



Dectron

DRY-O-TRON®

Design, Installation, Start-Up, and Operation Manual

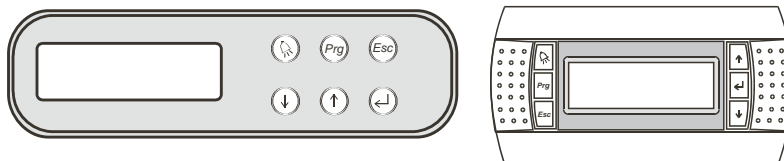
Arranged by Trades and Tasks

(Attach pages as addenda to contracts & work-orders.)

FOR MODELS

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Supersaire® CONTROLLER



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For future reference,
 write your model number* here _____
 write your serial number* here _____
 write your ref number* here _____

*See Product Description - Unit Nameplate.

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

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 attach copies of the appropriate pages to the task contract or work-order. License is hereby granted to copy and distribute as appropriate any pages contained herein for the sole purpose of assisting in the proper application, installation, operation, maintenance, and/or service of Dectron products only. All other rights are retained by Dectron.

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Corresponding Electronic File Name:

DS_SPVR_OM_2012-Mar-27.pdf

To the Owner:

This manual contains important instructions on designing for, installing, starting, 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.

Heating, Cooling, or Dehumidifying Construction Sites

The DRY-O-TRON® unit is not a convenience air conditioner. Its capacity is carefully matched to the expected load. Errors of installation, damage to the unit, and other performance reductions will be obvious once the building begins normal use.

Never use the unit to heat, cool, or dehumidify a construction site. The air coils must be protected against construction dusts until all construction dusts have been removed from the space, and from the outdoor-air intake (if any). Construction dusts bind to the cooling coil permanently and cannot be removed. Once bound, the dusts reduce heat transfer and airflow rate. **Filters will not prevent this.**

The resulting performance reduction and possible component damage are **not** covered by the Dectron warranty.

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Safety Warnings

Save this manual and refer to it whenever a question arises. This manual contains important safety information. Read the entire manual first, then follow the instructions for designing for, installing, starting, and/or operating this product.

Follow any safety, warning, operating, or instructional labels on and inside the product.

Do not attempt to move, install, or service this product unless you are qualified to do so.

WARNING



Risk of electric shock. Can cause injury or death.

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

WARNING

Risk of explosive pressure release. Can cause injury or death.

This product contains refrigerant liquid and vapor under high pressure. Some installation and service procedures could expose personnel to the risk of explosive discharge. Some installation and service procedures could expose personnel to the risk of frostbite from release of refrigerant.

Reclaim refrigerant to reduce the pressure to atmospheric before working on pipes, valves, heat exchangers, compressors, pressure switches, etc.

Once opened, do not close any manual refrigerant valves that might isolate refrigerant from the relief valve. If necessary, install relief valves (by others).

WARNING



Risk of flying liquids, gases, particles. Can cause eye injury.

Many tasks involve risk of exposure to flying materials which can cause eye injury. Always wear protective safety glasses or goggles, as appropriate.

WARNING

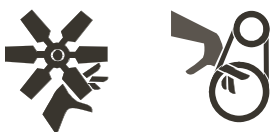


Risk of top-heavy units tipping over. Can cause property damage, injury, or death.

Some units and some ancillary equipment may be shipped in crates that are top heavy. Follow the instructions in the **Lifting and Locating** section, along with all appropriate codes and procedures.

Vertical units may be top-heavy even after removal from shipping materials. Follow the instructions in the **Lifting and Locating** section, along with all appropriate codes and procedures.

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

Warnings

DESCRIPTION

! WARNING



Risk of falling. Can cause injury or death.

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling. Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

! WARNING

Risk of contamination of breathing air. Can cause injury or death.

Application of this product may involve the intake of outdoor air. The point of intake must be carefully chosen to prevent intake of contaminants. Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants. Follow the instructions in this manual and all applicable codes.

! CAUTION

Risk of contact with hot surfaces. Can cause injury.

This product contains surfaces which can cause burn injury. The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation. Compressor crankcase heaters can be extremely hot at any time. Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts.

NOTICE

Risk of leaking water. Can cause property damage.

This product may use circulating water under pressure. This product requires a free-flowing drain. Freezing or other abnormal conditions could cause leakage or overflow. Uncontrolled water can cause expensive damage to buildings and other equipment. Do not locate this product above any equipment that could be damaged by water.

NOTICE

Risk of uncontrolled condensation. Can cause property damage.

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage. Read and follow the instructions in this manual. Optional material will be noted as being optional. All other material should be considered as important to the proper function of the product.

Product Description

DESCRIPTION

DRY-O-TRON® DS Series Energy-Recycling Dehumidifiers and Water Heaters for Indoor Pools, Whirlpools and Spas

DRY-O-TRON® is the original energy recycling dehumidifier. Tens of thousands of units have been installed throughout the world, and DRY-O-TRON® has become synonymous with quality, reliability and energy savings.

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 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

DESCRIPTION

Your DRY-O-TRON® energy recycling dehumidifier and water heater is a precision engineered product, finely tuned to the conditions in your natatorium to achieve maximum performance and energy savings.

Your DRY-O-TRON® has been tested at our factory by skilled personnel. The installation of this state-of-the-art equipment must be performed by an experienced heating, ventilation and air conditioning (HVAC) technician, who has been trained by Dectron.

IMPORTANT!

The DRY-O-TRON® is one of several key components in your natatorium environment control system. In order for your natatorium to be comfortable and condensation free the following areas must be addressed by you and your contractor, engineer and architect design team:

- Δ Humidity control
- Δ Air distribution
- Δ Duct design
- Δ Ventilation requirements
- Δ Moisture migration
- Δ Pool water chemistry

A humidity control system will not provide the expected comfort level and building protection if any of these are overlooked.

Dectron provides guidelines (included in this manual) for each of these critical areas. **These guidelines have been developed from years of field experience and should be strictly adhered to or there is a good**

chance that your system will not work as expected. It is the responsibility of the owner and his design team (contractor, engineer and architect) to ensure that careful consideration has been given to all of the aspects of natatorium environment control.

At Dectron, we care about how you protect your investment.

The DS Series

- Δ Recycles energy
- Δ Saves up to 80% of the energy costs associated with indoor pools and spas
- Δ Helps protect against building damage resulting from uncontrolled humidity
- Δ Heats the pool water (See ventilation limitations under **Major Airflow Options** and under **Building Construction-Outdoor-Air Intake.**)
- Δ Maintains relative humidity levels between 50 and 60% - Guaranteed!
- Δ Can provide year round comfort with optional air conditioning
- Δ Contributes to space heating in cold weather

The DRY-O-TRON® DS Series

When properly installed according to Dectron's instructions, the DRY-O-TRON® will give years of trouble-free comfort, energy savings and building protection.

The DRY-O-TRON® features a unique patented simultaneous energy recycling system. Only DRY-O-TRON® can heat air and water continuously and at the same time with recycled energy to provide ultra-smooth control over space conditions. This means a more comfortable envi-

ronment for the bather. Water and air temperatures are always maintained close to their set point, while relative humidity levels are kept to a comfortable 50-60%. DRY-O-TRON® can also be equipped with optional air conditioning for year round space temperature control.

Dectron is the only manufacturer of energy recycling dehumidifiers that will guarantee pool water temperature and space relative humidity conditions, in writing. Dectron stands behind their product!

DRY-O-TRON® dehumidifiers features 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 start-up with built-in diagnostics and troubleshooting in the unlikely event that service is required.

Dectron uses state-of-the-art computer design and model selection programs which incorporate ASHRAE ventilation requirements to design the right DRY-O-TRON® system for every application.

Product Description

How the DRY-O-TRON® Works

In the natatorium, there is a vapor pressure difference between the pool water and the enclosure air. This produces continuous evaporation of pool water, resulting in high humidity conditions and a steady drop in pool water temperature if left uncontrolled. The high humidity can result in serious building decay, and the pool water requires virtually continuous heating.

An earlier practice called for exhausting the humid air, replacing it with outdoor air which had to be heated to room temperature. In addition, a full size pool heater was required to maintain pool water temperature. This procedure was costly and wasted energy as well.

The heat lost by the pool when evaporation takes place is actually "trapped" by the moisture in the air. A DRY-O-TRON® unit is engineered to capture this trapped energy, and to recycle it back to the pool where it came from! This energy recycling can save up to 80% of the cost of heating your pool by earlier methods. Now you can protect your investment from humidity damage, provide a comfortable environment for bathing, and save money at the same time! You can also feel good about making your contribution to the environment by using recycled energy.

The DRY-O-TRON® dehumidifiers have been specifically designed to offer a complete solution for natatorium

environment control. In DRY-O-TRON® units, cooling is used to produce from moist air:

- Δ Comfortable, dry supply air
- Δ Total heating requirement for pool water
- Δ Condensate (returned to the pool if desired, reducing make-up water requirements.)

The energy cycle of this process has an efficiency of 100% since all moisture or latent heat is converted into sensible heat for recycling. The electrical energy required to operate the system is also converted into sensible heat and contributes to space heating.

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. The DRY-O-TRON® is the only system on the market which can simultaneously and continuously recycle this recovered energy into:

- Δ Heating the supply air. The leaving supply air dry bulb temperature is always the same or higher than the entering return air (except during cold pool water start-up and when the air-conditioning option is in use).

A built-in automatic compensation system permits unit startup regardless of water temperatures. During initial start-up with low pool water temperature, all available heat is directed to the pool

water. Once the desired temperature is reached, the water heating system adjusts its output automatically.

The DRY-O-TRON®'s capability of simultaneously and continuously recycling heat to air and water ensures a more stable natatorium environment.

DRY-O-TRON® units are available in a number of configurations which will easily accept the introduction of controlled quantities of outdoor air. DRY-O-TRON® models DS 40 and larger are equipped with a standard make-up air intake which will allow up to 15% outdoor air.

Product Description

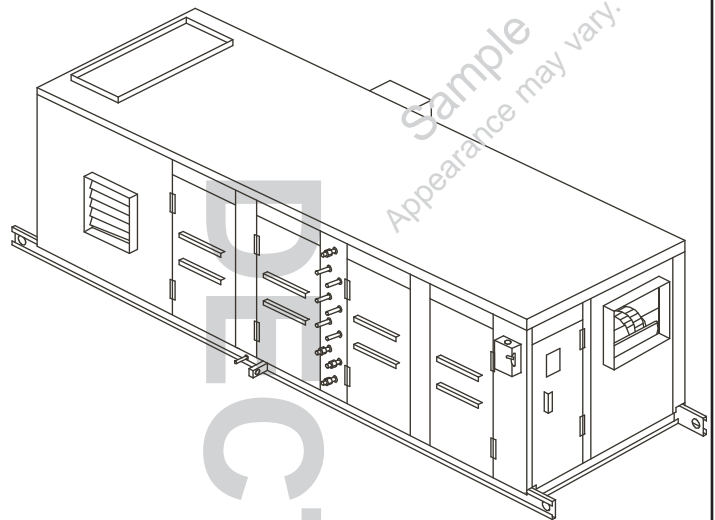
Features

- Δ Standard operator panel
- Δ Energy efficiency
- Δ Little maintenance required
- Δ Simple operation
- Δ Simple installation

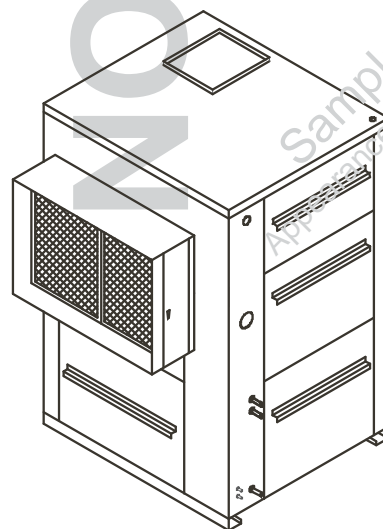
- Δ The basic Dectron DS series DRY-O-TRON® units offer dehumidification of natatorium air as well as pool water heating. The optional Cooling mode offers space cooling.
- Δ The DS series DRY-O-TRON® unit controls an auxiliary pool water heater as necessary to maintain pool water temperature.
- Δ An 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.
- Δ DS series DRY-O-TRON® units are supplied with heat exchangers, air filter(s), and all controls.
- Δ An optional outdoor air intake system includes an automatic damper to stop the outdoor airflow during unoccupied periods.
- Δ A microprocessor control system automatically determines the proper operating mode, based on conditions and occupation. A simple connection to building management systems is available.

Δ Energy consumption

The DS DRY-O-TRON® series offers a temperature and humidity monitoring system that insures the unit is working only as necessary. Automatic refrigeration staging in the remote condenser matches the system capacity to the load. Energy consumption is always minimized.



Horizontal Configuration



Vertical Configuration

Product Description

Major Airflow Options

Basic DRY-O-TRON®

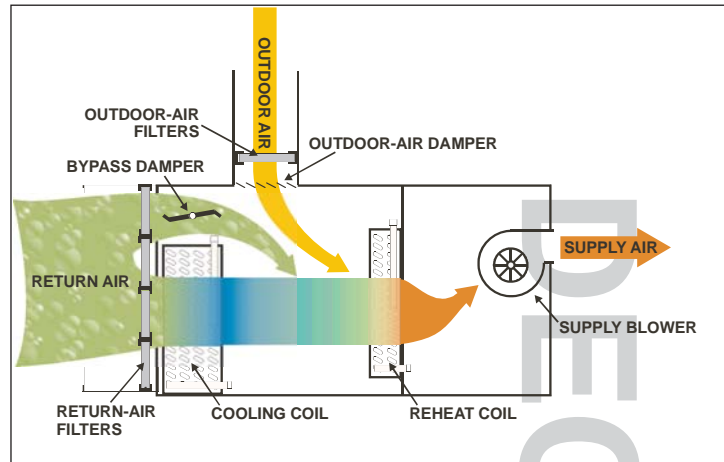
The basic DRY-O-TRON® controls the humidity in the space and returns to the pool the heat it has lost to evaporation.

The same amount of return air passes through the evaporator and the evaporator bypass.

The outdoor-air intake flow rate can be up to 15% of the total supply airflow rate, or up to 35% if the unit has the air-conditioning option, depending on outdoor temperature. The incoming outdoor air must be heated (by others) to not less than 32°F (0°C). There may be limitations on maximum flow rates. See subsequent page in this manual.

Any unit with more than 15% outdoor air must have an auxiliary pool heater, which may be by others.

A built-in clock may limit the intake of outdoor air and/or the exhaust of room air to occupied periods only.

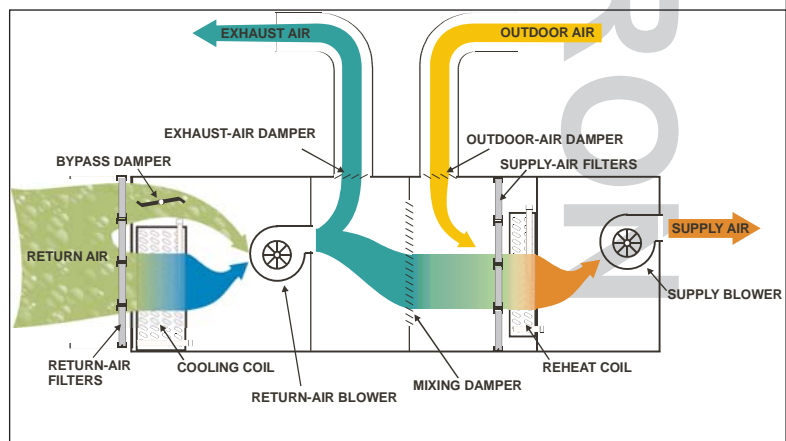
**DRY-O-TRON® with Economizer**

The economizer reduces the amount of energy required for cooling by using a full flow of outdoor air when possible.

The same amount of return air passes through the evaporator and the evaporator bypass.

Under normal (not economizer) mode the outdoor-air intake flow rate can be up to 15% (or up to 35% with air-conditioning option) of the total supply airflow rate, depending on outdoor temperature.

Except in economizer mode, the incoming outdoor air must be heated (by others) to not less than 32°F (0°C). There may be limitations on maximum flow rates. See subsequent page in this manual.



In order to maintain a negative pressure on the natatorium, the exhaust airflow rate should be 110% of the outdoor air intake flow rate.

When outdoor air conditions permit, the refrigeration system is automatically stopped and the room exhaust air and outdoor air intake flow rates are varied to control temperature.

The outdoor-air intake damper(s) must be adjusted mechanically to limit the intake flow to maintain a slight negative pressure on the room.

Natatoriums with DRY-O-TRON® units having the Economizer option must also have auxiliary pool heaters, which may be by others.

Some units with the economizer option may also be equipped with the Intelligent Energy Saver option. The Intelligent Energy Saver® economizer reduces the amount of energy required for cooling and for dehumidification by using an increased flow of outdoor air when possible. A preset amount of outdoor air is brought in during occupied periods, and is increased only as necessary for dehumidification or cooling.

For more information on the Economizer option, refer to [Appendix M5 - Economizer](#).

Major Airflow Options

Product Description

DRY-O-TRON® with SmartSaver®

The SmartSaver® exchanges heat from the exhaust air to the incoming outdoor air to save heating energy. A heat pipe or a thermo-siphon system is installed between the exhaust air and the outdoor air intake. When the outdoor air is colder than the room exhaust air, the SmartSaver® recovers heat from the exhaust stream and delivers it to the outdoor air intake.

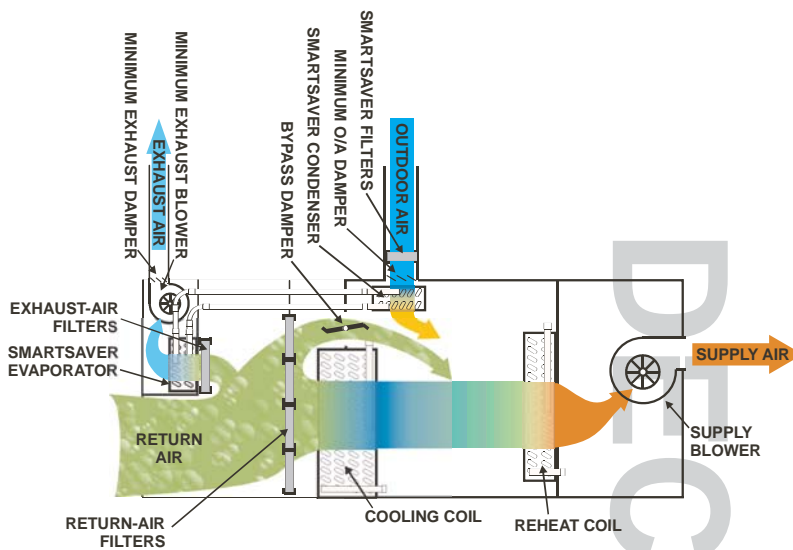
The same amount of air passes through the bypass and the evaporator.

