.50
	-7.0	-7.6	32.34	11.32	32.12	11.68	31.91	12.05	31.80	12.24	31.70	12.44	31.50	12.85
	-5.0	-5.6	33.78	11.76	33.54	12.13	33.31	12.51	33.19	12.70	33.08	12.91	32.86	13.33
	-3.0	-3.7	35.17	12.04	34.91	12.40	34.67	12.79	34.54	12.99	34.43	13.19	34.19	13.62
	0.0	-0.7	37.41	12.47	37.13	12.85	36.86	13.24	36.72	13.44	36.58	13.65	35.36	13.04
	3.0	2.2	39.34	12.71	39.04	13.08	38.73	13.47	38.58	13.67	38.30	13.46	35.36	11.90
	5.0	4.1	39.69	12.19	39.36	12.54	39.03	12.91	38.87	13.10	38.30	12.67	35.36	11.18
	7.0	6.0	40.86	12.25	40.52	12.60	40.18	12.96	39.78	12.67	38.30	11.92	35.36	10.50
	9.0	7.9	42.32	12.50	41.97	12.86	41.25	12.63	39.78	11.90	38.30	11.19	35.36	9.84
	11.0	9.8	43.81	12.77	44.20	13.33	41.25	11.86	39.78	11.17	38.30	10.51	35.36	9.25
	13.0	11.8	45.38	13.05	44.20	12.48	41.25	11.10	39.78	10.44	38.30	9.80	35.36	8.73
15.0	13.7	47.14	13.12	44.20	11.71	41.25	10.41	39.78	9.79	38.30	9.23	35.36	8.26	
18.0	15.8	47.14	12.23	44.20	10.91	41.25	9.68	39.78	9.17	38.30	8.67	35.36	7.75	
20.0	17.6	47.14	11.51	44.20	10.27	41.25	9.17	39.78	8.69	38.30	8.22	35.36	7.33	
23.0	20.2	47.14	10.54	44.20	9.40	41.25	8.47	39.78	8.02	38.30	7.58	35.36	6.74	
26.0	22.0	47.14	9.90	44.20	8.90	41.25	8.01	39.78	7.57	38.30	7.16	35.36	6.36	
30.0	24.1	47.14	9.25	44.20	8.34	41.25	7.47	39.78	7.06	38.30	6.66	35.36	6.01	
100%	-29.8	-30.0	19.20	7.98	19.11	8.29	19.03	8.62	18.99	8.79	18.96	8.97	18.90	9.34
	-25.0	-25.4	20.21	8.39	20.12	8.71	20.03	9.04	19.99	9.22	19.96	9.40	19.89	9.78
	-19.8	-20.0	22.46	8.90	22.35	9.23	22.26	9.57	22.21	9.75	22.17	9.93	22.10	10.32
	-18.8	-19.0	24.49	9.12	24.36	9.44	24.24	9.79	24.19	9.97	24.14	10.15	24.04	10.54
	-16.7	-17.0	25.76	9.55	25.61	9.88	25.48	10.23	25.42	10.42	25.36	10.60	25.24	11.00
	-13.7	-15.0	27.03	10.05	26.88	10.39	26.73	10.75	26.66	10.94	26.60	11.13	26.47	11.54
	-11.8	-13.0	28.34	10.48	28.17	10.83	28.00	11.20	27.93	11.39	27.85	11.58	27.71	12.00
	-9.8	-11.0	29.67	10.93	29.48	11.28	29.31	11.66	29.22	11.85	29.14	12.05	28.97	12.47
	-9.5	-10.0	30.35	11.10	30.16	11.46	29.97	11.83	29.88	12.03	29.79	12.23	29.62	12.65
	-8.5	-9.1	30.97	11.31	30.77	11.67	30.57	12.05	30.48	12.25	30.38	12.45	30.21	12.88
	-7.0	-7.6	32.01	11.65	31.79	12.02	31.59	12.41	31.49	12.61	31.39	12.82	31.19	13.25
	-5.0	-5.6	33.42	12.12	33.19	12.50	32.96	12.89	32.86	13.10	32.74	13.31	32.14	13.17
	-3.0	-3.7	34.78	12.41	34.54	12.79	34.29	13.19	34.17	13.40	34.06	13.62	32.14	12.42
	0.0	-0.7	36.98	12.88	36.71	13.27	36.44	13.68	36.16	13.46	34.82	12.74	32.14	11.29
	3.0	2.2	38.87	13.13	38.56	13.52	37.50	13.00	36.16	12.29	34.82	11.60	32.14	10.27
	5.0	4.1	39.18	12.60	38.86	12.96	37.50	12.24	36.16	11.56	34.82	10.90	32.14	9.64
	7.0	6.0	40.33	12.66	40.18	12.83	37.50	11.50	36.16	10.86	34.82	10.24	32.14	9.08
	9.0	7.9	41.76	12.94	40.18	12.07	37.50	10.79	36.16	10.19	34.82	9.59	32.14	8.54
	11.0	9.8	42.86	12.61	40.18	11.33	37.50	10.12	36.16	9.55	34.82	9.05	32.14	8.13
	13.0	11.8	42.86	11.80	40.18	10.60	37.50	9.45	36.16	8.99	34.82	8.54	32.14	7.66
15.0	13.7	42.86	11.07	40.18	9.93	37.50	8.94	36.16	8.50	34.82	8.07	32.14	7.23	
18.0	15.8	42.86	10.31	40.18	9.26	37.50	8.39	36.16	7.97	34.82	7.57	32.14	6.78	
20.0	17.6	42.86	9.68	40.18	8.78	37.50	7.95	36.16	7.54	34.82	7.15	32.14	6.41	
23.0	20.2	42.86	8.94	40.18	8.11	37.50	7.32	36.16	6.95	34.82	6.57	32.14	5.99	
26.0	22.0	42.86	8.45	40.18	7.65	37.50	6.90	36.16	6.54	34.82	6.23	32.14	5.71	
30.0	24.1	42.86	7.90	40.18	7.15	37.50	6.42	36.16	6.14	34.82	5.89	32.14	5.40	

Abbreviations:  
 CR: Combination ratio  
 TC: Total capacity (kW)  
 PI: Power input (compressor + outdoor fan motor) (kW)  
 Notes:  
 Shaded cells indicate rating condition.

Table continued on next page ...



Table2-8.11:12HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
90%	-29.8	-30.0	18.78	2.20	18.69	2.29	18.61	2.40	18.58	2.45	18.55	2.50	18.49	2.62
	-25.0	-25.4	19.77	2.14	19.68	2.23	19.59	2.31	19.56	2.36	19.52	2.40	19.46	2.49
	-19.8	-20.0	21.97	9.18	21.87	9.52	21.77	9.88	21.73	10.07	21.69	10.27	21.62	10.68
	-18.8	-19.0	24.31	9.40	24.20	9.74	24.10	10.11	24.05	10.30	24.00	10.49	23.93	10.91
	-16.7	-17.0	25.52	9.85	25.39	10.20	25.27	10.57	25.22	10.76	25.17	10.96	25.07	11.39
	-13.7	-15.0	26.77	10.38	26.62	10.74	26.49	11.11	26.42	11.31	26.36	11.52	26.25	11.95
	-11.8	-13.0	28.05	10.83	27.89	11.20	27.74	11.58	27.66	11.78	27.59	11.99	27.46	12.43
	-9.8	-11.0	29.36	11.30	29.18	11.67	29.01	12.07	28.93	12.27	28.85	12.49	28.93	12.90
	-9.5	-10.0	30.03	11.48	29.84	11.86	29.66	12.26	29.58	12.46	29.49	12.68	28.93	12.56
	-8.5	-9.1	30.63	11.71	30.44	12.09	30.25	12.49	30.16	12.70	30.08	12.92	28.93	12.31
	-7.0	-7.6	31.65	12.07	31.44	12.46	31.25	12.87	31.15	13.08	31.34	13.28	28.93	11.89
	-5.0	-5.6	33.03	12.57	32.81	12.96	32.60	13.39	32.54	13.38	31.34	12.68	28.93	11.33
	-3.0	-3.7	34.37	12.88	34.13	13.29	33.75	13.30	32.54	12.62	31.34	11.95	28.93	10.67
	0.0	-0.7	36.51	13.39	36.16	13.42	33.75	12.11	32.54	11.48	31.34	10.86	28.93	9.66
	3.0	2.2	38.57	13.53	36.16	12.25	33.75	11.03	32.54	10.45	31.34	9.86	28.93	8.83
	5.0	4.1	38.57	12.72	36.16	11.51	33.75	10.36	32.54	9.81	31.34	9.26	28.93	8.36
	7.0	6.0	38.57	11.97	36.16	10.82	33.75	9.72	32.54	9.20	31.34	8.76	28.93	7.92
	9.0	7.9	38.57	11.24	36.16	10.15	33.75	9.14	32.54	8.65	31.34	8.17	28.93	7.23
	11.0	9.8	38.57	10.55	36.16	9.51	33.75	8.65	32.54	8.23	31.34	7.78	28.93	6.85
	13.0	11.8	38.57	9.85	36.16	8.95	33.75	8.15	32.54	7.76	31.34	7.33	28.93	6.48
15.0	13.7	38.57	9.24	36.16	8.45	33.75	7.70	32.54	7.33	31.34	6.97	28.93	6.19	
18.0	15.8	38.57	8.69	36.16	7.94	33.75	7.22	32.54	6.88	31.34	6.53	28.93	6.00	
20.0	17.6	38.57	8.22	36.16	7.51	33.75	6.82	32.54	6.49	31.34	6.22	28.93	5.73	
23.0	20.2	38.57	7.59	36.16	6.90	33.75	6.29	32.54	6.04	31.34	5.81	28.93	5.36	
26.0	22.0	38.57	7.15	36.16	6.50	33.75	5.99	32.54	5.76	31.34	5.53	28.93	5.10	
30.0	24.1	38.57	6.66	36.16	6.11	33.75	5.66	32.54	5.43	31.34	5.23	28.93	4.81	
80%	-29.8	-30.0	18.38	8.73	18.29	9.07	18.21	2.40	18.17	10.02	18.14	10.75	18.09	12.16
	-25.0	-25.4	19.34	9.13	19.25	9.48	19.17	9.85	19.13	10.34	19.10	10.92	19.04	11.99
	-19.8	-20.0	21.49	9.54	21.39	9.90	21.30	10.28	21.26	10.49	21.22	10.70	21.15	11.14
	-18.8	-19.0	24.09	9.77	23.98	10.13	23.89	10.52	23.85	10.73	23.82	10.94	23.76	11.38
	-16.7	-17.0	25.27	10.25	25.16	10.62	25.05	11.01	25.00	11.22	24.96	11.44	24.88	11.89
	-13.7	-15.0	26.49	10.80	26.36	11.19	26.24	11.59	26.18	11.81	26.13	12.03	25.71	12.02
	-11.8	-13.0	27.75	11.29	27.60	11.68	27.46	12.09	27.39	12.31	27.86	12.76	25.71	11.52
	-9.8	-11.0	29.03	11.79	28.86	12.19	28.71	12.61	28.93	12.86	27.86	12.23	25.71	11.01
	-9.5	-10.0	29.68	11.99	29.51	12.39	29.34	12.82	28.93	12.51	27.86	11.90	25.71	10.70
	-8.5	-9.1	30.27	12.23	30.09	12.64	30.00	12.89	28.93	12.27	27.86	11.66	25.71	10.48
	-7.0	-7.6	31.26	12.62	31.07	13.04	30.00	12.46	28.93	11.86	27.86	11.26	25.71	10.10
	-5.0	-5.6	32.60	13.16	32.14	13.08	30.00	11.88	28.93	11.28	27.86	10.72	25.71	9.59
	-3.0	-3.7	34.29	13.54	32.14	12.33	30.00	11.19	28.93	10.63	27.86	10.08	25.71	9.02
	0.0	-0.7	34.29	12.33	32.14	11.22	30.00	10.16	28.93	9.63	27.86	9.13	25.71	8.28
	3.0	2.2	34.29	11.24	32.14	10.21	30.00	9.22	28.93	8.80	27.86	8.40	25.71	7.63
	5.0	4.1	34.29	10.55	32.14	9.58	30.00	8.72	28.93	8.33	27.86	7.95	25.71	7.22
	7.0	6.0	34.29	9.90	32.14	9.01	30.00	8.26	28.93	7.89	27.86	7.46	25.71	6.57
	9.0	7.9	34.29	9.28	32.14	8.47	30.00	7.63	28.93	7.25	27.86	6.82	25.71	6.03
	11.0	9.8	34.29	8.77	32.14	8.06	30.00	7.25	28.93	6.89	27.86	6.44	25.71	5.72
	13.0	11.8	34.29	8.26	32.14	7.59	30.00	6.82	28.93	6.44	27.86	6.10	25.71	5.46
15.0	13.7	34.29	7.81	32.14	7.16	30.00	6.48	28.93	6.14	27.86	5.78	25.71	5.18	
18.0	15.8	34.29	7.33	32.14	6.71	30.00	6.19	28.93	5.97	27.86	5.75	25.71	5.25	
20.0	17.6	34.29	6.91	32.14	6.35	30.00	5.91	28.93	5.70	27.86	5.50	25.71	5.10	
23.0	20.2	34.29	6.34	32.14	5.92	30.00	5.52	28.93	5.32	27.86	5.13	25.71	4.77	
26.0	22.0	34.29	6.04	32.14	5.64	30.00	5.26	28.93	5.08	27.86	4.89	25.71	4.54	
30.0	24.1	34.29	5.70	32.14	5.32	30.00	4.96	28.93	4.79	27.86	4.61	25.71	4.12	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.11: 12HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	17.98	9.88	17.89	11.02	17.81	12.00	17.78	12.37	17.75	12.33	18.46	11.55
	-25.0	-25.4	18.92	10.16	18.83	11.09	18.75	11.86	18.72	12.13	18.68	12.04	19.44	11.24
	-19.8	-20.0	21.02	10.03	20.92	10.42	20.84	10.84	20.79	11.07	20.76	11.07	21.60	10.51
	-18.8	-19.0	23.86	10.28	23.77	10.68	23.70	11.10	23.67	11.32	23.65	11.56	22.50	10.91
	-16.7	-17.0	25.02	10.79	24.91	11.20	24.83	11.63	25.31	12.11	24.38	11.58	22.50	10.50
	-13.7	-15.0	26.20	11.39	26.09	11.81	26.25	12.28	25.31	11.73	24.38	11.19	22.50	10.14
	-11.8	-13.0	27.42	11.92	27.29	12.35	26.25	11.76	25.31	11.23	24.38	10.71	22.50	9.68
	-9.8	-11.0	28.67	12.47	28.13	12.31	26.25	11.26	25.31	10.74	24.38	10.22	22.50	9.22
	-9.5	-10.0	29.30	12.69	28.13	11.98	26.25	10.94	25.31	10.43	24.38	9.94	22.50	8.95
	-8.5	-9.1	30.00	12.79	28.13	11.75	26.25	10.71	25.31	10.22	24.38	9.72	22.50	8.76
	-7.0	-7.6	30.00	12.37	28.13	11.34	26.25	10.34	25.31	9.85	24.38	9.36	22.50	8.48
	-5.0	-5.6	30.00	11.79	28.13	10.79	26.25	9.82	25.31	9.35	24.38	8.90	22.50	8.12
	-3.0	-3.7	30.00	11.11	28.13	10.16	26.25	9.22	25.31	8.82	24.38	8.44	22.50	7.69
	0.0	-0.7	30.00	10.08	28.13	9.19	26.25	8.44	25.31	8.10	24.38	7.74	22.50	7.07
	3.0	2.2	30.00	9.14	28.13	8.44	26.25	7.78	25.31	7.45	24.38	7.13	22.50	6.51
	5.0	4.1	30.00	8.65	28.13	7.99	26.25	7.36	25.31	7.05	24.38	6.74	22.50	6.21
	7.0	6.0	30.00	8.18	28.13	7.49	26.25	6.75	25.31	6.40	24.38	6.07	22.50	5.57
	9.0	7.9	30.00	7.57	28.13	6.87	26.25	6.19	25.31	5.87	24.38	5.56	22.50	5.07
	11.0	9.8	30.00	7.19	28.13	6.51	26.25	5.84	25.31	5.58	24.38	5.33	22.50	4.89
	13.0	11.8	30.00	6.77	28.13	6.10	26.25	5.53	25.31	5.29	24.38	5.04	22.50	4.63
15.0	13.7	30.00	6.43	28.13	5.85	26.25	5.29	25.31	5.05	24.38	4.83	22.50	4.32	
18.0	15.8	30.00	6.13	28.13	5.76	26.25	5.40	25.31	5.14	24.38	4.81	22.50	4.29	
20.0	17.6	30.00	5.84	28.13	5.50	26.25	5.16	25.31	4.99	24.38	4.74	22.50	4.18	
23.0	20.2	30.00	5.46	28.13	5.14	26.25	4.82	25.31	4.66	24.38	4.52	22.50	4.13	
26.0	22.0	30.00	5.20	28.13	4.90	26.25	4.59	25.31	4.44	24.38	4.30	22.50	4.02	
30.0	24.1	30.00	4.91	28.13	4.61	26.25	4.24	25.31	4.01	24.38	3.80	22.50	3.36	
60%	-29.8	-30.0	17.58	11.75	17.50	12.25	17.43	11.60	17.39	11.26	17.36	10.75	16.49	9.75
	-25.0	-25.4	18.51	11.61	18.42	11.94	18.34	11.27	18.31	10.93	18.28	10.43	17.36	9.48
	-19.8	-20.0	20.57	10.75	20.47	11.19	20.38	10.69	20.34	10.58	20.31	10.12	19.29	9.22
	-18.8	-19.0	23.63	11.02	23.58	11.47	22.50	10.84	21.70	10.39	20.89	9.93	19.29	9.04
	-16.7	-17.0	24.76	11.59	24.11	11.33	22.50	10.43	21.70	9.98	20.89	9.53	19.29	8.67
	-13.7	-15.0	25.71	11.86	24.11	10.95	22.50	10.06	21.70	9.62	20.89	9.19	19.29	8.34
	-11.8	-13.0	25.71	11.36	24.11	10.47	22.50	9.61	21.70	9.18	20.89	8.76	19.29	8.01
	-9.8	-11.0	25.71	10.85	24.11	9.99	22.50	9.16	21.70	8.74	20.89	8.37	19.29	7.69
	-9.5	-10.0	25.71	10.55	24.11	9.71	22.50	8.89	21.70	8.50	20.89	8.17	19.29	7.50
	-8.5	-9.1	25.71	10.34	24.11	9.50	22.50	8.69	21.70	8.35	20.89	8.01	19.29	7.36
	-7.0	-7.6	25.71	9.96	24.11	9.14	22.50	8.42	21.70	8.09	20.89	7.76	19.29	7.12
	-5.0	-5.6	25.71	9.46	24.11	8.71	22.50	8.07	21.70	7.75	20.89	7.43	19.29	6.81
	-3.0	-3.7	25.71	8.90	24.11	8.26	22.50	7.64	21.70	7.34	20.89	7.04	19.29	6.45
	0.0	-0.7	25.71	8.17	24.11	7.58	22.50	7.02	21.70	6.73	20.89	6.46	19.29	6.00
	3.0	2.2	25.71	7.51	24.11	6.98	22.50	6.46	21.70	6.23	20.89	6.02	19.29	5.63
	5.0	4.1	25.71	7.11	24.11	6.61	22.50	6.16	21.70	5.96	20.89	5.77	19.29	5.39
	7.0	6.0	25.71	6.52	24.11	5.92	22.50	5.52	21.70	5.33	20.89	5.14	19.29	4.77
	9.0	7.9	25.71	5.96	24.11	5.47	22.50	5.07	21.70	4.85	20.89	4.66	19.29	4.27
	11.0	9.8	25.71	5.65	24.11	5.21	22.50	4.84	21.70	4.66	20.89	4.49	19.29	4.15
	13.0	11.8	25.71	5.35	24.11	4.93	22.50	4.58	21.70	4.42	20.89	4.26	19.29	3.94
15.0	13.7	25.71	5.12	24.11	4.67	22.50	4.31	21.70	4.10	20.89	3.94	19.29	3.63	
18.0	15.8	25.71	5.14	24.11	4.71	22.50	4.30	21.70	4.05	20.89	3.87	19.29	3.48	
20.0	17.6	25.71	5.00	24.11	4.65	22.50	4.14	21.70	3.95	20.89	3.72	19.29	3.38	
23.0	20.2	25.71	4.67	24.11	4.42	22.50	4.09	21.70	3.88	20.89	3.69	19.29	3.20	
26.0	22.0	25.71	4.45	24.11	4.21	22.50	3.98	21.70	3.86	20.89	3.75	19.29	3.60	
30.0	24.1	25.71	4.12	24.11	3.64	22.50	3.31	21.70	3.09	20.89	2.95	19.29	2.71	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.11:12HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-29.8	-30.0	18.32	10.96	17.18	10.14	16.03	9.35	15.46	8.96	14.89	8.61	13.74	7.96
	-25.0	-25.4	19.29	10.64	18.08	9.85	16.88	9.09	16.27	8.72	15.67	8.37	14.46	7.75
	-19.8	-20.0	21.43	10.31	20.09	9.57	18.75	8.85	18.08	8.49	17.41	8.13	16.07	7.50
	-18.8	-19.0	21.43	10.11	20.09	9.39	18.75	8.67	18.08	8.31	17.41	7.96	16.07	7.38
	-16.7	-17.0	21.43	9.72	20.09	9.01	18.75	8.30	18.08	7.96	17.41	7.69	16.07	7.14
	-13.7	-15.0	21.43	9.36	20.09	8.67	18.75	8.02	18.08	7.74	17.41	7.46	16.07	6.91
	-11.8	-13.0	21.43	8.94	20.09	8.26	18.75	7.71	18.08	7.43	17.41	7.17	16.07	6.62
	-9.8	-11.0	21.43	8.51	20.09	7.94	18.75	7.40	18.08	7.13	17.41	6.86	16.07	6.33
	-9.5	-10.0	21.43	8.29	20.09	7.75	18.75	7.21	18.08	6.95	17.41	6.68	16.07	6.16
	-8.5	-9.1	21.43	8.15	20.09	7.60	18.75	7.08	18.08	6.81	17.41	6.55	16.07	6.04
	-7.0	-7.6	21.43	7.89	20.09	7.36	18.75	6.84	18.08	6.59	17.41	6.34	16.07	5.89
	-5.0	-5.6	21.43	7.55	20.09	7.04	18.75	6.55	18.08	6.30	17.41	6.09	16.07	5.71
	-3.0	-3.7	21.43	7.15	20.09	6.67	18.75	6.21	18.08	6.02	17.41	5.84	16.07	5.48
	0.0	-0.7	21.43	6.56	20.09	6.16	18.75	5.81	18.08	5.64	17.41	5.47	16.07	5.14
	3.0	2.2	21.43	6.08	20.09	5.76	18.75	5.44	18.08	5.28	17.41	5.13	16.07	4.82
	5.0	4.1	21.43	5.82	20.09	5.51	18.75	5.12	18.08	4.88	17.41	4.66	16.07	4.21
	7.0	6.0	21.43	5.19	20.09	4.89	18.75	4.60	18.08	4.46	17.41	4.31	16.07	4.03
	9.0	7.9	21.43	4.77	20.09	4.44	18.75	4.13	18.08	3.96	17.41	3.82	16.07	3.51
	11.0	9.8	21.43	4.54	20.09	4.26	18.75	3.99	18.08	3.87	17.41	3.73	16.07	3.48
	13.0	11.8	21.43	4.30	20.09	4.04	18.75	3.79	18.08	3.66	17.41	3.55	16.07	3.30
15.0	13.7	21.43	3.99	20.09	3.72	18.75	3.49	18.08	3.36	17.41	3.25	16.07	3.02	
18.0	15.8	21.43	3.94	20.09	3.63	18.75	3.32	18.08	3.18	17.41	3.05	16.07	2.89	
20.0	17.6	21.43	3.79	20.09	3.49	18.75	3.17	18.08	3.03	17.41	2.89	16.07	2.71	
23.0	20.2	21.43	3.79	20.09	3.37	18.75	3.11	18.08	2.95	17.41	2.85	16.07	2.62	
26.0	22.0	21.43	3.76	20.09	3.62	18.75	3.51	18.08	3.46	17.41	3.41	16.07	3.02	
30.0	24.1	21.43	2.99	20.09	2.79	18.75	2.57	18.08	2.48	17.41	2.41	16.07	2.27	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table 2-8.12: 14HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	20.61	8.58	20.49	8.91	20.39	9.24	20.33	9.42	20.28	9.60	20.19	9.98
	-25.0	-25.4	21.69	8.91	21.57	9.23	21.46	9.57	21.40	9.75	21.35	9.93	21.25	10.32
	-19.8	-20.0	24.10	9.27	23.97	9.60	23.84	9.94	23.78	10.12	23.72	10.31	23.62	10.69
	-18.8	-19.0	25.86	9.48	25.71	9.81	25.56	10.16	25.48	10.34	25.41	10.52	25.28	10.91
	-16.7	-17.0	27.20	9.91	27.03	10.25	26.86	10.60	26.78	10.79	26.70	10.97	26.55	11.36
	-13.7	-15.0	28.58	10.41	28.39	10.76	28.21	11.12	28.12	11.30	28.04	11.49	27.87	11.89
	-11.8	-13.0	30.01	10.84	29.81	11.19	29.61	11.55	29.51	11.74	29.42	11.93	29.23	12.33
	-9.8	-11.0	31.49	11.27	31.27	11.62	31.05	12.00	30.94	12.19	30.84	12.38	30.63	12.79
	-9.5	-10.0	32.24	11.43	32.01	11.79	31.79	12.16	31.67	12.35	31.56	12.55	31.35	12.96
	-8.5	-9.1	32.93	11.63	32.69	11.99	32.46	12.37	32.34	12.56	32.23	12.76	32.01	13.18
	-7.0	-7.6	34.09	11.96	33.84	12.32	33.59	12.71	33.47	12.90	33.34	13.11	33.11	13.52
	-5.0	-5.6	35.66	12.39	35.40	12.77	35.14	13.16	35.01	13.36	34.88	13.57	34.61	14.00
	-3.0	-3.7	37.20	12.66	36.92	13.04	36.64	13.43	36.50	13.63	36.36	13.84	36.08	14.27
	0.0	-0.7	39.69	13.07	39.39	13.45	39.07	13.85	38.92	14.06	38.76	14.27	38.46	14.71
	3.0	2.2	41.86	13.27	41.53	13.66	41.21	14.06	41.04	14.27	40.88	14.48	40.55	14.92
	5.0	4.1	42.32	12.76	41.98	13.13	41.63	13.52	41.46	13.71	41.29	13.91	40.95	14.32
	7.0	6.0	43.61	12.80	43.25	13.17	42.89	13.55	42.71	13.75	42.53	13.95	42.18	14.36
	9.0	7.9	45.23	13.03	44.86	13.41	44.48	13.79	44.29	13.99	44.10	14.19	43.71	14.61
	11.0	9.8	46.85	13.27	46.45	13.65	46.05	14.04	45.85	14.24	45.65	14.45	45.25	14.87
	13.0	11.8	48.60	13.51	48.18	13.90	47.75	14.30	47.55	14.51	47.34	14.72	46.90	15.15
15.0	13.7	50.24	13.76	49.81	14.15	49.39	14.56	49.17	14.77	48.94	14.98	48.50	15.42	
18.0	15.8	52.10	14.03	51.66	14.43	51.20	14.85	50.95	15.06	50.72	15.28	50.14	15.19	
20.0	17.6	53.72	14.27	53.25	14.68	52.77	15.10	52.52	15.32	52.28	15.54	50.14	14.31	
23.0	20.2	56.04	14.64	55.53	15.06	55.02	15.49	54.22	15.60	54.32	15.28	50.14	13.11	
26.0	22.0	57.69	14.90	57.25	15.32	56.82	15.79	56.41	15.49	54.32	14.41	50.14	12.35	
30.0	24.1	59.78	15.22	59.13	15.62	58.74	16.11	56.41	14.45	54.32	13.42	50.14	11.48	
120%	-29.8	-30.0	20.44	8.70	20.33	9.03	20.23	9.38	20.18	9.56	20.13	9.74	20.04	10.13
	-25.0	-25.4	21.52	9.04	21.40	9.37	21.29	9.72	21.24	9.90	21.19	10.08	21.09	10.47
	-19.8	-20.0	23.91	9.41	23.78	9.74	23.65	10.09	23.60	10.28	23.54	10.46	23.44	10.86
	-18.8	-19.0	25.66	9.62	25.51	9.96	25.36	10.32	25.29	10.50	25.22	10.69	25.10	11.08
	-16.7	-17.0	26.99	10.07	26.82	10.41	26.66	10.77	26.58	10.95	26.50	11.14	26.36	11.54
	-13.7	-15.0	28.37	10.58	28.18	10.93	28.00	11.30	27.92	11.49	27.83	11.68	27.67	12.09
	-11.8	-13.0	29.79	11.01	29.59	11.37	29.39	11.74	29.30	11.93	29.20	12.13	29.02	12.54
	-9.8	-11.0	31.26	11.46	31.04	11.82	30.83	12.20	30.72	12.40	30.62	12.60	30.42	13.01
	-9.5	-10.0	32.01	11.63	31.78	11.99	31.56	12.37	31.45	12.57	31.34	12.77	31.13	13.19
	-8.5	-9.1	32.68	11.83	32.45	12.20	32.22	12.59	32.11	12.79	32.00	12.99	31.78	13.41
	-7.0	-7.6	33.84	12.17	33.60	12.55	33.35	12.94	33.23	13.14	33.11	13.34	32.88	13.77
	-5.0	-5.6	35.41	12.63	35.14	13.01	34.89	13.41	34.75	13.61	34.63	13.83	34.38	14.27
	-3.0	-3.7	36.94	12.90	36.66	13.29	36.38	13.69	36.25	13.90	36.11	14.11	35.84	14.55
	0.0	-0.7	39.36	13.33	39.06	13.72	38.76	14.13	38.62	14.35	38.47	14.56	38.19	15.01
	3.0	2.2	41.45	13.55	41.13	13.94	40.80	14.35	40.64	14.57	40.48	14.78	40.16	15.23
	5.0	4.1	41.91	13.03	41.55	13.40	41.21	13.79	41.04	13.99	40.87	14.20	40.52	14.62
	7.0	6.0	43.17	13.07	42.81	13.45	42.45	13.84	42.28	14.04	42.10	14.24	41.74	14.66
	9.0	7.9	44.77	13.32	44.39	13.70	44.01	14.09	43.82	14.30	43.63	14.50	43.25	14.93
	11.0	9.8	46.36	13.57	45.96	13.95	45.56	14.36	45.36	14.56	45.16	14.77	44.76	15.21
	13.0	11.8	48.08	13.83	47.66	14.23	47.24	14.64	47.03	14.85	46.82	15.06	46.29	15.00
15.0	13.7	49.71	14.09	49.28	14.49	48.84	14.91	48.62	15.12	48.40	15.34	46.29	14.09	
18.0	15.8	51.54	14.39	51.08	14.80	50.60	15.22	50.38	15.44	50.14	15.20	46.29	13.15	
20.0	17.6	53.11	14.65	52.62	15.06	52.15	15.49	52.07	15.35	50.14	14.33	46.29	12.38	
23.0	20.2	55.40	15.03	54.90	15.46	54.00	15.09	52.07	14.10	50.14	13.12	46.29	11.33	
26.0	22.0	57.10	15.31	56.68	15.77	54.00	14.22	52.07	13.28	50.14	12.36	46.29	10.66	
30.0	24.1	58.96	15.62	58.59	16.11	54.00	13.26	52.07	12.36	50.14	11.49	46.29	10.00	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.12: 14HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	19.89	8.66	19.97	9.00	19.87	9.35	20.03	9.73	19.78	9.72	19.90	10.31
	-25.0	-25.4	20.94	9.08	21.02	9.42	20.91	9.77	21.08	10.07	20.82	10.14	20.95	10.66
	-19.8	-20.0	23.26	9.57	23.35	9.92	23.24	10.28	23.43	10.46	23.13	10.66	23.28	11.06
	-18.8	-19.0	25.47	9.80	25.32	10.14	25.18	10.50	25.11	10.69	25.05	10.89	24.93	11.29
	-16.7	-17.0	26.79	10.25	26.63	10.60	26.47	10.97	26.39	11.16	26.32	11.36	26.18	11.76
	-13.7	-15.0	28.16	10.78	27.98	11.14	27.81	11.51	27.72	11.71	27.64	11.91	27.48	12.32
	-11.8	-13.0	29.57	11.23	29.38	11.59	29.19	11.97	29.10	12.17	29.00	12.37	28.83	12.80
	-9.8	-11.0	31.03	11.69	30.82	12.06	30.61	12.45	30.51	12.65	30.41	12.85	30.22	13.29
	-9.5	-10.0	31.78	11.86	31.56	12.24	31.34	12.63	31.23	12.83	31.13	13.04	30.92	13.47
	-8.5	-9.1	32.45	12.08	32.23	12.46	32.00	12.85	31.89	13.05	31.78	13.26	31.57	13.70
	-7.0	-7.6	33.60	12.43	33.35	12.81	33.12	13.21	33.01	13.42	32.89	13.63	32.66	14.08
	-5.0	-5.6	35.13	12.90	34.89	13.30	34.64	13.71	34.52	13.92	34.39	14.14	34.15	14.59
	-3.0	-3.7	36.60	13.19	36.33	13.58	36.06	14.00	35.93	14.21	35.80	14.43	35.55	14.89
	0.0	-0.7	38.96	13.64	38.67	14.04	38.37	14.46	38.23	14.68	38.09	14.91	37.81	15.37
	3.0	2.2	41.02	13.88	40.70	14.28	40.37	14.70	40.21	14.92	40.06	15.15	39.74	15.61
	5.0	4.1	41.45	13.34	41.10	13.73	40.76	14.13	40.59	14.33	40.42	14.54	40.09	14.98
	7.0	6.0	42.70	13.40	42.34	13.78	41.99	14.18	41.81	14.39	41.63	14.59	41.28	15.03
	9.0	7.9	44.26	13.66	43.89	14.05	43.52	14.45	43.33	14.66	43.14	14.88	42.43	14.68
	11.0	9.8	45.84	13.93	45.44	14.32	45.05	14.73	44.85	14.95	44.64	15.16	42.43	13.81
	13.0	11.8	47.51	14.21	47.10	14.62	46.68	15.04	46.47	15.25	45.96	14.81	42.43	12.91
15.0	13.7	49.10	14.49	48.66	14.91	48.23	15.33	47.73	14.89	45.96	13.93	42.43	12.11	
18.0	15.8	50.90	14.81	50.44	15.23	49.50	14.83	47.73	13.90	45.96	12.99	42.43	11.27	
20.0	17.6	52.42	15.09	53.04	15.85	49.50	13.98	47.73	13.07	45.96	12.22	42.43	10.61	
23.0	20.2	54.11	15.39	53.04	14.56	49.50	12.80	47.73	11.98	45.96	11.18	42.43	9.82	
26.0	22.0	55.77	15.69	53.04	13.71	49.50	12.02	47.73	11.24	45.96	10.54	42.43	9.29	
30.0	24.1	56.57	14.48	53.04	12.77	49.50	11.19	47.73	10.50	45.96	9.88	42.43	8.69	
100%	-29.8	-30.0	19.93	8.85	19.83	9.19	19.74	9.55	19.69	9.73	19.51	9.85	19.44	10.25
	-25.0	-25.4	20.98	9.27	20.87	9.61	20.77	9.98	20.73	10.17	20.54	10.31	20.46	10.72
	-19.8	-20.0	23.31	9.78	23.19	10.13	23.08	10.50	23.03	10.69	22.82	10.89	22.74	11.31
	-18.8	-19.0	25.29	10.01	25.15	10.36	25.01	10.74	24.95	10.93	24.89	11.13	24.78	11.55
	-16.7	-17.0	26.60	10.48	26.44	10.84	26.29	11.22	26.22	11.41	26.15	11.62	26.02	12.04
	-13.7	-15.0	27.96	11.03	27.79	11.39	27.62	11.78	27.54	11.98	27.46	12.19	27.32	12.62
	-11.8	-13.0	29.37	11.49	29.18	11.87	28.99	12.26	28.91	12.46	28.82	12.67	28.65	13.11
	-9.8	-11.0	30.81	11.97	30.61	12.35	30.41	12.75	30.31	12.96	30.22	13.18	30.03	13.62
	-9.5	-10.0	31.54	12.15	31.33	12.54	31.13	12.94	31.02	13.15	30.92	13.37	30.73	13.82
	-8.5	-9.1	32.19	12.38	31.97	12.77	31.76	13.17	31.66	13.39	31.56	13.61	31.36	14.06
	-7.0	-7.6	33.29	12.74	33.06	13.14	32.83	13.55	32.72	13.77	32.62	13.99	32.41	14.45
	-5.0	-5.6	34.77	13.23	34.53	13.64	34.29	14.06	34.17	14.28	34.05	14.51	33.82	14.99
	-3.0	-3.7	36.21	13.54	35.95	13.95	35.69	14.38	35.56	14.60	35.44	14.83	35.20	15.31
	0.0	-0.7	38.53	14.02	38.24	14.44	37.97	14.87	37.82	15.10	37.68	15.33	37.40	15.82
	3.0	2.2	40.55	14.28	40.24	14.70	39.92	15.13	39.76	15.36	39.61	15.59	38.57	15.09
	5.0	4.1	40.96	13.73	40.62	14.12	43.28	14.54	40.11	14.75	39.95	14.97	38.57	14.21
	7.0	6.0	42.19	13.79	41.84	14.19	45.00	14.60	41.30	14.81	41.79	15.21	38.57	13.36
	9.0	7.9	43.70	14.08	43.33	14.48	45.00	14.55	43.39	15.23	41.79	14.30	38.57	12.55
	11.0	9.8	45.24	14.37	44.86	14.78	45.00	14.38	43.39	14.31	41.79	13.43	38.57	11.77
	13.0	11.8	46.89	14.68	46.47	15.09	45.00	13.98	43.39	13.41	41.79	12.58	38.57	11.00
15.0	13.7	48.44	14.98	48.21	15.11	45.00	13.39	43.39	12.58	41.79	11.78	38.57	10.35	
18.0	15.8	50.19	15.33	48.21	14.10	45.00	12.48	43.39	11.70	41.79	10.97	38.57	9.71	
20.0	17.6	51.43	14.94	48.21	13.28	45.00	11.74	43.39	11.00	41.79	10.36	38.57	9.20	
23.0	20.2	51.43	13.68	48.21	12.15	45.00	10.72	43.39	10.14	41.79	9.57	38.57	8.49	
26.0	22.0	51.43	12.88	48.21	11.41	45.00	10.16	43.39	9.60	41.79	9.05	38.57	8.02	
30.0	24.1	51.43	11.99	48.21	10.63	45.00	9.51	43.39	8.98	41.79	8.45	38.57	7.47	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.12: 14HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	19.50	9.17	19.40	9.52	19.31	9.89	19.26	10.08	19.09	10.28	19.02	10.70
	-25.0	-25.4	20.52	9.59	20.42	9.94	20.32	10.32	20.28	10.52	20.09	10.72	20.02	11.15
	-19.8	-20.0	22.80	10.04	22.69	10.40	22.58	10.79	22.53	10.99	22.32	11.20	22.24	11.63
	-18.8	-19.0	25.12	10.28	24.99	10.64	24.86	11.03	24.80	11.23	24.75	11.44	24.65	11.88
	-16.7	-17.0	26.43	10.77	26.28	11.14	26.13	11.53	26.07	11.74	26.00	11.95	25.88	12.40
	-13.7	-15.0	27.78	11.34	27.61	11.72	27.45	12.12	27.38	12.33	27.30	12.55	27.17	13.00
	-11.8	-13.0	29.13	11.82	28.95	12.21	28.78	12.62	28.70	12.84	28.62	13.06	28.47	13.52
	-9.8	-11.0	30.51	12.32	30.32	12.72	30.13	13.14	30.04	13.35	29.95	13.58	29.78	14.05
	-9.5	-10.0	31.21	12.51	31.01	12.91	30.81	13.33	30.72	13.55	30.63	13.78	30.45	14.25
	-8.5	-9.1	31.85	12.75	31.64	13.15	31.44	13.58	31.34	13.80	31.24	14.03	31.06	14.51
	-7.0	-7.6	32.93	13.13	32.70	13.54	32.49	13.98	32.38	14.20	32.28	14.44	32.08	14.92
	-5.0	-5.6	34.39	13.65	34.15	14.07	33.91	14.52	33.80	14.75	33.69	14.99	33.47	15.49
	-3.0	-3.7	35.79	13.98	35.55	14.40	35.29	14.85	35.17	15.09	35.04	15.33	34.71	15.43
	0.0	-0.7	38.08	14.49	37.79	14.93	37.51	15.39	37.38	15.63	37.61	15.86	34.71	14.07
	3.0	2.2	40.04	14.78	39.73	15.22	39.42	15.68	39.05	15.36	37.61	14.48	34.71	12.81
	5.0	4.1	40.42	14.21	40.09	14.62	40.50	15.31	39.05	14.47	37.61	13.62	34.71	12.04
	7.0	6.0	41.61	14.29	41.26	14.70	40.50	14.41	39.05	13.60	37.61	12.80	34.71	11.29
	9.0	7.9	43.10	14.60	43.39	15.17	40.50	13.55	39.05	12.77	37.61	12.03	34.71	10.59
	11.0	9.8	44.59	14.92	43.39	14.25	40.50	12.73	39.05	11.98	37.61	11.27	34.71	10.00
	13.0	11.8	46.29	14.89	43.39	13.36	40.50	11.90	39.05	11.19	37.61	10.53	34.71	9.43
15.0	13.7	46.29	14.00	43.39	12.53	40.50	11.15	39.05	10.50	37.61	9.95	34.71	8.91	
18.0	15.8	46.29	13.04	43.39	11.66	40.50	10.39	39.05	9.86	37.61	9.35	34.71	8.36	
20.0	17.6	46.29	12.27	43.39	10.96	40.50	9.85	39.05	9.34	37.61	8.86	34.71	7.91	
23.0	20.2	46.29	11.21	43.39	10.08	40.50	9.09	39.05	8.62	37.61	8.16	34.71	7.25	
26.0	22.0	46.29	10.56	43.39	9.54	40.50	8.60	39.05	8.14	37.61	7.69	34.71	6.90	
30.0	24.1	46.29	9.90	43.39	8.93	40.50	8.01	39.05	7.57	37.61	7.15	34.71	6.51	
80%	-29.8	-30.0	19.07	9.34	18.98	9.70	18.89	10.09	18.85	10.29	18.67	10.51	18.60	10.95
	-25.0	-25.4	20.08	9.81	19.98	10.18	19.88	10.58	19.84	10.78	19.65	11.00	19.58	11.45
	-19.8	-20.0	22.31	10.37	22.19	10.76	22.09	11.16	22.04	11.38	21.84	11.60	21.76	12.06
	-18.8	-19.0	24.97	10.63	24.85	11.01	24.73	11.42	24.68	11.63	24.63	11.86	24.55	12.32
	-16.7	-17.0	26.21	11.14	26.08	11.53	25.95	11.94	25.89	12.16	25.84	12.39	25.74	12.86
	-13.7	-15.0	27.50	11.73	27.35	12.13	27.21	12.56	27.14	12.78	27.07	13.01	26.95	13.50
	-11.8	-13.0	28.82	12.24	28.65	12.65	28.49	13.08	28.42	13.31	28.34	13.55	28.21	14.04
	-9.8	-11.0	30.17	12.77	29.99	13.19	29.81	13.63	29.73	13.86	29.65	14.10	29.49	14.61
	-9.5	-10.0	30.86	12.97	30.67	13.40	30.48	13.84	30.39	14.08	30.31	14.32	30.14	14.82
	-8.5	-9.1	31.48	13.22	31.28	13.65	31.09	14.10	31.00	14.34	30.91	14.58	30.86	14.94
	-7.0	-7.6	32.54	13.63	32.32	14.07	32.12	14.53	32.02	14.77	31.92	15.02	30.86	14.44
	-5.0	-5.6	33.97	14.19	33.73	14.64	33.51	15.11	33.40	15.36	33.43	15.43	30.86	13.77
	-3.0	-3.7	35.34	14.55	35.09	15.00	34.86	15.48	34.71	15.37	33.43	14.56	30.86	12.98
	0.0	-0.7	37.56	15.11	37.28	15.58	36.00	14.79	34.71	14.01	33.43	13.25	30.86	11.78
	3.0	2.2	39.46	15.44	38.57	15.00	36.00	13.50	34.71	12.77	33.43	12.06	30.86	10.70
	5.0	4.1	39.81	14.83	38.57	14.11	36.00	12.69	34.71	11.99	33.43	11.33	30.86	10.07
	7.0	6.0	41.14	14.69	38.57	13.26	36.00	11.91	34.71	11.25	33.43	10.61	30.86	9.54
	9.0	7.9	41.14	13.82	38.57	12.45	36.00	11.16	34.71	10.54	33.43	9.98	30.86	8.77
	11.0	9.8	41.14	12.97	38.57	11.68	36.00	10.45	34.71	9.97	33.43	9.40	30.86	8.33
	13.0	11.8	41.14	12.13	38.57	10.92	36.00	9.86	34.71	9.39	33.43	8.93	30.86	7.84
15.0	13.7	41.14	11.36	38.57	10.25	36.00	9.32	34.71	8.88	33.43	8.44	30.86	7.44	
18.0	15.8	41.14	10.56	38.57	9.64	36.00	8.75	34.71	8.33	33.43	7.90	30.86	7.12	
20.0	17.6	41.14	10.01	38.57	9.12	36.00	8.28	34.71	7.86	33.43	7.47	30.86	6.79	
23.0	20.2	41.14	9.25	38.57	8.40	36.00	7.61	34.71	7.21	33.43	6.90	30.86	6.35	
26.0	22.0	41.14	8.74	38.57	7.93	36.00	7.15	34.71	6.85	33.43	6.58	30.86	6.05	
30.0	24.1	41.14	8.15	38.57	7.38	36.00	6.74	34.71	6.47	33.43	6.21	30.86	5.71	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.12: 14HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	18.66	9.91	18.56	10.54	18.48	11.76	18.44	12.47	18.27	13.14	18.20	14.22
	-25.0	-25.4	19.64	10.37	19.54	10.96	19.45	12.01	19.41	12.61	19.23	13.16	19.16	14.00
	-19.8	-20.0	21.82	10.82	21.71	11.23	21.61	11.67	21.56	11.90	21.36	12.14	21.28	12.64
	-18.8	-19.0	24.72	11.09	24.61	11.50	24.52	11.94	24.48	12.17	24.44	12.41	24.37	12.91
	-16.7	-17.0	25.94	11.63	25.82	12.05	25.71	12.50	25.66	12.73	25.61	12.98	25.53	13.49
	-13.7	-15.0	27.20	12.26	27.06	12.69	26.93	13.15	26.87	13.39	26.82	13.64	27.00	14.21
	-11.8	-13.0	28.49	12.81	28.33	13.25	28.19	13.72	28.12	13.97	28.06	14.22	27.00	13.63
	-9.8	-11.0	29.80	13.38	29.63	13.83	29.47	14.31	29.40	14.56	29.25	14.49	27.00	13.04
	-9.5	-10.0	30.47	13.60	30.29	14.06	30.12	14.54	30.38	14.84	29.25	14.10	27.00	12.68
	-8.5	-9.1	31.08	13.88	30.89	14.34	30.71	14.83	30.38	14.55	29.25	13.83	27.00	12.42
	-7.0	-7.6	32.10	14.32	31.91	14.79	31.50	14.78	30.38	14.05	29.25	13.36	27.00	11.98
	-5.0	-5.6	33.49	14.93	33.75	15.54	31.50	14.11	30.38	13.41	29.25	12.72	27.00	11.39
	-3.0	-3.7	34.83	15.32	33.75	14.67	31.50	13.31	30.38	12.63	29.25	11.98	27.00	10.71
	0.0	-0.7	36.00	14.68	33.75	13.35	31.50	12.08	30.38	11.46	29.25	10.85	27.00	9.75
	3.0	2.2	36.00	13.39	33.75	12.15	31.50	10.97	30.38	10.40	29.25	9.89	27.00	8.97
	5.0	4.1	36.00	12.59	33.75	11.41	31.50	10.29	30.38	9.82	29.25	9.37	27.00	8.50
	7.0	6.0	36.00	11.82	33.75	10.70	31.50	9.74	30.38	9.29	29.25	8.80	27.00	7.75
	9.0	7.9	36.00	11.08	33.75	10.00	31.50	9.01	30.38	8.51	29.25	8.04	27.00	7.14
	11.0	9.8	36.00	10.37	33.75	9.52	31.50	8.58	30.38	8.06	29.25	7.62	27.00	6.73
	13.0	11.8	36.00	9.78	33.75	8.98	31.50	8.06	30.38	7.61	29.25	7.15	27.00	6.33
15.0	13.7	36.00	9.24	33.75	8.48	31.50	7.67	30.38	7.24	29.25	6.75	27.00	6.05	
18.0	15.8	36.00	8.67	33.75	7.95	31.50	7.25	30.38	6.95	29.25	6.69	27.00	6.11	
20.0	17.6	36.00	8.20	33.75	7.50	31.50	6.89	30.38	6.64	29.25	6.40	27.00	5.92	
23.0	20.2	36.00	7.53	33.75	6.92	31.50	6.43	30.38	6.20	29.25	5.98	27.00	5.53	
26.0	22.0	36.00	7.08	33.75	6.58	31.50	6.13	30.38	5.90	29.25	5.69	27.00	5.28	
30.0	24.1	36.00	6.67	33.75	6.21	31.50	5.78	30.38	5.57	29.25	5.37	27.00	4.79	
60%	-29.8	-30.0	18.25	10.39	18.16	11.69	18.07	13.16	18.04	13.70	17.87	13.91	17.80	13.22
	-25.0	-25.4	19.21	10.91	19.12	11.98	19.03	13.13	18.98	13.52	18.81	13.63	18.74	12.87
	-19.8	-20.0	21.35	11.46	21.24	11.91	21.14	12.40	21.09	12.65	20.90	12.62	20.82	11.98
	-18.8	-19.0	24.46	11.75	24.38	12.20	24.31	12.69	24.28	12.95	24.25	13.21	23.14	12.54
	-16.7	-17.0	25.65	12.34	25.55	12.80	25.46	13.30	25.42	13.56	25.07	13.30	23.14	12.06
	-13.7	-15.0	26.87	13.03	26.75	13.50	27.00	14.12	26.04	13.49	25.07	12.87	23.14	11.65
	-11.8	-13.0	28.12	13.63	27.99	14.12	27.00	13.54	26.04	12.92	25.07	12.31	23.14	11.13
	-9.8	-11.0	29.40	14.26	28.93	14.16	27.00	12.95	26.04	12.36	25.07	11.76	23.14	10.61
	-9.5	-10.0	30.04	14.51	28.93	13.78	27.00	12.60	26.04	12.01	25.07	11.43	23.14	10.31
	-8.5	-9.1	30.86	14.73	28.93	13.51	27.00	12.34	26.04	11.76	25.07	11.19	23.14	10.08
	-7.0	-7.6	30.86	14.24	28.93	13.06	27.00	11.90	26.04	11.34	25.07	10.78	23.14	9.72
	-5.0	-5.6	30.86	13.58	28.93	12.42	27.00	11.32	26.04	10.76	25.07	10.23	23.14	9.30
	-3.0	-3.7	30.86	12.80	28.93	11.70	27.00	10.63	26.04	10.11	25.07	9.66	23.14	8.82
	0.0	-0.7	30.86	11.61	28.93	10.59	27.00	9.68	26.04	9.28	25.07	8.88	23.14	8.09
	3.0	2.2	30.86	10.53	28.93	9.68	27.00	8.90	26.04	8.54	25.07	8.16	23.14	7.45
	5.0	4.1	30.86	9.93	28.93	9.17	27.00	8.44	26.04	8.08	25.07	7.73	23.14	7.08
	7.0	6.0	30.86	9.39	28.93	8.60	27.00	7.68	26.04	7.29	25.07	6.95	23.14	6.35
	9.0	7.9	30.86	8.63	28.93	7.86	27.00	7.08	26.04	6.72	25.07	6.35	23.14	5.74
	11.0	9.8	30.86	8.19	28.93	7.42	27.00	6.66	26.04	6.33	25.07	6.07	23.14	5.53
	13.0	11.8	30.86	7.70	28.93	6.97	27.00	6.27	26.04	5.99	25.07	5.75	23.14	5.28
15.0	13.7	30.86	7.30	28.93	6.59	27.00	5.99	26.04	5.72	25.07	5.47	23.14	4.89	
18.0	15.8	30.86	6.99	28.93	6.55	27.00	6.04	26.04	5.75	25.07	5.47	23.14	4.82	
20.0	17.6	30.86	6.66	28.93	6.26	27.00	5.86	26.04	5.58	25.07	5.30	23.14	4.70	
23.0	20.2	30.86	6.22	28.93	5.84	27.00	5.48	26.04	5.31	25.07	5.13	23.14	4.60	
26.0	22.0	30.86	5.93	28.93	5.56	27.00	5.23	26.04	5.05	25.07	4.88	23.14	4.56	
30.0	24.1	30.86	5.59	28.93	5.24	27.00	4.74	26.04	4.49	25.07	4.24	23.14	3.76	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.12:14HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-29.8	-30.0	17.86	14.09	17.77	13.87	17.68	13.02	17.64	12.45	17.48	11.90	16.49	10.81
	-25.0	-25.4	18.80	13.78	18.70	13.49	18.61	12.64	18.57	12.09	18.40	11.56	17.36	10.51
	-19.8	-20.0	20.88	12.47	20.78	12.57	20.68	12.23	20.64	11.74	20.44	11.24	19.29	10.24
	-18.8	-19.0	24.22	12.79	24.11	13.03	22.50	12.02	21.70	11.51	20.89	11.02	19.29	10.03
	-16.7	-17.0	25.71	13.56	24.11	12.55	22.50	11.56	21.70	11.07	20.89	10.58	19.29	9.62
	-13.7	-15.0	25.71	13.13	24.11	12.13	22.50	11.15	21.70	10.66	20.89	10.19	19.29	9.25
	-11.8	-13.0	25.71	12.57	24.11	11.60	22.50	10.65	21.70	10.18	20.89	9.71	19.29	8.89
	-9.8	-11.0	25.71	12.02	24.11	11.07	22.50	10.14	21.70	9.68	20.89	9.28	19.29	8.53
	-9.5	-10.0	25.71	11.68	24.11	10.76	22.50	9.84	21.70	9.42	20.89	9.05	19.29	8.32
	-8.5	-9.1	25.71	11.43	24.11	10.52	22.50	9.63	21.70	9.26	20.89	8.89	19.29	8.16
	-7.0	-7.6	25.71	11.02	24.11	10.12	22.50	9.32	21.70	8.97	20.89	8.60	19.29	7.89
	-5.0	-5.6	25.71	10.46	24.11	9.64	22.50	8.93	21.70	8.58	20.89	8.22	19.29	7.55
	-3.0	-3.7	25.71	9.84	24.11	9.14	22.50	8.46	21.70	8.12	20.89	7.79	19.29	7.15
	0.0	-0.7	25.71	9.02	24.11	8.39	22.50	7.76	21.70	7.46	20.89	7.15	19.29	6.66
	3.0	2.2	25.71	8.31	24.11	7.72	22.50	7.14	21.70	6.90	20.89	6.68	19.29	6.24
	5.0	4.1	25.71	7.86	24.11	7.30	22.50	6.82	21.70	6.61	20.89	6.40	19.29	5.78
	7.0	6.0	25.71	7.08	24.11	6.54	22.50	6.10	21.70	5.89	20.89	5.69	19.29	5.29
	9.0	7.9	25.71	6.49	24.11	5.97	22.50	5.52	21.70	5.29	20.89	5.08	19.29	4.66
	11.0	9.8	25.71	6.15	24.11	5.73	22.50	5.34	21.70	5.15	20.89	4.92	19.29	4.51
	13.0	11.8	25.71	5.82	24.11	5.43	22.50	5.06	21.70	4.88	20.89	4.70	19.29	4.36
15.0	13.7	25.71	5.55	24.11	5.09	22.50	4.69	21.70	4.51	20.89	4.35	19.29	4.01	
18.0	15.8	25.71	5.60	24.11	5.05	22.50	4.58	21.70	4.37	20.89	4.18	19.29	3.77	
20.0	17.6	25.71	5.44	24.11	4.96	22.50	4.45	21.70	4.25	20.89	4.00	19.29	3.61	
23.0	20.2	25.71	5.17	24.11	4.89	22.50	4.33	21.70	4.12	20.89	3.85	19.29	3.42	
26.0	22.0	25.71	4.92	24.11	4.65	22.50	4.40	21.70	4.27	20.89	4.14	19.29	3.99	
30.0	24.1	25.71	4.35	24.11	3.90	22.50	3.54	21.70	3.33	20.89	3.14	19.29	2.89	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.



