

ComfortStar[®]

Technical Manual for CRT Series

20240613

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1. Rooftop package unit introduction

1.1 Modules Range

3 models: Cooling & Heating:3 TR, 4TR,5TR



3TR



4, 5TR

1.2 Adopt high reliable Copland compressor

- Better Liquid Handling

Radial compliance allows the scroll members to separate in the presence of liquid refrigerant, thus, providing protection against liquid damage.

- Greater Efficiency

With axial compliance, optimized force between two scrolls can be obtained, leading to high efficiency over the entire operating range.

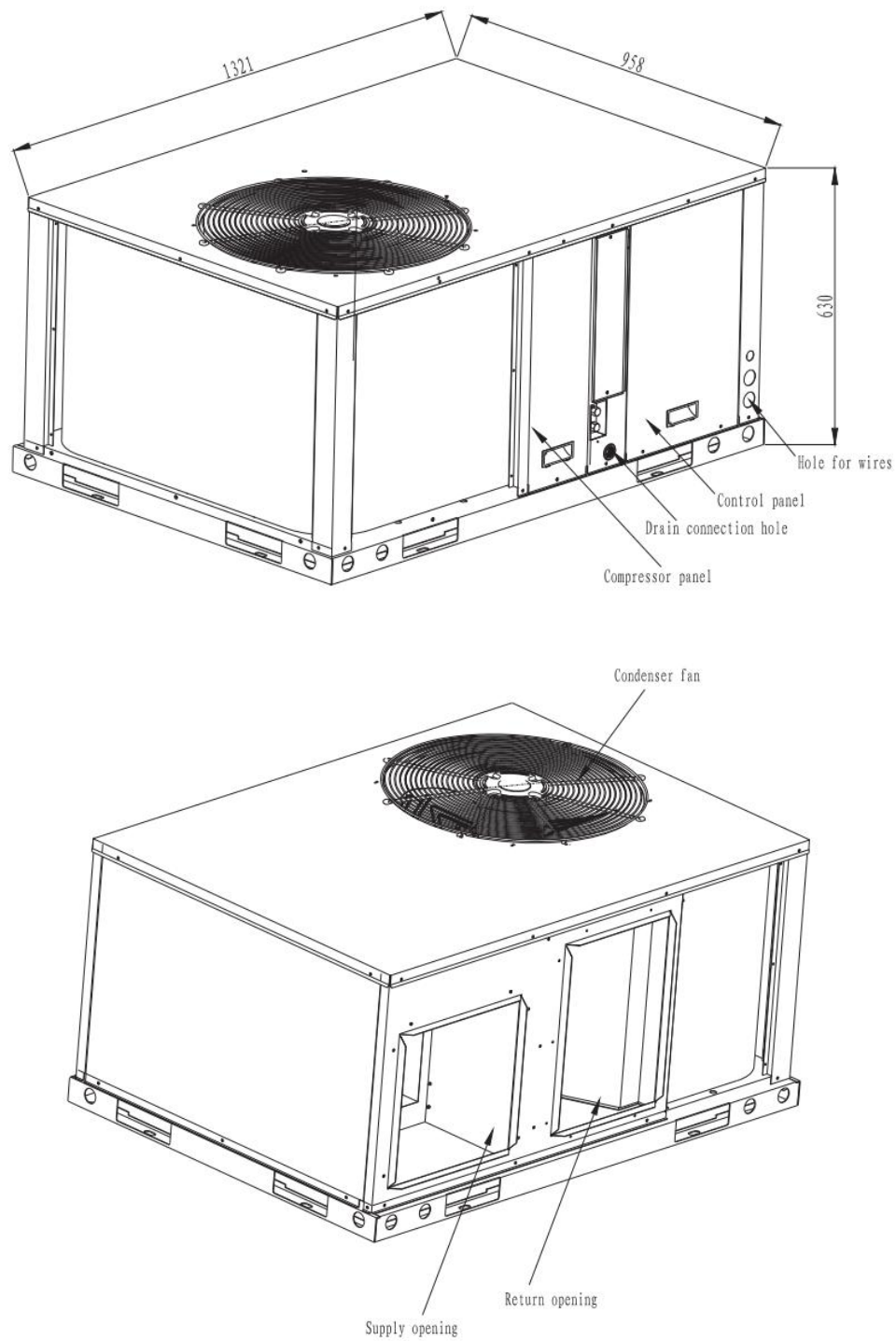
World famous scroll compressor with quick reactivity and operation stable. Compressor staging is controlled directly by the control temperature , high EER.

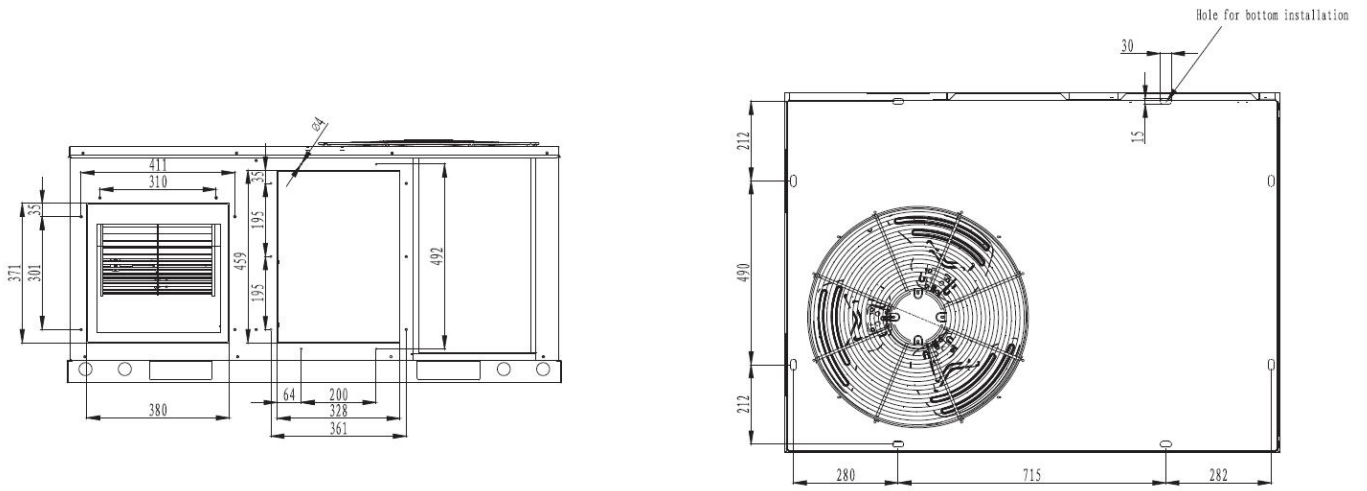
1.3 Provide easy access to system components for maintenance and service.

