

3. UNIT DIMENSIONS

Units: mm

■ 90KBTU/H Units (Hor.)

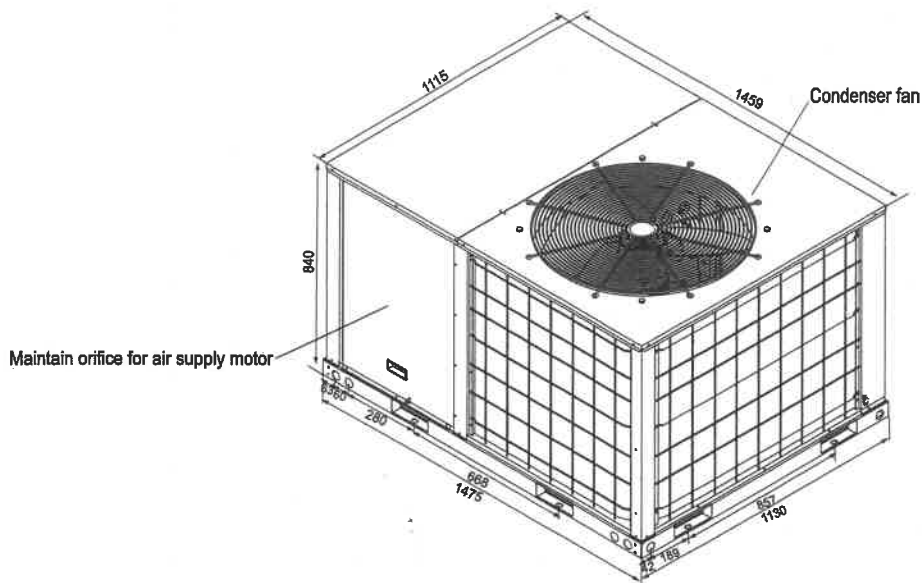


Fig.3-1

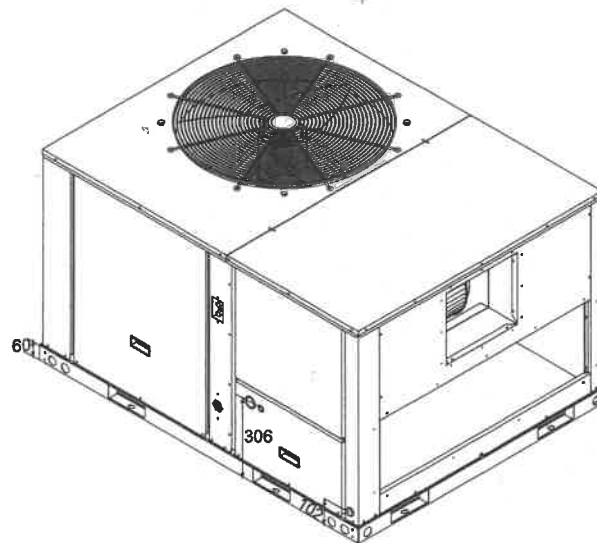


Fig.3-2

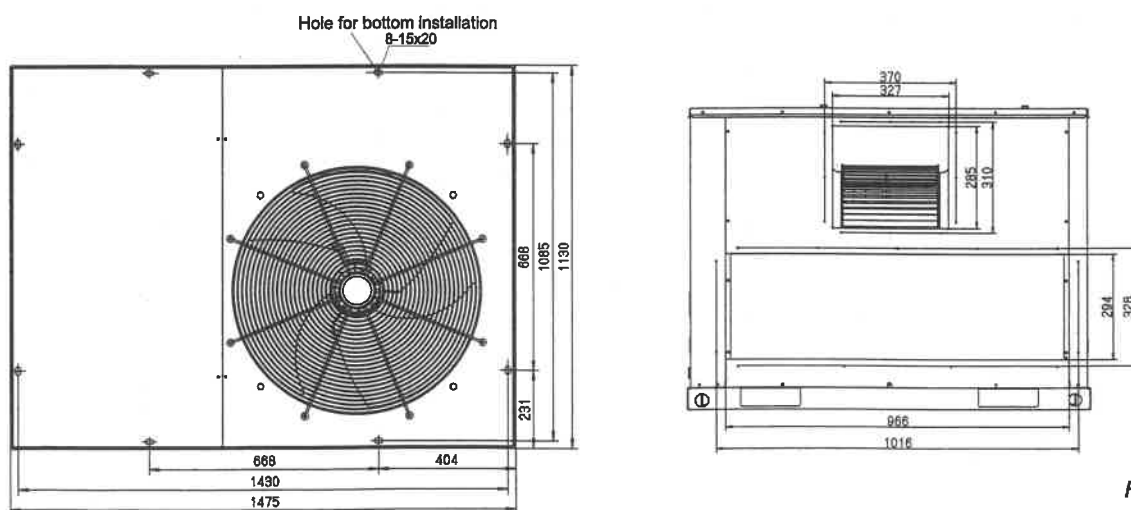


Fig.3-3

6. ELECTRICAL WIRING



WARNING

- An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.
- The appliance shall be installed in accordance with national wiring regulations.
- An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device(RCD)with the rating of above 10mA shall be incorporated in the fixed wiring according to the national rule.
- The appliance shall be installed in accordance with national wiring regulations.

6.1 Protections and safety control

- **Minutes delay for the compressor start-up**
At the beginning of energizing, 3-minutes delay should be taken to start the compressor. while after the stop of the compressor, 7-minutes delay should be taken to re-start the compressor.
- **Compressor discharge temperature protection**
When discharge temperature $>257^{\circ}\text{F}$, the compressor will stop.
- **Reverse phase protection relay**
 - The reverse phase protection relay will make the unit not start, when the power source is incorrectly connected.
 - The checking of phase order is just carried out at the first time of electrifying. If malfunction happens then the checking will be going on until the order of phase is right, and the E0 will be displayed on the board. If there is no problem in the first checking, then it will be omitted.
- **High pressure and low pressure protection**
When high pressure ≥ 638 Psi, and lower pressure ≤ 21 Psi, the unit will stop.

6.2 Electrical data

Tab.6-1

Nominal KBTU/H	Type of flow	Compressor				Evaporator fan motor			Condenser fan motor		
		STC	RNC	IPT	Qty	RNC	IPT	Qty	RNC (each)	IPT (each)	Qty
