Dectron

DRY-O-TRON®

Owner's Manual

FOR MODELS

DK	DKV	RK
010	010	010
015	015	015
020	020	020
030	030	030
040	040	040
050	050	050
060	060	060
080	080	080
100	100	100
120	120	120
150	150	150
200	200	200
240	240	240
300	300	300
360	360	360
420	420	420
480	480	480

With electro-mechanical controls

For future reference, write your model number* here _____

write your serial number* here _____

write your ref number* here _____

*See **Product Description - Unit Nameplate**.

NOTE:

For your convenience this manual is organized into tasks arranged in a workable order. Most material relevant to a single task is on one page or a group of sequential pages.

Please feel free to attach copies of the appropriate pages to the task work-order.

To the Owner:

This manual contains important instructions in operating and maintaining your DRY-O-TRON® and system. Please read the entire manual carefully and if you have any questions contact your local Dectron representative. Your warranty is valid only if conditions explained in this manual are met.

To the Installer:

This manual contains vital instructions for installing and starting up the DRY-O-TRON® and system. Please read the entire manual carefully and if you have any questions contact your local Dectron representative. Your customer's satisfaction is at stake and the DRY-O-TRON® warranty may be void if conditions explained in this manual are not met.

Contents

DRY-O-TRON® DK Series Make-up Air Dehumidifiers

Dectron Inc., the inventor of DRY-O-TRON®, is a company committed to being the absolute best at what they do - providing leading expertise and quality products to customers who need to control high humidity efficiently.

Today's DRY-O-TRON® represents years of intensive research and development by a team of highly qualified experts. Dectron has the only large-scale dehumidifier testing and environmental simulation laboratory in the industry. Every DRY-O-TRON® model line has been developed in this laboratory, and every customer's unit is fully factory tested before shipment.

The DRY-O-TRON® is available in a broad range of standard products for industrial and commercial applications. We also have a team of highly skilled engineering and manufacturing professionals who are dedicated to custom design projects.

Product Description

Make-Up Air Humidity Control

The DRY-O-TRON® DK/RK Series make-up air dehumidifier is a precision-engineered product, finely tuned to the conditions in any application to achieve maximum performance and energy savings.

The DRY-O-TRON® is fully tested under design conditions at our factory by skilled personnel. The installation of this state-of-the-art equipment must be performed by experienced heating, ventilation and air conditioning (HVAC) factory-trained technician.

The DK/RK Series is designed to treat make-up air removing moisture and reducing the relative humidity level of the discharge air. In conjunction with proper building design, this helps to reduce high humidity, condensation and their accompanying problems.

How the DRY-O-TRON® Works

In the DRY-O-TRON®, warm humid air passes through the dehumidifying coil and is cooled below its dew point, thereby condensing moisture. The heat captured by this process is combined with the heat generated from the compressor power consumption. This recovered heat is then partially used to reheat the air.

The excess heat is then rejected to an air-cooled or water-cooled condenser.

The DK Series has been designed to provide the flexibility to handle the extremely wide range of input air conditions that can be expected when using make-up air.

When properly installed according to Dectron's instructions, the DRY-O-TRON® will give years of trouble-free operation.

The DK Series:

- Removes moisture efficiently over a wide range of entering air conditions.
- Reduces the running time of the main air-conditioning system, saving energy and operating and maintenance costs.
- Supplies treated outdoor air as required by ventilation codes.
- Helps improve product/process quality.
- Helps reduce building repair and production maintenance costs.
- Dehumidifies even when cooling is not required.
- Pressurizes the facility to prevent infiltration of untreated air.
- Helps provide a comfortably dry working environment.
- Contributes to space cooling.
- Can be installed indoors or out doors (rooftop model).
- Can be added to existing air conditioning systems without complicated tie-ins.
- Uses state-of-the-art heavy duty scroll compressor technology for reliability and energy savings.
- Is constructed with a unique modular coil design which permits custom designs at lower cost.
- Low silhouette evaporators for maximum moisture removal.

DK Series - Customized for Every Project

The DK Series units offer solutions for a broad range of humidity control applications (see **Product Description - Major Options**).

To provide the best product at a competitive price, Dectron has used a modular approach to the design of the DK Series.

Each DK unit is customized for a particular project. By drawing on a stock of modular components including coils, enclosures and other key submodules, Dectron can rapidly respond to customer requests for make-up air treatment.

In addition Dectron has a Custom Division, staffed by a team of highly skilled engineering and manufacturing professionals who are dedicated to full custom design projects.

No matter what the requirements Dectron has the system solution . . . wherever humidity control is critical.

Contact your local Dectron representative for more information on DRY-O-TRON® DK Series.

Product description

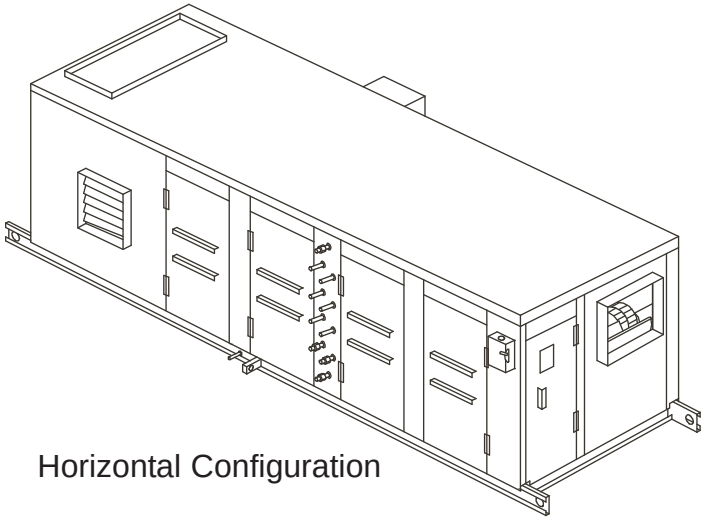
How the DRY-O-TRON® Works

In the DRY-O-TRON®, warm humid air passes through the dehumidifying coil and is cooled below its dew point, thereby condensing moisture. The heat captured by this process is combined with the heat generated from the compressor power consumption. This recovered heat is then available for recycling back to the supply airstream, contributing to space heating.

The DK unit is also capable of rejecting this heat to an air-cooled (optional) or water-cooled (optional) condenser, resulting in space cooling.

When properly installed according to Dectron's instructions, the DRY-O-TRON® will give years of trouble-free operation.

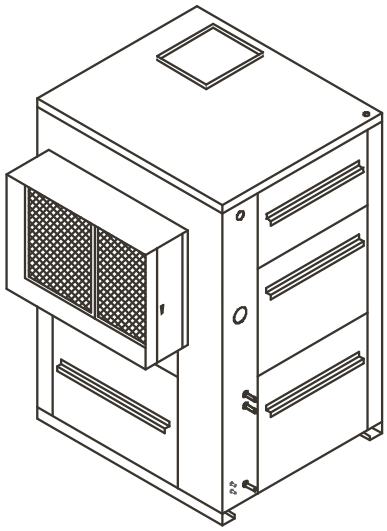
DRY-O-TRON® dehumidifiers feature standard microprocessor control. For the owner this means precise automatic control, high reliability, and ease-of-use. For the installer and service person this means simpler installation and startup and built-in diagnostics and troubleshooting in the unlikely event that service is required.



Horizontal Configuration

The DK/RK Series Features:

- Standard operator panel
- Energy efficiency
- Little maintenance required
- Simple operation
- Simple installation
- The basic Dectron DK/RK series DRY-O-TRON® units offer dehumidification of building air. The optional cooling mode offers space cooling.
- An optional hot-water heating system is available to make use of a building boiler system for heating. This factory modification must be ordered at time of purchase.
- DRY-O-TRON® DK/RK series units are supplied with heat exchangers, air filter(s), and all controls.
- An optional outdoor-air intake system includes an automatic damper to stop the outdoor-air flow during unoccupied periods.
- A microprocessor control system automatically determines the proper operating mode, based on conditions and occupation. A simple connection to building management systems is available.



Vertical Configuration

- Energy consumption

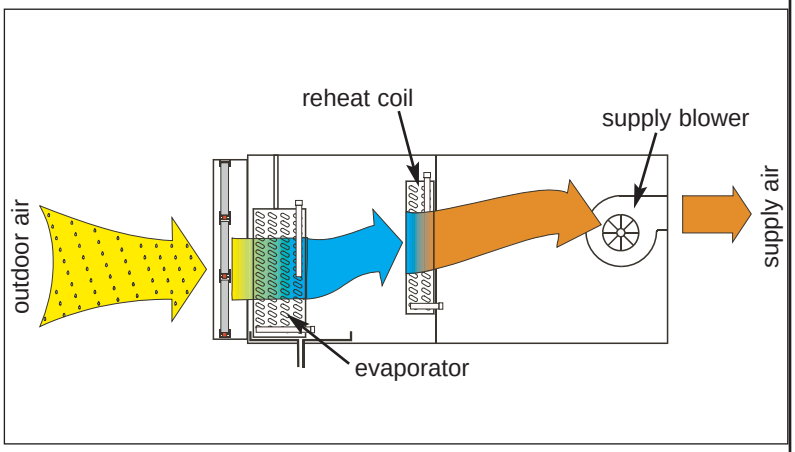
The DRY-O-TRON® DK/RK series offers a temperature and humidity monitoring system that insures the unit is working only as necessary.

Product Description Major Options

Basic DK/RK Series Unit

The basic DK/RK series unit controls the humidity of the outdoor air delivered to the space. When dehumidification is required, the evaporator chills the incoming air to remove moisture. Heat is returned to the air stream after the dehumidification.

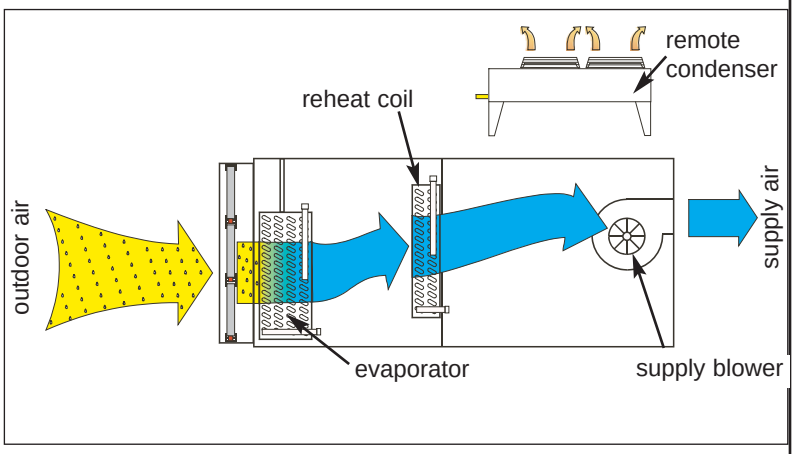
A built-in clock may control the intake of outdoor air to occupied periods only.



DK/RK Series Unit with Air-Cooled Cooling Option

With Air-Cooled Cooling Option, the DK/RK series unit is able to dehumidify and cool the delivered outdoor air.

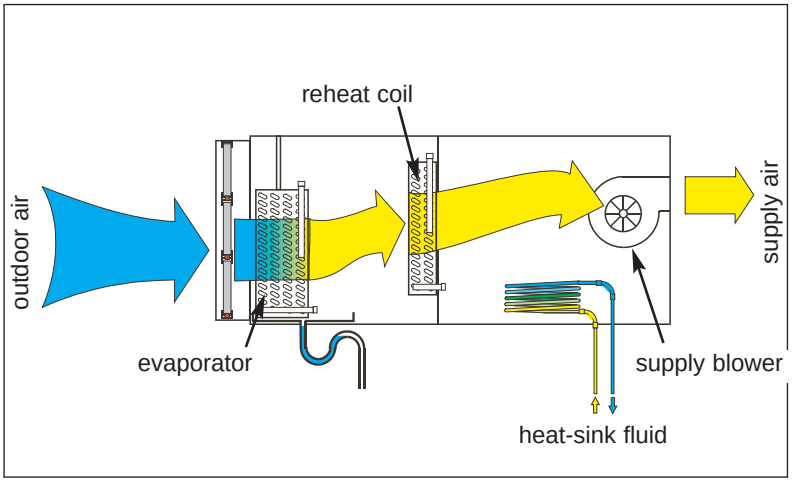
The heat removed can be put back into the airstream, as with a basic unit, or it can be delivered to a remote air-cooled heat exchanger.



DK/RK Series Unit with Fluid-Cooled Cooling Option

With Fluid-Cooled Cooling Option, the DK/RK series unit is able to dehumidify and cool the delivered outdoor air.

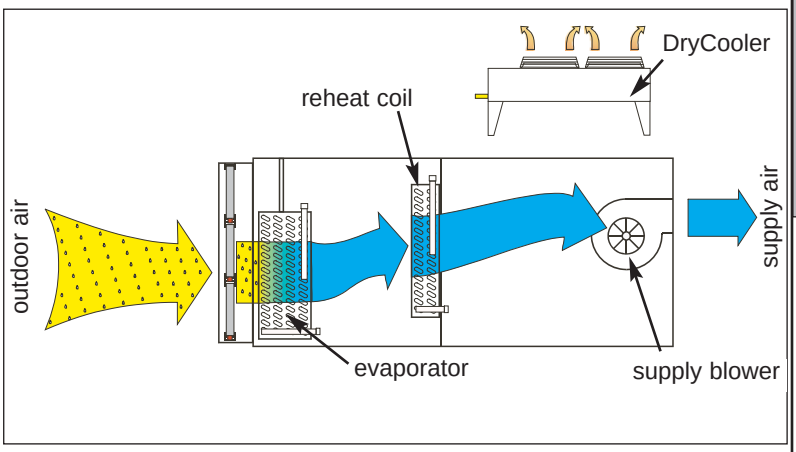
The heat removed can be put back into the airstream, as with a basic unit, or it can be delivered to an internal heat exchanger and thus to a flow of water or other fluid by others.



DK/RK Series Unit with DryCooler Cooling Option

With DryCooler Cooling Option, the DK/RK series unit is able to dehumidify and cool the delivered outdoor air.

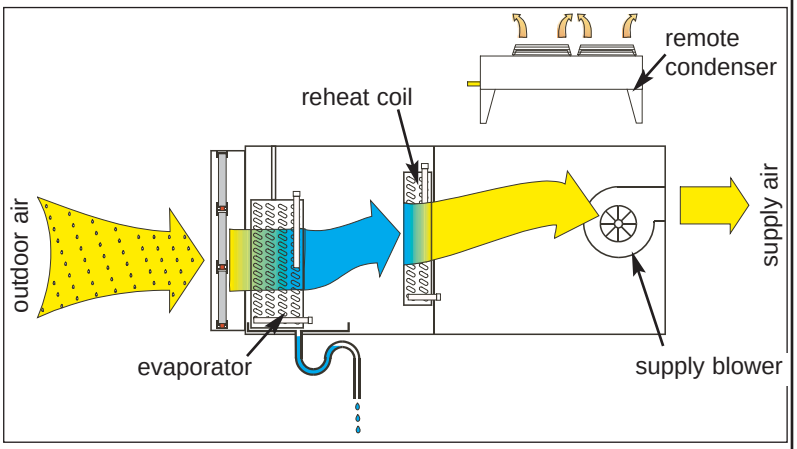
The heat removed can be put back into the airstream, as with a basic unit, or it can be delivered to a remote air-cooled heat exchanger via a flow of glycol solution.



DK/RK Series Unit with Variable-Reheat Option

Variable reheat is available as an adjunct to a cooling option.

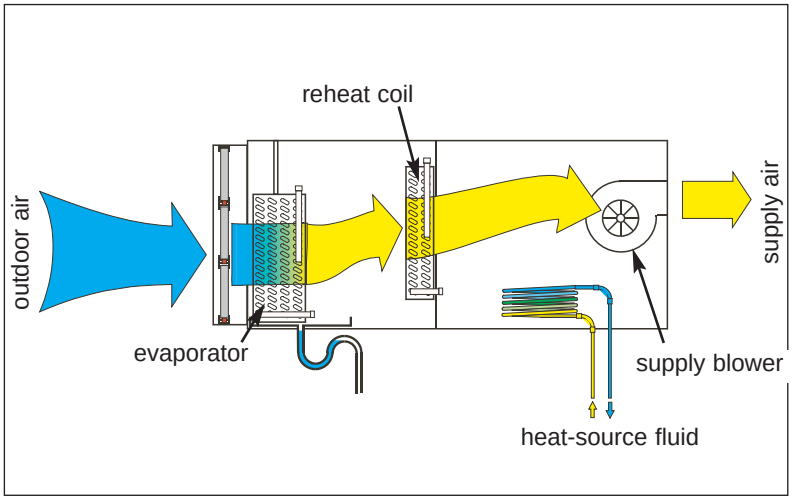
The heat removed can be put back into the airstream in variable amounts, with the remainder delivered to a cooling heat exchanger.



DK/RK Series Unit with Fluid-Cooled Cooling Option

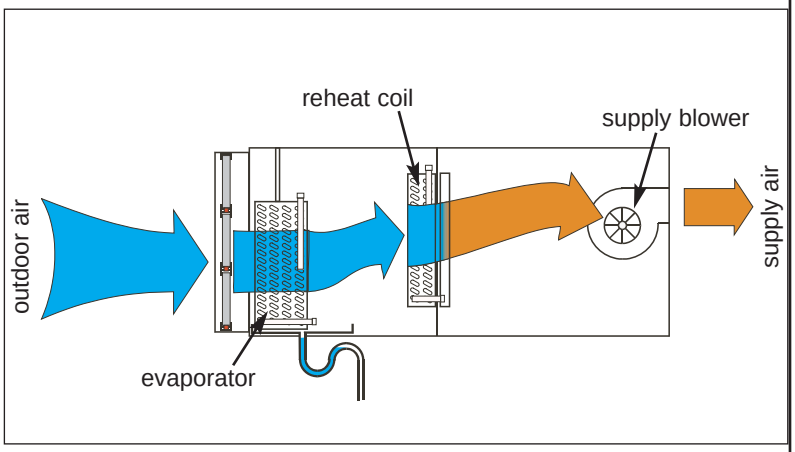
Variable reheat is available as an adjunct to the Fluid-Cooled Cooling Option.

The incoming outdoor air can be heated with heat removed from a flow of fluid by others.



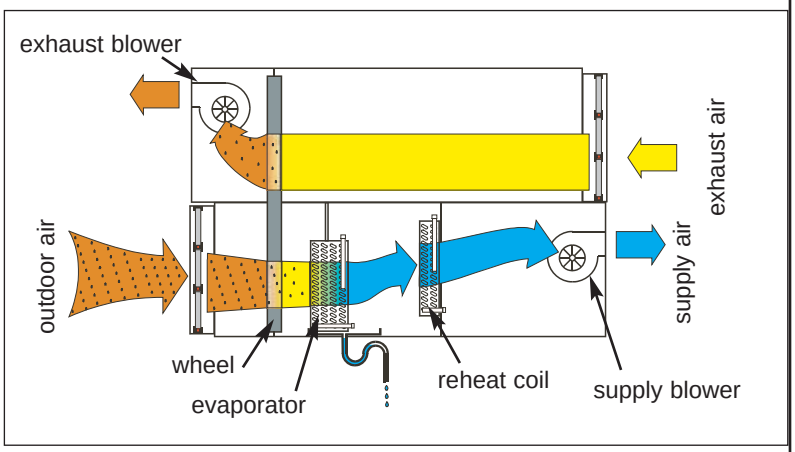
DK/RK Series Unit with Heating Option

With Heating Option, the DK/RK series unit is able to heat incoming outdoor air with electric heaters, with a hot-water (by others) heat exchanger, with a steam (by others) heat exchanger, with a gas boiler via a pumped-glycol solution, or with an indirect gas-fired furnace.



DK/RK Series Unit with Enthalpy-Wheel Option

With Enthalpy-Wheel Option, the DK/RK series unit is able to transfer heat and moisture between the incoming outdoor-air stream and the exhaust-air stream, thus saving energy.



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Product Description — Unit Nameplate

CSA and ETL Label

Model Nomenclature:

iXXX-SSS-V

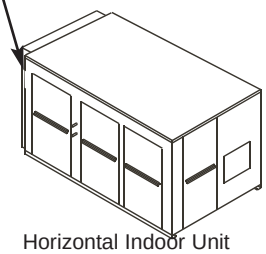
D = indoor cabinet
R = outdoor cabinet

Configuration
BH = natatorium dehumidifier, economizer, horizontal
SA = natatorium dehumidifier, skid only, no blower
SB = natatorium dehumidifier, skid only, with blower
SF = natatorium dehumidifier, field-assembled
SH = natatorium dehumidifier, horizontal
SPA = natatorium dehumidifier, field-assembled, no blower
SPB = natatorium dehumidifier, field-assembled, with blower
SV = natatorium dehumidifier, vertical

nominal moisture removal capacity in lbs./hr.

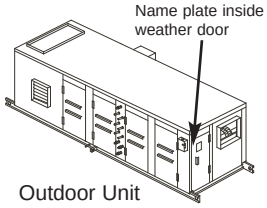
nominal voltage
2 = 208V, 1Φ, 60 Hz
3 = 230V, 1Φ, 60 Hz
4 = 208-230V, 1Φ, 60 Hz
5 = 208-230V, 3Φ, 60 Hz
6 = 230V, 3Φ, 60 Hz
7 = 460V, 3Φ, 60 Hz
8 = 575V, 3Φ, 60 Hz
9 = 208V, 3Φ, 60 Hz

Name plate on corner



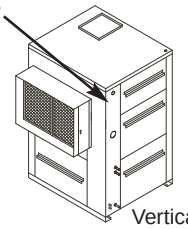
Horizontal Indoor Unit

Name plate inside weather door

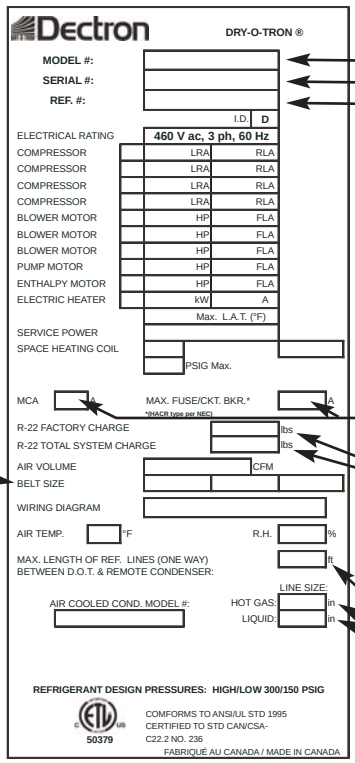


Outdoor Unit

Name plate on corner



Vertical Indoor Unit



If assistance is needed, have Model, Serial number, and Ref. number before calling.

Component specifications.

Important branch circuit information

As necessary, replace belt(s) with same type and size.

For units with air-cooled air conditioning, subtract the amount given by "R-22 Factory Charge" from the amount given by "R-22 Total System Charge". The difference must be added to the DRY-O-TRON® at installation. See **Installation - Piping - Refrigerant.**
This amount of refrigerant is supplied by others.

For units with air-cooled air-conditioning, the tubes connecting the DRY-O-TRON® to the remote condenser must be exactly as shown here. Consult Dectron before exceeding the maximum length of tube or changing the tube diameters.

Nameplate specifications supersede any other specifications or statements found in this manual.

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Installation

Unpacking and Locating

Important!

Inspect your unit immediately for shipping damage. Claims for shipping damage must be made with the shipping company. Dectron is not responsible for shipping damage.

Your unit has been factory tested for proper operation. Inspect the unit carefully upon arrival.

Notify the carrier immediately if shipping damage is suspected. If internal damage is suspected, indicate "contingent on internal inspection" when signing for the shipment. Keep copies of all documents, including photographs of any damage.

Δ Storage

It is best not to store your DRY-O-TRON® for long periods. If it must be stored, both indoor and outdoor units should be stored indoors in a space that is safe from accidental damage or vandalism. Where several DRY-O-TRON® units are stored together, maintain proper inventory identification since each DRY-O-TRON® is designed to a particular job specification.

Δ Unpacking

On a level surface, remove external crating materials. Remove any fasteners securing the unit to the freight skid.

Important!

Locate your unit where it will be protected from damage. Allow adequate space for service. (See below.)

Care must be taken to separate any fresh air intake from sources of contamination, such as drain vents and burner flues.

Δ **Select a suitable location** for the unit, where the unit will not be subject to damage.

Allow working clearances as shown below. Spacing requirements are also subject to applicable electrical codes. For units with hooded air intakes allow at least 3 feet (1 meter) of clear space around the hood for smooth intake air flow.

Intake air hoods should be suitably separated from such sources of contamination as drain vents and burner flues. See appropriate codes and standards.

See **Installation - Isolators and Drain** before proceeding.

Δ Lifting

Lift using only the integral lifting lugs. Where lifting lugs are not supplied, lift with forklift at the indicated points only.

Refer to the corner weights provided by Dectron. Do not use clamps or slings. Use spreaders to prevent squeezing the cabinet.

Δ Mechanical Room

Adequate space MUST be planned in advance for the mechanical room and duct work. If inadequate space is provided, then ductwork cannot be properly installed and the system will not function satisfactorily. Service access to the equipment is also very important for everything from air-filter replacement to maintenance and service checks.

Δ Completing

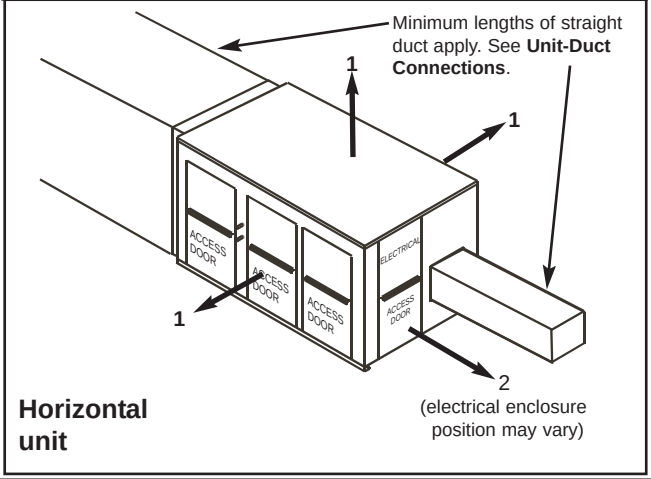
After the unit is positioned remove any internal shipping braces or pads. Release or remove any blower restraints. Confirm blower belt tension. Release or remove any compressor locks or restraints.

