

# **RH-CUBE 18 / DUO INDOOR UNIT**

## **(DA18-DX-V1M1F1R2 DA18-DUO-V1M1F1R2)**

### **INSTALLATION & SERVICE MANUAL**



- All safety information must be followed as provided.
- This manual is to be used by qualified, professionally trained HVAC technicians only.
- DewAir does not assume any responsibility for property damage or personal injury due to improper service procedures or services performed by an unqualified person.
- It is the owner's and installer's responsibility to read and comply with all safety warnings, information and instructions. Failure to heed safety information increases the risk of personal injury, property damage, and/or product damage.

#### **Registrations**



The RH-Cube 18 & Duo conform to UL 1995 Certified to CAN/CSA Standard CSA C22.2 No.236

*This installation and service manual is believed correct at the time of printing but is subject to revisions and corrections without advanced notice. There is no warranty expressed or implied as to the content in this printing. To ensure you have the latest manual, always check our website. Also, should something be unclear, please contact SUPPORT for guidance. All installation and maintenance is to be performed by a qualified and certified HVAC contractor who is licensed to service and perform repairs.*

# SAFETY WARNINGS

READ THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS CAREFULLY BEFORE INSTALLING AND OPERATING THIS DEVICE. PROPER ADHERENCE TO THESE INSTRUCTIONS IS ESSENTIAL TO OBTAIN MAXIMUM BENEFIT FROM YOUR WHOLE HOUSE DEHUMIDIFIER.

## **WARNING**

THIS SYMBOL MEANS IMPORTANT INSTRUCTIONS. FAILURE TO HEED THEM CAN RESULT IN SERIOUS INJURY OR DEATH.



## **WARNING**

THIS SYMBOL MEANS IMPORTANT INSTRUCTIONS. FAILURE TO HEED THEM CAN RESULT IN SERIOUS INJURY OR DEATH FROM ELECTRIC SHOCK.

## **CAUTION**

THIS SYMBOL MEANS IMPORTANT INSTRUCTIONS. FAILURE TO HEED THEM CAN RESULT IN INJURY OR MATERIAL PROPERTY DAMAGE

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# INSTALLATION INSTRUCTIONS

## CHOOSING LOCATION

- Install the unit indoors. Do not expose to elements. The unit is designed to be installed indoors in a space that is protected from rain and flooding.
- The unit must be level.
- When used as a stand-alone unit, avoid directing the discharge air at people.
- Allow sufficient clearance to handle the unit's overall dimensions, with enough space to access all sides for maintenance and service, as well as the necessary return and supply ductwork to the unit. See Figure 1.

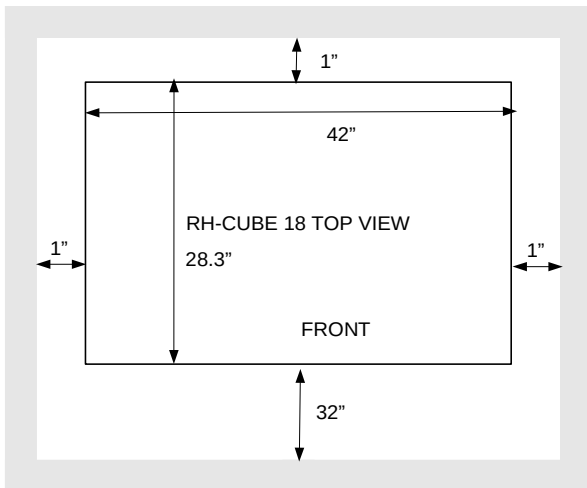


Figure 1 - Minimum clearances

- Allow at least 32" of clearance for filter and heat exchanger removal. Bear in mind that the heat exchangers must be removed as part of periodic inspection and maintenance, and that they weigh about 20 lb (9 kg) each. Avoid locations where removal or replacement of the heat exchangers will be awkward or unsafe.
- Locate the unit in an area where field wiring the control (low voltage) to the unit will be possible.
- Drain Accessibility: Allow for proper drainage and routing of any needed drain pipes. Because a drain trap is required and sufficient slope must be maintained between the unit and the drain, the unit must be elevated with respect to

the drain. Allow at least 1/4 inch per foot (2% slope) when running a line from the unit to the drain.

- Power: Locate the dehumidifier in an area where the cord's length (79 inch) easily reaches a 120 VAC electrical outlet with a minimum of a 15 Amp circuit capacity.
- The noise that an RH-Cube 18 generates is similar to that of a typical furnace. It is advisable to install the unit away from the living space. A closet, basement, attic, garage; or utility room are good choices.