90	Hor.	121.2	14.3	8.08	1	7.18	1.61	1	3.93	0.88	1
120	Hor.	66	9.6	5.7	2	3.50	1.84	1	2.51	0.98	1
180	Hor.	64+144	8.3+18.7	4.75+10.8	1+1	7.50	3.97	1	2.80	1.27	1
240	Hor.	144	18.7	10.8	2	8.90	4.35	1	2.84	1.29	2
300	Hor.	158	20.66	12.1	2	9.70	4.40	1	3.71	2.07	2
360	Hor.	197	24.52	13.7	2	13.60	7.40	1	3.71	2.07	2



NOTES

- STC: Starting Current (A) RNC: Running Current (A) IPT: Input Power (kW) Qty: Quantity
- These data are based on the following conditions. Evaporator Air Input Temperature 89.6°F DB, 73.4°F WB. Condenser Air Input Temperature 125.6°F DB.

6.3 Wiring provision

■ Field wiring

The units are internally wired at the factory according to generally accepted electrical technology.

■ Required field wiring

Main power wiring to the unit control wiring between the control center and the unit, and earth wiring are required in the field.

■ Required components

The following components are required: main power fuses, conduit coupling, and field supplied room thermostat.

■ Wire and fuse size selection for main power source

Wire and fuse sizes should be selected in accordance with national and standard, taking the designed maximum current shall be the total of the compressor maximum current, condenser fan motor current and evaporator fan motor current(refer to "electrical data").

■ Wire size between room thermostat and unit

The wire size between the room thermostat and the unit should be determined according to the following table, because the 24V power source is applied to the control circuit.

Tab.6-2

	Wiring length between room thermostat and unit(one way)				
	10m	15m	20m	30m	40m
Minimum wire size(mm ²)	0.5	0.5	0.75	0.75	1.0



NOTE

- Before connecting the device to the public low-voltage supply systems the permission of the electricity supplier is forcefully necessary.