INSTALLATION

Minimum Service Access[a] ft (m)

	1	2
DK-010 through DK-060	3 (1)	3[b] (1)
DK-080 through DK-200	4 (1.2)	3[b] (1)
DK-240 through DK-480	5 (1.5)	3[b] (1)

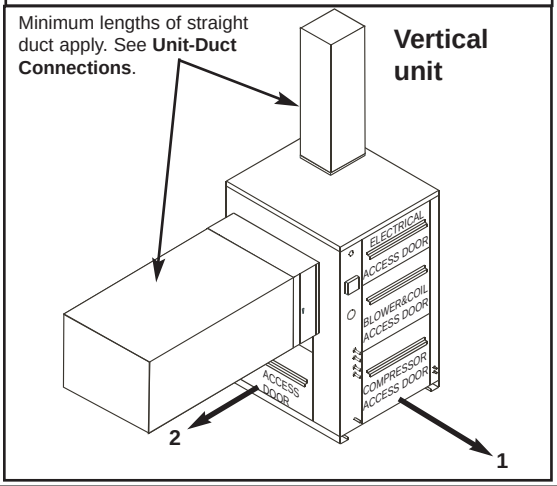
a - Access doors must be able to open to at least 90°.
b - (Canada) 1 meter
(USA) 3 ft for 230V, 3.5 ft for 460V units or per NEC exhibit 110-7, whichever is greater.



Minimum Service Access[a] ft (m)

	1	2
DKV-010 - DKV-060	3[b] (1)	2 (.6)
DKV-080 through DKV100	4 (1.2)	3 (1)

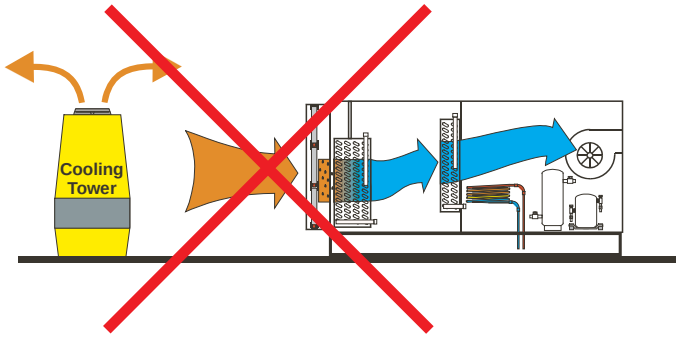
a - Access doors must be able to open to at least 90°.
b - (Canada) 1 meter
(USA) 3 ft for 230V, 3.5 ft for 460V units or per NEC exhibit 110-7, whichever is greater.



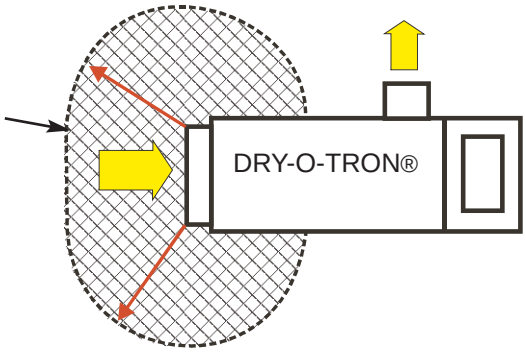
Data subject to change without notice.

Unpacking and Locating Installation

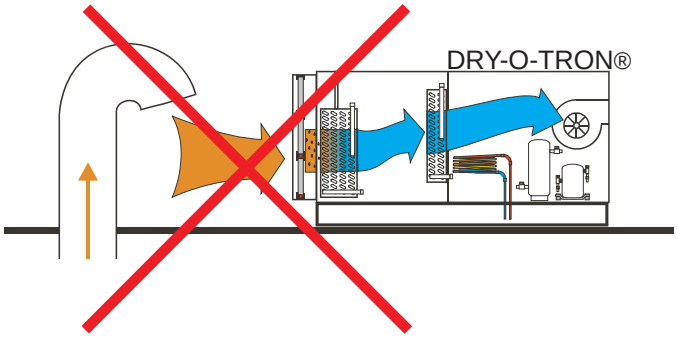
Do not locate the DK unit in such a way that the exhaust from a cooling tower or other machinery will be drawn into its intake.



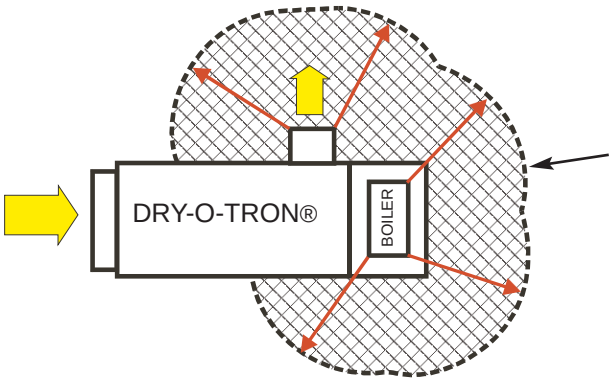
exclusion zone for exhausts of other equipment



Do not locate the DK unit in such a way that the exhaust from a building will be drawn into its intake.



For DK units equipped with gas boilers or gas furnaces, do not locate other machinery in such a way that combustion products will be drawn into them.



exclusion zone for intakes of other equipment, where the DRY-O-TRON® is equipped with a combustion device

INSTALLATION

Installation

Isolators and Drain

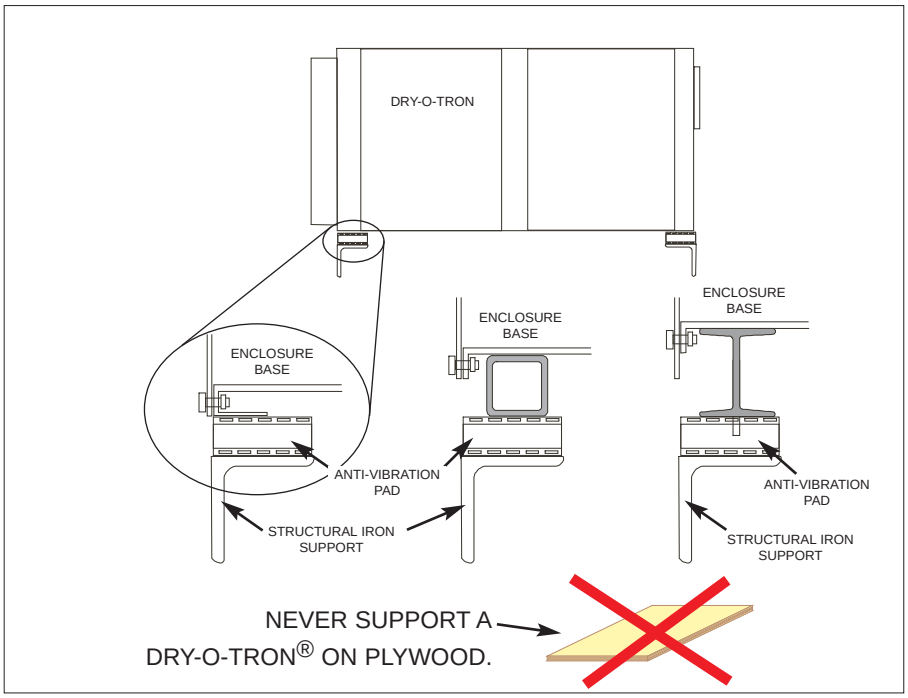
Sound and Vibration Elimination

Install anti-vibration springs or pads such as machinery cork, rubber pads or other approved isolation materials to isolate the DRY-O-TRON® from the supporting structure (see drawing at right).

IMPORTANT!

Do not mount the unit on a plywood sheet or any other material that will resonate.

Install flexible duct to all duct connections of the DRY-O-TRON® to prevent sound and vibration transmission. Use aerofoil-type turning vanes on all elbows. Elbows and acoustic insulation can be used to further reduce noise where necessary. See **Installation - Unit-Duct Connections**.

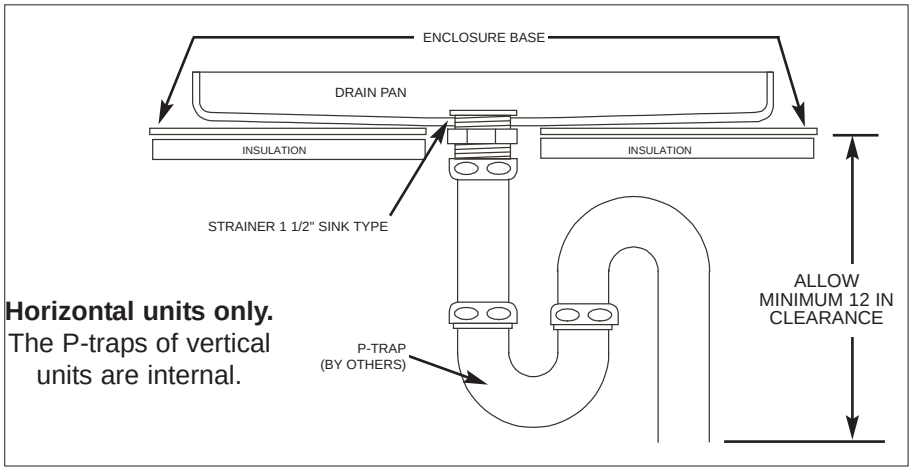


Condensate Drain Connection

Allow a minimum 12-inch clearance for the bottom drain connection. On horizontal units, a P-trap must be installed and filled with water to prevent air from entering the DRY-O-TRON® (which is under negative pressure) and to assure proper drainage of the condensate. Failure to do so will cause the drain pan to overflow. On vertical units, the internal P-trap is factory-installed.

Pour at least one gallon of clean water into the evaporator drain pan to fill the P-trap and to test the drain for leaks. If no leaks are found, initial the check list in **Start-up - Pre-startup Checklist**.

Use schedule 40 PVC or standard ABS plastic drainage pipe and slope the condensate drain line at least 1/4 inch per foot. The drain line must discharge through an air gap to a vented open pipe.

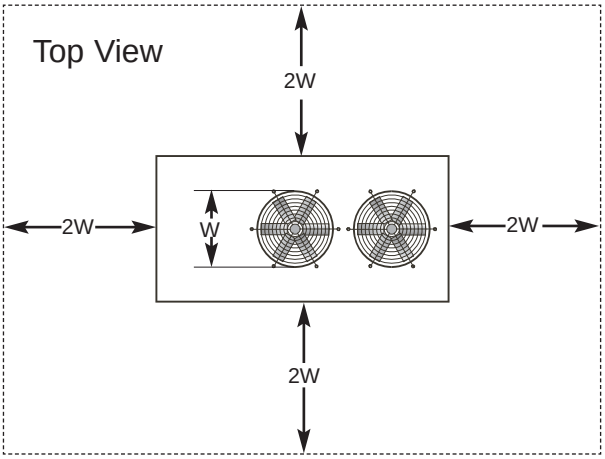


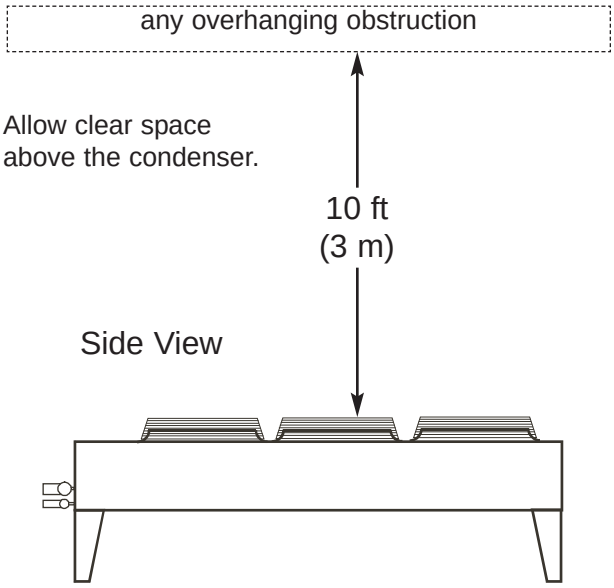
Horizontal units only. The P-traps of vertical units are internal.

Locate Remote Condenser

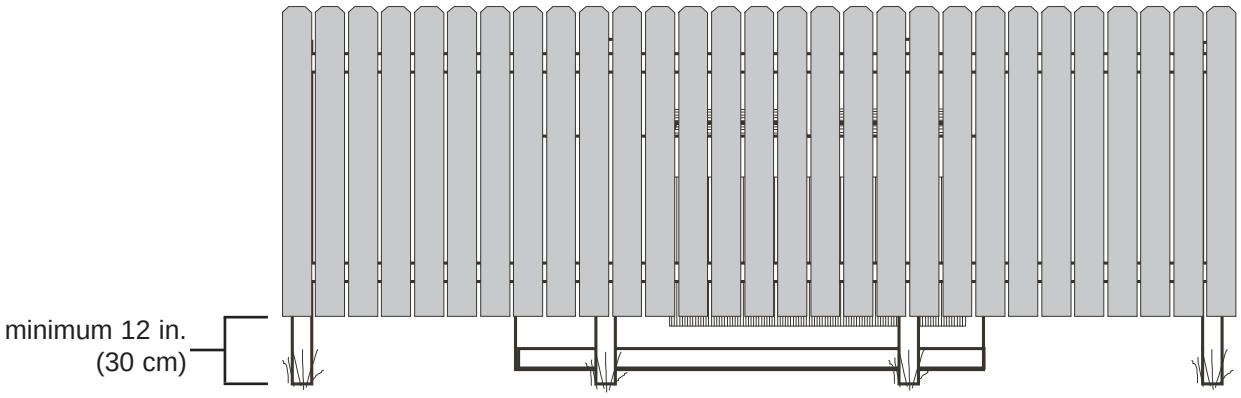
For units with air-cooled air conditioning, select a suitable location for the remote condenser, where it will not be subject to damage. Allow at least twice the width of the condenser fan of clear space around the condenser for smooth intake air flow and service accessibility. Spacing requirements are also subject to applicable electrical codes. Allow at least 10 feet (3 meters) of open space above the unit for exhaust air flow.

Allow clear space around the condenser equal to at least at least twice the width of the condenser fan.





The condenser should **not** be enclosed within a solid fence or wall, since such structures promote recirculation of air. If a fence or wall must be installed, it must be no closer to the condenser than "2W" (twice the width of the condenser fan) shown above, and must not extend lower than 12 inches (30 cm) above grade. Fences lower than 12 inches above grade may cause recirculation of heated air and a corresponding reduction in performance.



INSTALLATION

Installation Wiring Power

INSTALLATION

No field wiring of DRY-O-TRON® internal circuits is necessary. Only power and remote-control circuits are completed in the field.

Important!

Use only copper wire to connect the unit. The power input lugs are not sized for use with other wire. For units with factory supplied disconnects, follow instructions inside the disconnect.

Important!

Ground the unit using the grounding lug provided.

Important!

Always cover the electrical components with plastic before drilling or sawing the electrical enclosure. Do not allow metal chips to fall into the enclosure.

Important!

For units with air-cooled air conditioning, refer to the remote condenser manual.

Important!

For units with air-cooled air conditioning, wire the remote condenser according to the wiring diagram provided with it. Insure that the fan motors turn in the correct direction.

Δ Use properly sized wire

Refer to the unit nameplate for electrical ratings. Size wire according to applicable codes, with allowance for voltage drops. Unit terminal voltage should be nominal ±10% under all conditions, including compressor starting.

Δ Insure phase sequence

All the motors in the unit are connected for the same phase sequence. Be sure the phase sequence is correct before completing the installation.
NOTE: The blower running direction can be used to test phase sequence.

Δ Insure phase voltage

The DRY-O-TRON® complies with NEMA MG-1 and other standards for applied voltage. The applied voltage should be within ±10% of the nominal voltage shown on the nameplate. See ANSI C84.1. Phase voltages must be balanced within 2%.

Δ 208V units

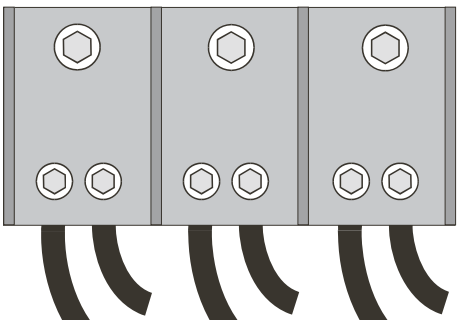
A 230V DRY-O-TRON® is designed to run on 208V also. In this case it is necessary to select the 208V primary tap on the control transformers. See the wiring diagram for the unit.

A minimum of 187V is required for compressor starting (see NEMA MG-1).

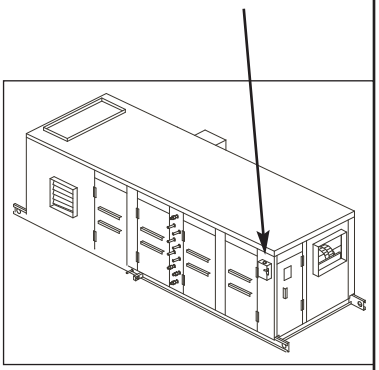
Δ Service power

The DRY-O-TRON® may be provided with service lights which require a separate 115VAC 15A 60Hz branch circuit. Wire this branch circuit to the service branch circuit input lugs. Use only copper wire.

Connect input power here.
Use copper wire only. Torque all connectors per NEC 110-14 or relevant code.



For units with factory-installed disconnects, connect power to the disconnect switch using the instructions in the switch.

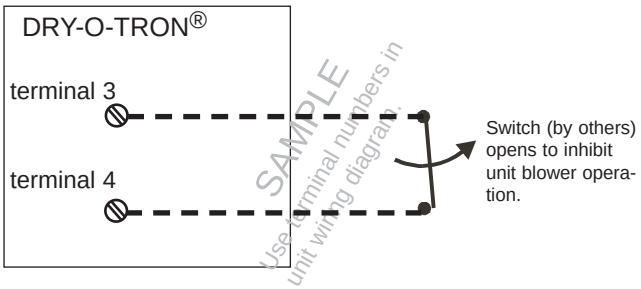


Turn on the branch-circuit disconnect switch. In some cases the blower may start. Some DRY-O-TRON® units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase sequence. If the green LED is not lit, confirm that the applied voltage is within ±10% of the nameplate voltage (NEMA MG-1), that all three phases are present, and that the phase sequence is correct.

REMOTE BLOWER ON-OFF SWITCH

Some installations may require remote ON-OFF control of the unit blower. Where this is the case, remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with an isolated switch (by others).

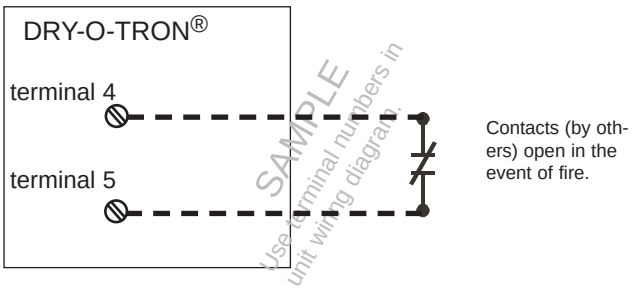
Open the switch to inhibit unit blower operation.



FIRE / SMOKE ALARM

Some installations may require the unit to stop in the event of a fire or smoke alarm condition. Where this is the case, remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with a set of isolated normally-closed alarm contacts (by others).

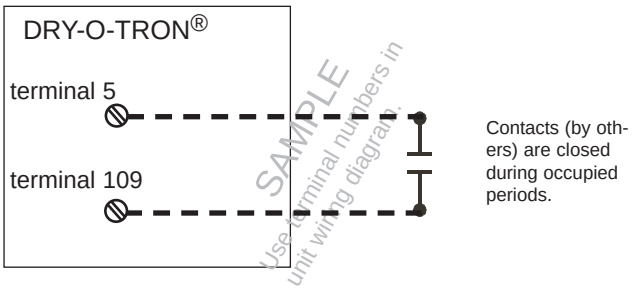
The contacts (by others) should open to indicate an alarm condition.



OCCUPATION SIGNAL

Some installations may require the unit to operate only when the building is occupied. Where this is the case, remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with a set of isolated contacts (by others).

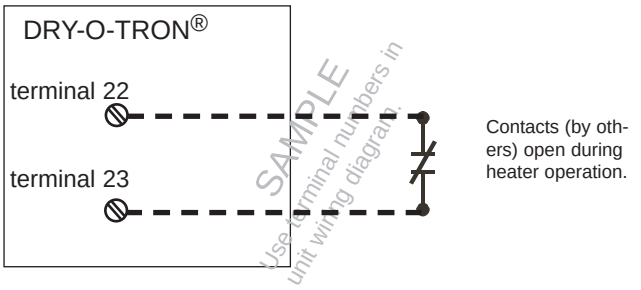
The contacts (by others) should be closed during periods of occupation.



AUXILIARY HEATER INTERLOCK SIGNAL

Some installations may have external space heaters (by others). Where this is the case, and if heating should have priority (compressor lockout, cooling and dehumidification inhibited during heating) then remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with a set of isolated contacts (by others).

The contacts (by others) should be open when the heater is ON.

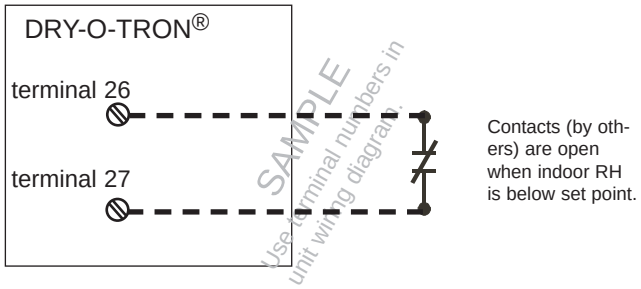


INSTALLATION

HUMIDISTAT SIGNAL

Some installations may require dehumidification of incoming air to cease when the indoor relative humidity is below a set point. Where this is the case, remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with the isolated contacts of a humidistat (by others).

The contacts (by others) should be open when the indoor relative humidity is below set point.

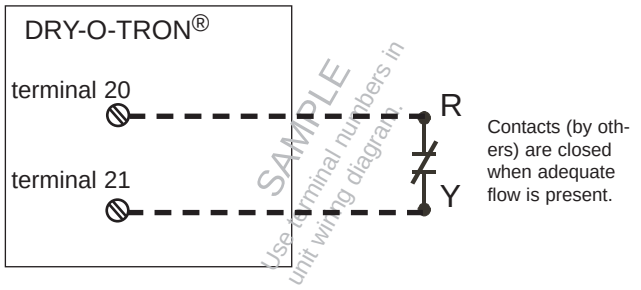


WATER FLOW SIGNAL

(units with water-cooled air conditioning only)

Some units may have water-cooled air conditioning. Of these, some units have built-in flow sensors and others may require field-installation of flow sensors. Where field installtion is required, remove the jumper from the terminals indicated in the unit wiring diagram, and replace it with the isolated contacts of the flow (pressure) switch provided.

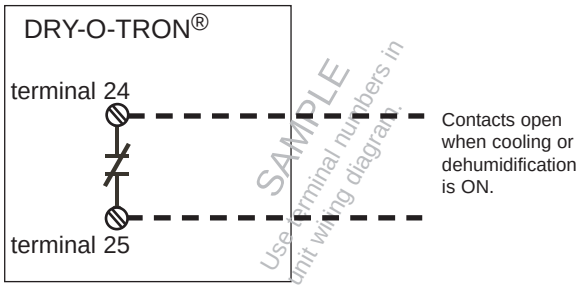
The contacts (by others) should be closed when the water flow is correct.



COOLING PRIORITY SIGNAL

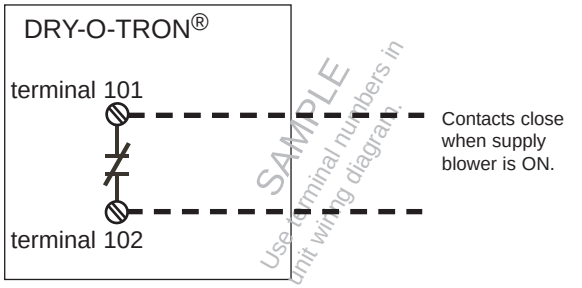
Some installations may have external space heaters (by others). Where this is the case, and if cooling should have priority (auxiliary heater lockout, heating inhibited during cooling) then connect the Remote Heater Lockout signal to the terminals indicated in the unit wiring diagram.

The contacts open when cooling or dehumidification is ON.



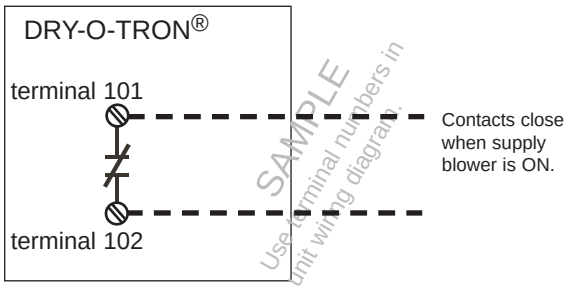
SUPPLY FAN INTERLOCK SIGNAL

An isolated contact rated 24VAC 8A closes when the supply blower is ON.



EXHAUST FAN INTERLOCK SIGNAL

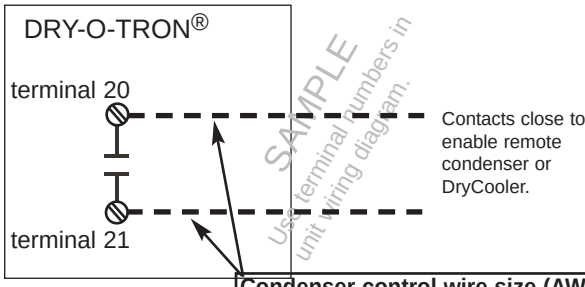
An isolated contact rated 24VAC 8A closes when the exhaust blower is ON.



REMOTE CONDENSER ENABLE SIGNAL

Some units, e.g. indoor, may have remote air-cooled condensers or remote DryCoolers. Where this is the case, connect the condenser enable signal to the terminals indicated in the unit wiring diagram.

The contacts close to enable the remote condenser or DryCooler.