## TIGHT LOCATIONS

In order to facilitate installations in cramped locations such as attics, the RH-Cube 18+ can be dismantled into three separate units which can be transported and then reassembled at the final location. Disassembly instructions are found at the end of this manual.

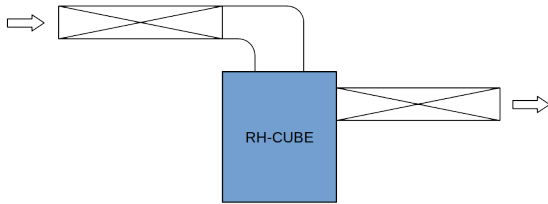
## DUCTING

- For safety reasons the Return Air (the rectangular opening on the top of the unit) requires, at a minimum, 3 feet of 12"x18" ducting or DewAir's optional return air muffler.
- For noise abatement into the living space it is recommended that the Return Air have a minimum of 6 feet of 12"x18" inside acoustic insulation ducting, preferably with an elbow.
- Ducts should not add more than 0.35 inches of static pressure. In the case where it is necessary to increase static load beyond 0.35 inches, please consult with the manufacturer.
- The installation and connections must be in compliance with national and local codes and be completely tight and leak free.
- For the supply air, you must open up one and ONLY one of 4 cutouts supplied (either side, top, or back). Ducting is optional. If ducting is used, it should be sized 8" x 14".
- Make sure there are no bends within 6" of the unit in the ductwork coming to or leaving from the unit. This will ensure that the air flows freely through the unit.

## DUCT CONFIGURATION CHOICES

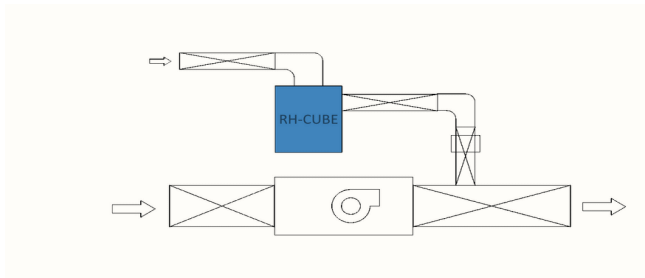
The RH-Cube 18 can be installed as a stand-alone device with separate ducting, or it can be installed in parallel to an existing HVAC system, or it can be installed serially. See the [app note #2 "RH-Cube 18 Ducting"](#) for more information.

### Free Standing Installation



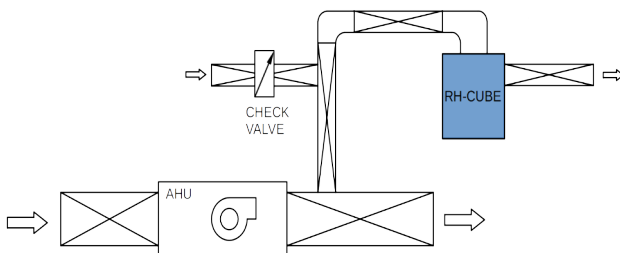
- Inlet: A minimum of 6" of open space is required from the inlet opening to an adjacent surface.
- It is recommended to maintain a separation of 10' between the inlet and discharge of the unit, this is to prevent short-circuiting of the air and reducing the effectiveness of the unit.

### Parallel Installation



In the Parallel Configuration the RH-Cube delivery air is combined with the delivery air of the air conditioning system. The main advantage to this configuration is that it distributes dehumidified air evenly and ensures that the delivery air is not saturated.

### Serial Installation (Patent Pending US 62974082)



In the Serial Configuration the RH-Cube is located immediately after the air conditioner so that the RH-Cube's

return air is taken directly from the delivery air of the air conditioning system.

This configuration improves the efficiency of the RH-Cube by 15% and additionally increases its dehumidification capacity by 15% because pre-cooling of the RH-Cube's air supply by the air conditioner enables the RH-Cube to reach a lower dewpoint.

## DRAIN INSTALLATION

When installing the condensate drainage system, follow all relevant plumbing codes.

It is highly recommended that a drain pan be placed under the unit if there is any possibility that water leakage could cause damage. Adhere to local codes regarding draining of the condensate from the pan. If a condensate pump is needed, install it in the drain pan as well.

A drain trap is required for the dehumidifier to drain properly. Install a 3/4" threaded male NPT adapter to the drain pan. Install a drain pipe assembly utilizing 3/4" PVC pipe to transport the condensate to a drain. Pitch of drain should be 1" per 10'.

The unit must be elevated with respect to the drain to account for a drain trap and the required slope to enable proper drainage. See Figure 2.