Table2-8.13:16HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	24.41	9.04	24.27	9.40	24.15	9.77	24.09	9.97	24.03	10.17	23.92	10.59
	-25.0	-25.4	25.69	9.45	25.55	9.82	25.42	10.20	25.35	10.39	25.29	10.60	25.17	11.02
	-19.8	-20.0	28.55	9.85	28.39	10.22	28.24	10.61	28.17	10.81	28.10	11.02	27.97	11.45
	-18.8	-19.0	30.97	10.09	30.79	10.47	30.61	10.86	30.52	11.06	30.44	11.27	30.28	11.71
	-16.7	-17.0	32.64	10.60	32.43	10.98	32.23	11.38	32.14	11.58	32.04	11.79	31.86	12.23
	-13.7	-15.0	34.36	11.18	34.14	11.57	33.92	11.98	33.81	12.19	33.71	12.40	33.50	12.85
	-11.8	-13.0	36.15	11.67	35.91	12.07	35.67	12.48	35.55	12.70	35.43	12.92	35.21	13.38
	-9.8	-11.0	38.00	12.17	37.73	12.58	37.47	13.00	37.34	13.22	37.22	13.45	36.97	13.91
	-9.5	-10.0	38.94	12.36	38.67	12.77	38.40	13.20	38.26	13.42	38.13	13.65	37.87	14.11
	-8.5	-9.1	39.81	12.60	39.52	13.02	39.24	13.45	39.10	13.67	38.96	13.90	38.69	14.37
	-7.0	-7.6	41.27	12.98	40.97	13.41	40.67	13.85	40.52	14.07	40.37	14.30	40.09	14.79
	-5.0	-5.6	43.26	13.50	42.94	13.94	42.62	14.39	42.46	14.62	42.30	14.86	41.99	15.35
	-3.0	-3.7	45.14	13.81	44.81	14.25	44.48	14.71	44.31	14.94	44.15	15.18	43.83	15.68
	0.0	-0.7	48.17	14.29	47.81	14.74	47.44	15.21	47.26	15.45	47.08	15.70	46.72	16.20
	3.0	2.2	50.80	14.52	50.38	14.97	49.99	15.44	49.79	15.68	49.59	15.93	49.19	16.44
	5.0	4.1	51.17	13.82	50.76	14.25	50.34	14.69	50.13	14.92	49.91	15.15	49.49	15.62
	7.0	6.0	52.75	13.84	52.30	14.27	51.86	14.71	51.64	14.94	51.42	15.17	50.97	15.64
	9.0	7.9	54.75	14.12	54.29	14.56	53.84	15.00	53.60	15.24	53.36	15.47	52.90	15.95
	11.0	9.8	56.78	14.40	56.30	14.85	55.82	15.30	55.57	15.54	55.33	15.78	55.71	16.45
	13.0	11.8	58.96	14.71	58.46	15.16	57.94	15.63	57.68	15.87	57.42	16.11	55.71	15.37
15.0	13.7	61.05	15.01	60.51	15.47	59.97	15.94	59.70	16.19	60.36	16.61	55.71	14.38	
18.0	15.8	63.37	15.35	62.81	15.82	62.24	16.31	62.68	16.54	60.36	15.46	55.71	13.37	
20.0	17.6	65.38	15.65	64.79	16.13	65.00	16.65	62.68	15.56	60.36	14.51	55.71	12.53	
23.0	20.2	68.29	16.10	67.66	16.60	65.00	15.23	62.68	14.20	60.36	13.23	55.71	11.48	
26.0	22.0	70.33	16.43	69.64	16.33	65.00	14.28	62.68	13.31	60.36	12.40	55.71	10.84	
30.0	24.1	72.72	16.83	69.64	15.17	65.00	13.26	62.68	12.34	60.36	11.57	55.71	10.08	
120%	-29.8	-30.0	24.10	9.11	23.97	9.48	23.85	9.86	23.79	10.06	23.73	10.26	23.63	10.69
	-25.0	-25.4	25.37	9.55	25.23	9.93	25.10	10.31	25.04	10.52	24.98	10.73	24.88	11.16
	-19.8	-20.0	28.19	10.02	28.03	10.40	27.89	10.80	27.82	11.01	27.76	11.22	27.64	11.67
	-18.8	-19.0	30.72	10.28	30.54	10.66	30.37	11.06	30.29	11.27	30.21	11.48	30.05	11.93
	-16.7	-17.0	32.38	10.79	32.18	11.18	31.98	11.59	31.89	11.80	31.80	12.02	31.63	12.47
	-13.7	-15.0	34.09	11.39	33.87	11.79	33.66	12.21	33.56	12.42	33.46	12.65	33.26	13.11
	-11.8	-13.0	35.87	11.90	35.63	12.31	35.40	12.73	35.28	12.95	35.17	13.18	34.95	13.65
	-9.8	-11.0	37.71	12.42	37.45	12.84	37.19	13.27	37.07	13.50	36.94	13.73	36.70	14.21
	-9.5	-10.0	38.65	12.62	38.38	13.04	38.11	13.48	37.98	13.70	37.85	13.93	37.60	14.42
	-8.5	-9.1	39.51	12.87	39.22	13.29	38.95	13.73	38.81	13.96	38.68	14.20	38.41	14.68
	-7.0	-7.6	40.93	13.26	40.64	13.70	40.36	14.15	40.22	14.38	40.08	14.62	39.80	15.12
	-5.0	-5.6	42.84	13.80	42.53	14.24	42.22	14.71	42.07	14.94	41.92	15.19	41.63	15.70
	-3.0	-3.7	44.69	14.12	44.36	14.57	44.03	15.04	43.87	15.28	43.71	15.53	43.39	16.05
	0.0	-0.7	47.67	14.64	47.31	15.10	46.95	15.57	46.77	15.82	46.59	16.07	46.24	16.60
	3.0	2.2	50.24	14.88	49.85	15.35	49.46	15.83	49.26	16.07	49.06	16.33	48.67	16.85
	5.0	4.1	50.62	14.17	50.20	14.60	49.78	15.06	49.57	15.29	49.36	15.52	48.94	16.02
	7.0	6.0	52.16	14.20	51.72	14.64	51.29	15.09	51.06	15.32	50.84	15.56	51.43	16.37
	9.0	7.9	54.13	14.50	53.68	14.94	53.21	15.40	52.98	15.64	52.74	15.88	51.43	15.38
	11.0	9.8	56.14	14.81	55.65	15.26	55.17	15.73	54.91	15.97	55.71	16.50	51.43	14.38
	13.0	11.8	58.27	15.13	57.76	15.60	57.24	16.07	57.86	16.48	55.71	15.41	51.43	13.42
15.0	13.7	60.31	15.46	59.77	15.93	60.00	16.47	57.86	15.44	55.71	14.44	51.43	12.53	
18.0	15.8	62.58	15.83	62.02	16.31	60.00	15.32	57.86	14.35	55.71	13.40	51.43	11.67	
20.0	17.6	64.55	16.15	64.29	16.34	60.00	14.37	57.86	13.45	55.71	12.56	51.43	11.02	
23.0	20.2	68.57	16.86	64.29	14.93	60.00	13.10	57.86	12.26	55.71	11.51	51.43	10.13	
26.0	22.0	68.57	15.86	64.29	14.01	60.00	12.27	57.86	11.56	55.71	10.86	51.43	9.52	
30.0	24.1	68.57	14.72	64.29	12.99	60.00	11.47	57.86	10.79	55.71	10.11	51.43	8.82	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.13: 16HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	23.94	9.29	23.81	9.67	23.69	10.06	23.64	10.26	23.58	10.47	23.48	10.91
	-25.0	-25.4	25.20	9.75	25.06	10.13	24.94	10.53	24.88	10.74	24.82	10.95	24.72	11.40
	-19.8	-20.0	28.00	10.24	27.85	10.63	27.71	11.04	27.64	11.25	27.58	11.47	27.47	11.93
	-18.8	-19.0	30.49	10.50	30.31	10.89	30.14	11.30	30.07	11.52	29.99	11.74	29.85	12.20
	-16.7	-17.0	32.13	11.03	31.94	11.43	31.75	11.85	31.66	12.07	31.57	12.29	31.41	12.76
	-13.7	-15.0	33.84	11.65	33.62	12.06	33.42	12.49	33.32	12.71	33.22	12.94	33.03	13.42
	-11.8	-13.0	35.60	12.18	35.37	12.60	35.14	13.03	35.03	13.26	34.92	13.49	34.71	13.98
	-9.8	-11.0	37.40	12.72	37.15	13.15	36.91	13.60	36.80	13.83	36.68	14.07	36.45	14.57
	-9.5	-10.0	38.30	12.93	38.04	13.36	37.79	13.81	37.67	14.04	37.55	14.28	37.31	14.78
	-8.5	-9.1	39.12	13.18	38.85	13.62	38.59	14.07	38.47	14.31	38.34	14.55	38.09	15.06
	-7.0	-7.6	40.51	13.60	40.22	14.04	39.95	14.50	39.81	14.74	39.68	14.99	39.41	15.51
	-5.0	-5.6	42.39	14.16	42.09	14.61	41.79	15.09	41.64	15.34	41.49	15.59	41.20	16.12
	-3.0	-3.7	44.21	14.50	43.88	14.96	43.56	15.45	43.41	15.70	43.25	15.95	42.94	16.49
	0.0	-0.7	47.15	15.05	46.79	15.52	46.44	16.02	46.26	16.27	46.08	16.53	45.74	17.08
	3.0	2.2	49.67	15.32	49.28	15.80	48.89	16.29	48.69	16.55	48.50	16.81	47.14	16.19
	5.0	4.1	50.02	14.58	49.60	15.03	49.19	15.50	48.98	15.74	48.77	15.98	47.14	15.20
	7.0	6.0	51.54	14.63	51.09	15.08	50.66	15.54	50.43	15.78	51.07	16.24	47.14	14.24
	9.0	7.9	53.46	14.96	53.00	15.41	52.55	15.88	53.04	16.22	51.07	15.22	47.14	13.32
	11.0	9.8	55.43	15.29	54.94	15.75	55.00	16.17	53.04	15.20	51.07	14.25	47.14	12.44
	13.0	11.8	57.51	15.65	57.00	16.12	55.00	15.11	53.04	14.18	51.07	13.29	47.14	11.62
15.0	13.7	59.50	16.00	58.93	15.95	55.00	14.12	53.04	13.25	51.07	12.41	47.14	10.95	
18.0	15.8	62.86	16.68	58.93	14.84	55.00	13.11	53.04	12.29	51.07	11.57	47.14	10.25	
20.0	17.6	62.86	15.68	58.93	13.91	55.00	12.30	53.04	11.58	51.07	10.93	47.14	9.67	
23.0	20.2	62.86	14.30	58.93	12.70	55.00	11.28	53.04	10.65	51.07	10.04	47.14	8.83	
26.0	22.0	62.86	13.41	58.93	11.90	55.00	10.63	53.04	10.02	51.07	9.43	47.14	8.28	
30.0	24.1	62.86	12.42	58.93	11.11	55.00	9.90	53.04	9.33	51.07	8.73	47.14	7.65	
100%	-29.8	-30.0	23.81	9.52	23.69	9.90	23.58	10.31	23.52	10.52	23.48	10.74	23.39	11.19
	-25.0	-25.4	25.06	9.99	24.93	10.38	24.82	10.80	24.76	11.01	24.71	11.23	24.62	11.70
	-19.8	-20.0	27.84	10.50	27.70	10.90	27.57	11.33	27.51	11.55	27.46	11.77	27.36	12.25
	-18.8	-19.0	30.26	10.77	30.10	11.18	29.94	11.60	29.87	11.83	29.79	12.05	29.66	12.54
	-16.7	-17.0	31.90	11.33	31.71	11.74	31.53	12.17	31.45	12.40	31.37	12.63	31.21	13.12
	-13.7	-15.0	33.58	11.97	33.38	12.39	33.19	12.84	33.09	13.07	33.00	13.31	32.82	13.81
	-11.8	-13.0	35.27	12.52	35.05	12.95	34.84	13.40	34.74	13.64	34.64	13.88	34.44	14.39
	-9.8	-11.0	37.01	13.08	36.77	13.52	36.54	13.99	36.42	14.23	36.31	14.48	36.10	15.00
	-9.5	-10.0	37.90	13.30	37.65	13.74	37.40	14.21	37.28	14.46	37.17	14.71	36.94	15.23
	-8.5	-9.1	38.70	13.57	38.44	14.02	38.19	14.49	38.06	14.74	37.94	14.99	37.71	15.52
	-7.0	-7.6	40.06	14.00	39.79	14.46	39.52	14.94	39.39	15.20	39.25	15.46	39.00	15.99
	-5.0	-5.6	41.92	14.59	41.62	15.07	41.32	15.56	41.18	15.82	41.04	16.09	40.76	16.64
	-3.0	-3.7	43.70	14.96	43.38	15.44	43.07	15.95	42.92	16.21	42.76	16.48	42.86	17.00
	0.0	-0.7	46.58	15.56	46.23	16.05	45.88	16.56	45.71	16.83	46.43	17.44	42.86	15.41
	3.0	2.2	49.05	15.86	48.67	16.35	48.28	16.87	48.21	16.82	46.43	15.85	42.86	13.96
	5.0	4.1	49.37	15.09	48.95	15.56	48.54	16.04	48.21	15.78	46.43	14.85	42.86	13.07
	7.0	6.0	50.84	15.16	50.40	15.62	50.00	15.70	48.21	14.80	46.43	13.90	42.86	12.22
	9.0	7.9	52.73	15.51	52.27	15.98	50.00	14.71	48.21	13.84	46.43	13.00	42.86	11.40
	11.0	9.8	54.64	15.87	53.57	15.47	50.00	13.77	48.21	12.95	46.43	12.16	42.86	10.72
	13.0	11.8	57.14	16.12	53.57	14.44	50.00	12.82	48.21	12.05	46.43	11.39	42.86	10.07
15.0	13.7	57.14	15.11	53.57	13.50	50.00	11.96	48.21	11.34	46.43	10.72	42.86	9.52	
18.0	15.8	57.14	14.03	53.57	12.50	50.00	12.10	48.21	10.61	46.43	10.03	42.86	8.91	
20.0	17.6	57.14	13.16	53.57	11.75	50.00	10.57	48.21	10.00	46.43	9.44	42.86	8.37	
23.0	20.2	57.14	11.99	53.57	10.81	50.00	9.69	48.21	9.17	46.43	8.62	42.86	7.63	
26.0	22.0	57.14	11.31	53.57	10.18	50.00	9.10	48.21	8.60	46.43	8.07	42.86	7.23	
30.0	24.1	57.14	10.56	53.57	9.47	50.00	8.42	48.21	7.92	46.43	7.50	42.86	6.77	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.13:16HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	23.29	9.67	23.17	10.06	23.06	10.49	23.01	10.71	22.97	10.93	22.88	11.42
	-25.0	-25.4	24.51	10.20	24.39	10.60	24.28	11.03	24.22	11.26	24.17	11.49	24.09	11.99
	-19.8	-20.0	27.24	10.84	27.10	11.25	26.97	11.70	26.92	11.93	26.86	12.17	26.76	12.67
	-18.8	-19.0	30.05	11.12	29.90	11.54	29.76	11.99	29.69	12.22	29.62	12.46	29.51	12.97
	-16.7	-17.0	31.61	11.70	31.44	12.12	31.28	12.58	31.21	12.82	31.13	13.06	31.00	13.58
	-13.7	-15.0	33.23	12.36	33.04	12.80	32.86	13.27	32.77	13.52	32.69	13.77	32.53	14.30
	-11.8	-13.0	34.89	12.94	34.68	13.39	34.48	13.87	34.38	14.12	34.29	14.38	34.11	14.91
	-9.8	-11.0	36.60	13.54	36.37	14.00	36.14	14.49	36.04	14.74	35.93	15.01	35.73	15.56
	-9.5	-10.0	37.47	13.77	37.23	14.23	36.99	14.73	36.88	14.98	36.77	15.25	36.56	15.80
	-8.5	-9.1	38.26	14.05	38.01	14.52	37.76	15.02	37.65	15.28	37.53	15.55	37.31	16.11
	-7.0	-7.6	39.59	14.52	39.33	15.00	39.07	15.51	38.94	15.77	38.81	16.04	38.57	16.29
	-5.0	-5.6	41.40	15.15	41.11	15.64	40.83	16.17	40.69	16.44	40.56	16.72	38.57	15.49
	-3.0	-3.7	43.15	15.55	42.84	16.05	42.54	16.58	42.39	16.86	41.79	16.40	38.57	14.56
	0.0	-0.7	45.96	16.20	45.62	16.72	45.00	16.62	43.39	15.72	41.79	14.83	38.57	13.14
	3.0	2.2	48.35	16.54	48.21	16.81	45.00	15.08	43.39	14.26	41.79	13.44	38.57	11.85
	5.0	4.1	48.64	15.73	48.21	15.77	45.00	14.14	43.39	13.34	41.79	12.57	38.57	11.15
	7.0	6.0	50.06	15.81	48.21	14.80	45.00	13.22	43.39	12.47	41.79	11.73	38.57	10.42
	9.0	7.9	51.43	15.40	48.21	13.84	45.00	12.34	43.39	11.60	41.79	10.99	38.57	9.82
	11.0	9.8	51.43	14.41	48.21	12.95	45.00	11.52	43.39	10.93	41.79	10.34	38.57	9.23
	13.0	11.8	51.43	13.43	48.21	12.03	45.00	10.84	43.39	10.25	41.79	9.69	38.57	8.62
	15.0	13.7	51.43	12.56	48.21	11.32	45.00	10.25	43.39	9.66	41.79	9.13	38.57	8.10
	18.0	15.8	51.43	11.67	48.21	10.59	45.00	9.57	43.39	9.07	41.79	8.58	38.57	7.67
20.0	17.6	51.43	11.01	48.21	9.99	45.00	9.01	43.39	8.53	41.79	8.05	38.57	7.27	
23.0	20.2	51.43	10.12	48.21	9.15	45.00	8.21	43.39	7.74	41.79	7.40	38.57	6.74	
26.0	22.0	51.43	9.52	48.21	8.56	45.00	7.67	43.39	7.34	41.79	7.01	38.57	6.37	
30.0	24.1	51.43	8.82	48.21	7.90	45.00	7.18	43.39	6.86	41.79	6.55	38.57	5.95	
80%	-29.8	-30.0	22.78	10.22	22.67	10.64	22.56	11.09	22.51	11.43	22.47	12.23	22.38	14.46
	-25.0	-25.4	23.98	10.74	23.86	11.16	23.75	11.62	23.70	11.95	23.65	12.63	23.56	14.47
	-19.8	-20.0	26.65	11.25	26.51	11.69	26.39	12.15	26.33	12.46	26.28	13.04	26.18	14.48
	-18.8	-19.0	29.74	11.56	29.61	12.01	29.48	12.48	29.42	12.73	29.37	12.99	29.28	13.53
	-16.7	-17.0	31.28	12.17	31.12	12.62	30.97	13.11	30.91	13.36	30.84	13.62	30.73	14.18
	-13.7	-15.0	32.86	12.88	32.68	13.34	32.52	13.84	32.44	14.10	32.36	14.37	32.23	14.94
	-11.8	-13.0	34.49	13.49	34.29	13.97	34.10	14.48	34.01	14.75	33.93	15.02	34.29	15.77
	-9.8	-11.0	36.16	14.13	35.94	14.62	35.73	15.15	35.63	15.42	35.53	15.70	34.29	15.07
	-9.5	-10.0	37.01	14.38	36.78	14.88	36.56	15.40	36.45	15.68	36.35	15.96	34.29	14.63
	-8.5	-9.1	37.78	14.69	37.54	15.19	37.31	15.72	37.20	16.00	37.14	16.00	34.29	14.32
	-7.0	-7.6	39.08	15.19	38.83	15.70	38.58	16.25	38.57	16.28	37.14	15.43	34.29	13.79
	-5.0	-5.6	40.84	15.87	40.57	16.40	40.00	16.32	38.57	15.50	37.14	14.66	34.29	13.07
	-3.0	-3.7	42.54	16.32	42.86	17.00	40.00	15.36	38.57	14.56	37.14	13.76	34.29	12.24
	0.0	-0.7	45.71	16.99	42.86	15.39	40.00	13.87	38.57	13.14	37.14	12.42	34.29	11.07
	3.0	2.2	45.71	15.44	42.86	13.96	40.00	12.53	38.57	11.85	37.14	11.24	34.29	10.13
	5.0	4.1	45.71	14.46	42.86	13.05	40.00	11.72	38.57	11.15	37.14	10.60	34.29	9.56
	7.0	6.0	45.71	13.54	42.86	12.21	40.00	10.98	38.57	10.43	37.14	9.87	34.29	8.84
	9.0	7.9	45.71	12.62	42.86	11.37	40.00	10.31	38.57	9.81	37.14	9.33	34.29	8.43
	11.0	9.8	45.71	11.81	42.86	10.72	40.00	9.68	38.57	9.20	37.14	8.74	34.29	7.86
	13.0	11.8	45.71	11.10	42.86	10.04	40.00	9.07	38.57	8.61	37.14	8.16	34.29	7.31
	15.0	13.7	45.71	10.44	42.86	9.47	40.00	8.52	38.57	8.07	37.14	7.61	34.29	6.90
	18.0	15.8	45.71	9.76	42.86	8.89	40.00	8.03	38.57	7.66	37.14	7.37	34.29	6.51
20.0	17.6	45.71	9.18	42.86	8.34	40.00	7.58	38.57	7.26	37.14	6.96	34.29	6.23	
23.0	20.2	45.71	8.38	42.86	7.60	40.00	7.01	38.57	6.71	37.14	6.43	34.29	5.89	
26.0	22.0	45.71	7.83	42.86	7.20	40.00	6.64	38.57	6.36	37.14	6.10	34.29	5.56	
30.0	24.1	45.71	7.29	42.86	6.72	40.00	6.20	38.57	5.94	37.14	5.60	34.29	4.95	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.13:16HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	22.29	10.49	22.17	10.94	22.07	12.06	22.02	12.96	21.98	13.91	21.90	15.29
	-25.0	-25.4	23.46	11.10	23.34	11.56	23.23	12.51	23.18	13.22	23.14	13.96	23.05	14.93
	-19.8	-20.0	26.07	11.85	25.94	12.32	25.81	12.84	25.76	13.10	25.71	13.38	25.61	13.97
	-18.8	-19.0	29.43	12.16	29.31	12.64	29.21	13.16	29.16	13.43	29.12	13.71	29.05	14.31
	-16.7	-17.0	30.93	12.82	30.79	13.31	30.67	13.84	30.61	14.11	30.56	14.40	30.00	14.34
	-13.7	-15.0	32.47	13.58	32.31	14.09	32.17	14.63	32.10	14.92	32.50	15.35	30.00	13.83
	-11.8	-13.0	34.06	14.25	33.88	14.77	33.71	15.33	33.75	15.43	32.50	14.66	30.00	13.18
	-9.8	-11.0	35.68	14.94	35.48	15.48	35.00	15.46	33.75	14.72	32.50	13.98	30.00	12.54
	-9.5	-10.0	36.50	15.22	36.29	15.76	35.00	15.03	33.75	14.29	32.50	13.57	30.00	12.15
	-8.5	-9.1	37.25	15.56	37.50	16.18	35.00	14.70	33.75	13.98	32.50	13.27	30.00	11.86
	-7.0	-7.6	38.51	16.11	37.50	15.61	35.00	14.16	33.75	13.45	32.50	12.76	30.00	11.40
	-5.0	-5.6	40.00	16.28	37.50	14.83	35.00	13.43	33.75	12.75	32.50	12.08	30.00	10.85
	-3.0	-3.7	40.00	15.29	37.50	13.92	35.00	12.59	33.75	11.93	32.50	11.31	30.00	10.24
	0.0	-0.7	40.00	13.84	37.50	12.55	35.00	11.34	33.75	10.84	32.50	10.32	30.00	9.35
	3.0	2.2	40.00	12.49	37.50	11.35	35.00	10.38	33.75	9.91	32.50	9.44	30.00	8.54
	5.0	4.1	40.00	11.68	37.50	10.71	35.00	9.79	33.75	9.34	32.50	8.91	30.00	8.05
	7.0	6.0	40.00	10.94	37.50	9.99	35.00	9.11	33.75	8.64	32.50	8.21	30.00	7.40
	9.0	7.9	40.00	10.28	37.50	9.43	35.00	8.62	33.75	8.23	32.50	7.87	30.00	7.20
	11.0	9.8	40.00	9.65	37.50	8.82	35.00	8.06	33.75	7.70	32.50	7.30	30.00	6.66
	13.0	11.8	40.00	9.03	37.50	8.25	35.00	7.50	33.75	7.14	32.50	6.83	30.00	6.22
15.0	13.7	40.00	8.47	37.50	7.70	35.00	7.03	33.75	6.74	32.50	6.49	30.00	5.92	
18.0	15.8	40.00	8.00	37.50	7.38	35.00	6.69	33.75	6.39	32.50	6.05	30.00	5.51	
20.0	17.6	40.00	7.53	37.50	7.00	35.00	6.39	33.75	6.08	32.50	5.79	30.00	5.21	
23.0	20.2	40.00	6.96	37.50	6.47	35.00	6.00	33.75	5.77	32.50	5.45	30.00	4.88	
26.0	22.0	40.00	6.59	37.50	6.12	35.00	5.66	33.75	5.45	32.50	5.22	30.00	4.80	
30.0	24.1	40.00	6.15	37.50	5.63	35.00	5.09	33.75	4.82	32.50	4.58	30.00	4.14	
60%	-29.8	-30.0	21.80	12.69	21.69	14.17	21.59	15.17	21.54	15.37	21.50	14.89	21.42	13.43
	-25.0	-25.4	22.95	12.96	22.83	14.11	22.73	14.81	22.68	14.90	22.63	14.41	22.55	12.99
	-19.8	-20.0	25.50	12.69	25.37	13.23	25.25	13.80	25.20	14.11	25.15	13.84	25.05	12.53
	-18.8	-19.0	29.12	13.04	29.03	13.58	28.95	14.16	28.93	14.23	27.86	13.57	25.71	12.27
	-16.7	-17.0	30.57	13.76	30.46	14.31	30.00	14.29	28.93	13.64	27.86	13.01	25.71	11.74
	-13.7	-15.0	32.06	14.60	32.14	15.08	30.00	13.78	28.93	13.14	27.86	12.51	25.71	11.27
	-11.8	-13.0	34.29	15.67	32.14	14.39	30.00	13.14	28.93	12.52	27.86	11.90	25.71	10.69
	-9.8	-11.0	34.29	14.97	32.14	13.72	30.00	12.49	28.93	11.89	27.86	11.30	25.71	10.22
	-9.5	-10.0	34.29	14.53	32.14	13.32	30.00	12.10	28.93	11.52	27.86	10.95	25.71	9.94
	-8.5	-9.1	34.29	14.22	32.14	13.02	30.00	11.84	28.93	11.25	27.86	10.72	25.71	9.74
	-7.0	-7.6	34.29	13.70	32.14	12.51	30.00	11.36	28.93	10.83	27.86	10.36	25.71	9.41
	-5.0	-5.6	34.29	12.99	32.14	11.85	30.00	10.81	28.93	10.35	27.86	9.88	25.71	8.97
	-3.0	-3.7	34.29	12.16	32.14	11.11	30.00	10.20	28.93	9.76	27.86	9.32	25.71	8.46
	0.0	-0.7	34.29	10.99	32.14	10.13	30.00	9.30	28.93	8.90	27.86	8.51	25.71	7.72
	3.0	2.2	34.29	10.05	32.14	9.27	30.00	8.51	28.93	8.14	27.86	7.76	25.71	7.16
	5.0	4.1	34.29	9.48	32.14	8.73	30.00	8.02	28.93	7.68	27.86	7.39	25.71	6.64
	7.0	6.0	34.29	8.81	32.14	8.09	30.00	7.36	28.93	7.09	27.86	6.80	25.71	6.26
	9.0	7.9	34.29	8.35	32.14	7.71	30.00	7.11	28.93	6.82	27.86	6.53	25.71	6.01
	11.0	9.8	34.29	7.80	32.14	7.15	30.00	6.59	28.93	6.32	27.86	6.08	25.71	5.56
	13.0	11.8	34.29	7.23	32.14	6.69	30.00	6.19	28.93	5.92	27.86	5.69	25.71	5.21
15.0	13.7	34.29	6.82	32.14	6.37	30.00	5.88	28.93	5.63	27.86	5.40	25.71	4.95	
18.0	15.8	34.29	6.44	32.14	5.93	30.00	5.47	28.93	5.25	27.86	5.06	25.71	4.63	
20.0	17.6	34.29	6.22	32.14	5.69	30.00	5.18	28.93	4.96	27.86	4.76	25.71	4.41	
23.0	20.2	34.29	5.82	32.14	5.34	30.00	4.84	28.93	4.61	27.86	4.40	25.71	3.99	
26.0	22.0	34.29	5.49	32.14	5.13	30.00	4.78	28.93	4.60	27.86	4.42	25.71	4.09	
30.0	24.1	34.29	4.92	32.14	4.49	30.00	4.13	28.93	3.95	27.86	3.79	25.71	3.50	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.13:16HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	°C DB	°C WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
50%	-29.8	-30.0	21.33	15.35	21.22	14.20	21.12	12.98	20.61	12.37	19.85	11.78	18.32	10.67
	-25.0	-25.4	22.45	14.83	22.34	13.71	22.23	12.55	21.70	11.96	20.89	11.40	19.29	10.34
	-19.8	-20.0	24.95	14.18	24.82	13.11	24.70	12.03	24.11	11.50	23.21	10.98	21.43	9.93
	-18.8	-19.0	28.57	13.90	26.79	12.84	25.00	11.78	24.11	11.25	23.21	10.73	21.43	9.72
	-16.7	-17.0	28.57	13.34	26.79	12.29	25.00	11.26	24.11	10.75	23.21	10.24	21.43	9.37
	-13.7	-15.0	28.57	12.84	26.79	11.82	25.00	10.80	24.11	10.30	23.21	9.88	21.43	9.07
	-11.8	-13.0	28.57	12.23	26.79	11.22	25.00	10.28	24.11	9.87	23.21	9.47	21.43	8.65
	-9.8	-11.0	28.57	11.62	26.79	10.65	25.00	9.83	24.11	9.44	23.21	9.05	21.43	8.26
	-9.5	-10.0	28.57	11.26	26.79	10.37	25.00	9.57	24.11	9.19	23.21	8.80	21.43	8.03
	-8.5	-9.1	28.57	10.99	26.79	10.16	25.00	9.38	24.11	9.00	23.21	8.61	21.43	7.86
	-7.0	-7.6	28.57	10.60	26.79	9.82	25.00	9.05	24.11	8.69	23.21	8.31	21.43	7.58
	-5.0	-5.6	28.57	10.12	26.79	9.37	25.00	8.64	24.11	8.27	23.21	7.91	21.43	7.27
	-3.0	-3.7	28.57	9.54	26.79	8.84	25.00	8.14	24.11	7.80	23.21	7.49	21.43	6.95
	0.0	-0.7	28.57	8.71	26.79	8.05	25.00	7.45	24.11	7.20	23.21	6.95	21.43	6.44
	3.0	2.2	28.57	7.95	26.79	7.41	25.00	6.93	24.11	6.69	23.21	6.46	21.43	5.99
	5.0	4.1	28.57	7.51	26.79	6.94	25.00	6.41	24.11	6.19	23.21	5.97	21.43	5.53
	7.0	6.0	28.57	6.98	26.79	6.54	25.00	6.04	24.11	5.82	23.21	5.62	21.43	5.13
	9.0	7.9	28.57	6.66	26.79	6.18	25.00	5.74	24.11	5.52	23.21	5.34	21.43	4.90
	11.0	9.8	28.57	6.17	26.79	5.75	25.00	5.33	24.11	5.15	23.21	4.95	21.43	4.56
	13.0	11.8	28.57	5.79	26.79	5.40	25.00	5.02	24.11	4.83	23.21	4.64	21.43	4.28
15.0	13.7	28.57	5.50	26.79	5.13	25.00	4.75	24.11	4.58	23.21	4.40	21.43	4.05	
18.0	15.8	28.57	5.13	26.79	4.80	25.00	4.45	24.11	4.29	23.21	4.12	21.43	3.79	
20.0	17.6	28.57	4.84	26.79	4.52	25.00	4.24	24.11	4.11	23.21	3.97	21.43	3.66	
23.0	20.2	28.57	4.49	26.79	4.15	25.00	3.83	24.11	3.69	23.21	3.57	21.43	3.40	
26.0	22.0	28.57	4.48	26.79	4.21	25.00	3.96	24.11	3.76	23.21	3.59	21.43	3.24	
30.0	24.1	28.57	3.83	26.79	3.61	25.00	3.40	24.11	3.35	23.21	3.25	21.43	3.06	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table2-8.14:18HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	25.09	9.59	24.96	9.97	24.84	10.36	24.79	10.57	24.74	10.78	24.64	11.21
	-25.0	-25.4	26.41	10.01	26.28	10.40	26.15	10.80	26.09	11.00	26.04	11.21	25.93	11.66
	-19.8	-20.0	29.34	10.40	29.19	10.79	29.06	11.20	28.99	11.41	28.93	11.63	28.82	12.08
	-18.8	-19.0	31.85	10.66	31.68	11.05	31.51	11.46	31.43	11.68	31.36	11.90	31.21	12.35
	-16.7	-17.0	33.55	11.18	33.36	11.58	33.17	12.00	33.08	12.21	32.99	12.43	32.82	12.89
	-13.7	-15.0	35.31	11.78	35.10	12.19	34.89	12.62	34.79	12.84	34.69	13.06	34.50	13.53
	-11.8	-13.0	37.14	12.28	36.90	12.70	36.67	13.14	36.56	13.36	36.45	13.59	36.23	14.07
	-9.8	-11.0	39.02	12.80	38.77	13.23	38.52	13.67	38.39	13.90	38.27	14.14	38.03	14.62
	-9.5	-10.0	39.98	12.99	39.72	13.42	39.46	13.87	39.33	14.10	39.20	14.34	38.95	14.82
	-8.5	-9.1	40.86	13.23	40.59	13.67	40.32	14.12	40.18	14.35	40.05	14.59	39.79	15.08
	-7.0	-7.6	42.35	13.62	42.06	14.07	41.77	14.53	41.63	14.77	41.49	15.01	41.21	15.51
	-5.0	-5.6	44.39	14.15	44.07	14.61	43.76	15.08	43.61	15.32	43.45	15.57	43.15	16.08
	-3.0	-3.7	46.37	14.46	46.03	14.92	45.70	15.40	45.53	15.64	45.37	15.89	45.04	16.41
	0.0	-0.7	49.58	14.95	49.21	15.42	48.84	15.91	48.66	16.15	48.47	16.41	48.11	16.93
	3.0	2.2	52.31	15.18	51.92	15.66	51.53	16.15	51.33	16.40	51.13	16.65	50.75	17.18
	5.0	4.1	52.80	14.53	52.39	14.98	51.98	15.45	51.78	15.69	51.57	15.93	51.15	16.43
	7.0	6.0	54.46	14.56	54.03	15.02	53.59	15.49	53.37	15.72	53.15	15.97	52.72	16.47
	9.0	7.9	56.53	14.84	56.08	15.30	55.62	15.78	55.39	16.02	55.16	16.27	54.70	16.77
	11.0	9.8	58.64	15.12	58.16	15.59	57.67	16.07	57.45	16.32	57.21	16.57	56.72	17.09
	13.0	11.8	60.89	15.42	60.39	15.90	59.89	16.39	59.63	16.64	59.38	16.90	58.86	17.43
15.0	13.7	63.05	15.71	62.52	16.20	62.00	16.70	61.73	16.96	61.46	17.22	60.92	17.76	
18.0	15.8	65.46	16.05	64.92	16.55	64.36	17.06	64.08	17.32	63.79	17.59	62.96	17.47	
20.0	17.6	67.56	16.34	66.98	16.85	66.40	17.37	66.10	17.64	65.81	17.91	62.96	16.45	
23.0	20.2	70.61	16.79	69.99	17.31	69.35	17.85	69.06	18.12	68.20	17.48	62.96	15.10	
26.0	22.0	72.74	17.11	72.08	17.65	71.45	18.19	70.83	17.69	68.20	16.49	62.96	14.20	
30.0	24.1	75.24	17.50	74.57	18.05	73.45	17.72	70.83	16.51	68.20	15.37	62.96	13.19	
120%	-29.8	-30.0	24.78	9.76	24.66	10.14	24.54	10.54	24.49	10.75	24.44	10.96	24.35	11.41
	-25.0	-25.4	26.08	10.19	25.95	10.57	25.84	10.98	25.78	11.19	25.73	11.41	25.63	11.86
	-19.8	-20.0	28.98	10.57	28.84	10.97	28.71	11.38	28.64	11.60	28.58	11.82	28.48	12.28
	-18.8	-19.0	31.58	10.83	31.42	11.23	31.25	11.65	31.18	11.87	31.10	12.09	30.96	12.55
	-16.7	-17.0	33.27	11.36	33.09	11.77	32.90	12.20	32.82	12.42	32.73	12.64	32.57	13.11
	-13.7	-15.0	35.03	11.98	34.82	12.40	34.62	12.83	34.52	13.06	34.42	13.29	34.24	13.77
	-11.8	-13.0	36.85	12.50	36.62	12.93	36.39	13.37	36.28	13.60	36.17	13.83	35.96	14.32
	-9.8	-11.0	38.72	13.03	38.47	13.47	38.22	13.92	38.10	14.15	37.98	14.39	37.75	14.89
	-9.5	-10.0	39.68	13.23	39.42	13.67	39.16	14.13	39.03	14.36	38.91	14.60	38.66	15.10
	-8.5	-9.1	40.55	13.48	40.28	13.93	40.01	14.39	39.88	14.62	39.75	14.87	39.50	15.37
	-7.0	-7.6	42.04	13.89	41.75	14.34	41.46	14.81	41.32	15.05	41.18	15.30	40.91	15.81
	-5.0	-5.6	44.06	14.43	43.75	14.90	43.44	15.38	43.29	15.63	43.14	15.88	42.84	16.40
	-3.0	-3.7	46.02	14.76	45.69	15.23	45.36	15.72	45.20	15.97	45.04	16.22	44.72	16.75
	0.0	-0.7	49.10	15.27	48.74	15.75	48.40	16.25	48.22	16.50	48.05	16.76	47.70	17.30
	3.0	2.2	51.78	15.52	51.39	16.01	51.00	16.51	50.81	16.76	50.62	17.03	50.24	17.57
	5.0	4.1	52.27	14.86	51.86	15.32	51.45	15.80	51.24	16.04	51.03	16.29	50.62	16.80
	7.0	6.0	53.89	14.91	53.46	15.37	53.02	15.84	52.82	16.09	52.60	16.33	52.16	16.84
	9.0	7.9	55.93	15.20	55.48	15.67	55.03	16.15	54.81	16.40	54.58	16.65	54.11	17.17
	11.0	9.8	58.00	15.50	57.53	15.98	57.06	16.47	56.81	16.72	56.57	16.98	56.08	17.51
	13.0	11.8	60.23	15.82	59.73	16.31	59.22	16.81	58.97	17.07	58.71	17.33	58.11	17.36
15.0	13.7	62.36	16.14	61.83	16.64	61.30	17.15	61.03	17.41	60.76	17.68	58.11	16.31	
18.0	15.8	64.73	16.50	64.17	17.01	63.61	17.53	63.33	17.80	62.96	17.51	58.11	15.20	
20.0	17.6	66.78	16.82	66.20	17.34	65.61	17.87	65.38	17.65	62.96	16.49	58.11	14.29	
23.0	20.2	69.76	17.30	69.13	17.84	67.80	17.32	65.38	16.21	62.96	15.12	58.11	13.06	
26.0	22.0	71.84	17.65	72.64	18.56	67.80	16.31	65.38	15.25	62.96	14.22	58.11	12.27	
30.0	24.1	74.29	18.07	72.64	17.33	67.80	15.22	65.38	14.18	62.96	13.21	58.11	11.48	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.14: 18HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
110%	-29.8	-30.0	24.60	9.93	24.49	10.31	24.38	10.72	24.32	10.93	24.28	11.15	24.19	11.61
	-25.0	-25.4	25.90	10.37	25.77	10.76	25.66	11.18	25.60	11.39	25.55	11.61	25.46	12.08
	-19.8	-20.0	28.78	10.77	28.64	11.17	28.51	11.60	28.45	11.82	28.39	12.05	28.29	12.52
	-18.8	-19.0	31.34	11.04	31.17	11.45	31.02	11.87	30.94	12.10	30.87	12.32	30.74	12.80
	-16.7	-17.0	33.02	11.59	32.83	12.00	32.66	12.44	32.57	12.66	32.49	12.89	32.34	13.38
	-13.7	-15.0	34.76	12.22	34.56	12.65	34.36	13.09	34.27	13.32	34.17	13.56	33.99	14.05
	-11.8	-13.0	36.57	12.76	36.34	13.19	36.12	13.65	36.02	13.88	35.91	14.12	35.71	14.62
	-9.8	-11.0	38.43	13.31	38.18	13.76	37.94	14.22	37.83	14.46	37.71	14.70	37.49	15.22
	-9.5	-10.0	39.38	13.52	39.13	13.97	38.87	14.43	38.75	14.68	38.63	14.92	38.39	15.44
	-8.5	-9.1	40.25	13.78	39.99	14.23	39.72	14.71	39.60	14.95	39.47	15.20	39.22	15.72
	-7.0	-7.6	41.73	14.21	41.44	14.67	41.16	15.15	41.03	15.39	40.89	15.65	40.63	16.18
	-5.0	-5.6	43.68	14.77	43.38	15.25	43.09	15.74	42.94	15.99	42.80	16.25	42.53	16.80
	-3.0	-3.7	45.56	15.11	45.24	15.59	44.93	16.09	44.77	16.35	44.62	16.61	44.32	17.16
	0.0	-0.7	48.60	15.66	48.24	16.15	47.90	16.65	47.72	16.92	47.55	17.19	47.21	17.74
	3.0	2.2	51.23	15.93	50.84	16.43	50.46	16.94	50.27	17.20	50.08	17.47	49.70	18.03
	5.0	4.1	51.69	15.26	51.29	15.72	50.87	16.21	50.67	16.46	50.47	16.71	50.06	17.24
	7.0	6.0	53.28	15.31	52.85	15.78	52.43	16.27	52.21	16.52	51.99	16.77	51.57	17.30
	9.0	7.9	55.29	15.63	54.85	16.11	54.39	16.60	54.16	16.86	53.93	17.12	53.27	17.08
	11.0	9.8	57.35	15.96	56.86	16.44	56.39	16.95	56.14	17.21	55.91	17.47	53.27	16.04
	13.0	11.8	59.51	16.31	59.01	16.80	58.51	17.32	58.25	17.58	57.71	17.18	53.27	15.02
15.0	13.7	61.59	16.65	61.07	17.16	60.53	17.68	59.93	17.23	57.71	16.15	53.27	14.07	
18.0	15.8	63.91	17.04	63.36	17.56	62.15	17.13	59.93	16.08	57.71	15.06	53.27	13.10	
20.0	17.6	65.92	17.39	66.59	18.24	62.15	16.14	59.93	15.14	57.71	14.15	53.27	12.30	
23.0	20.2	68.82	17.92	66.59	16.75	62.15	14.78	59.93	13.83	57.71	12.92	53.27	11.31	
26.0	22.0	71.03	17.78	66.59	15.76	62.15	13.88	59.93	12.99	57.71	12.13	53.27	10.69	
30.0	24.1	71.03	16.60	66.59	14.70	62.15	12.91	59.93	12.08	57.71	11.35	53.27	9.97	
100%	-29.8	-30.0	24.54	10.10	24.42	10.50	24.32	10.92	24.27	11.13	24.23	11.36	24.15	11.83
	-25.0	-25.4	25.83	10.56	25.71	10.97	25.60	11.40	25.55	11.62	25.50	11.85	25.42	12.33
	-19.8	-20.0	28.70	11.01	28.57	11.43	28.44	11.87	28.39	12.09	28.34	12.33	28.24	12.82
	-18.8	-19.0	31.10	11.29	30.95	11.71	30.80	12.15	30.73	12.38	30.66	12.62	30.54	13.11
	-16.7	-17.0	32.78	11.86	32.60	12.28	32.43	12.73	32.35	12.96	32.27	13.20	32.13	13.71
	-13.7	-15.0	34.51	12.52	34.31	12.95	34.12	13.41	34.03	13.65	33.94	13.90	33.78	14.41
	-11.8	-13.0	36.30	13.08	36.08	13.52	35.87	13.99	35.77	14.23	35.67	14.48	35.48	15.01
	-9.8	-11.0	38.15	13.66	37.91	14.11	37.68	14.59	37.57	14.84	37.46	15.09	37.24	15.63
	-9.5	-10.0	39.07	13.87	38.83	14.33	38.59	14.82	38.48	15.07	38.36	15.32	38.15	15.86
	-8.5	-9.1	39.90	14.14	39.65	14.61	39.40	15.10	39.28	15.35	39.17	15.61	38.94	16.15
	-7.0	-7.6	41.31	14.58	41.04	15.06	40.78	15.56	40.65	15.81	40.52	16.08	40.28	16.63
	-5.0	-5.6	43.22	15.18	42.93	15.67	42.65	16.18	42.51	16.44	42.36	16.71	42.09	17.28
	-3.0	-3.7	45.07	15.54	44.76	16.04	44.45	16.55	44.30	16.82	44.15	17.09	43.86	17.66
	0.0	-0.7	48.06	16.12	47.71	16.63	47.37	17.16	47.20	17.43	47.03	17.71	46.70	18.29
	3.0	2.2	50.63	16.43	50.26	16.94	49.88	17.47	49.69	17.75	49.50	18.03	48.43	17.64
	5.0	4.1	51.07	15.73	50.66	16.22	53.71	17.79	50.06	16.98	49.86	17.24	48.43	16.61
	7.0	6.0	52.63	15.81	52.20	16.29	56.50	18.10	51.56	17.05	51.35	17.31	48.43	15.61
	9.0	7.9	54.61	16.15	54.15	16.65	56.50	17.68	54.48	17.72	52.46	16.68	48.43	14.63
	11.0	9.8	56.60	16.51	56.13	17.01	56.50	17.17	54.48	16.67	52.46	15.66	48.43	13.75
	13.0	11.8	58.72	16.89	58.22	17.40	56.50	16.57	54.48	15.60	52.46	14.66	48.43	12.82
15.0	13.7	60.75	17.27	60.54	17.50	56.50	15.57	54.48	14.63	52.46	13.74	48.43	12.00	
18.0	15.8	63.01	17.70	60.54	16.35	56.50	14.50	54.48	13.61	52.46	12.78	48.43	11.24	
20.0	17.6	64.57	17.25	60.54	15.39	56.50	13.62	54.48	12.78	52.46	11.98	48.43	10.63	
23.0	20.2	64.57	15.81	60.54	14.08	56.50	12.45	54.48	11.71	52.46	11.04	48.43	9.77	
26.0	22.0	64.57	14.89	60.54	13.22	56.50	11.71	54.48	11.07	52.46	10.42	48.43	9.18	
30.0	24.1	64.57	13.83	60.54	12.27	56.50	10.95	54.48	10.33	52.46	9.72	48.43	8.51	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.14: 18HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	24.00	10.02	23.89	10.42	23.79	10.86	23.74	11.08	23.70	11.32	23.62	11.81
	-25.0	-25.4	25.27	10.59	25.15	11.01	25.04	11.45	24.99	11.68	24.95	11.92	24.87	12.42
	-19.8	-20.0	28.08	11.32	27.95	11.75	27.83	12.20	27.77	12.44	27.72	12.69	27.63	13.20
	-18.8	-19.0	30.89	11.61	30.74	12.04	30.61	12.50	30.54	12.74	30.48	12.99	30.38	13.50
	-16.7	-17.0	32.55	12.20	32.38	12.64	32.23	13.11	32.15	13.35	32.08	13.60	31.95	14.13
	-13.7	-15.0	34.27	12.89	34.08	13.34	33.91	13.82	33.82	14.07	33.74	14.33	33.59	14.86
	-11.8	-13.0	35.99	13.47	35.79	13.94	35.59	14.42	35.50	14.68	35.41	14.94	35.24	15.49
	-9.8	-11.0	37.76	14.08	37.53	14.55	37.32	15.05	37.21	15.31	37.11	15.58	36.92	16.14
	-9.5	-10.0	38.66	14.31	38.42	14.78	38.19	15.29	38.09	15.55	37.98	15.82	37.77	16.38
	-8.5	-9.1	39.47	14.59	39.23	15.08	38.99	15.58	38.88	15.85	38.77	16.12	38.55	16.69
	-7.0	-7.6	40.86	15.06	40.60	15.55	40.34	16.07	40.22	16.34	40.10	16.62	39.86	17.20
	-5.0	-5.6	42.73	15.69	42.45	16.19	42.17	16.73	42.04	17.00	41.91	17.29	41.65	17.88
	-3.0	-3.7	44.55	16.08	44.24	16.60	43.95	17.14	43.80	17.42	43.65	17.70	43.59	18.12
	0.0	-0.7	47.47	16.71	47.13	17.24	46.80	17.79	46.63	18.08	47.22	18.59	43.59	16.51
	3.0	2.2	49.99	17.06	49.62	17.59	49.24	18.14	49.03	17.99	47.22	16.98	43.59	15.03
	5.0	4.1	50.39	16.33	49.99	16.83	49.59	17.35	49.03	16.93	47.22	15.97	43.59	14.12
	7.0	6.0	51.90	16.42	51.49	16.92	50.85	16.86	49.03	15.92	47.22	15.01	43.59	13.24
	9.0	7.9	53.82	16.81	54.48	17.68	50.85	15.84	49.03	15.01	47.22	14.07	43.59	12.32
	11.0	9.8	55.77	17.20	54.48	16.65	50.85	14.87	49.03	14.03	47.22	13.16	43.59	11.50
	13.0	11.8	58.11	17.33	54.48	15.58	50.85	13.90	49.03	13.09	47.22	12.30	43.59	10.85
15.0	13.7	58.11	16.28	54.48	14.62	50.85	13.01	49.03	12.25	47.22	11.54	43.59	10.20	
18.0	15.8	58.11	15.19	54.48	13.60	50.85	12.08	49.03	11.44	47.22	10.82	43.59	9.65	
20.0	17.6	58.11	14.28	54.48	12.78	50.85	11.40	49.03	10.82	47.22	10.23	43.59	9.09	
23.0	20.2	58.11	13.04	54.48	11.68	50.85	10.51	49.03	9.94	47.22	9.38	43.59	8.32	
26.0	22.0	58.11	12.23	54.48	11.02	50.85	9.91	49.03	9.36	47.22	8.82	43.59	7.78	
30.0	24.1	58.11	11.43	54.48	10.30	50.85	9.20	49.03	8.67	47.22	8.17	43.59	7.28	
80%	-29.8	-30.0	23.48	10.46	23.37	10.89	23.27	11.35	23.23	11.59	23.19	11.84	23.11	12.36
	-25.0	-25.4	24.72	11.03	24.60	11.47	24.50	11.94	24.45	12.18	24.41	12.44	24.33	12.97
	-19.8	-20.0	27.47	11.72	27.34	12.17	27.22	12.65	27.17	12.90	27.12	13.16	27.03	13.71
	-18.8	-19.0	30.69	12.02	30.56	12.48	30.44	12.96	30.39	13.22	30.34	13.48	30.25	14.03
	-16.7	-17.0	32.28	12.64	32.13	13.11	31.99	13.60	31.93	13.86	31.87	14.12	31.76	14.68
	-13.7	-15.0	33.92	13.36	33.75	13.84	33.59	14.34	33.51	14.61	33.44	14.88	33.31	15.45
	-11.8	-13.0	35.61	13.98	35.41	14.47	35.23	14.98	35.15	15.25	35.07	15.53	34.91	16.12
	-9.8	-11.0	37.34	14.62	37.12	15.12	36.92	15.65	36.82	15.92	36.73	16.21	36.55	16.81
	-9.5	-10.0	38.22	14.87	37.99	15.37	37.78	15.90	37.68	16.18	37.58	16.47	37.39	17.07
	-8.5	-9.1	39.02	15.17	38.79	15.68	38.56	16.22	38.45	16.50	38.35	16.79	38.74	17.60
	-7.0	-7.6	40.37	15.67	40.12	16.19	39.88	16.74	39.76	17.03	39.65	17.32	38.74	17.01
	-5.0	-5.6	42.20	16.35	41.93	16.88	41.67	17.45	41.54	17.75	41.97	18.18	38.74	16.24
	-3.0	-3.7	43.98	16.78	43.68	17.33	43.40	17.90	43.59	18.09	41.97	17.14	38.74	15.30
	0.0	-0.7	46.82	17.48	46.49	18.04	45.20	17.39	43.59	16.49	41.97	15.59	38.74	13.88
	3.0	2.2	49.26	17.87	48.43	17.60	45.20	15.86	43.59	15.01	41.97	14.18	38.74	12.59
	5.0	4.1	49.62	17.10	48.43	16.57	45.20	14.90	43.59	14.09	41.97	13.31	38.74	11.79
	7.0	6.0	51.66	17.22	48.43	15.57	45.20	13.99	43.59	13.21	41.97	12.41	38.74	10.93
	9.0	7.9	51.66	16.19	48.43	14.60	45.20	13.05	43.59	12.32	41.97	11.60	38.74	10.34
	11.0	9.8	51.66	15.19	48.43	13.71	45.20	12.19	43.59	11.48	41.97	10.86	38.74	9.71
	13.0	11.8	51.66	14.21	48.43	12.78	45.20	11.41	43.59	10.81	41.97	10.26	38.74	9.10
15.0	13.7	51.66	13.32	48.43	11.97	45.20	10.88	43.59	10.26	41.97	9.61	38.74	8.53	
18.0	15.8	51.66	12.37	48.43	11.18	45.20	10.14	43.59	9.63	41.97	9.14	38.74	8.16	
20.0	17.6	51.66	11.63	48.43	10.57	45.20	9.56	43.59	9.07	41.97	8.60	38.74	7.67	
23.0	20.2	51.66	10.71	48.43	9.71	45.20	8.76	43.59	8.30	41.97	7.82	38.74	7.11	
26.0	22.0	51.66	10.10	48.43	9.13	45.20	8.21	43.59	7.75	41.97	7.38	38.74	6.74	
30.0	24.1	51.66	9.39	48.43	8.46	45.20	7.57	43.59	7.26	41.97	6.93	38.74	6.21	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...