The normal occupied-period outdoor-air intake flow rate can be up to 15% of the total supply airflow rate, or up to 35% if the unit has the air-conditioning option. Units with the SmartSaver option do not require incoming outdoor air to be heated, as long as the incoming outdoor air is above -20°F (-29°C).

Any unit with more than 15% outdoor air must have auxiliary pool heat, which may be by others.

The exhaust airflow rate should be 110% of the outdoor air intake flow rate.

For more information, refer to [Appendix M3 - SmartSaver](#).



DRY-O-TRON® Glycol SmartSaver®

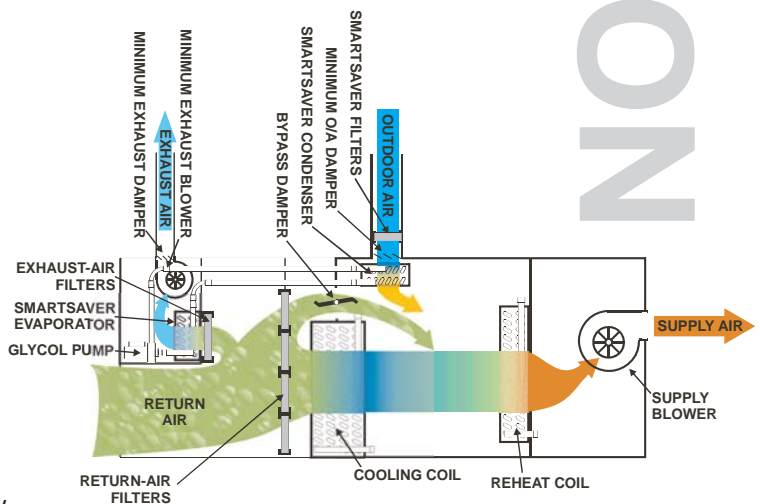
The SmartSaver® exchanges heat between the exhaust air and the incoming outdoor air to save energy. A pumped-glycol heat-exchange system is installed between the exhaust air and the outdoor air intake. When the outdoor air is colder than the room exhaust air, the SmartSaver® recovers heat from the exhaust stream and delivers it to the outdoor air intake stream. When the outdoor air is warmer than the room exhaust air, the SmartSaver® removes heat from the outdoor air intake stream and delivers it to the exhaust air stream.

The same amount of air passes through the bypass and the evaporator.

The normal occupied-period outdoor-air intake flow rate can be up to 15% of the total supply airflow rate, or up to 35% if the unit has the air-conditioning option. Units with the SmartSaver option do not require incoming outdoor air to be heated, as long as the incoming outdoor air is above -20°F (-29°C).

Any unit with more than 15% outdoor air must have auxiliary pool heat, which may be by others.

For more information, refer to [Appendix M3 - SmartSaver](#).



Product Description

Major Airflow Options

DESCRIPTION

DRY-O-TRON® with Purge Option

Superchlorination of a pool may produce gases and odors that preclude the presence of swimmers in the natatorium. Purge mode may be controlled manually to minimize the time in which people must be out of the natatorium during superchlorination.

On receipt of a manual input from the operator,

1. the refrigeration system is stopped,
2. the supply blower continues to run,
3. the evaporator face dampers close,
4. the evaporator bypass damper closes,
5. the outdoor-air damper opens completely,
6. the dampers for blower EF2 open, and
7. EF2 (the larger exhaust blower) runs.

Under normal conditions, half the return air passes through the evaporator while the other half passes through the bypass.

Under normal (not Purge) mode the outdoor-air intake flow rate can be up to 15% (or up to 35% with air-conditioning option) of the total supply airflow rate, depending on outdoor temperature. Except in Purge mode, the incoming outdoor air must be heated to not less than 32°F (0°C). There may be limitations on maximum flow rates. See subsequent page in this manual.

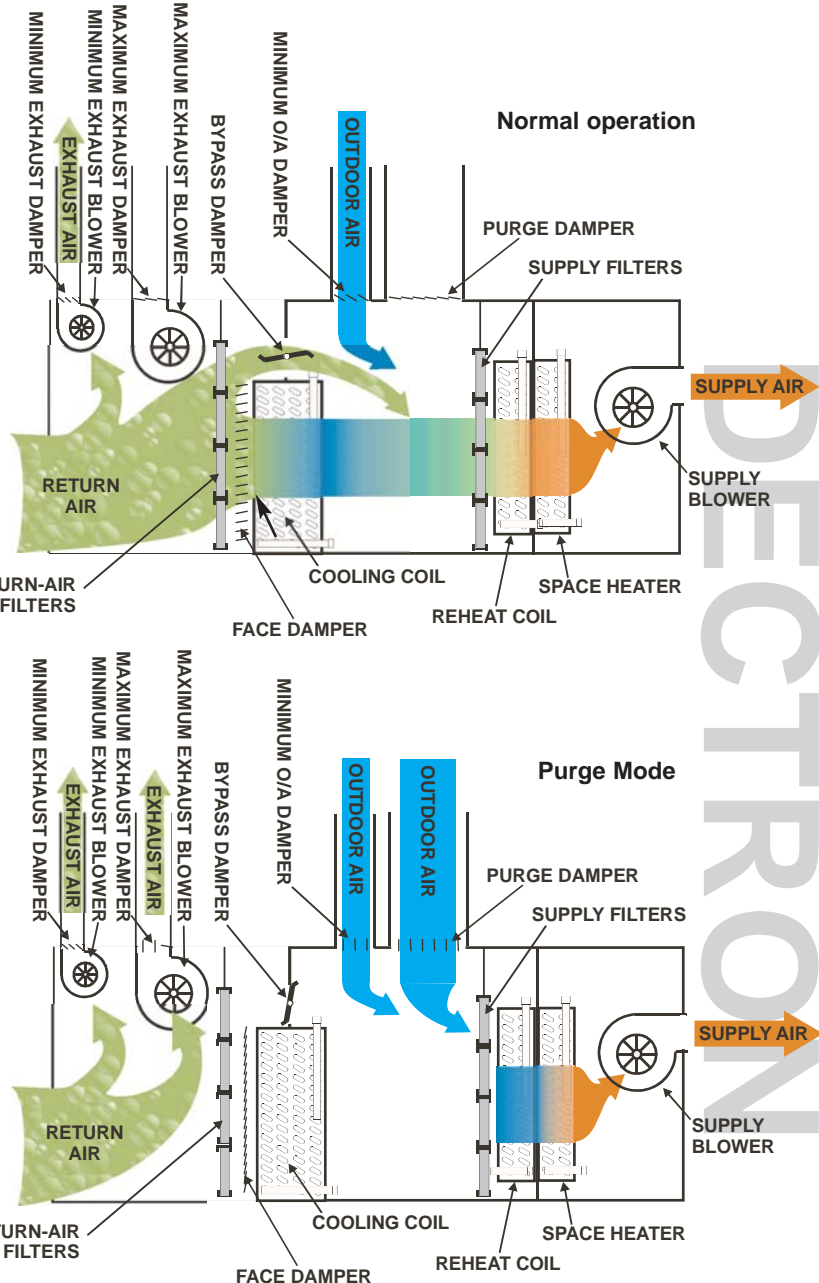
Natatoriums with DRY-O-TRON® units having the Economizer option must also have auxiliary pool heaters, which may be by others.

For more information, refer to [Appendix M6 - Purge](#).

EconoPurge Option

Units equipped with the Purge option may also be equipped to maximize energy conservation with a variation of economizer or Intelligent Energy Saver options.

If the unit is equipped with an outdoor-air temperature sensor, the Purge mode described above may also operate automatically during periods when the outdoor air is cool enough to control room temperature by ventilation alone. This mode is one of the economizer options.



If the unit is equipped with both outdoor-air temperature sensor and an outdoor-air humidity sensor, then the Purge mode described above may also operate automatically when the outdoor air is cool and dry enough to control room temperature and/or relative humidity by ventilation alone. This mode is one of the Intelligent Energy Saver options.

The outdoor-air intake damper(s) must be adjusted mechanically to limit the intake flow to maintain a slight negative pressure on the room.

Major Airflow Options

Product Description

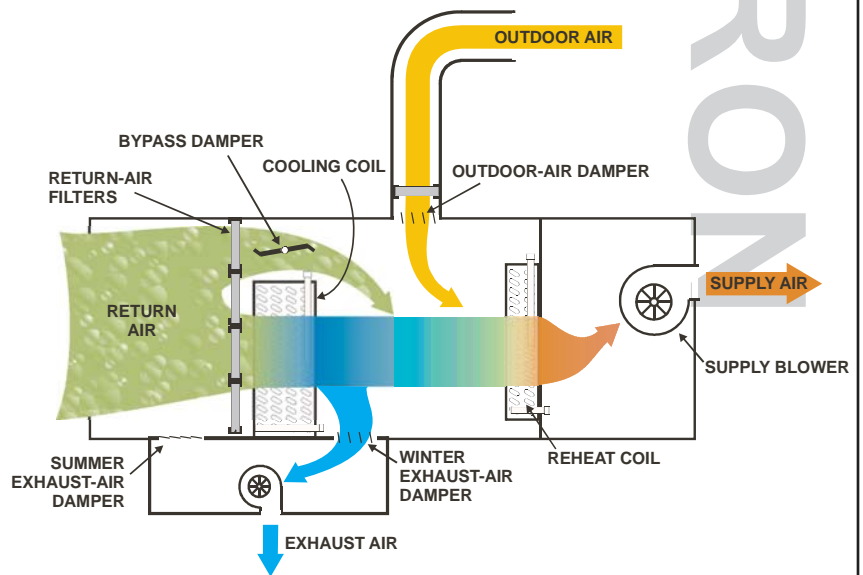
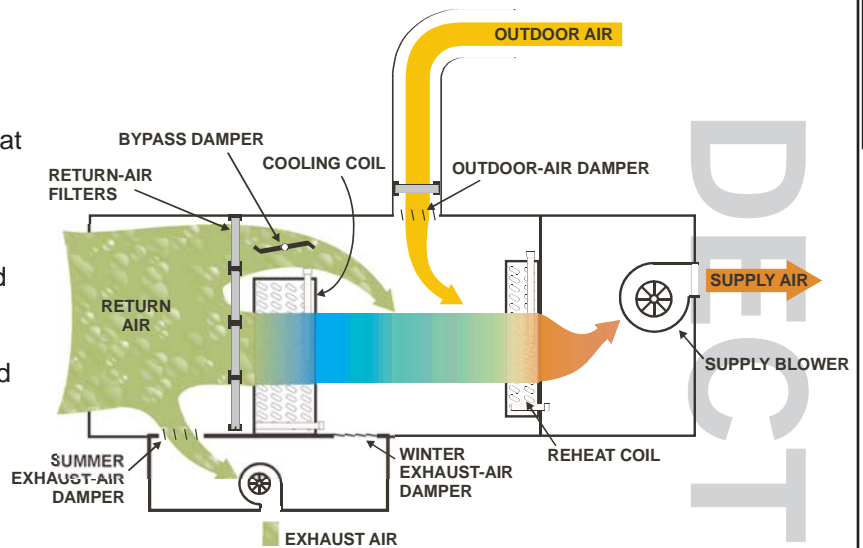
DRY-O-TRON® with EconoSaver®

The EconoSaver® reduces the amount of energy needed for heating by recovering heat with the refrigeration system.

In the summer, room air is exhausted directly. In winter mode, cold air from the evaporator is exhausted. The heat removed from the exhaust air is returned to the incoming outdoor air in the reheat heat exchanger. This reduces the energy needed for heating.

The same amount of return air passes through the evaporator and the evaporator bypass.

The outdoor-air intake flow rate can be up to 15% (or up to 35% with air-conditioning option) of the total supply airflow rate, depending on outdoor temperature. The incoming outdoor air must be heated (by others) to not less than 32°F (0°C). There may be limitations on maximum flow rates. See subsequent page in this manual.



Product Description

Available Air Connections

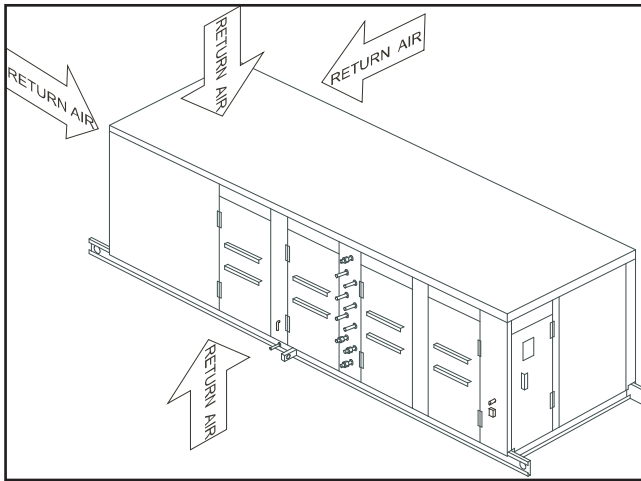
DESCRIPTION

NOTICE Optional Equipment - Some vertical units may have selectable supply-air discharge ports.

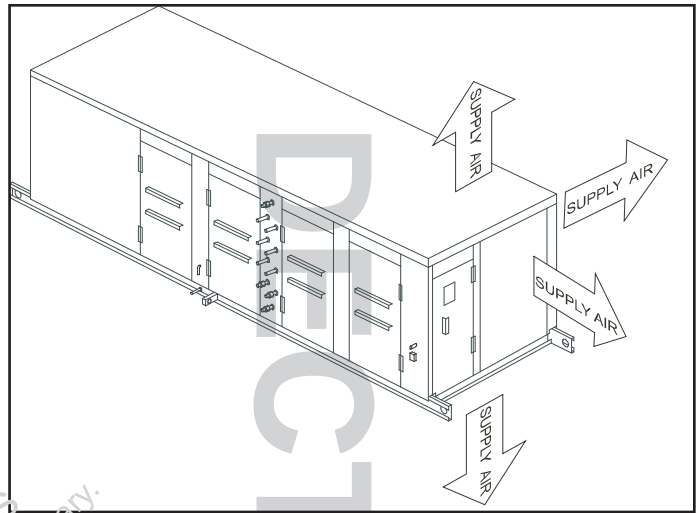
There are many options for duct connections. In many cases, these options can simplify duct work and lead to better airflow and better performance.

Some options are illustrated here. Other options are available. Contact your Dectron representative.

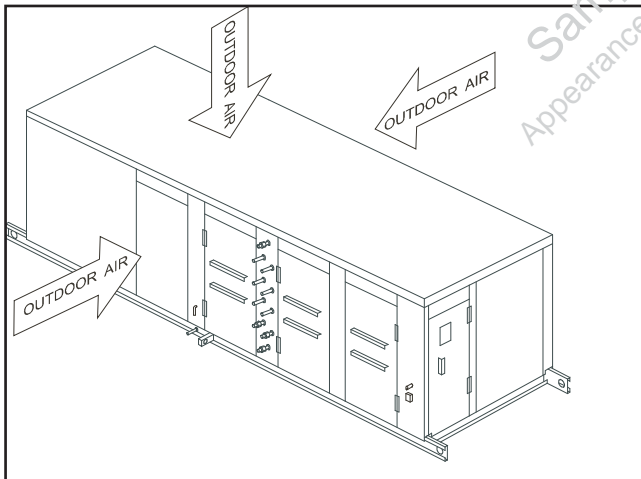
For outdoor units, suitable hoods are provided for outdoor air and exhaust air (if any).



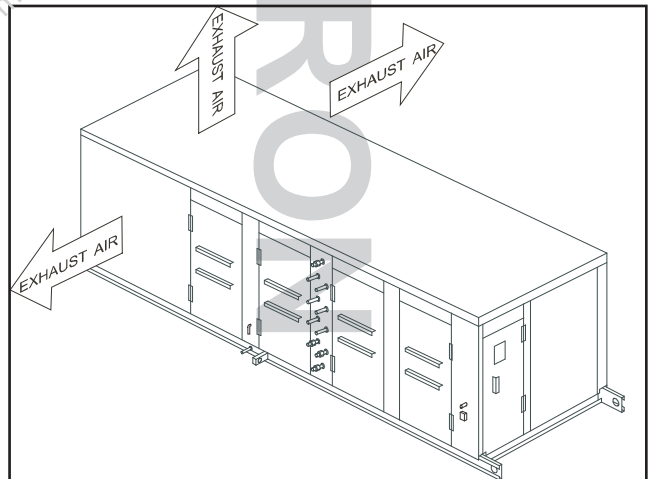
Horizontal Units, Return-Air Connections, Optional at Time of Sale



Horizontal Units, Supply-Air Connections Optional at Time of Sale



Horizontal Units, Outdoor-Air Connections Optional at Time of Sale (May be linked to other options.)



Horizontal Units, Exhaust-Air Connections Optional at Time of Sale (May be linked to other options.)

Data subject to change without notice.

Available Air Connections

Product Description

NOTICE Optional Equipment - Some vertical units may have selectable supply-air discharge ports.

The standard supply-air discharge for vertical units (model DSV-xxx) is vertically upward.

Some vertical units may have field-selectable ports allowing supply air to exit through the top or right side. Where this is the case, select the best port for the installation. It may be possible to eliminate an otherwise-required duct elbow near the unit. Cover the unused port with the blank cover.

Other adjustments, including adjustments to the blower, may be necessary. Open the front-middle access panel and/or the rear-top access panel to view the blower arrangements. Be sure air will flow in the proper direction.

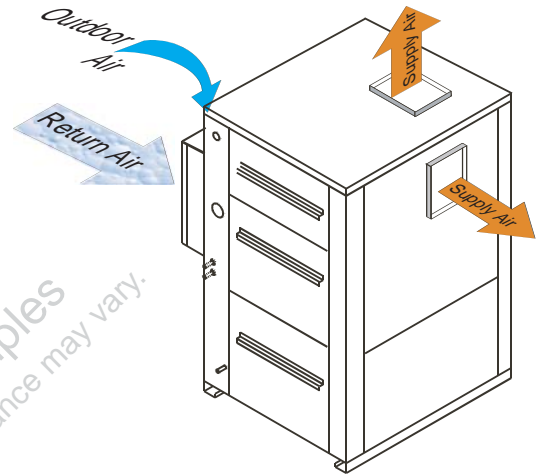
Some vertical units with plenum blowers may be equipped with a plenum. In this case, there may be several field-selectable ports for supply air. Choose the port (or ports) that allows the best duct routing. Close the other ports with the included covers.