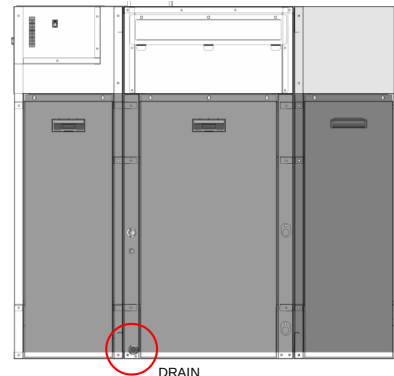


Figure 2 - Drain location

When connecting the 3/4" PVC pipe, use a wrench to prevent rotation of the RH-Cube pipe as per Figure 3.

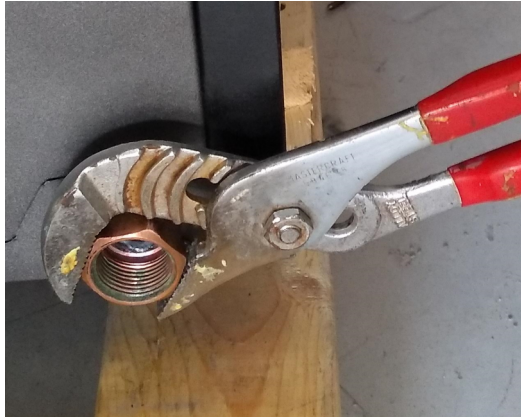


Figure 3 - Use a wrench to prevent drain pipe rotation

## ELECTRICAL REQUIREMENTS

### POWER

#### **⚠ WARNING ⚠**

**ELECTRICAL SHOCK HAZARD:** 120-VOLTS MAY CAUSE SERIOUS INJURY OR DEATH FROM ELECTRICAL SHOCK. DISCONNECT AND TAG ELECTRICAL SERVICE BEFORE STARTING INSTALLATION OR FIELD-SERVICE. LEAVE ELECTRICAL SERVICE DISCONNECTED UNTIL INSTALLATION OR FIELD-SERVICE IS COMPLETE.

**ELECTRICAL SHOCK HAZARD:** AN INTERRUPTED OR BROKEN GROUND MAY CAUSE PROPERTY DAMAGE, SERIOUS INJURY OR DEATH SHOULD AN ELECTRICAL FAULT OCCUR. THE CABINET MUST BE GROUNDED IN ACCORDANCE WITH NEC ANSI/NFPA 70-2011 OR LOCAL CODES. IN CANADA, REFER TO CANADIAN ELECTRICAL CODE CSA C22.1.

**FIRE HAZARD:** USE OF IMPROPER WIRE MAY CAUSE SERIOUS INJURY, PROPERTY DAMAGE OR DEATH DUE TO FIRE. DO NOT USE ALUMINUM WIRE FOR ELECTRICAL SERVICE TO THE DEHUMIDIFIER. USE ONLY COPPER WIRE.

#### **⚠ CAUTION ⚠**

USE OF AN UNDERSIZED CIRCUIT BREAKER MAY CAUSE PROPERTY DAMAGE AND/OR THE NEED FOR MOLD REMEDIATION SERVICE. SEE SPECIFICATIONS FOR WIRE AND CIRCUIT BREAKER SIZING.

INSTALLATION MUST BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN AND MUST COMPLY WITH ALL NATIONAL AND LOCAL CODES.

Remove power to the device before installing or servicing the equipment.

The dehumidifier is supplied with a 72 inch long, 3-prong, grounded power cord and is intended to be connected to a dedicated, grounded branch electrical circuit containing a properly sized fuse or circuit breaker. This circuit must run directly from the main circuit box to an electrical receptacle located within 6 feet of the intended location of the unit. This receptacle must be readily accessible or located as needed to comply with appropriate national or local codes or ordinances.

**United States Installations:** Make all electrical connections in accordance with the current edition of the NEC ANSI/NFPA 70 and any local codes or ordinances that may apply.

**Canada Installations:** Make all electrical connections in accordance with the current edition of the Canadian Electrical Code CSA C22.1 and any local codes or ordinances that may apply.