Condenser control wire size (AWG)

wire length (ft)	Number of fan contactors 1	2	3	4	5	6
10	20	20	20	20	20	18
20	20	20	20	20	18	14
30	20	20	20	20	18	14
40	20	20	20	18	16	12
50	20	20	20	18	14	10
60	20	20	20	16	14	10
70	20	20	18	16	14	10
80	20	20	18	16	12	10
90	20	20	18	16	12	10
100	20	20	18	14	12	10
110	20	20	16	14	12	10

INSTALLATION

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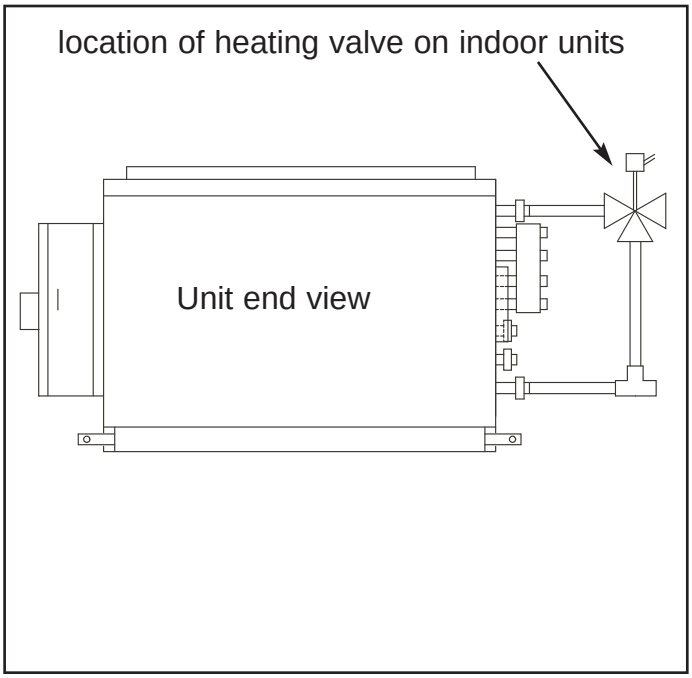
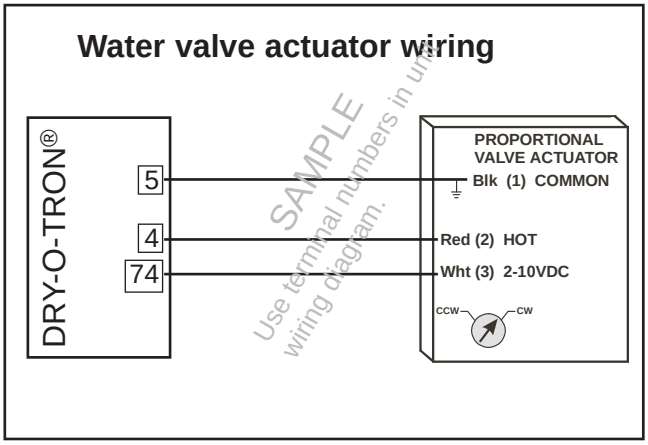
HOT WATER OR STEAM HEAT UNITS ONLY

Some installations may have hot water or steam heating systems. In these cases there may be an electrically actuated valve to control the flow of the hot fluid. On indoor units this valve is located outside the unit cabinet.



In this case the valve is installed in the field. The actuator must be wired exactly as shown. **Failure to follow these instructions exactly may cause permanent damage.**

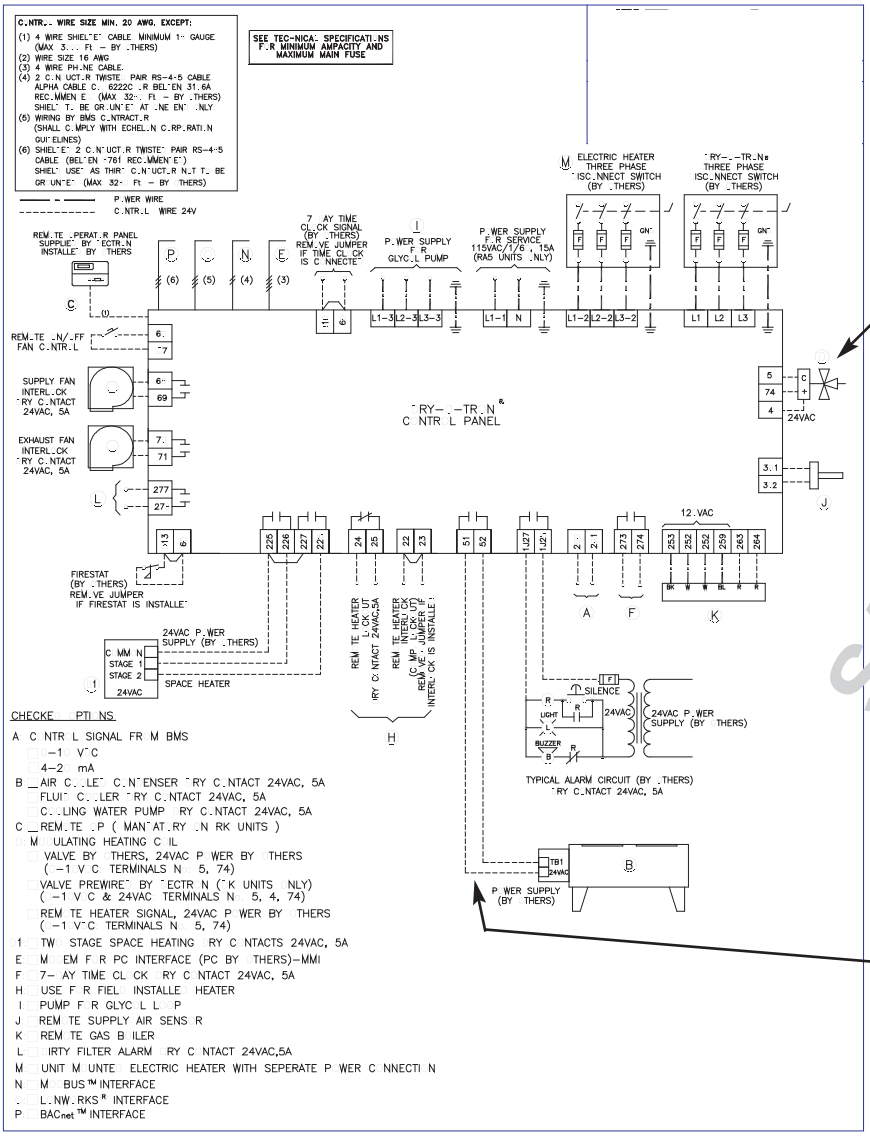
Actuator wiring must follow the wiring diagram for your unit. Take care to prevent the application of other voltages to these wires.



INSTALLATION

INSTALLATION

Each DRY-O-TRON® has an associated field wiring diagram.



Heating valve
Use care in wiring a heating valve. See **Installation - Wiring - Control Signals**.

Condenser control wire size (AWG)

length (ft)	Number of condenser fans 1	2	3	4	5	6
10	20	20	20	20	20	18
20	20	20	20	20	18	14
30	20	20	20	20	18	14
40	20	20	20	18	16	12
50	20	20	20	18	14	10
60	20	20	20	16	14	10
70	20	20	18	16	14	10
80	20	20	18	16	12	10
90	20	20	18	16	12	10
100	20	20	18	14	12	10
110	20	20	16	14	12	10

Data subject to change without notice.

Unit - Duct Connections Installation

Important!

Poor duct design can reduce the amount of air delivered.

IMPORTANT!
Poor duct design resulting in uneven air distribution at a dehumidifier air inlet will reduce the moisture removal capacity and increase compressor running time and power consumption. In addition compressor life expectancy is reduced and ice build-up may occur on the dehumidifier coil. The following duct design guidelines must be followed for your system to function correctly.

Duct design must conform to the ASHRAE low-pressure, low-velocity duct standards. If there is a question concerning duct design, sizing, choice of materials, air velocities, or static pressures contact Dectron for assistance.

Air velocities should be kept low to allow good air movement and low noise. Higher static pressures result in higher power requirements and increased noise. The maximum external static pressure is specified for each unit. Static pressures higher than specified may reduce air flow below the minimum acceptable value.

Select grilles, registers, and diffusers for low static pressure loss, required throw, and specified air flow.

Δ Duct material

The DRY-O-TRON® is suitable for use with any duct material, subject to the requirements of this section and standard practice. Standard galvanized steel duct is recommended.

All elbows near the unit must be equipped with aerofoil turning vanes and acoustic insulation.

Where located in areas below room temperature, ductwork must be insulated on the outside with 2- inch fiberglass wrap with FSK facing. All ducts must be designed to be dry. All seams must be sealed. If a below-grade duct system is used, transite or PVC-coated, round metal ductwork should be used.

Δ Flexible duct connectors

Use flexible duct connectors to attach the ducts to the DRY-O-TRON®. Install the flexible duct in such a way as to prevent mechanical loads from being applied to the unit, and to prevent unit vibration from being transmitted to the ductwork.

INSTALLATION

Intake Duct

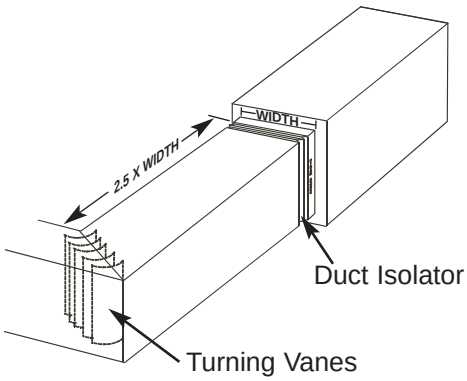
Note: Outdoor units may have direct intake hoods rather than intake ducts. This section applies only to units with intake ducts.

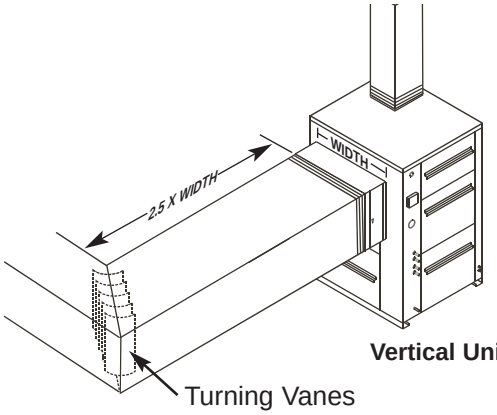
Poor intake-duct design can prevent proper dehumidification by causing uneven air distribution over the evaporator. Reduced capacity and/or equipment damage may result.

It is very important to allow straight length in the intake duct as shown. There should be no elbows, transitions, offsets, or other flow interruptions closer than 2.5 X WIDTH of the return duct opening.

If turning vanes are not used in elbows, allow a length of straight duct equal to at least 5 X WIDTH.

Horizontal Unit





Vertical Unit

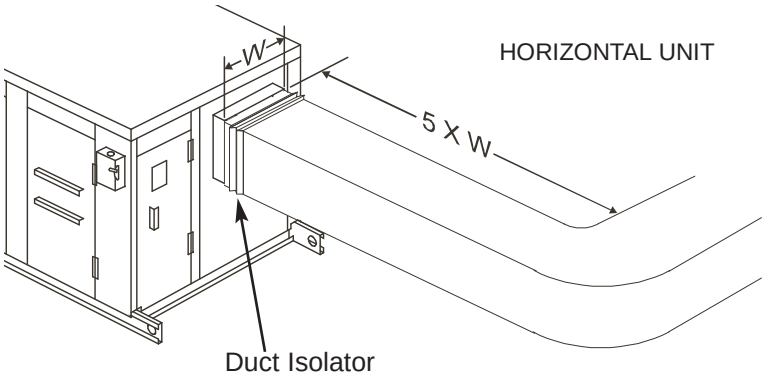
INSTALLATION

Supply Duct

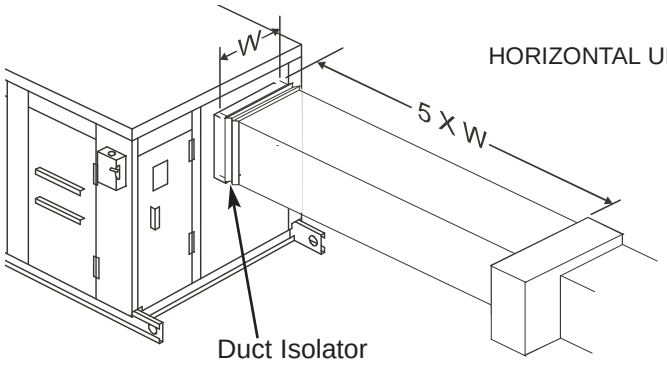
Refer to AMCA[1] guidelines for system effect considerations.

To prevent unexpected external energy loss, allow a section of straight duct with a length five times the blower width leaving the DRY-O-TRON®. There should be no elbows, transitions, offsets, duct heaters, or other flow interruptions closer that 5 X the width of the blower.

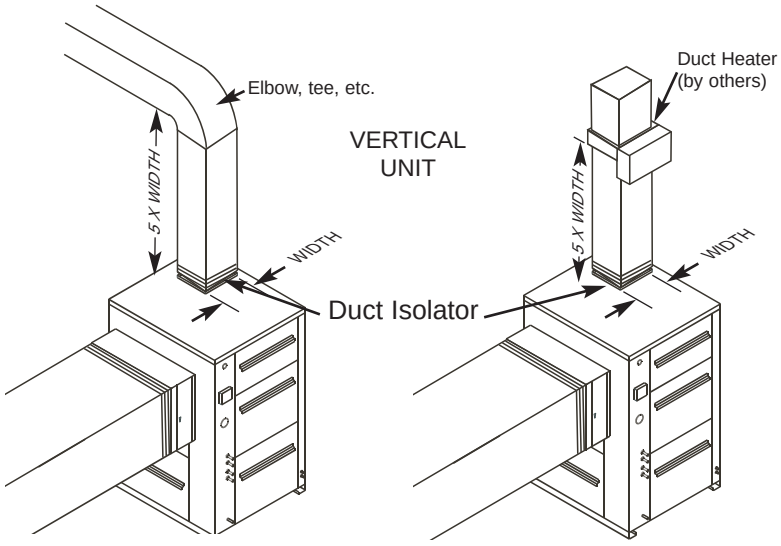
On special order, Dectron may be able to provide bottom, top, or side discharge blowers. On special order, Dectron may be able to offer reversed blower rotation.



Some units may have external duct heaters (by others). To prevent heater failures and hot spots, locate the heater at least 5 X the duct width away from the blower, or any air flow interruptions such as elbows and transitions.

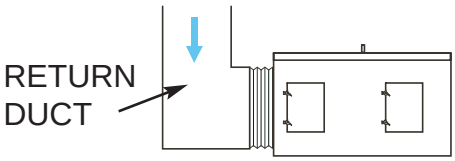


Some units may have dampers to close off one or more ducts. Use care in assembling ducts so that these dampers will not be obstructed.



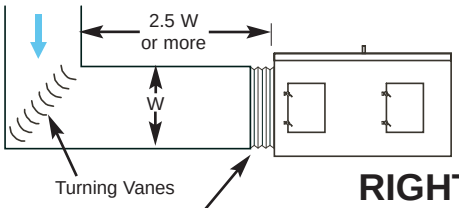
1. Air Movement and Control Association International, Inc.
   30 West University Drive
   Arlington Heights, Illinois 60004-1893

Standard Practice for Ducts



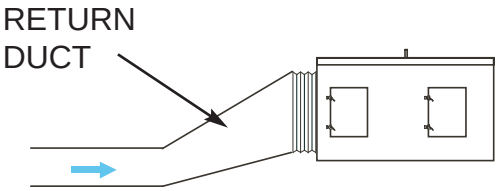
WRONG

The air will not be evenly distributed over the evaporator.



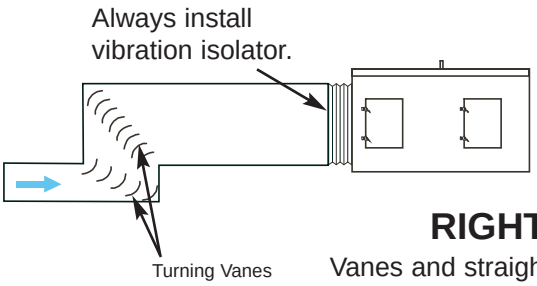
RIGHT

Vanes and straight length allow air to flow evenly.



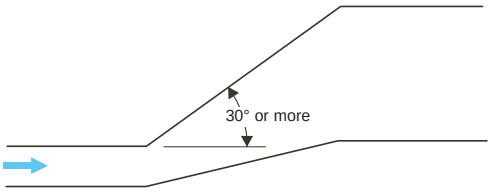
WRONG

The air will not be evenly distributed over the evaporator.



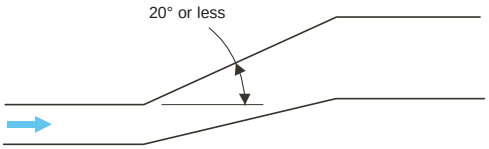
RIGHT

Vanes and straight length allow air to flow evenly.



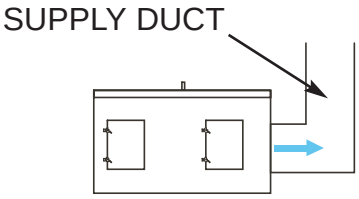
WRONG

Air cannot follow this steep angle.



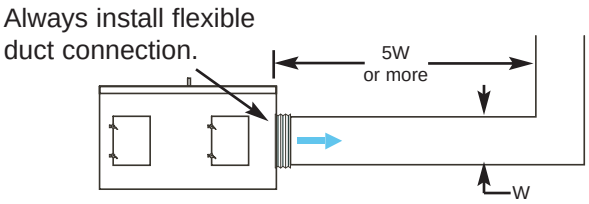
RIGHT

Air can follow this transition.



WRONG

Reduction of airflow will result from the elbow being too close.



RIGHT

Sufficient straight length allows proper air flow. Flexible duct connection absorbs vibration.

Interior Surface Temperatures to Prevent Condensation

Operating Condition	Minimum Surface Temperature °F (Room Dew Point °F)				
Relative Humidity %	**Room Dry Bulb Temperature °F**				
	72	**76**	**80**	**84**	**88**
40	51 (46)	55 (50)	59 (54)	62 (57)	65 (60)
50	57 (52)	61 (56)	65 (60)	68 (63)	72 (67)
60	62 (57)	66 (61)	70 (65)	73 (68)	77 (72)

INSTALLATION

Important! - Do NOT turn on the electric power unless the power supply voltage matches that specified on the unit nameplate.

Important! - Never run the blower without the filters in place. Regardless of filters, never run the blower when construction dust is present. The resulting heat exchanger damage is not covered by the Dectron warranty.

Important! - Airflow must be set and confirmed before the refrigeration system is adjusted.

Important! - Airflow must be set with the air-side doors or access panels closed.

Adjust airflow

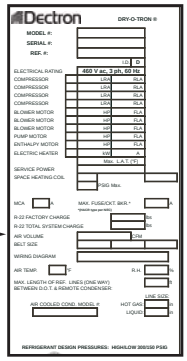
Before the DRY-O-TRON® is operated, the air flows in the supply duct and exhaust duct (if connected to the DRY-O-TRON®) must be measured and set by a qualified air-balance technician. Air flow must be measured with all air-side access doors closed. If the unit is equipped with a variable-speed drive on the supply blower, be sure the motor is running at full speed.

The air flow of units without variable-speed motor drives is adjusted by changing the variable sheave on the blower motor shaft. Do not use other sheaves or change the airflow outside the range given on the unit nameplate, without the express approval of Dectron. Always follow appropriate lock-out/tag-out procedures.

To run the blower(s) only:

1. Some DRY-O-TRON® units may have compressor overload devices located in the unit control box. In this case, move the overload control to OFF or STOP.
   For units without compressor overloads, temporarily disconnect the Auxiliary Heater Interlock. (See **Installation - Wiring - Input Signals**.)
2. Turn on the branch-circuit disconnect switch. Some DRY-O-TRON® units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase rotation. If the green LED is not lit, a qualified person should confirm that the applied voltage is within ±10% of the nameplate voltage (NEMA MG-1), that all three phases are present, and that the phase rotation is correct. Move only branch-circuit wires to correct phase rotation - never move factory-installed wires without first contacting Dectron.
   See below for units without voltage monitors.

3. In the DRY-O-TRON® electrical enclosure, press START on the blower motor overload(s) (if any). Leave the compressor overload(s) (if any) in the STOP position.
4. Adjust the occupation signal to OCCUPIED (see **Installation - Wiring - Input Signals**).
5. Turn ON the unit ON/OFF switch located near the electrical control enclosure. The blower(s) will start as soon as the isolation damper(s) (if any) has opened.
   For units without voltage monitors (above) - if the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the DRY-O-TRON® input lugs. Torque the connectors as discussed earlier. Move only branch-circuit wires to correct phase rotation - never move factory-installed wires without first contacting Dectron.
6. Adjust the air flow to ±10% of the nameplate value. For units with remotely-controlled variable-speed blowers adjust the air flow to ±10% of the nameplate value at full speed. Adjust the minimum speed so that the minimum air flow is not less than 75% of the nameplate value.
7. Stop the blower by turning OFF the unit ON/OFF switch located near the electrical control enclosure.
8. If the Auxiliary Heater Interlock was disconnected in step 1, reconnect it now. (See **Installation - Wiring - Input Signals**.)



If possible and safe, leave the electrical power connected to the DRY-O-TRON®. This will allow the compressor crankcase heater(s) to function. The crankcase heaters must be on continuously for at least 10 hours before the compressors are started.

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY

ASSEMBLING AND BRAZING CONDENSER TUBES

IMPORTANT:

Contact Dectron before exceeding the maximum tube length specified on the unit nameplate. Contact Dectron before changing the tube size specified on the unit nameplate. (See Product Description - Unit Nameplate.)

IMPORTANT:

Never allow dirt or other foreign materials to enter the remote condenser or the tubes connecting it to the DRY-O-TRON®. Foreign material may damage valves and other components.

If the insides of the tubes are contaminated with dirt, oil, sludge, rust, or other materials, then they must be thoroughly cleaned.

IMPORTANT:

Never allow liquid water to enter the remote condenser or the tubes connecting it.

Water must be removed from the remote condenser and the tubes that connect it to the DRY-O-TRON®. Evacuation will take much longer if liquid water is present.

Note: Some DRY-O-TRON® units may have two pairs of tubes to the remote condenser.

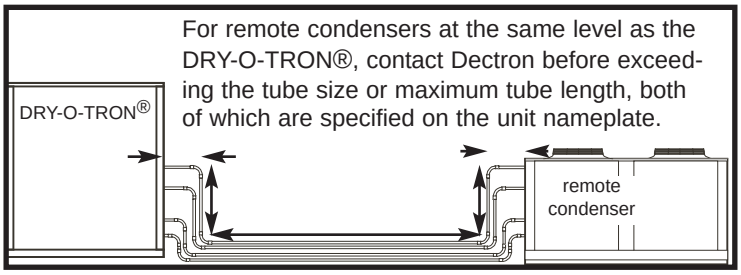
Connect the refrigerant tubes between the DRY-O-TRON® and the remote chiller. Use only clean Type ACR copper tube. Silver braze the copper tube joints using BCuP filler. Soft solder is subject to long-term failure. If flux must be used, use only enough flux to solder. Excess flux can contaminate the refrigeration system and damage components

During silver brazing the inside of the tube must be protected from oxidation by flooding the tube with an inert gas such as nitrogen, argon, or carbon dioxide. Silver brazing copper tubes with air inside will produce a flaky copper oxide scale that can contaminate the refrigeration system and damage components.

IMPORTANT:

Check carefully for leaks.

INSTALLATION

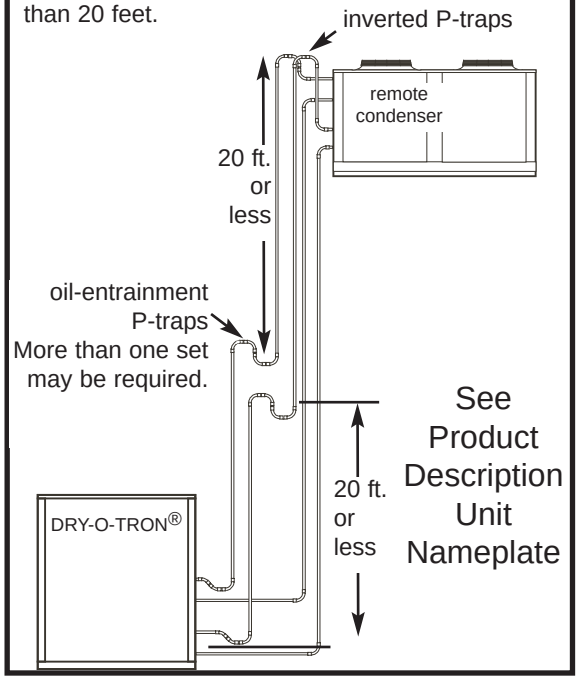


For remote condensers at the same level as the DRY-O-TRON®, contact Dectron before exceeding the tube size or maximum tube length, both of which are specified on the unit nameplate.

Contact Dectron for remote condensers located below the DRY-O-TRON®.

For remote condensers located above the DRY-O-TRON®, contact Dectron before exceeding the tube size or maximum tube length, both of which are specified on the unit nameplate.

P-traps must be installed in the hot-gas riser tubes to break up the lift into segments of less than 20 feet.



See Product Description Unit Nameplate

INSTALLATION

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY
EVACUATION, REFRIGERANT AND OIL CHARGING

IMPORTANT:
Check for leaks before attempting to evacuate the condenser and tubes.

IMPORTANT:
Some DRY-O-TRON® units may have two pairs of tubes to the remote condenser. Each pair must be evacuated and charged independently.

IMPORTANT:
The remote condenser and the tubes connecting it to the DRY-O-TRON® must be evacuated to a pressure below 500 microns of mercury as measured by an electronic vacuum gauge. Compound gauges as found on refrigeration manifolds are inadequate.

To insure a correct reading, install the electronic vacuum gauge far away from the vacuum pump, or use a reliable vacuum valve to isolate the gauge and system from the pump while reading the vacuum.