The plenum of some vertical units may be removable. This may facilitate moving the unit through tight clearances.

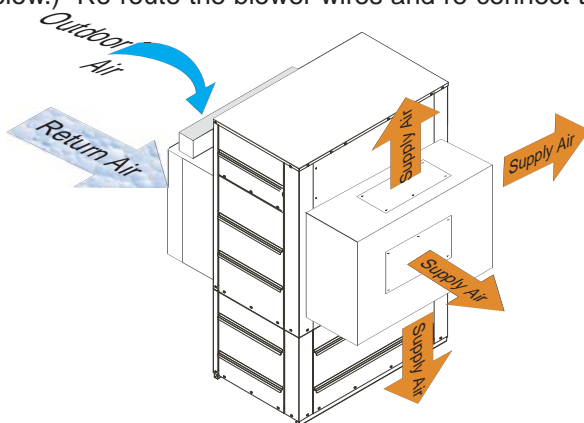
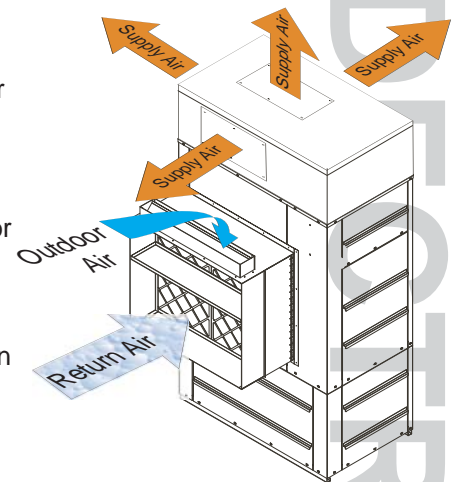
To remove the plenum, open the access panel and disconnect the motor or the variable-frequency drive (if so equipped). Remove and retain the mounting screws. Carefully remove the plenum, setting it aside in a protected area.

When the unit is in its final position, re-assemble the plenum, fastening it in place with the mounting screws. Re-connect and torque the wires to the blower or drive.

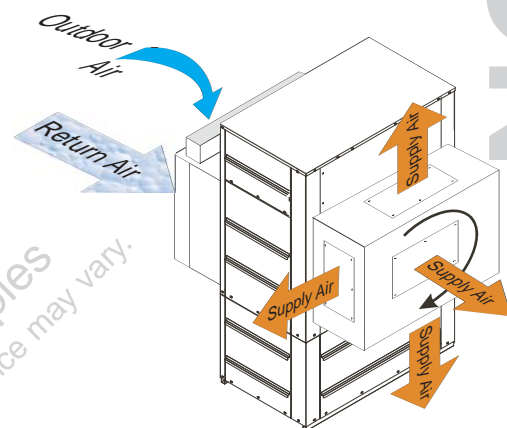
It may be possible to re-locate the plenum of some vertical units for more choices of supply-air direction. In this case, remove the plenum as described above. Remove the side panel and use it to close the top of the unit. Mount the plenum where the side panel was. (See the illustrations below.) Re-route the blower wires and re-connect them.



Samples Appearance may vary.



Samples Appearance may vary.



Product Description

Unit Nameplate

DESCRIPTION

CSA and ETL Label

Model Nomenclature:

iXXX-SSS-V

D = indoor cabinet
R = outdoor cabinet

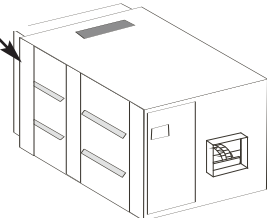
Configuration

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.

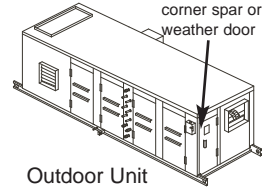
nominal voltage
2 = 208V, 1Φ, 60 Hz
3 = 230V, 1Φ, 60 Hz
4 = 208-230V, 1Φ, 60 Hz
5 = 208-230V, 3Φ, 60 Hz
6 = 230V, 3Φ, 60 Hz
7 = 460V, 3Φ, 60 Hz
8 = 575V, 3Φ, 60 Hz
9 = 208V, 3Φ, 60 Hz

Name plate on corner



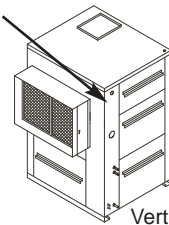
Horizontal Indoor Unit

Name plate on corner spar or inside weather door



Outdoor Unit

Name plate on corner



Vertical Indoor Unit

Dectron DRY-O-TRON®

MODEL #: _____
SERIAL #: _____

I.D. D

ELECTRICAL RATING: 460 V ac, 3 ph, 60 Hz

COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
PUMP MOTOR	HP	FLA
ENTHALPY MOTOR	HP	FLA
ELECTRIC HEATER	KW	A
	Max. L.A.T. (°F)	

SERVICE POWER _____
SPACE HEATING COIL _____
PSIG Max. _____

MCA _____ A MAX. FUSE/CKT. BKR.* _____ A
(*NACR type per NEC)

FACTORY CHARGE _____ lbs

AIR VOLUME _____ CFM
BELT SIZE _____

WIRING DIAGRAM _____

REFRIGERANT DESIGN PRESSURES: HIGH/LOW 300/150 PSIG

ETL 50379 COMFORMS TO ANSI/UL STD 1995 CSA LR 45671
CERTIFIED TO STD CAN/CSA-C22.2 NO. 236 FABRIQUÉ AU CANADA / MADE IN CANADA

If assistance is needed, have model, serial number, and Ref. number (below) before calling.

Component specifications.

Important branch circuit information

Adjust supply-airflow to this value ±10%.

Replace with belt of same type and size when necessary.

For units with air-cooled air conditioning, subtract the amount of refrigerant given by "Factory Charge" from the amount given by "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.

At installation, add type and amount of refrigeration oil as shown.

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.

Operating conditions: Make sure unit is operating within these conditions. Unit has been selected and sized accordingly.

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

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BUILDING CONSTRUCTION

NOTICE

Risk of uncontrolled condensation. Can cause property damage.

The information presented in this section represents Dectron's best effort as of the time of issue. This information should be considered in all building designs incorporating a pool. Where any steps are not clear, Dectron offers technical assistance at 1-800-667-6338 or 1-800-676-2566.

Dectron does not warrant that this information is complete for any particular application.

Follow all applicable codes and regulations. Where any recommendations in this manual conflict with such legal requirements, the legal requirements take precedence.

Dectron, Inc. does not engage in architectural or building-engineering services. All responsibility for proper and functional building design and construction is borne by others.

! WARNING

Risk of contamination of breathing air. Can cause injury or death.

Application of this product may involve the intake of outdoor air. The point of intake must be carefully chosen to prevent intake of contaminants.

Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants.

Follow the instructions in this manual and in all applicable codes.

! WARNING

Risk of falling. Can cause injury or death.

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.



Designs should include adequate service access, maintenance access, and fall protection.

! WARNING

Risk of fire/smoke alarm failure. Can cause property damage, injury, or death.

Placement of fire/smoke detectors is critical for reliability. Read and follow the instructions in this manual, the alarm manual (by others), and all applicable codes.

NOTICE

Risk of uncontrolled condensation. Can cause property damage.

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

Read and follow the instructions in this manual. Optional material will be noted as being optional. All other material should be considered as important to the proper function of the product.

DECTRON

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BUILDING
CONSTRUCTION

Building Construction

Moisture Migration

BUILDING CONSTRUCTION

The pool enclosure should be built to the latest building codes and must be suitable for year-round operation at 50% to 60% relative humidity.

Vapor Retarder

Before the design of the roof and walls is finalized, the enclosure temperature and relative humidity must be known; thus determining the dew point (the temperature at which condensation will occur). For common dew points, see the graph below.

If the room air goes below this dew point temperature, water will condense from the air.

IMPORTANT!

Check the pool enclosure design (exterior walls AND ceilings) for proper vapor retarder location.

When the outdoor air temperature is sufficiently low, parts of the exterior wall and ceiling will be at or below the dew point temperature. These parts **MUST** be on the outdoor (or cold side) of the vapor retarder.

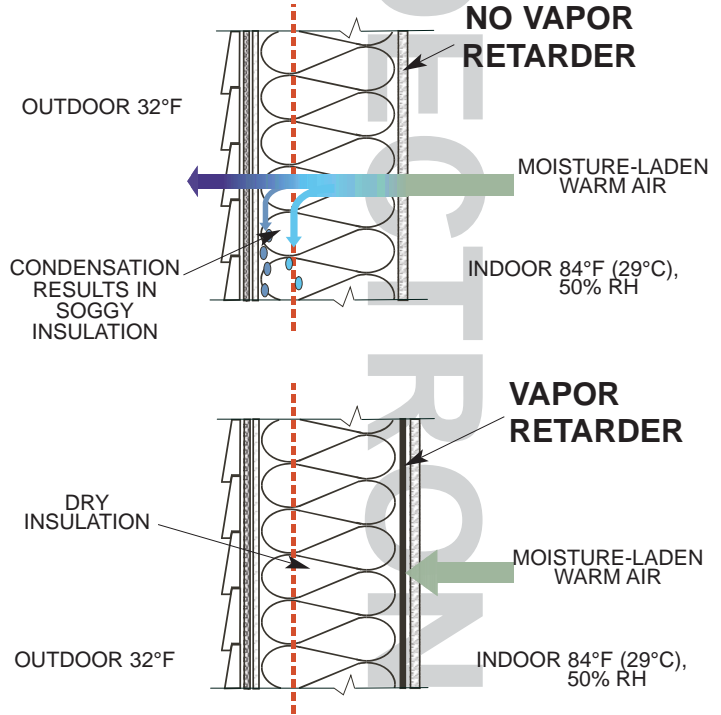
The vapor retarder should be adequate for the purpose and should be continuous. All seams should be completely sealed. Penetrations, as for conduit, etc., should be sealed.

NOTE: Where the inside building finish includes a perforated material, a continuous vapor retarder must be installed behind it.

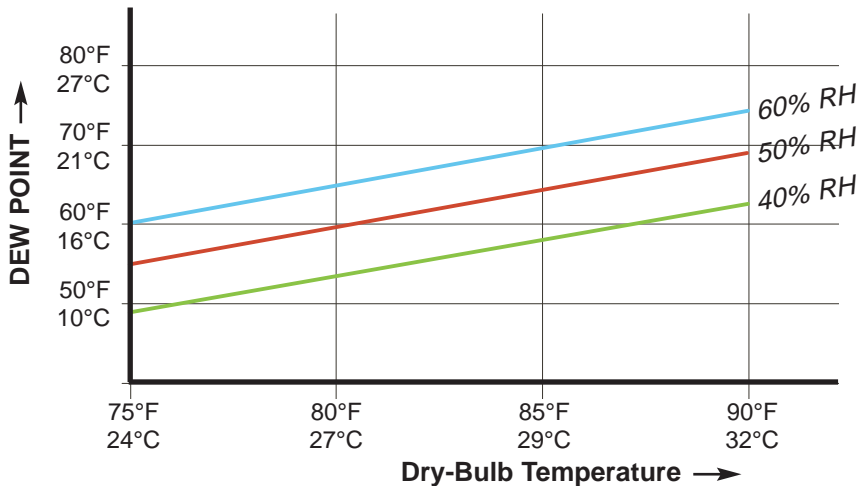
Failure to install the vapor retarder properly will result in condensation forming in the structure, with all the consequent damages.

See Water Vapor Retarders in ASHRAE Handbook of Fundamentals.

For this example, the dew point of the room air is 63.4°F (17.4°C). This temperature will occur somewhere in the wall.



DEWPOINTS vs. DRY-BULB TEMPERATURES



Example:

An indoor pool enclosure has air at 85°F and 60% relative humidity. What is the dew point?

On the chart at left, start at 85°F dry-bulb temperature. Go up to the blue 60% RH line, then left to 70°F dew point.

The dew point of this air is 70°F. Surfaces allowed to go below this temperature will sweat.

Data subject to change without notice.

Door & Window Design Building Construction

BUILDING CONSTRUCTION

Window Design

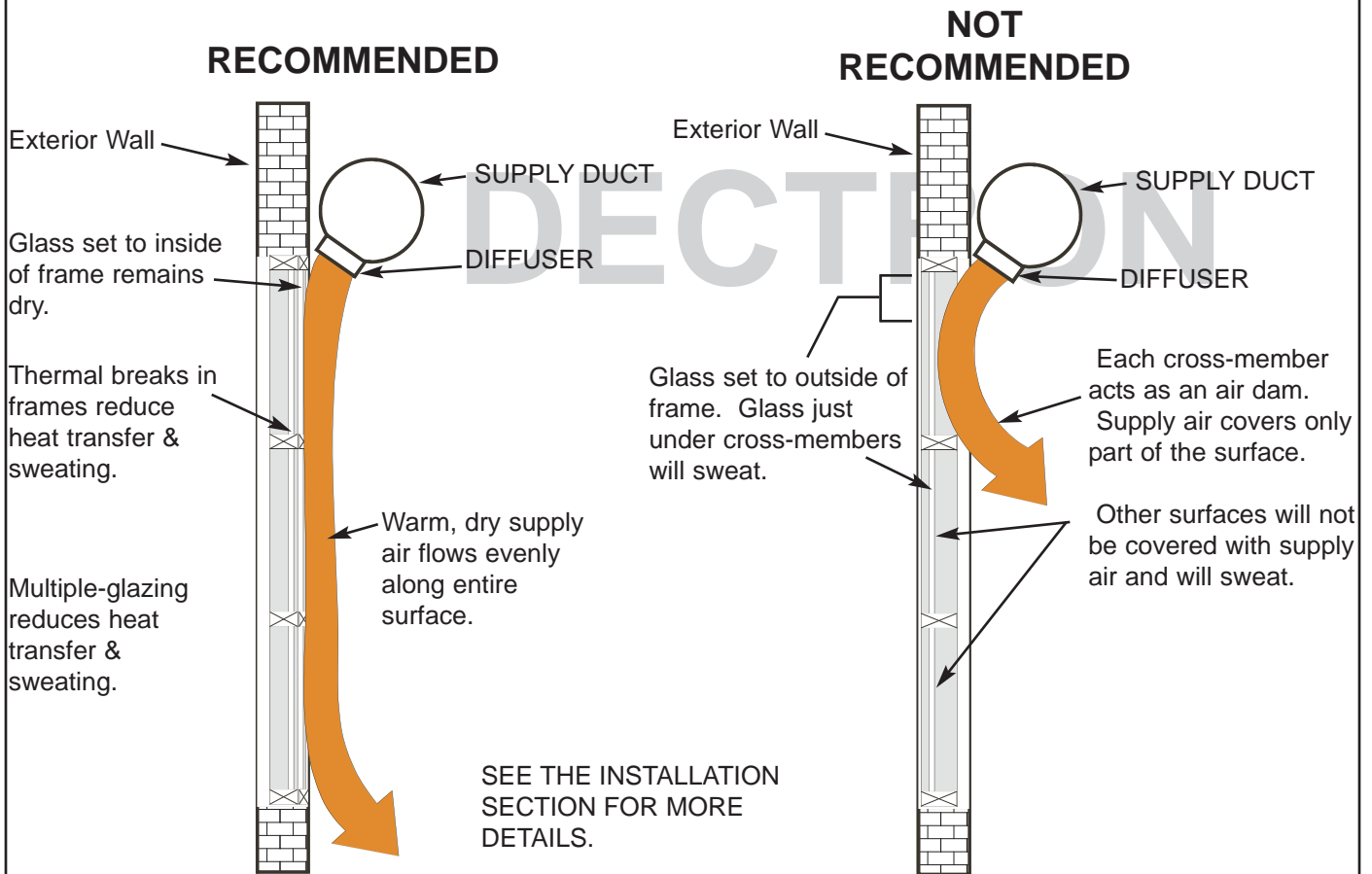
Special attention must be paid to the exterior glass components such as windows and patio doors. Due to their low insulation values, windows are usually the building element with the lowest inside-surface temperature. In cold climates, windows and exterior glass doors should

1. be double-paned or even triple-paned (to reduce heat transfer through the glass),
2. have frames with thermal breaks (to reduce heat transfer through the frames), and
3. be glazed to the inside of frames and walls (to allow smooth airflow along the inner surfaces).

Even a triple-pane window can have an inside-surface temperature below the room dew point. The entire surface area of exterior windows **MUST** be blanketed with warm supply air from the perimeter air-distribution system to raise the window's inside surface temperature above the dew point and thus prevent condensation. Windows must be designed to allow unobstructed air movement on the inside surface. Avoid windows with panes recessed to the outside. Avoid heavy window frames which protrude to the inside. Both of these prevent proper air movement and result in condensation.

See "Coanda effect" in ASHRAE Handbook of Fundamentals.

Other building elements which create thermal bridges must either be avoided or be blanketed with warm air to prevent condensation damage. Skylights are especially vulnerable to condensation, since precipitation falling on the skylight causes rapid cooling and a direct warm-air supply can be difficult to achieve.