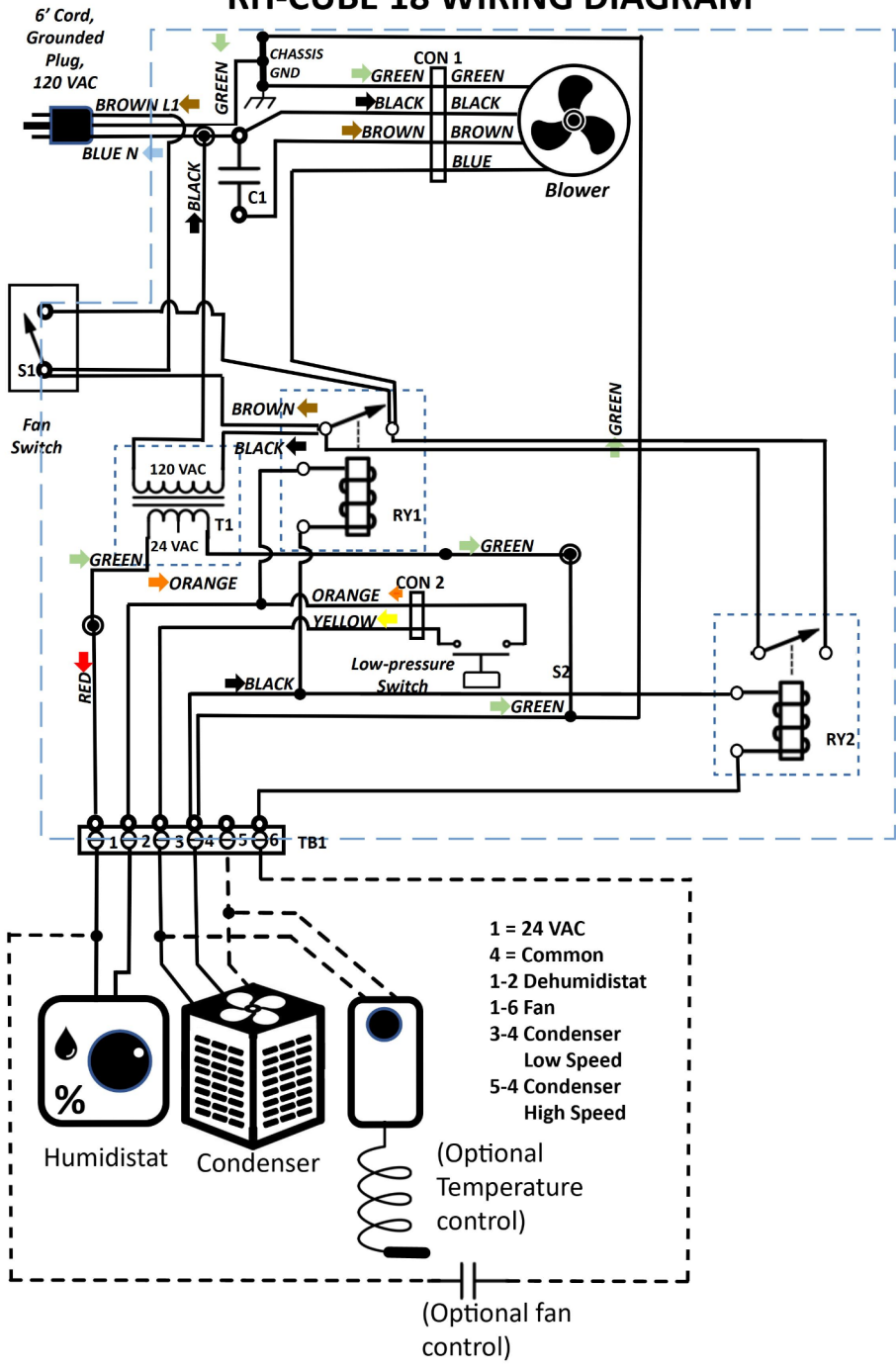
#### Low Voltage Connections

The RH-Cube 18 control wiring requires 24 Volt minimum, 25VA service from the indoor transformer. Route control wires through the low voltage port and terminate in accordance with the wiring diagram provided inside the control panel cover.