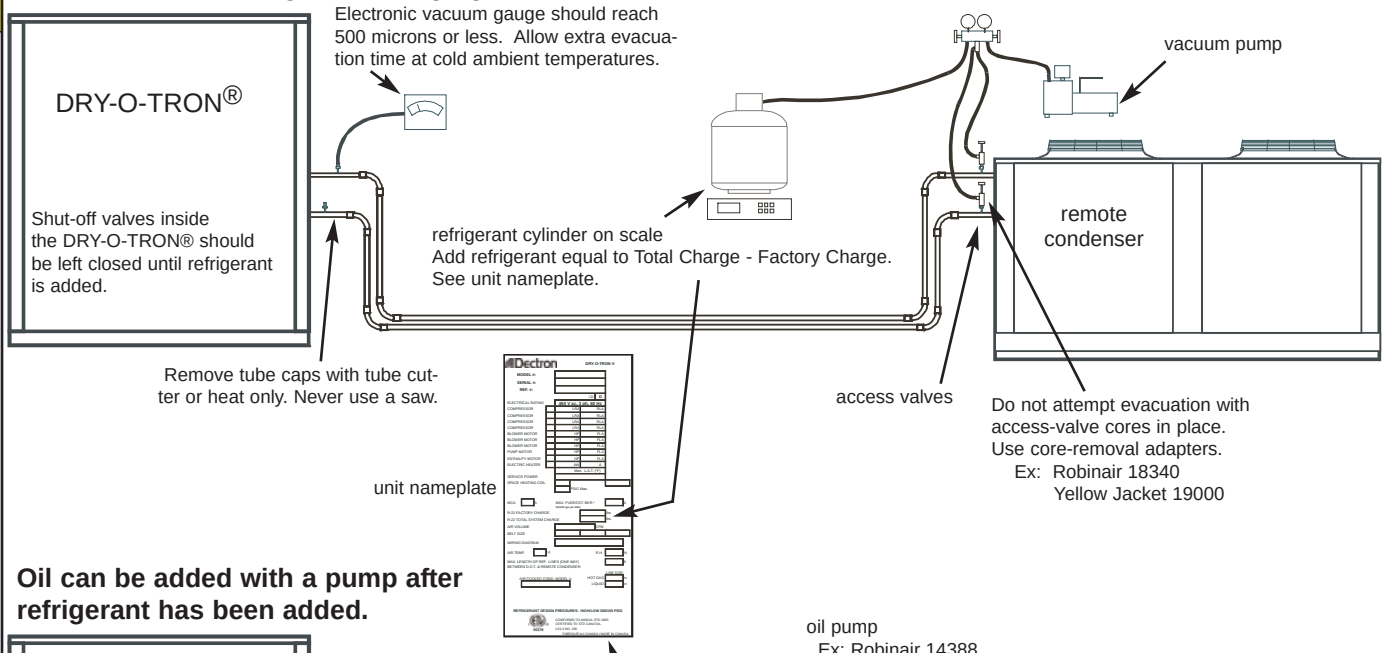
The colder the ambient temperature is, the longer proper evacuation takes. Allow enough time at low pressures to remove the water. The triple-evacuation method can be helpful.

After proper evacuation, pump in the weight and type of refrigerant (by others) specified on the unit nameplate (see **Product Description - Unit Nameplate**) through the remote condenser access valves. Be careful to prevent the entrance of air into the system.

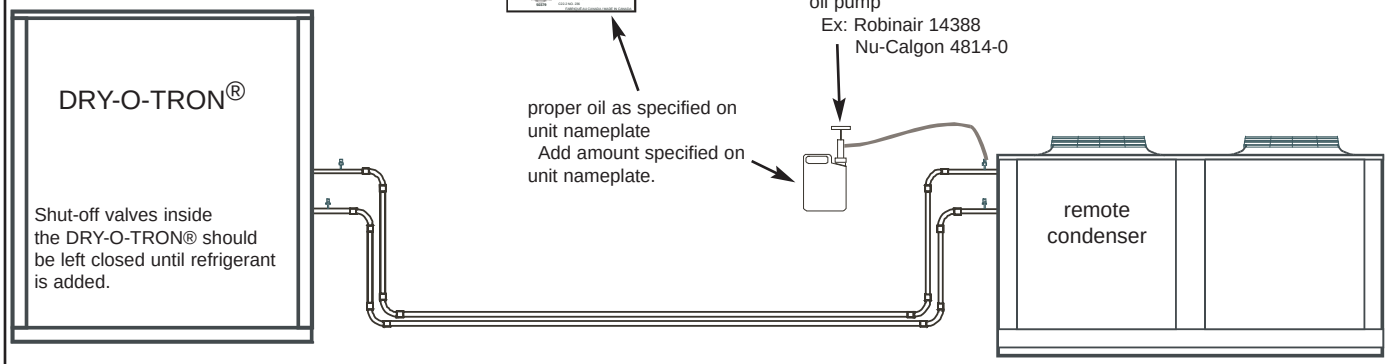
After proper evacuation, pump in the amount and type of oil (by others) specified on the unit nameplate. Be careful to prevent the entrance of air into the system. **Note: Some DRY-O-TRON® units may have synthetic oils. Follow recommended procedures for dispensing oils.**

Open the condenser isolation valves (2 per circuit) located inside the DRY-O-TRON®. Locate and open the refrigerant receiver isolation valves (2 per circuit).

Evacuation and refrigerant charging



Oil can be added with a pump after refrigerant has been added.



Data subject to change without notice.

Condenser Water Piping Installation

UNITS WITH WATER-COOLED OR FLUID-COOLED AIR CONDITIONING ONLY

IMPORTANT:

Contact Dectron before changing the temperature range or flow rate of the water or fluid. (See Product Description - Unit Nameplate.)

IMPORTANT:

Never allow dirt or other foreign materials to enter the tubes connecting to the DRY-O-TRON®. Foreign material may cause damage to valves and other components.

If the insides of the tubes are contaminated with dirt, oil, sludge, rust, or other materials, then the pipes must be thoroughly cleaned.

Where connection must be made to metal tube other than copper tube, install a dielectric union between the different tubes to reduce corrosion.

Where flux must be used, use only enough flux to solder. Excess flux can contaminate the heat transfer fluid.

IMPORTANT:

Constant water or fluid flow is essential. All pumps, cooling towers, fans, etc., involved in cooling the water or fluid must be enabled whenever the DRY-O-TRON® is operational. Do not allow a timer or other device to inhibit operation at any time the DRY-O-TRON® is operational.

IMPORTANT:

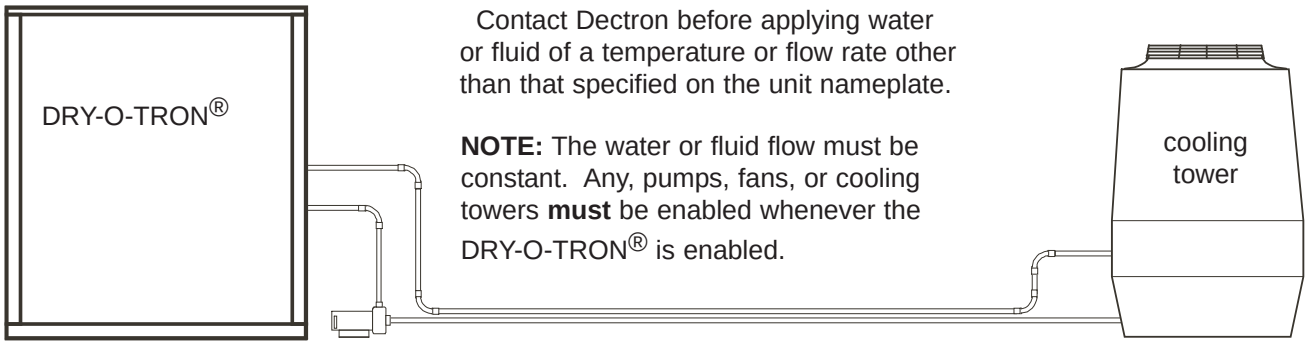
Cooling water must be protected from freezing if the water flow could be interrupted during low ambient temperatures.

IMPORTANT:

If a fluid other than water is used for condenser cooling, use only the type and concentration specified on the unit nameplate. (See **Product Description - Unit Nameplate**.)

Water or Fluid Pressure Switch

The flow pressure switch (see field wiring diagram) must be adjusted at installation. Adjust the switch to make as the flow rate approaches normal and to break as the flow rate decreases to less than 1/2 of normal. See **Startup - Pre-Startup Adjustments**.



Contact Dectron before applying water or fluid of a temperature or flow rate other than that specified on the unit nameplate.

NOTE: The water or fluid flow must be constant. Any, pumps, fans, or cooling towers **must** be enabled whenever the DRY-O-TRON® is enabled.

Port locations may vary. See the unit port labels.

INSTALLATION

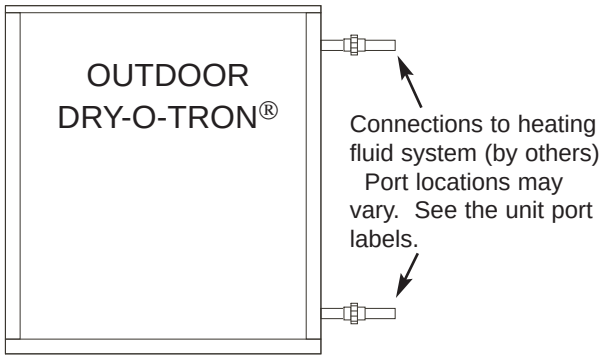
WATER-HEATED, GLYCOL-HEATED, OR STEAM-HEATED UNITS ONLY

Connect the **heating fluid** tubes between the DRY-O-TRON® and the hot fluid source. Where connection must be made to metal tube other than copper, install a dielectric union between the different tubes to reduce corrosion.

For units heated by glycol solution do **not** use galvanized pipe or tube.

Where copper tubes are soft soldered, use only enough flux to solder. Excess flux can contaminate the heat transfer fluid.

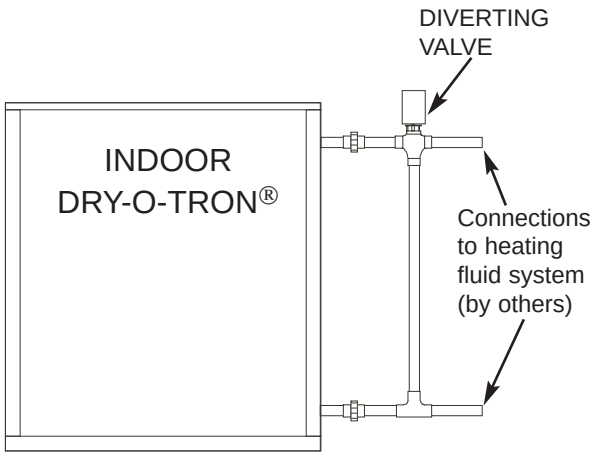
Where copper tubes are silver soldered, the inside of the tube must be protected from oxidation during soldering by flooding the tube with an inert gas such as nitrogen, argon, or carbon dioxide.



Indoor DRY-O-TRON® units with integral steam- or hot-water heating have external valves (supplied by Dectron, installed by others). Install and connect this valve with its accompanying tube assembly as shown.

IMPORTANT!

See Installation - Wiring - Heating Valve for proper methods of wiring this valve.

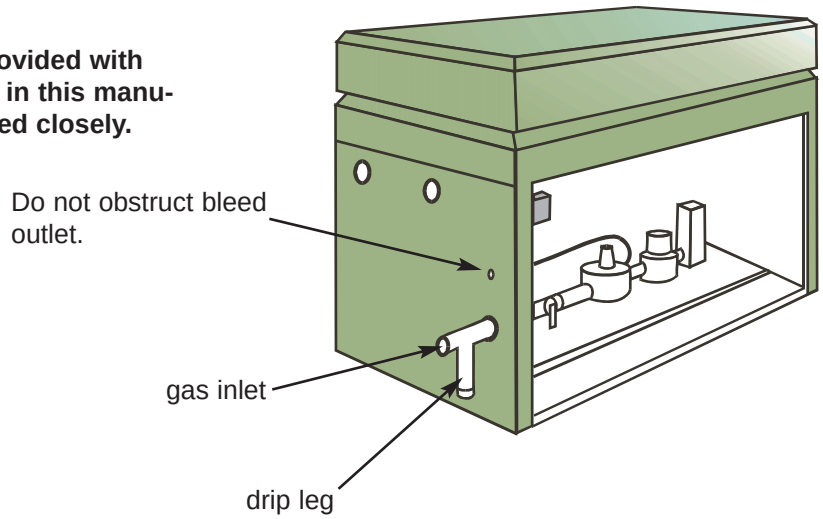


Port locations may vary. See the unit port labels.

Boiler Piping Installation

Some units may be supplied with a gas-fired boiler to provide space heat. In this case, the boiler-fuel gas piping must be installed by the latest applicable codes.

Information in the boiler manual provided with the unit supercedes any information in this manual. Applicable codes must be followed closely.



The normal supply pressure for natural gas fueled boilers is 7" W.C. to 14" W.C. Consult Dectron for other supply pressures.

Maximum equivalent pipe length (in feet) for natural gas (1000Btu/ft^3, 0.60 specific gravity, and 0.5" W.C. pressure drop)

input firing rate \ pipe size	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
136 MBTU	15	60	200						
512			15	65	130	500			
627			10	45	95	340			
726				35	75	260			
825				25	55	185	500		
926				20	45	150	400		
1083				15	35	120	300		
1178					25	85	200		
1287					20	75	170	560	
1413					15	65	165	500	
1570					15	50	125	400	
1758					10	40	100	340	
2100					10	30	75	260	
2500						20	55	160	600
3000						15	40	120	500
3500						10	30	80	400
4000						5	25	65	300

Installation Piping Condensate Drain

Important!

The condensate drain must be installed and the P-trap must be filled before starting the unit.

Δ Select materials

Ordinary schedule 40 PVC or ABS plastic pipe is adequate in most cases. Do not reduce the pipe size below that provided on the unit.

Δ Install P-trap

For horizontal units, an adequate P-trap must be installed. If a P-trap is provided with the unit, use it. If one is not provided, use the recommended size P-trap. The P-trap must be sized for negative 1.5 inch water column pressure (or lower) in the DRY-O-TRON® cabinet.

Vertical units have factory-installed internal P-traps.

For long runs or possible unintentional traps, a vacuum breaker on the outlet side of the P-trap may be necessary. Follow standard procedures.

Δ Route drain pipe

Route the drain pipe so that the only trap is the P-trap. In horizontal runs, slope the pipe downward at least 1/4" per foot (2 cm per meter).

Deliver the condensate to a suitable point. Check local codes for allowable procedures. Expect many gallons of water per hour.

Δ Fill P-trap

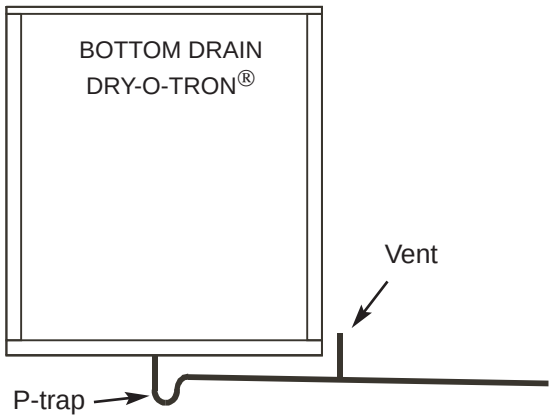
To prevent air from being drawn through the condensate drain pipe, the P-trap must be filled with water before starting the unit blower(s). Failure to do this will cause the drain pan to overflow during operation.

Δ Condensate pump

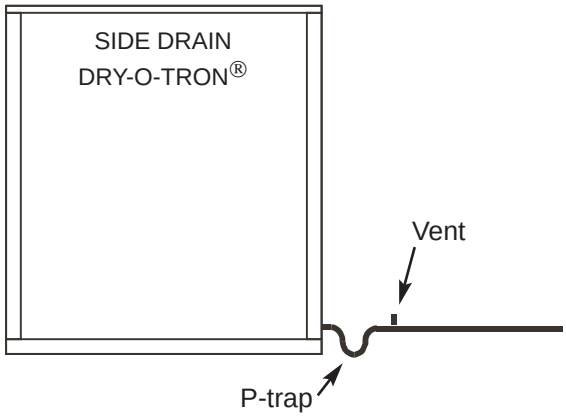
If a condensate pump must be used, be sure it has enough pressure and volume capability. If the condensate is to be delivered to a pipe that might be pressurized above atmospheric pressure, install a check valve to prevent backflow.

Some DRY-O-TRON® units have bottom **condensate drains**. The requirements for bottom drains is covered in **Installation - Isolators and Drain**, since drain arrangements may have to be made before the unit is placed.

Depending on conditions, bottom drains may have to be protected against freezing.



Some DRY-O-TRON® units have side condensate drains. Use the same pipe materials and methods used for bottom condensate drains. **Side drains on outdoor units must be protected from freezing.**



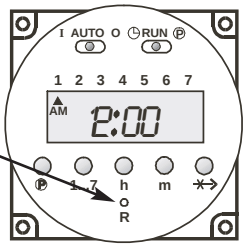
Contents

Startup Pre-Startup Adjustments External Clock

Some units may be equipped with a seven-day time clock to increase outdoor air intake during Occupied periods. In this case the clock must be set for local time and for Occupied periods.

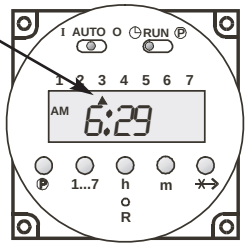
If mistakes are made while programming, all settings can be erased by pressing **R**.

If the display shows , use a short piece of wire to press **R**, and start over.



A. Set present day and time-of-day

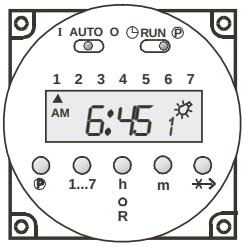
1. Move **RUN** switch to ◷ (RUN Ⓟ).
2. Press **1...7** to move the indicator under the day of the week. (ex. **3** for Wednesday)
3. Press **h** to set the hour of the day. (ex: 6 AM)
4. Press m to set the minutes past the hour. (ex: 6:29 AM)



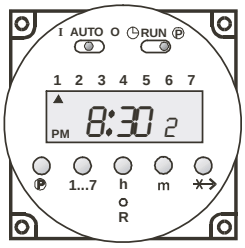
5. Move **RUN** switch to RUN (RUN Ⓟ).
6. Colon will blink. Clock is now set to day and time.

B. Set Occupied period for Mondays.

1. Move **RUN** switch to Ⓟ (RUN Ⓟ).
2. Press **1...7** to move the pointer under day **1** for Monday. The *1* indicates the first timer action. ☼ indicates Occupied.
3. Press **h** to set the hour of the beginning of the Monday Occupied period. (ex: 6 AM)
4. Press **m** to set the minute of the beginning of the Monday Occupied period. (ex: 6:45 AM)

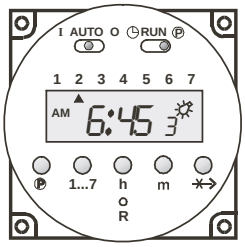


5. Press Ⓟ to set the end of the Monday Occupied period. The *2* indicates the second timer action. The ☼ disappears to indicate Unoccupied.
6. Press **h** to set the hour of the end of the Monday Occupied period. (ex: 8 PM)
7. Press **m** to set the minute of the end of the Monday Occupied period. (ex: 8:30 PM)



C. Set Occupied period for other days.

1. Press Ⓟ to change to timer action 3.
2. Press **1...7** to move the indicator under 2 (for Tuesday).
3. Repeat steps B3 through B7, using the appropriate times for Tuesdays.
4. Repeat above steps for other days of the week.



5. When the Occupied periods for all days have been set, move **RUN** switch to RUN (RUN Ⓟ).
   The **AUTO** switch should remain on Auto (I AUTO O).
6. Occupied periods are now set and become effective on the next Occupied period.

Manual operation

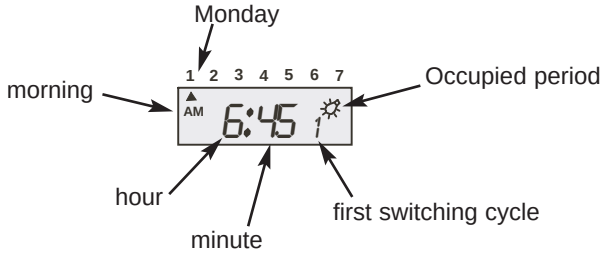
To force an Occupied period, move the **AUTO** switch to "I" (I AUTO O). Leave the **RUN** switch on RUN (RUN Ⓟ).

To force an Unoccupied period, move the **Auto** switch to O (I AUTO O). Leave the **Run** switch on Run (RUN Ⓟ).

To skip the next Occupied period, press ✶↔.

Indication of Occupied period

The symbol ☼ in the upper right corner of the display indicates that the present time is in an Occupied period. ex:



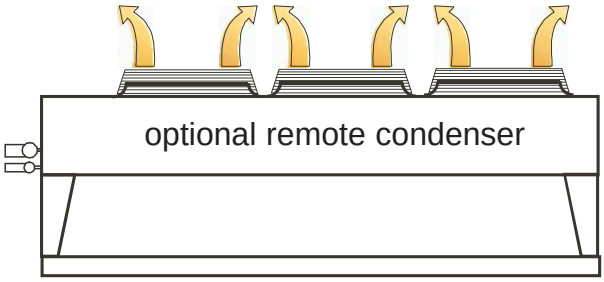
Data subject to change without notice.

CONDENSER FAN ROTATION (units with air-cooled air conditioning option only)

Units with optional air-cooled air conditioning will have a remote condenser. The condenser fans must rotate so as to produce an upward air discharge as shown.

Single phase fans will inherently turn the proper direction. If three phase fans turn the wrong way, a qualified person should disconnect the branch circuit and interchange any two wires on the power inlet lugs in the condenser control enclosure. **Do not move any factory installed wires.**

Discharge air must flow upward.



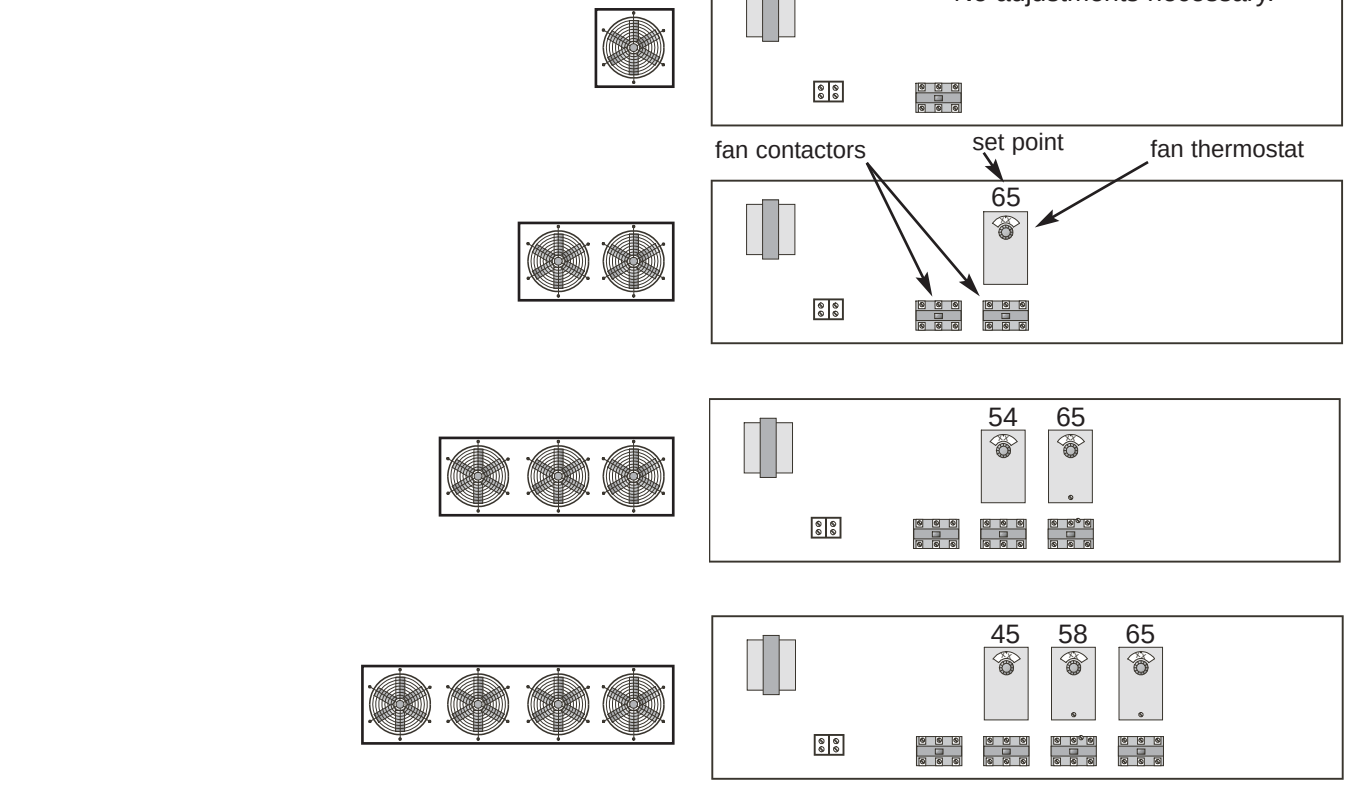
CONDENSER FAN THERMOSTATS (units with air-cooled air conditioning option only)

Units with optional air-cooled air conditioning will have a remote condenser. Some remote condensers may have more than one fan. Condensers with multiple fans have a minimum number of fans that run continuously whenever the DRY-O-TRON® is in cooling mode. Any other fans will be controlled by thermostats sensing outdoor air temperature.

The thermostats must be adjusted at installation, using the diagrams below and on the next page.