Table 2-8.14: 18HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
70%	-29.8	-30.0	22.97	11.05	22.87	11.50	22.77	12.00	22.72	12.33	22.68	13.13	22.61	15.06
	-25.0	-25.4	24.18	11.62	24.07	12.09	23.97	12.59	23.92	12.91	23.88	13.58	23.80	15.09
	-19.8	-20.0	26.87	12.25	26.74	12.74	26.63	13.25	26.58	13.52	26.53	13.80	26.44	14.40
	-18.8	-19.0	30.39	12.57	30.28	13.06	30.18	13.58	30.14	13.85	30.10	14.14	30.04	14.74
	-16.7	-17.0	31.95	13.23	31.81	13.73	31.69	14.26	31.64	14.54	31.59	14.83	31.51	15.43
	-13.7	-15.0	33.55	14.00	33.40	14.51	33.26	15.06	33.19	15.34	33.13	15.64	33.03	16.26
	-11.8	-13.0	35.20	14.66	35.02	15.19	34.86	15.75	34.79	16.04	34.72	16.34	33.90	16.09
	-9.8	-11.0	36.89	15.36	36.69	15.90	36.51	16.47	36.42	16.77	36.72	17.11	33.90	15.39
	-9.5	-10.0	37.74	15.63	37.54	16.17	37.34	16.75	37.25	17.05	36.72	16.65	33.90	14.97
	-8.5	-9.1	38.52	15.96	38.31	16.51	38.10	17.10	38.14	17.18	36.72	16.34	33.90	14.67
	-7.0	-7.6	39.84	16.50	39.60	17.07	39.55	17.47	38.14	16.61	36.72	15.78	33.90	14.14
	-5.0	-5.6	41.62	17.25	41.36	17.83	39.55	16.67	38.14	15.85	36.72	15.03	33.90	13.45
	-3.0	-3.7	43.33	17.73	42.38	17.33	39.55	15.71	38.14	14.93	36.72	14.15	33.90	12.64
	0.0	-0.7	45.20	17.32	42.38	15.76	39.55	14.25	38.14	13.52	36.72	12.81	33.90	11.40
	3.0	2.2	45.20	15.78	42.38	14.34	39.55	12.94	38.14	12.26	36.72	11.60	33.90	10.46
	5.0	4.1	45.20	14.82	42.38	13.45	39.55	12.13	38.14	11.48	36.72	10.94	33.90	9.90
	7.0	6.0	45.20	13.90	42.38	12.60	39.55	11.24	38.14	10.67	36.72	10.12	33.90	9.07
	9.0	7.9	45.20	12.97	42.38	11.69	39.55	10.58	38.14	10.08	36.72	9.61	33.90	8.67
	11.0	9.8	45.20	12.19	42.38	10.97	39.55	9.96	38.14	9.49	36.72	9.02	33.90	8.10
	13.0	11.8	45.20	11.35	42.38	10.31	39.55	9.33	38.14	8.87	36.72	8.41	33.90	7.58
15.0	13.7	45.20	10.77	42.38	9.71	39.55	8.76	38.14	8.32	36.72	7.88	33.90	7.06	
18.0	15.8	45.20	10.09	42.38	9.21	39.55	8.37	38.14	7.98	36.72	7.50	33.90	6.66	
20.0	17.6	45.20	9.51	42.38	8.67	39.55	7.85	38.14	7.50	36.72	7.20	33.90	6.36	
23.0	20.2	45.20	8.69	42.38	7.90	39.55	7.23	38.14	6.96	36.72	6.67	33.90	6.12	
26.0	22.0	45.20	8.14	42.38	7.41	39.55	6.86	38.14	6.59	36.72	6.32	33.90	5.79	
30.0	24.1	45.20	7.52	42.38	6.96	39.55	6.41	38.14	6.06	36.72	5.71	33.90	5.06	
60%	-29.8	-30.0	22.47	11.56	22.37	12.97	22.27	14.72	22.23	15.49	22.19	16.11	22.12	16.15
	-25.0	-25.4	23.66	12.22	23.55	13.41	23.45	14.79	23.40	15.37	23.36	15.82	23.28	15.66
	-19.8	-20.0	26.28	13.01	26.16	13.55	26.05	14.12	26.00	14.42	25.95	14.74	25.87	15.07
	-18.8	-19.0	30.09	13.36	30.01	13.90	29.94	14.48	29.91	14.78	29.89	15.10	29.06	14.80
	-16.7	-17.0	31.61	14.08	31.50	14.63	31.41	15.22	31.37	15.53	31.48	15.72	29.06	14.24
	-13.7	-15.0	33.16	14.92	33.04	15.49	32.93	16.09	32.69	15.97	31.48	15.21	29.06	13.74
	-11.8	-13.0	34.76	15.65	34.61	16.24	33.90	16.02	32.69	15.28	31.48	14.57	29.06	13.13
	-9.8	-11.0	36.39	16.42	36.32	16.78	33.90	15.33	32.69	14.61	31.48	13.91	29.06	12.52
	-9.5	-10.0	37.22	16.73	36.32	16.33	33.90	14.89	32.69	14.20	31.48	13.51	29.06	12.16
	-8.5	-9.1	38.74	17.45	36.32	16.00	33.90	14.59	32.69	13.91	31.48	13.23	29.06	11.88
	-7.0	-7.6	38.74	16.87	36.32	15.47	33.90	14.09	32.69	13.42	31.48	12.75	29.06	11.43
	-5.0	-5.6	38.74	16.10	36.32	14.72	33.90	13.40	32.69	12.74	31.48	12.09	29.06	10.89
	-3.0	-3.7	38.74	15.16	36.32	13.85	33.90	12.58	32.69	11.94	31.48	11.33	29.06	10.29
	0.0	-0.7	38.74	13.75	36.32	12.52	33.90	11.35	32.69	10.86	31.48	10.38	29.06	9.42
	3.0	2.2	38.74	12.47	36.32	11.35	33.90	10.41	32.69	9.97	31.48	9.51	29.06	8.63
	5.0	4.1	38.74	11.66	36.32	10.73	33.90	9.83	32.69	9.41	31.48	8.99	29.06	8.15
	7.0	6.0	38.74	10.83	36.32	9.89	33.90	9.03	32.69	8.59	31.48	8.17	29.06	7.33
	9.0	7.9	38.74	10.22	36.32	9.42	33.90	8.63	32.69	8.25	31.48	7.90	29.06	7.19
	11.0	9.8	38.74	9.59	36.32	8.81	33.90	8.06	32.69	7.70	31.48	7.37	29.06	6.70
	13.0	11.8	38.74	9.03	36.32	8.21	33.90	7.52	32.69	7.18	31.48	6.85	29.06	6.23
15.0	13.7	38.74	8.42	36.32	7.70	33.90	7.00	32.69	6.74	31.48	6.47	29.06	5.89	
18.0	15.8	38.74	8.05	36.32	7.25	33.90	6.60	32.69	6.31	31.48	6.02	29.06	5.50	
20.0	17.6	38.74	7.56	36.32	7.07	33.90	6.30	32.69	6.01	31.48	5.72	29.06	5.20	
23.0	20.2	38.74	7.00	36.32	6.53	33.90	6.07	32.69	5.75	31.48	5.43	29.06	4.82	
26.0	22.0	38.74	6.63	36.32	6.18	33.90	5.74	32.69	5.54	31.48	5.32	29.06	4.91	
30.0	24.1	38.74	6.22	36.32	5.58	33.90	5.08	32.69	4.77	31.48	4.55	29.06	4.14	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.14:18HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	-29.8	-30.0	21.98	15.36	21.88	16.30	21.79	15.51	21.75	14.88	21.71	14.21	20.70	12.84
	-25.0	-25.4	23.14	15.21	23.03	15.87	22.94	15.03	22.89	14.41	22.85	13.76	21.79	12.45
	-19.8	-20.0	25.71	14.21	25.59	14.83	25.48	14.47	25.43	13.86	25.39	13.25	24.21	12.03
	-18.8	-19.0	29.82	14.60	30.27	15.43	28.25	14.20	27.24	13.60	26.23	12.99	24.21	11.79
	-16.7	-17.0	31.28	15.42	30.27	14.86	28.25	13.65	27.24	13.06	26.23	12.47	24.21	11.29
	-13.7	-15.0	32.29	15.58	30.27	14.38	28.25	13.18	27.24	12.59	26.23	12.01	24.21	10.87
	-11.8	-13.0	32.29	14.91	30.27	13.73	28.25	12.59	27.24	12.01	26.23	11.45	24.21	10.35
	-9.8	-11.0	32.29	14.26	30.27	13.12	28.25	11.99	27.24	11.43	26.23	10.88	24.21	9.92
	-9.5	-10.0	32.29	13.86	30.27	12.74	28.25	11.63	27.24	11.09	26.23	10.58	24.21	9.66
	-8.5	-9.1	32.29	13.56	30.27	12.45	28.25	11.38	27.24	10.83	26.23	10.37	24.21	9.48
	-7.0	-7.6	32.29	13.07	30.27	11.99	28.25	10.93	27.24	10.48	26.23	10.05	24.21	9.17
	-5.0	-5.6	32.29	12.41	30.27	11.37	28.25	10.46	27.24	10.03	26.23	9.60	24.21	8.76
	-3.0	-3.7	32.29	11.64	30.27	10.72	28.25	9.89	27.24	9.48	26.23	9.08	24.21	8.27
	0.0	-0.7	32.29	10.60	30.27	9.81	28.25	9.05	27.24	8.67	26.23	8.30	24.21	7.58
	3.0	2.2	32.29	9.71	30.27	8.99	28.25	8.29	27.24	7.95	26.23	7.62	24.21	7.06
	5.0	4.1	32.29	9.18	30.27	8.49	28.25	7.82	27.24	7.42	26.23	7.04	24.21	6.43
	7.0	6.0	32.29	8.37	30.27	7.69	28.25	7.05	27.24	6.79	26.23	6.49	24.21	5.97
	9.0	7.9	32.29	8.06	30.27	7.47	28.25	6.89	27.24	6.61	26.23	6.33	24.21	5.80
	11.0	9.8	32.29	7.49	30.27	6.92	28.25	6.39	27.24	6.14	26.23	5.88	24.21	5.41
	13.0	11.8	32.29	6.97	30.27	6.43	28.25	5.99	27.24	5.75	26.23	5.51	24.21	5.08
15.0	13.7	32.29	6.55	30.27	6.11	28.25	5.65	27.24	5.42	26.23	5.20	24.21	4.77	
18.0	15.8	32.29	6.15	30.27	5.68	28.25	5.28	27.24	5.09	26.23	4.88	24.21	4.48	
20.0	17.6	32.29	5.84	30.27	5.40	28.25	4.98	27.24	4.79	26.23	4.62	24.21	4.28	
23.0	20.2	32.29	5.59	30.27	5.08	28.25	4.63	27.24	4.42	26.23	4.20	24.21	3.85	
26.0	22.0	32.29	5.38	30.27	5.05	28.25	4.72	27.24	4.56	26.23	4.39	24.21	3.84	
30.0	24.1	32.29	4.63	30.27	4.27	28.25	3.96	27.24	3.80	26.23	3.68	24.21	3.44	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table2-8.15:20HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	29.98	11.14	29.81	11.60	29.64	12.08	29.55	12.33	29.47	12.59	29.33	13.13
	-25.0	-25.4	31.56	11.72	31.38	12.19	31.20	12.68	31.11	12.93	31.03	13.19	30.87	13.74
	-19.8	-20.0	35.07	12.40	34.86	12.88	34.66	13.38	34.57	13.64	34.47	13.91	34.30	14.47
	-18.8	-19.0	38.39	12.72	38.15	13.20	37.91	13.71	37.79	13.97	37.68	14.23	37.46	14.79
	-16.7	-17.0	40.39	13.36	40.12	13.85	39.85	14.36	39.72	14.62	39.60	14.89	39.36	15.46
	-13.7	-15.0	42.45	14.10	42.16	14.60	41.87	15.12	41.73	15.39	41.59	15.67	41.32	16.24
	-11.8	-13.0	44.59	14.73	44.27	15.23	43.96	15.76	43.81	16.04	43.65	16.32	43.36	16.90
	-9.8	-11.0	46.79	15.37	46.45	15.88	46.11	16.42	45.95	16.70	45.78	16.99	45.46	17.58
	-9.5	-10.0	47.91	15.61	47.55	16.13	47.21	16.67	47.04	16.95	46.87	17.24	46.53	17.83
	-8.5	-9.1	48.93	15.91	48.57	16.44	48.21	16.98	48.03	17.27	47.86	17.56	47.51	18.16
	-7.0	-7.6	50.67	16.40	50.28	16.93	49.91	17.49	49.72	17.78	49.53	18.07	49.16	18.68
	-5.0	-5.6	53.03	17.06	52.63	17.60	52.21	18.17	52.02	18.47	51.82	18.77	51.42	19.39
	-3.0	-3.7	55.35	17.46	54.90	18.01	54.48	18.58	54.26	18.88	54.04	19.18	53.62	19.81
	0.0	-0.7	59.07	18.09	58.60	18.65	58.12	19.23	57.89	19.53	57.64	19.84	57.20	20.48
	3.0	2.2	62.29	18.40	61.76	18.96	61.27	19.55	61.02	19.85	60.77	20.16	60.27	20.80
	5.0	4.1	62.97	17.60	62.44	18.13	61.92	18.69	61.65	18.97	61.39	19.26	60.86	19.86
	7.0	6.0	64.94	17.65	64.39	18.19	63.83	18.74	63.56	19.02	63.28	19.31	62.72	19.91
	9.0	7.9	67.33	18.01	66.75	18.56	66.17	19.12	65.90	19.40	65.58	19.70	65.00	20.31
	11.0	9.8	69.78	18.38	69.15	18.93	68.55	19.50	68.24	19.79	67.93	20.09	67.32	20.71
	13.0	11.8	72.36	18.77	71.74	19.33	71.11	19.91	70.78	20.21	70.46	20.52	70.20	20.78
15.0	13.7	74.87	19.16	74.20	19.73	73.51	20.32	73.20	20.62	72.84	20.93	70.20	19.35	
18.0	15.8	77.65	19.60	76.95	20.18	76.25	20.78	75.90	21.09	76.05	21.05	70.20	17.82	
20.0	17.6	80.02	19.99	79.30	20.58	78.57	21.19	78.97	21.31	76.05	19.66	70.20	16.56	
23.0	20.2	83.55	20.57	83.20	20.96	81.90	20.85	78.97	19.29	76.05	17.76	70.20	14.91	
26.0	22.0	93.60	17.36	85.75	21.39	81.90	19.47	78.97	17.96	76.05	16.51	70.20	14.02	
30.0	24.1	94.95	18.55	88.68	21.80	81.90	17.95	78.97	16.52	76.05	15.16	70.20	13.04	
120%	-29.8	-30.0	29.59	11.18	29.42	11.64	29.26	12.13	29.18	12.39	29.10	12.65	28.97	13.20
	-25.0	-25.4	31.15	11.81	30.97	12.28	30.80	12.78	30.72	13.04	30.64	13.31	30.49	13.86
	-19.8	-20.0	34.61	12.61	34.41	13.10	34.22	13.61	34.13	13.87	34.04	14.15	33.88	14.71
	-18.8	-19.0	38.06	12.93	37.82	13.42	37.59	13.94	37.48	14.20	37.37	14.48	37.16	15.05
	-16.7	-17.0	40.05	13.59	39.78	14.09	39.52	14.61	39.40	14.88	39.28	15.15	39.04	15.73
	-13.7	-15.0	42.10	14.35	41.81	14.85	41.53	15.38	41.39	15.66	41.26	15.94	41.00	16.53
	-11.8	-13.0	44.23	14.99	43.91	15.51	43.61	16.05	43.46	16.33	43.31	16.61	43.02	17.21
	-9.8	-11.0	46.42	15.65	46.08	16.18	45.75	16.73	45.59	17.01	45.42	17.31	45.11	17.91
	-9.5	-10.0	47.53	15.90	47.18	16.43	46.84	16.99	46.67	17.27	46.50	17.56	46.17	18.18
	-8.5	-9.1	48.55	16.21	48.19	16.75	47.84	17.31	47.66	17.60	47.49	17.89	47.15	18.51
	-7.0	-7.6	50.28	16.72	49.89	17.26	49.52	17.83	49.33	18.12	49.15	18.43	48.79	19.05
	-5.0	-5.6	52.62	17.40	52.21	17.96	51.82	18.54	51.62	18.84	51.42	19.15	51.03	19.79
	-3.0	-3.7	54.91	17.82	54.49	18.38	54.05	18.97	53.84	19.27	53.63	19.58	53.22	20.23
	0.0	-0.7	58.49	18.47	58.03	19.05	57.58	19.65	57.35	19.96	57.14	20.27	56.69	20.93
	3.0	2.2	61.64	18.80	61.14	19.38	60.63	19.98	60.39	20.29	60.14	20.61	59.65	21.27
	5.0	4.1	62.30	17.99	61.78	18.53	61.25	19.10	60.99	19.39	60.73	19.69	60.21	20.30
	7.0	6.0	64.24	18.05	63.69	18.60	63.14	19.16	62.86	19.45	62.59	19.75	62.03	20.36
	9.0	7.9	66.59	18.44	66.01	18.99	65.43	19.56	65.14	19.86	64.85	20.16	64.80	20.57
	11.0	9.8	69.00	18.83	68.40	19.39	67.78	19.97	67.49	20.27	67.19	20.58	64.80	19.17
	13.0	11.8	71.56	19.25	70.93	19.82	70.29	20.41	69.97	20.72	70.20	20.77	64.80	17.74
15.0	13.7	74.00	19.66	73.34	20.24	72.68	20.84	72.90	20.89	70.20	19.34	64.80	16.44	
18.0	15.8	76.73	20.12	76.04	20.72	75.60	20.78	72.90	19.26	70.20	17.81	64.80	15.08	
20.0	17.6	79.09	20.54	78.37	21.15	75.60	19.39	72.90	17.98	70.20	16.60	64.80	14.13	
23.0	20.2	81.68	20.98	81.00	20.34	75.60	17.51	72.90	16.19	70.20	14.92	64.80	12.95	
26.0	22.0	84.21	21.41	81.00	18.96	75.60	16.30	72.90	15.02	70.20	14.01	64.80	12.17	
30.0	24.1	84.21	19.55	81.00	17.48	75.60	14.92	72.90	13.96	70.20	13.05	64.80	11.29	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.15: 20HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	29.34	11.38	29.18	11.85	29.02	12.35	28.95	12.61	28.87	12.88	28.74	13.45
	-25.0	-25.4	30.89	12.03	30.71	12.51	30.55	13.02	30.47	13.29	30.39	13.56	30.26	14.13
	-19.8	-20.0	34.32	12.86	34.13	13.36	33.94	13.88	33.85	14.15	33.77	14.43	33.62	15.01
	-18.8	-19.0	37.75	13.19	37.51	13.69	37.29	14.21	37.18	14.49	37.08	14.77	36.88	15.36
	-16.7	-17.0	39.72	13.86	39.46	14.37	39.21	14.90	39.09	15.18	38.98	15.46	38.75	16.06
	-13.7	-15.0	41.77	14.64	41.48	15.16	41.21	15.71	41.07	15.99	40.95	16.28	40.69	16.89
	-11.8	-13.0	43.88	15.31	43.57	15.84	43.27	16.39	43.12	16.68	42.98	16.97	42.71	17.59
	-9.8	-11.0	46.05	15.99	45.72	16.53	45.40	17.10	45.24	17.39	45.08	17.69	44.77	18.32
	-9.5	-10.0	47.16	16.25	46.82	16.80	46.48	17.36	46.32	17.66	46.15	17.96	45.83	18.59
	-8.5	-9.1	48.17	16.58	47.81	17.12	47.47	17.70	47.30	18.00	47.13	18.30	46.80	18.94
	-7.0	-7.6	49.89	17.10	49.51	17.66	49.15	18.24	48.96	18.55	48.78	18.86	48.44	19.51
	-5.0	-5.6	52.14	17.81	51.76	18.38	51.37	18.98	51.19	19.29	51.00	19.61	50.64	20.28
	-3.0	-3.7	54.32	18.24	53.91	18.82	53.50	19.43	53.30	19.74	53.11	20.06	52.72	20.73
	0.0	-0.7	57.86	18.93	57.41	19.52	56.97	20.14	56.75	20.46	56.53	20.79	56.09	21.47
	3.0	2.2	60.96	19.29	60.45	19.89	59.96	20.51	59.72	20.83	59.48	21.15	59.40	21.59
	5.0	4.1	61.59	18.45	61.09	19.01	60.57	19.59	60.31	19.89	60.03	20.20	59.40	20.14
	7.0	6.0	63.49	18.54	62.94	19.09	62.40	19.67	62.12	19.97	61.85	20.28	59.40	18.77
	9.0	7.9	65.81	18.94	65.24	19.51	64.65	20.10	64.36	20.41	64.35	20.30	59.40	17.45
	11.0	9.8	68.17	19.36	67.57	19.94	66.96	20.54	66.82	20.31	64.35	18.89	59.40	16.17
	13.0	11.8	70.67	19.81	70.04	20.40	69.30	20.23	66.82	18.83	64.35	17.47	59.40	14.92
15.0	13.7	73.06	20.25	72.41	20.85	69.30	18.81	66.82	17.50	64.35	16.20	59.40	13.92	
18.0	15.8	75.71	20.76	74.25	19.96	69.30	17.32	66.82	16.09	64.35	14.88	59.40	13.00	
20.0	17.6	78.16	21.21	74.25	18.61	69.30	16.11	66.82	14.94	64.35	13.95	59.40	12.23	
23.0	20.2	79.20	19.29	74.25	16.80	69.30	14.49	66.82	13.62	64.35	12.77	59.40	11.16	
26.0	22.0	79.20	17.99	74.25	15.60	69.30	13.66	66.82	12.83	64.35	12.00	59.40	10.45	
30.0	24.1	79.20	16.52	74.25	14.37	69.30	12.69	66.82	11.90	64.35	11.12	59.40	9.64	
100%	-29.8	-30.0	29.12	11.63	28.95	12.11	28.80	12.63	28.73	12.90	28.67	13.17	28.54	13.75
	-25.0	-25.4	30.65	12.30	30.48	12.80	30.32	13.32	30.25	13.59	30.18	13.88	30.05	14.47
	-19.8	-20.0	34.06	13.16	33.87	13.67	33.69	14.21	33.61	14.49	33.53	14.78	33.38	15.39
	-18.8	-19.0	37.46	13.50	37.23	14.02	37.01	14.56	36.91	14.84	36.81	15.13	36.62	15.74
	-16.7	-17.0	39.41	14.20	39.16	14.72	38.92	15.27	38.81	15.56	38.70	15.85	38.48	16.47
	-13.7	-15.0	41.44	15.01	41.17	15.54	40.91	16.10	40.78	16.40	40.65	16.70	40.41	17.33
	-11.8	-13.0	43.54	15.70	43.24	16.24	42.95	16.82	42.81	17.11	42.67	17.42	42.41	18.06
	-9.8	-11.0	45.68	16.41	45.37	16.97	45.06	17.55	44.90	17.86	44.75	18.17	44.47	18.83
	-9.5	-10.0	46.74	16.68	46.42	17.24	46.11	17.83	45.95	18.14	45.80	18.45	45.51	19.11
	-8.5	-9.1	47.71	17.02	47.38	17.59	47.05	18.18	46.89	18.49	46.73	18.81	46.43	19.48
	-7.0	-7.6	49.35	17.56	49.00	18.14	48.65	18.75	48.48	19.06	48.31	19.39	47.98	20.06
	-5.0	-5.6	51.57	18.30	51.19	18.89	50.82	19.52	50.63	19.84	50.46	20.17	50.10	20.86
	-3.0	-3.7	53.71	18.76	53.31	19.36	52.93	19.99	52.73	20.32	52.53	20.65	52.14	21.35
	0.0	-0.7	57.18	19.50	56.76	20.11	56.31	20.75	56.10	21.08	55.88	21.43	54.00	20.29
	3.0	2.2	60.21	19.90	59.72	20.51	59.24	21.15	59.00	21.48	58.50	20.99	54.00	18.22
	5.0	4.1	60.84	19.03	60.32	19.60	59.81	20.21	60.75	20.93	58.50	19.58	54.00	16.96
	7.0	6.0	62.66	19.13	62.11	19.70	63.00	20.30	60.75	19.53	58.50	18.22	54.00	15.72
	9.0	7.9	64.95	19.57	64.38	20.15	63.00	19.45	60.75	18.16	58.50	16.94	54.00	14.56
	11.0	9.8	67.25	20.02	67.50	20.62	63.00	18.09	60.75	16.86	58.50	15.70	54.00	13.62
	13.0	11.8	69.67	20.51	67.50	19.12	63.00	16.71	60.75	15.58	58.50	14.45	54.00	12.76
15.0	13.7	72.00	20.19	67.50	17.77	63.00	15.49	60.75	14.39	58.50	13.55	54.00	11.98	
18.0	15.8	72.00	18.63	67.50	16.36	63.00	14.24	60.75	13.41	58.50	12.63	54.00	11.15	
20.0	17.6	72.00	17.36	67.50	15.18	63.00	13.41	60.75	12.62	58.50	11.89	54.00	10.45	
23.0	20.2	72.00	15.62	67.50	13.79	63.00	12.27	60.75	11.56	58.50	10.84	54.00	9.49	
26.0	22.0	72.00	14.50	67.50	12.97	63.00	11.50	60.75	10.83	58.50	10.13	54.00	8.96	
30.0	24.1	72.00	13.49	67.50	12.03	63.00	10.64	60.75	9.99	58.50	9.34	54.00	8.40	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.15: 20HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	28.48	12.40	28.33	12.92	28.18	13.47	28.11	13.75	28.04	14.05	27.92	14.67
	-25.0	-25.4	29.98	12.94	29.82	13.47	29.66	14.02	29.59	14.31	29.52	14.61	29.39	15.23
	-19.8	-20.0	33.32	13.55	33.13	14.07	32.96	14.63	32.88	14.93	32.80	15.23	32.66	15.86
	-18.8	-19.0	37.18	13.90	36.96	14.43	36.76	15.00	36.66	15.29	36.57	15.59	36.40	16.23
	-16.7	-17.0	39.12	14.63	38.88	15.17	38.65	15.74	38.54	16.04	38.44	16.35	38.24	16.99
	-13.7	-15.0	41.12	15.47	40.86	16.02	40.62	16.61	40.50	16.92	40.38	17.23	40.16	17.90
	-11.8	-13.0	43.12	16.18	42.84	16.75	42.57	17.35	42.44	17.66	42.32	17.99	42.08	18.66
	-9.8	-11.0	45.18	16.93	44.87	17.51	44.58	18.12	44.44	18.44	44.30	18.77	44.04	19.46
	-9.5	-10.0	46.22	17.21	45.91	17.80	45.60	18.41	45.46	18.74	45.31	19.07	45.03	19.76
	-8.5	-9.1	47.17	17.57	46.85	18.16	46.53	18.78	46.38	19.11	46.23	19.44	45.93	20.14
	-7.0	-7.6	48.78	18.14	48.43	18.74	48.10	19.38	47.93	19.71	47.77	20.05	47.46	20.76
	-5.0	-5.6	50.95	18.92	50.59	19.54	50.23	20.19	50.05	20.53	49.87	20.88	48.60	20.25
	-3.0	-3.7	53.06	19.42	52.67	20.05	52.29	20.70	52.09	21.05	52.65	21.56	48.60	18.91
	0.0	-0.7	56.47	20.21	56.03	20.85	56.70	21.96	54.67	20.66	52.65	19.37	48.60	16.91
	3.0	2.2	59.40	20.65	58.92	21.29	56.70	19.77	54.67	18.57	52.65	17.39	48.60	15.09
	5.0	4.1	59.97	19.74	59.46	20.35	56.70	18.44	54.67	17.28	52.65	16.16	48.60	13.99
	7.0	6.0	61.75	19.86	60.75	19.42	56.70	17.14	54.67	16.05	52.65	14.96	48.60	13.14
	9.0	7.9	64.80	20.38	60.75	18.06	56.70	15.90	54.67	14.84	52.65	13.82	48.60	12.16
	11.0	9.8	64.80	18.98	60.75	16.77	56.70	14.71	54.67	13.81	52.65	13.07	48.60	11.40
	13.0	11.8	64.80	17.55	60.75	15.47	56.70	13.67	54.67	12.93	52.65	12.23	48.60	10.70
15.0	13.7	64.80	16.27	60.75	14.32	56.70	12.85	54.67	12.16	52.65	11.46	48.60	10.00	
18.0	15.8	64.80	14.94	60.75	13.34	56.70	11.95	54.67	11.30	52.65	10.67	48.60	9.42	
20.0	17.6	64.80	13.95	60.75	12.55	56.70	11.23	54.67	10.60	52.65	10.00	48.60	8.94	
23.0	20.2	64.80	12.77	60.75	11.46	56.70	10.24	54.67	9.62	52.65	9.12	48.60	8.28	
26.0	22.0	64.80	11.97	60.75	10.73	56.70	9.55	54.67	9.05	52.65	8.63	48.60	7.84	
30.0	24.1	64.80	11.10	60.75	9.90	56.70	8.89	54.67	8.49	52.65	8.09	48.60	7.32	
80%	-29.8	-30.0	27.87	12.86	27.71	13.40	27.57	13.97	27.50	14.27	27.43	14.58	27.32	15.24
	-25.0	-25.4	29.33	13.42	29.17	13.97	29.02	14.55	28.94	14.85	28.88	15.17	28.75	15.84
	-19.8	-20.0	32.59	14.05	32.41	14.60	32.24	15.19	32.16	15.50	32.09	15.82	31.95	16.50
	-18.8	-19.0	36.89	14.41	36.70	14.98	36.52	15.57	36.43	15.88	36.35	16.21	36.21	16.89
	-16.7	-17.0	38.75	15.17	38.53	15.74	38.32	16.35	38.23	16.66	38.14	16.99	37.96	17.68
	-13.7	-15.0	40.66	16.05	40.42	16.63	40.19	17.26	40.08	17.58	39.97	17.92	39.78	18.63
	-11.8	-13.0	42.62	16.81	42.36	17.41	42.11	18.04	41.99	18.37	41.87	18.72	41.64	19.44
	-9.8	-11.0	44.64	17.60	44.35	18.21	44.07	18.86	43.94	19.20	43.81	19.55	43.20	19.52
	-9.5	-10.0	45.66	17.90	45.36	18.52	45.07	19.18	44.93	19.52	44.79	19.87	43.20	18.91
	-8.5	-9.1	46.59	18.28	46.28	18.91	45.98	19.57	45.83	19.91	45.69	20.27	43.20	18.47
	-7.0	-7.6	48.16	18.90	47.83	19.53	47.51	20.21	47.35	20.56	46.80	20.05	43.20	17.70
	-5.0	-5.6	50.30	19.73	49.93	20.39	50.40	21.33	48.60	20.15	46.80	18.97	43.20	16.68
	-3.0	-3.7	52.35	20.27	51.97	20.94	50.40	19.98	48.60	18.82	46.80	17.72	43.20	15.54
	0.0	-0.7	55.65	21.14	54.00	20.07	50.40	17.89	48.60	16.84	46.80	15.80	43.20	13.78
	3.0	2.2	57.60	20.18	54.00	18.05	50.40	16.01	48.60	15.04	46.80	14.08	43.20	12.54
	5.0	4.1	57.60	18.80	54.00	16.78	50.40	14.85	48.60	13.92	46.80	13.18	43.20	11.81
	7.0	6.0	57.60	17.49	54.00	15.56	50.40	13.78	48.60	13.07	46.80	12.39	43.20	10.86
	9.0	7.9	57.60	16.23	54.00	14.41	50.40	12.80	48.60	12.12	46.80	11.41	43.20	10.15
	11.0	9.8	57.60	15.01	54.00	13.45	50.40	12.07	48.60	11.44	46.80	10.69	43.20	9.45
	13.0	11.8	57.60	13.88	54.00	12.59	50.40	11.29	48.60	10.64	46.80	10.03	43.20	8.78
15.0	13.7	57.60	13.02	54.00	11.82	50.40	10.66	48.60	9.99	46.80	9.31	43.20	8.29	
18.0	15.8	57.60	12.13	54.00	11.00	50.40	9.89	48.60	9.34	46.80	8.95	43.20	8.17	
20.0	17.6	57.60	11.41	54.00	10.30	50.40	9.25	48.60	8.86	46.80	8.48	43.20	7.77	
23.0	20.2	57.60	10.37	54.00	9.35	50.40	8.56	48.60	8.20	46.80	7.85	43.20	7.19	
26.0	22.0	57.60	9.69	54.00	8.81	50.40	8.09	48.60	7.76	46.80	7.43	43.20	6.80	
30.0	24.1	57.60	8.95	54.00	8.25	50.40	7.58	48.60	7.25	46.80	6.94	43.20	6.21	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.15: 20HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	27.26	13.44	27.11	14.02	26.97	14.63	26.90	14.96	26.84	15.30	26.72	19.72
	-25.0	-25.4	28.69	14.04	28.53	14.62	28.39	15.25	28.32	15.58	28.25	15.92	28.13	16.76
	-19.8	-20.0	31.88	14.71	31.70	15.30	31.54	15.94	31.46	16.27	31.39	16.62	31.25	17.35
	-18.8	-19.0	36.49	15.10	36.31	15.70	36.15	16.34	36.08	16.68	36.01	17.02	35.89	17.76
	-16.7	-17.0	38.30	15.90	38.10	16.52	37.92	17.17	37.84	17.51	37.76	17.86	37.80	18.44
	-13.7	-15.0	40.17	16.84	39.95	17.47	39.74	18.14	39.64	18.49	39.55	18.86	37.80	17.71
	-11.8	-13.0	42.09	17.66	41.84	18.30	41.61	18.99	41.50	19.35	40.95	18.87	37.80	16.80
	-9.8	-11.0	44.05	18.51	43.78	19.17	44.10	19.98	42.53	18.94	40.95	17.91	37.80	15.90
	-9.5	-10.0	45.04	18.84	44.76	19.51	44.10	19.38	42.53	18.34	40.95	17.33	37.80	15.37
	-8.5	-9.1	45.95	19.25	45.65	19.93	44.10	18.93	42.53	17.91	40.95	16.91	37.80	14.97
	-7.0	-7.6	47.47	19.92	47.25	20.19	44.10	18.15	42.53	17.16	40.95	16.18	37.80	14.28
	-5.0	-5.6	50.40	21.12	47.25	19.10	44.10	17.13	42.53	16.18	40.95	15.23	37.80	13.41
	-3.0	-3.7	50.40	19.76	47.25	17.82	44.10	15.95	42.53	15.03	40.95	14.13	37.80	12.62
	0.0	-0.7	50.40	17.73	47.25	15.92	44.10	14.16	42.53	13.39	40.95	12.73	37.80	11.46
	3.0	2.2	50.40	15.84	47.25	14.16	44.10	12.80	42.53	12.19	40.95	11.59	37.80	10.44
	5.0	4.1	50.40	14.67	47.25	13.23	44.10	12.03	42.53	11.47	40.95	10.91	37.80	9.81
	7.0	6.0	50.40	13.62	47.25	12.44	44.10	11.13	42.53	10.53	40.95	9.94	37.80	8.86
	9.0	7.9	50.40	12.67	47.25	11.47	44.10	10.34	42.53	9.81	40.95	9.30	37.80	8.38
	11.0	9.8	50.40	11.94	47.25	10.76	44.10	9.65	42.53	9.14	40.95	8.66	37.80	7.84
	13.0	11.8	50.40	11.16	47.25	10.03	44.10	9.02	42.53	8.52	40.95	8.13	37.80	7.39
15.0	13.7	50.40	10.53	47.25	9.41	44.10	8.43	42.53	8.04	40.95	7.67	37.80	7.02	
18.0	15.8	50.40	9.74	47.25	8.93	44.10	8.27	42.53	7.97	40.95	7.42	37.80	6.61	
20.0	17.6	50.40	9.13	47.25	8.48	44.10	7.85	42.53	7.56	40.95	7.26	37.80	6.35	
23.0	20.2	50.40	8.44	47.25	7.83	44.10	7.26	42.53	6.97	40.95	6.71	37.80	6.18	
26.0	22.0	50.40	7.98	47.25	7.41	44.10	6.85	42.53	6.61	40.95	6.34	37.80	5.83	
30.0	24.1	50.40	7.47	47.25	6.93	44.10	6.41	42.53	6.02	40.95	5.57	37.80	4.95	
60%	-29.8	-30.0	26.67	14.28	26.52	14.91	26.38	15.69	26.31	15.80	26.25	16.31	26.14	16.93
	-25.0	-25.4	28.07	14.93	27.91	15.57	27.77	16.32	27.70	16.59	27.64	16.64	27.52	16.37
	-19.8	-20.0	31.19	15.65	31.01	16.31	30.85	17.01	30.78	17.38	30.71	16.97	30.57	15.90
	-18.8	-19.0	36.07	16.08	35.92	16.74	35.79	17.45	36.45	18.18	35.10	17.30	32.40	15.54
	-16.7	-17.0	37.83	16.95	37.66	17.63	37.80	18.27	36.45	17.38	35.10	16.52	32.40	14.79
	-13.7	-15.0	39.64	17.98	39.45	18.68	37.80	17.55	36.45	16.67	35.10	15.81	32.40	14.12
	-11.8	-13.0	41.50	18.88	40.50	18.38	37.80	16.64	36.45	15.81	35.10	14.96	32.40	13.31
	-9.8	-11.0	43.20	19.15	40.50	17.43	37.80	15.75	36.45	14.93	35.10	14.11	32.40	12.57
	-9.5	-10.0	43.20	18.56	40.50	16.86	37.80	15.22	36.45	14.41	35.10	13.61	32.40	12.21
	-8.5	-9.1	43.20	18.12	40.50	16.45	37.80	14.83	36.45	14.03	35.10	13.25	32.40	11.96
	-7.0	-7.6	43.20	17.36	40.50	15.75	37.80	14.16	36.45	13.37	35.10	12.71	32.40	11.53
	-5.0	-5.6	43.20	16.38	40.50	14.79	37.80	13.28	36.45	12.69	35.10	12.11	32.40	10.96
	-3.0	-3.7	43.20	15.21	40.50	13.73	37.80	12.51	36.45	11.94	35.10	11.38	32.40	10.31
	0.0	-0.7	43.20	13.50	40.50	12.39	37.80	11.34	36.45	10.83	35.10	10.33	32.40	9.34
	3.0	2.2	43.20	12.28	40.50	11.28	37.80	10.33	36.45	9.84	35.10	9.40	32.40	8.65
	5.0	4.1	43.20	11.54	40.50	10.61	37.80	9.68	36.45	9.24	35.10	8.91	32.40	8.23
	7.0	6.0	43.20	10.67	40.50	9.66	37.80	8.76	36.45	8.42	35.10	8.07	32.40	7.42
	9.0	7.9	43.20	9.88	40.50	9.07	37.80	8.25	36.45	7.90	35.10	7.56	32.40	6.92
	11.0	9.8	43.20	9.22	40.50	8.40	37.80	7.74	36.45	7.43	35.10	7.12	32.40	6.53
	13.0	11.8	43.20	8.56	40.50	7.91	37.80	7.30	36.45	6.99	35.10	6.71	32.40	6.14
15.0	13.7	43.20	8.09	40.50	7.48	37.80	6.90	36.45	6.65	35.10	6.37	32.40	5.83	
18.0	15.8	43.20	7.96	40.50	7.21	37.80	6.56	36.45	6.22	35.10	5.94	32.40	5.44	
20.0	17.6	43.20	7.55	40.50	6.93	37.80	6.26	36.45	5.97	35.10	5.65	32.40	5.15	
23.0	20.2	43.20	6.97	40.50	6.52	37.80	6.09	36.45	5.75	35.10	5.32	32.40	4.73	
26.0	22.0	43.20	6.58	40.50	6.16	37.80	5.74	36.45	5.53	35.10	5.34	32.40	4.95	
30.0	24.1	43.20	6.01	40.50	5.42	37.80	4.90	36.45	4.63	35.10	4.40	32.40	4.02	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.15:20HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
	°C DB	°C WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
50%	-29.8	-30.0	26.09	13.55	25.94	13.71	26.93	15.79	25.97	15.10	25.01	14.00	23.09	13.10
	-25.0	-25.4	27.46	14.67	27.31	14.65	28.35	15.45	27.34	14.75	26.33	14.10	24.30	12.69
	-19.8	-20.0	30.51	16.21	30.34	16.55	31.50	15.11	30.38	14.41	29.25	13.72	27.00	12.32
	-18.8	-19.0	36.00	17.60	33.75	16.18	31.50	14.77	30.38	14.06	29.25	13.37	27.00	11.99
	-16.7	-17.0	36.00	16.82	33.75	15.43	31.50	14.05	30.38	13.37	29.25	12.68	27.00	11.45
	-13.7	-15.0	36.00	16.13	33.75	14.74	31.50	13.39	30.38	12.71	29.25	12.07	27.00	11.07
	-11.8	-13.0	36.00	15.28	33.75	13.94	31.50	12.61	30.38	12.05	29.25	11.55	27.00	10.56
	-9.8	-11.0	36.00	14.42	33.75	13.10	31.50	11.99	30.38	11.51	29.25	11.02	27.00	10.05
	-9.5	-10.0	36.00	13.93	33.75	12.65	31.50	11.66	30.38	11.18	29.25	10.70	27.00	9.75
	-8.5	-9.1	36.00	13.55	33.75	12.38	31.50	11.41	30.38	10.94	29.25	10.47	27.00	9.53
	-7.0	-7.6	36.00	12.91	33.75	11.94	31.50	11.00	30.38	10.53	29.25	10.08	27.00	9.17
	-5.0	-5.6	36.00	12.28	33.75	11.36	31.50	10.44	30.38	10.01	29.25	9.57	27.00	8.76
	-3.0	-3.7	36.00	11.55	33.75	10.69	31.50	9.82	30.38	9.40	29.25	8.99	27.00	8.35
	0.0	-0.7	36.00	10.48	33.75	9.69	31.50	8.93	30.38	8.64	29.25	8.33	27.00	7.74
	3.0	2.2	36.00	9.53	33.75	8.86	31.50	8.29	30.38	8.02	29.25	7.74	27.00	7.20
	5.0	4.1	36.00	8.98	33.75	8.43	31.50	7.89	30.38	7.49	29.25	7.11	27.00	6.42
	7.0	6.0	36.00	8.13	33.75	7.61	31.50	7.09	30.38	6.84	29.25	6.59	27.00	6.09
	9.0	7.9	36.00	7.62	33.75	7.09	31.50	6.58	30.38	6.35	29.25	6.10	27.00	5.63
	11.0	9.8	36.00	7.17	33.75	6.69	31.50	6.22	30.38	5.99	29.25	5.77	27.00	5.32
	13.0	11.8	36.00	6.76	33.75	6.31	31.50	5.86	30.38	5.64	29.25	5.43	27.00	5.01
15.0	13.7	36.00	6.42	33.75	5.98	31.50	5.55	30.38	5.33	29.25	5.13	27.00	4.73	
18.0	15.8	36.00	6.00	33.75	5.56	31.50	5.18	30.38	5.00	29.25	4.80	27.00	4.43	
20.0	17.6	36.00	5.77	33.75	5.27	31.50	4.89	30.38	4.70	29.25	4.55	27.00	4.26	
23.0	20.2	36.00	5.42	33.75	4.94	31.50	4.51	30.38	4.27	29.25	4.11	27.00	3.84	
26.0	22.0	36.00	5.34	33.75	5.03	31.50	4.73	30.38	4.61	29.25	4.48	27.00	3.97	
30.0	24.1	36.00	4.44	33.75	4.09	31.50	3.82	30.38	3.73	29.25	3.66	27.00	3.43	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table2-8.16:22HP heating capacity