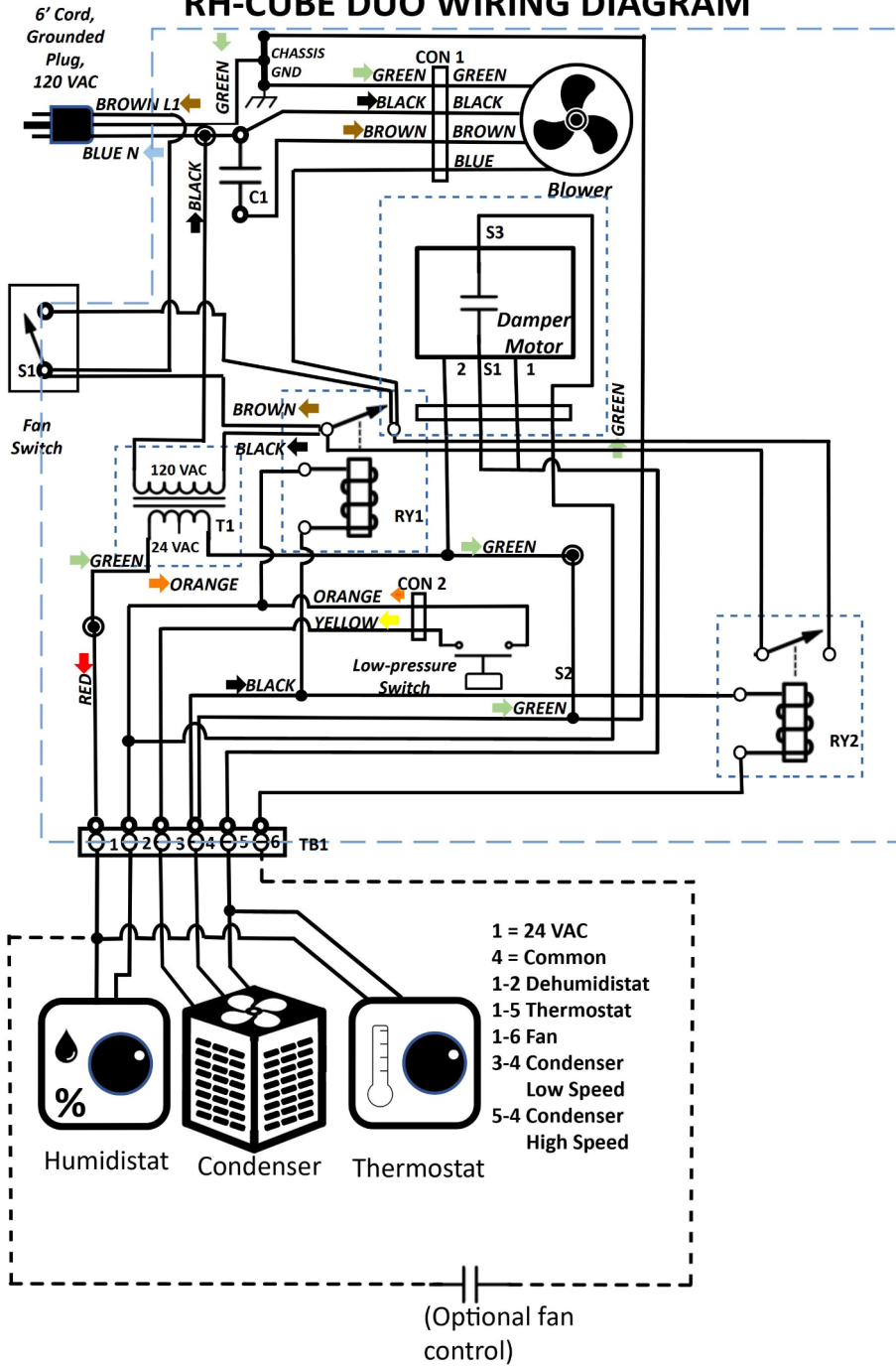
#### Remote Dehumidistat Location

The unit is controlled by a remote dehumidistat supplied by others. It should be located in a conditioned space, ideally, in an area close to the heating or air conditioning system thermostat, out of drafts, away from heat sources, and out of direct sunlight. It should be located approximately five feet above the floor in an area with good air circulation at an average temperature and relative humidity.

# RH-CUBE 18 WIRING DIAGRAM



# RH-CUBE DUO WIRING DIAGRAM





# REFRIGERANT CHARGE

There are two recommended methods to charge a system: weigh in or exact charge, and subcool methods. Refer to your condenser's installation manual for details.

# SYSTEM START-UP

This is the procedure for the complete system startup. It is to be carried out once both the indoor and outdoor units have been installed and the refrigerant lines connected. As part of this procedure, the Installer Checklist, which is found on page 12, is to be filled out and a copy sent to DewAir, either electronically or via post. It is important to send a completed copy of this form to DewAir as it affects the warranty.

## TEMPERATURE AND HUMIDITY SENSORS

When measuring the coil intake and leaving conditions the sensors must be inserted a minimum of 6 inches into the appropriate port (Figure 4).



Figure 4 – Sensor ports

# MAINTENANCE

## FILTER INSPECTION & REPLACEMENT

**IMPORTANT NOTE:** Never operate unit without a filter installed as dust and lint will build up on internal parts resulting in loss of efficiency, equipment damage and possible fire.

The air filter is accessed via the air filter access panel at the front of the unit.

The air filter should be inspected on a regular basis and replaced when found to be dirty. The inspection interval will vary depending on the dust present in the air for a particular location. Inspection once a month is recommended.



Figure 5 – Air filter location

## FAN MOTOR

The fan motor is permanently lubricated and does not require additional oiling.