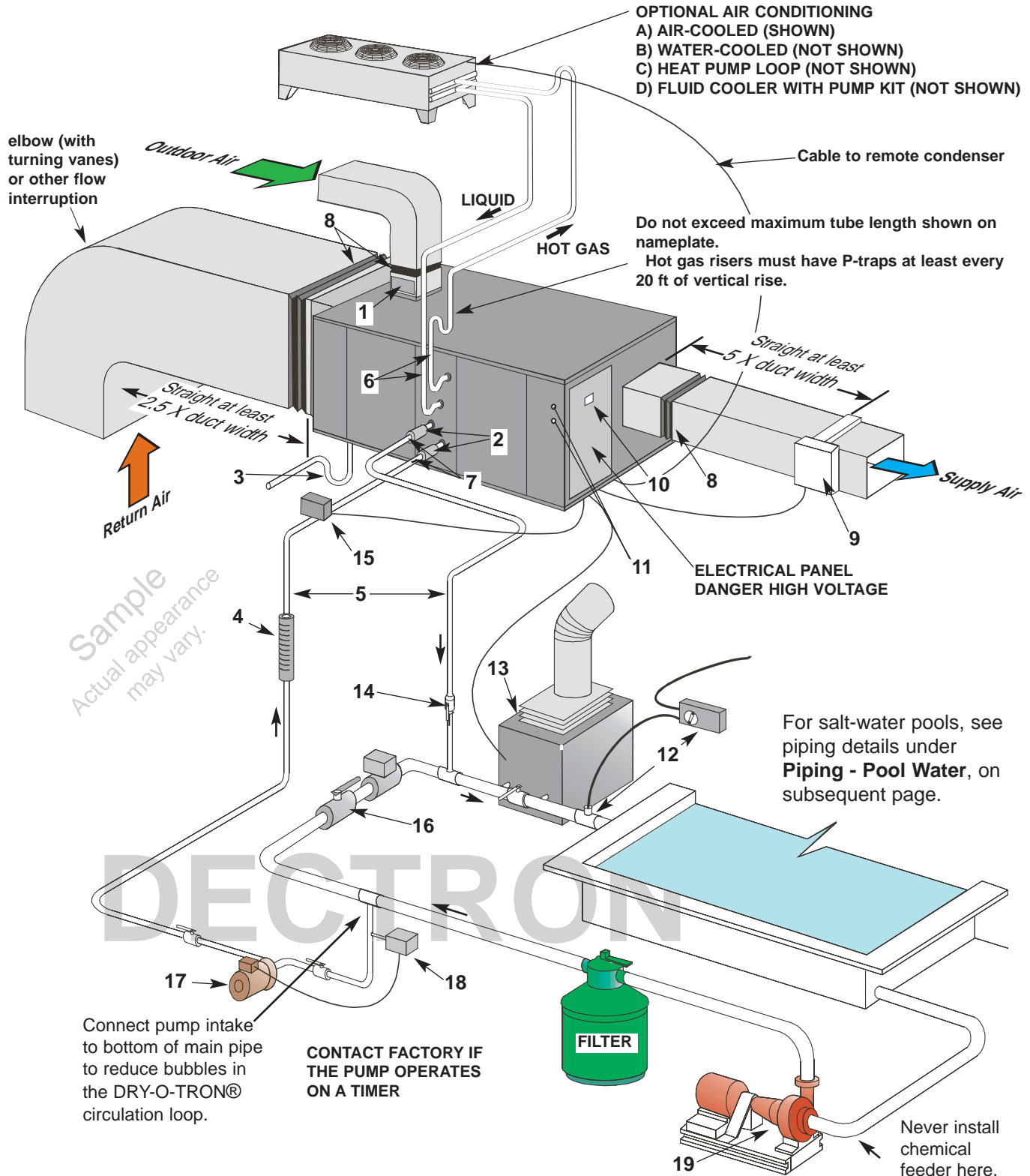


Building Construction

Component Overview

Building construction must accommodate the arrangements below.

BUILDING CONSTRUCTION



Component Overview

Building Construction

1. Outdoor air filter & manual damper

- Optional motorized damper actuator
- Seven-day time clock

2. Pool water isolation valves (by others)

3. P-Trap and Condensate Drain (by others)

- Must be installed and filled with water
- Condensate to be returned to the pool via the skimmer (consult local codes)
- Failure to install the P-trap will cause the drip pan to overflow and flood areas beneath the DRY-O-TRON®.
- Optional side connection available

4. Water flow meter (by others)

5. Pool Water Connection (by others)

- Water circuit components must be of non-corrosive material.
- Pool water piping must be the same size as the connection on the DRY-O-TRON®.
- Increase the pipe size if the DRY-O-TRON® and the by-pass (throttling) valve are more than 10 feet apart.

6. Air Conditioning (OPTIONAL)

- Pipe must be same size as the connection on the DRY-O-TRON®.
- Optional water-cooled or dry-cooler heat rejection.
- Pipe must be so supported as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

7. Pressure/Temperature Ports (by others)

- Ideal for measuring pressure drop across the water heater
- Remote mount sensors (Optional)

8. Flexible Duct Connection (by others)

- For vibration isolation
- For attenuation of sound due to vibration
- Required on any return, supply, outdoor air, and exhaust connections to the DRY-O-TRON®

9. Duct Heater (by others)

- Size to cover the pool enclosure heat losses and the outdoor air load
- Optional unit-mounted hot water, steam or electric heat
- Controlled by the DRY-O-TRON®'s microprocessor

10. Operator Panel

- Mounted on the electrical panel door
- Optional remote mounting (by others)

11. Refrigerant Access Valves

- Service gauge connection
- Refrigerant charging access
- Upper Valve is head pressure
- Lower valve is suction pressure
- Compressor oil-pressure port may also be present.

12. Automatic Chemical Feeder (by others)

- Must be located in the main pool return line downstream of the DRY-O-TRON® and all auxiliary equipment to prevent corrosion and equipment deterioration

13. Auxiliary Water Heater controlled by the DRY-O-TRON® (by others)

- Should be located downstream of the DRY-O-TRON® and before the automatic chemical feeder

NOTE: An auxiliary pool-water heater is recommended for all installations.

NOTE: An auxiliary pool-water heater is required for natatoriums with DRY-O-TRON® units having more than 15% makeup air or having the Economizer, Intelligent Energy Saver, or EconoPurge options.

NOTE: An auxiliary pool-water heater is required for pools in which

- (a) the water is exposed to outdoor conditions (such as a swim-through pool), or
- (b) the water is kept at a higher temperature than the room air, or
- (c) uninsulated pool walls are exposed to outdoor conditions.

14. Throttling Ball Valve (circuit setter, by others)

- Install at lowest point in the discharge line
- Adjust water flow until the outlet water temperature is 12 to 20°F above the inlet water temperature during water heating.

15. Water Pressure Switch (unit mounted in Models 60 and larger)

Inhibits water heating mode during main filter backwash or in case of insufficient water flow

16. By-Pass Valve (by others)

- Throttle to force water through the DRY-O-TRON® when the recommended secondary circulating pump is not used

17. Secondary Circulating Pump (by others)

- Must be suitable for pool water
- Secondary circulating pump selection for an OPEN system and :
 - Δ DRY-O-TRON® flow rate
 - Δ Total pressure drop including: DRY-O-TRON®, external piping, valve pressure drop and elevation difference between the pool water surface and the DRY-O-TRON®
- Use dielectric couplings for water pump connections
- Pump must stop during backwash

18. Water Pressure Switch (by others)

- Stops the secondary circulating pump
 - Δ During main filter backwash
 - Δ In case of insufficient water flow in the pool water filter loop

19. Main Filter Pump (by others)

- Usually sized for pool water filtration and sanitation only
- **CAUTION:** Secondary circulating pump is required if the main filter pump cannot produce the additional flow required by the DRY-O-TRON® at the necessary pressure.
- Pumps controlled by timers: contact factory for suggested piping detail.

BUILDING CONSTRUCTION

Building Construction Heating and Cooling Availability

BUILDING CONSTRUCTION

Heating Availability

Room-temperature control is an important part of humidity control.

The dehumidifier capacity is matched to the rated pool-evaporation rate. The pool-evaporation rate will increase if

- 1. the pool temperature remains the same while room temperature is decreased, or
- 2. the pool temperature is increased while the room temperature remains the same.

Space heat **must** be under the control of the DRY-O-TRON®. All installations **must** have space heat available year-round. The DRY-O-TRON® will command only enough heat to keep the evaporation rate within a workable range.

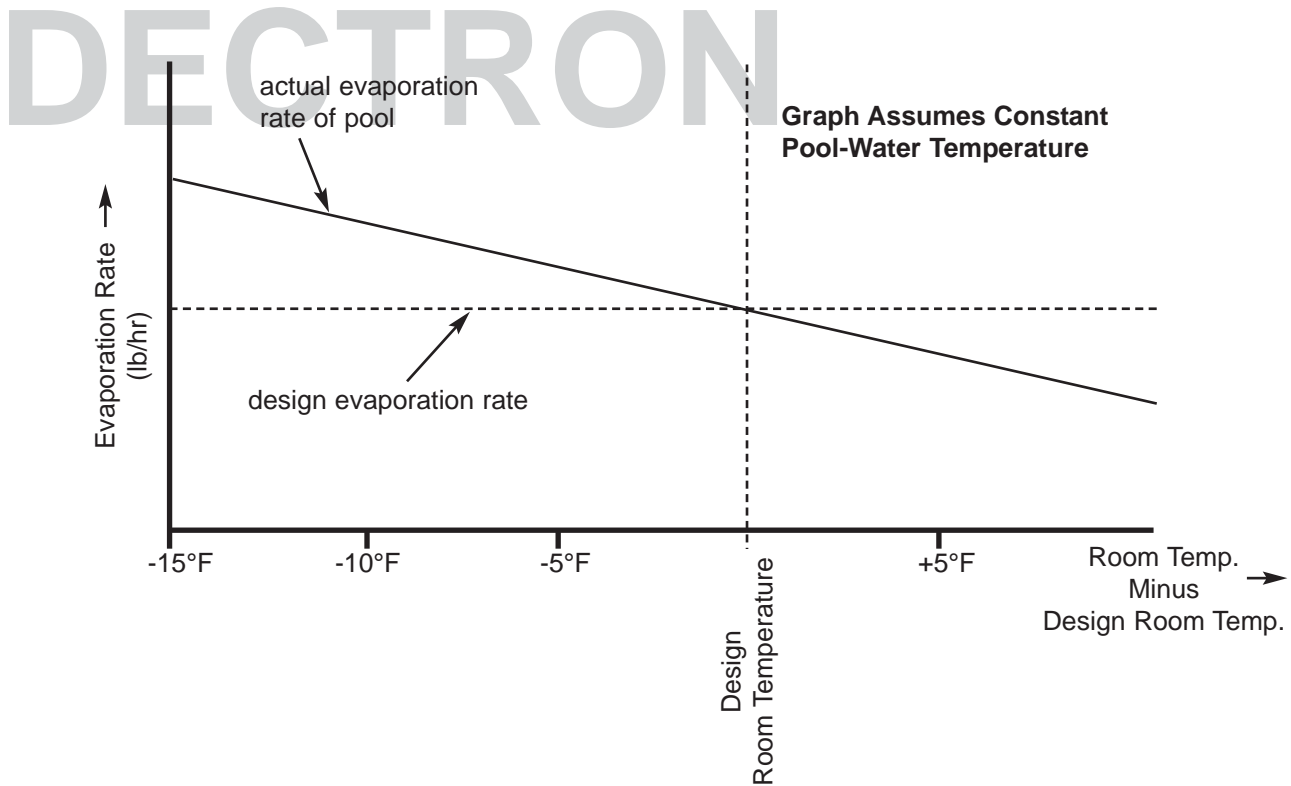
NOTE: Where space heaters are by others, the space heaters must heat the supply air. Do not install a heater in the return duct.

NOTE: Unless equipped with a space heater, the DRY-O-TRON® does not produce significant heat - it recycles heat. A dedicated space heater must be ordered with the unit or provided by others.

NOTE: Building heat losses are calculated by others and consequently are sized by others. Dectron does not select space-heater capacities.

NOTE: Attempting to heat the air with the pool will increase the evaporation rate.

NOTE: Unless otherwise noted, hot-water or hot-glycol space heaters supplied by Dectron require the water or fluid temperature to be between 160°F (71°C) and 180°F (82°C) for full heating capacity.



Cooling Availability

Where the DRY-O-TRON® unit has the cooling option and any required cooling water or other fluid is provided by others, it is **essential** that the cooling water or fluid be available at any time the DRY-O-TRON® may be operating.

Do **not** turn off cooling water or fluid based on time-of-day, time-of-year, outdoor temperature, or other considerations.

Data subject to change without notice.

Outdoor-Air Intake

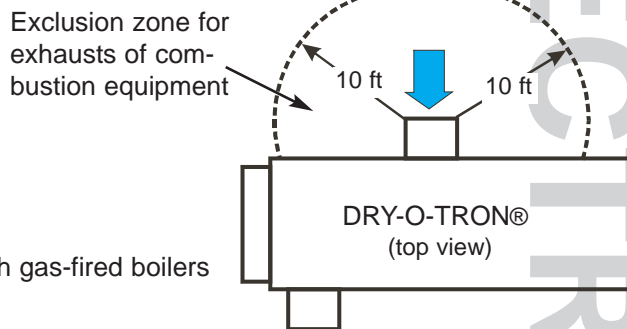
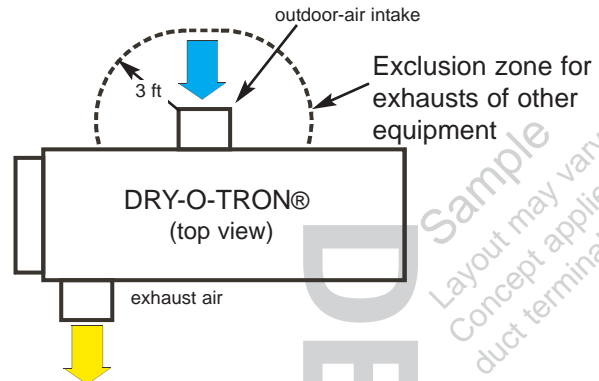
Building Construction



WARNING

Risk of contamination of breathing air. Can cause injury or death.
Follow the instructions in this manual and all applicable codes.

- Intake air hoods or grilles should be suitably separated from such sources of contamination as drain vents, burner flues, laundry and chemical-room exhausts, etc. See appropriate codes and standards.
- Do not locate the unit in such a way that the exhaust from a cooling tower or other machinery will be drawn into its intake.
- Allow at least 3 ft (1 m) of clear space around an intake hood or grille for smooth intake airflow.

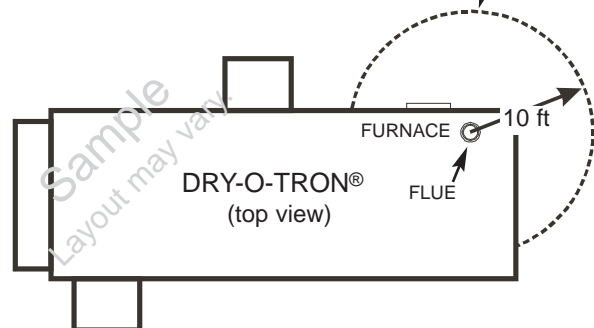
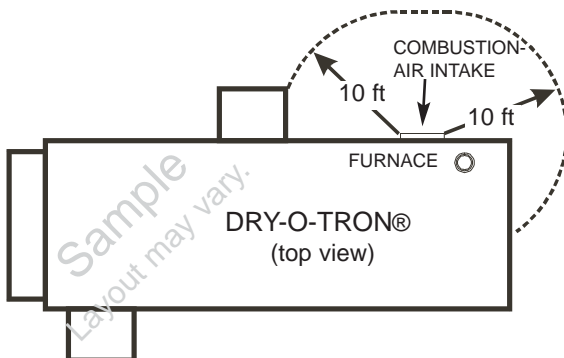
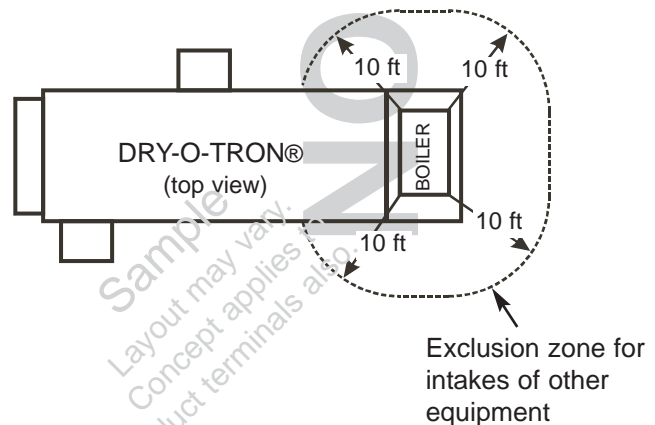


- Some units may be equipped with gas-fired boilers or gas-fired furnaces.

Where this is the case, no building-air intake should be located closer to the flue than shown. Refer to fuel-gas codes, or consult the local Authority Having Jurisdiction. Other applicable standards which specify a larger separation take precedence.

To insure clean combustion air, no exhaust of other equipment should be located any closer to the air intake than shown.

See also Appendices H6, H7, or H8 for boilers or [Appendix H2 Heatco](#) or [Appendix H9 TEGA](#) for furnaces.



BUILDING CONSTRUCTION

Building Construction

Air Handler Location

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

- Indoor units may not work correctly if the equipment-room temperature goes below 70°F (21°C).
- The location must not contain corrosive-chemical storage, or connect to any space that contains corrosive-chemical storage. Such connection includes, but is not limited to:
 - grilles or ducts through walls,
 - unsealed gaps at corners, roof, or ceiling,
 - doors that are not self-closing, etc.
- The location must not include a natatorium or spa room, or any space where the **exterior** of the unit would be exposed to chloramines outgassing from a pool.
- There are other requirements for suitability - see other pages in this section.

Allow working clearances as shown below. Inadequate working spaces may compromise workplace safety. Inadequate working spaces may preclude proper maintenance, such as filter and belt replacement. Inadequate working space may prevent component replacement should that become necessary.

Spacing requirements are also subject to applicable electrical and mechanical codes. This is particularly true where optional built-in electrical disconnects are provided. Check with your local code-enforcement authorities.

Where access doors are hinged, all doors must be able to open at least 90°.

For units with hooded air intakes allow at least 3 feet (1 meter) of clear space around the hood for smooth intake airflow. Intake air hoods should be suitably separated from such sources of contamination as drain vents and burner flues. See appropriate codes and standards.

Minimum Service Clearances

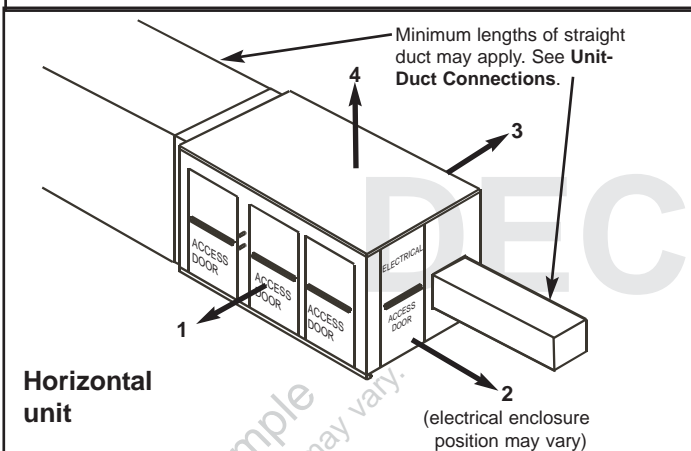
HORIZONTAL UNITS

Minimum Service Access^a ft (m)

	1	2 ^b	3	4
010 through 030	2 (0.6)	3 (1)	2 (0.6)	3 (1)
040 through 062	3 (1)	3 (1)	3 (1)	3 (1)
080 through 808	5 (1.5)	3 (1)	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 Table 110.26(A)(1), whichever is greater.