6.5 Main power supply

Tab.6-4

Model type	Unit main power	Main power switch	Fuse	Wires for Power supplies	Type of wires
90KBTU/H	380-415V 3N~ 50Hz	40A	30A	3x10mm ² +2x6mm ²	3xUL1015 7AWG 2xUL1015 9AWG
120KBTU/H	380-415V 3N~ 50Hz	50A	40A	3x10mm ² +2x6mm ²	3xUL1015 7AWG 2xUL1015 9AWG
180KBTU/H	380-415V 3N~ 50Hz	75A	63A	3x16mm ² +2x10mm ²	3xUL1015 5AWG 2xUL1015 7AWG
240KBTU/H	380-415V 3N~ 50Hz	100A	90A	3x25mm ² +2x10mm ²	3xUL1015 3AWG 2xUL1015 7AWG
300KBTU/H	380-415V 3N~ 50Hz	120A	100A	3x35mm ² +2x16mm ²	3xUL1015 2AWG 2xUL1015 5AWG
360KBTU/H	380-415V 3N~ 50Hz	120A	100A	3x35mm ² +2x16mm ²	3xUL1015 2AWG 2xUL1015 5AWG



NOTE

- The power supply designation is H07RN-F.

6.4 Operating conditions

For proper performance, run the unit under the following temperature conditions:

Tab.6-3

Cooling operation	Outdoor temperature: 50°F to 115°F
	Room temperature: 62°F to 88°F
	Caution Room relative humidity less than 80%. If the unit operates in excess of this figure, the surface of the unit may attract condensation.
Heating operation	Outdoor temperature: 15°F to 75°F
	Room temperature: 32°F to 88°F

7. SPECIFICATION

7.1 Physical Data

Tab.7-1

Nominal KBTU/H		90KBTU/H	120KBTU/H	180KBTU/H	240KBTU/H
Model type		H/P	H/P	H/P	H/P
Type of flow		Hor.	Hor.	Hor.	Hor.
Capacity	Cooling capacity (net)(Btu/h)(I)	89000	120000	180000	240000
	Heating capacity (Btu/h)	103000	137000	191000	260000
Performance	EER	11.3	11.2	10.8	10.6
Dimensions	Length(mm)	1475	1483	1965	1670
	Width(mm)	1130	1138	1130	2192
	Height(mm)	840	1231	1230	1247
Net weight(kg)		244	343	492	690
Refrigerant type		R410A	R410A	R410A	R410A
Flow control		Piston	Piston	Piston	Piston
Compressor	Quantity/Type	1/Scroll	2/Scroll	2/Scroll	2/Scroll
Outdoor coil	Row s	3	2.5	3.5	3
	Fins per inch	17	17	16	17
	Tube diameter(in.)	9/32	9/32	5/16	9/32
Indoor coil	Row s	3	4	4	4
	Fins per inch	19	17	19	19
	Tube diameter(in.)	9/32	9/32	9/32	9/32
Outdoor fan	Quantity used/diameter(mm)	1/700	1/700	1/750	2/750
	Type	Propeller	Propeller	Propeller	Propeller
	Drive type	Direct	Direct	Direct	Direct
	Quantity speeds	2	1	1	1
	Quantity motors/power(kW)	1/0.98	1/1.31	1/1.26	2/2.6
	Motor RPM	878	967	955	955
	Total nominal CFM	5686	7733	7857	16400
Indoor fan	Quantity used/model	1/10×10	1/12×12	1/15×15	1/SYD315R2-L
	Type	FC Centrifugal	FC Centrifugal	FC Centrifugal	FC Centrifugal
	Drive type	Direct	Belt	Belt	Belt
	Quantity speeds	3	Variable sheave	Variable sheave	Variable sheave
	Quantity motors/power(kW)	1/1.61 (80Pa)	1/1.84 (90Pa)	1/3.97 (110Pa)	1/4.57 (120Pa)
	Motor RPM	1110	1430	1430	1440
	Total nominal CFM(II)	2830 (80Pa)	3900 (90Pa)	7000 (110Pa)	8800 (120Pa)

NOTES

- (I) Cooling capacities are rated at 95°F ambient DB, 80°F entering DB, 67°F entering WB.
 (II) Units are suitable for operation to ±20% of nominal CFM.