## HEAT EXCHANGER INSPECTION & MAINTENANCE

Periodically, the removable heat exchangers (which weigh 20 pounds each) should be inspected, and if found to be dirty, be washed using dish soap and lukewarm water, thoroughly rinsed, and air-dried.

## HEAT EXCHANGER REMOVAL AND REPLACEMENT

The RH-Cube 18 has four heat exchangers which are accessed via the two doors at the front of the unit. Each door is held in place by two hex-head bolts. Remove the bolts using the supplied Allen key. Removing the doors exposes the heat exchangers. The heat exchangers can

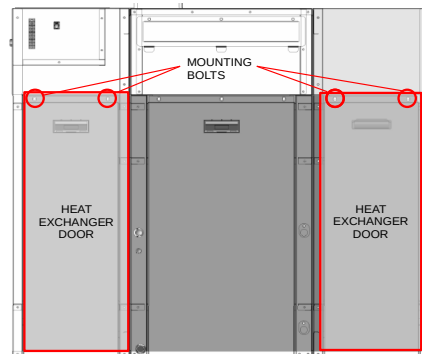


Figure 6 – Heat Exchanger Doors

then be slid out. To replace the heat exchangers, reverse the process.

**NOTE: DO NOT OVER-TIGHTEN THE DOOR BOLTS WHEN REATTACHING THE DOORS AS THE BOLTS DO NOT REQUIRE MUCH TORQUE. WHEN A SLIGHT COMPRESSION OF THE FOAM INSULATION ON THE BACK OF THE DOORS IS OBSERVED, THEN SUFFICIENT TORQUE HAS BEEN APPLIED. IF USING AN ELECTRIC SCREW DRIVER, USE ONLY THE LOWEST TORQUE SETTING.**

## DRAIN

As with any plumbing system, the RH-Cube's drainage system should be inspected periodically to ensure that the unit is draining freely, and remedial action taken if required.

## DRAIN PAN CLEANING

Periodically the drain pan should be inspected and clean. The drain pan sits directly below the evaporator coil and is fed by the two drip pans which collect moisture from the heat exchangers.

The drip pans are located immediately below the heat exchangers, and can be inspected by removing the heat exchangers. The drip pans are held in place by a single sheet metal screw which must be removed. Once the drip pans are removed, the drain pan can be inspected and cleaned from the side.

## DRAIN PAN REMOVAL

If required, the drain pan can be removed via the drain pan access door. To remove the door, unscrew the three hex-head bolts using the supplied Allen key.

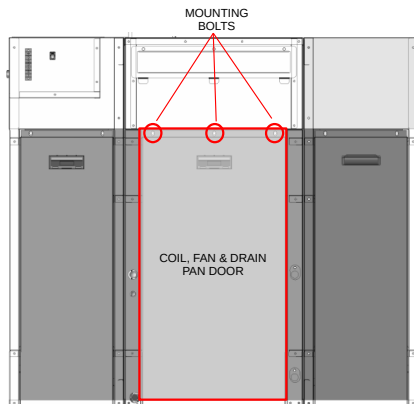


Figure 7 – Drain pan access doors

Removing the door exposes the drain pan. To remove the pan first it must be disconnected from the drain pipe

located at the front of the unit (Figure 8). The drain pipe is connected to the drain pan by a push-to-connect Sharkbite U712 coupling (Figure 9). Release the connection by pushing on the U712 release clip.

Once the drain pipe is disconnected the pan can be removed via the access door.

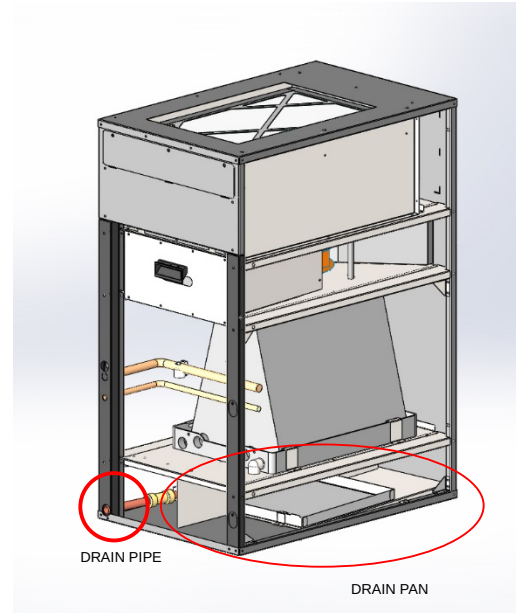


Figure 8 – Door removed to show location of drain pipe and drain pan



Figure 9 - Detailed view of Sharkbite coupling of drain pan to drain pipe

# DISASSEMBLY

The RH-Cube 18+ can be disassembled to facilitate fitting through narrow openings and into tight spaces. It comes apart into three sections: the center section houses the A-coil and fan. The left and right sections house the four heat exchangers (two per side).