1.4 Flexible installation, on rooftop or ground are available. Anywhere removable as requirement with fixed.

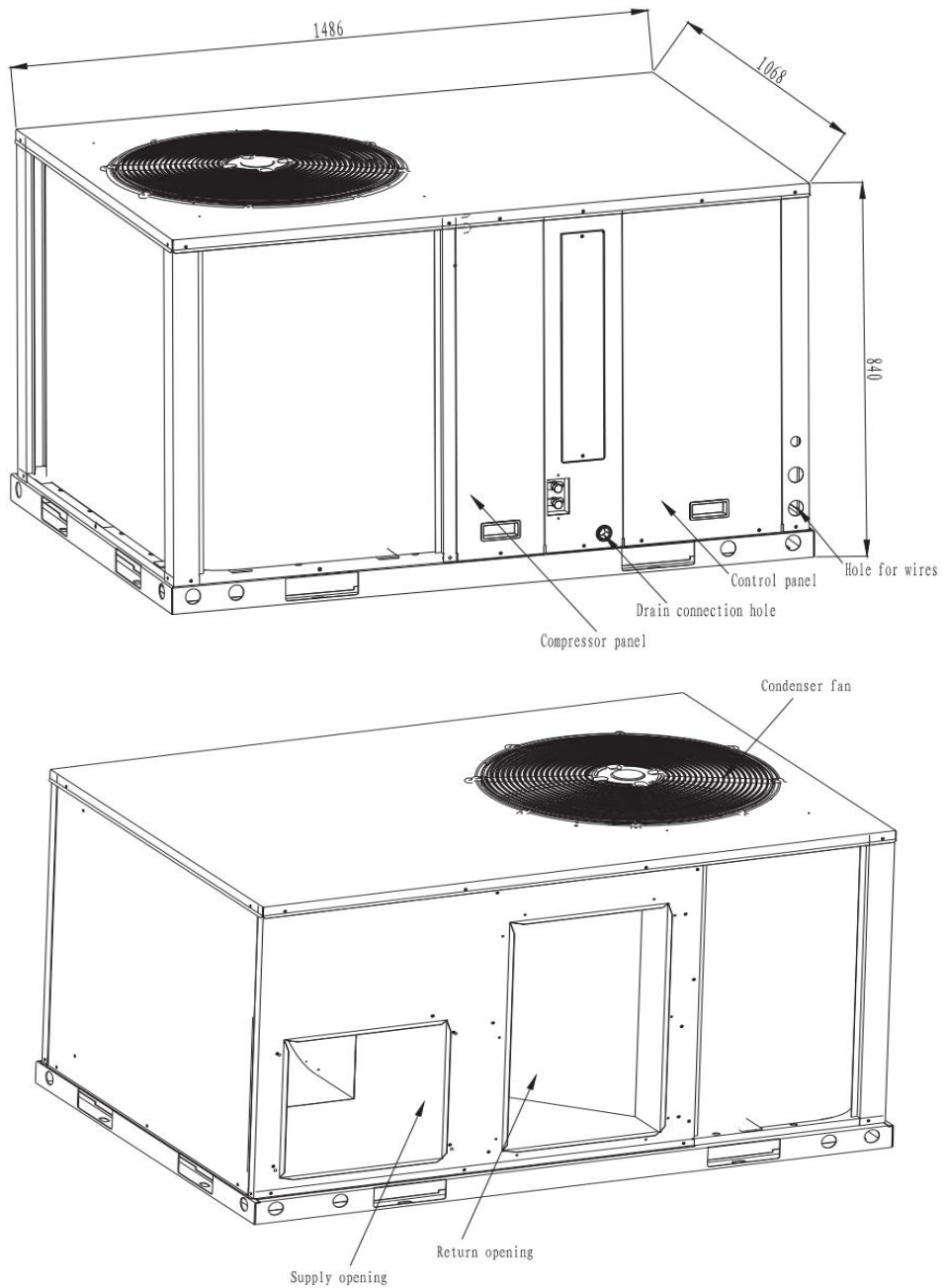
2. Dimensions

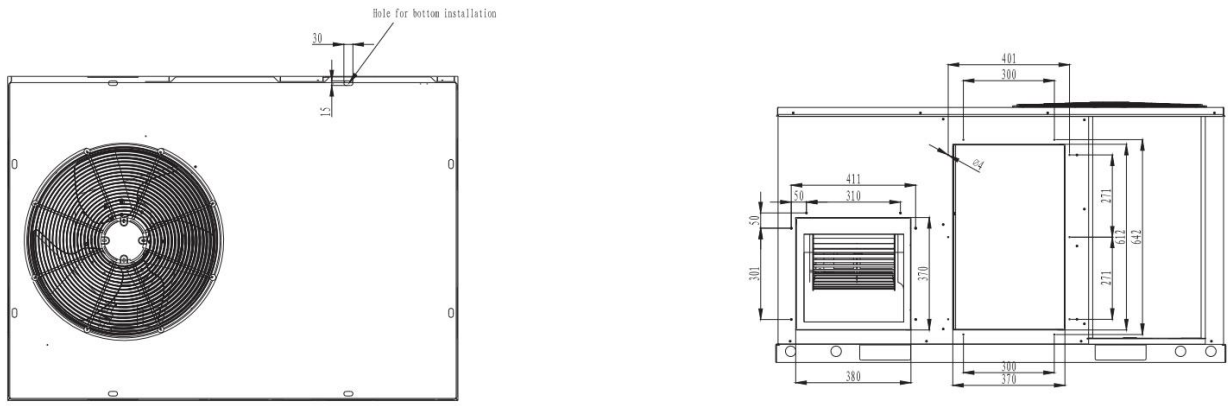
2.1 3Tons C/ O Units



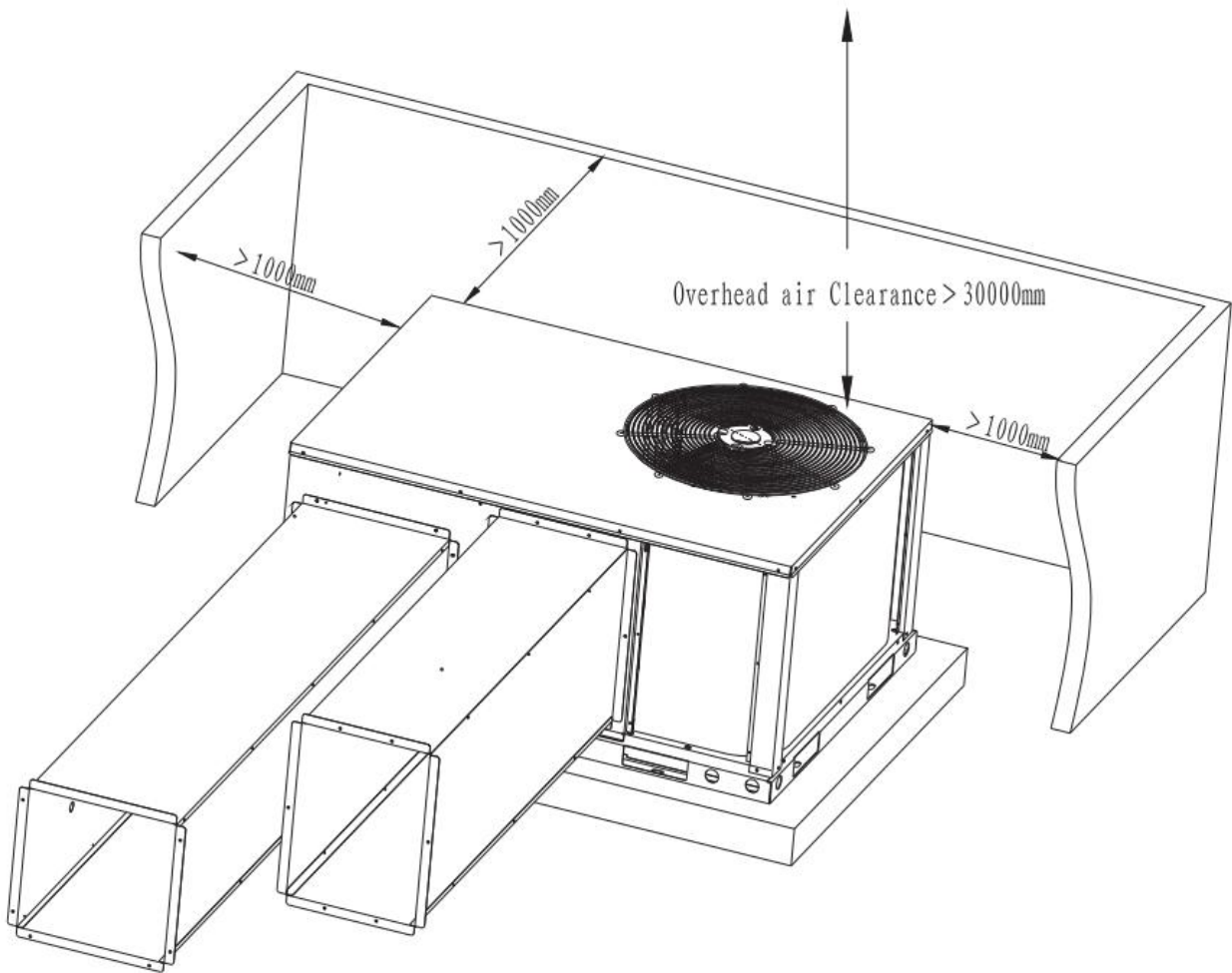


4.5Tons C/O Units





2.2 Installation base dimension



3. Electric characteristics

Nominal ton		3TONS	4TONS	5TONS
Model type		C/O	C/O	C/O
Type of flow		Hor.	Hor.	Hor.
Unit main power	VOL	208-230V	208-230V	208-230V
	Hz	60	60	60
Applicable voltage	Max.	253	253	253
	Min.	187	187	187
Compressor motor	STC	22.5	26	32.8
	RNC	11.9	18.6	21.6
	IPT	2.71	4.16	4.72
Evaporator fan motor	RNC	1.36	2.87	2.87
	IPT	0.31	0.66	0.66
Condenser fan motor	RNC	1.12	2.25	2.25
	IPT	0.25	0.52	0.52