7.2 Parameter For Air Volume

- Parameter table for indoor unit air volume

Tab.7-2

Static pressure (Pa)	90KBTU/H			
		High speed	Middle speed	Low speed
0	Fan speed(RPM)	1035	936	844
	Power input(W)	1716	1432	1197
	Air flow (CFM)	3074	2697	2403
50	Fan speed(RPM)	1081	991	909
	Power input(W)	1652	1409	1160
	Air flow (CFM)	2981	2596	2284
80	Fan speed(RPM)	1110	1026	954
	Power input(W)	1650	1360	1137
	Air flow (CFM)	2951	2574	2223
100	Fan speed(RPM)	1127	1051	984
	Power input(W)	1591	1377	1126
	Air flow (CFM)	2825	2438	2146
150	Fan speed(RPM)	1173	1110	/
	Power input(W)	1525	1338	/
	Air flow (CFM)	2657	2313	/
200	Fan speed(RPM)	1217	1165	/
	Power input(W)	1449	1281	/
	Air flow (CFM)	2483	2187	/
250	Fan speed(RPM)	1263	/	/
	Power input(W)	1420	/	/
	Air flow (CFM)	2331	/	/

Tab.7-3

BLOWER DRIVE OPTIONS							
UNIT MAIN POWER	MODEL TYPE	MOTOR			BLOWER		
		HP	RPM	PULLEY PITCH DIA. (INCH)	SPEED RANGE (RPM)		PULLEY PITCH DIA. (INCH)
					MINIMUM	MAXIMUM	
380-415V 3N~ 50Hz	120KBTU/H	2	1400	4.53~5.25	931	1016	7.48
	180KBTU/H	5.3	1440	4.53~5.25	949	1112	7.48
	240KBTU/H	5.3	1440	4.53~5.25	1081	1284	5.91
	300KBTU/H	7.3	1440	4.53~5.25	925	1088	7.09
	360KBTU/H	7.3	1440	4.53~5.25	1022	1195	6.30

7.3 Capacity Data

Heating capacity for 90KBTU/H:

Net Capacities(kW)-2830 CFM								
Outdoor Temp(°F) 70% RH	Peak Net Heating(kW) at Indicated Dry Bulb(°F)				Peak Total Power(kW) at Indicated Dry Bulb(°F)			
	59	68	75.2	80.6	59	68	75.2	80.6
15.8	17	16.5	16.4	16.4	7.2	7.9	8.3	8.9
21.2	17.8	17.3	17.1	16.9	7.3	8	8.4	9
26.6	18.8	18.5	18.4	18.1	7.4	8.1	8.6	9.2
32	20.3	20	19.7	19.4	7.5	8.2	8.7	9.3
37.4	23.3	23.1	22.7	22.4	7.6	8.4	8.9	9.4
44.6	30.3	30	29.6	29.2	7.9	8.9	9.2	9.7
48.2	30.5	30.2	29.9	29.6	8.2	9.1	9.6	10.2
53.6	32.4	33.5	33.4	33.1	8.5	9.5	10	10.6
59	35	34.4	34.2	33.8	8.7	9.7	10.2	10.8
64.4	37.1	36.4	36	35.7	9	9.9	10.5	11.1
69.8	39.8	38.9	38.4	37.9	9.1	10.1	10.6	11.1
75.2	42	40.9	40.2	39.8	9.3	10.2	11	11.4

Notes:
1. For other airflows, see heating capacity correction factor tables.
2. Heating capacities and power are integrated to include the effects of defrost in the frost region.