The unit is designed to be only disassembled and reassembled once. Disassembling multiple times will void the warranty.

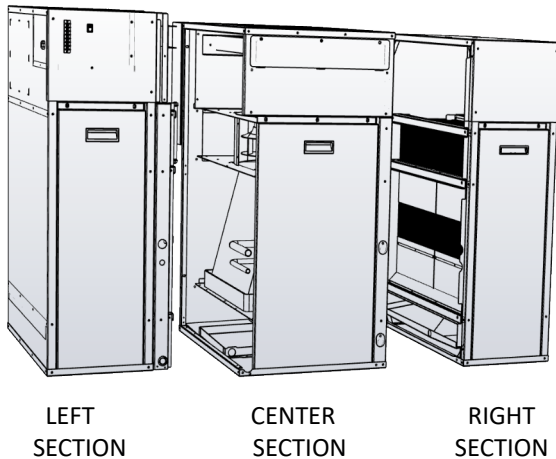


Figure 10 – Three section of RH-Cube 18+

Here are the disassembly steps. To reassemble, reverse these steps are reversed.

1. Set the unit up on a flat surface.
2. Remove the doors from all three sections. Use the provided Allen key to unscrew the seven bolts holding the doors as per Figure 6 and Figure 7.
  1. Remove all four heat exchangers by sliding them out.
  2. Disconnect the two MATE-N-LOK electrical connectors between the center section and the underside of the electrical box in the left section.
  3. The left and right sections are each held in place to the center section by five bolts: two that are accessible on the outside back of the unit (Figure 11), and three that are accessed via the heat exchanger doors (Figure 12).

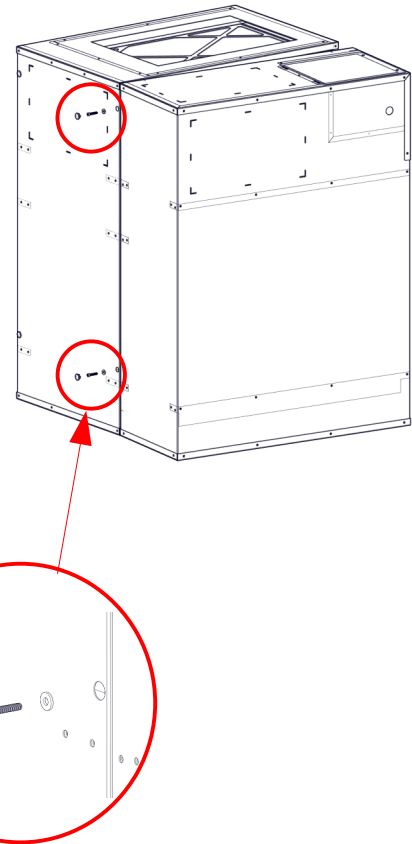


Figure 11 – Two bolts at the rear secure the sections.

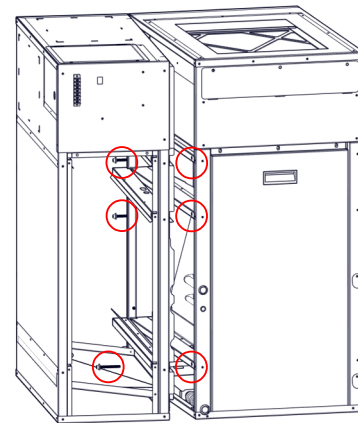


Figure 12 – Three bolts accessed via heat exchanger sections.

For the left side:

4. Expose the two bolts at the rear of the unit (Figure 12) by removing the plastic cap. The cap can be removed by carefully prying with a screwdriver or knife.
5. Unscrew the two bolts using the supplied Allen key.
6. Unscrew the three bolts inside the heat exchanger section using the supplied Allen key (Figure 13).
7. The heat exchanger section can now be pulled away from the center section, starting in the front as shown in Figure 13.
8. As you are pulling the units apart, make note the way the heat exchanger section's tabs fit into the center section. This will be important when reassembling the unit.

Also make note of the drain pipes that allow the heat exchanger pan to empty into the drain pan. Make sure on reassembly that these pipes are properly positioned.