VERTICAL UNITS

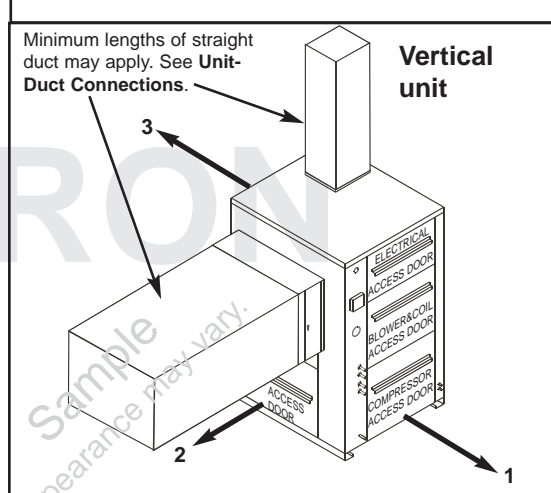
Minimum Service Access^a ft (m)

	1 ^b	2	3
010 through 030	3 (1)	2 (.6)	1.5 (.5) ^c
040 through 062	3 (1)	2 (.6)	2(.6)
080 through 152	4 (1.2)	3 (1)	3 (1)

a - Access doors must be able to open to at least 90°.

b - (Canada) minimum 1 meter
(USA) minimum 3 ft for 230V, 3.5 ft for 460V units or per NEC Table 110.26(A)(1), whichever is greater.

c - recommended



Overhead Air Handler Location Building Construction

WARNING



Risk of falling. Can cause injury or death.

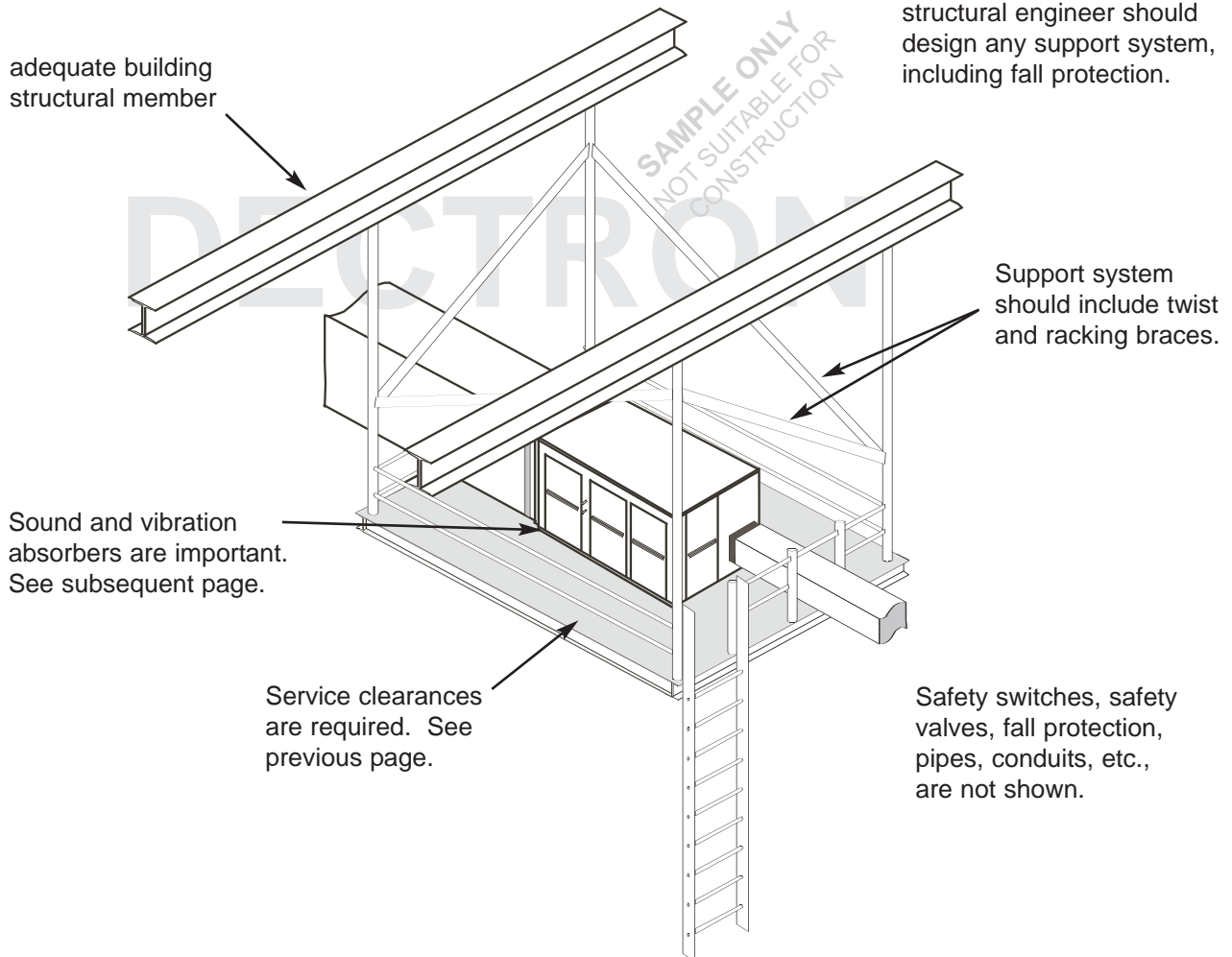
Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling. Designs should include adequate service and maintenance access.

If the air handler unit must be located overhead, then:

1. The space must not contain corrosive-chemical storage, or connect to any space that contains corrosive-chemical storage.
2. The space must not include a natatorium or spa room, or any space where the exterior of the unit would be exposed to chloramines outgassing from a pool.
3. A mezzanine floor must be constructed to allow the minimum service access.
4. Minimum straight lengths of duct may be required. See **Installation - Ducting**.

NOTICE

This diagram is for illustration only, and is not suitable for any particular purpose. A qualified structural engineer should design any support system, including fall protection.



BUILDING CONSTRUCTION

Building Construction Remote Condenser or DryCooler Location

The length of the tubes connecting the remote air-cooled condenser to the DRY-O-TRON® must not exceed that shown on the DRY-O-TRON® nameplate (See **Product Description - Unit Nameplate.**)



Select a suitable location for the condenser, where

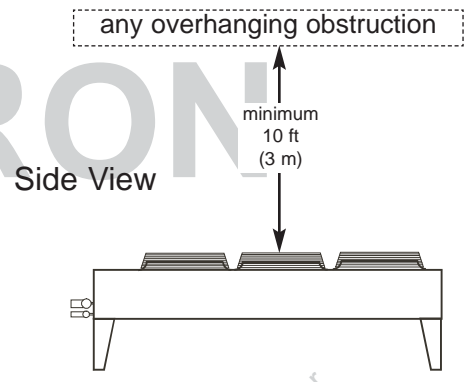
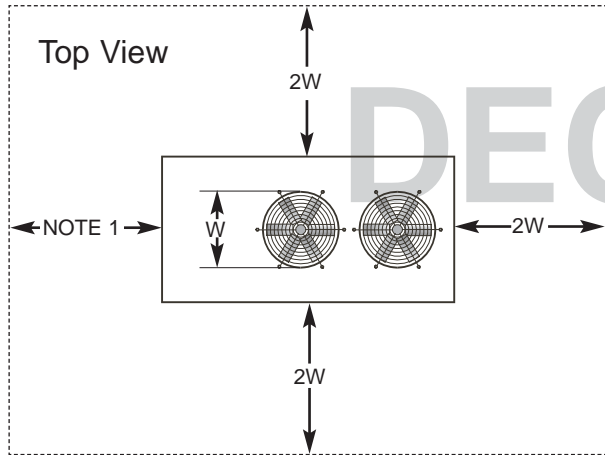
- (a) it will not be subject to damage from traffic, falling ice, or vandalism,
- (b) it will not be in the vicinity of steam, hot air, or fume exhausts, and
- (c) where airflow will not be impeded by accumulations of ice, snow, lint, etc.

Any supporting structure must be suitable for the weight of the condenser. Spacing requirements are also subject to applicable electrical codes.

BUILDING CONSTRUCTION

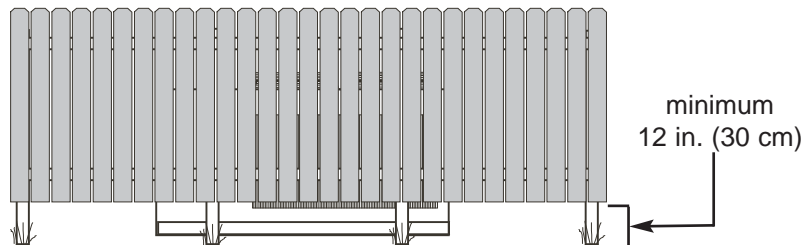
NOTE 1: The clearance in front of the electrical enclosure must be at least the greatest of:

- a) twice the width of a fan, or
- b) (Canada) the greater of 1 meter or the distance specified by CEC 2-238, or
- c) (U.S) the greater of 36 inches (230V condensers), 42 inches (460V condensers), or the distance specified by NEC 110-26, or
- d) the distance specified by other applicable code.



The condenser should **not** be enclosed within a solid fence or wall, or in a pit, since such structures promote recirculation of air. If a solid 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.

Vegetation under a fence must be kept short.



For further information, see **Lifting and Locating - Select Remote Condenser Location.**

Building Construction

Minimum Straight Duct

Return Duct

NOTE: If used as natatorium dehumidifier, do not install a DRY-O-TRON® dehumidifier in a return-air plenum room. Corrosive chemicals in the air may shorten the life of the electrical components.

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

IMPORTANT!

Allow sufficient space for a straight length of full-sized return duct as shown. This section of duct must have the same width and height as the duct connection on the unit. 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.

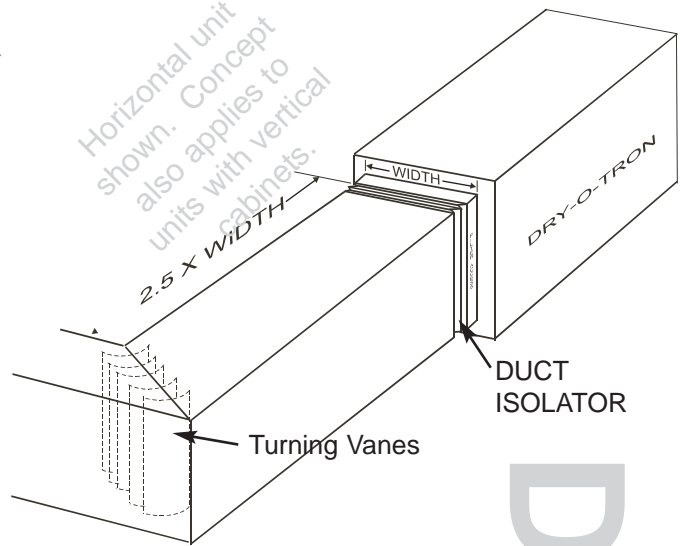
NOTE: For DRY-O-TRON units with return plenum boxes, the minimum straight length for the return duct is five times the lesser dimension of the return-duct connection. See Product Description - Available Air Connections.

NOTE: High relative humidity can cause failure of the adhesive used in fibrous duct liner. If such duct liner must be used inside a duct, use only water-resistant types.

NOTE: Do not install a duct heater in the return duct.

NOTE: Do not allow any air other than room air to enter the return duct. Do not allow outdoor air or air mixed with outdoor air to enter the return duct.

See Installation - Ducts for more information.



BUILDING CONSTRUCTION

Supply Duct Near Unit

Refer to AMCA¹ guidelines for system- effect considerations.

To prevent unexpected reduction of airflow, 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 than 5 X the width of the blower outlet.

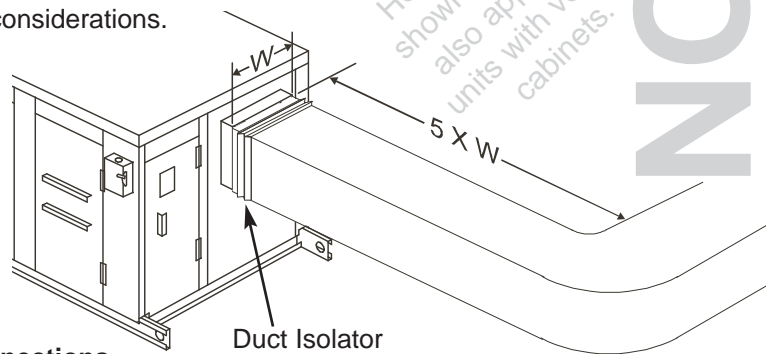
On special order, Dectron may be able to provide bottom, top, or side discharge blowers. See Product Description - Available Air Connections. Minimum straight duct lengths still apply.

NOTE: On special order, Dectron may be able to offer reversed blower rotation.

NOTE: On special order, Dectron may be able to offer electric heaters that can be mounted on the blower outlet.

NOTE: Minimum straight supply-duct lengths are not required for units equipped with plenum blowers for supply air.

See Installation - Ducts for more information.



DECTRON

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

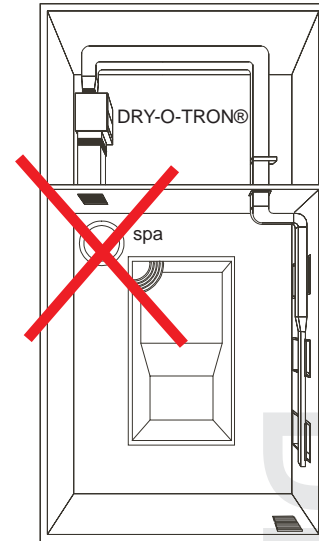
Spa/Return-Grille Placement

Building Construction

Never allow the return grille of a DRY-O-TRON® to be located near or above a spa or hot tub.

The temperature and agitation of spas increases the rate of production of corrosive chloramine gases. Chloramines are corrosive to most metals found in buildings, electrical systems, and HVAC equipment.

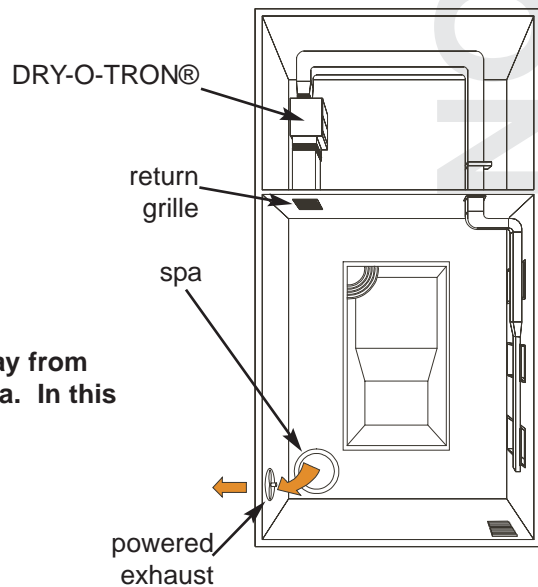
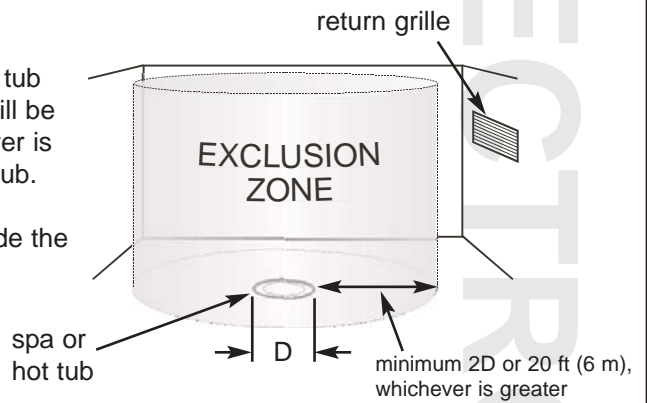
Also, over time oxidized human skin oils will irrevocably foul the return duct and damage the DRY-O-TRON®. Oxidized oils cannot be removed by washing.



**BUILDING
CONSTRUCTION**

Locate the return-air grille(s) as far away from a spa or hot tub as possible. At minimum install the return grille so that it will be more than twice the width of a spa or 20 ft. (6 m.) (whichever is greater) horizontally away from the edge of the spa or hot tub.

Never install a return grille above a spa or hot tub, or inside the imaginary cylinder marked "Exclusion Zone" at right.



IMPORTANT!

The better solution is to locate the return grille well away from the spa and take the room-exhaust air from above the spa. In this case, the example exhaust system would be by others.

Building Construction

Outdoor-Air Intake

BUILDING CONSTRUCTION

NOTICE

Risk of unit damage. Risk of building damage from water leakage. Apply the requirements applicable to your unit. Do not confuse options.

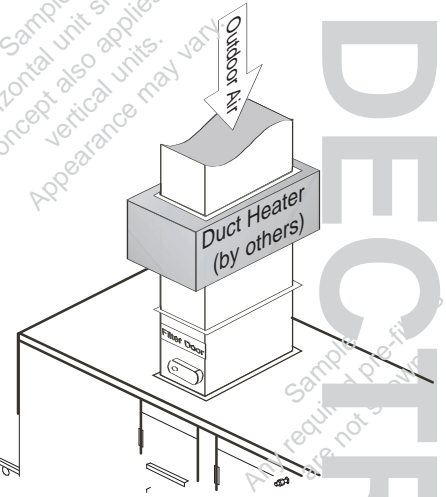
For units without the Economizer, Purge, or SmartSaver options, the minimum temperature for outdoor air entering the unit is 32°F (0°C).

For units with the SmartSaver option, the minimum temperature for outdoor air entering the unit during normal occupied periods is -20°F (-28°C).

For units with the Economizer or Purge options, the minimum temperature for outdoor air entering the unit during normal occupied periods is 32°F (0°C). The minimum temperature for outdoor air entering the unit during Economizer or Purge mode is -20°F (-28°C).

Where outdoor temperatures may go below the minimum temperature, the incoming outdoor air must be pre-heated (by others) to at least the minimum temperature before it enters the unit. Any such heater must be sized to heat the maximum amount of outdoor air to the required minimum value, even with the lowest likely outdoor temperature. Failure to do so could cause unexpected condensation and other problems.