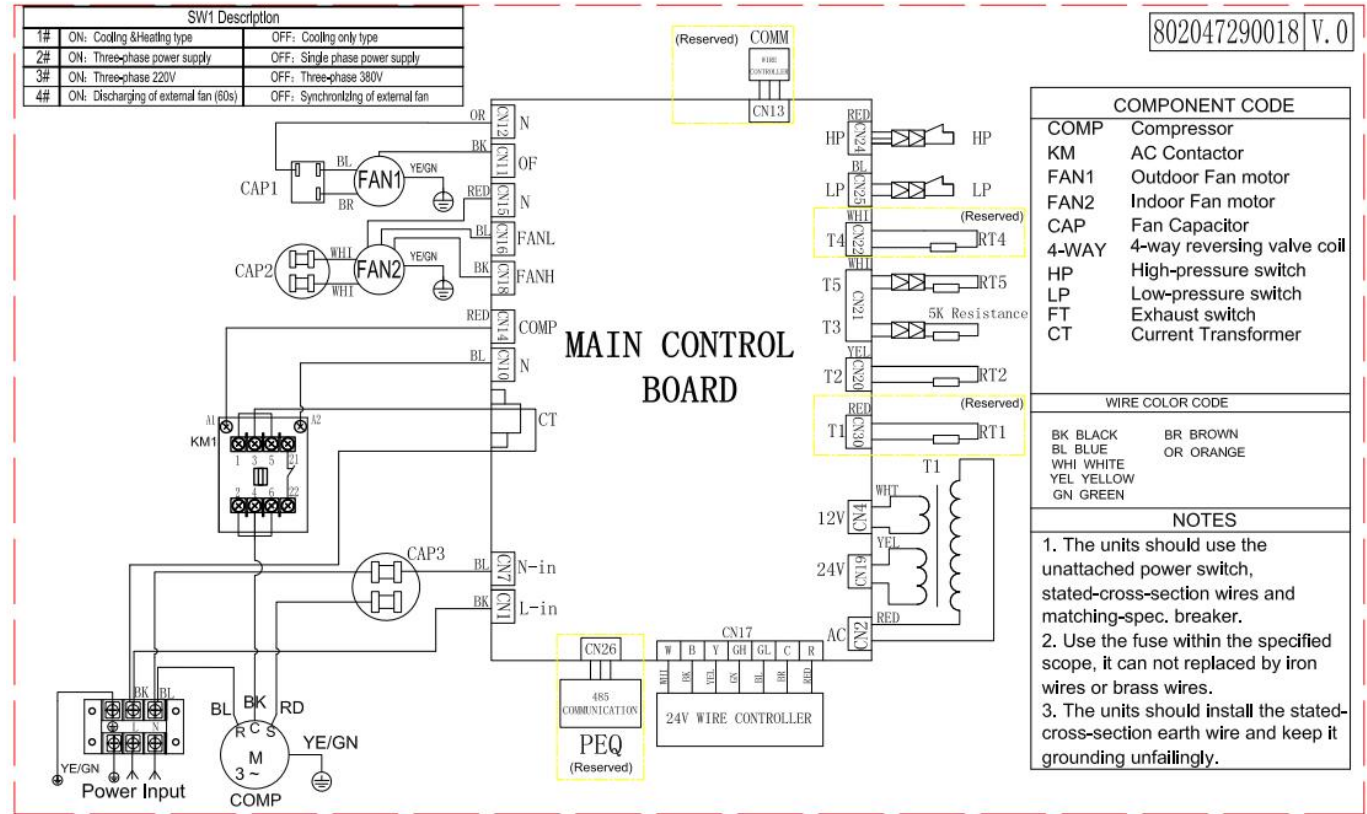
- VOL: Unit Power Supply Rated Voltage (V)
- HZ: Frequency (HZ)
- STC: Starting Current (A)
- RNC: Running Current (A)
- IPT: Input (kw)

Main Power Supply

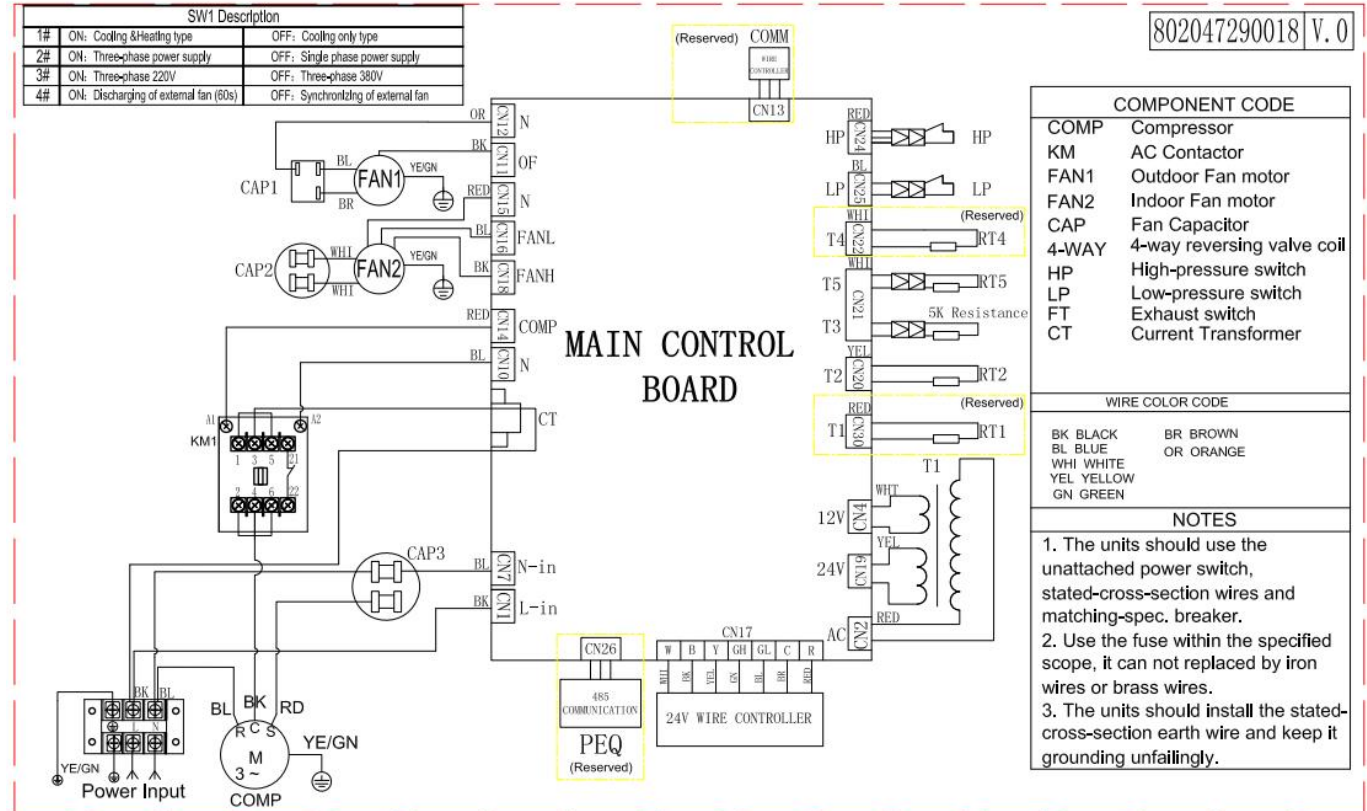
Model type		Unit main power	Main power switch	Fuse	Wires for power supplies	Type of wires
3Tons	C/O H/P	220V 1N ~ 60Hz	50A	40A	3×16mm ² +2×10mm ²	3×UL1015 5AWG 2×UL1015 7AWG
4Tons	C/O H/P	220V 1N ~ 60Hz	50A	40A	3×16mm ² +2×10mm ²	3×UL1015 5AWG 2×UL1015 7AWG
5Tons	C/O H/P	220V 1N ~ 60Hz	63A	50A	3×16mm ² +2×10mm ²	3×UL1015 5AWG 2×UL1015 7AWG