9. Repeat steps 4 through 8 for the right side.

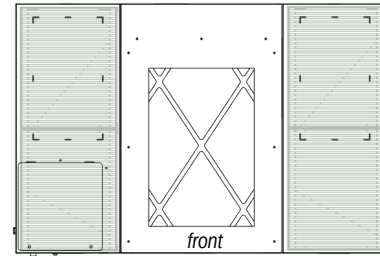
## REASSEMBLY

1. Place the center section on a flat level surface.
2. When reattaching the heat exchanger sections, pull the two sections tightly together before applying the bolts.
3. When screwing in the bolts be careful to not cross-thread.
4. Reverse the 9 steps followed for disassembly.

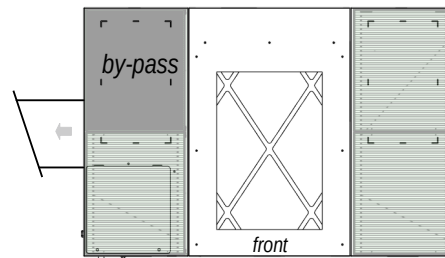
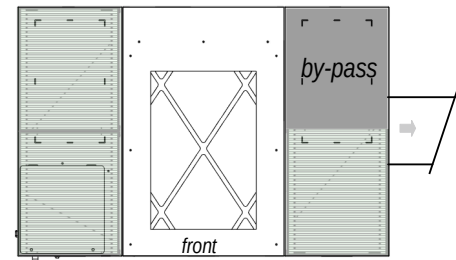
## RH-CUBE 18 TO COOL CONVERSION

An Rh-Cube 18 contains four heat exchangers, and an Rh-Cube Cool contains three heat exchangers and one heat exchanger by-pass. An RH-Cube 18 can be converted to an RH-Cube Cool and vice versa by exchanging one of the heat exchangers with a heat exchanger by-pass.

Even though the heat exchanger by-pass can occupy any one of four positions, best practice dictates that the by-pass be located at the back of the unit on the same side as the delivery air. The figures below illustrate this.



**RH-Cube 18**  
4 Heat Exchangers



**RH-Cube Cool**  
3 Heat Exchangers / 1 By-Pass  
Note: By-Pass is located on the same side as the delivery air

Figure 13 – Top view of RH-Cube illustrating the recommended location of the heat exchanger by-pass.

Follow the instructions outlined in **Heat exchanger removal and replacement** to swap heat exchanger and by-pass units.

# RH-CUBE™ 18 SPECIFICATIONS

Typical Power Consumption	340 Watts @ 80°F and 60% RH
Blower power, STP performance	336 W (0.44 HP)
	610 CFM @ 0" WG
	545 CFM @ 0.2" WG (50 Pascals) 500 CFM @ 0.35" WG (87 Pascals)
Supply Voltage, Cord	115 VAC - 1 phase, 60 Hz, 6 foot cord (grounded)
Power Circuit (Max Current Draw)	15 A breaker (Max draw 3.2 A)
Drain connection	3/4" (19 mm) NTP threaded female
Control Device (not included)	Dehumidistat or Thermostat (consult installation manual)
Output Control Power	24 VAC up to 30 VA to power dehumidistat control
Blower Switch	Auto or always on
Return Duct (air into RH-Cube)	Required Minimum: 3 foot duct. Opening on top is 12" (30.5 cm) x 18" (46 cm)
Supply Duct (air out of RH-Cube)	Duct optional but recommended. Cutout choice on left, right, top, and back. 8" (20.5 cm) x 14" (35.6 cm)
Other blower duct system connect	Refer to installation manual for several options
Service Access Front	Connection pipes, electrical control, blower switch Evaporator coil, four heat exchangers, filter cover
Service Access Top	Electrical components box
Air Filter(standard recommended)	Camfil 24 x 16 x 2 30/30 MERV 8 Part # 049880-016
Filter Maintenance	Inspect every 1-2 months, replace every 3-4 months or as needed
Alternative Air Filter (premium)	Camfil 24 x 16 x 2 30/30 Dual 9 Part # 0406331-016
Equipment Weight, Ship Weight	Equipment 310 lbs (117 Kg), Ship 350 lbs (136 Kg)
Disassembled maneuvering Dimensions and Weight	Left and Right Sections: 11.4" x 38" x 28.3" Weight (each) – 95 lbs Center Section: 8.3" x 38" x 28.3" Weight – 108 lbs
Equipment Dimensions (incl. pipes)	44.0" x 28.4" x 38.2" 112 cm x 72 cm x 97 cm
Shipping Dimensions	47.0" x 32.0" x 44.0" 120 cm x 82 cm x 112 cm

## ORDERING PART NUMBERS

Rh-Cube Model	Part Number
18	DA-900-0003
COOL	DA-900-0004
DUO	DA-900-0005