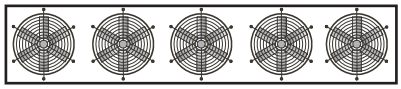
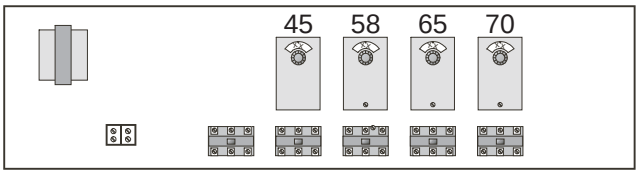
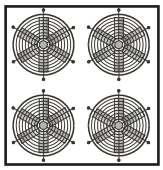
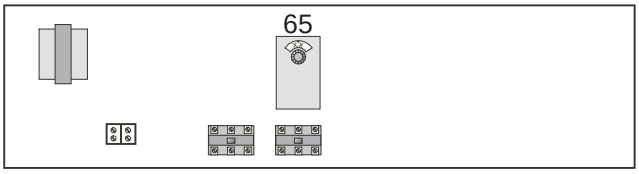
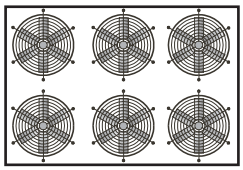
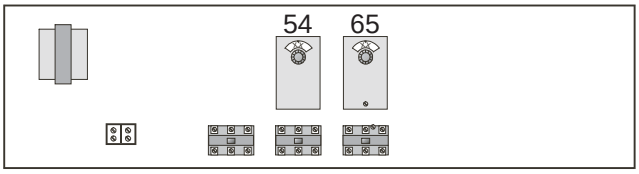
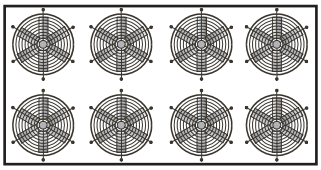
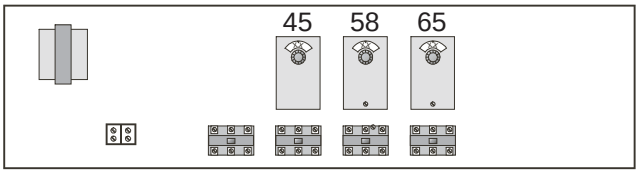
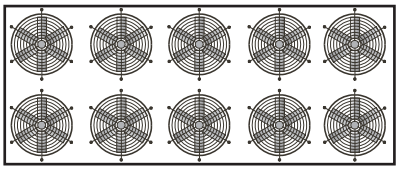
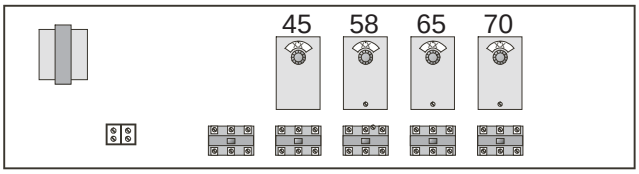
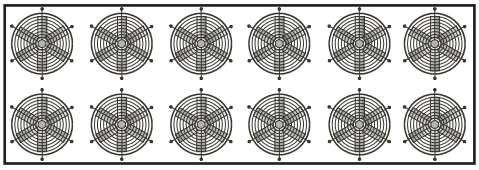
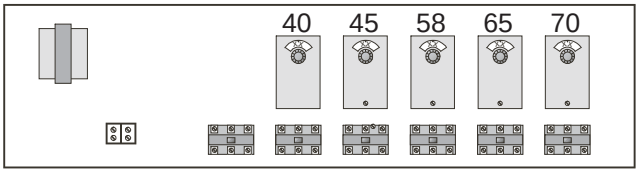
FAN ARRANGEMENT

CONDENSER CONTROL ENCLOSURE



STARTUP

FAN THERMOSTATS, continued

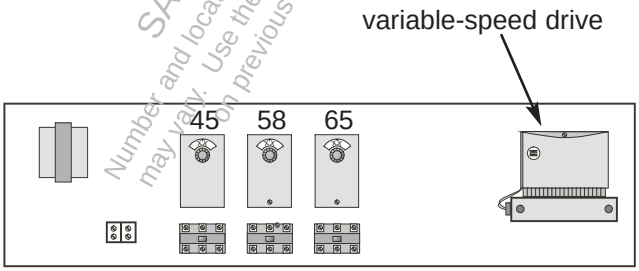
FAN ARRANGEMENT	CONDENSER CONTROL ENCLOSURE
	
	
	
	
	
	

STARTUP

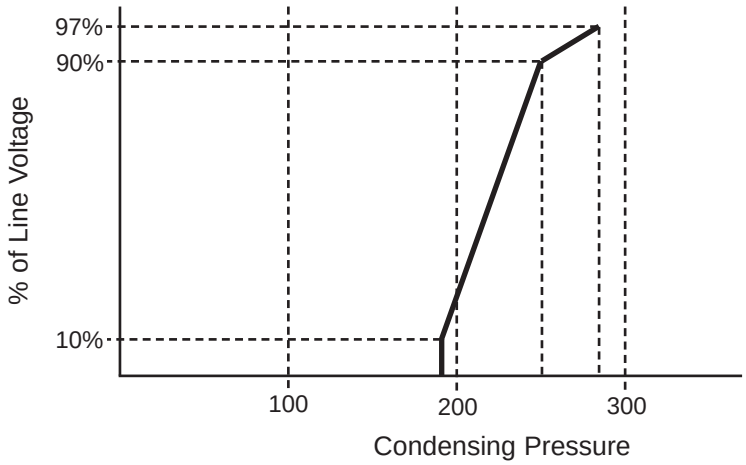
Data subject to change without notice.

CONDENSER FAN PRESSURE CONTROL
(units with air-cooled air conditioning option only)

Some remote air-cooled condensers may have one fan or one pair of fans with variable-speed control. In this case, the speed of the fans increases with increasing condensing pressure.



The variable speed drive changes the voltage applied to the controlled fan motor(s) according to the chart below:



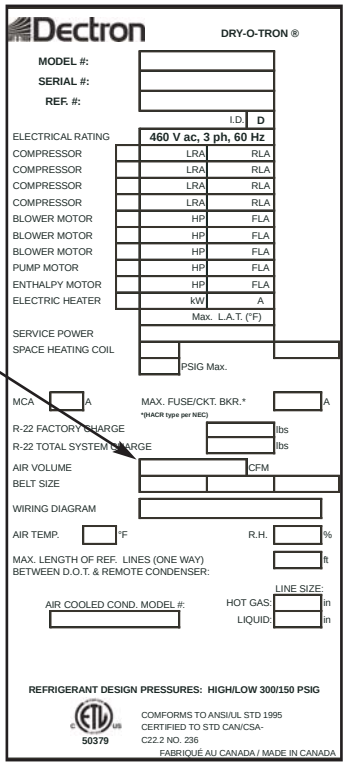
STARTUP

CONDENSER FLUID FLOW (units with fluid-cooled air-conditioning option only)

Units with optional fluid-cooled air conditioning must have a constant flow of fluid of the correct temperature.

Unit Size	Flow (GPM) Water @ 90°F
010	16
015	20
020	32
030	36
040	44
050	58
060	72
080	88
100	116
120	152
150	174
200	232
240	304
300	348
360	464
420	500
480	608

Confirm that the supply air flow is within ±10% of the amount specified on the unit nameplate.



Pre-Startup Adjustments

Do not adjust any valves other than the ones specified below.

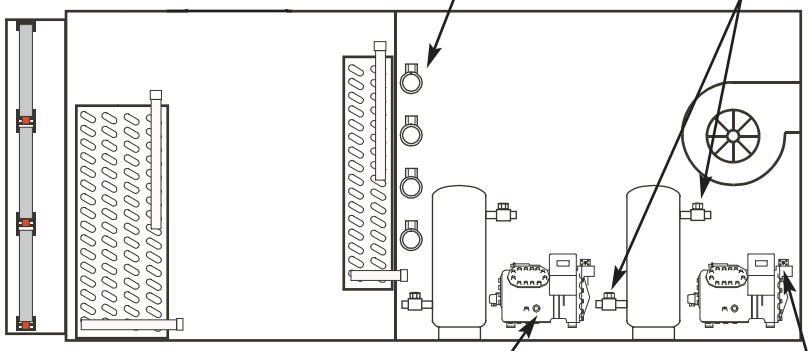
Be sure that the following manual valves have been opened:

1. Depending on the size of the unit, the compressor(s) may have manual isolation valves. These valves must be opened before attempting to operate the compressor(s). **Do not open these valves until the compressor crankcase heaters have been powered for at least 10 hours.**

2. Depending on the type of unit, there may be refrigerant receivers. Where present, each receiver will have two isolation valves. **These valves must be opened before attempting to operate the compressor(s).**

3. For units with air-cooled air conditioning only - all condenser tubes will have an isolation valve inside the cabinet. **These valves must be opened before attempting to operate the compressor(s).**

4. **Note: Some units may have other valves similar in appearance to those mentioned above. Do not adjust any valves other than those mentioned in steps 1-3. Since valve locations may vary, be sure of the function of a valve before adjusting.**

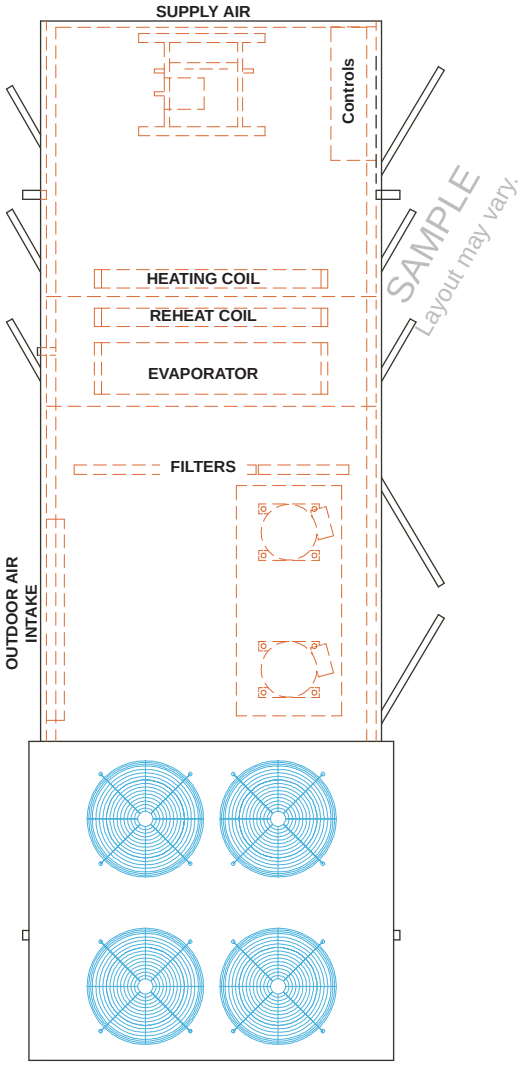


STARTUP

CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE

There may be several air filters, some of which may not be readily visible. Units with exhaust air blowers may have exhaust air filters.

Some units may have filters that lift out.



CLOSE ALL AIR COMPARTMENT DOORS AND ACCESS PANELS

NOTE: The control enclosure door is not an air compartment door.

When the blower starts, the strong suction on the air compartment could cause an open door to close suddenly. Be sure to close and secure them before starting the blower.

Pre-Startup Checklist

Print your initials in the boxes to indicate completion. Print "N/A" for items which are not applicable to the installation.

Space

Confirm that adequate space has been left around the DRY-O-TRON® (see **Installation - Unpacking and Locating**). your initials

Confirm that no construction dust or other debris is in the duct(s). your initials

Confirm that no construction dust or other debris will be drawn into the unit. your initials

Piping

For units with water- or fluid-cooled air conditioning, confirm that the water or fluid flow is within tolerance according to the unit specifications. (See **Startup - Pre-Startup Adjustments**.) your initials

Confirm that the condensate drain pipe is properly connected with a P-trap, and is free of leaks. (See **Installation - Piping - Condensate Drain**.) your initials

Confirm that the condensate drain P-trap has been filled with water and that the drain works. your initials

For units requiring a condensate pump, confirm that the pump is operating. your initials

Wiring

Confirm that the voltage to be applied to the DRY-O-TRON® corresponds to that specified on the unit nameplate and to the other requirements of **Installation - Wiring - Power**. your initials

Confirm that the size of the wire supplying electric power to the DRY-O-TRON® is adequate for the circuit ampacity shown on the nameplate. your initials

For long lengths of power wiring or marginal voltage, confirm that the wire size is adequate for less than 10% voltage drop under compressor starting current. your initials

Confirm that only copper wire was used for any connections to the DRY-O-TRON®. your initials

Confirm that the unit is properly grounded. your initials

Confirm that all electrical connections have been checked for tightness and re-torqued as necessary. your initials

Confirm that all electrical enclosures are clean and dry. your initials

For 3-phase units, confirm that the phase sequence is correct for proper blower rotation. See **Installation - Air Distribution - Adjust Airflow**.) your initials

Confirm that the control signal wiring is complete, as shown in the unit field-wiring diagram. your initials

STARTUP

Completed by _____ Ph. ( ) _ _ _ - _ _ _ _

Startup Pre-Startup Checklist

Unit preparation

For indoor DRY-O-TRON® units, confirm that the unit is supported on vibration isolators (see **Installation - Isolators and Drain**). your initials

Confirm that all shipping blocks, shipping braces, compressor locks, etc., have been removed or released for normal operation. your initials

Confirm that the blower belt is properly installed, aligned and tensioned. your initials

Confirm that the air intake is unobstructed. your initials

Confirm that the air volumes have been measured and are correct. (See **Installation - Air Distribution - Adjust Airflow**.) your initials

Confirm that all air filters are clean and in place. (See **Startup - Pre-Startup Adjustments**.) your initials

Confirm that the air heat exchangers are clean. your initials

Confirm that power has been applied to the crankcase heaters for at least 10 hours. your initials

Air distribution

For end-intake units, confirm that the the intake duct (if any) has the minimum straight length. (See **Installation - Unit-Duct Connections**.) your initials

Confirm that the supply duct has the minimum straight length (see **Installation - Unit-Duct Connections**). your initials

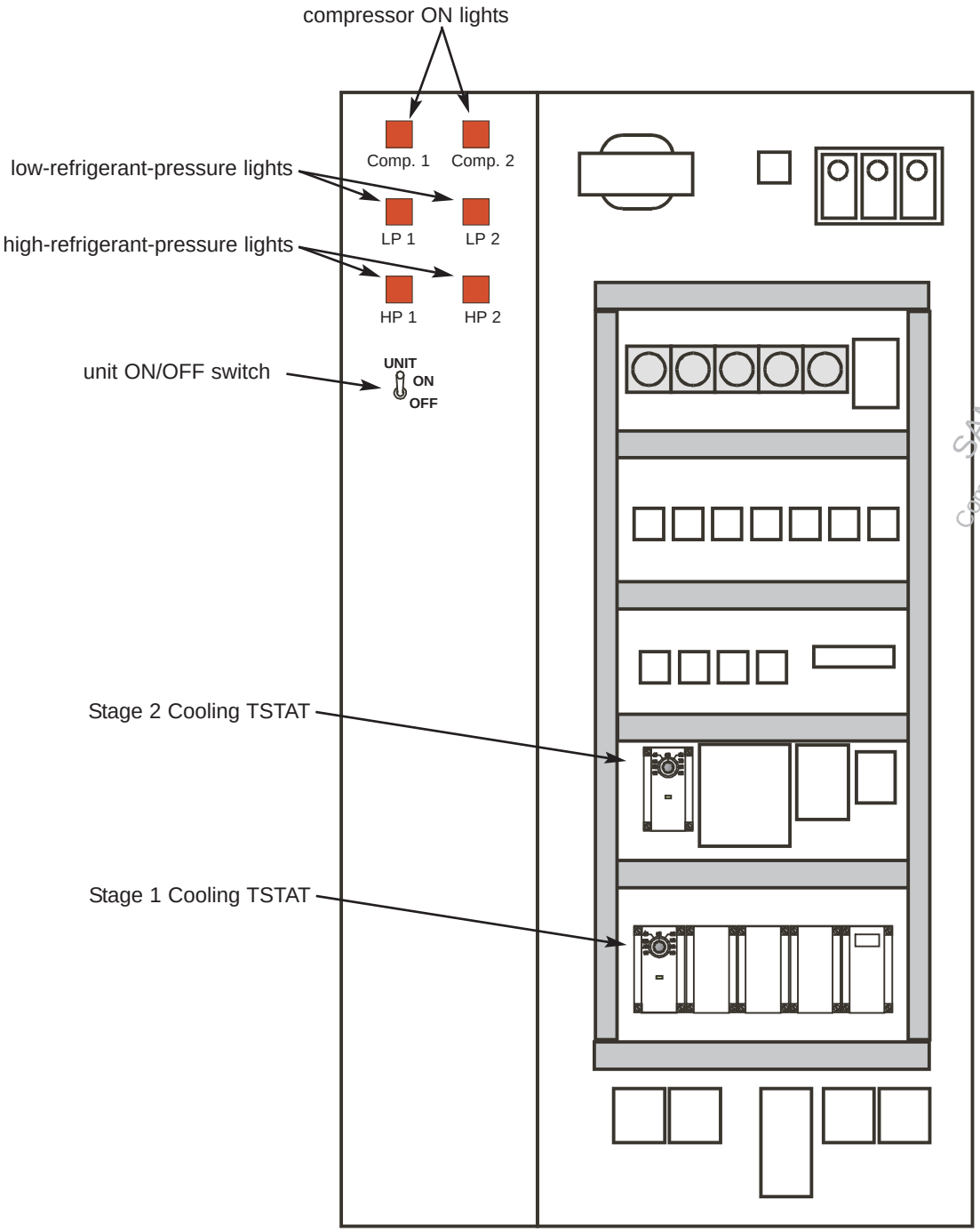
Confirm that all ducts have been sized and installed correctly to limit the external static pressure to no more than the specified amount. your initials

Confirm that all grilles and diffusers are unobstructed. your initials

Confirm that all construction dust and debris has been removed from the duct(s). your initials

Completed by _____ Ph. ( ) _ _ _ - _ _ _ _

Control Locations



Startup Enable Operation

IMPORTANT!

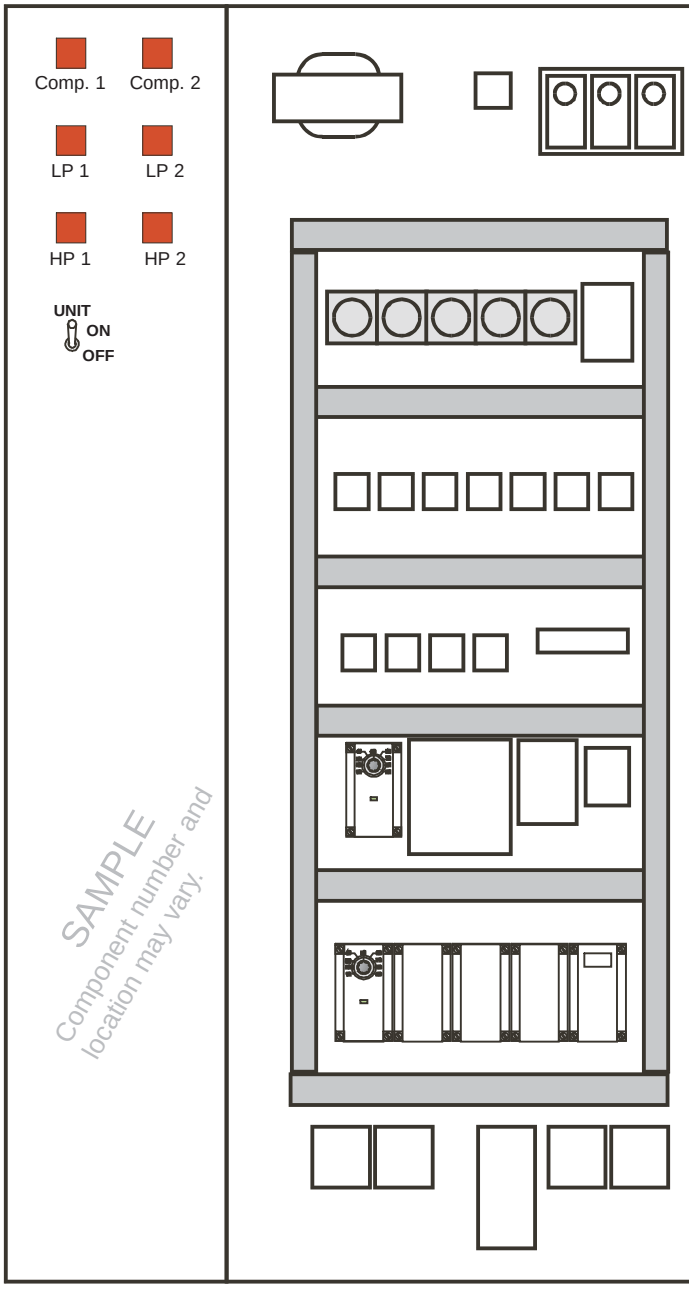
This energy recycling dehumidification system has been completely tested under design conditions at the factory. **Startup must be performed by a qualified factory-trained service and installation technician.**

Once startup is completed, all portions of the "Startup Report and Warranty Registration" form must be completely filled in and a copy must be sent to the Dectron representative or to the Dectron factory in order to register and validate the warranty.

Important!

Do NOT turn on the electric power unless the power supply voltage matches that specified on the unit nameplate. Be certain that there is no construction dust in the return duct (if any). Be certain that no construction dust will be drawn into the unit.

1. Apply electric power - This starts the compressor crankcase heaters. **Allow no less than 10 hours of crankcase heater operation before enabling a compressor.**
2. **Be sure the air-compartment doors and/or panels are closed securely.**
3. Be sure that all inputs are connected and are in the normal condition.
4. Turn ON the unit ON/OFF switch. If the occupation signal is OCCUPIED, the blower should start.
5. Press START on the enthalpy wheel motor overload (if any). If the occupation signal is OCCUPIED, the wheel (if any) should start.
6. Press START on the compressor overload(s) (if any).
7. If the occupation signal is OCCUPIED, the compressor(s) may start, depending on the demand.



STARTUP

Dehumidification Startup

The enthalpy control senses the temperature and relative humidity of the outdoor air entering the unit.

Dehumidification will take place

IF the time is in an OCCUPIED period,

AND IF the blower is running,

AND IF allowed by the Auxiliary Heater Interlock Signal (if any),

AND IF the refrigerant pressures are in the correct range,

AND IF the compressor winding temperature(s) is below the limit,

AND IF the compressor discharge temperature(s) is below the limit,

AND IF the compressor overload(s) (if any) is enabled,

AND IF the compressor three-minute delay is completed,

AND IF the indoor humidistat (if any, by others) is above set point,

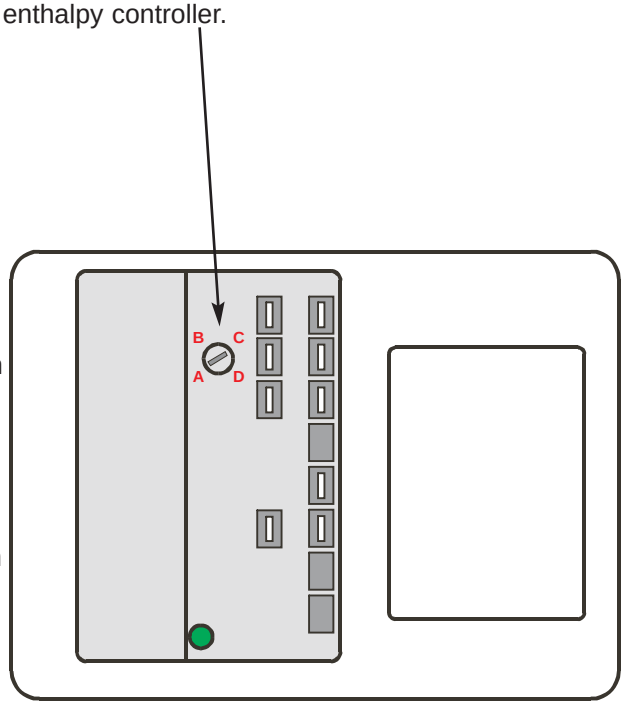
AND IF the enthalpy of the outdoor air is greater than set point.

Consult Dectron before adjusting the enthalpy controller.

See **Operation - Flow Chart**.

The enthalpy controller is located in the electrical enclosure.
The sensor is in the unit air intake, behind the filters.

On some older unit, the entire enthalpy controller may be located in the air intake, behind the filters.



Startup Cooling

The first-stage cooling thermostat senses the temperature of the air entering the unit from outside.

First-stage cooling will take place

IF the time is in an OCCUPIED period,

AND IF the blower is running,

AND IF allowed by the auxiliary heater interlock (if any),

AND IF the circuit-1 refrigerant pressures are in the correct range,

AND IF the compressor-1 winding temperatures are below the limit,

AND IF the compressor-1 discharge temperature is below the limit,

AND IF the compressor-1 overload is enabled,

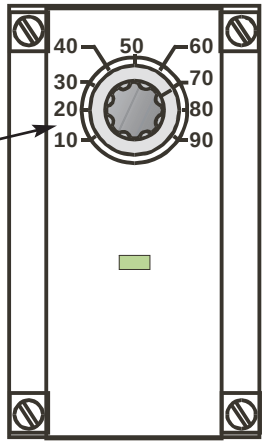
AND IF the compressor-1 three-minute delay is completed,

AND IF the indoor humidistat (if any, by others) is above set point,

AND IF the enthalpy of the outdoor air is greater than set point,

AND IF the temperature of the outdoor air entering the unit is sufficiently above the set point of the first-stage cooling thermostat.

The first-stage cooling thermostat is located in the unit electrical enclosure. It senses intake air temperature.



See **Operation - Flow Chart**.

The second-stage cooling thermostat senses the temperature of the cooled air entering the reheat coil.

Second-stage cooling will take place

IF first-stage cooling is ON,

AND IF the circuit-2 refrigerant pressures are in the correct range,

AND IF the compressor-2 winding temperatures are below the limit,

AND IF the compressor-2 discharge temperature is below the limit,

AND IF the compressor-2 overload is enabled,

AND IF the compressor-2 three-minute delay is completed,

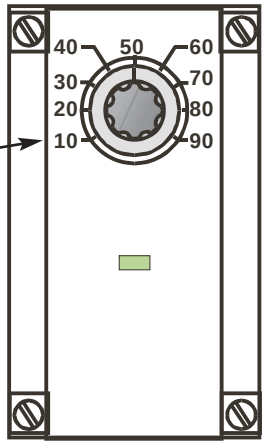
AND IF the indoor humidistat (if any, by others) is above set point,

AND IF the enthalpy of the outdoor air is greater than set point,

AND IF the temperature of the air entering the reheat coil is sufficiently above the set point of the second-stage cooling thermostat.

Consult Dectron before adjusting the second-stage cooling thermostat.

The second-stage cooling thermostat is located in the unit electrical enclosure. It senses cooled air temperature.