Air Flow (CFM)			2100				2830				3800				
Ent (DB)			(°F)	75	80	85	90	75	80	85	90	75	80	85	90
Ambient Temperature	85	61	TC	77.6	79.4	81.1	82.9	82.4	84.2	86.1	88.0	84.4	86.3	88.2	90.2
			SC	67.8	75.6	80.6	81.5	72.5	79.5	83.5	86.5	77.1	79.7	83.2	87.7
			PI	7012.8	7157.9	7413.1	7703.3	7250.1	7395.2	7660.3	7955.5	7348.9	7499.0	7764.1	8064.2
		67	TC	89.9	91.9	93.9	96.0	91.0	93.0	95.1	97.2	91.8	93.8	95.9	98.0
			SC	50.7	64.0	77.1	89.7	53.1	67.8	80.7	91.7	54.6	69.0	83.5	95.5
			PI	7460.0	7635.1	8045.9	8396.0	7514.3	7689.4	8105.3	8455.4	7553.9	7729.0	8144.8	8494.9
		73	TC	93.7	95.8	97.9	100.0	94.3	96.4	98.5	100.6	94.5	96.6	98.7	100.9
			SC	31.9	46.2	57.3	67.8	32.4	45.9	57.6	70.5	32.9	50.0	58.6	70.8
			PI	8494.4	8694.5	9044.6	9439.8	8524.1	8724.2	9074.3	9469.4	8534.0	8734.1	9084.2	9484.3
	95	61	TC	73.7	75.4	77.1	78.8	76.1	77.8	79.6	81.4	78.4	80.2	82.0	83.8
			SC	64.7	70.8	73.3	76.8	67.4	73.8	76.5	80.7	70.3	74.5	78.8	82.1
			PI	7576.0	7756.1	8016.3	8311.4	7694.6	7874.8	8139.9	8440.0	7808.3	7993.4	8258.5	8558.6
		67	TC	80.7	82.5	84.4	86.2	82.2	89.0	91.9	93.4	86.5	91.4	93.4	95.2
			SC	49.0	62.9	76.9	81.6	51.4	66.6	81.8	86.7	53.8	70.2	86.1	87.4
			PI	7497.2	7694.3	7929.9	8280.0	7571.3	7900.2	8300.7	8635.9	7783.9	8009.0	8374.8	8724.9
		73	TC	92.9	95.0	97.1	99.2	93.4	95.5	97.6	99.7	93.8	95.9	98.0	100.1
			SC	30.8	45.4	57.6	69.9	31.3	46.4	59.4	72.7	31.9	47.2	60.9	74.6
			PI	8930.9	9181.0	9656.6	10056.7	8955.7	9205.8	9681.4	10081.5	8975.4	9225.5	9701.1	10101.2
	105	61	TC	67.2	68.7	70.3	71.9	69.5	71.1	72.7	74.4	71.6	73.2	74.9	76.6
			SC	61.5	63.5	66.6	68.6	66.3	67.6	71.6	73.8	70.4	71.7	73.2	75.8
			PI	7750.7	7980.8	8331.7	8626.8	7864.4	8099.5	8450.3	8750.4	7968.2	8203.3	8559.1	8859.2
		67	TC	79.5	81.3	83.1	85.0	81.4	83.2	85.1	87.0	82.9	84.8	86.6	88.6
			SC	46.1	60.2	74.5	81.7	48.8	61.4	80.3	85.7	51.4	68.5	85.9	87.7
			PI	7917.1	8162.3	8518.1	8863.2	8011.0	8256.2	8617.0	8962.1	8085.2	8335.3	8691.1	9041.2
		73	TC	90.4	92.4	94.5	96.5	90.3	92.3	94.3	96.4	91.8	93.8	95.9	98.0
			SC	29.3	44.1	59.5	72.2	29.2	45.6	60.9	74.2	30.5	47.4	62.5	76.3
			PI	9650.3	9930.4	10506.0	10901.1	9645.3	9925.4	10496.1	10896.2	9719.5	9999.6	10575.2	10975.3
	115	61	TC	54.7	56.1	57.5	59.0	56.6	58.0	59.5	61.0	59.2	60.7	62.2	63.8
			SC	52.6	54.1	56.0	58.3	50.6	53.8	57.2	58.8	56.7	58.6	60.6	62.9
			PI	8307.4	8552.6	8777.7	9072.9	8401.4	8646.5	8876.6	9171.8	8529.9	8780.0	9010.1	9310.2
		67	TC	66.1	67.7	69.4	71.1	67.9	69.6	71.3	73.0	69.5	71.2	72.9	74.7
			SC	37.2	51.6	65.0	69.9	39.9	55.5	67.9	71.8	42.5	59.7	71.7	74.3
			PI	8611.1	8881.2	9237.1	9582.2	8700.1	8975.2	9331.0	9676.2	8779.2	9054.3	9410.1	9760.2
		73	TC	80.2	82.1	84.1	86.1	75.4	77.2	79.1	81.0	82.3	84.3	86.3	88.3
			SC	21.8	35.8	50.8	66.1	22.4	37.9	53.1	67.8	23.1	39.9	56.2	72.0
			PI	9721.5	10016.7	10592.2	10992.3	9484.2	9774.4	10345.1	10740.2	9825.3	10125.4	10701.0	11101.1