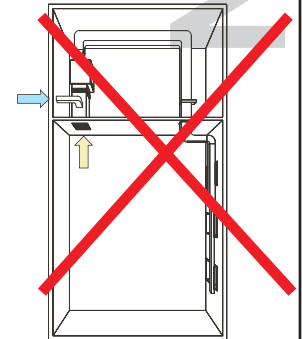
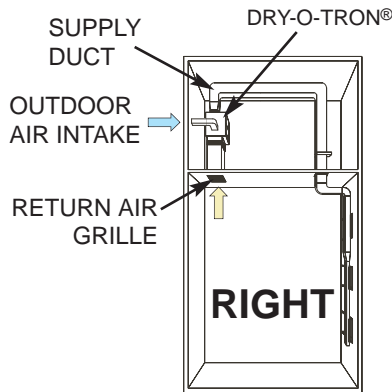
Where the above temperatures cannot be achieved, any outdoor-air intake will require a separate outdoor-air intake system (by others). Separate systems must not change the pressure or flow in ducts connected the unit, must not deliver outdoor air to the return duct, and must not allow mixed air to enter the return duct.



NOTICE

Risk of unit damage. Risk of building damage from water leakage. Never allow outdoor air to enter the unit return duct. Only room air near design conditions should enter the return duct.

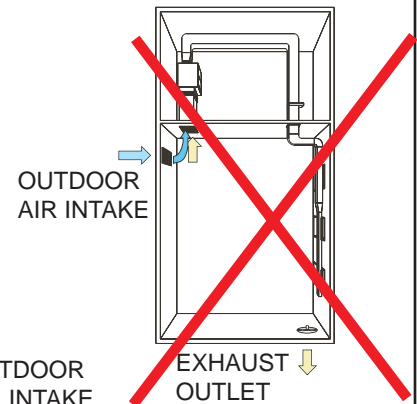
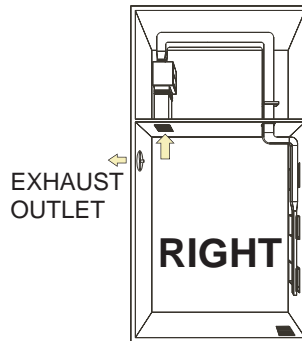
Outdoor air should always enter through a hood, cap, or gooseneck in order to prevent the entry of rain, snow, etc. A screen should be provided to exclude leaves, insects, etc.



Some facilities may already have separate ventilation systems by others. In this case, the DRY-O-TRON® can control ventilation as needed.

Where ventilation is by others, arrange makeup air to enter the room far away from the DRY-O-TRON® return duct grille.

Never allow outdoor air or air mixed with outdoor air to enter the return grille.



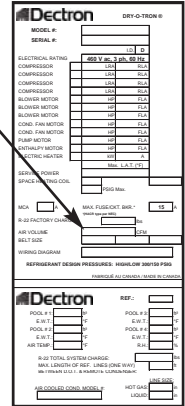
Outdoor-Air Intake

Building Construction

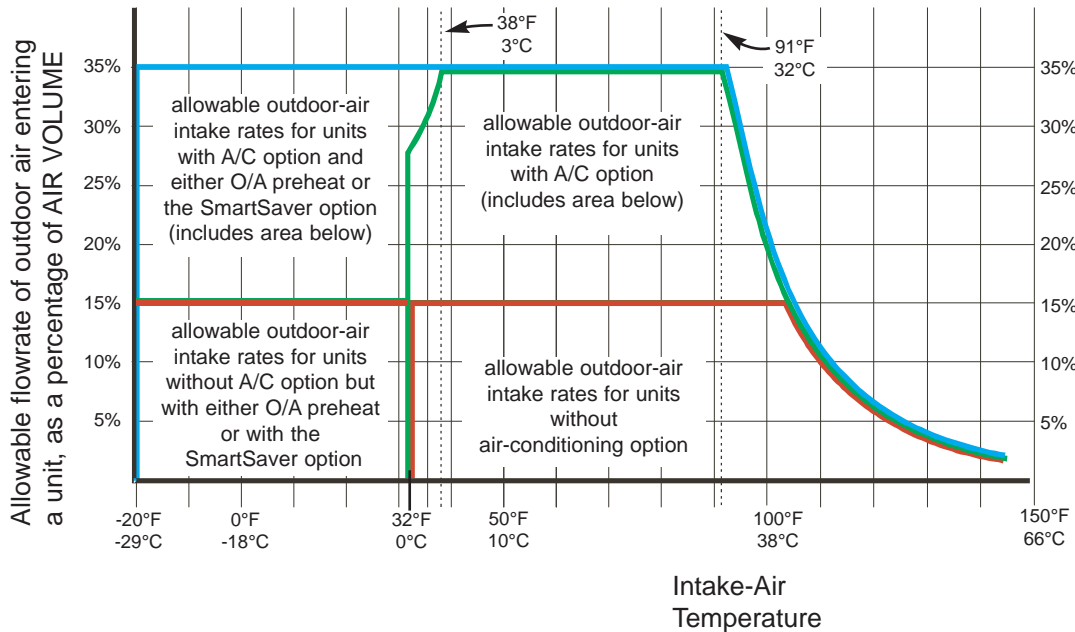
NOTICE Risk of unit damage. Risk of building damage from water leakage. Apply the requirements applicable to your unit. Do not confuse options.

The maximum amount of outdoor air that can enter a unit depends on the outdoor temperature and the unit options.

- The air-handler nameplate shows the required supply airflow rate in cubic feet per minute (CFM) at sea level, marked "AIR VOLUME".
- Where connected to the DRY-O-TRON®, the outdoor-air intake (if any) flow rate is determined by the project engineer. Any outdoor airflow rate must not exceed the value shown in the chart below, except:
 - a) Units with the Economizer option can have up to 100% of nameplate value AIR VOLUME during Economizer mode.
 - b) Units with the Intelligent Energy Saver option can have up to 100% of nameplate value AIR VOLUME during Intelligent Energy Saver mode.
 - c) Units with the Purge option can have up to 100% of nameplate value AIR VOLUME during Purge mode.
 - d) Units specially designed and documented for different conditions.



BUILDING CONSTRUCTION



DECTRON

Building Construction

Standard Practice for Ducts

RETURN DUCT

WRONG

The air will not be evenly distributed over the evaporator.

2.5 W or more

Turning Vanes

RIGHT

Always install vibration isolator. Vanes and straight length allow air to flow evenly.

RETURN DUCT

WRONG

The air will not be evenly distributed over the evaporator.

Always install vibration isolator.

Turning Vanes

RIGHT

Vanes and straight length allow air to flow evenly.

30° or more

WRONG

Air cannot follow this steep angle.

20° or less

RIGHT

Air can follow this transition.

SUPPLY DUCT

WRONG

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

Always install flexible duct connection.

5W or more

W

RIGHT

Sufficient straight length allows proper airflow. Flexible duct connection absorbs vibration.

Window set to outside

WRONG

Air cannot reach the lower part of the window.

Window set to inside

Δ Linear diffusers with volume control.
Δ Register with double deflection and volume control.

RIGHT

Dry air reaches all the window.

Data subject to change without notice.

Duct-Traversing Planes

Building Construction

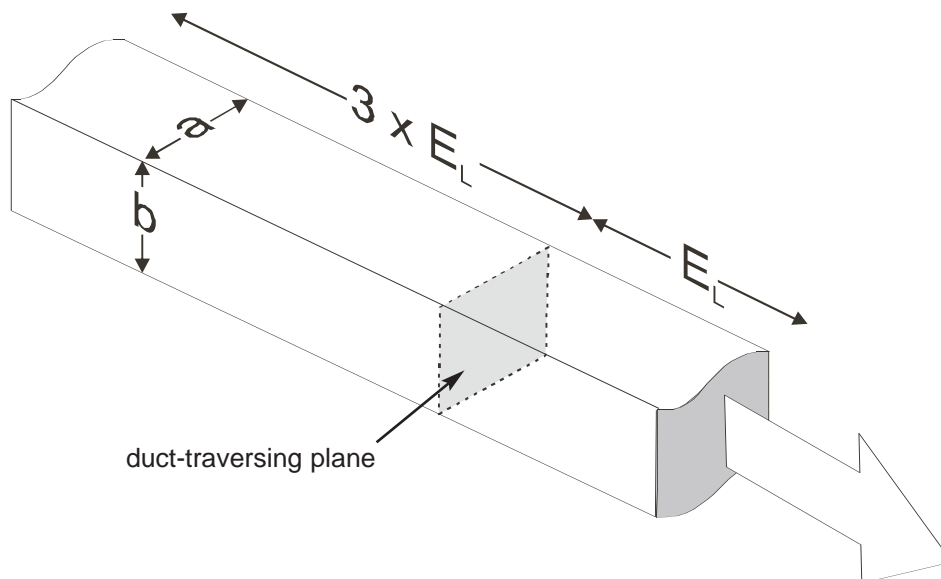
This is not a convenience air conditioner - it is a process dehumidifier. Proper airflow is essential.

Be sure to arrange sections of the supply duct, the outdoor-air intake duct (if any), and the exhaust-air duct (if any) for airflow measurement. The traversing plane for airflow measurement should be accessible and

1. full-sized, unbranched, and straight for at least three effective duct diameters upstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater, and
2. full-sized, unbranched, and straight for at least one effective duct diameter downstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater.

For this purpose, the effective duct diameter E_L is given by

$$E_L = \sqrt{4ab / \pi}$$



Indoor Units

Air in outdoor-air intake ducts may contain fog or rain. If outdoor-air intake ducts must be insulated on the inside, use only moisture-resistant insulation.

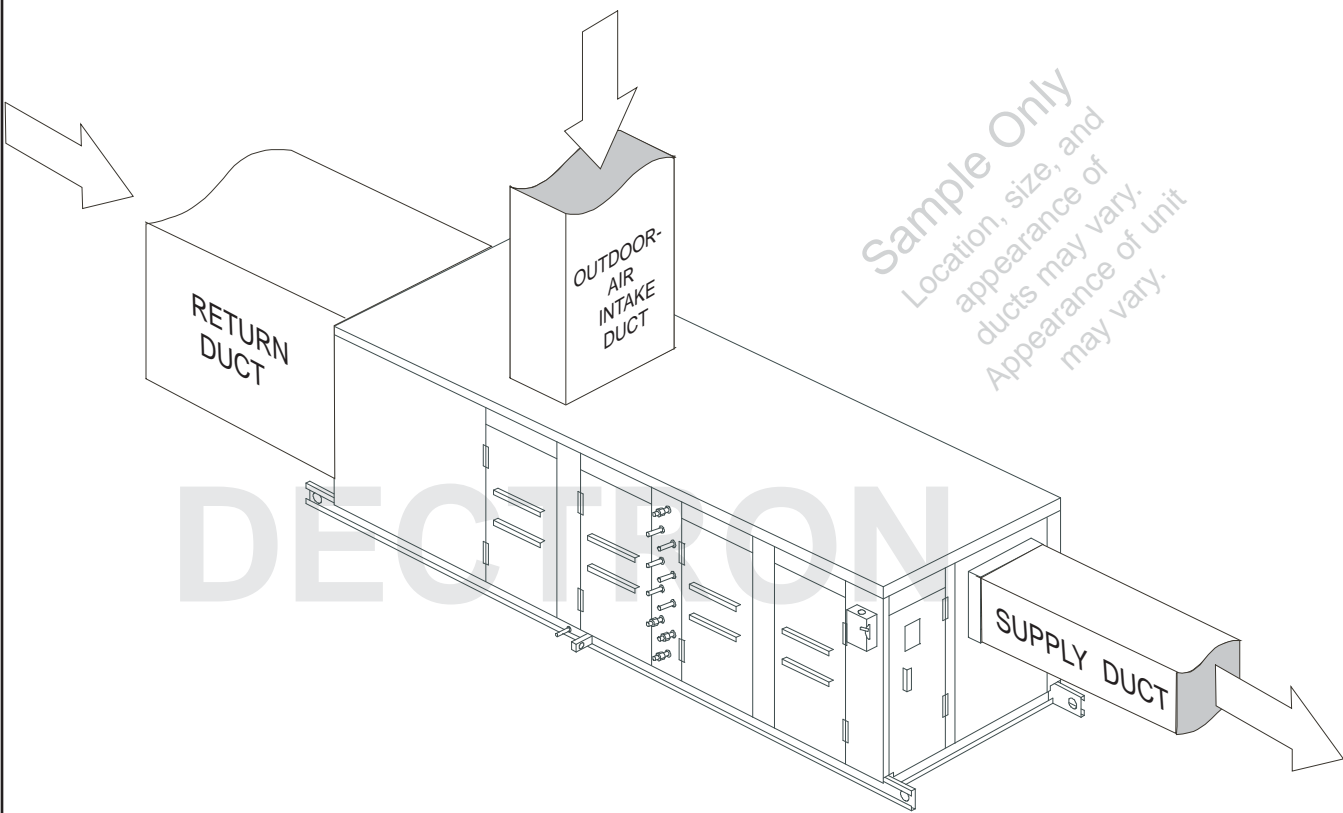
Where possible, a better solution is to insulate the exterior of the duct and cover the insulation with a suitable vapor retarder to prevent sweating.

Outdoor Units

To prevent condensation inside any ducts that are exposed to outdoor air, any such ducts should be

- (a) insulated on the outside to insure that the projected room-air dewpoint temperature (usually 60 to 70°F (15 to 21°C) for natatoriums) will occur on the outside of the duct, or
- (b) insulated on the inside, with moisture-resistant insulation and an integral vapor retarder toward the center of the duct, or
- (c) both.

BUILDING CONSTRUCTION



Fire/Smoke Detectors

Building Construction

BUILDING CONSTRUCTION



WARNING

Risk of fire/smoke alarm failure. Can cause property damage, injury, or death.

Placement of fire/smoke detectors is critical for reliability. Read and follow the instructions in this manual, the alarm manual, and all applicable codes.

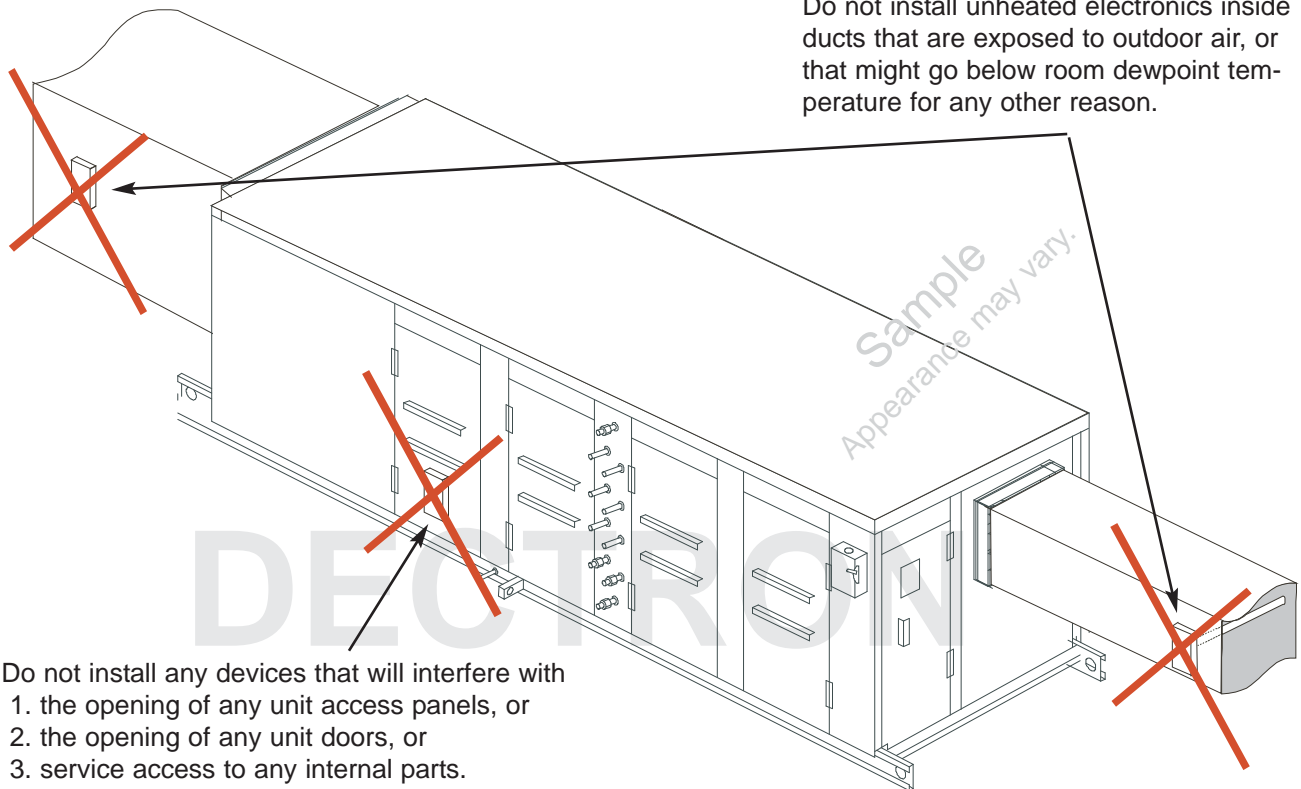
Other than the controls of the DRY-O-TRON® unit, no electronic components or other equipment that is subject to moisture damage should be installed in the DRY-O-TRON® unit, unless special arrangements are made with Dectron at time of sale.

Where fire/smoke detectors must be located in any duct that may cool below room-air dewpoint (usually 60 to 70°F (15 to 21°C) for natatoriums), either the detector must be heated to prevent condensation, or must be located well within the heated space of the building. No unheated electronics, including fire/smoke detectors, should be located in ducts exposed to outdoor air, due to the risk of condensation.

Moist air from the building will move through ducts, even with the blower off. If air contacts any surface below its dew point (usually 60 to 70°F (15 to 21°C) for natatoriums), water will condense onto that surface.

Should fire/smoke detectors be required to be inside the DRY-O-TRON® unit, use care in locating any such device to prevent interference with service access. Service access requires that all doors and panels be easily operable and that all service spaces between pipes and other components remain open for entry and exit. Dectron accepts no responsibility for delays, extra costs, or other damages due to misplacement of a fire/smoke detector by others.

Do not install unheated electronics inside ducts that are exposed to outdoor air, or that might go below room dewpoint temperature for any other reason.



- Do not install any devices that will interfere with
1. the opening of any unit access panels, or
 2. the opening of any unit doors, or
 3. service access to any internal parts.

NOTE: Spaces between internal components may be required for access.