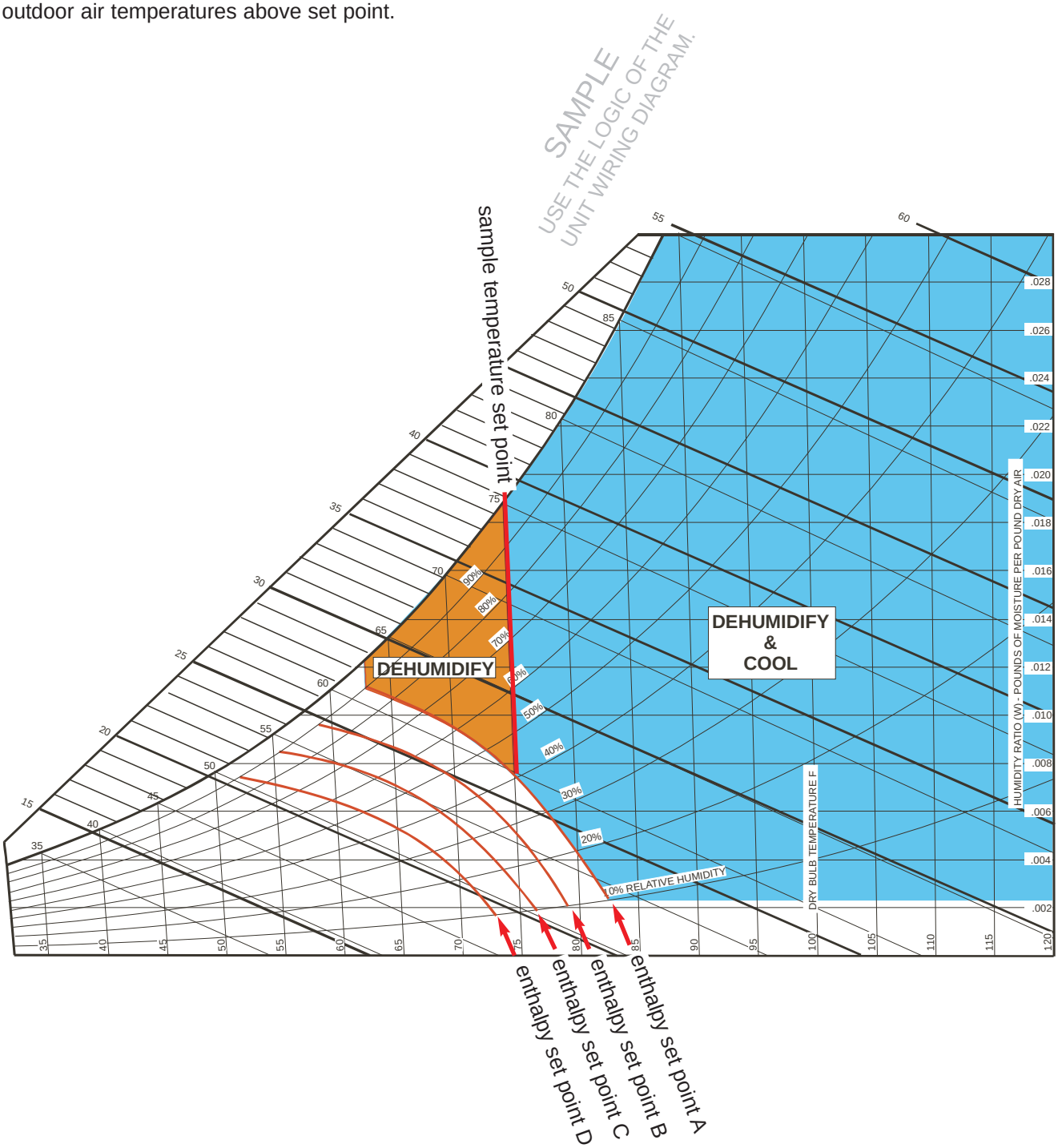


See **Operation - Flow Chart**.

Operation Description

As shown in the psychrometric chart below, the DK series dehumidifies for incoming outdoor air enthalpies above set point.

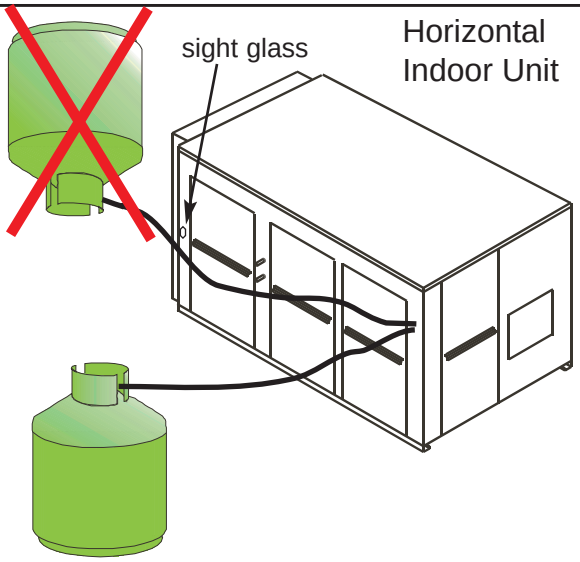
The DK series dehumidifies and cools for incoming outdoor air enthalpies above set point and incoming outdoor air temperatures above set point.



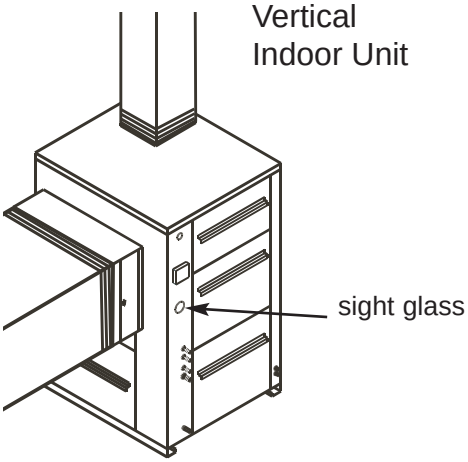
COMPLETE REFRIGERANT FILL

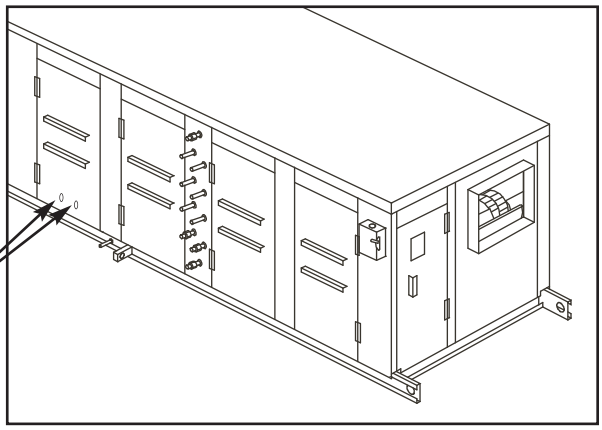
For units with air-cooled air conditioning assembled in the field, the required additional weight of refrigerant (see **Product Description - Unit Nameplate**) should have been added when the remote condenser was installed in **Installation - Piping - Refrigerant**. If not all the refrigerant was added, it must be added now.

If the additional refrigerant cannot be pumped into the remote condenser access valves while the compressor is OFF, then refrigerant vapor only can be added to the unit through the suction access valve while the compressor is running. **NEVER ADD LIQUID REFRIGERANT TO THE SUCTION ACCESS VALVE.** Units with multiple refrigeration circuits will have multiple sight glasses and multiple suction access valves.



After the unit has been running in Dehumidification mode for 30 minutes, the refrigerant sight glass(es) should be full (no bubbles). The amount of refrigerant added is computed from the unit nameplate. (See **Installation - Piping - Refrigerant**.)





Outdoor units (model RK) have sight glasses located behind transparent windows in access panels.

STARTUP

TXV Adjustment Startup

The expansion valve(s) must be adjusted at startup, since airflow affects the evaporator loading. To obtain proper operation and long life, it is important to adjust the expansion valve(s) as described below.

→ Do not attempt to adjust the expansion valve based on evaporator superheat. ←

Adjust circuit #1 expansion valve(s)-

1. Choose a time when the outdoor air temperature and relative humidity are well above the nameplate values, so that the unit will operate at maximum capacity. (See **Product Description - Unit Nameplate**).
2. For units with air-cooled air conditioning, be sure that the specified additional refrigerant has been added. (See **Product Description - Unit Nameplate**, **Installation - Piping - Refrigerant**, and **Startup - Add Refrigerant**.)
3. Be sure that the air flow has been adjusted to the value shown on the unit nameplate. (See **Product Description - Unit Nameplate**.)
4. If the evaporator bypass damper (if any) is manually operated, be sure that it is fully open.
5. Install the remote sensor of a known-accurate electronic thermometer (by others) by clamping it tightly to the compressor discharge tube, about six inches from the compressor shell.
6. Insulate the sensor with at least 1/2" (1 cm) of insulation (suitable for 200°F (93°C)) for at least 3 inches on either side.
7. Tape the insulation to prevent air leakage onto the sensor when the blower runs.
8. Route the sensor cable out the access panel or access door of the unit.
9. Connect the cable to the thermometer.
10. Some units have more than one refrigeration circuit. Identify the expansion valve(s) associated with each circuit.
11. Some units may have more than one expansion valve for each refrigeration circuit. In this case, install probes of an electronic thermometer on the expansion valve bulbs.
12. Close the access panels or doors.
13. Start the unit per the instructions given in **Startup - Enable Operation**.
14. Be sure that the refrigerant sight glass is completely full of liquid, with no bubbles. If bubbles are present, return to Step 2 or contact Dectron.
15. After the compressor(s) has been running for at least 20 minutes, the compressor discharge temperature as measured by the thermometer should be as shown on the following page.
16. (a) If the compressor discharge temperature is too low, close the expansion valve(s) half a turn at the time, allowing at least 15 minutes between adjustments, until the compressor discharge temperature is correct.

    (b) If the compressor discharge temperature is too high, open the expansion valve(s) half a turn at the time, allowing at least 15 minutes between adjustments, until the compressor discharge temperature is correct.

    (c) For multiple expansion valves, try to keep the average expansion-valve bulb temperatures as nearly the same as possible, while meeting the requirements of (a) and (b) above.
17. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment, then check to be sure the compressor discharge temperature is in the correct range.
18. Remove the thermometer probes.
19. Replace the expansion valve caps.
20. Repeat the above steps for any other refrigeration circuits.

Startup Check Conditions

WARNING **Risk of frostbite. Risk of eye damage.**
Improper handling of refrigerants and refrigerant hoses can allow release of liquid refrigerant. Exposure to liquid refrigerant can cause frostbite and severe eye damage. Wear gloves, eye protection, and any other appropriate protective equipment. Follow all safety procedures.

After 30 minutes of operation near nameplate room conditions:

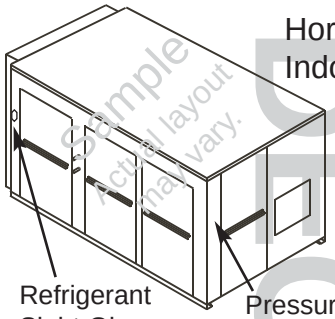
a) The refrigerant sight glass should be full of liquid. There should be no bubbles.

b) The evaporator pressure should be between:

R22	R134A	R407C	R410A
60 - 80 PSIG	29 - 43 PSIG	55 - 75 PSIG	105 - 135 PSIG

c) The condenser pressure should be between:

R22	R134A	R407C	R410A
225-275 PSIG	145 - 181 PSIG	245 - 300 PSIG	340 - 420 PSIG

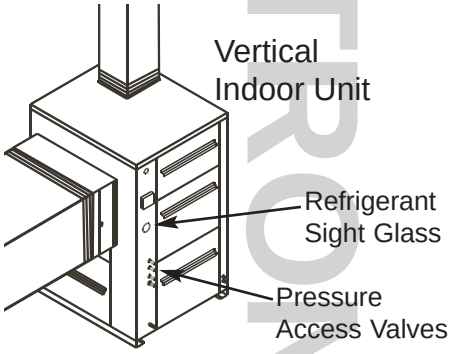


Note: Units with multiple refrigeration circuits will have multiple sight glasses, suction-access valves, and discharge-access valves.

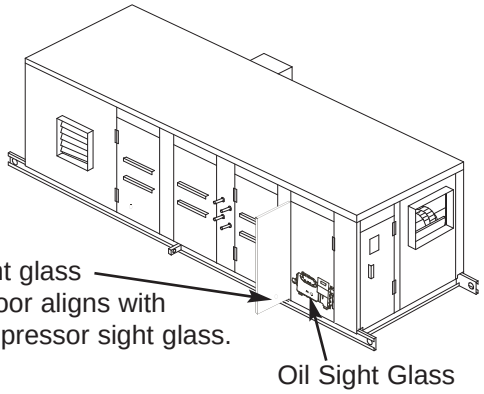
d) Some units may have compressor oil-pressure access valves. The pressure on any oil-pressure access valve should be no less than 25 PSI above evaporator pressure.

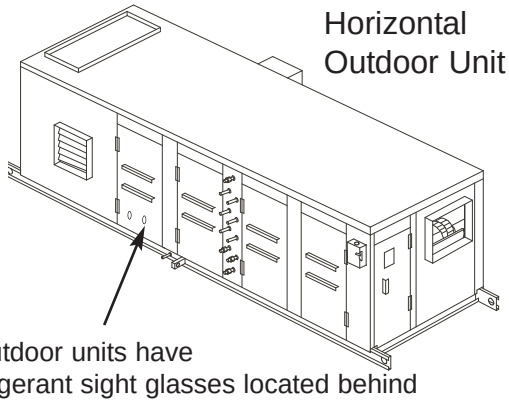
e) The compressors of some units may have oil-level sight glasses. In this case, the oil level should be near the middle of the sight glass. The oil in the sight glass should not be foaming.

f) The temperature of hot gas leaving the compressor(s) should be in one of the following ranges:



R-22	R134A	R-407C	R-410A
180°F (82°C) to 200°F (93°C)	160°F (77°C) to 180°F (88°C)	160°F (71°C) to 180°F (82°C)	150°F (66°C) to 170°F (77°C)





STARTUP

Adjust Flow-Pressure Switch
Water-Cooled or Fluid-Cooled Units Only

The water-cooled condenser flow rate(s) (if any) must be near the values shown in **Startup - Pre-Startup Adjustments**.

Adjusting water flow rate(s)-

Flow rates are most easily set with the recommended flow meter (see **Installation - Piping**). If this is not possible, the flow rate can be set by

1. Choose a time when the outdoor air temperature and relative humidity are well above the nameplate values, so that the unit will operate at maximum cooling capacity.
2. Attach a thermometer to the inlet and outlet water or fluid pipes.
3. Insulate the thermometer and the pipe with at least 1/2” (1 cm) of insulation for at least 3 inches on either side.
4. Allow the unit to operate in Cooling mode at maximum capacity for at least 20 minutes.
5. Read the entering water temperature.
6. Read the leaving water temperature.
7. Subtract the entering water temperature from the leaving water temperature. The difference should be between 10°F (5.6°C) and 20°F (11.2°C). Adjust the water flow until this condition is reached.
8. Check the temperature difference again twenty minutes after the last adjustment to be sure it is stable.

Adjusting the water pressure switches:

The water pressure switch informs the unit controller that water flow is present. To adjust this pressure switch, first adjust the water flow as shown above, then:

1. Turn the pressure switch adjusting screw counter-clockwise until the pressure switch contacts open. The DRY-O-TRON® controller will stop Cooling mode.
2. Slowly turn the pressure-switch adjusting screw clockwise until the pressure switch contacts just make, then turn the screw an additional 1/2 turn clockwise.
3. Stop the pump and confirm that the pressure switch responds to the drastic reduction in water flow.
4. Re-adjust as necessary for proper operation.

STARTUP

Startup

The Start-up Report and Warranty Registration form must be completed and a copy must be sent to Dectron.

Dectron provides training for installers and service technicians for a nominal fee. Contact the Dectron service department for details.

In some cases Dectron may be able to provide Dectron personnel to **supervise** the startup procedure for a fee. In this case, the Dectron employee will travel to the site and supervise, guide, and assist the contractor in the start-up. The Dectron employee does not do the startup, he or she supports and trains the contractor as the contractor does the startup. This service is referred to as " factory startup **supervision**".

Factory startup supervision must be purchased in advance to allow for scheduling personnel. Before Dectron personnel can be assigned to the task, the Dectron service department must receive:

1. the completed pre-startup checklist found in **Startup - Pre-Startup Checklist**
   Each applicable item of the checklist must be initialed (use "N/A" where an item is not applicable) and both sides of the checklist must be signed and dated by the responsible party. The responsible party must be authorized to obligate his company to pay for the factory startup assistance.
2. telephone confirmation from the responsible party to the Dectron service department that all applicable steps of the installation and startup procedure, along with any other steps specified by the Dectron service department have been completed
   The responsible party may request a specific date for the factory startup supervision. The Dectron service department will then schedule factory startup supervision with the responsible party.

Upon accepting the scheduled date for factory startup supervision, the responsible party accepts the responsibility to:

1. provide a qualified and licensed (as necessary) refrigeration technician to be on site for the duration of the factory startup supervision,
   The technician will accomplish the startup while being instructed as necessary by the Dectron employee. This training will be of great value in any future service to the equipment.
2. provide and install any extra material such as refrigerant, wire, or other material,
3. provide any necessary equipment such as hand tools, instruments, pumps, ladders, etc., and
4. make available as necessary any other personnel needed for the startup, such as plumbing and electrical contractors.

If upon arrival the Dectron employee sees that installation steps have been neglected, he will return to Dectron and the full price of the factory startup supervision will be billed. Examples of such neglected steps include, but are not limited to, incomplete connection of electric power, incomplete ductwork, incomplete connection of remote condenser (if any), incomplete control wiring, etc.

Dectron also offers service and installation seminars as well as operation and maintenance seminars. Consult Dectron or your Dectron representative for details.

Warranty Registration Startup

DRY-O-TRON® DK Series
Startup Report & Warranty Registration

Warranty void unless this form is completed and a copy returned to Dectron within 1 week after start-up!

Installation Name . . . . . .

Installation Address . . . . . .

Dectron Representative . . . . . .

Model # . . . . . Serial # . . . . . Ref # . . . . . .

Compressor #1 Serial # . . . . . Compressor #3 Serial # . . . . . Blower Belt Size . . . . . .

Compressor #2 Serial # . . . . . Compressor #4 Serial # . . . . . .

Electrical power	L1 - L2	L2 - L3	L1 - L3	Nameplate
Supply Blower voltage				
Supply Blower amperage				
Exhaust Blower amperage				
Compressor #1 amperage				
Compressor #2 amperage				
Compressor #3 amperage				
Compressor #4 amperage				
Compressor voltage				

Adequate service access provided? (See **Installation - Unpacking & Locating**.) your initials

Units level and vibration isolated? (See **Installation - Isolators & Drain**.) your initials

Condensate drain connected and P-trap installed and filled? (See **Installation - Isolators & Drain**.) your initials

Condensate drain tested? (See **Installation - Isolators & Drain**.) your initials

Condensate pump installed properly? (See **Installation - Isolators & Drain**.) your initials

Main disconnect switch installed? (See **Installation - Wiring - Power**.) your initials

Wire connections checked for tightness? (See **Installation - Wiring - Power**.) your initials

Start-up check lists complete? (See **Installation - Startup - Pre-Startup Checklists**.) your initials

Blower rotation on 3-phase units correct? (See **Installation - Wiring - Power**.) your initials

Air flow and blower speed adjusted? (See **Installation - Air Distribution - Adjust Airflow**.) your initials

No fault codes are displayed on operator panel? your initials

Set points are at design conditions? (See unit nameplate.) your initials

Air flow.....cfm

Optional outdoor air cooled condenser location Above D.O.T. ☐ Below D.O.T. ☐ Same level as D.O.T. ☐

Refrigerant connection size.....Hot gas .....Liquid Pipe length from D.O.T. to condenser.....

STARTUP

Data subject to change without notice.

DRY-O-TRON® DK Series
Startup Report & Warranty Registration

Warranty void unless this form is completed and a copy returned to Dectron within 1 week after start-up!

Operational Data

NOTE: To Obtain Adequate Readings, a Delay of Ten (10) Minutes is Required After Every Operation or Adjustment.

		Dehumidification		A/C Only		Heating
Entering Air Temperature	°F					
Leaving Air Temperature	°F					
Entering Relative Humidity	%					
Condenser Pressure	PSIG	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	
Suction Pressure	PSIG	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	
Oil Pressure	PSIG	Comp. #1 / Comp. #2	Comp. #3 / Comp. #4	Comp. #1 / Comp. #2	Comp. #3 / Comp. #4	
Sight Glass Clear?	Y/N	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	
TX Valve Bulb Temperature	°F	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	
Compressor Discharge Temp.	°F	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	
Air Leaving Cooling Coil Temp.	°F	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	Circuit #1 / Circuit #2	Circuit #3 / Circuit #4	

Comments: ----------

Form completed by .....Signature .....

Company Name .....

Date.....Telephone ( ) .....

Data subject to change without notice.

STARTUP

Warranty

Terms of Limited Warranty
DRY-O-TRON® Energy Recycling Dehumidifiers (packaged units) and Factory Supplied Accessories

General
Dectron Inc. warrants as set forth and for the time periods shown below that it will furnish to the original owner, through a Dectron Inc. authorized installing contractor or service organization, a new or rebuilt part for a part which has failed because of a defect in workmanship or material. Dectron Inc. reserves the right to apply handling and inspection charges in the case of parts or equipment improperly returned as defective whether under warranty or not.

Registration and Start-Up Report
Warranty void unless upon start-up of the unit the "Start-Up Report and Warranty Registration" is completed and sent to the factory within one week of initial start-up. This will also register the compressor warranty with the compressor manufacturer.

Initial 30 Days Warranty
During the first 30 days from initial start-up and subject to prior approval from the factory, Dectron Inc. will provide and/or reimburse the approved labor, materials, and shipping costs incurred in the replacement of a defective part.

Remainder of 25-month Warranty
Upon expiry of the initial 30 days warranty, and until completion of the twenty-fifth month from date of shipment from Dectron Inc., if any part supplied by Dectron Inc. fails because of a defect in workmanship or material Dectron Inc. will furnish a new or rebuilt part F.O.B. factory. No reimbursement will be made for expenses incurred in making field adjustments or replacements unless specifically re-approved by Dectron Inc. in writing beforehand.

Applicability
This warranty is applicable only to products that are purchased and retained in the United States and Canada. This warranty is not applicable to:

- Δ Products that have become defective or damaged as a result of the use of a contaminated water circuit or operation at abnormal water temperatures and/or flow rates.
- Δ Parts that wear out due to normal usage, such as air filters, belts, fuses and refrigerant.
- Δ Products that have been moved from the location where they were first installed.
- Δ Any portion of the system not supplied by Dectron Inc.
- Δ Products on which the model and/or serial number plates have been removed or defaced.
- Δ Products on which payment is in default.
- Δ Products which have become defective or damaged as a result of unauthorized opening of refrigerant circuit, improper wiring, electrical supply characteristics, poor maintenance, accidents, transportation, misuse, abuse, fire, flood, alteration and/or misapplication of the product.
- Δ Products operated without clean, properly installed air filters.
- Δ Products not installed, operated, and maintained as per the applicable Dectron Inc. Owner's Manual.

Transportation Costs
After the initial 30-day warranty period has expired, charges covering transportation of the defective part(s) to Dectron Inc. from the customer site and replacement part(s) from Dectron Inc. to the customer site are not covered by this warranty.

Limitations
This warranty is given in lieu of all other warranties. Anything in the warranty notwithstanding, any implied warranties of fitness for particular purpose and merchantability shall be limited to the duration of this express warranty. Manufacturer expressly disclaims and excludes any liability for consequential or incidental damage for breach of any express or implied warranty.

Where a jurisdiction does not allow limitations or exclusions in a warranty, the foregoing limitations and exclusions shall not apply to the extent of legislation, however, in such case the balance of the above warranty shall remain in full force and effect.

This warranty gives specific legal rights. Other rights may vary according to local legislation.

Obtaining Warranty Service
Normally, the DECTRON INC. AUTHORIZED CONTRACTOR who installed the products will provide warranty service to the owner. Should the installing contractor be unavailable, contact your local Dectron, Inc. representative or the factory.

Force Majeure
Dectron Inc. will not be liable for delay or failure to provide warranty service due to government restrictions or restraints, war, strikes, material shortages, acts of God or other causes beyond Dectron Inc.'s control.

STARTUP

Warranty

Terms of Limited Warranty
DRY-O-TRON® Energy Recycling Dehumidifiers (packaged units) and Factory Supplied Accessories

Optional Third to Fifth Year Compressor Warranty
Under this warranty a new or re-built compressor will be supplied at Dectron Inc.'s expense, F.O.B. factory, provided the failed compressor is returned to the factory with transportation prepaid. This extended compressor warranty is subject to all the terms of the standard DRY-O-TRON® warranty but applied to the compressor only.[1] This extended warranty must be purchased before shipment of the unit.

[1]Does not cover labor costs.

Optional Third to Fifth Year Coil Warranty
Under this warranty a new or re-built coil will be supplied at Dectron Inc.'s expense, F.O.B. factory, provided the failed coil is returned to the factory with transportation prepaid. This extended coil warranty is subject to all the terms of the standard DRY-O-TRON® warranty but applied to the coil only.[2] This extended warranty must be purchased before shipment of the unit.

[2]Does not cover labor costs.

Optional Delayed Start-Up Warranty
Under this warranty upon expiry of the initial 30 days warranty, and until completion of 34 months from date of shipment from Dectron Inc., if any part supplied by Dectron Inc. fails because of a defect in workmanship or material Dectron Inc. will furnish a new or rebuilt part F.O.B. factory. No reimbursement will be made for expenses incurred in making field adjustments or replacements unless specifically re-approved by Dectron Inc. in writing beforehand.

The optional delayed start-up warranty is only valid if all of the following conditions are met:

- Δ Water or condensation are not allowed to enter the electrical panel.
- Δ Indoor units are stored in a dry and protected area.
- Δ Electrical power must not be connected.
- Δ Unit not tampered with or vandalized in any fashion.
- Δ Start-Up Report and Warranty Registration is completed and sent to the factory within one week of initial start-up.

This optional delayed start-up warranty is subject to all the terms of the standard DRY-O-TRON® warranty. This extended warranty must be purchased before shipment of the unit.

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Fax: 514-334-9184

Contents

Operation Maintenance Schedule

The following list is important to the proper function and long life of the unit.

Every Month

Check the Air Filters

- All units have intake-air filters. Some units also have exhaust-air filters. The unit cannot work properly with dirty filters.
- All dirty filters should be replaced with identical new filters. Filters for outdoor air should be moisture resistant.
- **Do not operate the unit for any amount of time without all filters in place.**

Check the blower belt

- Check for excessive wear. Be sure the belt will operate another month.
- Check the blower belt tension. Belts should not be so loose as to cause increased slip, nor so tight as to cause excessive shaft bearing wear.

Check that the condensate drain pan(s) is clean.

For indoor units-

- Remove all chemicals from the DRY-O-TRON® equipment room.

Every Six Months

Check that there are no bubbles in the sight glass after 10 minutes of compressor operation. See **Startup - Adjustments**.

Check the compressor discharge temperature. See **Startup - TXV Adjustment**.

Check that the heat wheel (if any) is not dirty. Clean as necessary. See **Operation - Maintenance - Heat Wheel**.

For units with gas-fueled boilers, check the heat transfer fluid properties.

- The color should be fluorescent pink.
- The pH should be 8.0 to 10.0.
- The minimum reserve alkalinity should be 11.0ml.
- The refractive index should be 1.38.
- The specific gravity should be 1.08.
- In the event of significant differences from the above values, contact Dectron for corrective actions.

Every Twelve Months

Check for blower bearing wear.

Grease the blower bearings.

- Use a high quality grease for HVAC applications.
- Do not over-grease. Add grease until just a little oozes out from the bearing shield.

Check the condensate drain pan for any accumulated residue. Clean as necessary.

Check the air heat transfer coils for dirt and/or trash.

- If the coils are dirty
  - Δ Clean the coils with a solution of mild soap in warm water. Do not use corrosive cleaning agents.
  - Δ Increase the frequency of filter replacement. Dirty filters leak dirt onto the coils.