Notes:

1. All capacities are net and have considered indoor fan heat.
2. TC=Total Capacity. (Unit:1000Btu/h)
3. SC=SensibleCapacity. (Unit:1000Btu/h)
4. PI=Power input (unit:W)
5. Different air volume in the above table, need to adjust in the field.

7.3 Capacity Data

Heating capacity for 90KBTU/H:

Outdoor Temp(°F) 70% RH	Net Capacities(kW)-2830 CFM							
	Peak Net Heating(kW) at Indicated Dry Bulb(°F)				Peak Total Power(kW) at Indicated Dry Bulb(°F)			
	59	68	75.2	80.6	59	68	75.2	80.6
15.8	17	16.5	16.4	16.4	7.2	7.9	8.3	8.9
21.2	17.8	17.3	17.1	16.9	7.3	8	8.4	9
26.6	18.8	18.5	18.4	18.1	7.4	8.1	8.6	9.2
32	20.3	20	19.7	19.4	7.5	8.2	8.7	9.3
37.4	23.3	23.1	22.7	22.4	7.6	8.4	8.9	9.4
44.6	30.3	30	29.6	29.2	7.9	8.9	9.2	9.7
48.2	30.5	30.2	29.9	29.6	8.2	9.1	9.6	10.2
53.6	32.4	33.5	33.4	33.1	8.5	9.5	10	10.6
59	35	34.4	34.2	33.8	8.7	9.7	10.2	10.8
64.4	37.1	36.4	36	35.7	9	9.9	10.5	11.1
69.8	39.8	38.9	38.4	37.9	9.1	10.1	10.6	11.1
75.2	42	40.9	40.2	39.8	9.3	10.2	11	11.4

Notes:

1. For other airflows, see heating capacity correction factor tables.
2. Heating capacities and power are integrated to include the effects of defrost in the frost region.