4. Wiring diagrams and field wiring

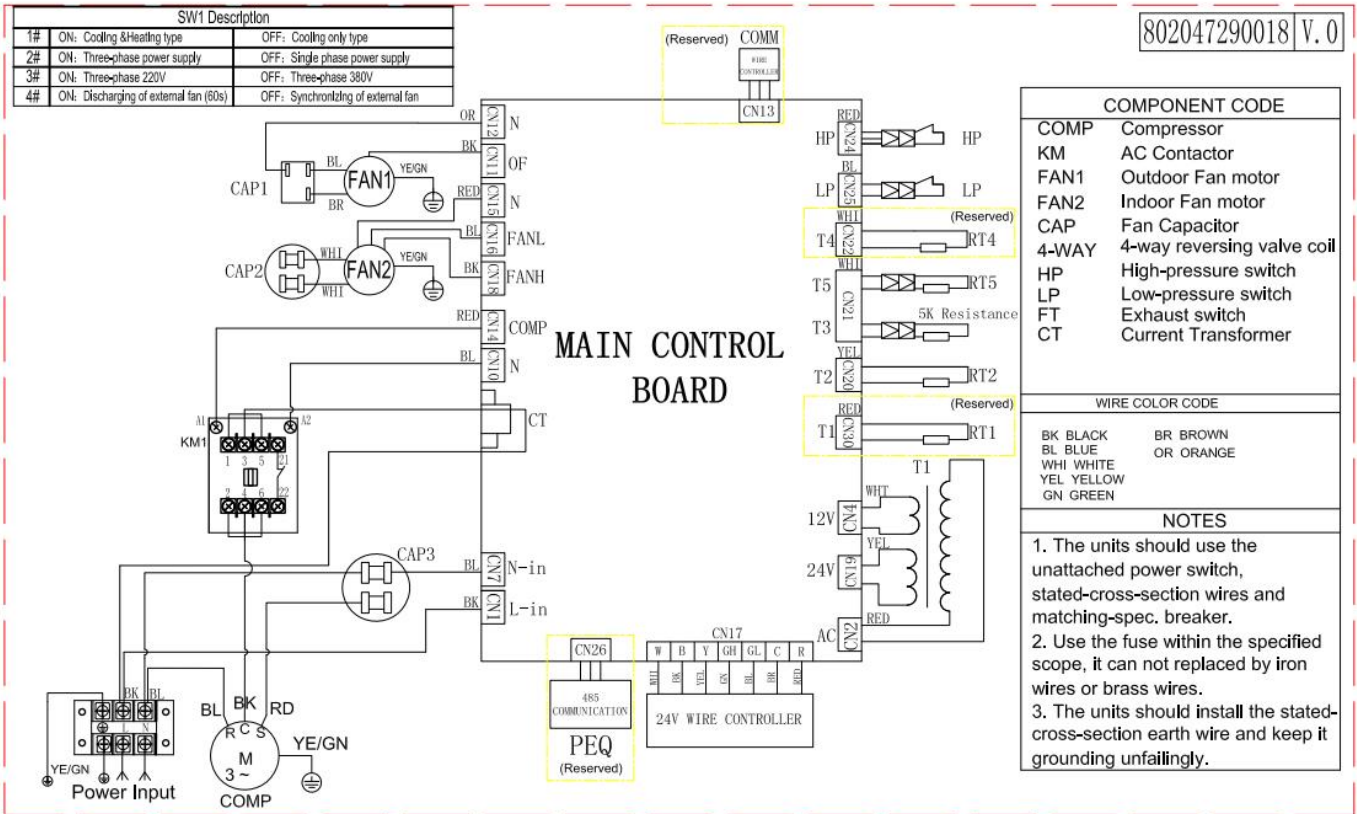
CRT36-1



CRT48-1



CRT60-1

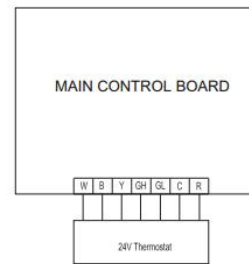
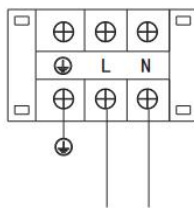


Field wiring

●Power supply

220V 1N ~ 60Hz
3/4/5 Tons C/O Units
3/4/5 Tons H/P Units

220V 1N ~ 60Hz
3/4/5 Tons C/O Units
3/4/5 Tons H/P Units







W : Heat relay
B : Changeover valve
Y : Compressor contactor
GH : High wind fan relay
LH : Low wind fan relay
C : 24VAC common
R : Power

Fig.6-2

●Suggestion: Thermostat choose electrical thermostat series of honeywell, such as RTH111、RTH2300/RTH221、TH5220D.

5. Accessories

Tab.1-1

Name of accessories	Qty	Shape
Manual	1	
Drain pipe	1	
Snap ring	1	
Drain joint	1	

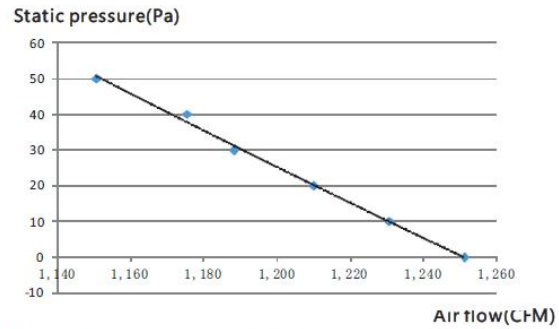
6. Static pressure and air flow

Air flow

For 220V 1N ~ 60Hz

3 Tons C/O Units

Static pressure (Pa)	Air flow (CFM)	Brake power (kW)	Fan speed (rpm)
0	1251	309	720
10	1231	308	735
20	1210	306	750
30	1188	306	765
40	1175	311	775
50	1151	304	790
60	1137	300	805

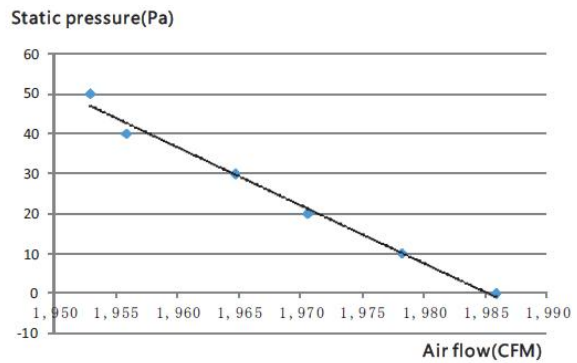


● Curve diagram of static pressure, air flow volumn

For 220V 1N ~ 60Hz

4 Tons C/O Units

Static pressure (Pa)	Air flow (CFM)	Brake power (kW)	Fan speed (rpm)
0	1986	730	1040
10	1978	728	1055
20	1971	725	1070
30	1965	722	1085
40	1956	717	1095
50	1953	711	1105
60	1947	709	1120