Building Construction

Air Distribution

Under-floor Supply-Air Distribution

Where the supply diffusers will be in or just above the floor, they should be primarily along any exterior walls and directed toward windows, doors, or other surfaces that might cool below room-air dew point. Allow 3 to 5 CFM per square foot (15 - 26 l/s per square meter) of exterior glass. If possible, direct supply air through linear diffusers with steerable vanes.

In the case below, the return grille should be located 8 to 15 ft. (2.5 to 4.5 m) up an interior wall.

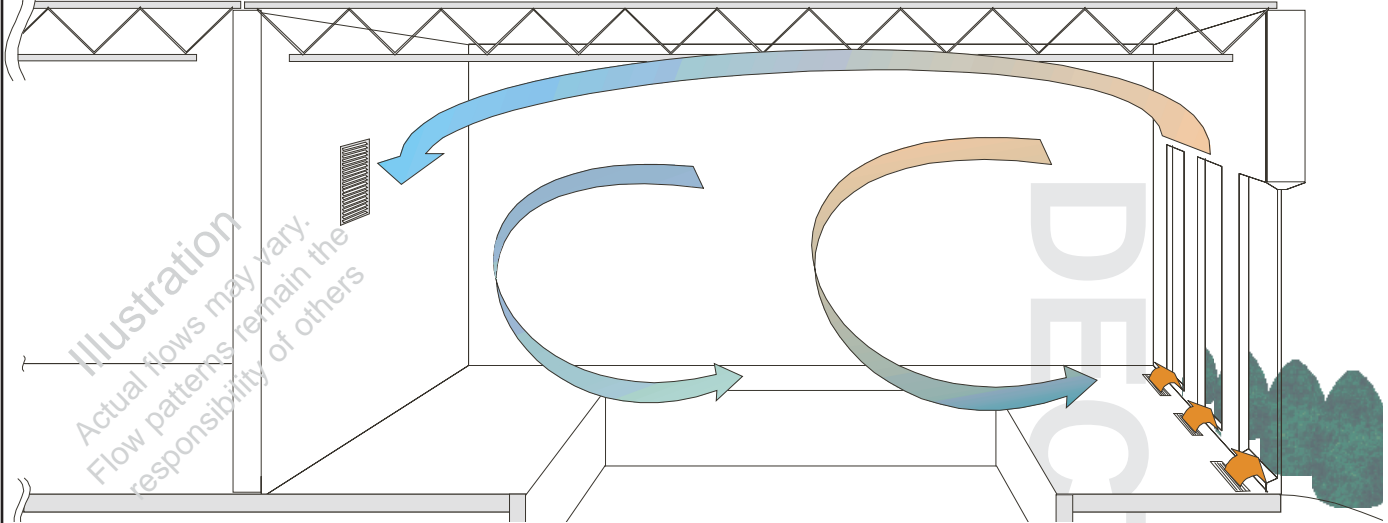
Air speeds over a pool surface should be 10 to 50 FPM (0.05 to 0.25 m/s) in heating mode. Note that temperature and humidity buoyancy effects should be considered. Dectron offers computerized analysis of airflows.

For tall or very tall windows, more complex supply-diffuser placements may be necessary. See **Installation - Air Distribution** and **Installation - Ducts** in this manual for further considerations.

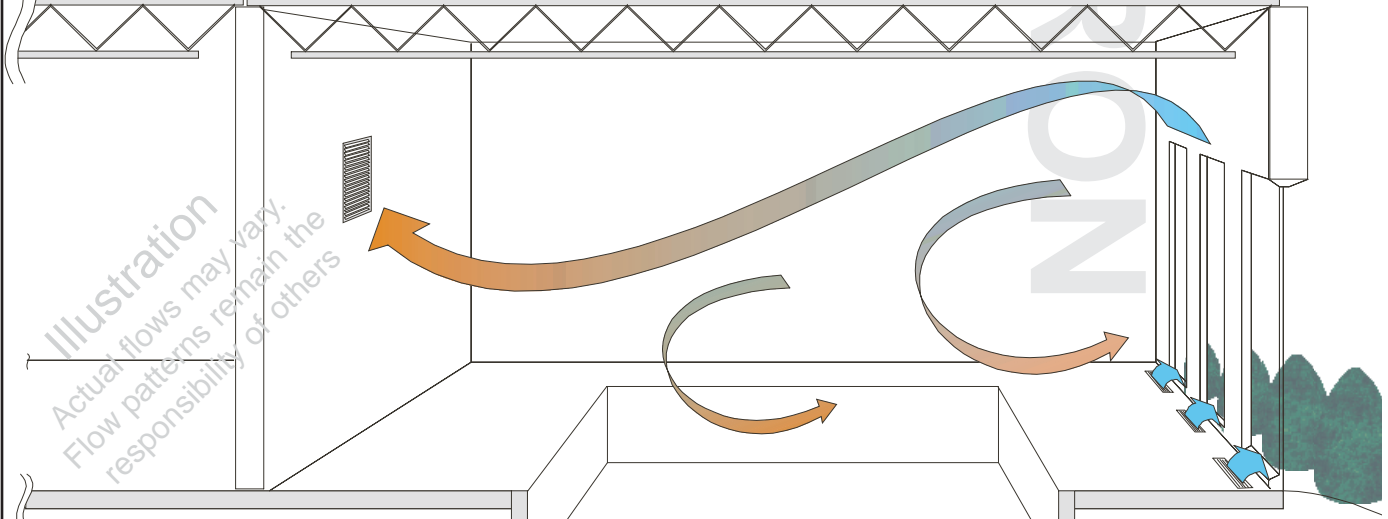
High ceilings or large room dimensions may require more than one return grille.

For units equipped with the Purge feature, see **Appendix M6 - Purge** for further considerations.

Heating Mode



Cooling Mode



BUILDING CONSTRUCTION

Illustration
Actual flows may vary.
Flow patterns remain the
responsibility of others

DECTRON

Data subject to change without notice.

Air Distribution

Building Construction

Overhead Supply-Air Distribution

Where the supply diffusers will be overhead, they should be primarily along any exterior walls and directed toward windows, doors, or other surfaces that might cool below room-air dew point. Allow 3 to 5 CFM per square foot (15 - 26 l/s per square meter) of exterior glass. If possible, direct supply air through linear diffusers with steerable vanes.

In the case below, the bottom of the return grille should be located 8 to 15 ft. (2.5 to 4.5 m) up an interior wall.

Air speeds over a pool surface should be 10 to 50 FPM (0.05 to 0.25 m/s) in heating mode. Note that temperature and humidity buoyancy effects should be considered. Dectron offers computerized analysis of airflows.

For tall or very tall windows, more complex supply-diffuser placements may be necessary. See **Installation - Air Distribution** and **Installation - Ducts** in this manual for further considerations.

High ceilings or large room dimensions may require more than one return grille.

For units equipped with the Purge feature, see **Appendix M6 - Purge** for further considerations.

BUILDING CONSTRUCTION

Heating Mode

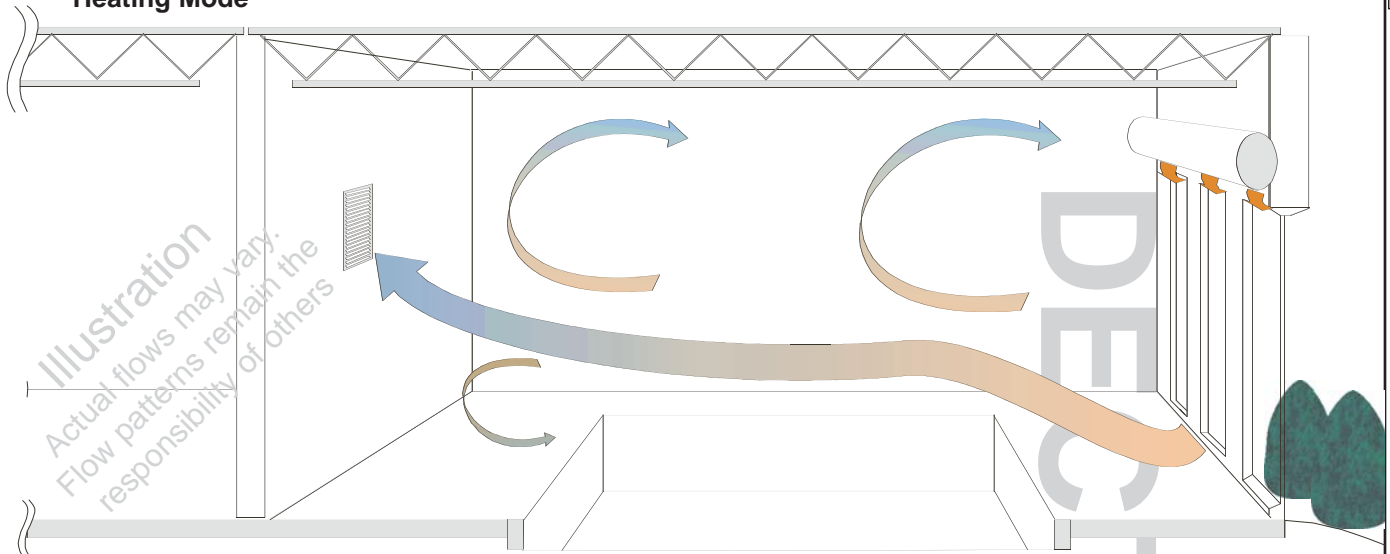


Illustration
Actual flows may vary.
Flow patterns remain the
responsibility of others

Cooling Mode

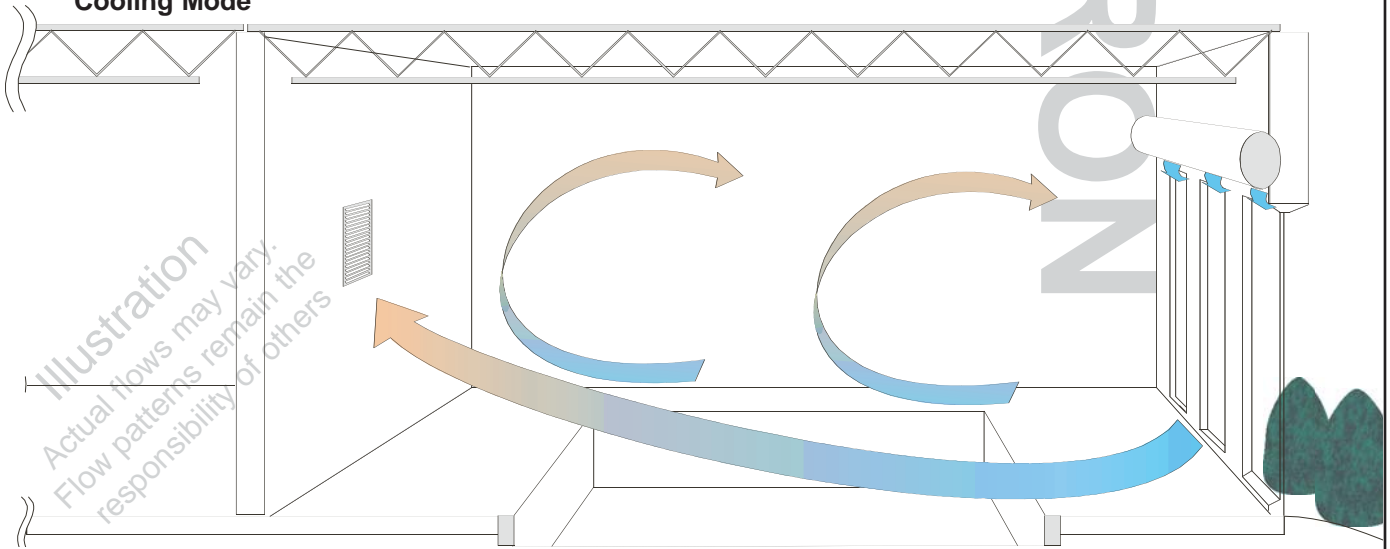


Illustration
Actual flows may vary.
Flow patterns remain the
responsibility of others

Data subject to change without notice.

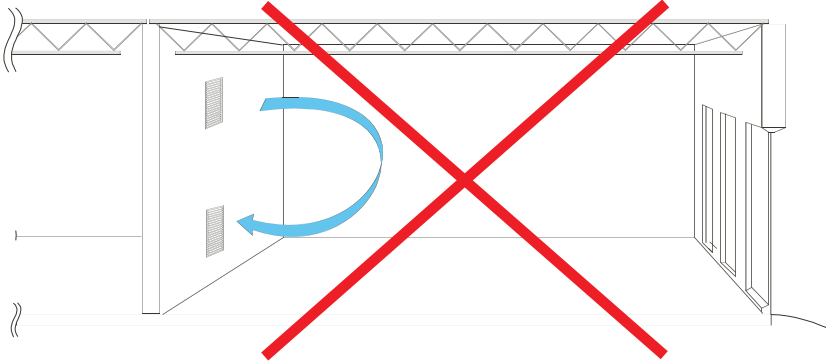
Building Construction

Air Distribution

BUILDING CONSTRUCTION

Examples of Mis-Directed Air

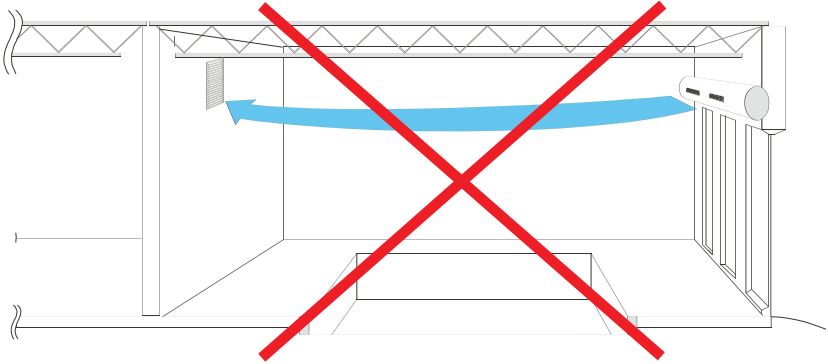
Lack of proper ducting can lead to shorted air flows. In the example at right, the supply air projects a short distance into the room and is drawn back into the return grille.



This leaves the exterior walls and windows with no protection against condensation.

The DRY-O-TRON controller will detect the supply air entering the return and will erroneously conclude that the cooling and/or dehumidification demand is completed.

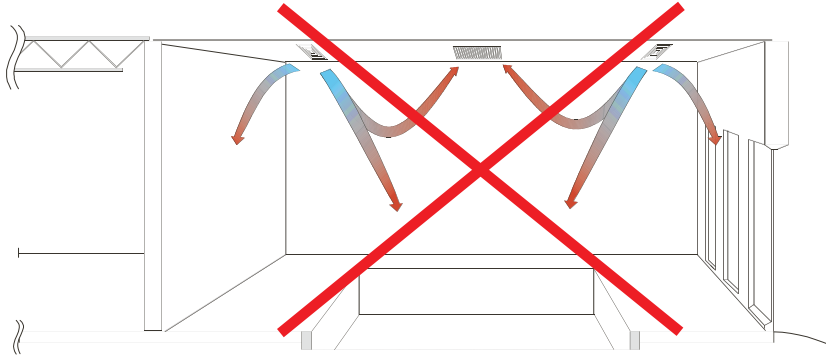
In the example at right, the supply air projects across the top of the room and is drawn back into the return grille.



This leaves the exterior walls and windows with no protection against condensation.

The quality of the air at the pool surface will suffer.

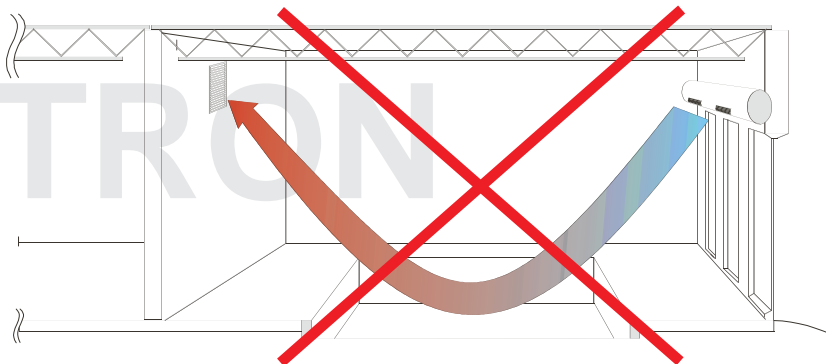
In the example at right, having both the supply diffusers and the return grille in the ceiling causes a large part of the supply air to be directed back into the return grille, leading to unexpected operation.



A large amount of supply air is being directed toward the pool, where it will elevate the evaporation rate.

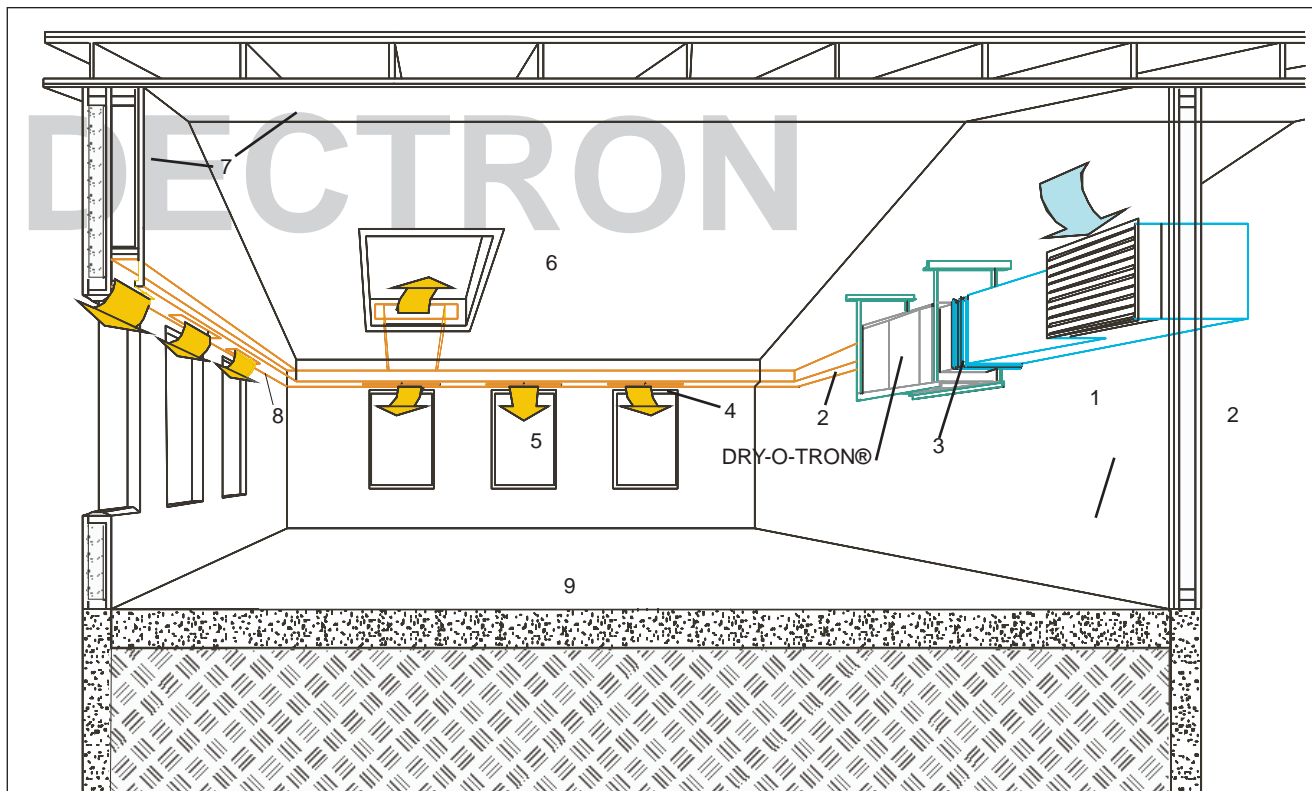
Only a fraction of the supply air reaches the windows, which are the most likely surfaces for condensation.