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
130%	-29.8	-30.0	31.21	11.84	31.03	12.32	30.85	12.83	30.77	13.09	30.68	13.36	30.52	13.92
	-25.0	-25.4	32.86	12.37	32.66	12.86	32.48	13.38	32.39	13.64	32.30	13.92	32.13	14.48
	-19.8	-20.0	36.51	12.89	36.29	13.39	36.08	13.91	35.98	14.18	35.89	14.46	35.70	15.03
	-18.8	-19.0	39.46	13.21	39.21	13.72	38.97	14.24	38.85	14.51	38.73	14.79	38.51	15.37
	-16.7	-17.0	41.49	13.88	41.22	14.39	40.95	14.92	40.82	15.19	40.70	15.47	40.45	16.06
	-13.7	-15.0	43.60	14.64	43.31	15.16	43.02	15.70	42.88	15.98	42.73	16.27	42.46	16.87
	-11.8	-13.0	45.78	15.28	45.46	15.81	45.15	16.36	44.99	16.65	44.84	16.94	44.54	17.54
	-9.8	-11.0	48.03	15.94	47.68	16.48	47.35	17.04	47.18	17.33	47.01	17.63	46.68	18.24
	-9.5	-10.0	49.18	16.19	48.82	16.73	48.47	17.29	48.29	17.58	48.12	17.88	47.78	18.50
	-8.5	-9.1	50.22	16.50	49.86	17.04	49.49	17.61	49.31	17.91	49.13	18.21	48.78	18.83
	-7.0	-7.6	52.00	16.99	51.61	17.55	51.22	18.13	51.03	18.43	50.84	18.73	50.47	19.36
	-5.0	-5.6	54.42	17.67	54.01	18.24	53.60	18.83	53.39	19.13	53.18	19.44	52.78	20.09
	-3.0	-3.7	56.78	18.07	56.34	18.64	55.90	19.24	55.68	19.55	55.47	19.86	55.03	20.51
	0.0	-0.7	60.60	18.70	60.11	19.29	59.64	19.89	59.39	20.20	59.16	20.52	58.67	21.18
	3.0	2.2	63.97	19.02	63.45	19.60	62.93	20.21	62.67	20.52	62.41	20.84	61.89	21.49
	5.0	4.1	64.77	18.19	64.22	18.75	63.67	19.32	63.40	19.62	63.12	19.92	62.56	20.54
	7.0	6.0	66.84	18.25	66.27	18.80	65.72	19.37	65.40	19.67	65.12	19.97	64.56	20.58
	9.0	7.9	69.33	18.61	68.75	19.17	68.17	19.75	67.87	20.05	67.58	20.36	66.99	20.98
	11.0	9.8	71.87	18.97	71.26	19.54	70.65	20.13	70.34	20.44	70.01	20.75	69.42	21.38
	13.0	11.8	74.55	19.36	73.89	19.95	73.28	20.55	72.95	20.85	72.63	21.17	71.98	21.81
15.0	13.7	77.11	19.74	76.44	20.34	75.79	20.95	75.43	21.26	75.09	21.58	74.42	22.24	
18.0	15.8	80.01	20.18	79.28	20.78	78.61	21.40	78.25	21.72	77.87	22.05	76.89	21.70	
20.0	17.6	82.46	20.56	81.74	21.18	81.01	21.81	80.68	22.13	80.28	22.43	76.89	20.24	
23.0	20.2	86.13	21.13	83.69	21.14	82.96	21.77	82.59	22.09	82.18	22.41	76.89	18.20	
26.0	22.0	87.41	20.87	86.08	21.42	85.33	22.05	84.95	22.37	84.53	22.69	76.89	16.92	
30.0	24.1	89.89	21.12	88.70	21.82	87.91	22.46	86.50	20.39	83.29	18.66	76.89	15.54	
120%	-29.8	-30.0	30.78	11.90	30.60	12.39	30.43	12.91	30.35	13.17	30.27	13.45	30.11	14.02
	-25.0	-25.4	32.40	12.48	32.21	12.97	32.03	13.49	31.94	13.76	31.86	14.04	31.70	14.62
	-19.8	-20.0	36.00	13.08	35.79	13.59	35.59	14.12	35.49	14.39	35.40	14.68	35.22	15.27
	-18.8	-19.0	39.09	13.41	38.85	13.92	38.61	14.46	38.50	14.73	38.38	15.02	38.17	15.61
	-16.7	-17.0	41.12	14.09	40.85	14.61	40.59	15.15	40.46	15.43	40.34	15.72	40.10	16.31
	-13.7	-15.0	43.22	14.87	42.93	15.40	42.64	15.95	42.50	16.24	42.36	16.53	42.10	17.14
	-11.8	-13.0	45.39	15.53	45.08	16.07	44.76	16.63	44.61	16.92	44.46	17.22	44.17	17.83
	-9.8	-11.0	47.62	16.21	47.29	16.76	46.95	17.33	46.78	17.62	46.62	17.92	46.30	18.55
	-9.5	-10.0	48.77	16.46	48.42	17.01	48.07	17.59	47.89	17.88	47.72	18.19	47.39	18.82
	-8.5	-9.1	49.81	16.78	49.44	17.34	49.08	17.92	48.90	18.21	48.73	18.52	48.39	19.16
	-7.0	-7.6	51.58	17.30	51.19	17.86	50.81	18.45	50.62	18.75	50.44	19.06	50.06	19.71
	-5.0	-5.6	53.99	17.99	53.57	18.57	53.17	19.17	52.95	19.48	52.76	19.80	52.37	20.46
	-3.0	-3.7	56.32	18.41	55.89	18.99	55.46	19.60	55.24	19.91	55.02	20.23	54.60	20.90
	0.0	-0.7	60.12	19.07	59.64	19.67	59.17	20.28	58.93	20.60	58.70	20.93	58.23	21.60
	3.0	2.2	63.40	19.41	62.89	20.00	62.40	20.62	62.15	20.94	61.91	21.27	61.40	21.94
	5.0	4.1	64.15	18.57	63.62	19.13	63.10	19.72	62.83	20.02	62.56	20.33	62.04	20.96
	7.0	6.0	66.16	18.63	65.61	19.19	65.05	19.78	64.78	20.08	64.50	20.38	63.94	21.01
	9.0	7.9	68.59	19.01	68.01	19.58	67.43	20.18	67.14	20.48	66.85	20.79	66.29	21.43
	11.0	9.8	71.10	19.39	70.49	19.98	69.88	20.58	69.57	20.89	69.26	21.20	68.63	21.86
	13.0	11.8	73.74	19.81	73.11	20.40	72.47	21.02	72.14	21.33	71.82	21.65	70.97	21.43
15.0	13.7	76.25	20.22	75.59	20.82	74.94	21.44	74.58	21.76	74.27	22.09	70.97	19.88	
18.0	15.8	79.08	20.68	78.38	21.29	77.71	21.93	77.33	22.26	76.89	21.68	70.97	18.31	
20.0	17.6	81.52	21.09	80.83	21.71	80.10	22.36	79.84	21.95	76.89	20.22	70.97	16.99	
23.0	20.2	84.09	21.48	83.36	22.11	82.80	21.46	79.84	19.82	76.89	18.23	70.97	15.29	
26.0	22.0	86.67	21.89	85.91	22.54	82.80	20.01	79.84	18.43	76.89	16.91	70.97	14.42	
30.0	24.1	89.25	22.30	88.47	22.96	82.80	18.38	79.84	16.88	76.89	15.53	70.97	13.41	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...



Table2-8.16:22HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW	TC kW	PI kW
110%	-29.8	-30.0	30.60	12.21	30.42	12.71	30.25	13.23	30.17	13.50	30.10	13.78	29.95	14.36
	-25.0	-25.4	32.21	12.78	32.02	13.28	31.85	13.81	31.76	14.09	31.68	14.37	31.53	14.96
	-19.8	-20.0	35.79	13.31	35.58	13.83	35.39	14.37	35.29	14.65	35.20	14.94	35.03	15.55
	-18.8	-19.0	38.75	13.66	38.51	14.18	38.28	14.72	38.17	15.00	38.06	15.29	37.85	15.90
	-16.7	-17.0	40.76	14.35	40.50	14.88	40.24	15.43	40.12	15.71	40.00	16.01	39.77	16.62
	-13.7	-15.0	42.85	15.15	42.57	15.69	42.29	16.25	42.15	16.54	42.02	16.84	41.76	17.47
	-11.8	-13.0	45.01	15.83	44.70	16.38	44.40	16.95	44.25	17.25	44.10	17.55	43.81	18.19
	-9.8	-11.0	47.24	16.53	46.90	17.09	46.57	17.67	46.41	17.97	46.25	18.28	45.93	18.93
	-9.5	-10.0	48.37	16.79	48.02	17.35	47.68	17.94	47.52	18.25	47.35	18.56	47.02	19.20
	-8.5	-9.1	49.40	17.12	49.05	17.69	48.69	18.28	48.52	18.59	48.35	18.90	48.01	19.56
	-7.0	-7.6	51.15	17.66	50.78	18.23	50.40	18.83	50.22	19.15	50.04	19.47	49.68	20.13
	-5.0	-5.6	53.55	18.38	53.15	18.97	52.75	19.58	52.55	19.90	52.35	20.23	51.96	20.91
	-3.0	-3.7	55.87	18.82	55.44	19.42	55.01	20.04	54.80	20.36	54.59	20.69	54.18	21.38
	0.0	-0.7	59.53	19.51	59.07	20.12	58.61	20.75	58.39	21.08	58.18	21.42	57.74	22.11
	3.0	2.2	62.74	19.87	62.24	20.48	61.73	21.11	61.49	21.44	61.24	21.78	60.75	22.47
	5.0	4.1	63.44	19.01	62.92	19.59	62.41	20.19	62.15	20.49	61.89	20.81	61.34	21.46
	7.0	6.0	65.40	19.09	64.87	19.66	64.32	20.26	64.04	20.56	63.76	20.88	63.21	21.53
	9.0	7.9	67.81	19.49	67.25	20.07	66.65	20.68	66.36	20.99	66.07	21.31	65.06	20.92
	11.0	9.8	70.27	19.90	69.66	20.50	69.06	21.11	68.75	21.43	68.45	21.75	65.06	19.44
	13.0	11.8	72.84	20.35	72.21	20.95	71.57	21.58	71.28	21.90	70.48	21.10	65.06	17.95
15.0	13.7	75.36	20.78	74.69	21.40	74.03	22.04	73.19	21.17	70.48	19.59	65.06	16.61	
18.0	15.8	78.14	21.27	77.44	21.90	75.90	21.05	73.19	19.51	70.48	18.03	65.06	15.24	
20.0	17.6	80.50	21.72	79.60	22.20	75.90	19.63	73.19	18.15	70.48	16.71	65.06	14.35	
23.0	20.2	82.30	21.52	81.32	20.56	75.90	17.65	73.19	16.27	70.48	15.09	65.06	13.16	
26.0	22.0	84.61	21.78	81.32	19.15	75.90	16.38	73.19	15.18	70.48	14.19	65.06	12.36	
30.0	24.1	86.92	22.04	81.32	17.56	75.90	15.09	73.19	14.12	70.48	13.21	65.06	11.44	
100%	-29.8	-30.0	30.38	12.44	30.20	12.95	30.04	13.48	29.97	13.76	29.89	14.05	29.75	14.65
	-25.0	-25.4	31.98	13.03	31.79	13.54	31.62	14.09	31.54	14.37	31.47	14.66	31.32	15.27
	-19.8	-20.0	35.53	13.60	35.33	14.13	35.14	14.68	35.05	14.97	34.96	15.27	34.80	15.89
	-18.8	-19.0	38.42	13.95	38.19	14.48	37.97	15.04	37.86	15.33	37.76	15.63	37.56	16.26
	-16.7	-17.0	40.43	14.67	40.17	15.21	39.92	15.77	39.81	16.07	39.69	16.37	39.47	17.00
	-13.7	-15.0	42.50	15.49	42.22	16.04	41.95	16.62	41.82	16.92	41.69	17.23	41.44	17.88
	-11.8	-13.0	44.65	16.20	44.35	16.76	44.05	17.35	43.90	17.65	43.76	17.97	43.48	18.62
	-9.8	-11.0	46.86	16.92	46.53	17.49	46.21	18.10	46.05	18.41	45.89	18.73	45.59	19.39
	-9.5	-10.0	47.99	17.20	47.65	17.78	47.31	18.38	47.14	18.69	46.98	19.01	46.67	19.69
	-8.5	-9.1	49.01	17.54	48.66	18.13	48.31	18.74	48.14	19.05	47.98	19.38	47.65	20.06
	-7.0	-7.6	50.74	18.10	50.38	18.69	50.01	19.31	49.83	19.64	49.66	19.97	49.31	20.66
	-5.0	-5.6	53.06	18.85	52.66	19.46	52.28	20.09	52.10	20.42	51.92	20.76	51.55	21.47
	-3.0	-3.7	55.27	19.31	54.85	19.93	54.45	20.57	54.26	20.90	54.07	21.24	53.67	21.96
	0.0	-0.7	58.85	20.04	58.40	20.67	57.97	21.32	57.75	21.66	57.53	22.01	57.10	22.74
	3.0	2.2	61.98	20.43	61.50	21.06	61.01	21.72	60.77	22.06	60.53	22.40	59.14	21.67
	5.0	4.1	62.68	19.55	62.18	20.14	65.66	22.11	61.40	21.08	61.14	21.40	59.14	20.19
	7.0	6.0	64.60	19.64	64.05	20.23	69.00	22.50	63.25	21.16	64.07	21.79	59.14	18.75
	9.0	7.9	66.98	20.07	66.39	20.68	69.00	21.30	66.54	21.81	64.07	20.27	59.14	17.39
	11.0	9.8	69.37	20.52	68.77	21.13	69.00	21.77	66.54	20.25	64.07	18.84	59.14	16.09
	13.0	11.8	71.91	21.00	71.26	21.62	69.00	20.15	66.54	18.74	64.07	17.35	59.14	14.85
15.0	13.7	74.35	21.47	73.93	21.52	69.00	18.69	66.54	17.34	64.07	16.06	59.14	13.95	
18.0	15.8	77.03	22.01	73.93	19.83	69.00	17.14	66.54	15.89	64.07	14.80	59.14	13.02	
20.0	17.6	78.86	21.14	73.93	18.43	69.00	15.91	66.54	14.84	64.07	13.96	59.14	12.25	
23.0	20.2	78.86	19.07	73.93	16.56	69.00	14.47	66.54	13.61	64.07	12.77	59.14	11.19	
26.0	22.0	78.86	17.70	73.93	15.35	69.00	13.60	66.54	12.78	64.07	12.00	59.14	10.46	
30.0	24.1	78.86	16.23	73.93	14.30	69.00	12.65	66.54	11.85	64.07	11.08	59.14	9.68	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table 2-8.16: 22HP heating capacity (continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
90%	-29.8	-30.0	29.72	12.79	29.55	13.32	29.39	13.89	29.31	14.18	29.24	14.48	29.11	15.12
	-25.0	-25.4	31.28	13.34	31.10	13.88	30.93	14.45	30.86	14.75	30.78	15.05	30.64	15.69
	-19.8	-20.0	34.76	13.96	34.56	14.50	34.37	15.08	34.29	15.38	34.20	15.69	34.04	16.33
	-18.8	-19.0	38.12	14.32	37.90	14.87	37.68	15.45	37.58	15.75	37.49	16.06	37.31	16.71
	-16.7	-17.0	40.11	15.06	39.86	15.62	39.63	16.21	39.51	16.51	39.40	16.83	39.20	17.49
	-13.7	-15.0	42.17	15.92	41.90	16.49	41.64	17.09	41.51	17.40	41.39	17.73	41.16	18.40
	-11.8	-13.0	44.30	16.66	44.00	17.24	43.72	17.85	43.58	18.17	43.45	18.50	43.18	19.18
	-9.8	-11.0	46.46	17.42	46.15	18.01	45.85	18.63	45.70	18.96	45.56	19.29	45.27	19.99
	-9.5	-10.0	47.54	17.70	47.22	18.30	46.91	18.93	46.76	19.26	46.61	19.60	46.32	20.30
	-8.5	-9.1	48.53	18.06	48.19	18.67	47.87	19.30	47.71	19.63	47.55	19.97	47.25	20.68
	-7.0	-7.6	50.18	18.64	49.83	19.26	49.49	19.91	49.32	20.24	49.15	20.59	48.83	21.31
	-5.0	-5.6	52.43	19.43	52.06	20.06	51.69	20.73	51.51	21.07	51.33	21.42	50.98	22.16
	-3.0	-3.7	54.61	19.92	54.23	20.56	53.83	21.23	53.64	21.58	53.43	21.94	53.23	22.29
	0.0	-0.7	58.15	20.71	57.70	21.36	57.26	22.05	57.05	22.40	57.66	22.95	53.23	20.00
	3.0	2.2	61.20	21.14	60.72	21.79	60.24	22.48	59.88	22.06	57.66	20.64	53.23	17.88
	5.0	4.1	61.85	20.22	61.35	20.84	62.10	21.93	59.88	20.56	57.66	19.20	53.23	16.58
	7.0	6.0	63.73	20.33	63.17	20.95	62.10	20.46	59.88	19.10	57.66	17.81	53.23	15.31
	9.0	7.9	66.04	20.81	66.54	21.67	62.10	18.99	59.88	17.72	57.66	16.49	53.23	14.24
	11.0	9.8	68.37	21.29	66.54	20.15	62.10	17.61	59.88	16.40	57.66	15.23	53.23	13.46
	13.0	11.8	70.97	21.15	66.54	18.61	62.10	16.23	59.88	15.06	57.66	14.21	53.23	12.60
15.0	13.7	70.97	19.63	66.54	17.23	62.10	14.99	59.88	14.15	57.66	13.36	53.23	11.83	
18.0	15.8	70.97	18.02	66.54	15.76	62.10	13.98	59.88	13.19	57.66	12.46	53.23	11.01	
20.0	17.6	70.97	16.73	66.54	14.71	62.10	13.17	59.88	12.43	57.66	11.69	53.23	10.32	
23.0	20.2	70.97	15.04	66.54	13.48	62.10	12.04	59.88	11.34	57.66	10.65	53.23	9.44	
26.0	22.0	70.97	14.15	66.54	12.66	62.10	11.26	59.88	10.62	57.66	9.94	53.23	8.94	
30.0	24.1	70.97	13.15	66.54	11.76	62.10	10.40	59.88	9.75	57.66	9.28	53.23	8.34	
80%	-29.8	-30.0	29.07	13.20	28.90	13.76	28.75	14.34	28.68	14.65	28.61	14.97	28.47	15.63
	-25.0	-25.4	30.60	13.78	30.43	14.34	30.26	14.93	30.19	15.24	30.11	15.56	29.97	16.24
	-19.8	-20.0	34.00	14.42	33.81	14.99	33.62	15.59	33.54	15.91	33.46	16.23	33.30	16.91
	-18.8	-19.0	37.84	14.80	37.63	15.37	37.43	15.98	37.34	16.30	37.25	16.62	37.09	17.31
	-16.7	-17.0	39.81	15.58	39.57	16.16	39.35	16.78	39.25	17.10	39.15	17.43	38.96	18.13
	-13.7	-15.0	41.81	16.47	41.56	17.07	41.32	17.70	41.21	18.03	41.10	18.37	40.89	19.09
	-11.8	-13.0	43.84	17.24	43.56	17.85	43.30	18.50	43.18	18.83	43.05	19.18	42.82	19.91
	-9.8	-11.0	45.92	18.04	45.62	18.66	45.34	19.32	45.20	19.66	45.06	20.02	44.80	20.76
	-9.5	-10.0	46.98	18.35	46.67	18.97	46.37	19.64	46.22	19.98	46.08	20.34	45.81	21.08
	-8.5	-9.1	47.94	18.73	47.62	19.36	47.31	20.03	47.16	20.38	47.01	20.74	47.31	21.58
	-7.0	-7.6	49.57	19.34	49.23	19.99	48.90	20.67	48.74	21.03	48.59	21.39	47.31	20.73
	-5.0	-5.6	51.78	20.18	51.41	20.85	51.05	21.55	50.89	21.91	51.26	22.28	47.31	19.58
	-3.0	-3.7	53.92	20.72	53.53	21.39	53.13	22.10	53.23	22.18	51.26	20.83	47.31	18.24
	0.0	-0.7	57.35	21.57	56.91	22.26	55.20	21.14	53.23	19.87	51.26	18.63	47.31	16.23
	3.0	2.2	60.31	22.05	59.14	21.40	55.20	18.97	53.23	17.79	51.26	16.63	47.31	14.44
	5.0	4.1	60.91	21.09	59.14	19.94	55.20	17.60	53.23	16.48	51.26	15.39	47.31	13.59
	7.0	6.0	63.09	20.85	59.14	18.50	55.20	16.31	53.23	15.22	51.26	14.31	47.31	12.77
	9.0	7.9	63.09	19.36	59.14	17.17	55.20	15.04	53.23	14.12	51.26	13.32	47.31	11.77
	11.0	9.8	63.09	17.96	59.14	15.86	55.20	14.08	53.23	13.35	51.26	12.56	47.31	11.02
	13.0	11.8	63.09	16.56	59.14	14.64	55.20	13.19	53.23	12.52	51.26	11.75	47.31	10.32
15.0	13.7	63.09	15.26	59.14	13.74	55.20	12.39	53.23	11.74	51.26	11.10	47.31	9.68	
18.0	15.8	63.09	14.18	59.14	12.81	55.20	11.54	53.23	10.91	51.26	10.31	47.31	9.26	
20.0	17.6	63.09	13.34	59.14	12.05	55.20	10.82	53.23	10.22	51.26	9.66	47.31	8.78	
23.0	20.2	63.09	12.19	59.14	10.96	55.20	9.80	53.23	9.36	51.26	8.92	47.31	8.11	
26.0	22.0	63.09	11.41	59.14	10.27	55.20	9.26	53.23	8.84	51.26	8.43	47.31	7.66	
30.0	24.1	63.09	10.56	59.14	9.47	55.20	8.66	53.23	8.27	51.26	7.88	47.31	7.14	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.16:22HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
	°C DB	°C WB	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
70%	-29.8	-30.0	28.44	13.77	28.28	14.35	28.12	14.98	28.05	15.30	27.98	15.65	27.86	16.36
	-25.0	-25.4	29.94	14.37	29.76	14.97	29.60	15.60	29.53	15.93	29.46	16.28	29.32	17.00
	-19.8	-20.0	33.26	15.05	33.07	15.65	32.89	16.29	32.81	16.63	32.73	16.98	32.58	17.71
	-18.8	-19.0	37.50	15.45	37.32	16.05	37.15	16.70	37.07	17.04	36.99	17.39	36.86	18.13
	-16.7	-17.0	39.38	16.26	39.17	16.88	38.98	17.54	38.88	17.88	38.80	18.24	38.64	18.99
	-13.7	-15.0	41.31	17.21	41.08	17.84	40.86	18.52	40.76	18.87	40.66	19.24	40.47	20.01
	-11.8	-13.0	43.30	18.03	43.04	18.68	42.80	19.37	42.68	19.73	42.57	20.10	41.40	19.51
	-9.8	-11.0	45.33	18.88	45.05	19.55	44.78	20.25	44.65	20.62	44.85	20.86	41.40	18.49
	-9.5	-10.0	46.36	19.22	46.07	19.89	45.79	20.60	46.58	21.39	44.85	20.20	41.40	17.88
	-8.5	-9.1	47.30	19.62	47.00	20.30	46.71	21.02	46.58	20.90	44.85	19.73	41.40	17.43
	-7.0	-7.6	48.90	20.29	48.56	20.98	48.30	21.25	46.58	20.06	44.85	18.90	41.40	16.66
	-5.0	-5.6	51.04	21.20	51.75	22.37	48.30	20.07	46.58	18.94	44.85	17.82	41.40	15.65
	-3.0	-3.7	53.11	21.79	51.75	20.94	48.30	18.72	46.58	17.62	44.85	16.55	41.40	14.49
	0.0	-0.7	55.20	20.91	51.75	18.74	48.30	16.66	46.58	15.64	44.85	14.65	41.40	13.13
	3.0	2.2	55.20	18.71	51.75	16.71	48.30	14.81	46.58	14.01	44.85	13.32	41.40	11.97
	5.0	4.1	55.20	17.39	51.75	15.48	48.30	13.86	46.58	13.18	44.85	12.52	41.40	11.25
	7.0	6.0	55.20	16.09	51.75	14.34	48.30	13.02	46.58	12.39	44.85	11.67	41.40	10.25
	9.0	7.9	55.20	14.87	51.75	13.39	48.30	12.01	46.58	11.36	44.85	10.74	41.40	9.60
	11.0	9.8	55.20	13.90	51.75	12.68	48.30	11.29	46.58	10.65	44.85	10.07	41.40	8.94
	13.0	11.8	55.20	13.02	51.75	11.85	48.30	10.57	46.58	9.91	44.85	9.36	41.40	8.42
15.0	13.7	55.20	12.21	51.75	11.10	48.30	10.00	46.58	9.30	44.85	8.81	41.40	7.93	
18.0	15.8	55.20	11.35	51.75	10.32	48.30	9.38	46.58	8.98	44.85	8.61	41.40	7.79	
20.0	17.6	55.20	10.67	51.75	9.65	48.30	8.88	46.58	8.53	44.85	8.16	41.40	7.49	
23.0	20.2	55.20	9.65	51.75	8.88	48.30	8.20	46.58	7.86	44.85	7.54	41.40	6.91	
26.0	22.0	55.20	9.09	51.75	8.39	48.30	7.73	46.58	7.42	44.85	7.13	41.40	6.52	
30.0	24.1	55.20	8.49	51.75	7.85	48.30	7.22	46.58	6.92	44.85	6.63	41.40	5.81	
60%	-29.8	-30.0	27.82	13.70	27.66	14.33	27.51	15.48	27.44	16.21	27.38	16.99	27.25	18.52
	-25.0	-25.4	29.28	14.58	29.12	15.22	28.96	16.29	28.89	16.89	28.82	17.50	28.68	18.19
	-19.8	-20.0	32.54	15.46	32.35	16.11	32.18	17.28	32.10	17.65	32.02	18.03	31.87	17.70
	-18.8	-19.0	37.07	16.34	36.91	17.01	36.77	17.71	36.70	18.09	36.64	18.47	35.49	17.87
	-16.7	-17.0	38.90	17.23	38.71	17.90	38.55	18.62	38.47	19.00	38.44	19.04	35.49	17.05
	-13.7	-15.0	40.78	18.25	40.57	18.94	40.38	19.69	39.92	19.29	38.44	18.28	35.49	16.29
	-11.8	-13.0	42.71	19.15	42.47	19.86	41.40	19.29	39.92	18.29	38.44	17.31	35.49	15.39
	-9.8	-11.0	44.68	20.08	44.36	20.26	41.40	18.27	39.92	17.32	38.44	16.35	35.49	14.49
	-9.5	-10.0	45.68	20.45	44.36	19.62	41.40	17.67	39.92	16.72	38.44	15.79	35.49	13.96
	-8.5	-9.1	47.31	21.13	44.36	19.15	41.40	17.24	39.92	16.31	38.44	15.37	35.49	13.58
	-7.0	-7.6	47.31	20.27	44.36	18.33	41.40	16.47	39.92	15.56	38.44	14.66	35.49	13.11
	-5.0	-5.6	47.31	19.13	44.36	17.27	41.40	15.46	39.92	14.58	38.44	13.78	35.49	12.49
	-3.0	-3.7	47.31	17.82	44.36	16.04	41.40	14.31	39.92	13.62	38.44	12.98	35.49	11.76
	0.0	-0.7	47.31	15.85	44.36	14.18	41.40	12.97	39.92	12.39	38.44	11.81	35.49	10.67
	3.0	2.2	47.31	14.10	44.36	12.94	41.40	11.81	39.92	11.28	38.44	10.75	35.49	9.70
	5.0	4.1	47.31	13.25	44.36	12.17	41.40	11.11	39.92	10.59	38.44	10.09	35.49	9.22
	7.0	6.0	47.31	12.47	44.36	11.37	41.40	10.11	39.92	9.61	38.44	9.13	35.49	8.35
	9.0	7.9	47.31	11.46	44.36	10.42	41.40	9.46	39.92	9.00	38.44	8.60	35.49	7.83
	11.0	9.8	47.31	10.74	44.36	9.78	41.40	8.81	39.92	8.43	38.44	8.05	35.49	7.34
	13.0	11.8	47.31	10.01	44.36	9.05	41.40	8.29	39.92	7.93	38.44	7.58	35.49	6.91
15.0	13.7	47.31	9.38	44.36	8.55	41.40	7.80	39.92	7.46	38.44	7.16	35.49	6.56	
18.0	15.8	47.31	8.99	44.36	8.36	41.40	7.65	39.92	7.25	38.44	6.80	35.49	6.10	
20.0	17.6	47.31	8.50	44.36	7.92	41.40	7.37	39.92	6.96	38.44	6.57	35.49	5.84	
23.0	20.2	47.31	7.85	44.36	7.30	41.40	6.80	39.92	6.53	38.44	6.30	35.49	5.56	
26.0	22.0	47.31	7.39	44.36	6.89	41.40	6.39	39.92	6.17	38.44	5.92	35.49	5.47	
30.0	24.1	47.31	6.90	44.36	6.42	41.40	5.70	39.92	5.38	38.44	5.02	35.49	4.47	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

Table continued on next page ...

Table2-8.16:22HP heating capacity(continued)

CR	Outdoor air temp.		Indoor air temp. °C DB											
			16.0		18.0		20.0		21.0		22.0		24.0	
			TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
50%	°C DB	°C WB	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
	-29.8	-30.0	27.22	16.32	27.06	19.66	29.50	18.95	28.44	17.92	27.39	17.08	25.28	15.34
	-25.0	-25.4	28.65	16.82	28.48	19.12	31.05	18.24	29.94	17.28	28.83	16.45	26.61	14.77
	-19.8	-20.0	31.83	17.26	31.65	18.01	34.50	17.36	33.27	16.53	32.04	15.72	29.57	14.12
	-18.8	-19.0	36.62	17.73	36.96	18.58	34.50	16.95	33.27	16.14	32.04	15.34	29.57	13.76
	-16.7	-17.0	38.39	18.72	36.96	17.75	34.50	16.16	33.27	15.37	32.04	14.57	29.57	13.01
	-13.7	-15.0	39.43	18.61	36.96	17.01	34.50	15.43	33.27	14.64	32.04	13.87	29.57	12.47
	-11.8	-13.0	39.43	17.64	36.96	16.07	34.50	14.54	33.27	13.78	32.04	13.04	29.57	11.92
	-9.8	-11.0	39.43	16.69	36.96	15.17	34.50	13.68	33.27	13.02	32.04	12.46	29.57	11.39
	-9.5	-10.0	39.43	16.13	36.96	14.62	34.50	13.20	33.27	12.66	32.04	12.11	29.57	11.05
	-8.5	-9.1	39.43	15.70	36.96	14.22	34.50	12.93	33.27	12.40	32.04	11.87	29.57	10.81
	-7.0	-7.6	39.43	14.98	36.96	13.55	34.50	12.49	33.27	11.96	32.04	11.43	29.57	10.41
	-5.0	-5.6	39.43	13.99	36.96	12.91	34.50	11.89	33.27	11.38	32.04	10.87	29.57	9.89
	-3.0	-3.7	39.43	13.16	36.96	12.15	34.50	11.17	33.27	10.70	32.04	10.22	29.57	9.33
	0.0	-0.7	39.43	11.95	36.96	11.03	34.50	10.13	33.27	9.71	32.04	9.32	29.57	8.63
	3.0	2.2	39.43	10.88	36.96	10.04	34.50	9.28	33.27	8.95	32.04	8.63	29.57	8.00
	5.0	4.1	39.43	10.22	36.96	9.44	34.50	8.81	33.27	8.50	32.04	8.20	29.57	7.33
	7.0	6.0	39.43	9.24	36.96	8.57	34.50	7.94	33.27	7.65	32.04	7.35	29.57	6.77
	9.0	7.9	39.43	8.63	36.96	8.00	34.50	7.39	33.27	7.11	32.04	6.82	29.57	6.27
	11.0	9.8	39.43	8.11	36.96	7.52	34.50	6.96	33.27	6.70	32.04	6.43	29.57	5.90
13.0	11.8	39.43	7.61	36.96	7.08	34.50	6.55	33.27	6.31	32.04	6.04	29.57	5.56	
15.0	13.7	39.43	7.19	36.96	6.70	34.50	6.22	33.27	5.96	32.04	5.72	29.57	5.24	
18.0	15.8	39.43	6.87	36.96	6.31	34.50	5.77	33.27	5.53	32.04	5.32	29.57	4.89	
20.0	17.6	39.43	6.70	36.96	6.00	34.50	5.49	33.27	5.25	32.04	4.99	29.57	4.61	
23.0	20.2	39.43	6.30	36.96	5.77	34.50	5.16	33.27	4.93	32.04	4.61	29.57	4.20	
26.0	22.0	39.43	5.92	36.96	5.54	34.50	5.19	33.27	5.00	32.04	4.88	29.57	4.62	
30.0	24.1	39.43	5.07	36.96	4.61	34.50	4.22	33.27	4.04	32.04	3.93	29.57	3.75	

Abbreviations:

CR: Combination ratio

TC: Total capacity (kW)

PI: Power input (compressor + outdoor fan motor) (kW)

Notes:

Shaded cells indicate rating condition.

### 8.3 Capacity Correction Factors for Piping Length and Level Difference

Figure 2-8.1: Rate of change in cooling capacity

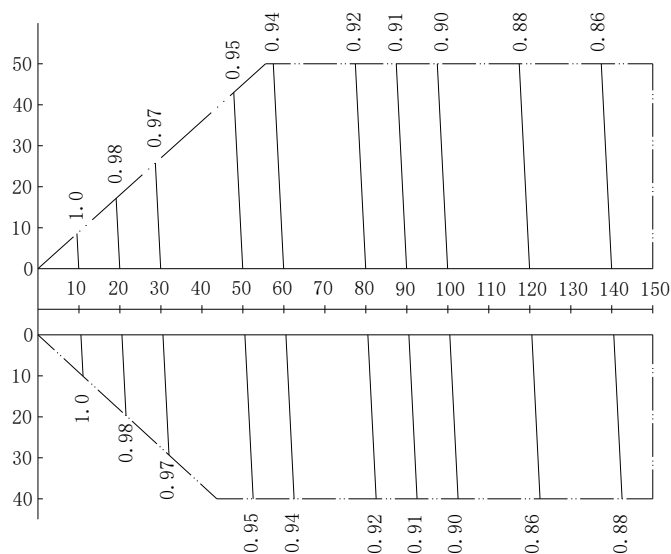
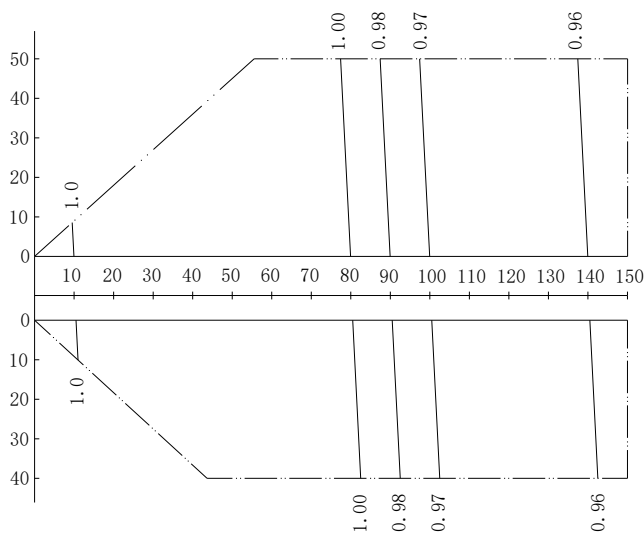


Figure 2-8.2: Rate of change in heating capacity



Notes:

1. The horizontal axis shows equivalent length of piping between farthest indoor unit and first outdoor branch joint; the vertical axis shows the largest level difference between indoor unit and outdoor unit. For level differences, positive values indicate that the outdoor unit is above the indoor unit, negative values indicate that the outdoor unit is below the indoor unit.
2. These figures illustrate the rate of change in capacity of a system with only standard indoor units at maximum load (with the thermostat set to maximum) under standard conditions. Under partial load conditions there is only a minor deviation from the rate of change in capacity shown in these figures.
3. The capacity of the system is either the total capacity of the indoor units obtained from indoor unit capacity tables or the corrected capacity of the outdoor units as per the calculations below, whichever is smaller.

Corrected capacity of outdoor units	=	Capacity of outdoor units obtained from outdoor unit capacity tables at the combination ratio	x	Capacity correction factor
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### 8.4 Capacity Correction Factors for Frost Accumulation

The heating capacity tables do not take account of the reduction in capacity when frost has accumulated or while the defrosting operation is in progress. If snow has accumulated against the outside surface of the outdoor unit heat exchanger heating capacity is reduced. The reduction in heating capacity is dependent on a number of factors including the outdoor temperature, the relative humidity and the amount of frosting which has occurred.