In the event of a future shutdown, be sure to leave power on the unit for the crankcase heaters. To start the DRY-O-TRON® again, follow the steps in the **STARTUP** section of this manual.

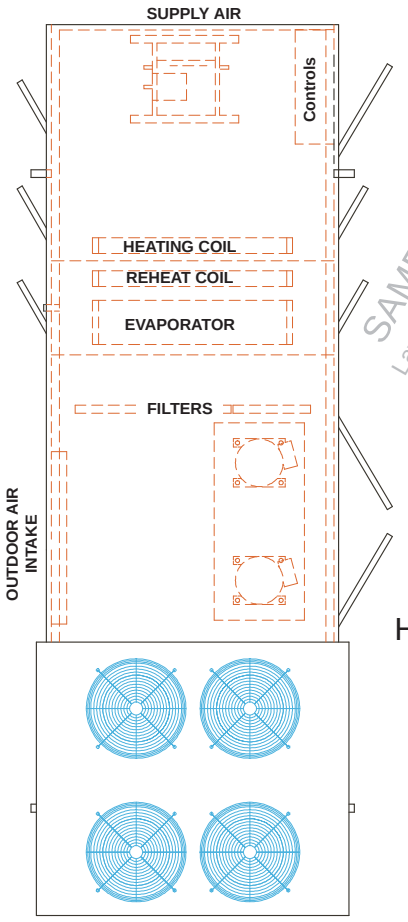
OPERATION

Check Air Filters

There may be several air filters, some of which may not be readily visible. To be sure that all the filters are clean and in place, use the draw tabs to remove all the filters, then re-install them .

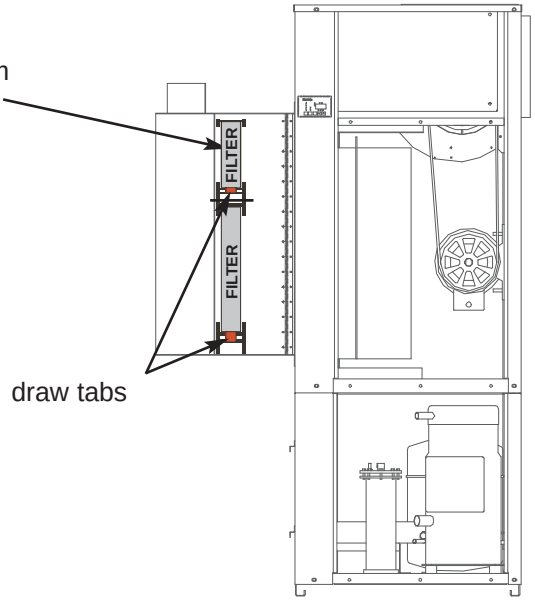
Other units may have filters that lift out. In this case the filters will be directly accessible.

Filters for outdoor air must be moisture resistant.



HORIZONTAL UNIT

There may be several air filters, some of which may not be visible from the access panel. To be sure that all the filters are clean and in place, use the draw tabs to remove all the filters, then re-install them.



VERTICAL UNIT

OPERATION

Belts should not be frayed, glazed, or excessively worn. Follow standard belt inspection procedures recommended by the belt manufacturer.

To check belt tension, first disconnect electric power from the unit and follow all recommended safety precautions. Obtain and use a V-Belt tension gauge according to the instructions provided with it. Most major belt manufacturers provide or recommend a suitable gauge for their belts.

In an emergency, the guidelines below may help until a belt tension gauge is obtained.

Measure the distance in inches between the shaft centers. Multiply the number of inches by 1/64. This will be the deflection (D) in the diagram at right.

ex: For S=32 inches,

D= 32in x 1/64 = 1/2 in.

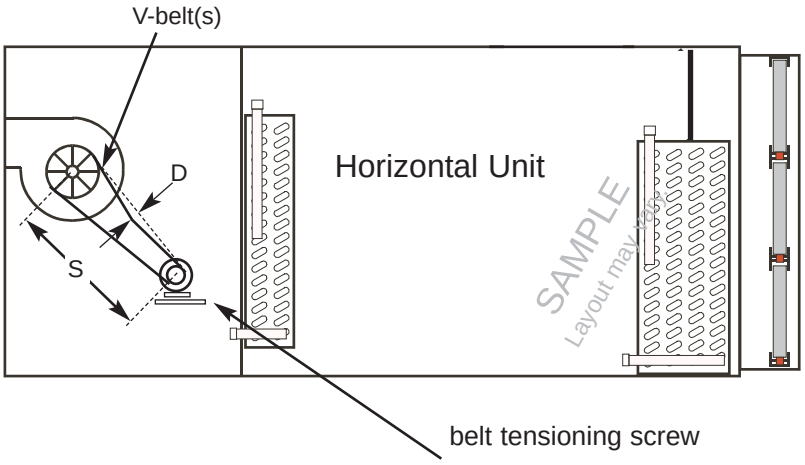
Measure the diameter of the smaller sheave.

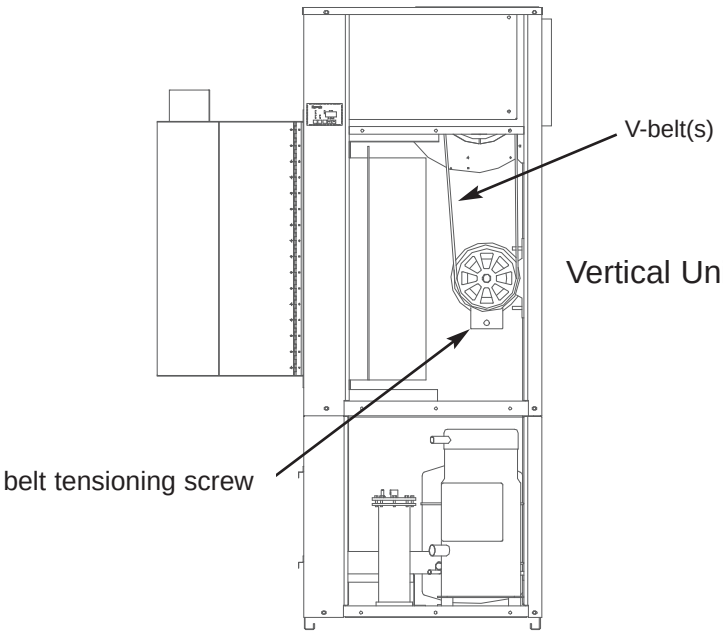
Read the V-belt cross-section size from the belt label or from the unit nameplate.

Adjust the belt tension to cause the force needed to produce the deflection D to be near that shown in the table on the next page.

ex: For the above example of 32 inches between shaft centers, assume that the belt is a new B60 and that the smaller sheave is 7 inches in diameter. From the table on the next page, a new B60 belt with a 7 inch small sheave should require 6.3 pounds of force to produce the 1/2 inch deflection.

Adjust the belt tension until the measured force necessary to produce the 1/2 inch deflection is about 6.3 pounds.





OPERATION

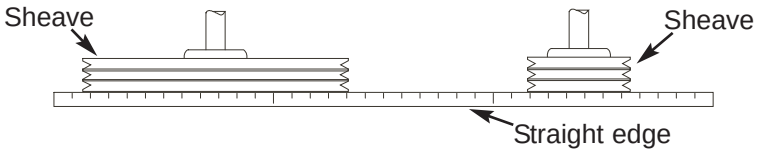
V-Belt Tensioning

Belt size	Small sheave diameter (in)	Deflection force (lbs.)		
		Initial Installation	Re-tensioning	
			Max.	Min.
A	3.0 - 3.4	3.3	2.9	2.2
	3.6 - 4.2	3.5	3.1	2.4
	4.6 - 6.0	3.7	3.3	2.5
B	4.6 - 5.4	6.0	5.1	4.0
	5.6 - 7.4	6.3	5.5	4.2
	8.6 - 9.4	6.6	5.7	4.4
C	7.0 - 8.5	13.2	11.5	8.8
	9.0 - 12.0	13.9	12.1	9.3
	13.0 - 16.0	14.6	12.6	9.7
D	12.0 - 15.5	26.5	22.9	17.6
	16.0 - 18.0	27.8	24.3	18.7
	22.0 - 27.0	29.1	25.6	19.6
E	17.7 - 23.6	39.7	34.4	26.5
	23.7 - 31.5	41.7	36.2	27.8
	31.6 - 39.3	43.7	37.9	29.1
AX	2.1 - 3.4	4.4	3.7	2.9
	3.6 - 4.2	4.6	4.0	3.1
	4.6 - 6.0	4.9	4.2	3.3
BX	3.7 - 5.4	7.7	6.6	5.1
	5.6 - 7.4	8.2	7.1	5.5
	8.6 - 9.4	8.6	7.5	5.7
CX	5.8 - 8.5	17.2	15.0	11.5
	9.0 - 12.0	18.1	15.7	12.1
	13.0 - 16.0	19.0	16.5	12.8
3V	2.65 - 3.35	5.5	4.8	3.9
	3.65 - 4.12	6.4	5.7	4.4
	4.5 - 5.6	7.5	6.6	5.1
	6.0 - 10.6	8.6	7.5	5.7
5V	7.1 - 8.5	19.2	16.7	13.0
	9.0 - 11.8	23.3	20.3	15.6
	12.5 - 16.0	27.3	23.8	18.5
8V	12.5 - 16.0	50.9	44.3	34.4
	17.0 - 20.0	57.1	49.8	38.6
	21.2 - 24.8	61.3	53.3	41.4
3VX	2.2 - 3.35	5.5	4.8	3.9
	3.65 - 4.12	6.4	5.7	4.4
	4.5 - 5.6	7.5	6.6	5.0
	6.0 - 10.6	8.6	7.5	5.7
5VX	4.4 - 8.5	19.2	16.7	13.0
	9.0 - 11.8	23.3	20.3	15.6
	12.5 - 16.0	27.3	23.8	18.5

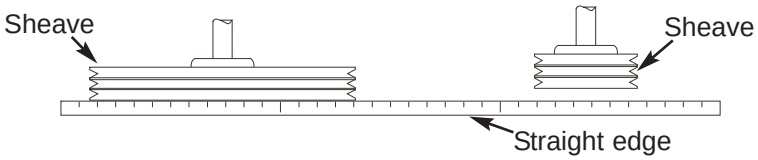
Where sheaves carry more than one belt, never replace only one belt. If any belt must be replaced, replace all the belts with new ones. When replacing multiple belts use only new belts from the same manufacturer and the same lot number, or use matched belts. Failure to do this will result in severe belt wear.

When removing or replacing belts, always relieve the belt tension to position the belts. Never prize the belts with a screwdriver or other tool.

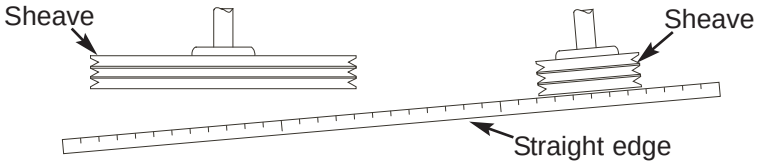
Belt sheaves must be properly aligned, as shown below.



While the sheaves were aligned at the factory, future adjustments may cause varying degrees of misalignment. A common problem is parallel misalignment, as shown below. Parallel misalignment causes excessive belt, sheave, and bearing wear.



Another common problem is angular misalignment, as shown below. Angular misalignment causes excessive belt, sheave, and bearing wear.

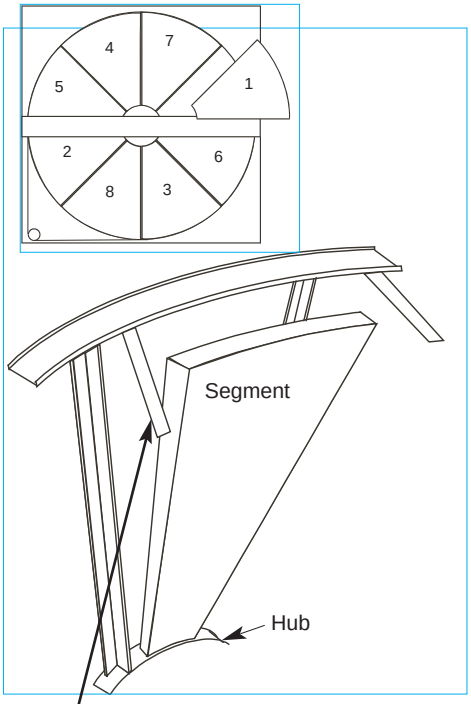


OPERATION

Some units may have heat recovery wheels. In this case, the wheels may have to be cleaned occasionally to maintain proper operation.

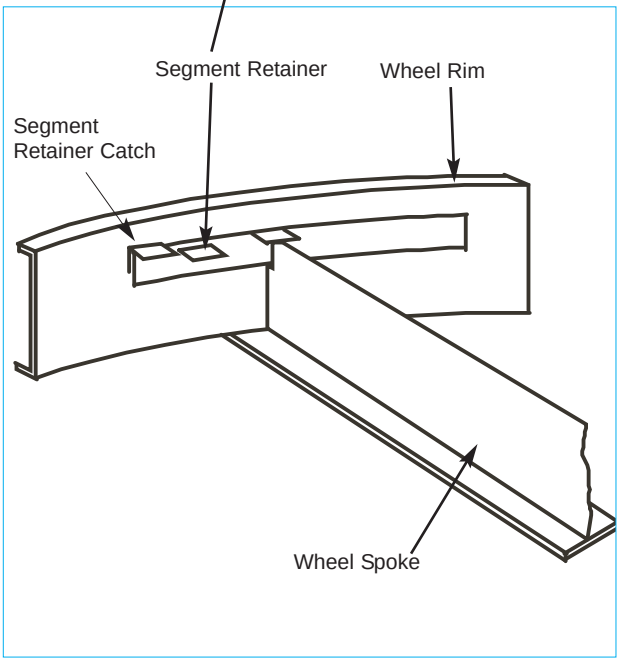
To remove the segments:

1. Turn off electric power.
2. Unlock the retainer catches for one segment. Move the retainer up and away to allow the segment to be removed.
3. Pull outward and upward to remove one segment.
4. Store the segment so that it does not become bent or twisted, and so that the media does not get scratched or deformed.
5. In order to keep the wheel balanced and easy to turn, next remove the opposite segment.
6. Repeat until all segments are removed.



To wash the segments:

1. If any loose particles are ont he surface of the wheel, brush them off carefully. Do not deform the media.
2. Soak the segments in a 5% solution of non-acid based coil cleaner, such as Acti-Klean (W.W. Grainger 5W042). Alternatively, soak the segments in warm water with alkaline detergent.
3. When all dirt films have dissolved or loosened, remove the segments and rinse them with clean water.
4. Drain the excess water from the segments.



To re-install the segments:

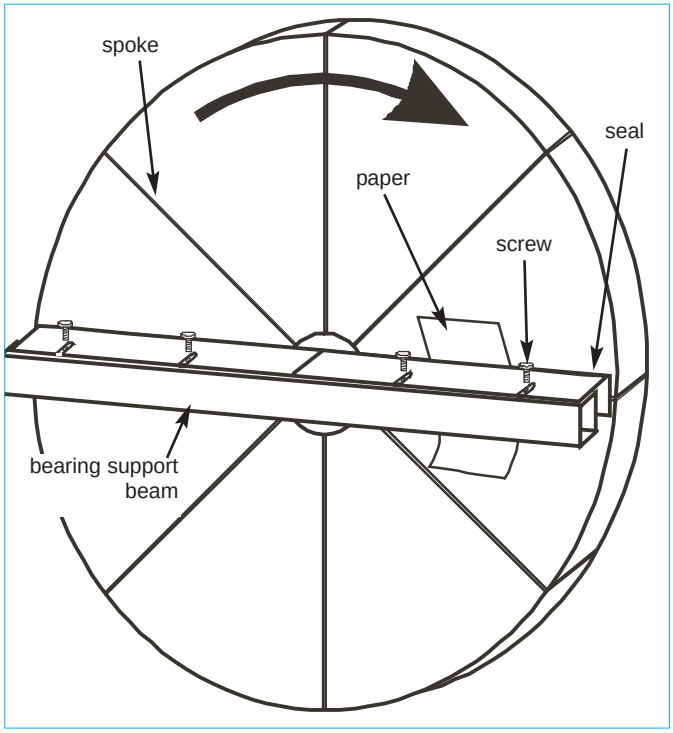
1. Turn off electric power.
2. With the embedded stiffener facing the motor side of the wheel, insert the narrow end of the segment into the hub.
3. Holding the segment by the two upper corners, press the segment into the hub and inward against the wheel spokes.
4. Close the segment retainers, and latch them with the retainer catches.
5. In order to keep the wheel balanced and easy to turn, next install the opposite segment.
6. Repeat until all segments are installed.

OPERATION

Some units may have heat wheels, in which case the air seals may need adjusting occasionally, e.g. after each cleaning.

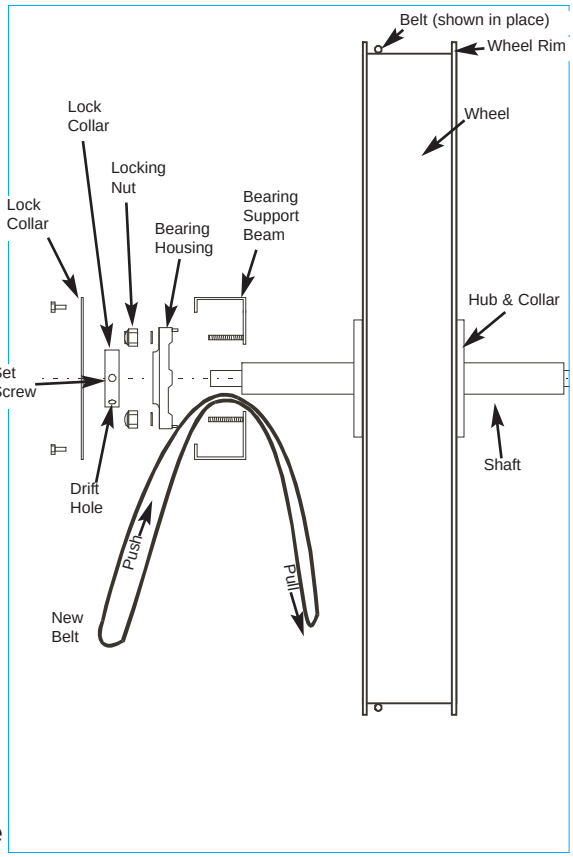
To adjust the air seals:

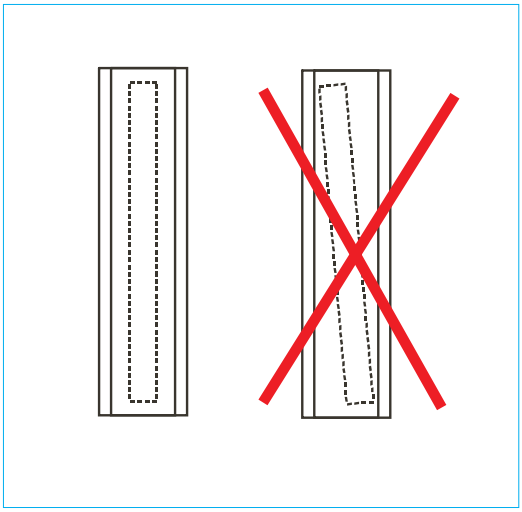
1. Turn off the electric power.
2. By hand, rotate the wheel clockwise until two opposing spokes are hidden behind the bearing support beam.
3. Loosen air seal screws.
4. Slide the seals slightly away from the wheel.
5. Place a folded peice of paper between the seals and the wheel.
6. Slide the seals toward the wheel until there is a slight friction on the paper as it is moved back and forth along the length of the spoke.
7. Tighten the seal screws.
8. Check again for a slight friction on the paper as described above. Remove paper before operating.
9. Some wheels may have a separate hub seal. Use above method to adjust any hub seal.



To replace the wheel belt:

1. Turn off electric power.
2. Remove the belt-side bearing access plate, if any.
3. Loosen the bearing collar set screw.
4. Using a soft drift in the drift pin hole, tap the bearing collar in the direction of wheel rotation. This should loosen the bearing from the shaft.
5. Remove the bearing collar.
6. Remove the nuts securing the bearing housing to the bearing support beam.
7. Remove the bearing from the shaft.
8. Remove the air seals (or hub seal, if any) from the bearing support beam.
9. Remove the old belt.
10. Push a small loop of the new belt throught he space between the shaft and the bearing support beam as shown.
11. Carefully pull most of the belt through the gap. Do not cut or scrape the belt on metal parts. Leave enough belt to loop over the shaft.
12. Loop the trailing end of the belt over the shaft.
13. Re-install the bearing onto the wheel shaft, being careful to align the locating pins into their holes in the bearing support beam. Secure the bearing with the locking nuts and washers.
14. Work the new belt around the wheel and the pulley.
15. Re-install the air seals or the hub seal (if any). See previous page for seal adjustment procedure.
16. Re-install the bearing locking collar. Using the soft drift, tighten the collar by rotating the collar opposite the direction of wheel rotation. Tighten the set screw.
17. Re-install the Bearing Access Cover.
18. Connect electric power and run the wheel. Be sure the wheel runs freely. Be sure the belt tracks evenly.



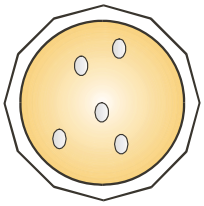


OPERATION

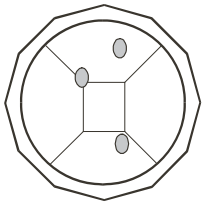
Be sure there are no bubbles or droplets in the refrigerant sight glasses after five minutes of compressor operation.

Drain pans may collect dirt or other foreign materials. Keep them clean by washing them out as necessary. Be sure the condensate drain works.

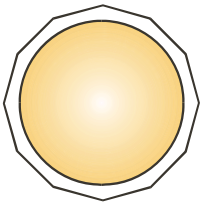
If bubbles or droplets are noted, contact Dectron or a Dectron-certified technician.



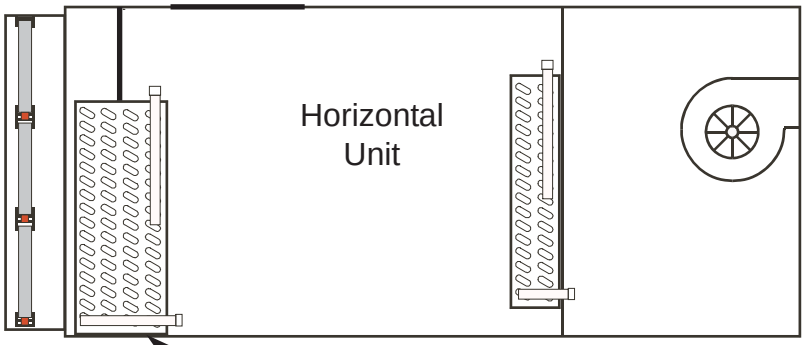
Bubbles in the sight glass indicate problems such as a possible loss of refrigerant.



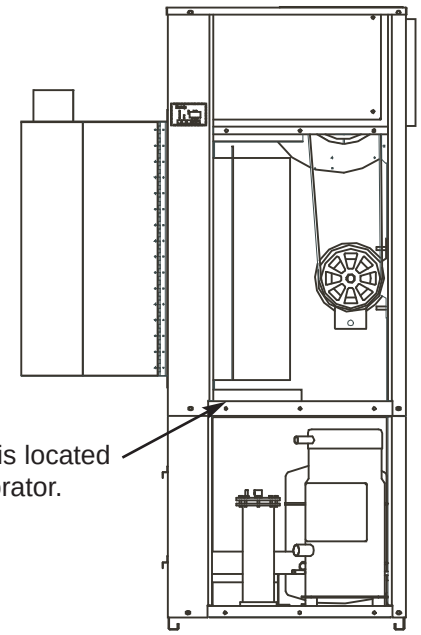
Oil droplets in the sight glass may indicate severe problems such as loss of refrigerant.



After 5 minutes of compressor operation, the sight glass should be clear and full of liquid refrigerant.



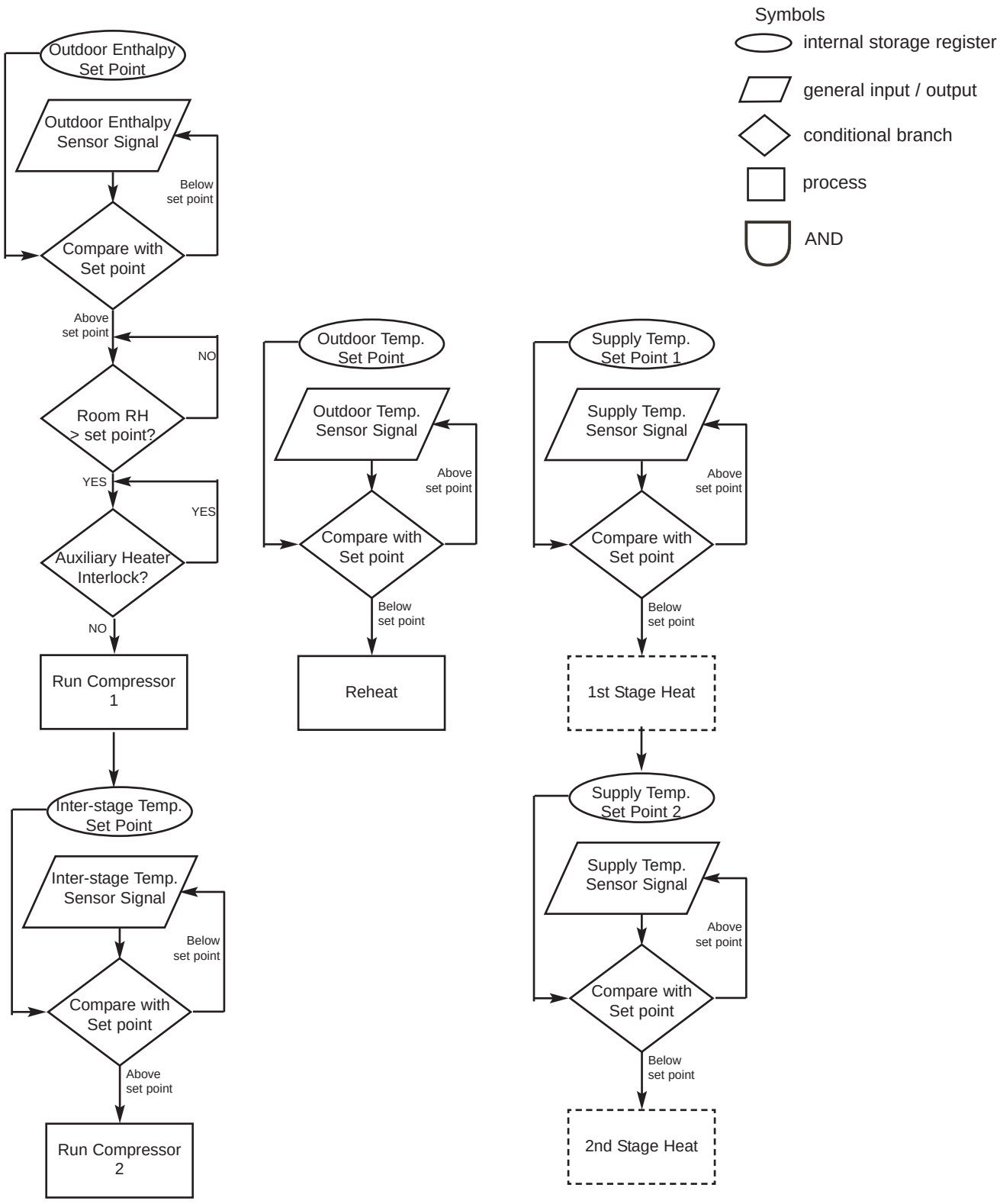
Some units have sight glasses located behind transparent windows in access panels.