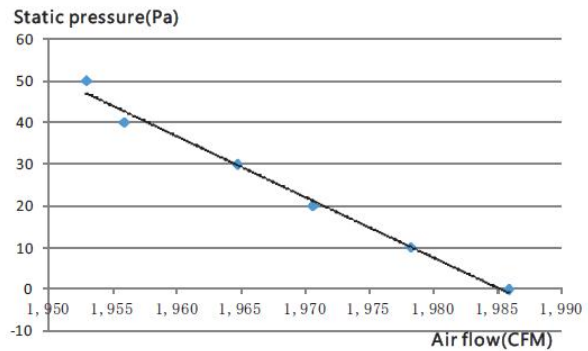


● Curve diagram of static pressure, air flow volumn

For 220V 1N ~ 60Hz

5 Tons C/O Units

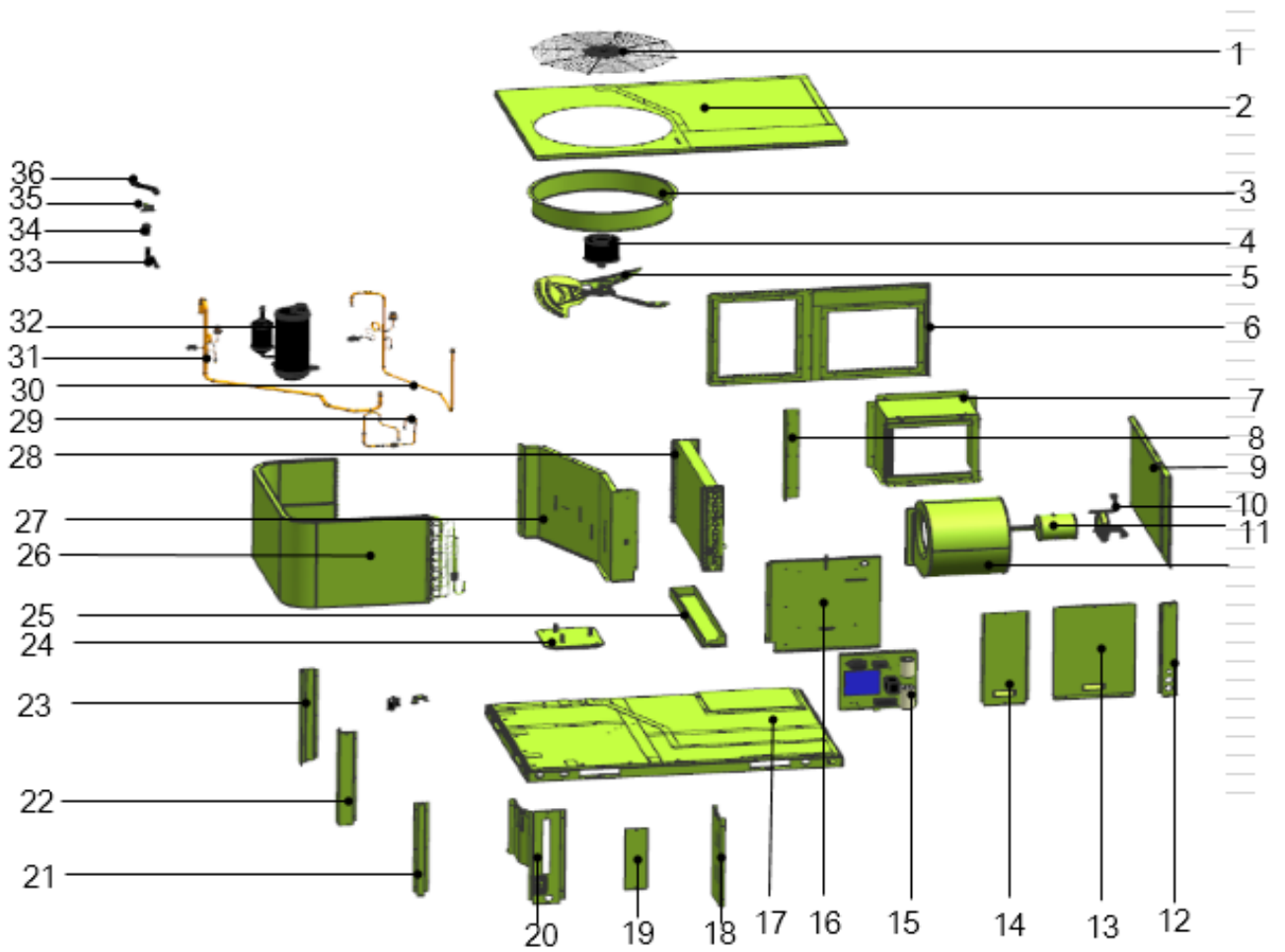
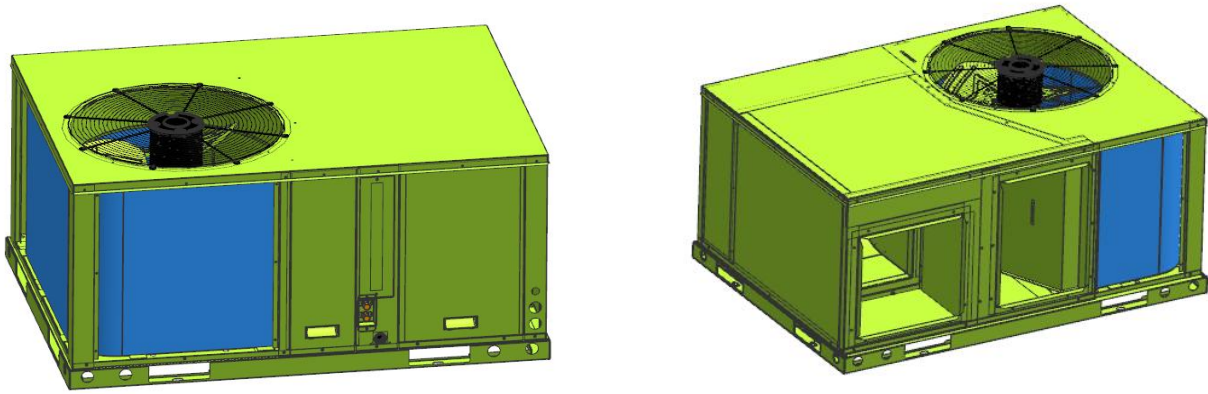
Static pressure (Pa)	Air flow (CFM)	Brake power (kW)	Fan speed (rpm)
0	1986	730	1040
10	1978	728	1055
20	1971	725	1070
30	1965	722	1085
40	1956	717	1095
50	1953	711	1105
60	1947	709	1120