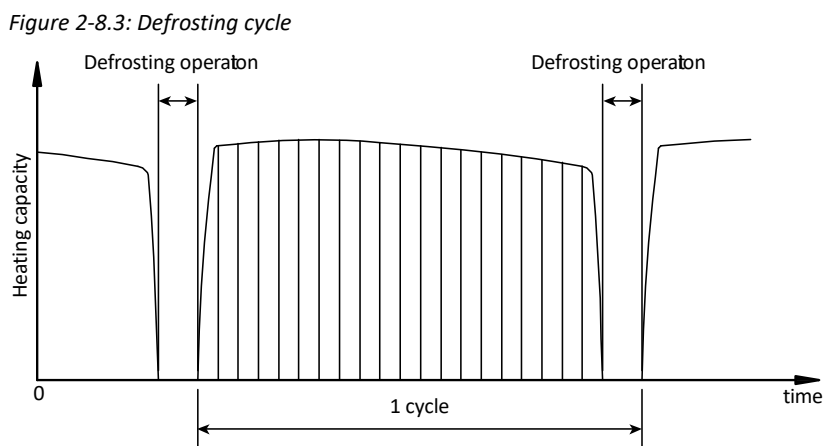
Corrected heating capacity values, which take these factors into account, can be calculated as follows, using the correction factors for frost accumulation given in Table 2-8.27:

$$\text{Corrected heating capacity} = \text{Value given in outdoor heating capacity table} \times \text{Correction factor for frost accumulation}$$

Table 2-8.19: Correction factor for frost accumulation

Heat exchanger inlet port temperature (°C / RH 85%)	-7	-5	-2	0	2	5	7
Correction factor for frost accumulation	0.94	0.93	0.89	0.8	0.83	0.88	1

Corrected heating capacities express the heating capacity over the heating/defrosting cycle shown in Figure 2-8.3.



# 9 Operating Limits

Figure 2-9.1: Cooling operating limits

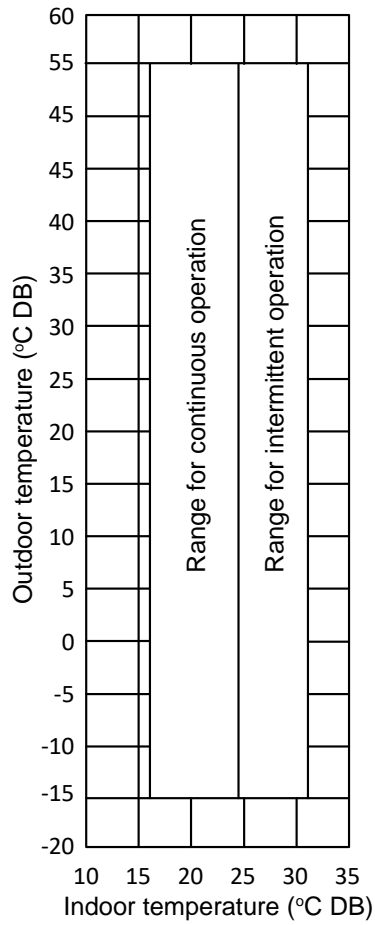
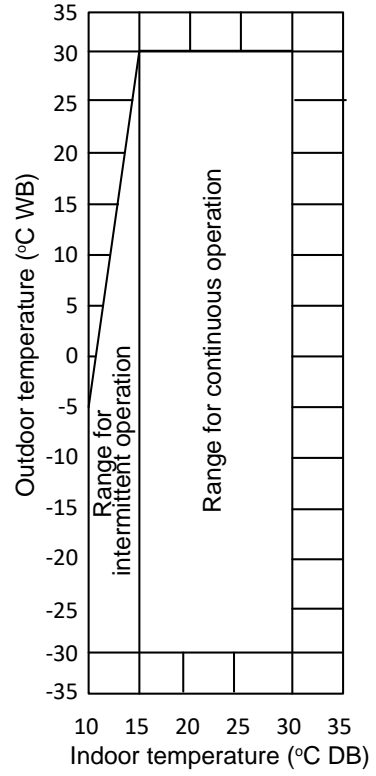


Figure 2-9.2: Heating operating limits



Notes:

1. These figures assume the following operating conditions:
  - Equivalent piping length: 5m
  - Level difference: 0

# 10 Sound Levels

## 10.1 Overall

Table 2-10.1: Sound pressure level

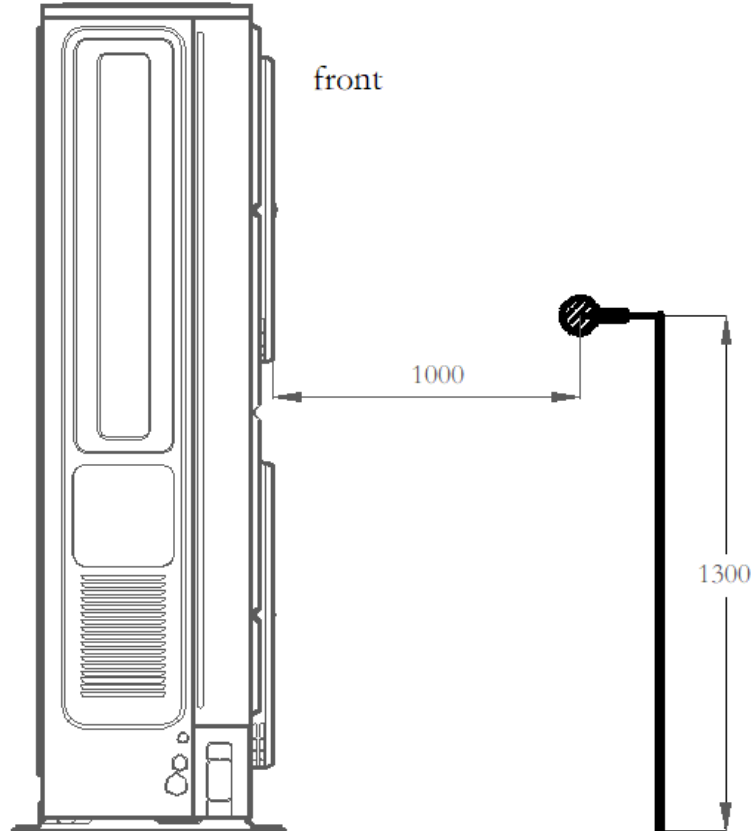
Model	dB(A)
8HP	56
10HP	57
12HP	58
14HP	59
16HP	60
18HP	61
20HP	61
22HP	62
24HP	61
26HP	62
28HP	62
30HP	63
32HP	64
34HP	64

Model	dB(A)
36HP	64
38HP	64
40HP	65
42HP	65
44HP	65
46HP	65
48HP	65
50HP	65
52HP	66
54HP	66
56HP	66
58HP	66
60HP	66
62HP	67

Model	dB(A)
64HP	67
66HP	67
68HP	67
70HP	67
72HP	67
74HP	67
76HP	67
78HP	67
80HP	68
82HP	68
84HP	68
86HP	68
88HP	68

- Notes:
1. Sound pressure level is measured at a position 1m in front of the unit and 1.3m above the floor in a semi-anechoic chamber. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.

Figure 2-10.1: Sound pressure level measurement (unit: mm)





## 10.2 Octave Band Levels

Figure 2-10.2: 8HP octave band level

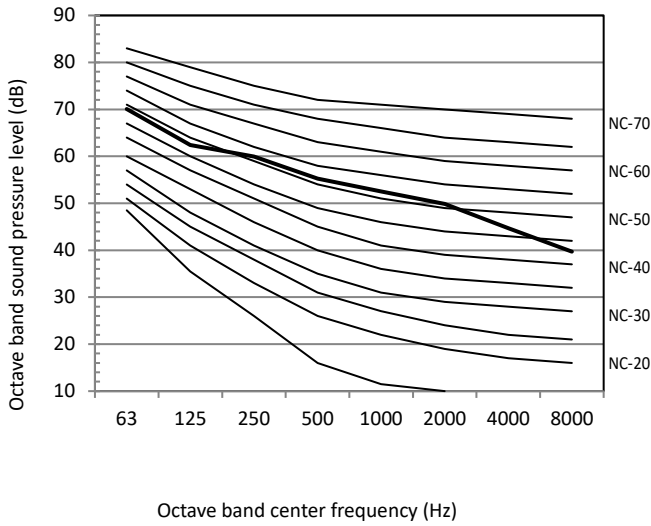


Figure 2-10.3: 10HP octave band level

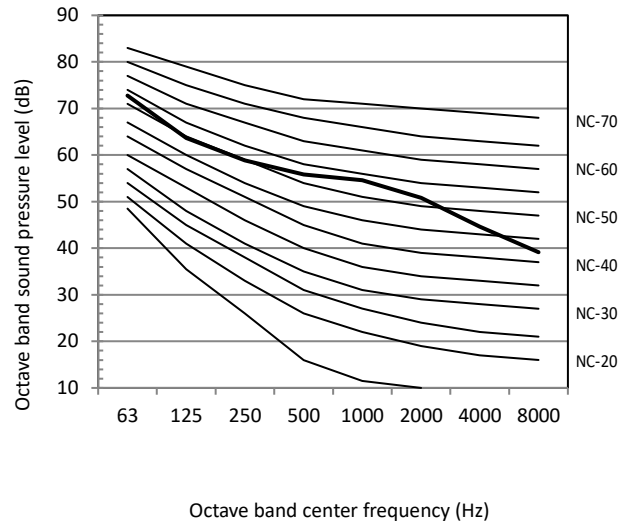


Figure 2-10.4: 12HP octave band level

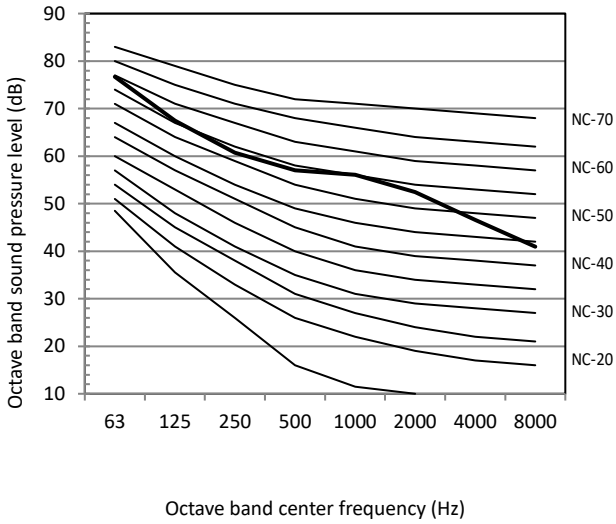


Figure 2-10.5: 14HP octave band level

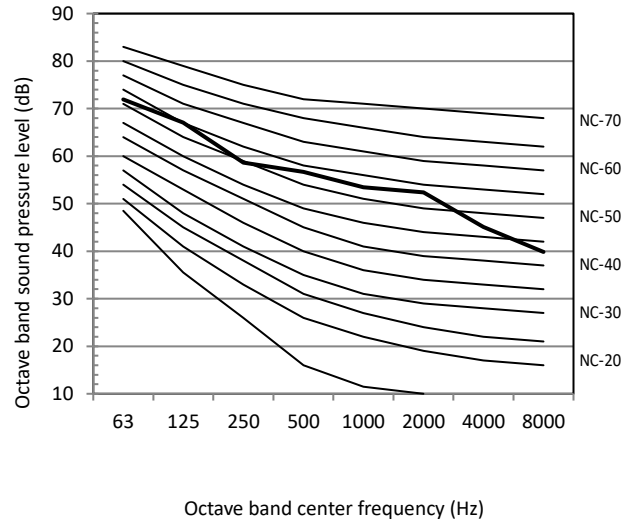


Figure 2-10.6: 16HP octave band level

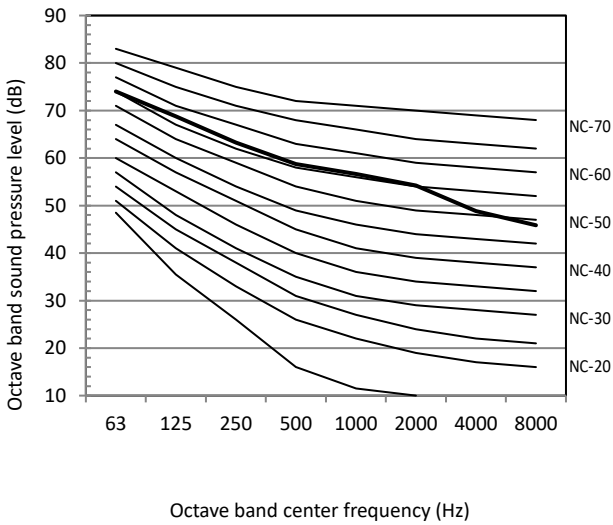


Figure 2-10.7: 18HP octave band level

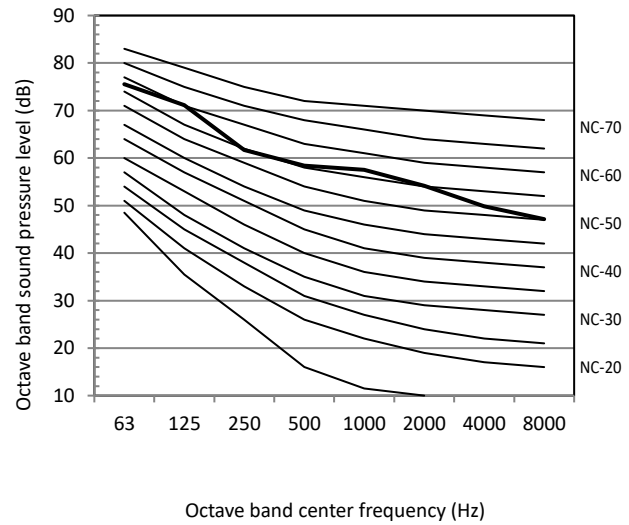
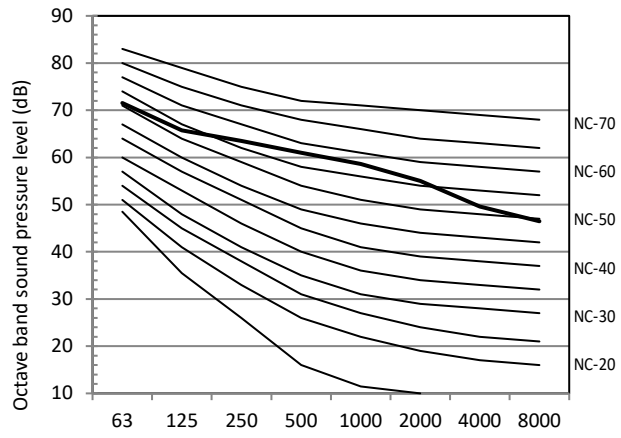
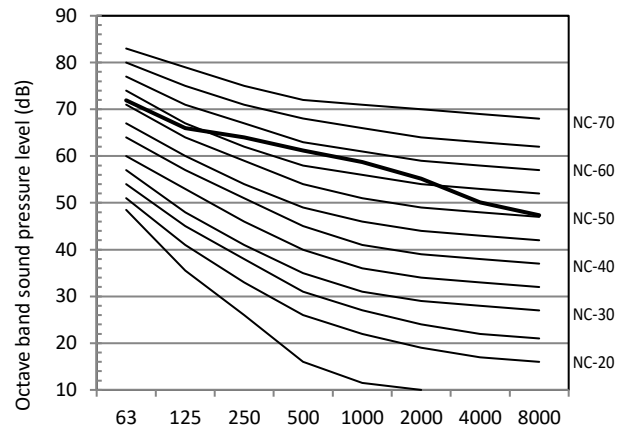


Figure 2-10.8: 20HP octave band level



Octave band center frequency (Hz)

Figure 2-10.9: 22HP octave band level









Octave band center frequency (Hz)

# 11 Accessories

## 11.1 Standard Accessories

Table 2-11.1: Standard accessories

Name	Shape	Quantity	Function
Installation and owner's manual		1	
L-shaped connection pipe		2	Connecting gas pipes
Wrench		1	Removing the side plate screws
Build-out resistor		1	Enhances communication stability
S-shaped connection pipe		1	Connecting gas and liquid pipes
Plastic ring		3	Protecting power line

### S-shaped pipe

Figure 2-11.1: S-shaped pipe size (unit: mm)

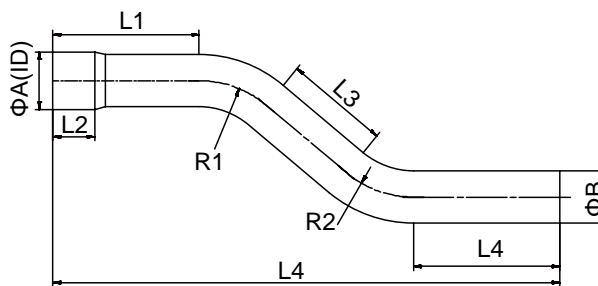


Table 2-11.2: L-shaped pipe size (unit: mm)

Size	8-14HP		16-22HP	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
L1	70	50	70	50
L2	20	10	20	20
L3	50	75	55	90
L4	70	60	70	80
L5	242	198	253	235
φA(ID)	25.4	12.7	28.6	15.9
φB	25.0	12.7	28.6	16.0
R1	50	25	55	30
R2	50	25	55	30
Thickness	1.2	0.75	1.2	0.75

## 11.2 Optional Accessories

Table 2-11.3: Optional accessories

Optional accessories	Model	Packed dimensions (mm)	Net/gross weight (kg)	Function
Outdoor branch joint kits	FQZHW-02N1E	255×150×185	1.8 / 2.0	Distribute refrigerant to indoor units and balance flow resistance between outdoor units
	FQZHW-03N1E	345×160×285	3.7 / 4.3	
	FQZHW-04N1G	470×260×370	6.0 / 6.6	
Indoor branch joint kits	FQZHN-01D	290×105×100	0.3 / 0.4	
	FQZHN-02D	290×105×100	0.4 / 0.6	
	FQZHN-03D	310×130×125	0.6 / 0.9	
	FQZHN-04D	350×170×180	1.1 / 1.5	
	FQZHN-05D	365×195×215	1.4 / 1.9	
	FQZHN-06D	390×230×255	2.5 / 3.1	
	FQZHN-07D	390×230×255	2.8 / 3.4	

# Part 3

# System Design and Installation

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## 1 Preface to Part 3

### 1.1 Notes for Installers Boxes

The information contained in this Engineering Data Book may primarily be of use during the system design stage of a V8S Series VRF project. Additional important information which may primarily be of use during field installation has been placed in boxes, such as the example below, titled “Notes for installers”.

#### Notes for installers



- Notes for installers boxes contain important information which may primarily be of use during field installation, rather than during desk-based system design.

### 1.2 Definitions

In this Engineering Data Book, the term “applicable legislation” refers to all national, local and other laws, standards, codes, rules, regulations and other legislation that apply in a given situation.

### 1.3 Precautions

All system installation including installation of piping and electrical works must only be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation.

## 2 Unit Placement and Installation

### 2.1 Outdoor Units

#### 2.1.1 Placement considerations

Placement of outdoor units should take account of the following considerations:

- Air conditioners should not be exposed to direct radiation from a high-temperature heat source.
- Air conditioners should not be installed in positions where dust or dirt may affect heat exchangers.
- Air conditioners should not be installed in locations where exposure to oil or to corrosive or harmful gases, such as acidic or alkaline gases, may occur.
- Air conditioners should not be installed in locations where exposure to salinity may occur unless the anti-corrosion treatment for high-salinity areas customization option has been added and the precautions described in Part 3, 10 “Installation in Areas of High Salinity” are taken.
- Outdoor units should be installed in well-drained, well-ventilated positions that are as close as possible to the indoor units.

#### 2.1.2 Installation Space Requirements

Outdoor units must be spaced such that sufficient air may flow through each unit. See Part 2-3 “Installation Space Requirements” for details about the spacing requirements in different scenarios.

In all installation examples in this chapter, the direction of connecting pipe for outdoor unit installation is forward or downward. When the rear pipe is connected and installed, the installation space on the right side of the outdoor unit shall be at least 250mm;

If the particular circumstances of an installation require a unit to be placed closer to a wall than specified in Figures 2-3.1 to 2-3.20, a discharge duct should be installed. Refer to Part 3-3 “Outdoor Unit Ducting and Shielding”. Depending on the height of adjacent walls relative to the height of the units, ducting may be required.

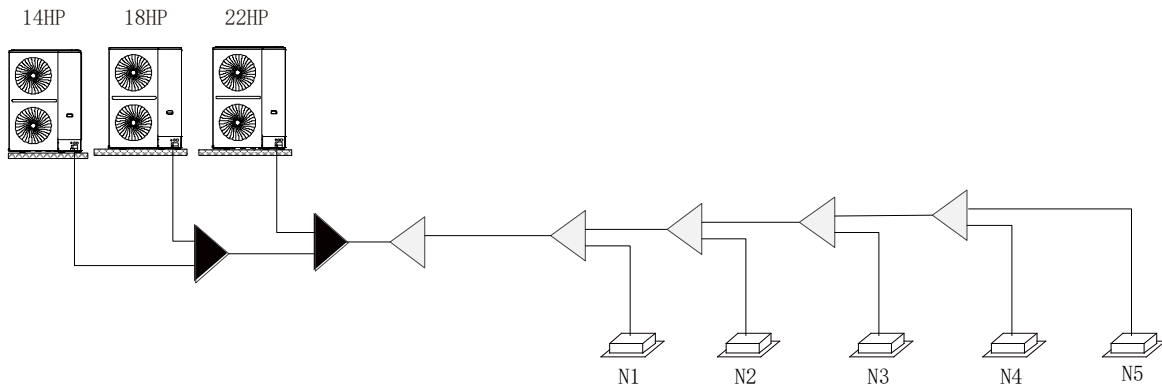
### 2.1.3 Master and slave unit positioning

In systems with multiple outdoor units, the units should be placed in order from largest capacity unit to smallest capacity unit. The largest capacity unit must be placed on the first branch, and be set as the master unit, while the others should be set as slave units. Refer to the V8S Service Manual, Part 4 for details of how to set units as master/slave.

The example in Figure 3-2.1 illustrates the placing of units in a 54 (22+18+14) HP combination:

- Place the 22HP unit on the first branch and set it as the master unit.
- Place the 18HP and 14HP units on the next branches and set them as slave units.

Figure 3-2.1: Positioning of master and slave units



### 2.1.4 Base structures

Outdoor unit base structure design should take account of the following considerations:

- The base of the outdoor unit must use the solid concrete surface as the cement base or the steel beam frame base.
- The base must be completely level to ensure that every point of contact is even.
- During installation, make sure the base supports the vertical folds of the front and back under plates of the chassis directly as the vertical folds of the front and back under plates are unit where the actual support for the unit load is.
- No gravel layer is required when the base is built on the roof surface, but the sand and cement on the concrete surface must be level, and the base should be chamfered along the edge.
- A water drainage ditch should be set around the base to drain the water around the equipment. Potential risk: slip.
- Check the load-bearing capacity of the roof to make sure it can support the load.
- When you choose to install the piping from the bottom, the base height should be above 200mm.
- Make sure the base where the unit is installed is strong enough to prevent vibrations and noise.
- Use six ground bolts (M8) to secure the unit in place. Best is to screw in the ground bolt until it is embedded in the base surface by at least 3 threads.
- Please refer to the Figure 3-2.3 below for the installation position of expansion bolts.

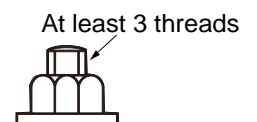


Figure 3-2.2: Outdoor unit typical concrete base structure design (unit: mm)

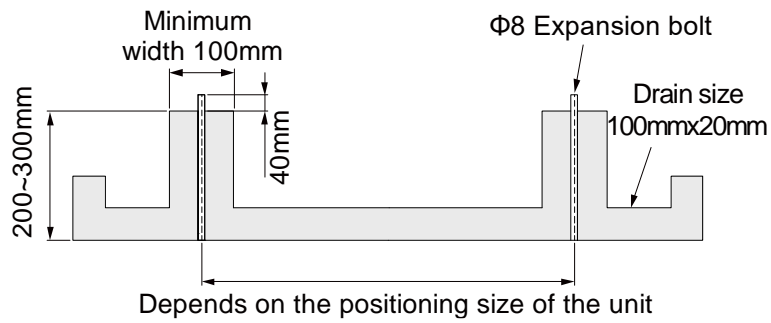


Figure 3-2.3: Expansion bolt positioning

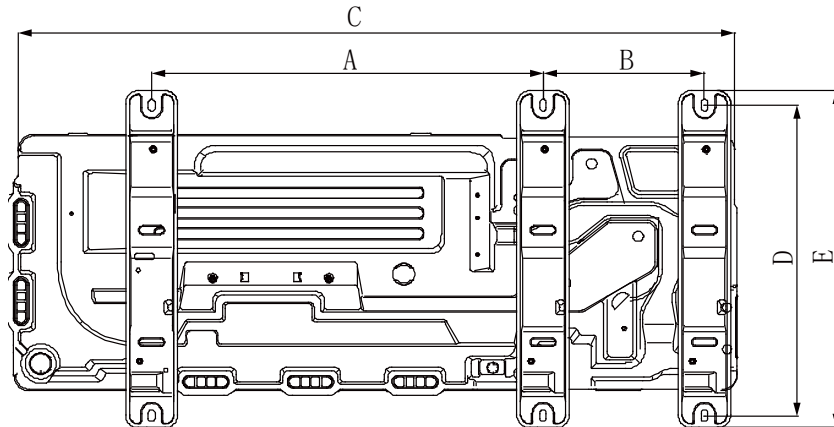


Table 3-2.1: Expansion bolt spacings

(unit: mm)

HP Size	8-14HP	16-22HP
A	614	674
B	278	278
C	1130	1250
D	534	534
E	580	580

## 2.1.5 Acceptance and unpacking

### Notes for installers



- When units are delivered check whether any damage occurred during shipment. If there is damage to the surface or outside of a unit, submit a written report to the shipping company.
- Check that the model, specifications and quantity of the units delivered are as ordered.
- Check that all accessories ordered have been included. Retain the Installation and Owner's Manual for future reference.

## 2.1.6 Hoisting

### Notes for installers



- Do not remove any packaging before hoisting. If units are not packaged or if the packaging is damaged, use suitable boards or packing material to protect the units.
- Hoist one unit at a time, using two ropes to ensure stability.
- Keep units upright during hoisting, ensuring that the angle to the vertical does not exceed 30°.
- It is better to use a crane and two long belts to lift the unit as per Figure 3-2.4.
- Handle the unit carefully to protect it, and note the position of the center of gravity of the unit.



Figure 3-2.4: Hoisting

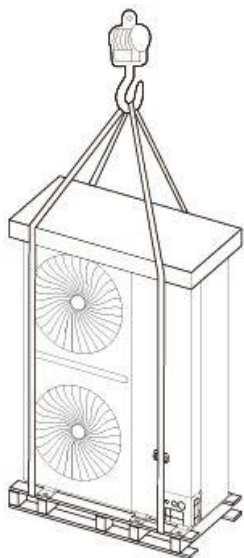


Figure 3-2.5: 8-24HP Center of gravity

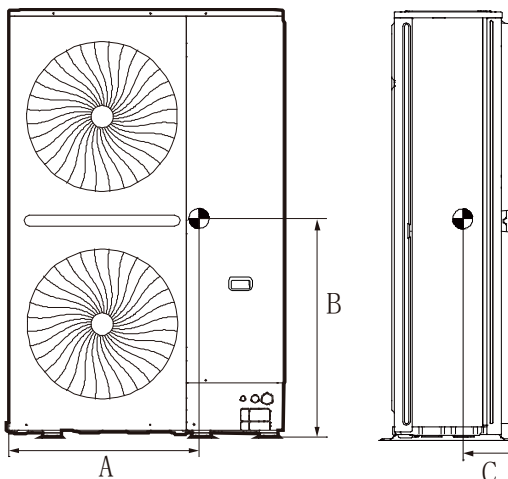


Table 3-2.2: Center of gravity (unit: mm)

Dimension	8-14HP	16-18HP	20-22HP
A	715	704	685
B	775	780	780
C	267	286	281

## 2.2 Indoor Units

### 2.2.1 Placement considerations

Placement of indoor units should take account of the following considerations:

- Sufficient space for drain piping and for access during servicing and maintenance should be allowed.
- To ensure a good cooling/heating effect, short-circuit ventilation (where outlet air returns quickly to a unit’s air inlet) should be avoided.
- To prevent excessive noise or vibration during operation, suspension rods or other weight-bearing fixings should typically be able to bear twice the unit’s weight.

#### Notes for installers



- Before installing an indoor unit, check that the model to be installed is as specified in the construction drawings and confirm the correct orientation of the unit.
- Ensure that units are installed at the correct height.
- To allow smooth condensate drainage and to ensure unit stability (to prevent excessive noise or vibration), ensure that units are level to within 1° of the horizontal. If a unit is not level to within 1° of the horizontal, water leakage or abnormal vibration/noise may occur.

### 3 Outdoor Unit Ducting and Shielding

#### 3.1 Ducting Requirements

Figures 2-3.1 to Figures 2-3.20 show spacing requirements in different scenarios. If the installation space requirement cannot be met due to special installation conditions, the air duct should be installed.

#### 3.2 Design Considerations

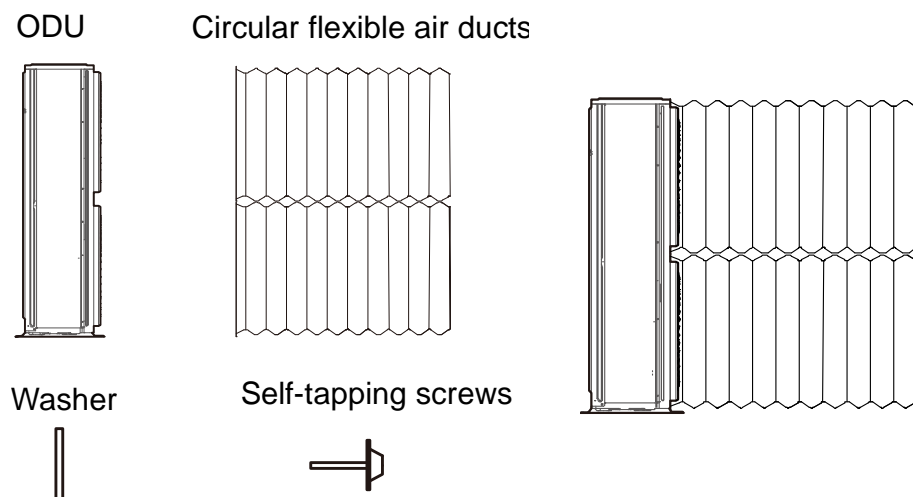
Outdoor unit ducting design should take account of the following:

- The addition of louvers will affect the air output of the unit, so the use of louvers is not recommended. If you want to use it, please control the shutter angle below 15° and ensure that the effective opening rate of the shutter is more than 90%.
- The exhaust duct of each fan must be installed independently. It is forbidden to assemble the exhaust hood between machines in parallel in any form, otherwise it may cause unit failure.
- Please install a soft connection between the machine and the air duct to prevent vibration and noise.
- Circular flexible air duct must be used for installation.

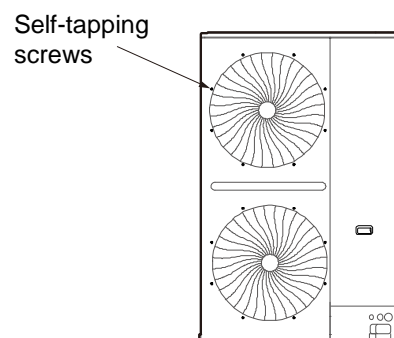
Table 3-3.1: The Recommended diameters of Circular flexible air ducts:

HP	Diameters of Grille (mm)	Minimum diameters of air ducts(mm)
8-14HP	665	≥700
16-22HP	793	≥820

Figure 3-3.1: Fittings required for installing air duct



Fixing Circular flexible air ducts on the front panel by self-tapping screws. There are advised to use 8 self-tapping screws, and the position as shown on the right.



### 3.3 Fan Performance

Figure 3-3.2: 8HP units fan performance

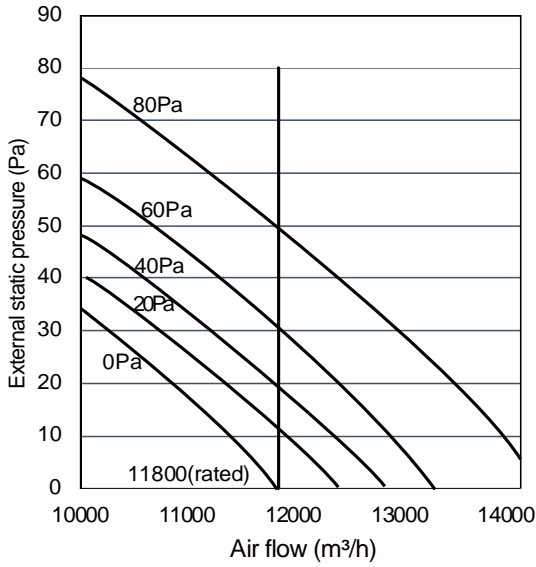


Figure 3-3.3: 10HP units fan performance

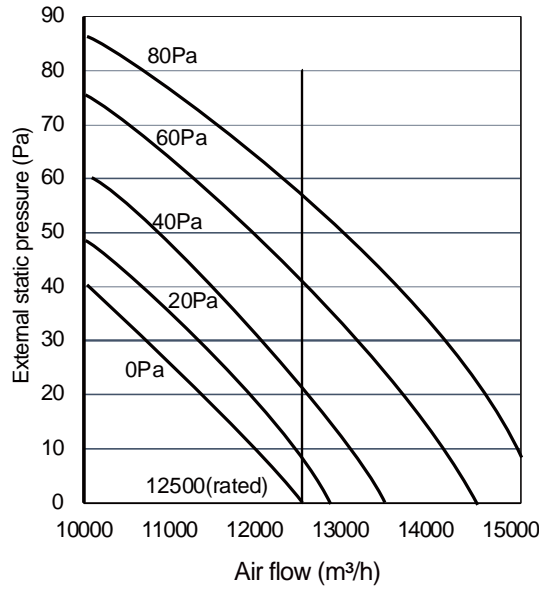


Figure 3-3.4: 12HP units fan performance

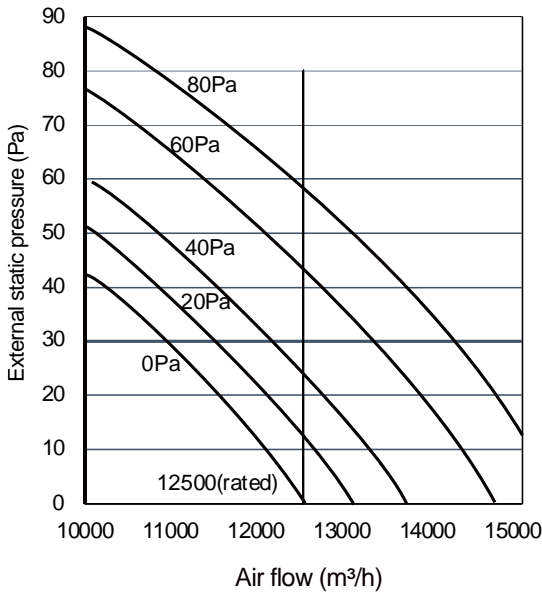


Figure 3-3.5: 14HP units fan performance

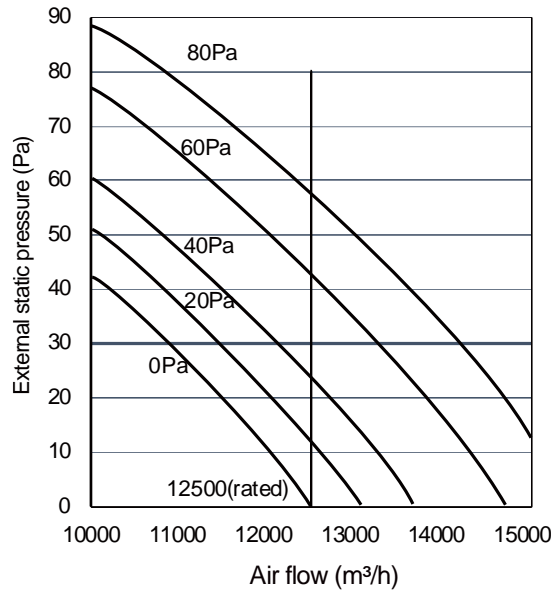


Figure 3-3.6: 16HP units fan performance

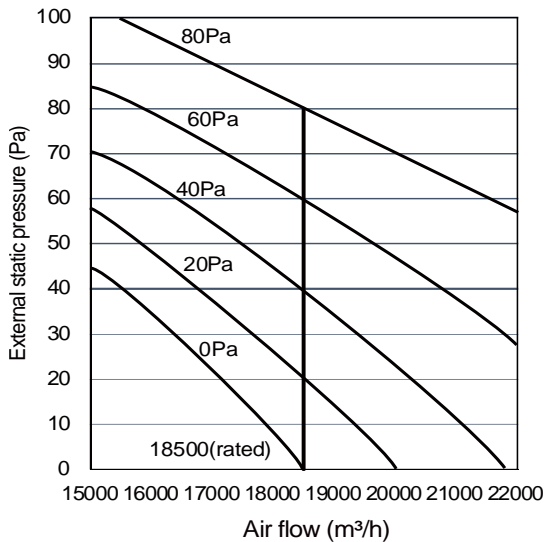


Figure 3-3.7: 18HP units fan performance

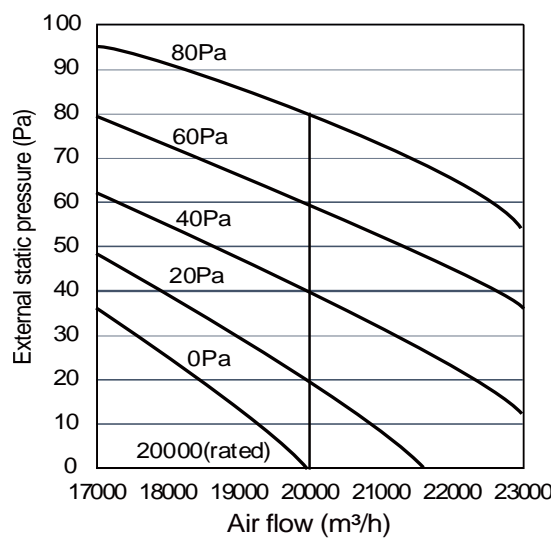


Figure 3-3.8: 20HP units fan performance

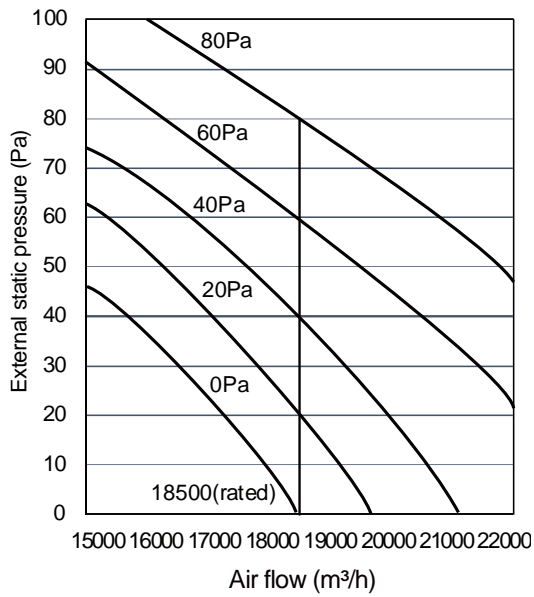
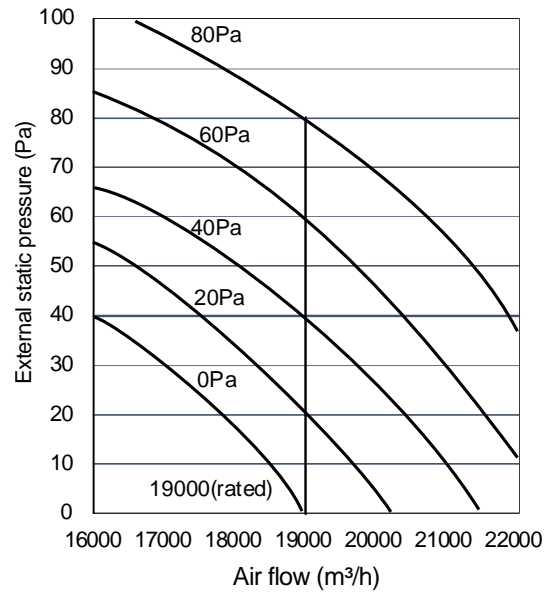


Figure 3-3.9: 22HP units fan performance



### Notes for installers

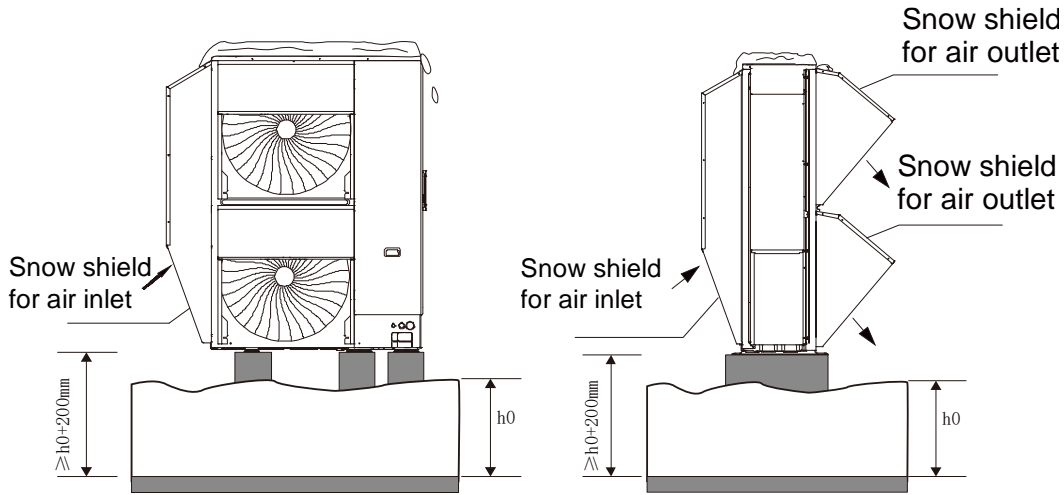


- These fan characteristics Curve above including both base models and high static pressure models.
- Base models can provide 35Pa maximum external static pressure. High static pressure models can provide 80Pa maximum external static pressure.
- If the external static pressure you needed over 35Pa, please contact us by suppliers for customized high static pressure models.

### 3.4 Snow Shielding

In areas of high snowfall, snow shields should be installed on air inlets and outlets to prevent snow from entering the units. Additionally, the foundation or base height of ODU is required to be the expected maximum snowfall thickness  $h_0 + 200\text{mm}$ , preventing the snow from exceeding the bottom of the unit.

Figure 3-3.11: Outdoor unit snow shielding



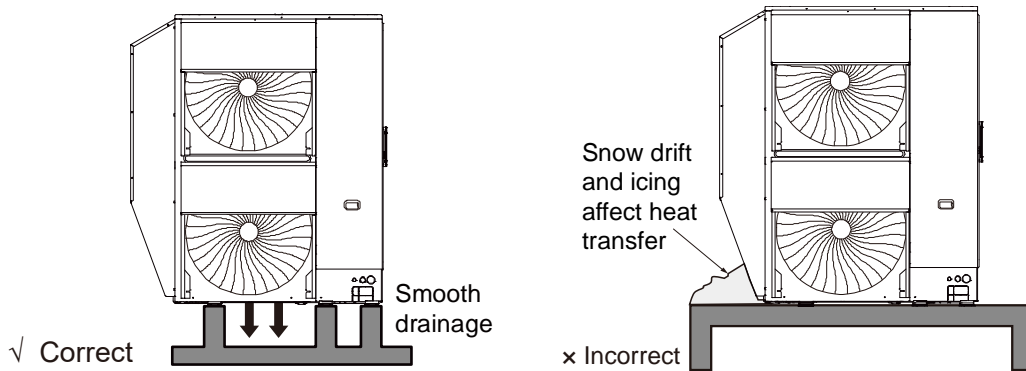
Notes:

1. In severe cold areas, longitudinal foundation base shall be used to ensure that drainage is not obstructed. The height of foundation is recommended to be  $\geq 500\text{ mm}$ .

### 3.5 Installation direction

It is forbidden to install the outdoor unit horizontally along the base to avoid snow and ice accumulation that may hinder the drainage of the chassis.

Figure 3-3.12: Installation direction with snow shield



Notes:

2. In severe cold areas, longitudinal foundation base shall be used to ensure that drainage is not obstructed. The height of foundation is recommended to be  $\geq 500\text{ mm}$ .

## 4 Refrigerant Piping Design

### 4.1 Design Considerations

Refrigerant piping design should take account of the following considerations:

- The amount of brazing required should be kept to a minimum.
- On the two inside sides of the first indoor branch joint ("A" in Figures 3-4.1 and 3-4.4) the system should, as far as possible, be equal in terms of number of units, total capacities and total piping lengths.

### 4.2 Material Specification

Only seamless phosphorus-deoxidized copper piping that complies with all applicable legislation should be used. Temper grades and minimum thicknesses for different diameters of piping are specified in Table 3-4.1.

Table 3-4.1: Piping temper and thickness

Piping outer diameter(mm)	Temper <sup>1</sup>	Minimum thickness (mm)
Φ6.35	O (annealed)	0.80
Φ9.52		0.80
Φ12.7		1.00
Φ15.9		1.00
Φ19.1		1.00
Φ22.2	1/2H (half hard)	1.00
Φ25.4		1.00
Φ28.6		1.00
Φ31.8		1.25
Φ34.9		1.25
Φ38.1		1.50
Φ41.3		1.50
Φ44.5		1.50
Φ50.8		1.80
Φ54.0		1.80

Notes:

1. O: coiled piping; 1/2H: straight piping.
2. Thicknesses for different diameters of piping should comply with local regulations.
3. Design pressure of R410A refrigerant is 4.2MPa(42bar).
4. Only seamless phosphorus-deoxidized copper piping that complies with all applicable legislation should be used

### 4.3 Permitted Piping Lengths and Level Differences

The piping length and level difference requirements that apply are summarized in *Table 3-4.2* and are fully described as follows (refer to *Figure 3-4.1*):

Figure 3-4.1: Permitted refrigerant piping lengths and level differences

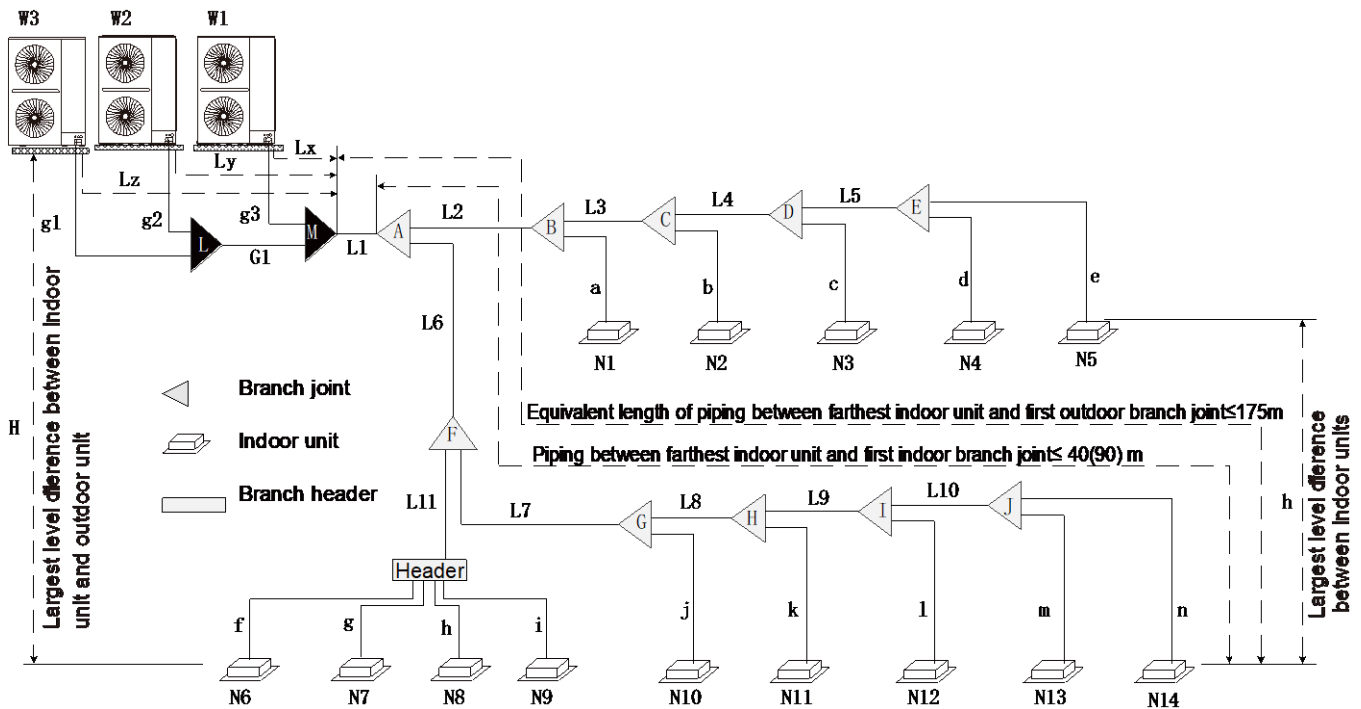


Table 3-4.2: Pipe and component Names

Name	Designation	Name	Designation
Outdoor unit connection pipe	g1,g2,g3	Indoor unit main pipe	L2 to L10
Outdoor unit main pipe	G1,G2	Indoor unit branch joint	A to J
Outdoor unit branch joint	L,M	Indoor unit auxiliary connection pipe	a to n
Main pipe	L1		

Table 3-4.3: Summary of permitted refrigerant piping lengths and level differences

Category		Permitted values	Piping in Figure 3-4.2	
Piping lengths	Total piping length	≤ 560m	L1+L2+L3+L4+L5+L6+L7+L8+...+L11+a+b+c+d+e+f+g+h+i+...+m+n	
	Piping between farthest indoor unit and first outdoor branch joint	Actual length	≤ 150m	L1+L2+L3+L4+L5+e or L1+L6+L7+L8+L9+L10+n
		Equivalent length	≤ 175m	(Refer to Requirement 1)
	Piping between farthest indoor unit and first indoor branch joint	≤ 40m/90m	L2+L3+L4+L5+e or L6+L7+L8+L9+L10+n	(Refer to Requirement 2)
Piping between outdoor unit and outdoor branch joint	≤ 10m	Lx, Ly, Lz		
Level differences	Largest level difference between indoor unit and outdoor unit	Outdoor unit is above	≤ 50m	H (Refer to Requirement 3)
		Outdoor unit is below	≤ 40m	
	Largest level difference between indoor units	≤ 30m	h	

- Requirement 1:** The piping between the farthest indoor unit (N14) and the first outdoor branch joint (M) should not exceed 150m (actual length) and 175m (equivalent length). (The equivalent length of each branch joint is 0.5m, and the equivalent length of each branch header is 1m.)
- Requirement 2:** The piping between the farthest indoor unit (N14) and first indoor branch joint (A) should not exceed 40m in length ( $\Sigma\{L2 \text{ to } L5\} + e \leq 40\text{m}$  or  $\Sigma\{L6 \text{ to } L10\} + n \leq 40\text{m}$ ) unless the following conditions are met and the following measures are taken, in which case the permitted length is up to 90m.