		Air Flow (CFM)		2100				2830				3800			
		Ent (DB)	(°F)	75	80	85	90	75	80	85	90	75	80	85	90
Ambient Temperature	85	61	TC	77.6	79.4	81.1	82.9	82.4	84.2	86.1	88.0	84.4	86.3	88.2	90.2
			SC	67.8	75.6	80.6	81.5	72.5	79.5	83.5	86.5	77.1	79.7	83.2	87.7
			PI	7012.8	7157.9	7413.1	7703.3	7250.1	7395.2	7660.3	7955.5	7348.9	7499.0	7764.1	8064.2
		67	TC	89.9	91.9	93.9	96.0	91.0	93.0	95.1	97.2	91.8	93.8	95.9	98.0
			SC	50.7	64.0	77.1	89.7	53.1	67.8	80.7	91.7	54.6	69.0	83.5	95.5
			PI	7460.0	7635.1	8045.9	8396.0	7514.3	7689.4	8105.3	8455.4	7553.9	7729.0	8144.8	8494.9
		73	TC	93.7	95.8	97.9	100.0	94.3	96.4	98.5	100.6	94.5	96.6	98.7	100.9
			SC	31.9	46.2	57.3	67.8	32.4	45.9	57.6	70.5	32.9	50.0	58.6	70.8
			PI	8494.4	8694.5	9044.6	9439.8	8524.1	8724.2	9074.3	9469.4	8534.0	8734.1	9084.2	9484.3
	95	61	TC	73.7	75.4	77.1	78.8	76.1	77.8	79.6	81.4	78.4	80.2	82.0	83.8
			SC	64.7	70.8	73.3	76.8	67.4	73.8	76.5	80.7	70.3	74.5	78.8	82.1
			PI	7576.0	7756.1	8016.3	8311.4	7694.6	7874.8	8139.9	8440.0	7808.3	7993.4	8258.5	8558.6
		67	TC	80.7	82.5	84.4	86.2	82.2	89.0	91.9	93.4	86.5	91.4	93.4	95.2
			SC	49.0	62.9	76.9	81.6	51.4	66.6	81.8	86.7	53.8	70.2	86.1	87.4
			PI	7497.2	7694.3	7929.9	8280.0	7571.3	7900.2	8300.7	8635.9	7783.9	8009.0	8374.8	8724.9
		73	TC	92.9	95.0	97.1	99.2	93.4	95.5	97.6	99.7	93.8	95.9	98.0	100.1
			SC	30.8	45.4	57.6	69.9	31.3	46.4	59.4	72.7	31.9	47.2	60.9	74.6
			PI	8930.9	9181.0	9656.6	10056.7	8955.7	9205.8	9681.4	10081.5	8975.4	9225.5	9701.1	10101.2
	105	61	TC	67.2	68.7	70.3	71.9	69.5	71.1	72.7	74.4	71.6	73.2	74.9	76.6
			SC	61.5	63.5	66.6	68.6	66.3	67.6	71.6	73.8	70.4	71.7	73.2	75.8
			PI	7750.7	7980.8	8331.7	8626.8	7864.4	8099.5	8450.3	8750.4	7968.2	8203.3	8559.1	8859.2
		67	TC	79.5	81.3	83.1	85.0	81.4	83.2	85.1	87.0	82.9	84.8	86.6	88.6
			SC	46.1	60.2	74.5	81.7	48.8	61.4	80.3	85.7	51.4	68.5	85.9	87.7
			PI	7917.1	8162.3	8518.1	8863.2	8011.0	8256.2	8617.0	8962.1	8085.2	8335.3	8691.1	9041.2
		73	TC	90.4	92.4	94.5	96.5	90.3	92.3	94.3	96.4	91.8	93.8	95.9	98.0
			SC	29.3	44.1	59.5	72.2	29.2	45.6	60.9	74.2	30.5	47.4	62.5	76.3
			PI	9650.3	9930.4	10506.0	10901.1	9645.3	9925.4	10496.1	10896.2	9719.5	9999.6	10575.2	10975.3
	115	61	TC	54.7	56.1	57.5	59.0	56.6	58.0	59.5	61.0	59.2	60.7	62.2	63.8
			SC	52.6	54.1	56.0	58.3	50.6	53.8	57.2	58.8	56.7	58.6	60.6	62.9
			PI	8307.4	8552.6	8777.7	9072.9	8401.4	8646.5	8876.6	9171.8	8529.9	8780.0	9010.1	9310.2
		67	TC	66.1	67.7	69.4	71.1	67.9	69.6	71.3	73.0	69.5	71.2	72.9	74.7
			SC	37.2	51.6	65.0	69.9	39.9	55.5	67.9	71.8	42.5	59.7	71.7	74.3
			PI	8611.1	8881.2	9237.1	9582.2	8700.1	8975.2	9331.0	9676.2	8779.2	9054.3	9410.1	9760.2
		73	TC	80.2	82.1	84.1	86.1	75.4	77.2	79.1	81.0	82.3	84.3	86.3	88.3
			SC	21.8	35.8	50.8	66.1	22.4	37.9	53.1	67.8	23.1	39.9	56.2	72.0
			PI	9721.5	10016.7	10592.2	10992.3	9484.2	9774.4	10345.1	10740.2	9825.3	10125.4	10701.0	11101.1

Notes:

1. All capacities are net and have considered indoor fan heat.
2. TC=Total Capacity. (Unit:1000Btu/h)
3. SC=SensibleCapacity. (Unit:1000Btu/h)
4. PI=Power input (unit:W)
5. Different air volume in the above table, need to adjust in the field.