● Curve diagram of static pressure, air flow volumn

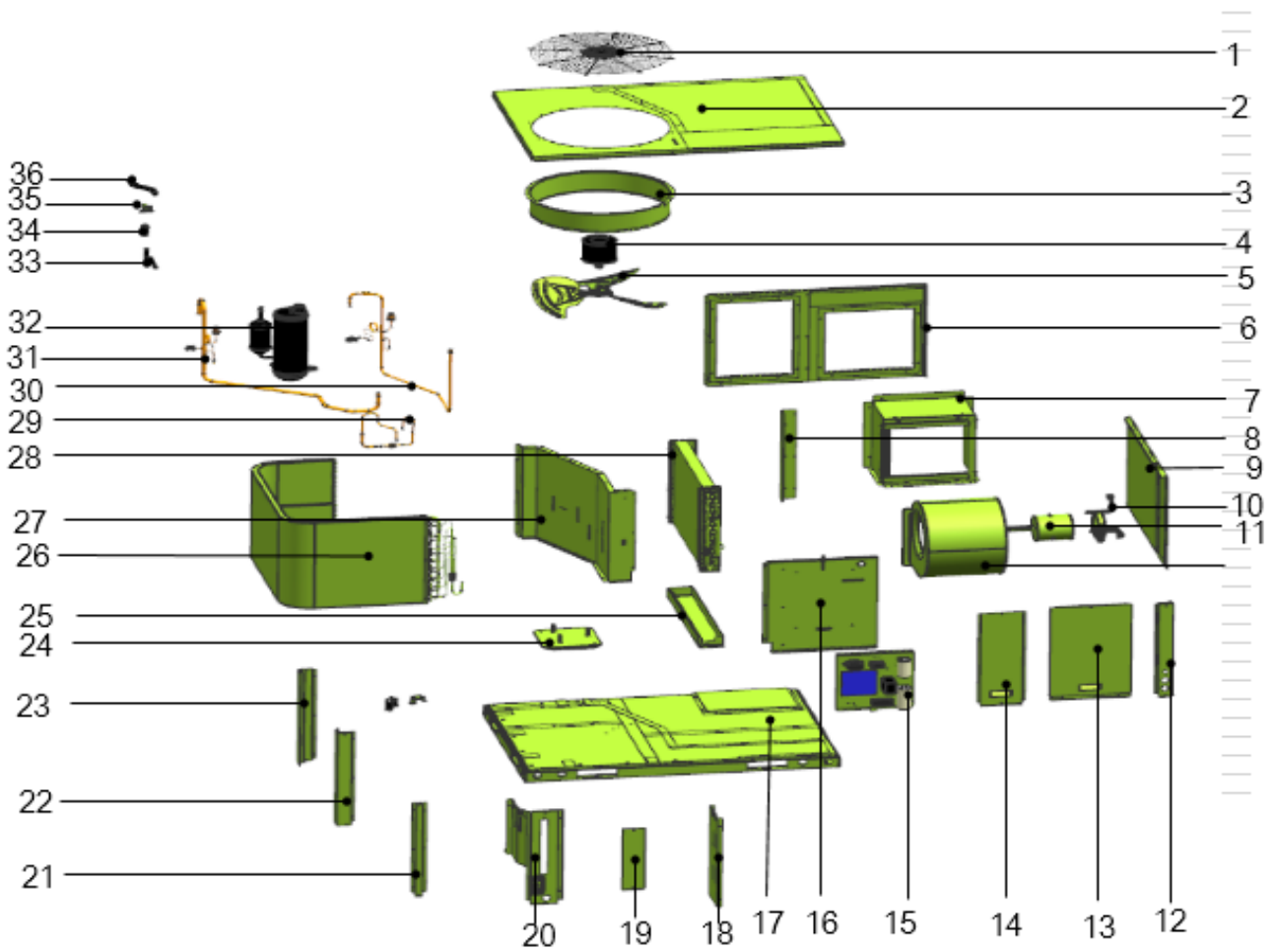
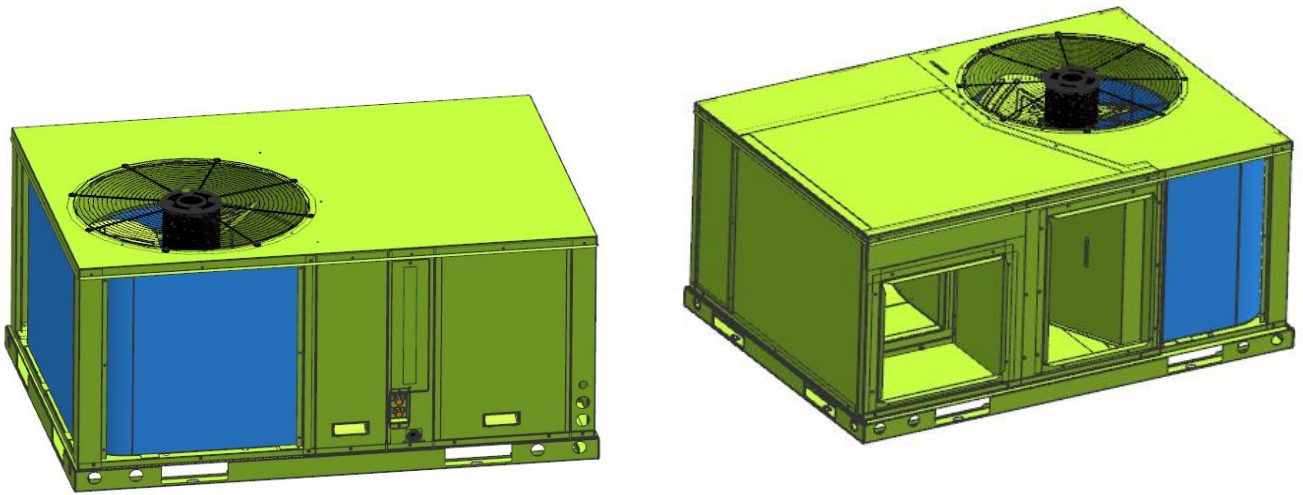
7. Exploded view

CRT36-1



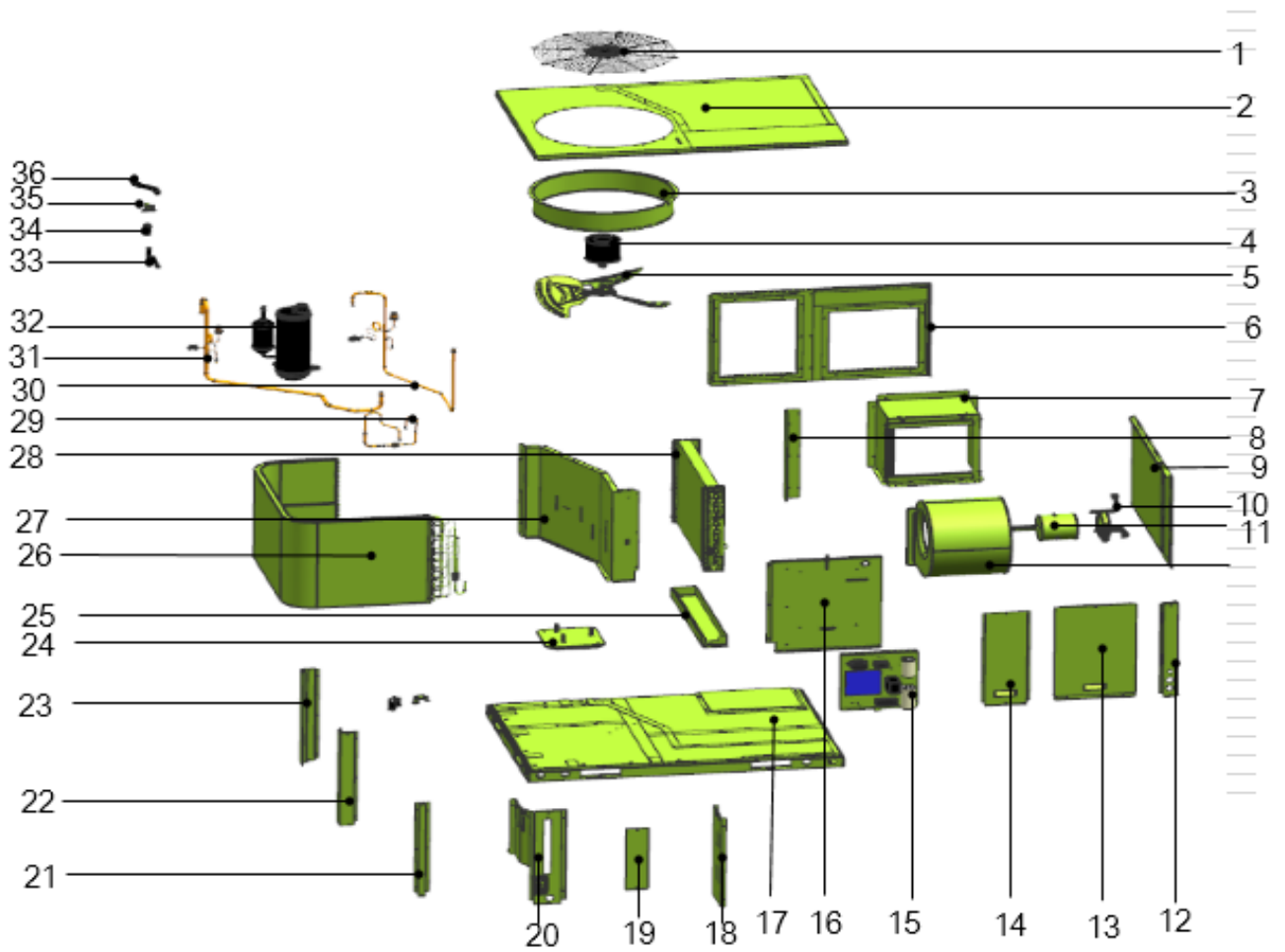
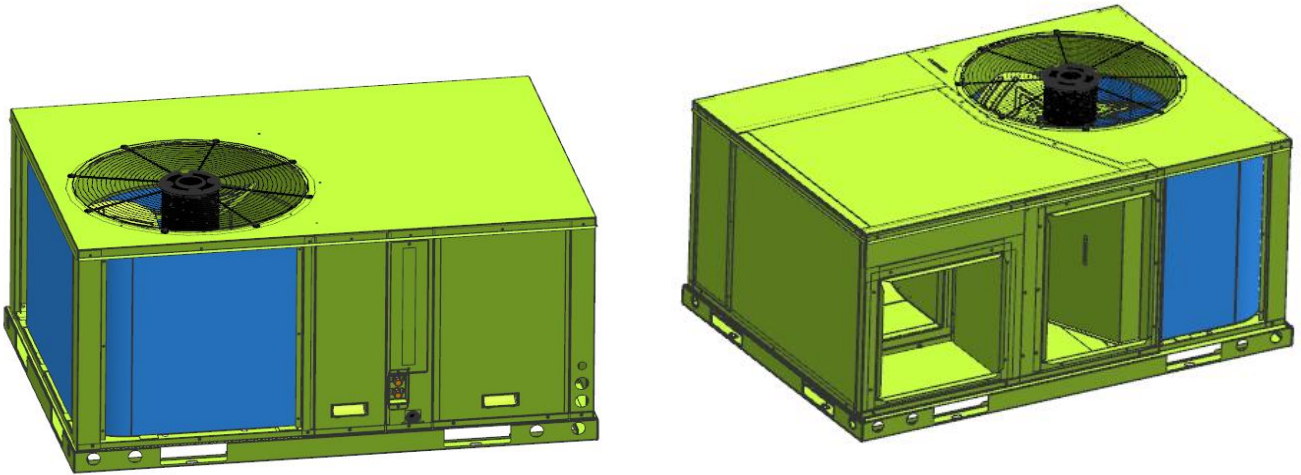
No.	Part Name	Quantity	No.	Part Name	Quantity
1	Outer fan grille	1	19	Sealing plate cotton assembly	1
2	Top cover cotton component	1	20	Front column applicator assembly 2	1
3	Air guide ring assembly	1	21	Front column 1	1
4	outdoor fan motor	1	22	Left column 1	1
5	Axial fan blade	1	23	Left column 2	1
6	Air outlet side panel cotton assembly	1	24	Compressor base weldment	1
7	Air duct component	1	25	Water tray cotton assembly	1
8	Evaporator sealing plate applicator assembly	1	26	Condenser unit	1
9	Right side panel cotton component	1	27	Middle partition cotton assembly 1	1
10	Motor retaining ring	1	28	Evaporator component	1
11	Indoor fan motor	1	29	Throttling component	1
12	Front column applicator assembly 3	1	29.1	stop valve	1
13	Inner cover cotton assembly	1	30	Exhaust pipe assembly	1
14	Outer cover	1	30.1	Needle valve	1
15	Electronic control unit	1	30.2	High Pressure Switch	1
15.1	Compressor capacitance	1	31	Air return pipe	1
15.2	Insert fan capacitor	1	31.1	Needle valve assembly	1
15.3	AC contactor	1	31.2	Low Pressure Switch	1
15.4	transformer	1	32	Compressor	1
15.5	Electric control board assembly	1	33	Drainage elbow	1
16	Middle partition cotton assembly 2	1	34	Water outlet	1
17	Chassis parts	1	35	Drain connector	1
18	Electronically controlled sealing plate welding parts	1	36	rubber tube	1