**Conditions:**

- Each indoor auxiliary pipe (from each indoor unit to its nearest branch joint) joint does not exceed 40m in length (a to n each  $\leq 40\text{m}$ ).
- The difference in length between {the piping from first indoor branch joint (A) to the farthest indoor unit (N14)} and {the piping from the first indoor branch joint (A) to the nearest indoor unit (N1)} does not exceed 40m. That is:  $(\Sigma\{L6 \text{ to } L10\} + n) - (L2 + a) \leq 40\text{m}$ .

**Measures:**

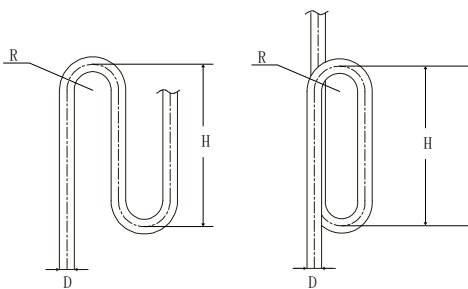
- Increase the diameter of the indoor gas pipes (the piping between the first indoor branch joint and all other indoor branch joints, L2 to L10) as *Table 3-4.4*, except for indoor main pipes which are already the same size as the main pipe (L1), for which no diameter increases are required.

*Table 3-4.4: Diameter increase requirements*

Standard(mm)	Increased (mm)
Φ9.52	Φ12.7
Φ12.7	Φ15.9
Φ15.9	Φ19.1
Φ19.1	Φ22.2
Φ22.2	Φ25.4
Φ25.4	Φ28.6
Φ28.6	Φ31.8
Φ31.8	Φ38.1
Φ38.1	Φ41.3
Φ41.3	Φ44.5
Φ44.5	Φ50.8
Φ50.8	Φ54.0

- Requirement 3:** The largest level difference between indoor unit and outdoor unit should not exceed 50m (if the outdoor unit is above) or 40m (if the outdoor unit is below). Additionally: If the outdoor unit is above and the level difference is greater than 20m, it is recommended that an oil return bend with dimensions as specified in *Figure 3-4.2* is set every 10m in the gas pipe of the main pipe.

*Figure 3-4.2: Oil return bend*



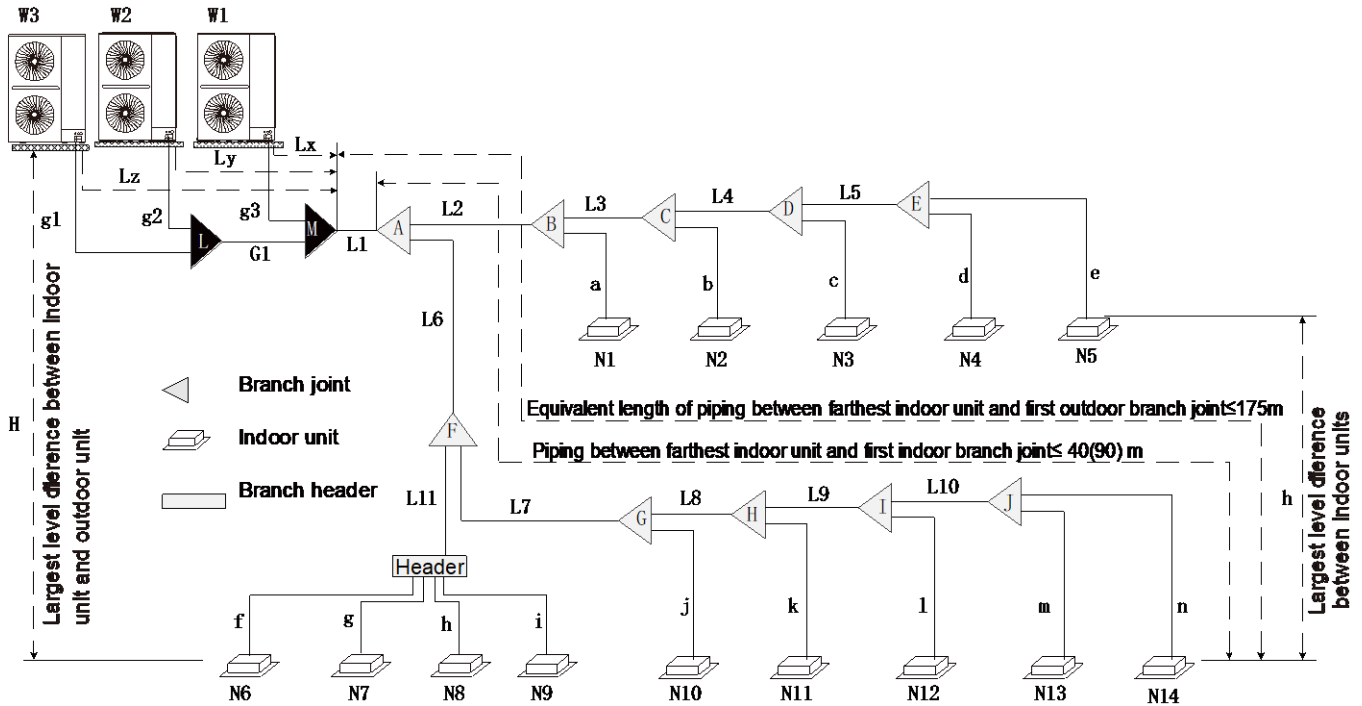
*Table 3-4.5: Oil return bend requirements unit (mm)*

Pipe dimension(D)	Bend radius(R)	Height(H)
Φ19.1	≥ 31	≥ 300
Φ22.2		
Φ25.4	≥ 45	≥ 300
Φ28.6		
Φ31.8	≥ 60	≥ 300
Φ38.1		
Φ41.3	≥ 80	≥ 500
Φ44.5		
Φ50.8	≥ 90	≥ 500
Φ54.0		
Φ63.5		



### 4.4 Selecting Piping Diameters

Tables 3-4.6 to 3-4.10, below, specify the required pipe diameters for the indoor and outdoor piping.



#### 4.4.1 Diameters of Main pipe and first indoor branch joint

Table 3-4.6: Main pipe<sup>1</sup> (L1) and first indoor branch joint (A)

Total capacity of outdoor units	Equivalent length between the farthest indoor unit and the first outdoor branch joint < 90m			Equivalent length between the farthest indoor unit and the first outdoor branch joint ≥ 90m		
	Gas pipe (mm)	Liquid pipe (mm)	Branch joint kit	Gas pipe (mm)	Liquid pipe (mm)	Branch joint kit
8HP	Φ19.1	Φ9.52	FQZHN-01D	Φ22.2	Φ12.7	FQZHN-02D
10HP	Φ22.2	Φ9.52	FQZHN-02D	Φ25.4	Φ12.7	FQZHN-02D
12-14HP	Φ25.4	Φ12.7	FQZHN-02D	Φ28.6	Φ12.7	FQZHN-03D
16HP	Φ28.6	Φ12.7	FQZHN-03D	Φ31.8	Φ12.7	FQZHN-03D
18-24HP	Φ28.6	Φ15.9	FQZHN-03D	Φ31.8	Φ15.9	FQZHN-03D
26-34HP	Φ31.8	Φ19.1	FQZHN-03D	Φ38.1	Φ19.1	FQZHN-04D
36-54HP	Φ38.1	Φ19.1	FQZHN-04D	Φ41.3	Φ19.1	FQZHN-05D
56-66HP	Φ41.3	Φ19.1	FQZHN-05D	Φ44.5	Φ22.2	FQZHN-05D
68-82HP	Φ44.5	Φ22.2	FQZHN-05D	Φ50.8	Φ22.2	FQZHN-06D
84-88HP	Φ50.8	Φ22.2	FQZHN-06D	Φ54.0	Φ25.4	FQZHN-06D

#### 4.4.2 Diameters of Indoor main pipes and indoor branch joint kits

Based on the total capacity of the indoor unit, select the branch joint for the indoor unit from the following table

Table 3-4.7: Indoor main pipes (L2 to L11) and indoor branch joint kits

Total capacity indexes of indoor units	Gas pipe (mm)	Liquid pipe (mm)	Branch joint kit
Capacity indexes < 168	Φ15.9	Φ9.52	FQZHN-01D
168 ≤ Capacity indexes < 224	Φ19.1	Φ9.52	FQZHN-01D
224 ≤ Capacity indexes < 330	Φ22.2	Φ9.52	FQZHN-02D
330 ≤ Capacity indexes < 470	Φ28.6	Φ12.7	FQZHN-03D
470 ≤ Capacity indexes < 710	Φ28.6	Φ15.9	FQZHN-03D
710 ≤ Capacity indexes < 1040	Φ31.8	Φ19.1	FQZHN-03D
1040 ≤ Capacity indexes < 1540	Φ38.1	Φ19.1	FQZHN-04D
1540 ≤ Capacity indexes < 1900	Φ41.3	Φ19.1	FQZHN-05D
1900 ≤ Capacity indexes < 2350	Φ44.5	Φ22.2	FQZHN-05D
2350 ≤ Capacity indexes < 2500	Φ50.8	Φ22.2	FQZHN-06D
2500 ≤ Capacity indexes < 3024	Φ50.8	Φ25.4	FQZHN-06D
3024 ≤ Capacity indexes	Φ54.0	Φ28.6	FQZHN-07D

Notes:

- If indoor main pipes (L2 to L11) are larger than the main pipe (L1), indoor main pipes should reduce to the main pipe's size.

#### 4.4.3 Diameters of branch joint diameters for the outdoor unit

Figure 3-4.3: Outdoor connection pipes

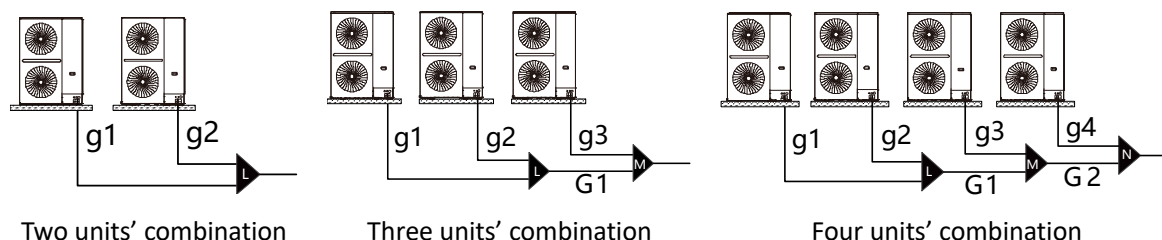


Table 3-4.8: Outdoor connection pipes (g1 to g3, G1)

Pipes	Outdoor unit capacity	Gas pipe (mm)	Liquid pipe (mm)
g1 to g4	8-14HP	Φ25.4	Φ12.7
	16-22HP	Φ28.6	Φ15.9
G1	46-88HP	Φ38.1	Φ19.1
G2	68-88HP	Φ44.5	Φ22.2

Table 3-4.9: Outdoor branch joint kits (L to M)

No. of outdoor units	Outdoor unit capacity	Branch joint kit
2	24-44 HP	L:FQZHW-02N1E
3	46-66HP	L+M:FQZHW-03N1E
4	68-88HP	L+M+N: FQZHW-04N1G

Note:

Please refer to the installation manual of branch header for detailed selection and installation requirements.

#### 4.4.4 Diameters of Indoor units auxiliary connection pipes

Table 3-4.10: Indoor auxiliary pipes (a to n)

Capacity of indoor unit (kW)	Gas pipe (mm)	Liquid pipe (mm)
Capacity $\leq$ 5.6	$\Phi$ 12.7	$\Phi$ 6.35
5.6 < Capacity $\leq$ 16	$\Phi$ 15.9	$\Phi$ 9.52

Notes:

1. The size of indoor side branch pipe shall not be larger than that of main pipe. If the size of main pipe selected according to the above table is larger than that of main pipe, the size of branch pipe shall be reduced to make it the same as that of main pipe.
2. If the indoor unit capacity exceeds the range in the table above, select the pipe diameter according to the manual of the indoor unit.

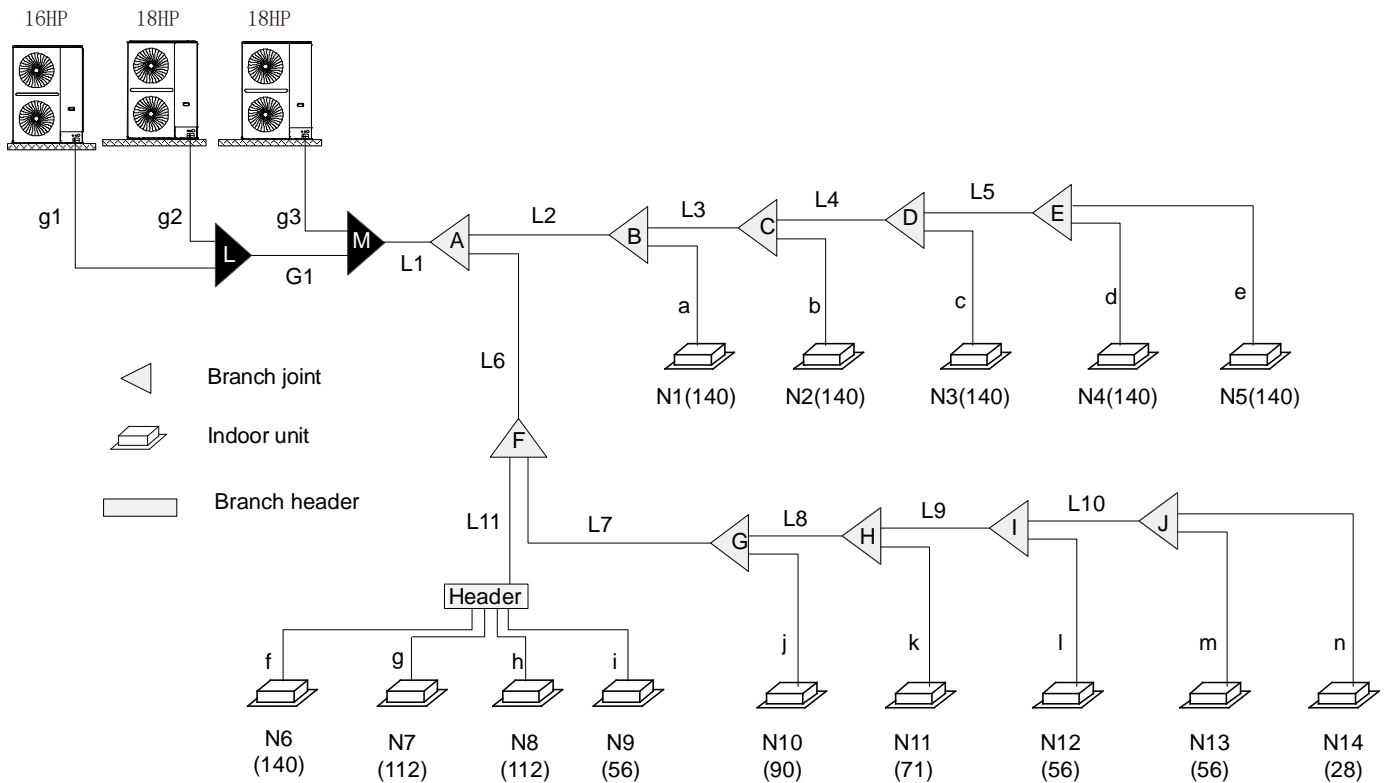
**If the required pipe size is not available, you can use other diameters by considering the following factors:**

1. In case the standard size is not available in local market, one size up of gas pipe, and one size down of liquid pipe should be used.
2. Pipe sizes bigger than corresponding "Size up Size" cannot be used under any circumstances.

## 4.5 Refrigerant Piping Selection Example

The example below illustrates the piping selection procedure for a system consisting of three outdoor units (16HP+18HP+18HP) and 14 indoor units. The system's equivalent length between the farthest indoor unit and the first outdoor branch joint is in excess of 90m; the piping between the farthest indoor unit and the first indoor branch joint is less than 40m in length; and each indoor auxiliary pipe (from each indoor unit to its nearest branch joint) is less than 10m in length.

Figure 3-4.4: Refrigerant piping selection example



### Step 1: Select indoor auxiliary pipes (a to n)

- The capacity of indoor units N1 to N8, N10 and N11 is larger than 5.6kW, so indoor auxiliary connection pipe a to i is  $\Phi 15.9/\Phi 9.52$ .
- The capacity of indoor units N9, N12 to N14 is equal or less than 5.6kW, so indoor auxiliary connection pipe i to n is  $\Phi 12.7/\Phi 6.35$ .

### Step 2: Select indoor main pipes L2 to L11 and indoor branch joints B to J

- The indoor units (N1 to N5) downstream of indoor branch joint B have total capacity of  $14 * 5 = 70\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L2 is  $\Phi 28.6 / \Phi 15.9$ . Indoor branch joint B is FQZHN-03D.
- The indoor units (N2 to N5) downstream of indoor branch joint C have total capacity of  $14 * 4 = 56\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L3 is  $\Phi 28.6 / \Phi 15.9$ . Indoor branch joint C is FQZHN-03D.
- The indoor units (N3 to N5) downstream of indoor branch joint D have total capacity of  $14 * 3 = 42\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L4 is  $\Phi 28.6 / \Phi 12.7$ . Indoor branch joint D is FQZHN-03D.
- The indoor units (N4 and N5) downstream of indoor branch joint E have total capacity of  $14 * 2 = 28\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L5 is  $\Phi 22.2 / \Phi 9.52$ . Indoor branch joint E is FQZHN-02D.
- The indoor units (N6 to N14) downstream of indoor branch joint F have total capacity of  $14 + 11.2 * 2 + 9 + 7.1 + 5.6 * 3 + 2.8 = 72.1\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L6 is  $\Phi 31.8 / \Phi 19.1$ . Indoor branch joint F is FQZHN-03D.
- The indoor units (N10 to N14) downstream of indoor branch joint G have total capacity of  $2.8 + 5.6 * 2 + 7.1 + 9 = 30.1\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L7 is  $\Phi 22.2 / \Phi 9.52$ . Indoor branch joint G is FQZHN-02D.
- The indoor units (N11 to N14) downstream of indoor branch joint H have total capacity of  $2.8 + 5.6 * 2 + 7.1 = 21.1\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L8 is  $\Phi 19.1 / \Phi 9.52$ . Indoor branch joint H is FQZHN-01D.

Legend	
L <sub>1</sub>	Main pipe
L <sub>2</sub> to L <sub>11</sub>	Indoor main pipes
a to n	Indoor auxiliary pipes
A to J	Indoor branch joints
L, M	Outdoor branch joints
G1, g1, g2, g3	Outdoor connection pipes
Figures in parentheses indicate indoor unit capacity indexes.	

- The indoor units (N12 to N14) downstream of indoor branch joint I have total capacity of  $2.8 + 5.6 * 2 = 14\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L9 is  $\Phi 15.9 / \Phi 9.52$ . Indoor branch joint I is FQZHN-01D.
- The indoor units (N13 and N14) downstream of indoor branch joint J have total capacity of  $2.8 + 5.6 = 8.4\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L10 is  $\Phi 15.9 / \Phi 9.52$ . Indoor branch joint J is FQZHN-01D.
- The indoor units (N6 to N9) downstream of indoor branch header have total capacity of  $14 + 11.2 * 2 + 5.6 = 42\text{kW}$ . Refer to Table 3-4.7. Indoor main pipe L11 is  $\Phi 28.6 / \Phi 12.7$ . Indoor branch header is 1 to 4.

**Step 3: Select main pipe and first indoor branch joint A**

- The indoor units (N1 to N14) downstream of indoor branch joint A have total capacity of  $14 * 6 + 11.2 * 2 + 9 + 7.1 + 5.6 * 3 + 2.8 = 142.1\text{kW}$ . The system's equivalent length between the farthest indoor unit and the first outdoor branch joint is in excess of 90m. The total capacity of the outdoor units is  $18 + 18 + 16 = 52\text{HP}$ . Refer to Table 3-4.6.
- Main pipe L1 Refer to Table 4.6 is  $\Phi 41.3 / \Phi 19.1$ . Indoor branch joint A Refer to Table 3-4.7 is FQZHN-05D.

**Step 4: Select outdoor connection pipes and outdoor branch joints**

- The master unit is 18HP and the slave one unit is 18HP and the slave two unit is 16HP. Refer to Table 3-4.8. Outdoor connection pipes g1 is  $\Phi 28.6 / \Phi 15.9$ , g2 is  $\Phi 28.6 / \Phi 15.9$ , g3 is  $\Phi 28.6 / \Phi 15.9$ . Outdoor connection pipe G1 is  $\Phi 38.1 / \Phi 19.1$ .
- There are three outdoor units in the system. Refer to Table 3-4.9. Outdoor branch joints L and M are FQZHW-03N1E.

**4.6 Branch Joints dimensions**

Branch joint dimensions are given in *Tables 3-4.11 and Table 3-4.12*

Table 3-4.11: Indoor branch joint dimensions (unit: mm)

Model	Gas side joints	Liquid side joints
FQZHN-01D		
FQZHN-02D		
FQZHN-03D		

Table continued on next page ...

Table 3-4.11: Indoor branch joint dimensions (unit: mm) (continued)

Model	Gas side joints	Liquid side joints
FQZHN-04D		
FQZHN-05D		
FQZHN-06D		
FQZHN-07D		

Table 3-4.12: Outdoor branch joint dimensions for 2/3/4 units' combination (unit: mm)

Model	Gas side joints	Liquid side joints
FQZHW-02N1E		
FQZHW-03N1E		

Table continued on next page ...

Table 3-4.12: Outdoor branch joint dimensions for 2/3/4 units' combination (unit: mm)

Model	Gas side joints	Liquid side joints
FQZHW-04N1G		

#### 4.7 Refrigerant Leakage Precautions

R410A refrigerant is not flammable in air at temperatures up to 100°C at atmospheric pressure and is generally considered a safe substance to use in air conditioning systems. Nevertheless, precautions should be taken to avoid danger to life in the unlikely event of a major refrigerant leakage. Precautions should be taken in accordance with all applicable legislation. Where no applicable legislation exists, the following may be used as a guide:

- Air conditioned rooms should be large enough that if leakage of all the refrigerant in the system occurs, the concentration of the refrigerant in the room does not reach a level dangerous to health.
- A critical concentration (at which point R410A becomes dangerous to human health) of 0.44 kg/m<sup>3</sup> can be used.
- The potential concentration of refrigerant in a room following a leak can be calculated as follows:
  - Calculate the total amount of refrigerant in the system (“A”) as the nameplate charge (the charge in the system when delivered from the factory) plus the additional charge added as Part 3, 8.1 “Calculating Additional Refrigerant Charge”.
  - Calculate the total volume (“B”) of the smallest room into which refrigerant could potentially leak.
  - Calculate the potential refrigerant concentration as “A” divided by “B”.
  - If A/B is equal or more than 0.44 kg/m<sup>3</sup>, countermeasures such installing mechanical ventilators (either ventilating regularly or controlled by refrigerant leakage detectors) should be taken.
- Since R410A is heavier than air, particular consideration should be given to leak scenarios in basement rooms.



Figure 3-4.5: Potential refrigerant leak scenario

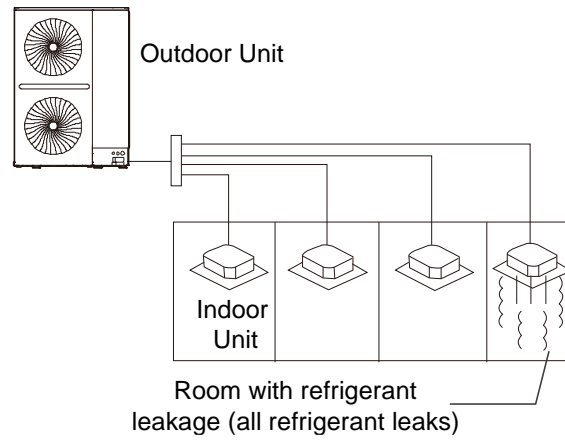
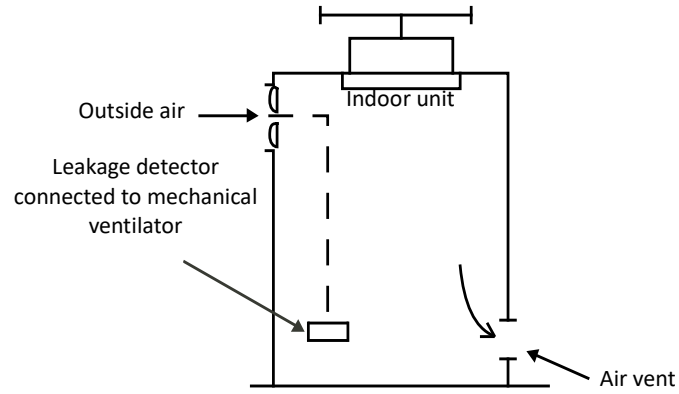



Figure 3-4.6: Mechanical ventilator controlled by refrigerant leak detector



## 5 Refrigerant Piping Installation

### 5.1 Procedure and Principles

#### 5.1.1 Installation procedure

**Notes for installers** 

Installation of the refrigerant piping system should proceed in the following order:

Pipe insulation

Pipe brazing and installation

Pipe flushing

Gastightness test

Joint insulation

Vacuum drying

Note: Pipe flushing should be performed once the brazed connections have been completed with the exception of the final connections to the indoor units. That is, flushing should be performed once the outdoor units have been connected but before the indoor units are connected.

#### 5.1.2 Three principles for refrigerant piping

	Reasons	Measures
<b>CLEAN</b>	Particles such as oxide produced during brazing and/or building dust can lead to compressor malfunction	<ul style="list-style-type: none"> <li>▪ Seal piping during storage<sup>1</sup></li> <li>▪ Flow nitrogen during brazing<sup>2</sup></li> <li>▪ Pipe flushing<sup>3</sup></li> </ul>
<b>DRY</b>	Moisture can lead to ice formation or oxidization of internal components leading to abnormal operation or compressor damage	<ul style="list-style-type: none"> <li>▪ Pipe flushing<sup>3</sup></li> <li>▪ Vacuum drying<sup>4</sup></li> </ul>
<b>SEALED</b>	Imperfect seals can lead to refrigerant leakage	<ul style="list-style-type: none"> <li>▪ Pipe manipulation<sup>5</sup> and brazing<sup>2</sup> techniques</li> <li>▪ Gastightness test<sup>6</sup></li> </ul>

Notes:

1. See Part 3, 5.2.1 "Pipe delivery, storage and sealing".
2. See Part 3, 5.5 "Brazing".
3. See Part 3, 5.9 "Pipe Flushing".
4. See Part 3, 5.11 "Vacuum Drying".
5. See Part 3, 5.3 "Manipulating Copper Piping".
6. See Part 3, 5.10 "Gastightness Test".

## 5.2 Storing Copper Piping

### 5.2.1 Pipe delivery, storage and sealing

#### Notes for installers



- Ensure that piping does not get bent or deformed during delivery or whilst stored.
- On construction sites store piping in a designated location.
- To prevent dust or moisture entering, piping should be kept sealed whilst in storage and until it is about to be connected. If piping is to be used soon, seal the openings with plugs or adhesive tape. If piping is to be stored for a long time, charge the piping with nitrogen at 0.2-0.5MPa and seal the openings by brazing.
- Storing piping directly on the ground risks dust or water ingress. Wooden supports can be used to raise piping off the ground.
- During installation, ensure that piping to be inserted through a hole in a wall is sealed to ensure dust and/or fragments of wall do not enter.
- Be sure to seal piping being installed outdoors (especially if being installed vertically) to prevent rain entering.

## 5.3 Manipulating Copper Piping

### 5.3.1 De-oiling

#### Notes for installers



- Lubrication oil used during some copper pipe manufacturing processes can cause deposits to form in R410A refrigerant systems, causing system errors. Oil-free copper piping should therefore be selected. If ordinary (oily) copper piping is used, it must be cleaned with gauze dipped in tetrachloroethylene solution prior to installation.

#### Caution

- Never use carbon tetrachloride (CCl<sub>4</sub>) for pipe cleansing or flushing, as doing so will seriously damage the system.

### 5.3.2 Cutting copper piping and removing burrs

#### Notes for installers



- Use a pipe cutter rather than a saw or cutting machine to cut piping. Rotate the piping evenly and slowly, applying even force to ensure that the piping does not become deformed during cutting. Using a saw or cutting machine to cut piping runs the risk of copper shavings entering the piping. Copper shavings are difficult to remove and pose a serious risk to the system if they enter the compressor or block the throttling unit.
- After cutting using a pipe cutter, use a reamer/scrapper to remove any burrs that have formed at the opening, keeping the opening of the piping downwards to avoid copper shavings from entering the piping.
- Remove burrs carefully to avoid scratches, which may prevent a proper seal being formed and lead to refrigerant leakage.

### 5.3.3 Expanding copper piping ends

#### Notes for installers

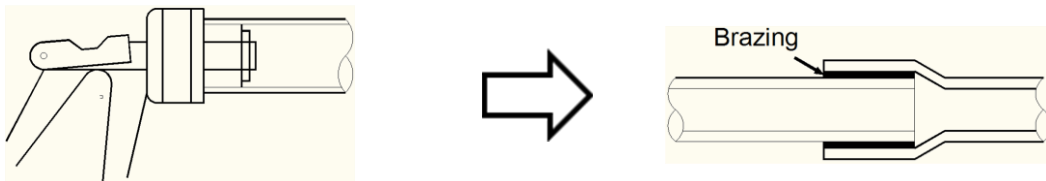


- Ends of copper piping can be expanded so that another length of piping can be inserted and the joint brazed.
- Insert the expanding head of the pipe expander into the pipe. After completing pipe expansion, rotate the copper pipe a few degrees to rectify the straight line mark left by the expanding head.

#### Caution

- Ensure that the expanded section of piping is smooth and even. Remove any burrs that remain after cutting.

Figure 3-5.1: Expanding copper piping ends



### 5.3.4 Flared joints

Flared joints should be used where a screw thread connection is required.

#### Notes for installers

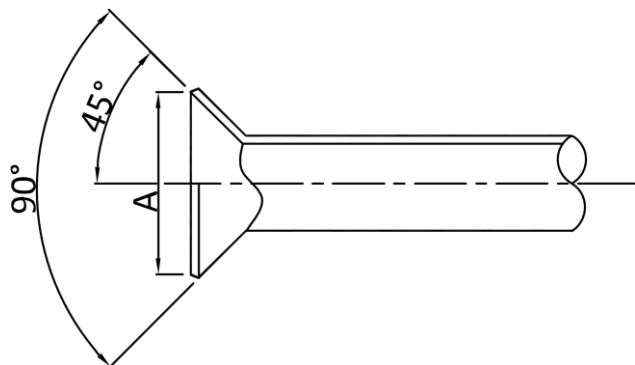


- Before flaring 1/2H (half hard) piping, anneal the end of the pipe to be flared.
- Remember to place the flare nut on the piping before flaring.
- Ensure the flared opening is not cracked, deformed or scratched, otherwise it will not form a good seal and refrigerant leakage may occur.
- The diameter of the flared opening should be within the ranges specified in Table 3-5.1. Refer to Figure 3-5.2.

Table 3-5.1: Flared opening size ranges

Pipe (mm)	Flared opening diameter (A) (mm)
Φ6.35	8.7 - 9.1
Φ9.52	12.8 - 13.2
Φ12.7	16.2 - 16.6
Φ15.9	19.3 - 19.7
Φ19.1	23.6 - 24.0

Figure 3-5.2: Flared opening



- When connecting a flared joint, apply some compressor oil to the inner and outer surfaces of the flared opening

### 5.3.5 Bending piping

Bending copper piping reduces the number of brazed joints required and can improve quality and save material.

#### Notes for installers



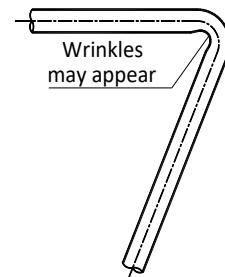
##### Piping bending methods

- Hand bending is suitable for thin copper piping ( $\Phi 6.35\text{mm} - \Phi 12.7\text{mm}$ ).
- Mechanical bending (using a bending spring, manual bending machine or powered bending machine) is suitable for a wide range of diameters ( $\Phi 6.35\text{mm} - \Phi 54.0\text{mm}$ ).

##### Caution

- When using a spring bender, ensure that the bender is clean before inserting it in the piping.
- After bending a copper pipe, ensure that there are no wrinkles or deformation on either side of the pipe.
- Ensure that bend angles do not exceed  $90^\circ$ , otherwise wrinkles may appear on the inner side of the pipe, and the pipe may buckle or crack. Refer to Figure 3-5.3.
- Do not use a pipe that has buckled during the bending process; ensure that the cross section at the bend is greater than  $2/3$  of the original area.

Figure 3-5.3: Pipe bending in excess of  $90^\circ$



### 5.4 Refrigerant Piping Supports

When the air conditioning is running, the refrigerant piping will deform (shrink, expand, droop). To avoid damage to piping, hangers or supports should be spaced as per the criteria in the Table 3-5.2. In general, the gas and liquid pipes should be suspended in parallel and the interval between support points should be selected according to the diameter of the gas pipe.

Table 3-5.2: Refrigerant piping support spacings

Pipe (mm)	Interval between support points (m)	
	Horizontal Piping	Vertical Piping
$< \Phi 20$	1	1.5
$\Phi 20 - \Phi 40$	1.5	2
$> \Phi 40$	2	2.5

Suitable insulation should be provided between the piping and the supports. If wooden dowels or blocks are to be used, use wood that has undergone preservative treatment.

Changes in refrigerant flow direction and refrigerant temperature result in movement, expansion and shrinkage of the refrigerant piping. Piping should therefore not be fixed too tightly, otherwise stress concentrations may occur in the piping, with the potential for rupturing.

## 5.5 Brazing

Care must be taken to prevent oxide forming on the inside of copper piping during brazing. The presence of oxide in a refrigerant system adversely affects the operation of valves and compressors, potentially leading to low efficiency or even compressor failure. To prevent oxidation, during brazing nitrogen should be flowed through the refrigerant piping.

### Notes for installers



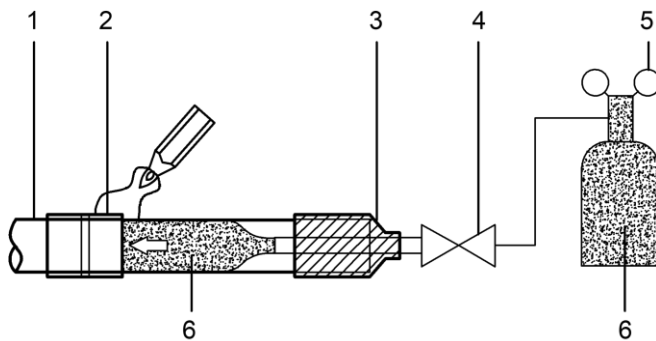
#### Warning

- Never flow oxygen through piping as doing so aids oxidation and could easily lead to explosion and as such is extremely dangerous.
- Take appropriate safety precautions such as having a fire extinguisher to hand whilst brazing.

#### Flowing nitrogen during brazing

- Use a pressure reducing valve to flow nitrogen through copper piping at 0.02-0.03MPa during brazing.
- Start the flow before brazing starts and ensure that the nitrogen continuously passes through the section being brazed until the brazing is complete and the copper has cooled down completely.

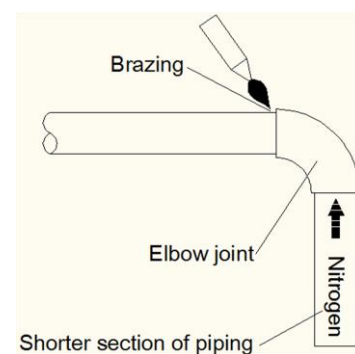
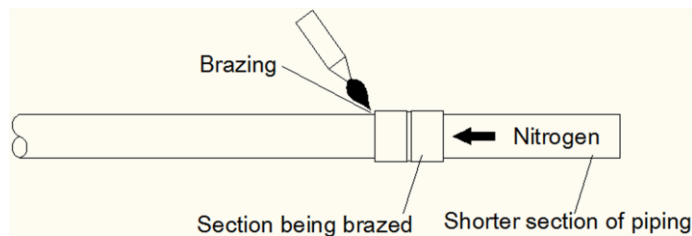
Figure 3-5.4: Flowing nitrogen through piping during brazing



Legend	
1	Copper piping
2	Section being brazed
3	Nitrogen connection
4	Hand valve
5	Pressure-reducing valve
6	Nitrogen

- When joining a shorter section of piping to a longer section, flow nitrogen from the shorter side to allow better displacement of air with nitrogen.
- If the distance from the point where nitrogen enters the piping to the joint to be brazed is long, ensure that the nitrogen is flowed for sufficient time to discharge all the air from the section to be brazed before commencing brazing.

Figure 3-5.5: Flowing nitrogen from shorter side during brazing

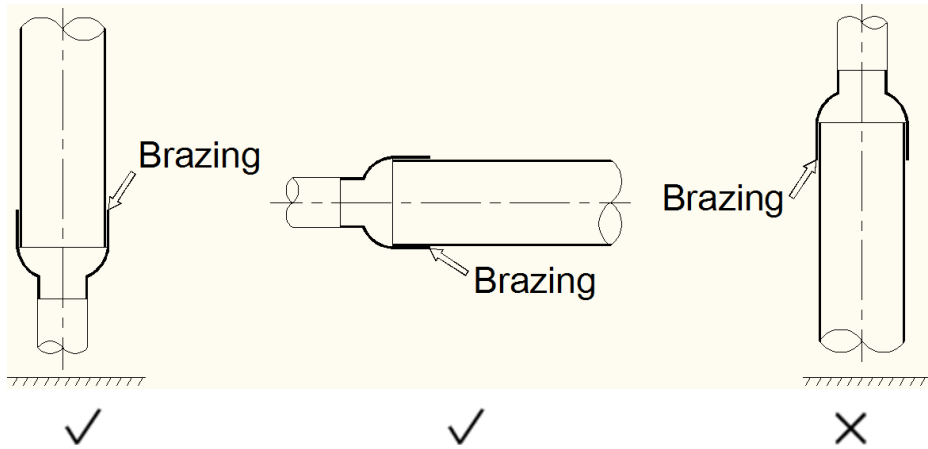


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**Piping orientation during brazing**

Brazing should be conducted downwards or horizontally to avoid filler leakage.

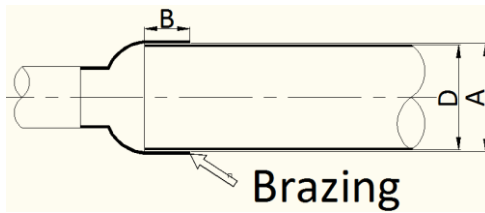
Figure 3-5.6: Piping orientation during brazing



**Piping overlap during brazing**

Table 3-5.3 specifies the minimum permissible piping overlap and the range of permissible gap sizes for brazed joints on piping of different diameters. Refer also to Figure 3-5.7.

Figure 3-5.7: Piping overlap and gap for brazed joints



Legend	
A	Inner diameter of larger pipe
D	Outer diameter of smaller pipe
B	Inlaid depth (overlap)

Table 3-5.3: Piping overlap and gap for brazed joints<sup>1</sup>

D (mm)	Minimum permissible B (mm)	Permissible A – D (mm)
5 < D < 8	6	0.05 - 0.21
8 < D < 12	7	
12 < D < 16	8	0.05 - 0.27
16 < D < 25	10	
25 < D < 35	12	0.05 - 0.35
35 < D < 45	14	

Notes:

1. A, B, D refer to the dimensions shown in Figure 3-5.7.

**Filler**

- Use a copper/phosphorus brazing alloy (BCuP) filler that does not require flux.
- Do not use flux. Flux can cause corrosion of piping and can affect the performance of compressor oil.
- Do not use anti-oxidants when brazing. Residue can clog piping and damage components.

## 5.6 Branch Joints

### 5.6.1 U-type branch joint

#### Notes for installers



- Use U-shaped branch joints as specified on the construction drawings – do not replace U-shaped branch joints with tee joints.
- To avoid accumulation of oil in the outdoor units, outdoor branch joints should be installed horizontally and must not be higher than the outdoor unit refrigerant outlets. Refer to Figure 3-5.9.
- Indoor branch joints may be installed either horizontally or vertically. Horizontal branch joints must be installed at an angle to the horizontal not exceeding 10° in order to avoid uneven distribution of refrigerant and possible malfunction. Refer to Figure 3-5.8.

Figure 3-5.8: Branch joint orientation

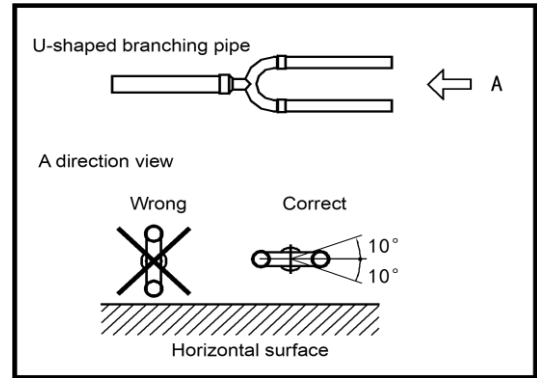
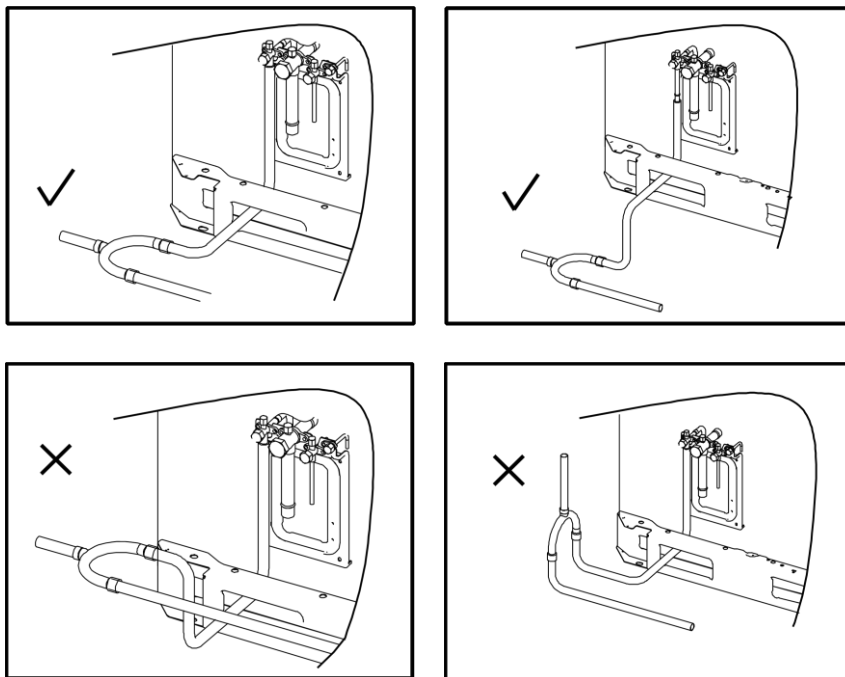
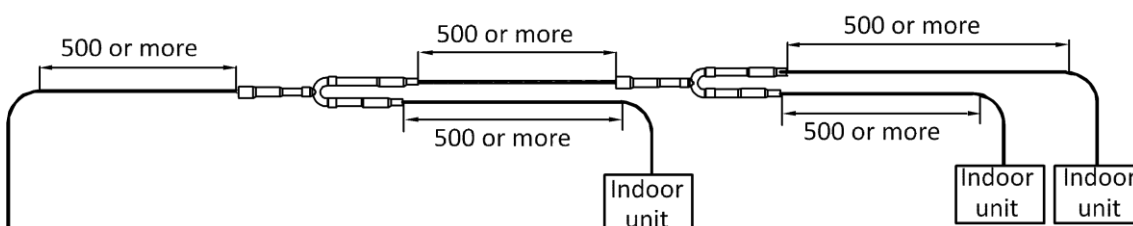


Figure 3-5.9: Installation of outdoor branch joints



- To ensure even distribution of refrigerant, branch joints should not be installed within 500mm of a 90° bend, another branch joint or the straight section of piping leading to an indoor unit, with the minimum 500mm being measured from the point where the branch joint is connected to the piping, as shown in Figure 3-5.10.