OPERATION

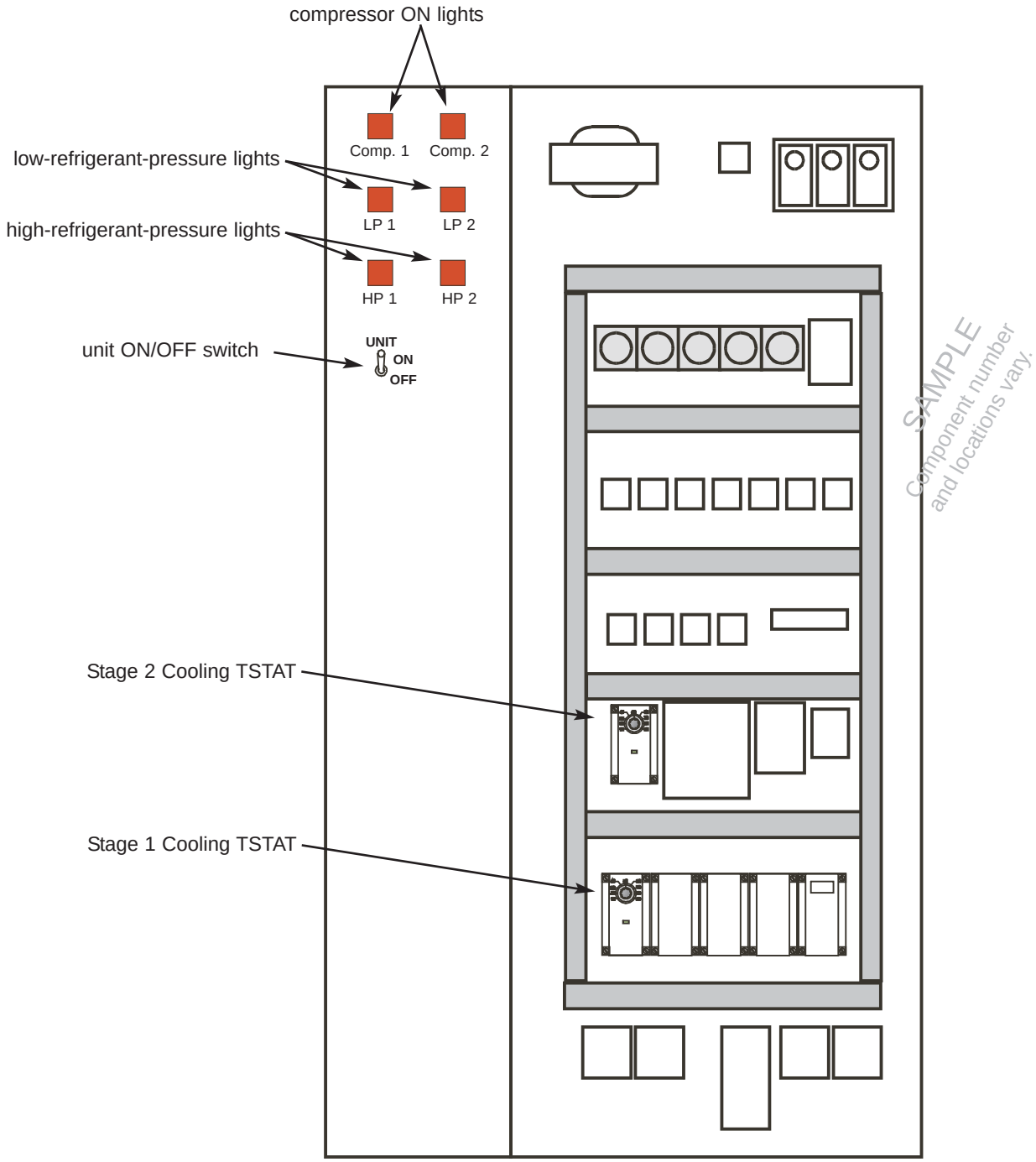
1. Choose a time when the outdoor air temperature and relative humidity are well above the nameplate values, so that the unit will operate at maximum capacity. (See **Product Description - Unit Nameplate**).
2. Install the remote sensor of a known-accurate electronic thermometer (by others) by clamping it tightly to the compressor discharge tube, about six inches from the compressor shell.
3. Insulate the sensor with at least 1/2" (1 cm) of insulation (suitable for 200°F (93°C)) for at least 3 inches on either side.
4. Tape the insulation to prevent air leakage onto the sensor when the blower runs.
5. Route the sensor cable out the access panel or access door of the unit.
6. Connect the cable to the thermometer.
7. Close the access panels or doors.
8. Start the unit per the instructions given in **Startup - Enable Operation**.
9. Be sure that the refrigerant sight glass is completely full of liquid, with no bubbles. If bubbles are present, return to **Installation**.
10. After the compressor(s) has been running for at least 20 minutes, the compressor discharge temperature as measured by the thermometer should be between 180°F (82°C) and 200°F (93°C). If not, see Start-up - TXV Adjustment.
11. Remove the thermometer probes.
12. Repeat the above steps for any other refrigeration circuits.

Flow Chart



OPERATION

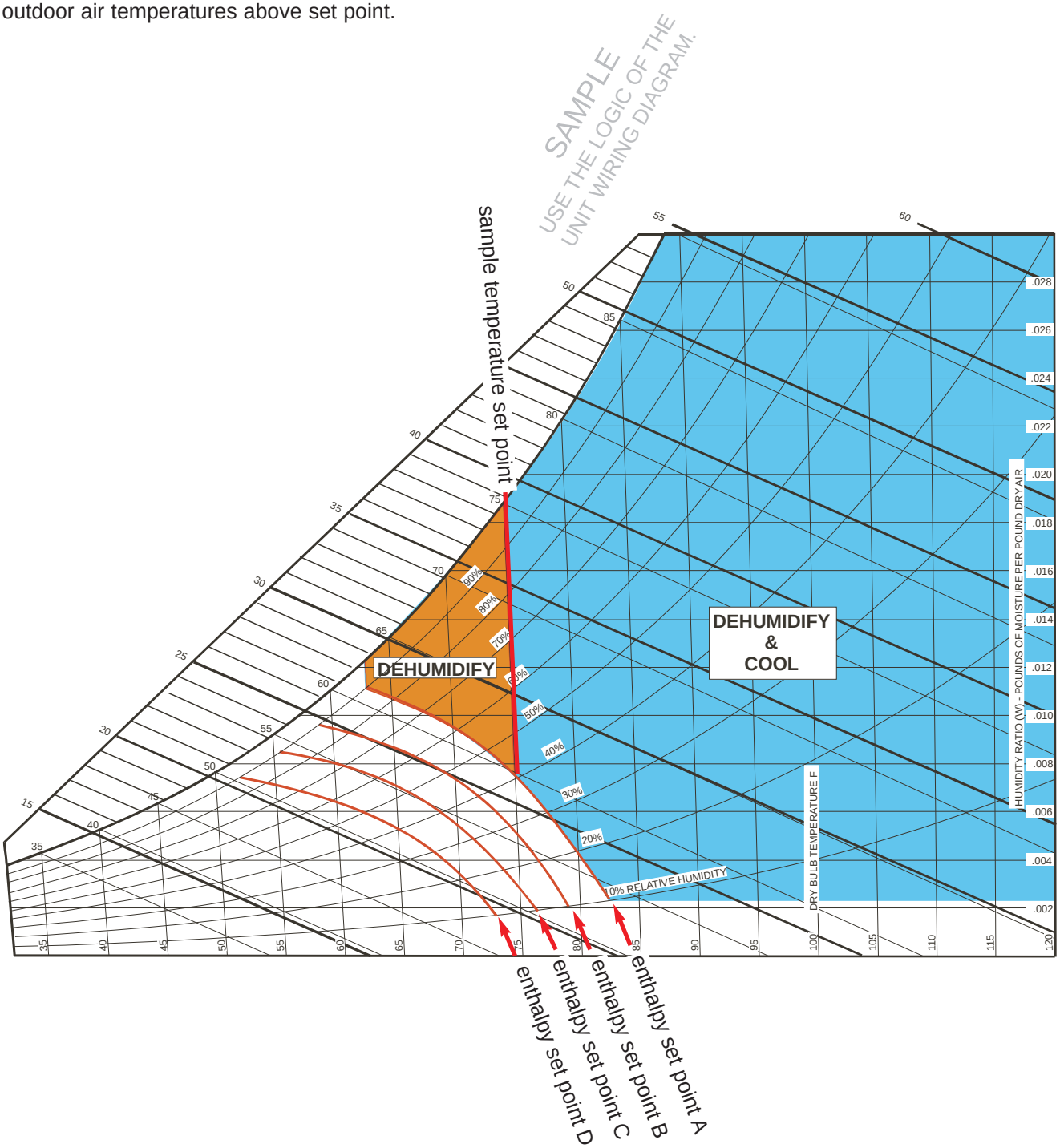
Operation Control Component Location



Operation Description

As shown in the psychrometric chart below, the DK series dehumidifies for incoming outdoor air enthalpies above set point.

The DK series dehumidifies and cools for incoming outdoor air enthalpies above set point and incoming outdoor air temperatures above set point.



OPERATION

Operation — Adjust Enthalpy Set Point

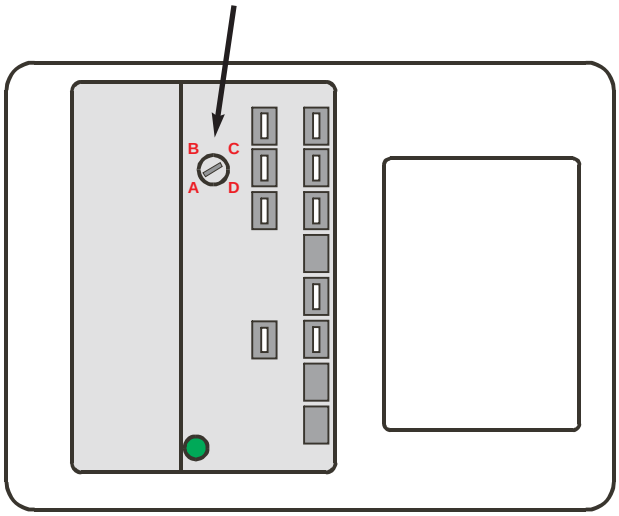
The enthalpy control senses the temperature and relative humidity of the outdoor air entering the unit. To minimize energy costs and protect the equipment, it limits refrigeration to periods when the intake air requires conditioning. Refer to **Operation - Operation Description and Operation - Flow Chart** for a graphical explanation of operation.

The enthalpy controller is set to match the refrigeration stage(s).

Consult Dectron before adjusting the enthalpy controller.
If the enthalpy controller must be adjusted, use a screwdriver to turn the adjusting screw. Refer to **Operation - Operation Description** for a comparison of the different settings available.

The enthalpy controller is located in the electrical enclosure.
The sensor is in the unit air intake, behind the filters.

On some older unit, the entire enthalpy controller may be located in the air intake, behind the filters.

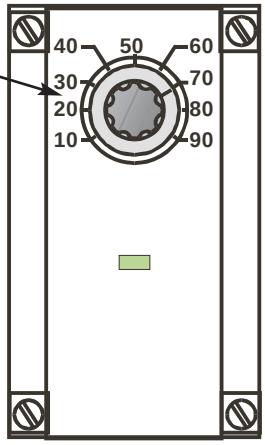


Adjust Cooling Set Point

The first-stage cooling thermostat is located in the unit electrical enclosure. It senses intake air temperature.

The first-stage cooling thermostat senses the temperature of the air entering the unit from outside.

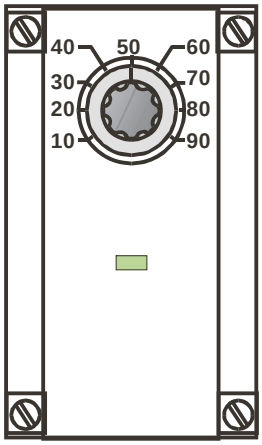
To adjust the first-stage cooling set point, turn the thermostat knob to the new setting.



The second-stage cooling thermostat is located in the unit electrical enclosure. It senses cooled air temperature.

The second-stage cooling thermostat senses the temperature of the cooled air entering the reheat coil.

Consult Dectron before adjusting the second-stage cooling thermostat.



OPERATION

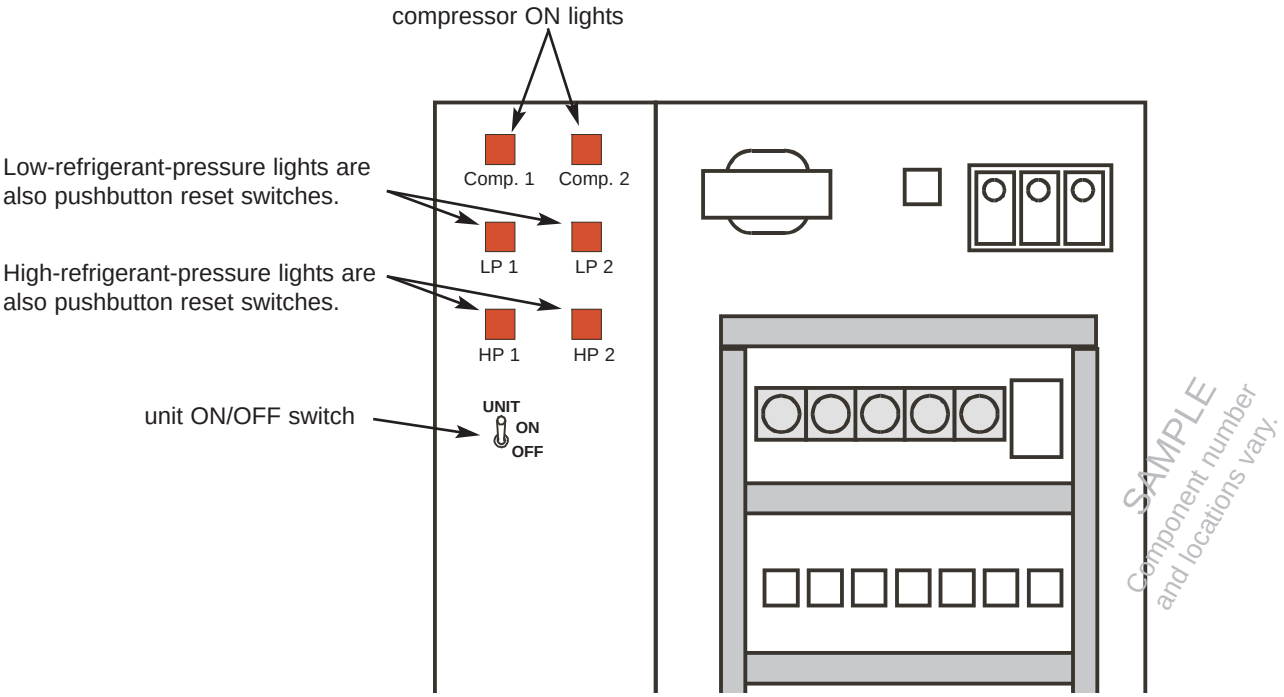
Operation Reset Alarms

Before resetting an alarm, try to correct the cause of the alarm.

Low refrigerant pressures and high refrigerant pressures in a refrigeration circuit will stop operation of that circuit. The pressure switches may be manual reset or automatic reset, depending on options. Both will illuminate a labelled alarm light.

Manual-reset switches latch mechanically. To reset the alarm, locate the switch and press the reset button on the switch.

Automatic-reset switches have latching circuits. To reset the alarm, press the alarm light, which is also a momentary push-button switch.



PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COOLING WATER FLOW SWITCH OPEN (water-cooled units only)	Reduction of cooling water flow.	• **Be sure the correct water flow is present.**
	Water pressure switch incorrectly adjusted.	• **Adjust switch. See Startup - Adjust Flow Switch.**
BLOWER OVERLOAD TRIPPED	Cabinet doors left open	• **Close all cabinet doors. Reset overload.**
	Excessive air flow	• **Be sure air flow is as specified on unit nameplate.**
	Overload device manual switch is OFF	Check switch position visually • **Press the OFF switch, then press the ON switch.**
	Blower motor current too high	Check that the blower motor current is not higher than the unit nameplate value • **Adjust the branch circuit voltage to the nameplate value ±10%.** • **Adjust the blower sheaves to produce design air flow.**
	Unexpected open switch circuit	Check for loose terminals on overload device auxiliary switch • **Tighten as necessary** Check for continuity of overload device auxiliary switch • **Replace as necessary**
	Defective overload device	Replace overload device as necessary. Contact Dectron or your Dectron representative for referral to a Dectron-certified technician.

OPERATION

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
	Manual isolation valves not opened at installation	• **Be sure all isolation valves are opened.**
ALARM  COMPRESSOR X HIGH PRESSURE	Loss of cooling water on water-cooled units	• **Be sure water flow is correct. See Startup - Adjust Flow Switches.** • **Be sure the cooling water temperature is not above that stated on the unit nameplate.**
	Loss of air flow in remote condensers on air-cooled units	• **Be sure the remote condenser safety switch is ON. Be sure that all fuses (if any) are good.** • **For polyphase condensers, be sure that all phases are present. Be sure the fans turn the proper direction.** • **Be sure that there are no walls, fences, bushes, or other air flow interruptions near the remote condenser. See Installation - Locate Remote Condenser.** • **Be sure the remote condenser is clean.**
	Improperly adjusted pressure control valve(s)	• **Consult Dectron or a Dectron-certified technician.**
	Intake air temperature too high	• **Be sure set points correspond to those shown on the unit nameplate.** • **Be sure controller outputs are not calling for heating. See unit wiring diagram.**
	Fouled or damaged reheat coil	• **Be sure reheat coil is not coated with foreign materials such as dirt from unfiltered outdoor air or scum from spas / hot tubs.** • **Be sure reheat coil is not corroded. Corrosion is due to poor chemical storage or excessive chloramine production.**
	Excess refrigerant	• **This will be most common in warm weather. Be sure the total refrigerant charge corresponds to the amount shown on the unit nameplate.**
	Defective high pressure switch	• **Consult Dectron or a Dectron-certified technician.**

OPERATION

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COMPRESSOR X DISCHARGE TEMP. TOO HIGH (DTS-X open)	Improperly adjusted refrigerant expansion valve(s)	• **Consult Dectron or a Dectron-certified technician.**
	Excessive return air flow	• **Contact an air-balance service to be sure the air flow is within tolerance.**
	Inadequate refrigerant	• **With the compressor running, check for bubbles in the sight glass(es). If bubbles are present contact Dectron or a Dectron-certified technician.**
	Defective temperature sensor	• **Consult Dectron or a Dectron-certified technician.**
COMPRESSOR X DISCHARGE TEMP. TOO LOW	Improperly adjusted refrigerant expansion valve(s)	• **Consult Dectron or a Dectron-certified technician.**
	Inadequate return air flow	• **Contact an air-balance service to be sure the air flow is within tolerance.**
	Improperly adjusted pressure control valve(s)	• **Consult Dectron or a Dectron-certified technician.**
ALARM  COMPRESSOR X LOW PRESSURE	Manual isolation valves not opened at installation	• **Be sure all manual isolation valves are open.**
	Inadequate refrigerant charge	• **The refrigerant sight glasses must be completely full whenever the compressor has been running for at least five minutes. If this is not the case, consult Dectron or a Dectron certified technician.**
	Low room air temperature	• **Be sure set points correspond to those shown on unit nameplate. Be sure room heater is working properly.**
	Low room humidity	• **Be sure set points correspond to those shown on unit nameplate. Be sure outdoor makeup air flow rate is not excessive.**
	Inadequate return air flow	• **Contact an air-balance service to be sure the air flow is within tolerance.**
	Clogged refrigerant filter-drier	• **Consult Dectron or a Dectron-certified technician.**
	Improperly adjusted pressure control valves	• **Consult Dectron or a Dectron-certified technician.**
	Defective refrigerant expansion valve	• **Consult Dectron or a Dectron-certified technician.**
	Defective pressure switch	• **Consult Dectron or a Dectron-certified technician.**

OPERATION

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COMPRESSOR 1 OIL FAILURE or COMPRESSOR 2 OIL FAILURE	Low oil level in compressor crankcase	• **Check oil level in compressor oil sight glass.** • **Be sure the evaporator pressure does not operate below 50 PSI for significant periods.** • **For units with air-cooled air conditioning, be sure the refrigerant tubes to the remote condenser are not longer than the length specified on the unit nameplate.** • **For units with air-cooled air conditioning, be sure the refrigerant tubes to the remote condenser are the same O.D. as specified on the unit nameplate.** • **For units with air-cooled air conditioning where the remote condenser is more than 20 feet above the DRY-O-TRON, be sure the hot gas riser tube(s) have P-traps as specified in this manual.**
	Excessive compressor wear	• **Consult Dectron or a Dectron-certified technician.**
	Compressor oil pump failure	• **Consult Dectron or a Dectron-certified technician.**
	Compressor oil pressure switch failure	• **Oil pressure should be more than 10 PSI above evaporator pressure.** • **Consult Dectron or a Dectron-certified technician.**
COMPRESSOR X OVERHEAT (CMT-X OPEN)	Applied voltage out of tolerance or out of balance	• **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1).**
	Low oil level in compressor crankcase	• **See "OIL PRESSURE FAILURE" above**
	Evaporator pressure too low or hot gas bypass valve open too long (when so equipped).	• **Be sure the evaporator pressure does not operate below 55 PSI for significant periods. Be sure HGBV is properly adjusted.**
	Defective refrigerant expansion valve	• **Consult Dectron or a Dectron-certified technician.**
	Defective compressor overheat detector	• **Consult Dectron or a Dectron-certified technician.**

OPERATION

Data subject to change without notice.

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COMPRESSOR X OVERLOAD TRIPS	Applied voltage out of tolerance or out of balance	• **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1). Reset overload.**
	Evaporator bypass damper closed when room is above 78°F and 40%rh.	• **Be sure evaporator bypass damper is fully open when the room temperature is above 78°F and the room relative humidity is above 40%.**
		• **Manual dampers should be locked in the open position when room is above 78°F and 40%rh. Automatic dampers have a motorized actuator to open the damper when the temperature of the air leaving the evaporator is above 50°F. Reset overload.**
	Room temperature too high	• **Be sure that the room temperature set point is near the value specified on the unit nameplate. Reset overload.**
		• **Be sure that the space heater is responding to signals from the DRY-O-TRON®. Reset overload.**
	Room humidity too high	• **Be sure that the room humidity set point is near the value specified on the unit nameplate. Reset overload.**
	Defective compressor overload device	• **Compare trip current to maximum current specified on unit nameplate. A qualified person should adjust or replace the overload as necessary.**
FIRESTAT ALARM TRIP Where so equipped, the DRY-O-TRON® will shut down.	Fire or smoke present	• **Be sure there is no fire.**
	Fire alarm (by others) has been tested but not completely reset	• **Contact your fire alarm technician.**
	Broken fire alarm wiring (by others)	• **Contact your fire alarm technician.**

OPERATION

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
FREEZESTAT TRIP The signal from freeze-stat (where so equipped) indicates imminent freezing of the heating coil. Where so equipped, the DRY-O-TRON® will shut down.	Heating fluid (water or steam) too cold Inadequate flow of heating fluid (water or steam) Excessive outdoor air flow rate Outdoor air temperature unex-pectedly low. Return air filters too dirty Defective freezestat	• **Be sure heating source is operating and properly adjusted.** • **Be sure flow rates are as specified.** • **Be sure the outdoor air intake rate is as specified.** • **Outdoor air intake rate may have to be reduced during coldest weather.** • **Replace with clean filters.** • **Check that the air temperature at the heating coil is approximately 40°F when the freezstat trips.**
GLYCOL PUMP OVER-LOAD The motor protection device for the glycol pump (where so equipped) has tripped.	Excessive glycol viscosity Glycol temperature colder than expected. Applied voltage out of tolerance or out of balance	• **Be sure the glycol is of the proper type and concentration.** • **Be sure glycol temperature is above -30°F.** • **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1). Reset overload.**
MAX. EXHAUST BLOW-ER OVERLOAD (Purge mode equipped units) The motor protection device for the larger exhaust air blower has tripped.	Excess maximum-exhaust air flow rate Applied voltage out of tolerance or out of balance	• **Be sure the Maximum Exhaust air flow rate is as specified. Excess air flow can overload some blowers.** • **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1). Reset overload.**

OPERATION

Data subject to change without notice.

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
MIN. EXHAUST BLOWER OVERLOAD (Purge mode equipped units) The motor protection device for the larger exhaust air blower has tripped.	Excess minimum-exhaust air flow rate	• **Be sure the Minimum Exhaust air flow rate is as specified. Excess air flow can overload some blowers.**
	Applied voltage out of tolerance or out of balance	• **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1). Reset overload.**
POWER FAILURE The voltage monitor circuit is open.	Input voltage out of range	• **A qualified person should be sure that the average applied voltage is within ±10% of the nameplate value and that the individual phase voltages are within ±1% of the average voltage (See NEMA MG-1).** • **Note that the input voltage can go below nominal ±10% at the moment of compressor startup. A qualified person should measure the input voltage at the moment of compressor start up.**
	Input voltage phase rotation reversed	• **A qualified person should interchange any two wires of the branch circuit. Do not move any factory-installed wires.**
	One or more phases of the input voltage are missing	• **A qualified person should determine that all phases are present. Check fuses and/or circuit breakers.**
	For 460 V units, there is a crack in the socket of the voltage monitor	• **A qualified person should inspect the socket. Replace as necessary.**
	Defective voltage monitor	• **Consult Dectron or a Dectron-certified technician.**