CRT48-1



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Outer fan grille	1	19	Sealing plate cotton assembly	1
2	Top cover cotton component	1	20	Front column applicator assembly 2	1
3	Air guide ring assembly	1	21	Front column 1	1
4	outdoor fan motor	1	22	Left column 1	1
5	Axial fan blade	1	23	Left column 2	1
6	Air outlet side panel cotton assembly	1	24	Compressor base weldment	1
7	Air duct component	1	25	Water tray cotton assembly	1
8	Evaporator sealing plate applicator assembly	1	26	Condenser unit	1
9	Right side panel cotton component	1	27	Middle partition cotton assembly 1	1
10	Motor retaining ring	1	28	Evaporator component	1
11	Indoor fan motor	1	29	Throttling component	1
12	Front column applicator assembly 3	1	29.1	stop valve	1
13	Inner cover cotton assembly	1	30	Exhaust pipe assembly	1
14	Outer cover	1	30.1	Needle valve	1
15	Electronic control unit	1	30.2	High Pressure Switch	1
15.1	Compressor capacitance	1	31	Air return pipe	1
15.2	Insert fan capacitor	1	31.1	Needle valve assembly	1
15.3	AC contactor	1	31.2	Low Pressure Switch	1
15.4	transformer	1	32	Compressor	1
15.5	Electric control board assembly	1	33	Drainage elbow	1
16	Middle partition cotton assembly 2	1	34	Water outlet	1
17	Chassis parts	1	35	Drain connector	1
18	Electronically controlled sealing plate welding parts	1	36	rubber tube	1

CRT60-1



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Outer fan grille	1	19	Sealing plate cotton assembly	1
2	Top cover cotton component	1	20	Front column applicator assembly 2	1
3	Air guide ring assembly	1	21	Front column 1	1
4	outdoor fan motor	1	22	Left column 1	1
5	Axial fan blade	1	23	Left column 2	1
6	Air outlet side panel cotton assembly	1	24	Compressor base weldment	1
7	Air duct component	1	25	Water tray cotton assembly	1
8	Evaporator sealing plate applicator assembly	1	26	Condenser unit	1
9	Right side panel cotton component	1	27	Middle partition cotton assembly 1	1
10	Motor retaining ring	1	28	Evaporator component	1
11	Indoor fan motor	1	29	Throttling component	1
12	Front column applicator assembly 3	1	29.1	stop valve	1
13	Inner cover cotton assembly	1	30	Exhaust pipe assembly	1
14	Outer cover	1	30.1	Needle valve	1
15	Electronic control unit	1	30.2	High Pressure Switch	1
15.1	Compressor capacitance	1	31	Air return pipe	1
15.2	Insert fan capacitor	1	31.1	Needle valve assembly	1
15.3	AC contactor	1	31.2	Low Pressure Switch	1
15.4	transformer	1	32	Compressor	1
15.5	Electric control board assembly	1	33	Drainage elbow	1
16	Middle partition cotton assembly 2	1	34	Water outlet	1
17	Chassis parts	1	35	Drain connector	1
18	Electronically controlled sealing plate welding parts	1	36	rubber tube	1

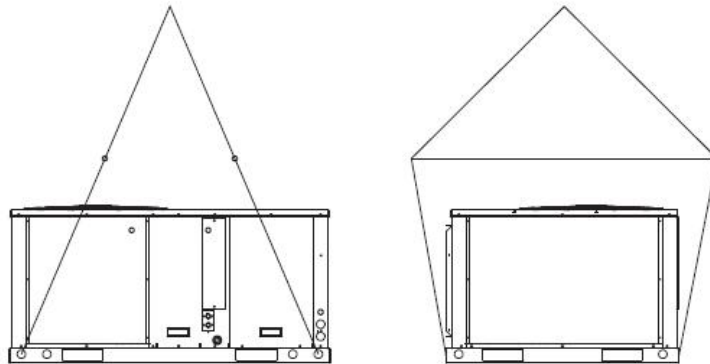
8. Troubleshooting

Digital display	Fault or protect definition
--	Normal standby
rC	Cooling mode
rH	Heating mode
rd	Defrost treatment in heating mode
E0	Communication failure of indoor and outdoor unit (reserved)
E1	Communication failure between indoor unit line controller (reserved)
E2	The failure of indoor temperature sensor T1 (reserved)
E3	The failure of evaporator tube temperature sensor T2
E4	
E5	The failure of condenser tube temperature sensor T3
E6	The failure of temperature sensor T4
E8	The failure of exhaust pipe temperature sensor T5
F1	Outdoor fan protection (reserved)
F2	Outdoor protection (reserved)
F3	High voltage protection
F4	Low voltage protection
F5	Water full protection
F7	High current protection for outdoor unit
F8	The protection of excessive exhaust pipe temperature
F9	The failure of three-phase sequence
P0	Low temperature of evaporator protection
P1	High temperature of condenser protection
L0	Three times P0 in 30mins
L1	Three times P1 in 30mins

9. Installation

1. Lifting

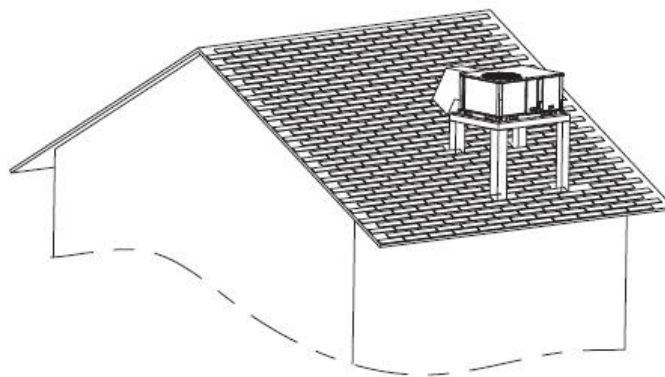
- Rigging cables should have adequate capability to resist 3 times weight of unit. Before lift, please check and ensure that hooks are holding tightly to unit and lifting angles are no less than 60°.
- Cloth material or hard-paper should be padded in the contact place between unit and rigging cable. Rigging cable should be entwined a round at the hook for prevent danger by cable slip because of weight unbalance.
- During lifting, anyone forbidden lingering under the lifting unit.