Figure 3-5.10: Branch joint spacing and separation from bends (unit: mm)





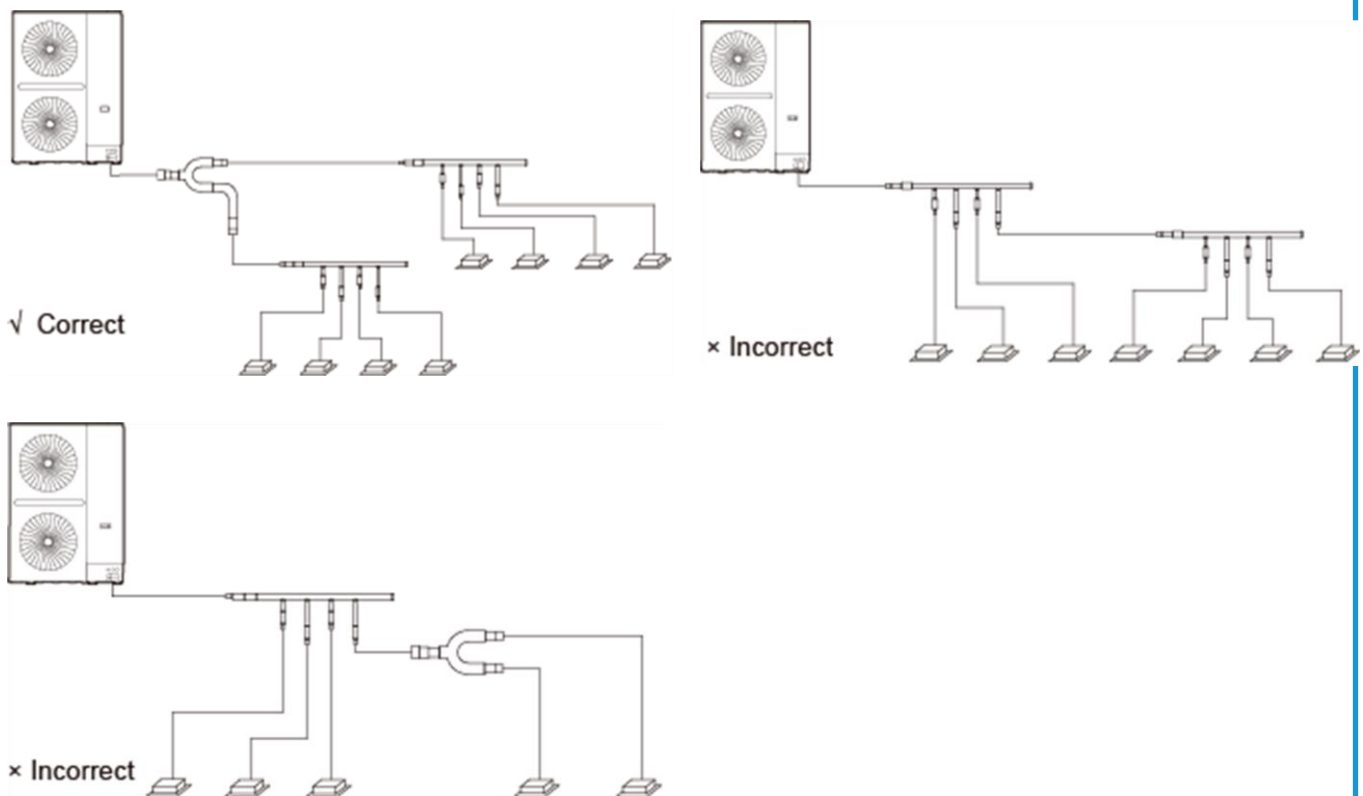
## 5.6.2 Branch header

### Notes for installers



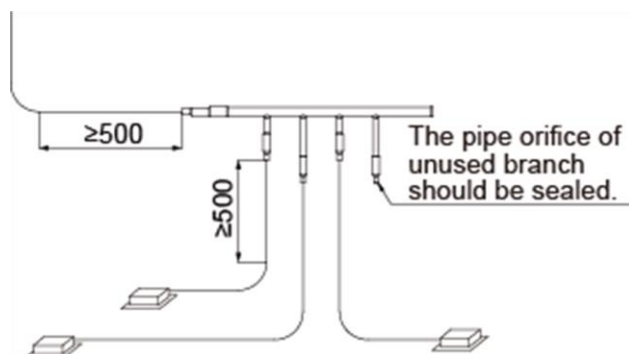
- The content in this section is only for attention during the installation of branch header.
- Please refer to the installation manual of branch header for detailed selection and installation requirements.
- Only parallel installation is allowed, but not serial installation for two branch headers, as shown in Figure 3-5.11
- Each branch can only be connected to indoor units, not to another branch joint, as shown in Figure 3-5.11

Figure 3-5.11: Installation of outdoor branch joints



- The straight horizontal piping distance between two adjacent branch pipes should  $\geq 500$ mm. The straight horizontal piping distance which indoor unit connecting behind the branch pipe should  $\geq 500$ mm.

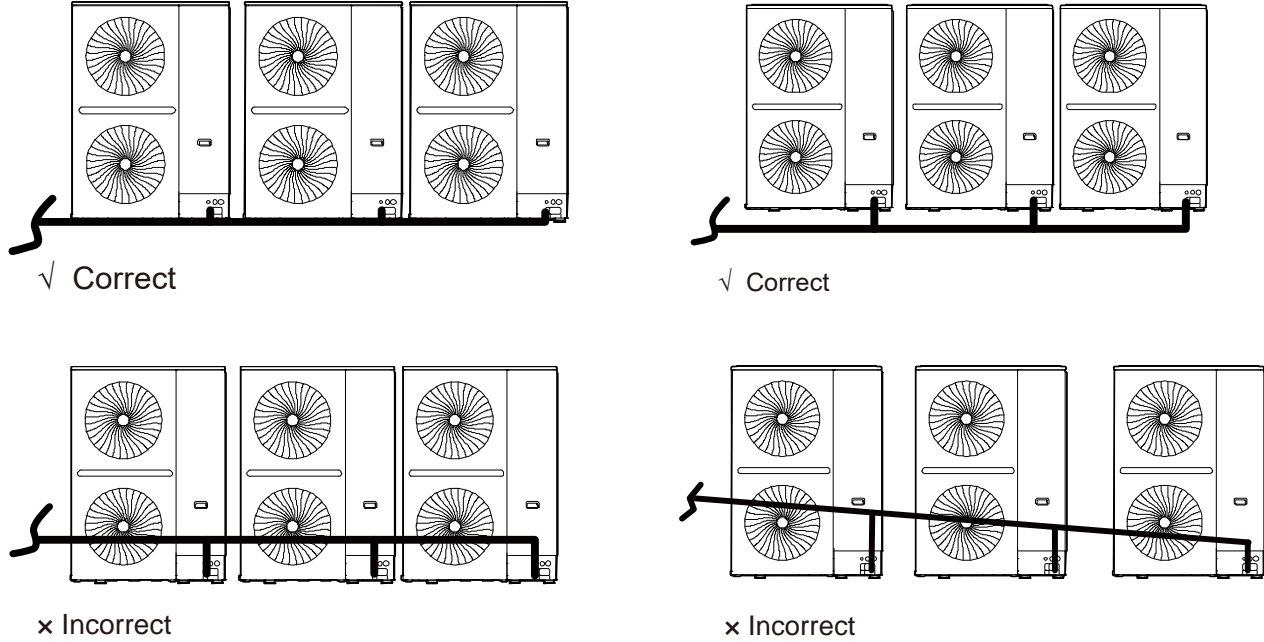
Figure 3-5.12: Branch header spacing and separation from bends (unit: mm)



## 5.7 Piping Connections between Outdoor Units

The piping between the outdoor units must be level or lower than the outlet pipes of outdoor units, as shown in Figure 3-5.13, Figure 3-5.14

Figure 3-5.13: Piping connections between outdoor units



When Branch lower than outlet pipes of outdoor units and the direction inclination angle should be between  $0^{\circ}\sim 15^{\circ}$

Figure 3-5.14: Piping connections between outdoor units

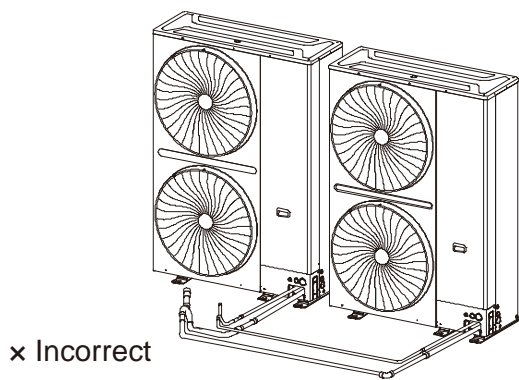
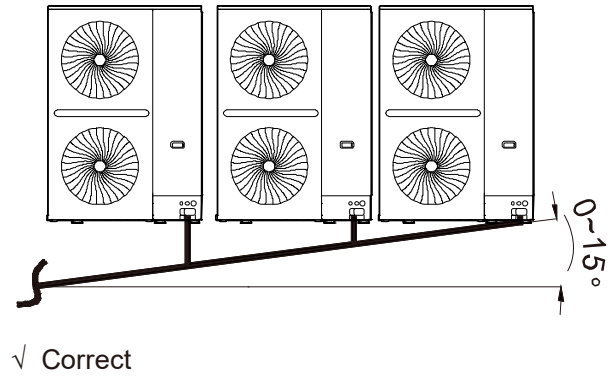
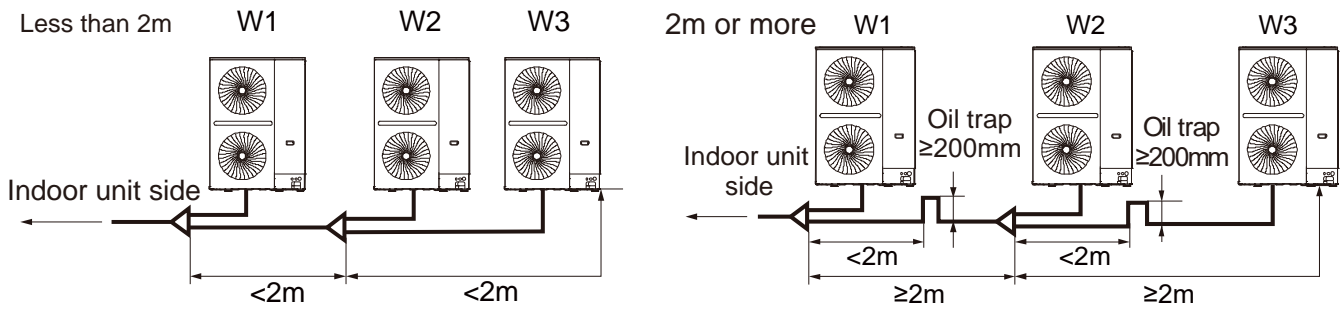


Figure 3-5.15: Piping connections inclination angle



In case that the piping length between outdoor units is 2m or more, the oil trap for the gas pipe should be provided so that accumulation of refrigerant oil may not occur.

Figure 3-5.16: Oil trap between outdoor units



## 5.8 Direction of refrigerant pipe connection

Field piping can be connected in 4 directions. Before connecting, knock off the plate in the corresponding direction.

Figure 3-5.16: Direction of refrigerant pipe connection

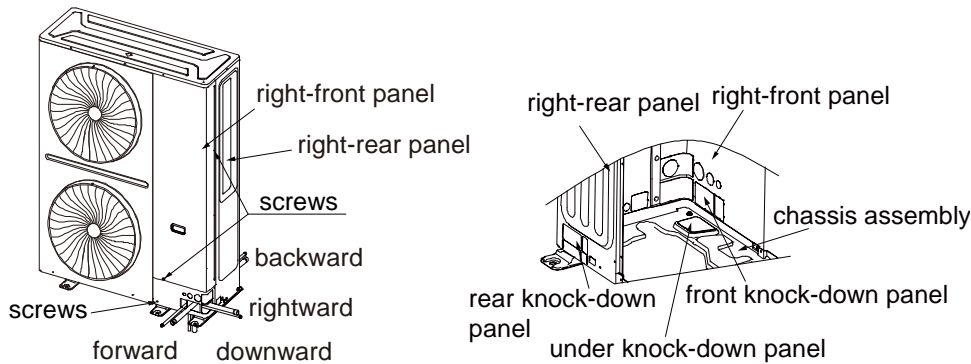


Figure 3-5.17: The connection method of the forward outlet pipe

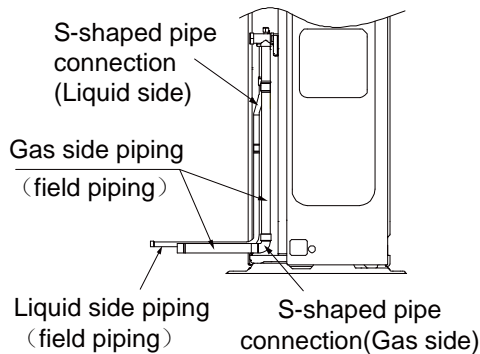


Figure 3-5.18: The connection method of the rightward outlet pipe.

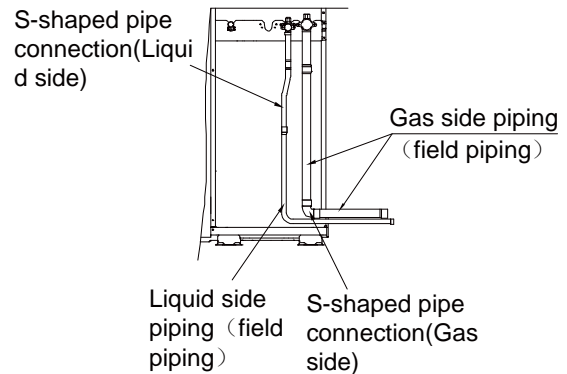


Figure 3-5.19: The connection method of the downward outlet pipe.

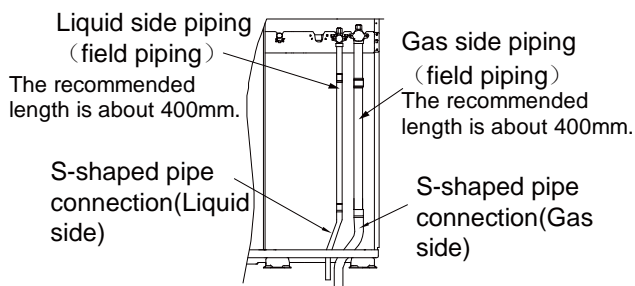
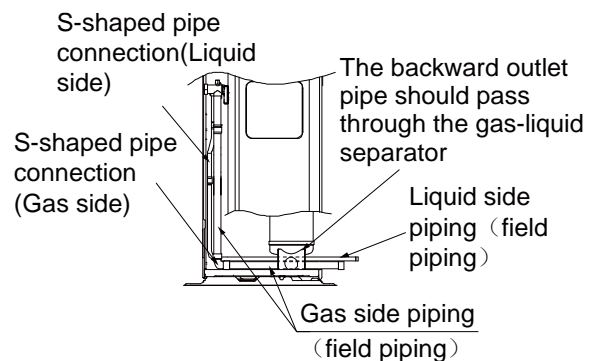


Figure 3-5.20: The connection method of the rightward outlet pipe.



## **5.9 Pipe Flushing**

### **5.9.1 Purpose**

To remove dust, other particles and moisture, which could cause compressor malfunction if not flushed out before the system is run, the refrigerant piping should be flushed using nitrogen. As described in Part 3, 5.1.1 "Installation procedure", pipe flushing should be performed once the piping connections have been completed with the exception of the final connections to the indoor units. That is, flushing should be performed once the outdoor units have been connected but before the indoor units are connected.

## 5.9.2 Procedure

### Notes for installers



#### Warning

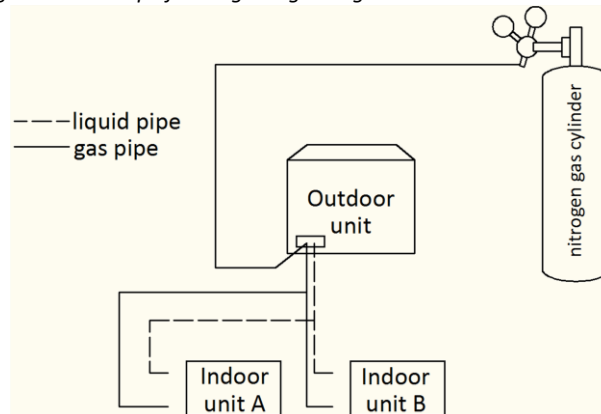
Only use nitrogen for flushing. Using carbon dioxide risks leaving condensation in the piping. Oxygen, air, refrigerant, flammable gases and toxic gases must not be used for flushing. Use of such gases may result in fire or explosion.

#### Procedure

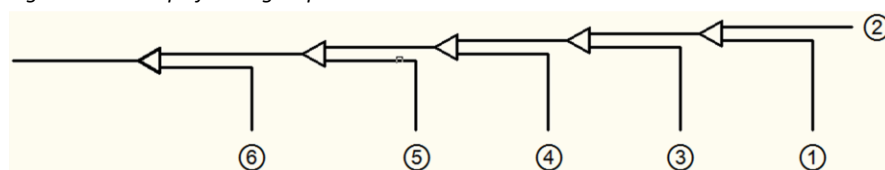
The liquid and gas sides can be flushed simultaneously; alternatively, one side can be flushed first and then Steps 1 to 8 repeated, for the other side. The flushing procedure is as follows:

1. Cover the inlets and outlets of the indoor units to prevent dirt getting blown in during pipe flushing. (Pipe flushing should be carried out before connecting the indoor units to the piping system.)
2. Attach a pressure reducing valve to a nitrogen cylinder.
3. Connect the pressure reducing valve outlet to the inlet on the liquid (or gas) side of the outdoor unit.
4. Use blind plugs to block all liquid (gas) side openings, except for the opening at the indoor unit which is furthest from the outdoor units ("Indoor unit A" in *Figure 3-5.21*).
5. Start to open the nitrogen cylinder valve and gradually increase the pressure to 0.5MPa.
6. Allow time for nitrogen to flow as far as the opening at indoor unit A.
7. Flush the first opening:
  - a) Using suitable material, such as a bag or cloth, press firmly against the opening at indoor unit A.
  - b) When the pressure becomes too high to block with your hand, suddenly remove your hand allowing gas to rush out.
  - c) Repeatedly flush in this manner until no further dirt or moisture is emitted from the piping. Use a clean cloth to check for dirt or moisture being emitted. Seal the opening once it has been flushed.
8. Flush the other openings in the same manner, working in sequence from indoor unit A towards the outdoor units. Refer to *Figure 3-5.22*.
9. Once flushing is complete, seal all openings to prevent dust and moisture from entering.

*Figure 3-5.21: Pipe flushing using nitrogen*



*Figure 3-5.22: Pipe flushing sequence<sup>1</sup>*



Notes:

1. 1-2-3-4-5-6 working towards the outdoor units.

## 5.10 Gastightness Test

### 5.10.1 Purpose

To prevent faults caused by refrigerant leakage, a gastightness test should be performed before system commissioning.

### 5.10.2 Procedure

#### Notes for installers



#### Warning

Only dry nitrogen should be used for gastightness testing. Oxygen, air, flammable gases and toxic gases must not be used for gastightness testing. Use of such gases may result in fire or explosion.

#### Procedure

The gastightness test procedure is as follows:

##### Step 1

- Once the piping system is complete and the indoor and outdoor units have been connected, vacuum the piping to -0.1MPa.

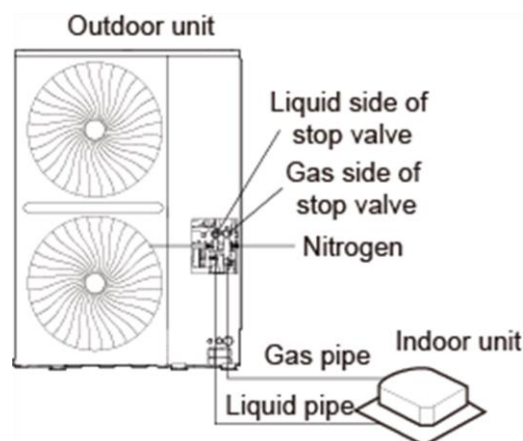
##### Step 2

- Charge the indoor piping with nitrogen at 0.3MPa through the needle valves on the liquid and gas stop valves and leave for at least 3 minutes (do not open the liquid or gas stop valves). Observe the pressure gauge to check for large leakages. If there is a large leakage, the pressure gauge will drop quickly.
- If there are no large leakages, charge the piping with nitrogen at 1.5MPa and leave for at least 3 minutes. Observe the pressure gauge to check for small leakages. If there is a small leakage, the pressure gauge will drop distinctly.
- If there are no small leakages, charge the piping with nitrogen at 4.2MPa and leave for at least 24 hours to check for micro leakages. Micro leakages are difficult to detect. To check for micro leakages, allow for any change in ambient temperature over the test period by adjusting the reference pressure by 0.01MPa per 1°C of temperature difference. Adjusted reference pressure = Pressure at pressurization + (temperature at observation – temperature at pressurization) x 0.01MPa. Compare the observed pressure with the adjusted reference pressure. If they are the same, the piping has passed the gastightness test. If the observed pressure is lower than the adjusted reference pressure, the piping has a micro leakage.
- If the leakage is detected, refer to Part 3, 5.10.3 “Leak detection”. Once the leak has been found and fixed, the gastightness test should be repeated.

##### Step 3

- If not continuing straight to vacuum drying (see Part 3, 5.11 “Vacuum Drying”) once the gastightness test is complete, reduce the system pressure to 0.5-0.8MPa and leave the system pressurized until ready to carry out the vacuum drying procedure.

Figure 3-5.19: Gastightness test



### 5.10.3 Leak detection

#### Notes for installers



The general methods for identifying the source of a leak are as follows:

1. Audio detection: relatively large leaks are audible.
2. Touch detection: place your hand at joints to feel for escaping gas.
3. Soapy water detection: small leaks can be detected by the formation of bubbles when soapy water is applied to a joint.
4. Refrigerant leak detection: for leaks that are difficult to detect, refrigerant leak detection may be used as follows:
  - a) Pressurize the piping with nitrogen at 0.3MPa.
  - b) Add refrigerant into the piping until the pressure reaches 0.5MPa.
  - c) Use a halogen refrigerant detector to find the leak.
  - d) If the leak source cannot be found, continuing charging with refrigerant to a pressure of 4MPa and then search again.

## 5.11 Vacuum Drying

### 5.11.1 Purpose

Vacuum drying should be performed in order to remove moisture and non-condensable gases from the system. Removing moisture prevents ice formation and oxidization of copper piping or other internal components. The presence of ice particles in the system would cause abnormal operation, whilst particles of oxidized copper can cause compressor damage. The presence of non-condensable gases in the system would lead to pressure fluctuations and poor heat exchange performance.

Vacuum drying also provides additional leak detection (in addition to the gastightness test).

## 5.11.2 Procedure

### Notes for installers



During vacuum drying, a vacuum pump is used to lower the pressure in the piping to the extent that any moisture present evaporates. At 5mmHg (755mmHg below typical atmospheric pressure) the boiling point of water is 0°C. Therefore a vacuum pump capable of maintaining a pressure of -756mmHg or lower should be used. Using a vacuum pump with a discharge in excess of 4L/s and a precision level of 0.02mmHg is recommended.

#### Caution

- Before performing vacuum drying, make sure that all the outdoor unit stop valves are firmly closed.
- Once the vacuum drying is complete and the vacuum pump is stopped, the low pressure in the piping could suck vacuum pump lubricant into the air conditioning system. The same could happen if the vacuum pump stops unexpectedly during the vacuum drying procedure. Mixing of pump lubricant with compressor oil could cause compressor malfunction and a one-way valve should therefore be used to prevent vacuum pump lubricant seeping into the piping system.

#### Procedure

The vacuum drying procedure is as follows:

##### Step 1

- Connect the blue (low pressure side) hose of a pressure gauge to the master unit gas pipe stop valve, the red (high pressure side) hose to the master unit liquid pipe stop valve and the yellow hose to the vacuum pump.

##### Step 2

- Start the vacuum pump and then open the pressure gauge valves to start vacuum the system.
- After 30 minutes, close the pressure gauge valves.
- After a further 5 to 10 minutes check the pressure gauge. If the gauge has returned to zero, check for leakages in the refrigerant piping.

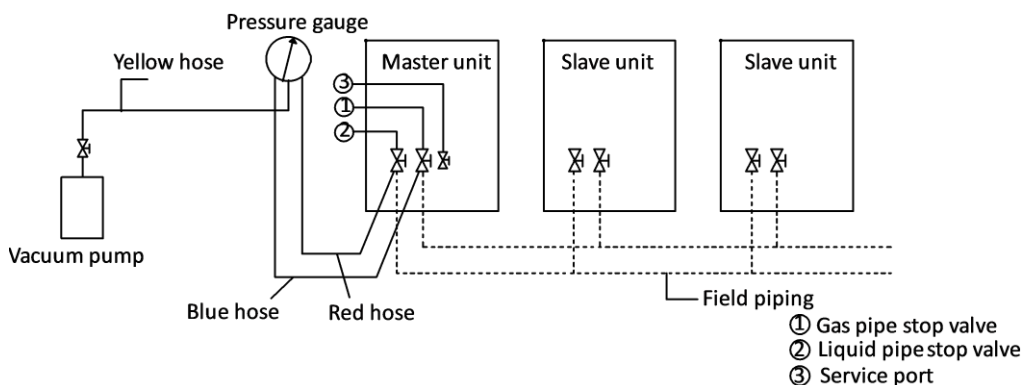
##### Step 3

- Re-open the pressure gauge valves and continue vacuum drying for at least 2 hours and until a pressure difference (below typical atmospheric pressure) of 756mmHg or more has been achieved. Once the pressure difference of at least 756mmHg has been achieved, continue vacuum drying for 2 hours.

##### Step 4

- Close the pressure gauge valves and then stop the vacuum pump.
- After 1 hour, check the pressure gauge. If the pressure in the piping has not increased, the procedure is finished. If the pressure has increased, check for leakages.
- After vacuum drying, **keep the blue and red hoses connected to the pressure gauge and to the master unit stop valves**, in preparation for refrigerant charging (see Part 3, 8 “Charging Refrigerant”).

Figure 3-5.15: Vacuum drying



Pressure gauge



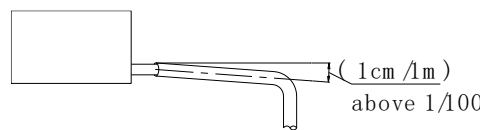
## 6 Drain Piping

### 6.1 Design Considerations

Drain piping design should take account of the following considerations:

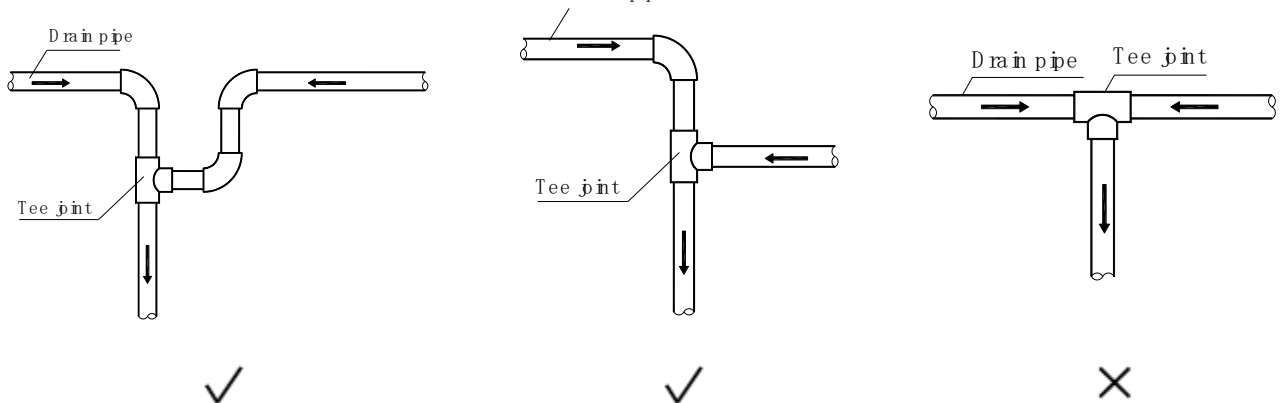
- Indoor unit condensate drain piping needs to be of sufficient diameter to carry the volume of condensate produced at the indoor units and installed at a slope sufficient to allow drainage. Discharge as close as possible to the indoor units is usually preferable.
- To prevent the drain piping becoming excessively long, consideration should be given to installing multiple drain piping systems, with each system having its own drainage point and providing drainage for a subset of the overall set of indoor units.
- The routing of drain piping should take into consideration the need to maintain sufficient slope for drainage whilst avoiding obstacles such as beams and ducting. The drain piping slope should be at least 1:100 away from indoor units. Refer to Figure 3-6.1.

Figure 3-6.1: Drain piping minimum slope requirement



- To avoid backflow and other potential complications, two horizontal drain pipes should not meet at the same level. Refer to the Figure 3-6.2 for suitable connection arrangements. Such arrangements also allow the slope of the two horizontal pipes to be selected independently.

Figure 3-6.2: Drain piping joints – correct and incorrect configurations



- Branch drain piping should join main drain piping from the top, as shown in Figure 3-6.3.
- Recommended support/hanger spacing is 0.8 – 1.0m for horizontal piping and 1.5 – 2.0m for vertical piping. Each vertical section should be fitted with at least two supports. For horizontal piping, spacing greater than those recommended leads to sagging and deformation of the pipe profile at the supports which impedes water flow and should therefore be avoided.
- Air vents should be fitted at the highest point of each drain piping system to ensure that condensation is discharged smoothly. U-bends or elbow joints should be used such that the vents face downwards, to prevent dust entering the piping. Refer to Figure 3-6.5. Air vents should not be installed too close to indoor unit lift pumps.

Figure 3-6.3: Branch drain piping joining main drain piping

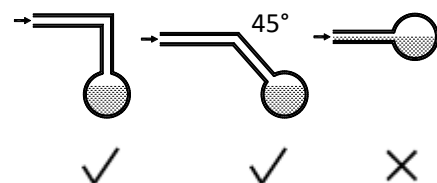


Figure 3-6.4: Effect of insufficient drain piping support

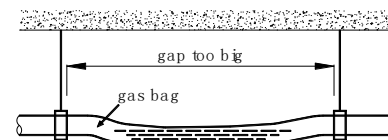
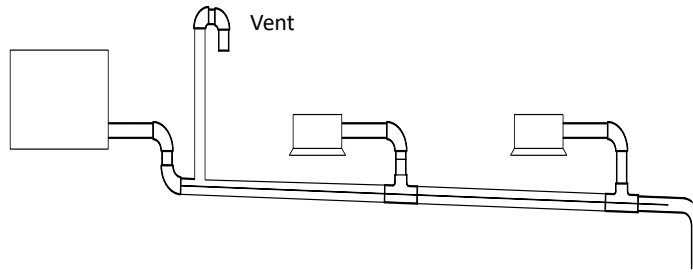


Figure 3-6.5: Drain piping air vents

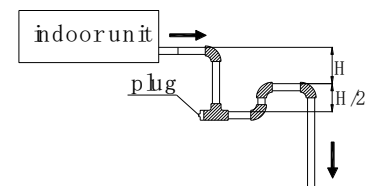


- Air conditioner drain piping should be installed separately from waste, rainwater and other drain piping and should not come into direct contact with the ground.
- Drain piping diameter should be not less than the indoor units' drain piping connection.
- To allow inspection and maintenance, the piping clamps shipped with units should be used to attach drain piping to indoor units – adhesive should not be used.
- Thermal insulation should be added to drain piping to prevent condensation forming. Thermal insulation should extend all the way to the connection with the indoor unit.
- Units with drain pumps should have separate drain piping systems from systems that use natural drainage.

## 6.2 Water Traps

For indoor units with a high negative pressure differential at the outlet of the drainage pan, a trap should be fitted to the drain piping to prevent poor drainage and/or water being blown back into the drainage pan. Traps should be arranged as in Figure 3-6.6. The vertical separation H should be in excess of 50mm. A plug may be fitted to allow cleaning or inspection.

Figure 3-6.6: Drain piping water traps



## 6.3 Selecting Piping Diameters

Select branch drainage piping (the drain piping connection to each unit) diameters according to indoor unit flow volume and select main drainage piping diameters according to the combined flow volume of the upstream indoor units. Use a design assumption of 2 liters of condensate per horsepower per hour. For example, the combined flow volume of three 2HP units and two 1.5HP units would be calculated as follows:

$$\begin{aligned} \text{Combined flow volume} &= 3 \times 2 \text{ L/HP/h} \times 2\text{HP} + 2 \times 2 \text{ L/HP/h} \times 1.5\text{HP} = 18 \text{ L/h} \end{aligned}$$

Tables 3-6.1 and 3-6.2 specify the required piping diameters for horizontal and vertical branch piping and for main piping. Note that main piping should use PVC40 or larger.

Table 3-6.1: Horizontal drain piping diameters

PVC piping	Nominal diameter (mm)	Capacity (L/h)		Remarks
		Slope 1:50	Slope 1:100	
PVC25	25	39	27	Branch piping only
PVC32	32	70	50	
PVC40	40	125	88	Branch or main piping
PVC50	50	247	175	
PVC63	63	473	334	

Table 3-6.2: Vertical drain piping diameters

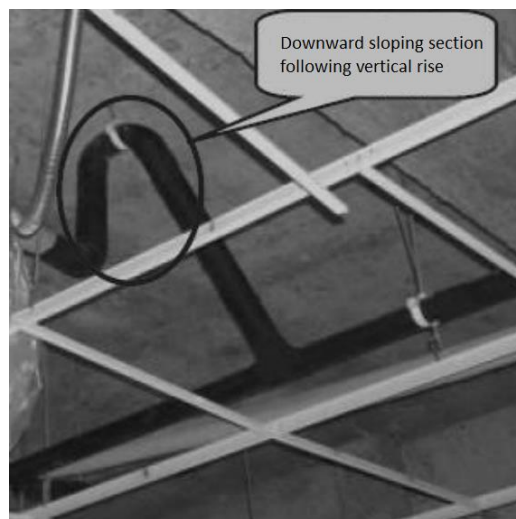
PVC piping	Nominal diameter (mm)	Capacity (L/h)	Remarks
PVC25	25	220	Branch piping only
PVC32	32	410	
PVC40	40	730	Branch or main piping
PVC50	50	1440	
PVC63	63	2760	
PVC75	75	5710	
PVC90	90	8280	

## 6.4 Drain Piping for Units with Lift Pumps

Drain piping for units with lift pumps should take account of the following additional considerations:

- A downward sloping section should immediately follow the vertically rising section adjacent to the unit, otherwise a water pump error will occur. Refer to Figure 3-6.7.
- Air vents should not be installed on vertically rising sections of drain piping, otherwise water may be discharged through the air vent or water flow may be impeded.

Figure 3-6.7: Downward sloping section of drain piping



## 6.5 Drain Piping Installation

### Notes for installers



Installation of the drain piping should proceed in the following order:



### Caution

- Ensure that all joints are firm and once the drain piping is all connected conduct a watertightness test and water flow test.
- Do not connect air conditioner drain piping to waste, rainwater or other drain piping and do not let air conditioner drain piping come into direct contact with the ground.
- For units with drain pumps, test that the drain pump functions properly by adding water to the unit's drainage pan and running the unit. To allow inspection and maintenance, the pipe clamps shipped with units should be used to attach drain piping to indoor units – adhesive should not be used.

## 6.6 Watertightness Test and Water Flow Test

Once installation of a drainage piping system is complete, watertightness and water flow tests should be performed.

### Notes for installers



#### Watertightness test

- Fill the piping with water and test for leakages over a 24-hour period.

#### Water flow test (natural drainage test)

- Slowly fill the drainage pan of each indoor unit with at least 600ml of water through the inspection port and check that the water is discharged through the outlet of the drain piping.

#### Caution

- The drain plug in the drainage pan is for removing accumulated water prior to performing indoor unit maintenance. During normal operation, the drain should be plugged to prevent leakage.

## 7 Insulation

### 7.1 Refrigerant Piping Insulation

#### 7.1.1

During operation, the temperature of the refrigerant piping varies. Insulation is required to ensure unit performance and compressor lifespan. During cooling, the gas pipe temperature can be very low. Insulation prevents condensation forming on the piping. During heating, the gas pipe temperature can be very high. Insulation serves as necessary protection from burns.

#### 7.1.2 Selecting insulation materials

Use heat-resistant polyethylene foam for the liquid pipes (able to withstand temperature of 70°C), and polyethylene foam for the gas pipes (able to withstand temperature of 120°C).

#### 7.1.3 Thickness of insulation

Minimum thicknesses for refrigerant piping insulation are specified in Table 3-7.1. In hot, humid environments, the thickness of insulation should be increased over and above the specifications in Table 3-7.1.

Table 3-7.1: Refrigerant piping insulation thickness

Pipe outer diameter (mm)	Minimum insulation thickness (mm) Humidity < 80%RH	Minimum insulation thickness (mm) Humidity ≥ 80%RH
Φ6.35	15	20
Φ9.52		
Φ12.7		
Φ15.9		
Φ19.1		
Φ22.2		
Φ25.4		
Φ28.6		
Φ31.8		
Φ38.1		
Φ41.3	20	25
Φ44.5		
Φ54.0		

### 7.1.4 Installation of piping insulation

With the exception of joint insulation, insulation should be applied to piping before fixing the piping in place. Insulation at joints in refrigerant piping should be applied after the gastightness test has been completed.

#### Notes for installers



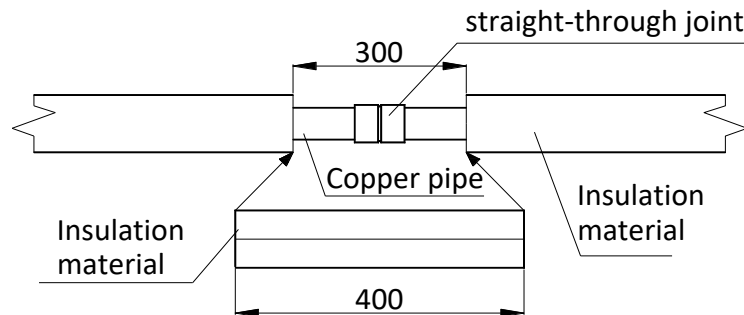
- Installation of insulation should be carried out in a manner suited to the type of insulation material being used.
- Ensure there are no gaps at the joints between sections of insulation.
- Do not apply tape too tightly as doing so may shrink insulation, reducing its insulating properties leading to condensation and loss of efficiency.
- Insulate gas and liquid pipes separately, otherwise heat exchange between the two sides will greatly impact efficiency.
- Do not bind the separately insulated gas and liquid pipes together too tightly as doing so can damage the joints between sections of insulation.

### 7.1.5 Installation of joint insulation

Insulation at joints in the refrigerant piping should be installed after the gastightness test has been successfully completed. The procedure at each joint is as follows:

1. Cut a section of insulation 50 to 100mm longer than the gap to be filled. Ensure that the cross-sectional and longitudinal openings are all cut evenly.
2. Embed the section into the gap ensuring that the ends abut tightly to the sections of insulation either side of the gap.
3. Glue the longitudinal cut and the joints with the sections of insulation either side of the gap.
4. Seal the seams with tape.

Figure 3-7.1: Installation of joint insulation (unit: mm)



### 7.2 Drain Piping Insulation

- Use rubber/plastic insulating tube with a B1 fire resistance rating.
- The insulation should typically be in excess of 10mm thick.
- For drain piping installed inside a wall, insulation is not required.
- Use suitable adhesive to seal seams and joints in the insulation and then bind with cloth reinforced tape of width not less than 50mm. Ensure tape is fixed firmly to avoid condensation.
- Ensure the drain piping insulation adjacent to the indoor unit drainage water outlet is fixed to the unit itself using adhesive, to prevent condensation and dripping.

### 7.3 Ducting Insulation

- Suitable insulation should be added to ducting in according with all applicable legislation.

## 8 Charging Refrigerant

### 8.1 Calculating Additional Refrigerant Charge

The additional refrigerant charge required depends on the lengths and diameters of the outdoor and indoor liquid pipes. Table 3-8.1 shows the additional refrigerant charge required per meter of equivalent pipe length for different diameters of pipe. The total additional refrigerant charge is obtained by summing the additional charge requirements for each of the outdoor and indoor liquid pipes, as in the following formula, where  $L_1$  to  $L_8$  represent the equivalent lengths of the pipes of different diameters. Assume 0.5m for the equivalent pipe length of each branch joint.

$$\begin{aligned}
 \text{Additional refrigerant charge R (kg)} &= L_1 (\Phi 6.35) \times 0.022 \\
 &+ L_2 (\Phi 9.52) \times 0.057 \\
 &+ L_3 (\Phi 12.7) \times 0.110 \\
 &+ L_4 (\Phi 15.9) \times 0.170 \\
 &+ L_5 (\Phi 19.1) \times 0.260 \\
 &+ L_6 (\Phi 22.2) \times 0.360 \\
 &+ L_7 (\Phi 25.4) \times 0.520 \\
 &+ L_8 (\Phi 28.6) \times 0.680
 \end{aligned}$$

Table 3-8.1: Additional refrigerant charge

Liquid side piping (mm)	Additional refrigerant charge per meter of equivalent length of piping (kg)
Φ6.35	0.022
Φ9.52	0.057
Φ12.7	0.110
Φ15.9	0.170
Φ19.1	0.260
Φ22.2	0.360
Φ25.4	0.520
Φ28.6	0.680

Strictly following the additional refrigerant charging amount calculation method, and determine that the additional amount shall not exceed the maximum refrigerant additional amount shown in table 3-8.2. If the additional refrigerant amount exceeds the limits, the total length of the pipeline construction scheme shall be shortened and the refrigerant charging amount shall be recalculated to meet the requirements.

Table 3-8.2: Maximum additional refrigerant charge amount (unit: kg)

Model	Maximum additional refrigerant	Model	Maximum additional refrigerant	Model	Maximum additional refrigerant
8HP	19	42HP	55	76HP	77
10HP	21	44HP	55	78HP	77
12HP	23	46HP	64.5	80HP	77
14HP	23	48HP	65	82HP	93
16HP	29	50HP	62.5	84HP	93
18HP	29	52HP	62.5	86HP	93
20HP	30	54HP	68.5	88HP	93
22HP	30	56HP	75		
24HP	38.5	58HP	75		
26HP	44	60HP	75		
28HP	44	62HP	75		
30HP	48	64HP	75		
32HP	50	66HP	75		
34HP	50	68HP	76		
36HP	54	70HP	76		
38HP	54	72HP	76		
40HP	55	74HP	77		

Notes:

1. The maximum addition refrigerant charge amount is based on the recommended combination.

## 8.2 Adding Refrigerant

### Notes for installers



#### Caution

- Only charge refrigerant after performing a gastightness test and vacuum drying.
- Never charge more refrigerant than required as doing so can lead to liquid hammering.
- Only use refrigerant R410A - charging with an unsuitable substance may cause explosions or accidents.
- Use tools and equipment designed for use with R410A to ensure required pressure resistance and to prevent foreign materials from entering the system.
- Refrigerant must be treated in accordance with applicable legislation.
- Always use protective gloves and protect your eyes when charging refrigerant.
- Open refrigerant containers slowly, and the power supply for all outdoor units should be turned on.
- The power supply for all outdoor units should be turned on, when add refrigerant

#### Procedure

The procedure for adding refrigerant is as follows:

##### Step 1

- Calculate additional refrigerant charge R (kg) (see Part 3, 8.1 “Calculating Additional Refrigerant Charge”)

##### Step 2

- Place a tank of R410A refrigerant on a weighing scale. Turn the tank upside down to ensure refrigerant is charged in a liquid state. (R410A is a blend of two different chemicals compounds. Charging gaseous R410A into the system could mean that the refrigerant charged is not of the correct composition).
- After vacuum drying (see Part 3, 5.11 “Vacuum Drying”), the blue and red pressure gauge hoses should still be connected to the pressure gauge and to the master unit stop valves.
- Connect the yellow hose from the pressure gauge to the R410A refrigerant tank.

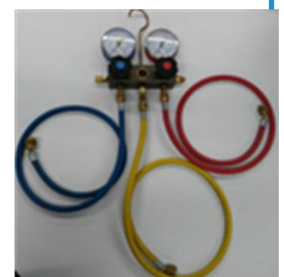
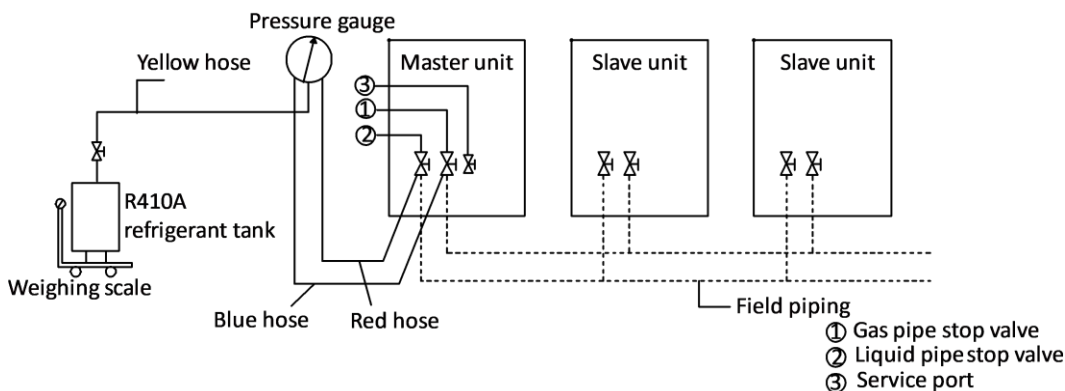
##### Step 3

- Open the valve where the yellow hose meets the pressure gauge, and open the refrigerant tank slightly to let the refrigerant eliminate the air. Caution: open the tank slowly to avoid freezing your hand.
- Set the weighing scale to zero.

##### Step 4

- Open the three valves on the pressure gauge to begin charging refrigerant.
- When the amount charged reaches R (kg), close the three valves. If the amount charged has not reached R (kg) but no additional refrigerant can be charged, close the three valves on the pressure gauge, run the outdoor units in cooling mode, and then open the yellow and blue valves. Continue charging until the full R (kg) of refrigerant has been charged, then close the yellow and blue valves. Note: Before running the system, be sure to complete all the pre-commissioning checks as listed in Part 3, 11.2 “Checklist Before Test Run” and be sure to open all stop valves as running the system with the stop valves closed would damage the compressor.

Figure 3-8.1: Charging refrigerant



Pressure gauge

## 9 Electrical Wiring

### 9.1 General

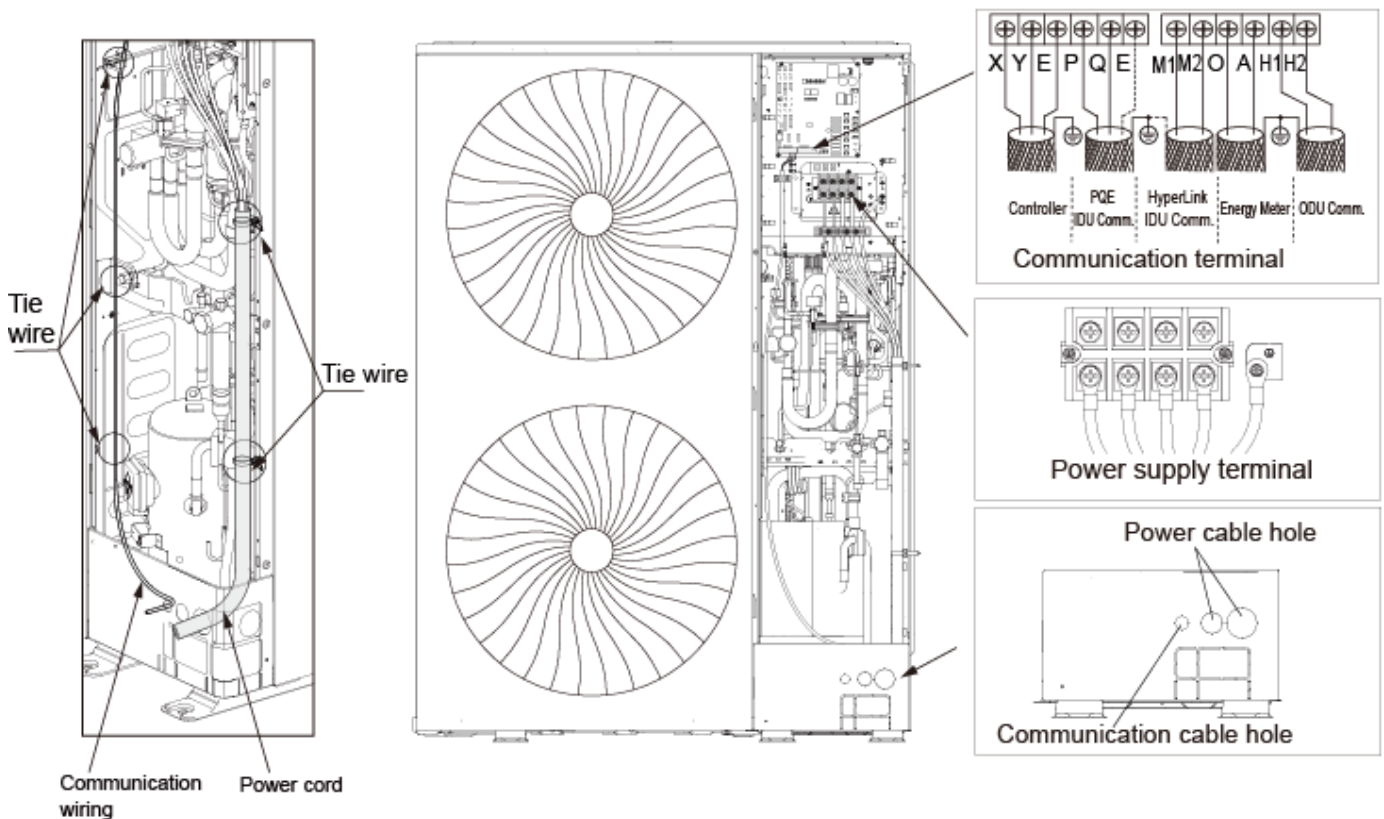
#### Notes for installers



#### Caution

- All installation and wiring must be carried out by competent and suitably qualified, certified and accredited professionals and in accordance with all applicable legislation.
- Electrical systems should be grounded in accordance with all applicable legislation.
- Overcurrent circuit breakers and residual-current circuit breakers (ground fault circuit interrupters) should be used in accordance with all applicable legislation.
- Make sure the grounding connection is safe and reliable. Do not connect the earth wire to public pipes, telephone earth wires, surge absorbers and other places that are not designed for grounding. Improper grounding may cause electric shock.
- Wiring patterns shown in this data book are general connection guides only and are not intended for, or to include all details for, any specific installation.
- Use only wires with copper cores for the connections.
- Wiring must be carried out in strict accordance with what is stated in the product nameplate.
- The refrigerant piping, power wiring and communication wiring are typically run in parallel. However, if EasyCom communication is not activated, the communication wiring should not be bound together with the refrigerant piping or power wiring. To prevent signal interference, the power wiring and communication wiring should not be run in the same conduit. If the power supply is less than 10A, a separation of at least 300mm between power wiring and communication wiring conduits should be maintained; if the power supply is in the range 10A to 50A then a separation of at least 500mm should be maintained.