2. Rooftop unit

- For roof top applications using a field fabricated frame and ducts, use the following procedure:
- The frame must be located and secured by bolting or welding to the roof. Flashing is required.
- The hole in the roof must be prepared in advance of installing the unit.
- Secure the ducts to the roof.
- Place the unit on the frame or roof curb.
- Secure the unit to the frame or roof curb.
- Insulate any ductwork outside of the structure with at least two (2) inches of insulation and then weatherproof. There must be a weatherproof seal where the duct enters the structure.
- Complete the installation according to the instructions in the following sections of this manual.

Typical rooftop application with frame



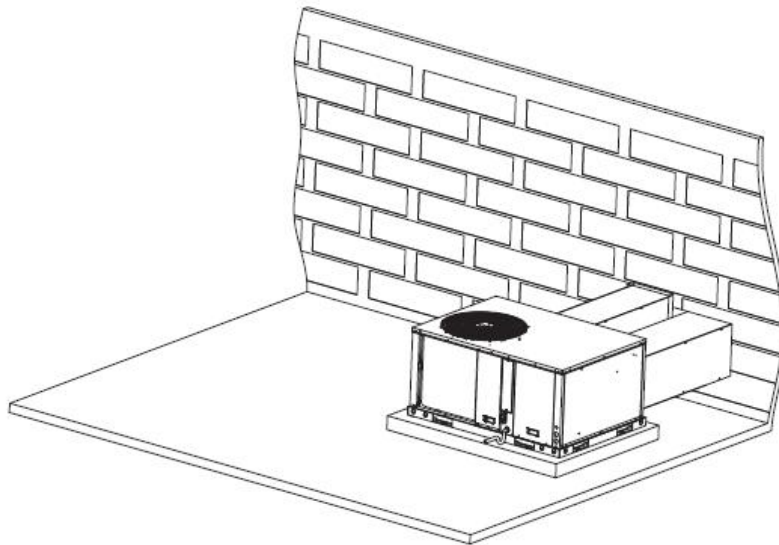
3. Ground level-horizontal unit

- For ground level installations, the unit should be positioned on a pad in the size of the unit or larger. The unit must be level on the pad. The pad must not come in contact with the structure. Be sure the outdoor portion of the supply and return air ducts are as short as possible.

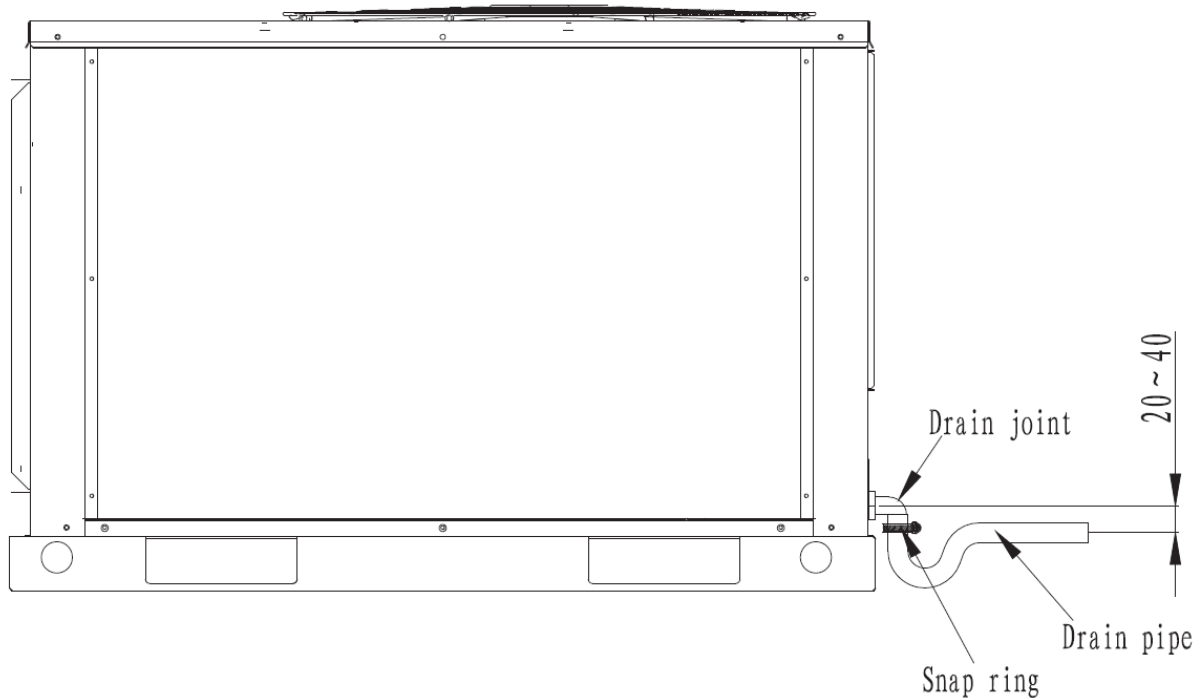
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- Proceed with the installation as follows:
- Place the unit on the pad.
- Attach the supply and return air ducts to the unit.
- Insulate any ductwork outside of the structure with at least 2 inches of insulation and weatherproof. There must be a weatherproof seal where the duct enters the structure.

Typical ground level application



4. Condensate drain piping



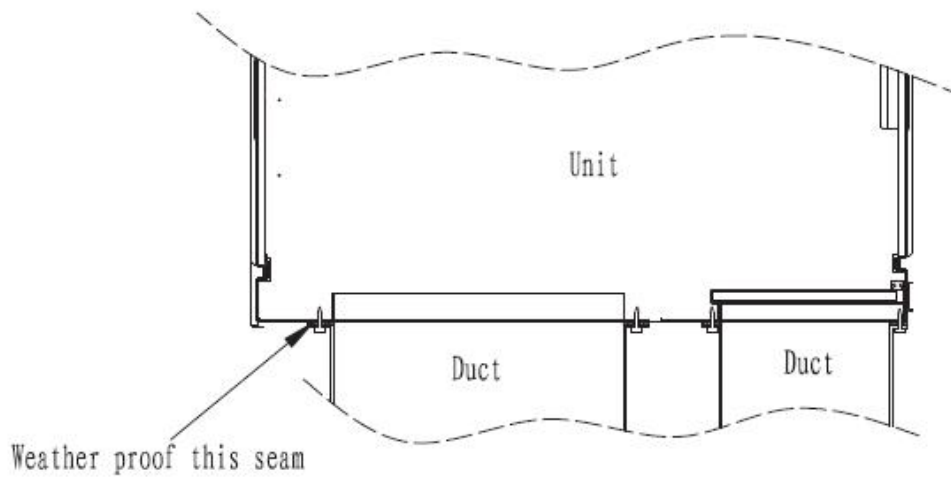
5. Ductwork

●Attaching horizontal ductwork to unit

- All conditioned air ductwork should be insulated to minimize heating and cooling duct losses. Use a minimum of two (2) inches of insulation with a vapor barrier. The outside ductwork
- must be weatherproofed between the unit and the building.
- When attaching ductwork to a horizontal unit, provide a flexible watertight connection to

💡 NOTE

Do not draw the canvas taut between the solid ducts.



10. Controller

- 24V conventional thermostat\wire controller
 - **Required components**
 - The following components are required: main power fuses, conduit coupling, and field supplied room thermostat.

Suggestion:Thermostat choose Non programmed electrical thermostat series of Honeywell such as RTH111, RTH2300/RTH221, TH5220D.