Figure 3-9.1: Wiring layout





## 9.2 Power Supply Wiring

Power supply wiring design and installation should adhere to the following requirements:

- Separate power supplies should be provided for the indoor units and outdoor units.
- Where five or more outdoor units are installed, additional residual current protection (leakage protection) should be installed.
- All the indoor units in a system (i.e. all the indoor units connected to the same set of outdoor units) should be tied into the same power circuit with the same power supply, overcurrent and residual current protection (leakage protection) and manual switch, as shown in Figure 3-9.2. Do not install separate protectors or manual switches for each indoor unit. Powering on and shutting down all indoor units in a system should be done simultaneously. The reason for this is that if an indoor unit that is running were to suddenly power off whilst the other indoor units continued running, the evaporator of the powered-off unit would freeze since refrigerant would continue flowing to that unit (its expansion valve would still be open) but its fan would have stopped. The indoor units that remain running would not get sufficient refrigerant so their performance would suffer. Additionally, liquid refrigerant returning directly to the compressor from the powered-off unit would cause liquid hammering, potentially damaging the compressor.
- Indoor units can be powered separate when EasyCom communication is activated, refer to Part3, 9.3.4 “M1 M2 communication”.
- For outdoor unit power wire sizing and circuit breaker sizing, refer to Table 2-6.1 in Part 2, 6 “Electrical Characteristics”.

Figure 3-9.2: Outdoor unit power supply wiring

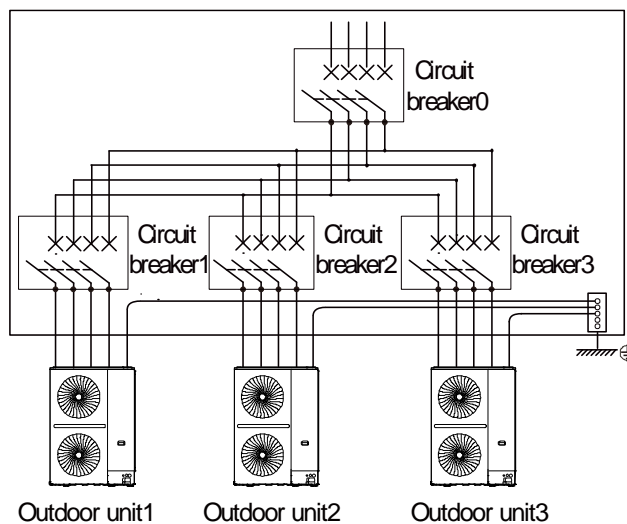
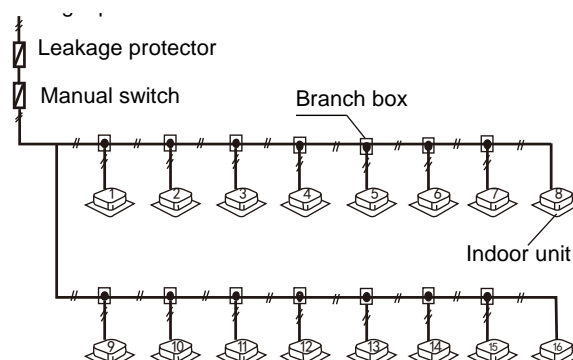


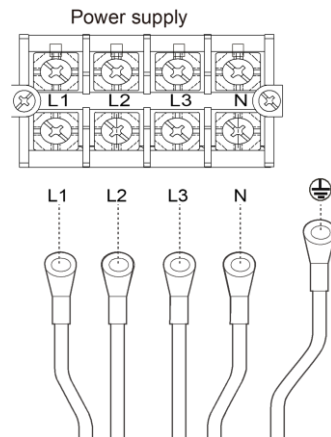
Figure 3-9.3: Indoor unit unified power supply wiring





The 380-415V, 3N~, 50Hz power supply should be connected to the outdoor unit power supply terminals as shown in Figure 3-9.4.

Figure 3-9.4: Outdoor unit 3-phase power supply terminals



### 9.3 Communication Wiring

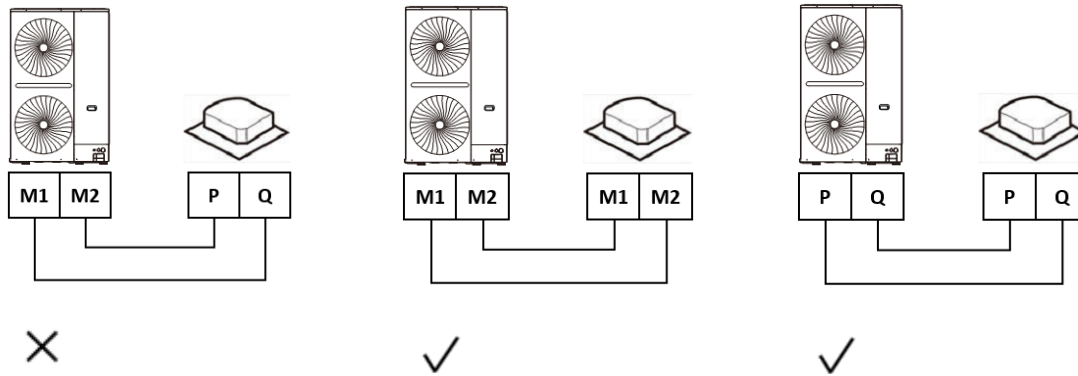
Communication wiring design and installation should adhere to the following requirements:

- Do not connect the communication line when the power is on.
- Connect the shielding nets at both ends of the shielded wire to the sheet metal “⊕” of the electronic control box.
- Do not connect the power cable to the terminal of communication line, otherwise, the motherboard will be damaged.
- Do not connect a system with both EasyCom (M1 M2) communication lines and P Q communication lines.
- When use EasyCom, It is forbidden to reverse the connection of the two communication ports (to up IDU) and (to down IDU) of the repeater.
- On-site wiring must comply with the relevant regulations of the local Country/region and must be completed by professionals.
- The communication wiring of the indoor and ODUs can only be connected to the master ODU.
- The communication lines between ODUs in combined system must be connected in a series.
- When a single communication line is not long enough, the joint must be crimped or soldered, and the copper wire at the joint shall not be exposed.
- V8S outdoor unit compatible with different generation indoor units, the communication connection type should follow table 3-9.1.

Table 3-9.1: Communication connection between ODU and IDUs

Indoor unit generation	Communication connection type	Wire diameter (mm <sup>2</sup> )	Length limitation (m)
All V8 indoor units and unified power supply	M1 M2 / P Q	2x0.75	2000 / 1200
All V8 indoor units and separate power supply	M1 M2	2x1.5	600 (2 repeaters are required)
At least one IDU or ODU is not V8 series	P Q E	3x0.75	1200

Figure 3-9.5: Communication wiring



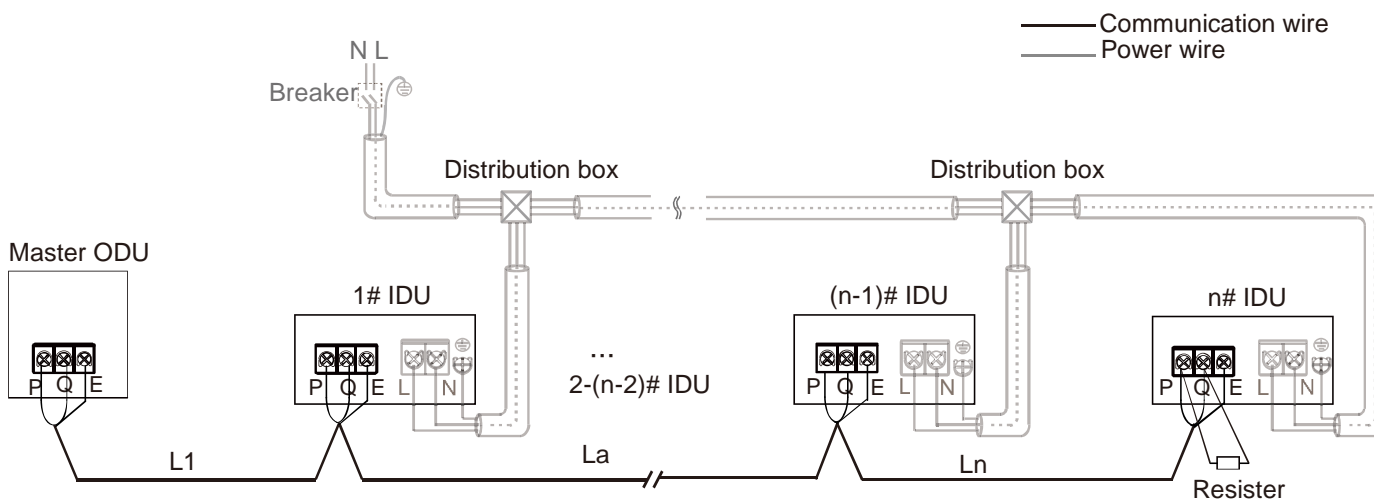
### 9.3.1 Outdoor unit and indoor units' P Q E communication

Communication wiring design and installation should adhere to the following requirements:

- 0.75mm<sup>2</sup> three-core shielded cable should be used for communication wiring. Using other types of cable can lead to interference and malfunction.
- Do not bind the communication line, refrigerant piping and power cable together.
- When the power cable and communication line are laid in parallel, the distance between the two lines must be 5cm or more to prevent signal source interference.
- The P Q E communication wires should be connected one unit after another in a daisy chain from the outdoor unit to the final indoor unit as shown in Figure 3-9.7. At the final indoor unit, a 120Ω resistor should be connected between the P and Q terminals. After the final indoor unit, the communication wiring should NOT be continued back to the outdoor unit – that is, do not attempt to form a closed loop.
- The P and Q communication wires should NOT be connecting to E.
- The shielding nets of the communication wires should be connected together and grounded. Grounding can be achieved by connecting to the metal casing adjacent to the P Q E terminals of the outdoor unit electrical control box.
- All IDUs in a system must be powered through a uniform power supply so that they can be powered on or off at the same time.

Figure 3-9.7: P Q E communication wiring configuration – IDUs uniform power supplied

- RS-485 (P Q E) communication wiring configuration  
 $L1+La+Ln \leq 1200\text{m}$ . Communication wiring  $3 \times 0.75\text{mm}^2$



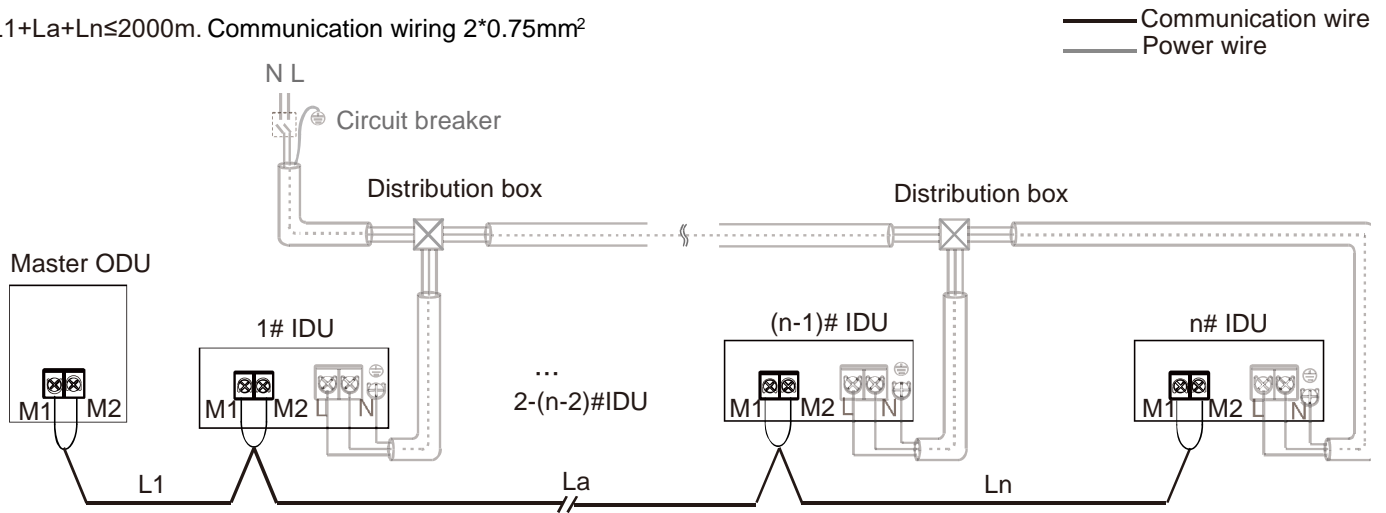
### 9.3.3 Outdoor unit and indoor units' M1, M2 communication-IDUs uniform power supplied

Communication wiring design and installation should adhere to the following requirements when all IDUs uniform power supplied:

- 0.75mm<sup>2</sup> two-core Shielded cable should be used for communication wiring when all the indoor units are uniform power supplied.
- All indoor units in the system are V8 indoor units.
- After the final indoor unit, the communication wiring CAN be continued back to the outdoor unit to ensure communication in case of disconnection point. In this situation, M1 M2 are polarized and M1 should connect to M1, M2 should connect to M2.

Figure 3-9.9: M1 M2 communication wiring configuration – IDUs uniform power supplied

$L1+La+Ln \leq 2000m$ . Communication wiring  $2 \times 0.75mm^2$



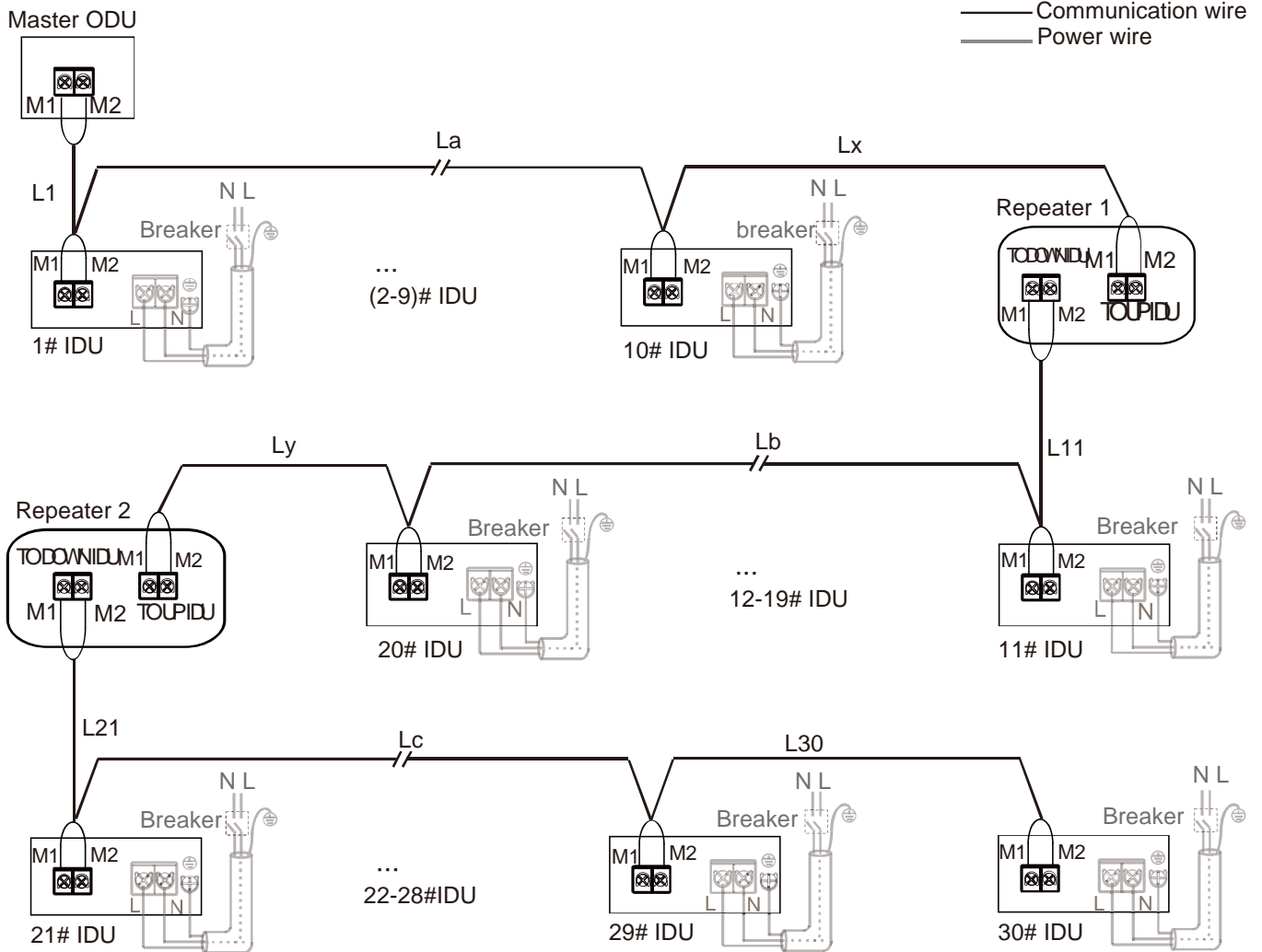
### 9.3.4 Outdoor unit and indoor units' M1, M2 communication- IDUs separate power supplied

Communication wiring design and installation should adhere to the following requirements when IDUs separate power supplied.

- 1.5mm<sup>2</sup> two-core Shielded cable should be used for communication wiring when indoor units are separate power supplied.
- All indoor units in the system are V8 indoor units.
- If the total distance is less than or equal to 200m and the total number of IDUs is less than or equal to 10 sets, the valve is powered and controlled by the master ODU.
- If the total distance is longer than 200m or the total number of IDUs is more than 10 sets, a repeater is required to increase the bus voltage. The load capacity of the repeater is the same as that of the ODU, and it can load a bus length of 200m or 10 IDUs.
- Maximum two repeaters can be installed in the same refrigerant system.
- The number of IDUs requiring power supply in the same refrigerant system is less than or equal to 30 sets.
- Keep the power on/off for both the repeater and the ODUs, or the repeater use an uninterruptible power supply.
- For repeater installation, please refer to the repeater installation manual. Do not reversely connect the upstream and downstream IDU ports of the repeater; otherwise, it will cause a communication failure
- After the final indoor unit, the communication wiring should NOT be continued back to the outdoor unit – that is, do not attempt to form a closed loop.

Figure 3-9.10: M1 M2 communication wiring configuration – IDUs separate power supplied

$L1+La+Lx \leq 200m$ ,  $L11+Lb+Ly \leq 200m$ ,  $L21+Lc+L30 \leq 200mm$ . Communication wiring  $2 \times 1.5mm^2$



### Notes for installers



The communication wires should be connected to the master outdoor unit terminals indicated in Figure 3-9.11 and Table 3-9.2.

#### Caution

- Communication wiring has polarity. Care should be taken to connect the poles correctly.

Figure 3-9.11: Master outdoor unit communication terminals

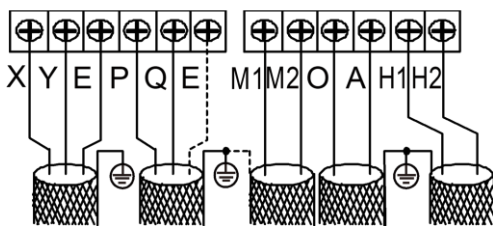


Table 3-9.2: Communication connections

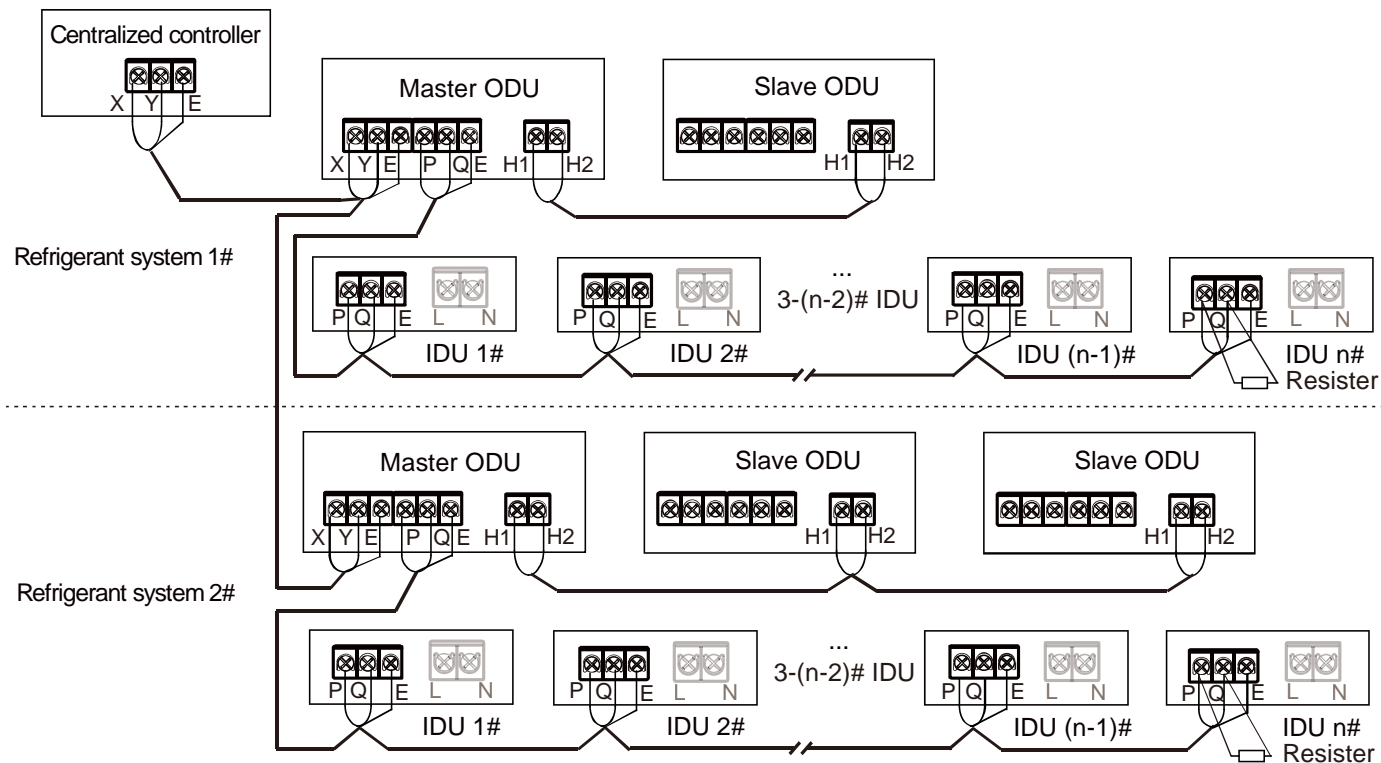
Terminals	Connection
X Y E	Connect to centralized controller
P Q E	Communication connection between indoor units and master outdoor unit
M1 M2	EasyCom communication connection between indoor units and master outdoor unit
O A	Connect to digital energy meter
H1 H2	Connect between outdoor units

### 9.3.5 Outdoor units' H1 H2 and XYE communication

The outdoor unit's combined system, and the communication lines between the ODUs must be connected in series.

- The H1 H2 communication wires should be connected one unit after another in a daisy chain from the master outdoor unit to the final slave outdoor unit. The XYE communication lines of the outdoor unit should be connected from the master unit.
- 0.75mm<sup>2</sup> two-core shielded cable should be used for communication wiring, and the length must not exceed 1200m.
- Connect the shielding nets at both ends of the shielded wire to the sheet metal “⊖” of the electronic control box.

Figure 3-9.12: Outdoor units' communication



## **10 Installation in Areas of High Salinity**

### **10.1 Caution**

Do not install outdoor units where they could be directly exposed to sea air. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.

Outdoor units installed in seaside locations should be placed such as to avoid direct exposure to the sea air and additional anticorrosion treatment options should be selected, otherwise the service life of the outdoor units will be seriously affected.

Air conditioning installed in seaside locations should be run regularly as the running of the outdoor unit fans helps prevent build-up of salt on the outdoor unit heat exchangers.

### **10.2 Placement and Installation**

Outdoor units should be installed 300m or more from the sea. If possible, well-ventilated indoor locations should be chosen. If it is necessary to install outdoor units outside, direct exposure to the sea air should be avoided. A canopy should be added to shield the units from sea air and rain.

Ensure that base structures drain well so that outdoor unit footings do not become waterlogged. Check that outdoor unit casing drainage holes are not blocked.

### **10.3 Inspection and maintenance**

In addition to standard outdoor unit servicing and maintenance, the following additional inspections and maintenance should be undertaken for outdoor units installed in seaside locations:

- A comprehensive post-installation inspection should check for any scratches or other damage to painted surfaces and any damaged areas should be repainted/repaired immediately.
- The units should be regularly cleaned using (non-salty) water to remove any salt that has accumulated. Areas cleaned should include the condenser, the refrigerant piping system, the outside surface of the unit casing and the outside surface of the electric control box.
- Regular inspections should check for corrosion and if necessary corroded components should be replaced and/or anti-corrosion treatments should be added.

# 11 Commissioning

## 11.1 Pre-commissioning Checks

Before turning on the power to the indoor and outdoor units, ensure the following:

- **Installation**

Check if the unit is installed correctly to prevent strange noises and vibrations when the unit starts.

- **Field wiring**

Based on the wiring schematic and the relevant regulations, make sure the field wiring is based on the instructions described in Part 3, "9" Electrical Wiring" on connecting wires.

- **Earth line**

Make sure the earth line is connected correctly, and the grounding terminal is tight.

- **Insulation test of main circuit**

Use the multimeter of 500V, apply a voltage of 500V DC between the power terminal and the earth terminal. Check that the insulation resistance is above 2 MΩ. Do not use the multimeter on the transmission line.

- **Fuses, circuit breakers, or protection devices**

Check that the fuses, circuit breakers, or locally installed protection devices comply with the size and type specified in Part 2, "7 Functional Components and Safety Devices". Make sure you use fuses and protection devices.

- **Internal wiring**

Visually inspect if the connections between the electrical component box and the interior of the unit is loose, or if the electrical components are damaged.

- **Piping dimensions and insulation**

Make sure the installation piping dimensions are correct, and the insulation work can be carried out normally.

- **Stop valve**

Make sure the stop valve is open on both the liquid, low pressure and high pressure gas sides.

- **Equipment damage**

Check for damaged components and extruded piping inside the unit.

- **Refrigerant leak**

Check for refrigerant leaks inside the unit. If there is a refrigerant leak, try to repair the leak. If the repair is not successful, please call the local agent. Do not come in contact with the refrigerant leaking from the refrigerant piping connections. It may cause frostbite.

- **Oil leak**

Check if there is oil leaking from the compressor. If there is an oil leak, try to repair the leak. If the repair is not successful, please call the local agent.

- **Air inlet/outlet**

Check for paper, cardboard or any other material that may obstruct the air inlet and outlet of the equipment.

- **Add additional refrigerant**

The amount of refrigerant to be added to this unit should be marked on the "Confirmation Table" which is placed at electrical control box front cover.

- **Installation date and field settings**

Make sure the installation date is recorded on the label of the electric control box cover, and the field settings are recorded as well.



## 11.2 Outdoor Unit Address and Communication Type Setting

### Step 1: Power on

Cover the lower panel of the ODU, and power on all IDUs and ODUs.

### Step 2: Enter commissioning mode

When the ODU is first powered on, it displays "-. -. -. .-", which means the unit is not commissioned. Long press the "DOWN" and "UP" buttons simultaneously for 5s on the master ODU to enter commissioning mode.

### Step 3: Set the number of IDUs in a system

The digital display of the master ODU displays "01 01", where 1st and 2nd digits always on, 3rd and 4th digits flashing. The 3rd and 4th digits represent the number of IDUs, the initial value is 1, short press the "DOWN" or "UP" button to change the number. Once the number of IDUs has been set, short press the "OK" button to confirm and automatically proceed to the next step.

### Step 4: Select the system communication protocol

Enter the communication protocol setting interface, the digital display of master ODU displays "02 0", where the 1st and 2nd digits always on, the 3rd digit off, the 4th digit flashing. The 4th digit of the digital display represents the communication protocol type, the initial value is 0. Short press the "DOWN" or "UP" button to change the communication protocol.

If the system is **all V8 IDUs**, and the IDUs and ODUs are connected by **PQ** communication, please select V8 protocol RS-485 (P Q) communication, and set the 4th digit of the master ODU digital display to **0**; ODU factory default V8 protocol RS-485 (P Q) communication.

If the system has a **non-V8 IDUs**, and the IDUs and ODUs are connected by **PQE** communication, please select the non-V8 protocol RS-485 (P Q E) communication and set the 4th digit of the master ODU digital display to **1**.

If the system is **all V8 IDUs**, the IDUS and ODUs are connected by **M1M2** communication, and all IDUs are powered uniformly, please select the EasyCom (M1M2) communication + **indoor unit uniform power supply**, and set the 4th digit of the master ODU digital display to **2**.

If the system is **all V8 IDUs**, the IDUS and ODUs are connected by **M1M2** communication, and there is separate power supply for IDUS, please select the HyperLink (M1M2) communication + **indoor unit separate power supply**, and set the 4th digit of the master ODU digital display to **3**.

Once the communication protocol has been set, short press the "OK" button to confirm and automatically proceed to the next step.

### Step 5: IDUs and ODUs address setting

Enter the auto addressing function, the digital display of master ODU flashes "AU Ad" and "X YZ" in rotation. "AU Ad" means the auto addressing is in progress, "X" represents the address of the ODU, "YZ" represents the number of detected IDUs; the auto addressing takes about 5-7 minutes, and automatically proceed to the next step after completion.

### Step 6: System initialization

Entering system initialization, the digital display of master ODU flashes "AU Ad" and "X YZ" in rotation. "INIt" means initialization is in progress, "X" represents the address of the ODU, "YZ" represents the number of detected IDUs; the system initialization takes about 3-5 minutes, and automatically proceed to the next step after completion.

### Step 7: End

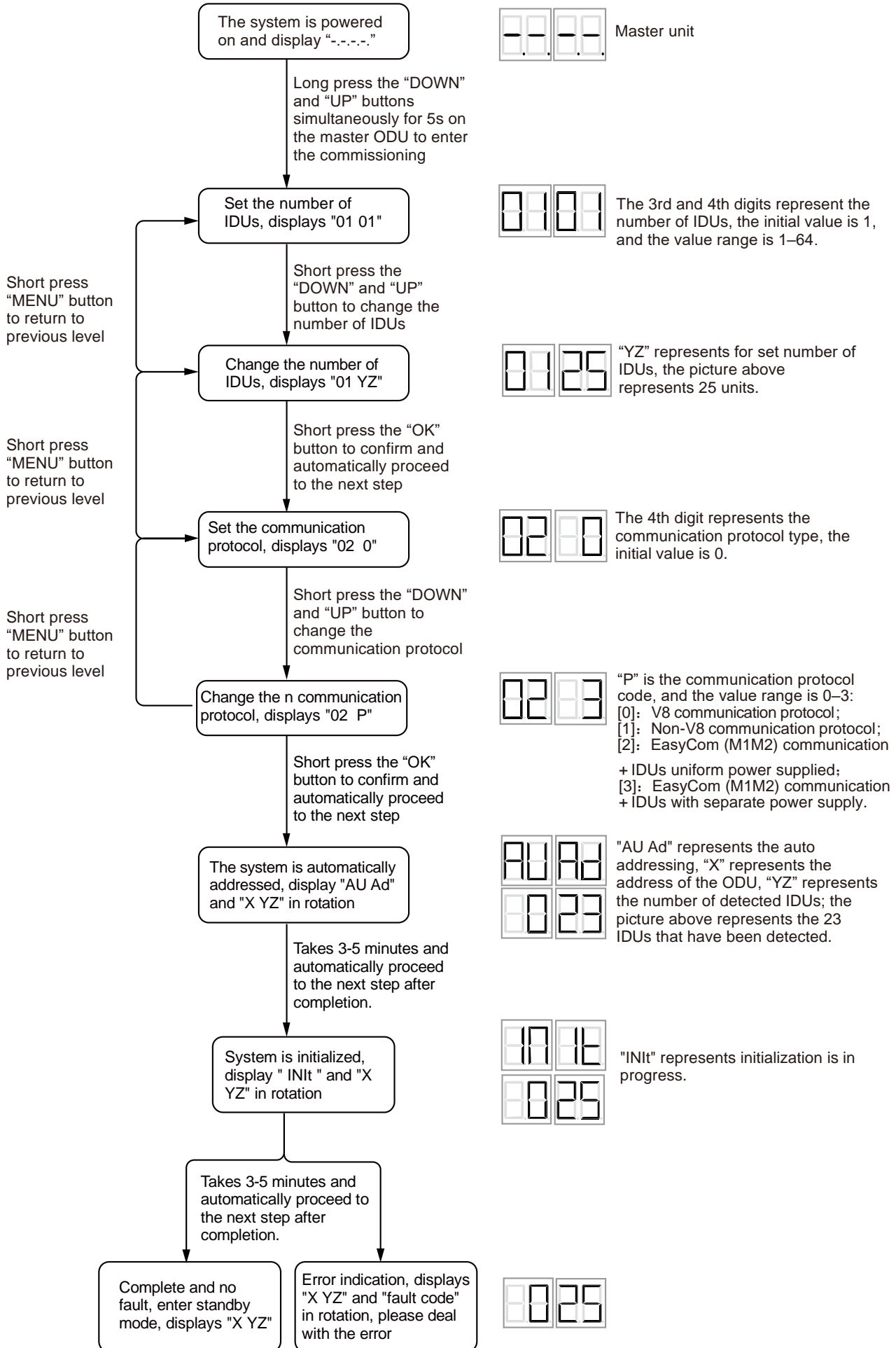
After system initialization, if there is no fault in the system, all ODUs will enter standby mode and the digital display will display "X YZ" ("X" represents the address of the ODUs, "YZ" represents the number of detected IDUs), and the unit can be turned on normally.

After system initialization, if the ODU detects a fault, the digital display of master ODU will display "X YZ" ("X" represents the address of the ODU, "YZ" represents the number of detected IDUs) and the error code in rotation. Please refer to the Error Code Table for troubleshooting, and the unit can be turned on normally after the fault is cleared.

### Step 8: Other settings

After completing the test run, you can set the relevant functions of the unit according to the actual functional requirements. For specific operations, please refer to related technical documents. If there is no special requirement, you can skip this step.

Figure 3-11.1: Test Run Procedure



### **11.3 Multi-system Projects**

For projects with multiple refrigerant systems, each independent refrigeration system (i.e. each system of up to three outdoor units and their connected indoor units) should be given a test run independently, before the multiple systems that make up a project are run simultaneously.

### **11.4 Operating the system**

#### **11.4.1 Commissioning test run of single refrigerant system**

After completing the above steps, a test run should be performed as described below and a V8 Series System Commissioning Report (see Part 3, 12 “Appendix to Part 3 – System Commissioning Report”) should be completed as a record of the operating status of the system during commissioning.

Note: When running the system for commissioning test runs, if the combination ratio is 100% or less, run all the indoor units and if the combination ratio is more than 100%, run indoor units with total capacity equal to the total capacity of the outdoor units.

The test run procedure is as follows:

1. Open the outdoor unit liquid and gas stop valves.
2. Turn on the power to the outdoor units.
3. If manual addressing is being used, set the addresses of each indoor unit.
4. Leave the power on for a minimum of 12 hours prior to running the system to ensure that the crankcase heaters have heated the compressor oil sufficiently.
5. Run the system:
  - a) Run the system in cooling mode with the following settings: temperature 17°C ; fan speed high.
  - b) After one hour, complete Sheet A of the system commissioning report then check the system parameters using the UP/DOWN button on each outdoor unit’s main PCB and complete the cooling mode columns of one Sheet D and one Sheet E of the system commissioning report for each outdoor unit.
  - c) Run the system in heating mode with the following settings: temperature 30°C ; fan speed high.
  - d) After one hour, complete Sheet B of the system commissioning report then check the system parameters using the UP/DOWN button on each outdoor unit’s main PCB and complete the heating mode columns of one Sheet D and one Sheet E of the system commissioning report for each outdoor unit.
6. Finally, complete Sheet C of the system commissioning report.

#### **11.4.2 Commissioning test run of multiple refrigerant systems**

Once the commissioning test run of each refrigerant system has been satisfactorily completed as per Part 3, “Commissioning test run of single refrigerant system”, run the multiple systems that make up a project simultaneously and check for any abnormalities.

## **12 Appendix to Part 3 – System Commissioning Report**

A total of up to 11 report sheets should be completed for each system:

- One Sheet A, one Sheet B and one Sheet C per system.
- One Sheet D and one Sheet E per outdoor unit.

## V8 Series System Commissioning Report – Sheet A

SYSTEM INFORMATION			
Project name and location		Customer company	
System name		Installation company	
Commissioning date		Agent company	
Outdoor ambient temp.		Commissioning engineer	
Power supply (V)	L1-L2	L2-L3	L3-L1

OUTDOOR UNIT INFORMATION				
	Master unit	Slave unit 1	Slave unit 2	Slave unit 3
Model				
Serial no.				

COOLING MODE PARAMETER RECORD (After running in cooling mode for one hour)	OUTDOOR UNITS													
		Master unit			Slave unit 1			Slave unit 2			Slave unit 3			
	Compressor suction pipe temperature													
	System pressure at check port													
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3	
	Phase currents (A)													
	Within normal range?													
	INDOOR UNITS													
	(Sample of over 20% of the indoor units including the unit farthest from the outdoor units)													
	Room no.	Model	Address	Set temp. (°C)	Inlet temp. (°C)	Outlet temp. (°C)	Drainage OK?	Abnormal noise/vibration?						

## V8 Series System Commissioning Report – Sheet B

Project name and location	System name
---------------------------	-------------

HEATING MODE PARAMETER RECORD <small>(After running in heating mode for one hour)</small>	<b>OUTDOOR UNITS</b>												
		Master unit			Slave unit 1			Slave unit 2			Slave unit 3		
	Compressor suction pipe temperature												
	System pressure at check port												
		L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
	Phase currents (A)												
	Within normal range?												
	<b>INDOOR UNITS</b> <small>(Sample of over 20% of the indoor units including the unit farthest from the outdoor units)</small>												
	Room no.	Model	Address	Set temp. (°C)	Inlet temp. (°C)	Outlet temp. (°C)	Drainage OK?	Abnormal noise/vibration?					

## V8 Series System Commissioning Report – Sheet C

Project name and location	System name
---------------------------	-------------

RECORD OF ISSUES SEEN DURING COMMISSIONING				
No.	Description of observed issue	Suspected cause	Troubleshooting undertaken	Serial no. of relevant unit
1				
2				
3				

OUTDOOR UNIT FINAL CHECKLIST				
	Master unit	Slave unit 1	Slave unit 2	Slave unit 3
System check performed?				
Any abnormal noise?				
Any abnormal vibration?				
Fan rotation normal?				

	Commissioning engineer	Dealer	Midea representative
Name:			
Signature:			
Date:			

## V8 Series System Commissioning Report – Sheet D

Project name and location		System name	Observed values	
DSP1 content	Parameters displayed on DSP2	Remarks	Cooling mode	Heating mode
--.--	"Standby (ODU address+ IDU number)/frequency/special status"			
0.--	Outdoor unit address	Master unit: 0; slave units: 1, 2 255 represents invalid address.		
1.--	Outdoor unit capacity	Actual value = value displayed (HP)		
2.--	Number of outdoor units	Only available for master unit, 1-4		
3.--	Number of indoor units set	Only available for master unit, 1-64		
4.--	Total capacity of outdoor unit	Only available for master unit, 0 displayed on slave units has no sense		
5.--	Target frequency of this ODU	Refer to Note 1		
6.--	Target frequency of ODU system	Target frequency= value displayed ×10		
7.--	Inverter compressor A actual frequency (Hz)	Actual value = value displayed		
8.--	Reserved			
9.--	Operating mode	Refer to Note 2		
10.--	Fan A speed index (rpm)	Actual value = value displayed		
11.--	Fan B speed index (rpm)	Actual value = value displayed		
12.--	Indoor heat exchanger pipe (T2) average temperature (°C)	Actual value = value displayed		
13.--	Indoor heat exchanger pipe (T2B) average temperature (°C)	Actual value = value displayed		
14.--	Main heat exchanger pipe (T3) temperature (°C)	Actual value = value displayed		
15.--	Outdoor ambient (T4) temperature (°C)	Actual value = value displayed		
16.--	Liquid pipe (T5) temperature (°C)	Actual value = value displayed		
17.--	Microchannel heat exchanger inlet pipe (T6A) temperature (°C)	Actual value = value displayed		
18.--	Microchannel heat exchanger outlet pipe (T6B) temperature (°C)	Actual value = value displayed		
19.--	Inverter compressor A discharge (T7C1)temperature (°C)	Actual value = value displayed		
20.--	Reserved			
21.--	Inverter compressor A suction (T71) temperature (°C)	Actual value = value displayed		
22.--	Reserved			
23.--	Outdoor heat exchanger gas (T8) temperature (°C)	Actual value = value displayed		
24.--	Inverter module heatsink (Ntc)temperature (°C)	Actual value = value displayed		
25.--	Heat recovery unit's T9 temperature (°C)_Reserved	Actual value = value displayed		
26.--	Outdoor heat exchanger liquid (TL)temperature (°C)	Actual value = value displayed		
27.--	Discharge superheat degree (°C)	Actual value = value displayed		
28.--	Primary current (A)	Actual value = value displayed /10		
29.--	Inverter compressor A current (A)	Actual value = value displayed /10		
30.--	Reserved			
31.--	EXVA position	Actual value = value displayed × 24		
32.--	Reserved			
33.--	EXVC position	Actual value = value displayed × 4		



## V8 Series System Commissioning Report – Sheet E

<b>Project name and location</b>	<b>System name</b>
----------------------------------	--------------------

... table continued from previous page

DSP1 content	Parameters displayed on DSP2	Remarks	Observed values	
			Cooling mode	Heating mode
34.--	EXVE position	Actual value = value displayed × 4		
35.--	Compressor discharge pressure (MPa)	Actual value = value displayed × 0.01		
36.--	Compressor suction pressure (MPa)	Actual value = value displayed × 0.01		
37.--	Quantity of indoor units on line	Actual value = value displayed		
38.--	Quantity of indoor units operating	Displayed on master unit PCB only		
39.--	Heat exchanger status (outdoor unit)	Refer to Note 3		
40.--	Special mode	Refer to Note 4		
41.--	Silent mode	0-14 ,14 represents the most silent		
42.--	Static pressure mode	Refer to Note 5		
43.--	Target evaporator (Tes) temperature (°C)	Actual value = value displayed Refer to Note 6		
44.--	Target condenser (Tcs) temperature (°C)	Actual value = value displayed Refer to Note 6		
45.--	DC Voltage (V)	Actual value = value displayed		
46.--	AC Voltage (V)	Actual value = value displayed		
47.---	Number of cooling mode IDUs	Actual value = value displayed		
48.--	Number of heating mode IDUs	Actual value = value displayed		
49.--	Capacity of cooling mode IDUs (HP)	Actual value = value displayed		
50.--	Capacity of heating mode IDUs (HP)	Actual value = value displayed		
51.--	Refrigerant volume judgment	Refer to Note 7		
52.---	Dirty blockage rate	0~10, 10 represents the worst		
53.--	Fan error			
54.---	Software version			
55.--	Most recent error or protection code			
-- --	--	End		

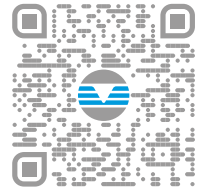
**Notes:**

1. Need to convert to current compressor output volume, example: compressor output volume is 98, Target frequency = Actual frequency \* 98 / 60Outdoor unit capacity setting:
2. Operating mode:
  - 0: off; 2: cooling; 3: heating; 5: main cooling (for heat recovery unit); 6: main heating (for heat recovery unit).
3. Heat exchanger status:
  - 0: off; 1: C1 (cooling mode) 2: D1: Disabled (cooling mode, (for heat recovery unit); 3: D2: Compressor OFF (cooling mode); 4: E1: (cooling mode)
  - 5: F1 Disabled (heating mode, for heat recovery unit); 6: F2: Compressor OFF (heating mode)
4. Special mode:
  - 0: no special mode; 1: oil return; 2: defrost; 3: start up; 4: stop; 5: quick check; 6: self cleaning.
5. Static pressure mode:
  - 0: 0 Pa; 1: 20 Pa; 2: 40 Pa; 3: 60 Pa; 4: 80 Pa;
6. Te: Low pressure equivalent saturation temperature (°C)    Tes: Target Te value.  
Tc: High pressure equivalent saturation temperature (°C)    Tcs: Target Tc value.
7. Refrigerant volume:
  - 0: No result; 1: Significantly insufficient; 2: Insufficient; 3: Normal; 4: Excessive; 5: Significantly Excessive.





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**CLIVET S.p.A.**

Via Camp Lonc 25, Z.I. Villapaiera 32032 - Feltre (BL) - Italy  
Tel. +39 0439 3131 - [info@clivet.it](mailto:info@clivet.it)

**CLIVET GMBH**

Hummelsbütteler Steindamm 84,  
22851 Norderstedt, Germany  
Tel. +49 40 325957-0 - [info.de@clivet.com](mailto:info.de@clivet.com)

**Clivet Group UK LTD**

Units F5 & F6 Railway Triangle,  
Portsmouth, Hampshire PO6 1TG  
Tel. +44 02392 381235 -  
[Enquiries@Clivetgroup.co.uk](mailto:Enquiries@Clivetgroup.co.uk)

**CLIVET LLC**

Office 508-511, Elektrozavodskaya st. 24,  
Moscow, Russian Federation, 107023  
Tel. +7495 6462009 - [info.ru@clivet.com](mailto:info.ru@clivet.com)

**CLIVET MIDEAST FZCO**

Dubai Silicon Oasis (DSO) Headquarter Building,  
Office EG-05, P.O Box-342009, Dubai, UAE  
Tel. +9714 3208499 - [info@clivet.ae](mailto:info@clivet.ae)

**Clivet South East Europe**

Jarušćica 9b  
10000, Zagreb, Croatia  
Tel. +3851 222 8784 - [info.see@clivet.com](mailto:info.see@clivet.com)

**CLIVET France**

10, rue du Fort de Saint Cyr - 78180 Montigny le  
Bretonneux, France  
[info.fr@clivet.com](mailto:info.fr@clivet.com)

**Clivet Airconditioning Systems Pvt Ltd**

Office No.501 & 502,5th Floor, Commercial -I,  
Kohinoor City, Old Premier Compound, Off LBS  
Marg, Kirod Road, Kurla West, Mumbai  
Maharashtra 400070, India  
Tel. +91 22 30930200 - [sales.india@clivet.com](mailto:sales.india@clivet.com)

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