In the example at right, the supply air is directed at the pool surface. The resulting air speed at the water surface will increase the evaporation rate. The increase may lead to uncontrolled humidity levels.



Air Distribution

Building Construction

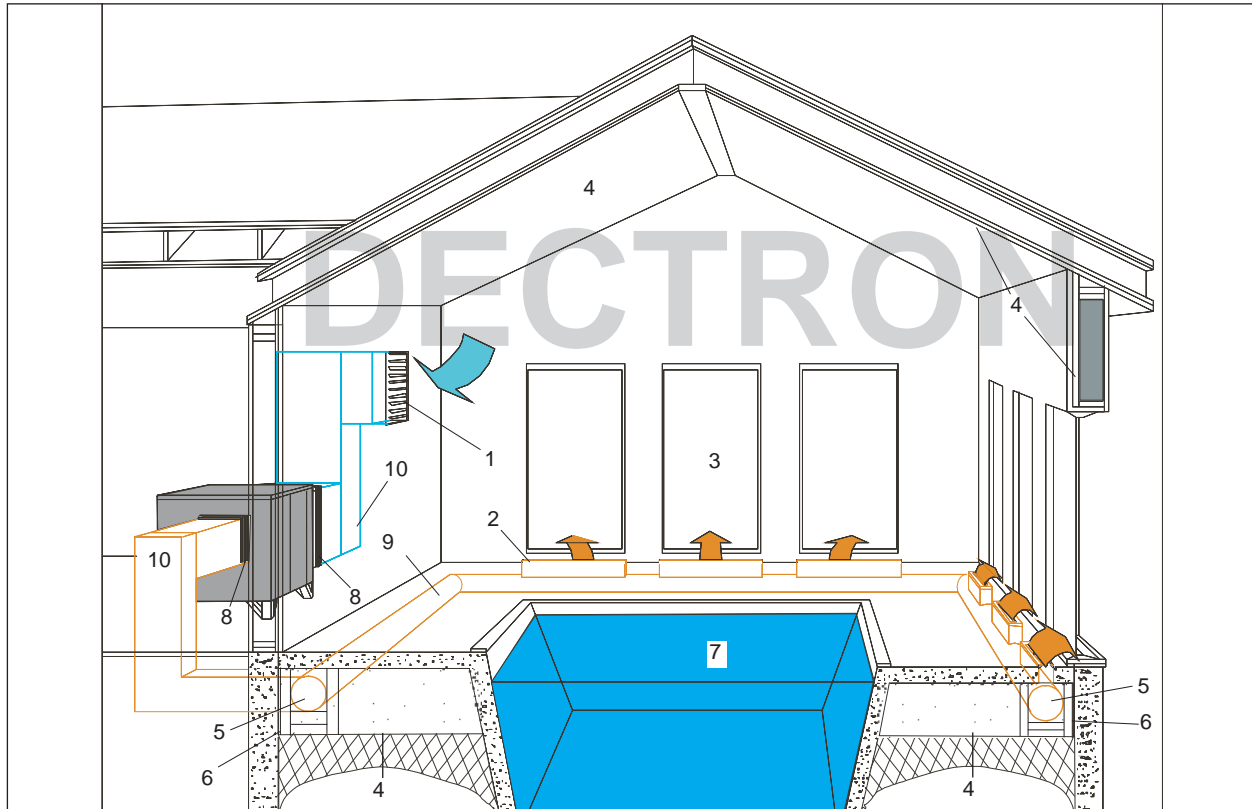


1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) above the floor. Arrange for suitable air distribution. Arrange to prevent accidental blockage.
2. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (Also see the guidelines in **Standard Practice for Ducts.**)
3. Always install flexible duct connections at the unit.
4. Linear diffusers must cover entire width of window.
5. Blanket entire window with supply air.
6. Skylights are not recommended since condensation on skylights is difficult to control.
7. A vapor barrier in all walls and ceilings is necessary. **Dehumidification will not prevent the condensation of liquid water inside cold walls.**
8. Direct air at glass surfaces from close range for glass mounted high on walls.
9. Do not direct air over pool surface.
10. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
11. See other requirements elsewhere in this section.

Building Construction

Air Distribution

Installations with sliding glass doors and/or windows set low in the wall should use under-floor perimeter supply air distribution with the supply air directed vertically upward along the glass surfaces. This configuration allows high air velocity and large air volumes.

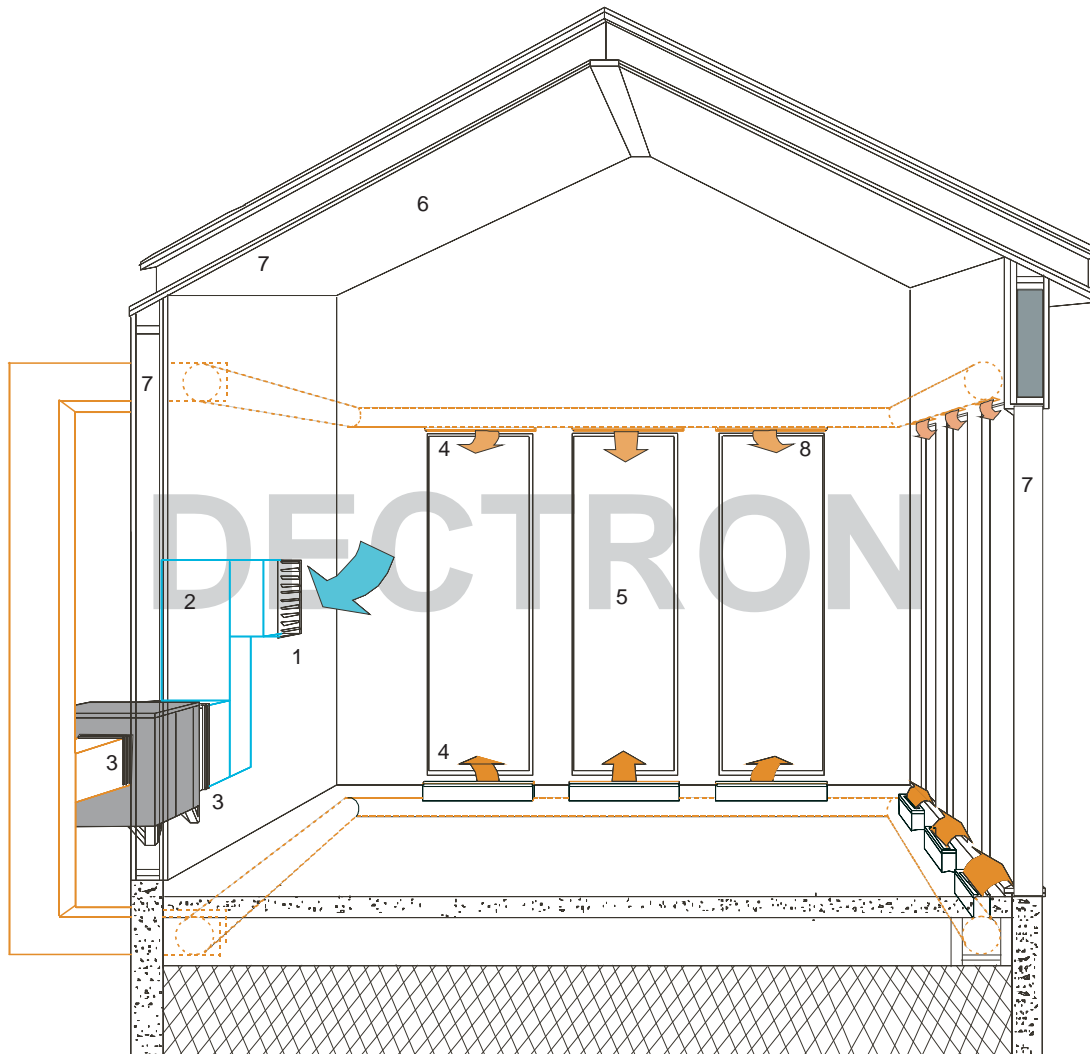


1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) up an interior wall. Allow for proper air circulation and arrange to prevent blocking of the inlet. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (See also **Installation - Duct Design** guidelines.)
2. Diffusers must be linear and must cover the entire width of each window.
3. Blanket each entire window with supply air.
4. A vapor barrier in all walls and ceilings is necessary. Dehumidification will not prevent the condensation of liquid water inside cold walls.
5. Where duct is installed below the floor, use PVC coated round metal duct.
6. Duct installed beneath the floor should be insulated with styrofoam insulation.
7. Do not direct air over the pool water surface.
8. Always install flexible duct connections at the unit.
9. Under-floor perimeter air distribution for low windows should be installed.
10. Install 90° elbow and use acoustic insulation up to elbow only to eliminate air movement noise (see also Duct Design guidelines)
11. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
12. See other requirements elsewhere in this section.

Air Distribution

Building Construction

Tall windows may require supply air to be directed toward them from both top and bottom.



BUILDING
CONSTRUCTION

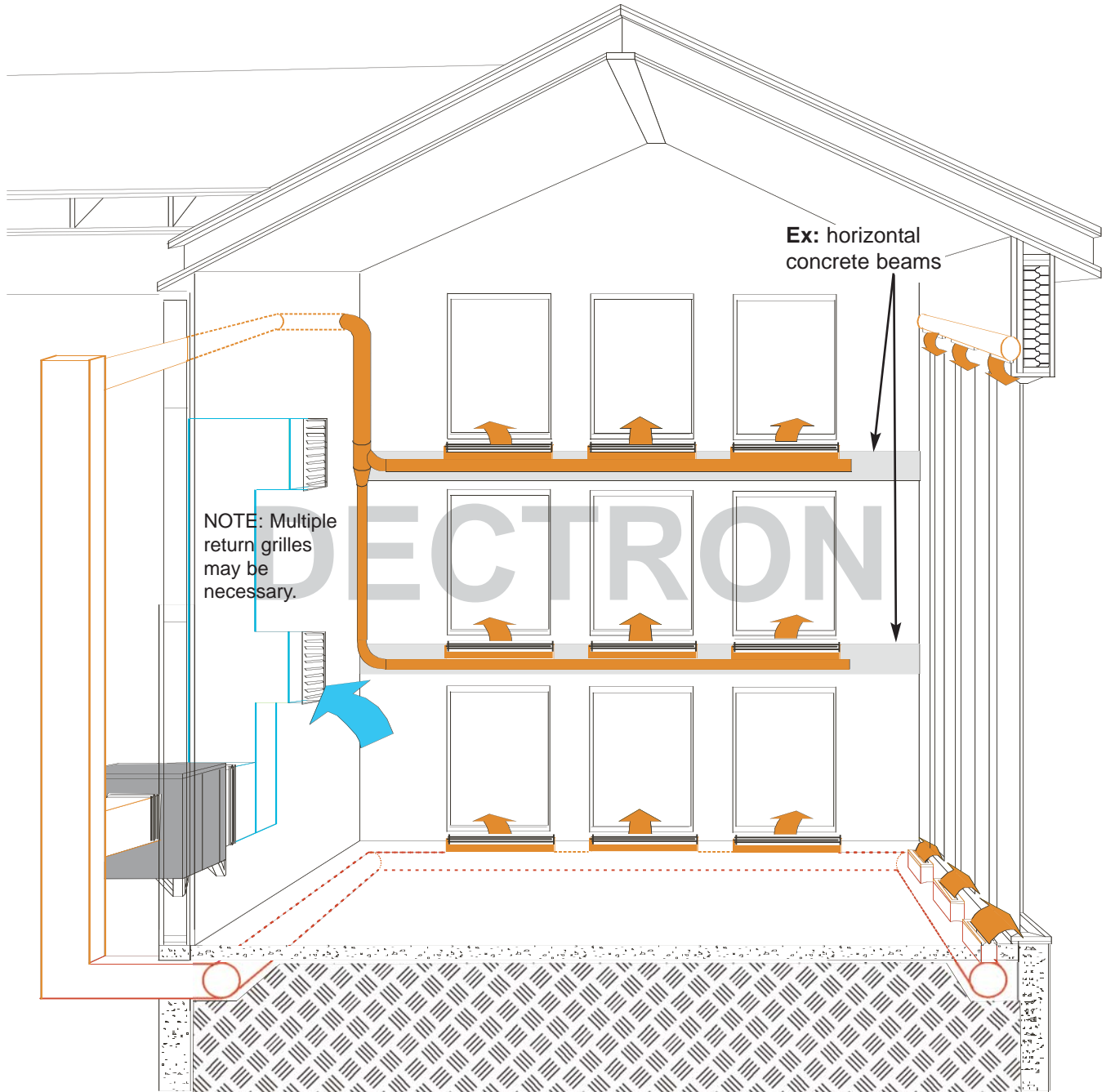
1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) up an interior wall for proper air circulation and to prevent blocking of the inlet. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (See also **Installation - Duct Design** guidelines.)
2. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (Also see the guidelines in **Unit-Duct Connections** and **Standard Practice for Ducts**.)
3. Always install flexible duct connections at the unit.
4. Linear diffusers must cover entire width of window.
5. Blanket entire window with supply air. Tall windows may require diffusers at top and bottom.
6. Skylights are not recommended since condensation on skylights is difficult to control.
7. A vapor barrier in all walls and ceilings is necessary. Dehumidification will not prevent the condensation of liquid water inside cold walls.
8. Direct air at glass surfaces from close range for glass mounted high on walls.
9. When installed for a natatorium, do not direct air over pool surface.
10. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
11. See other requirements elsewhere in this section.

Multiple Distribution for Very Tall Windows or Windows with Cross-Members

Installations with a) very tall windows, or b) windows separated by beams, or c) windows with wide interior frames may require multiple ducts and diffusers to assure air distribution that covers all window surfaces. Multiple return grilles may also be required.

Also see other requirements elsewhere in this section.

BUILDING CONSTRUCTION



Air Distribution

Building Construction

Direct 3 - 5 CFM of supply air per square foot (15 - 26 l/s per square meter) of glass to all exterior windows and doors, or other surfaces that might reach dew point.

Do place diffusers as close to the cold surface as possible, preferably within 12 inches (25 mm).

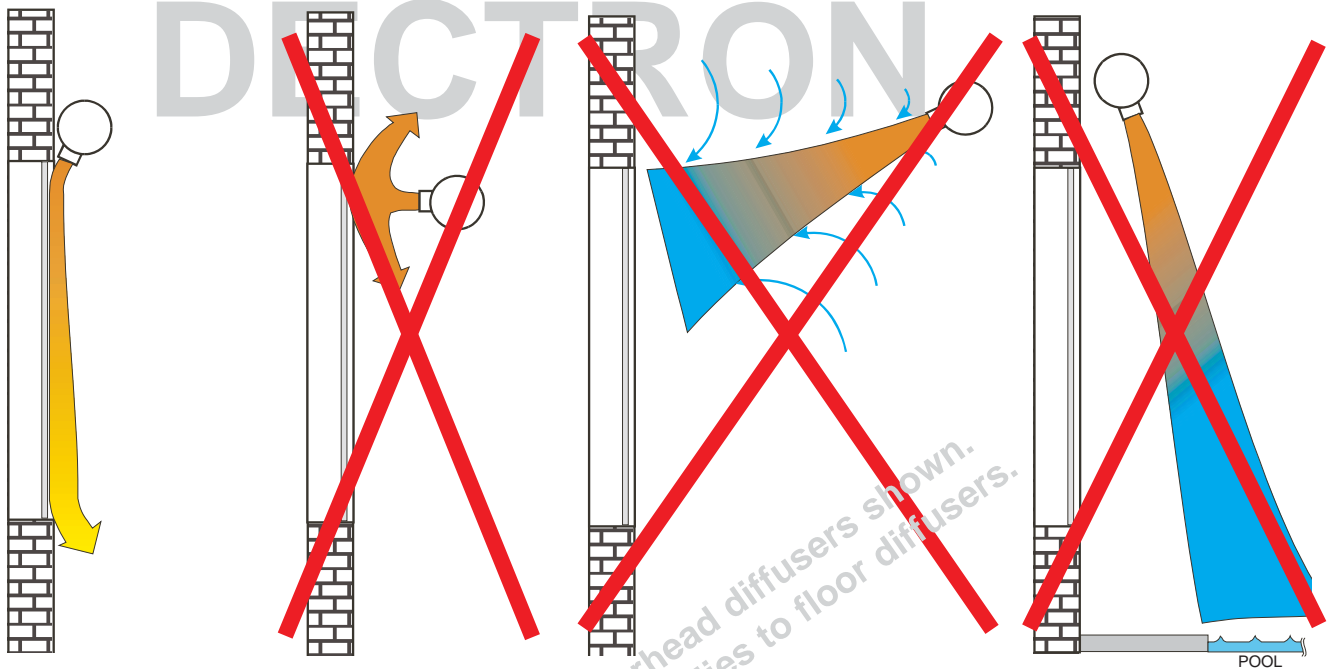
Do direct the air at the sharpest angle possible so the air will follow the surface. See "Coanda Effect" in ASHRAE Fundamentals.

Do not direct supply air perpendicular to the surface. Larger surfaces (like windows) will not be completely covered.

Do not use long throws. The resulting supply air mixed with room air will not prevent the windows from sweating.

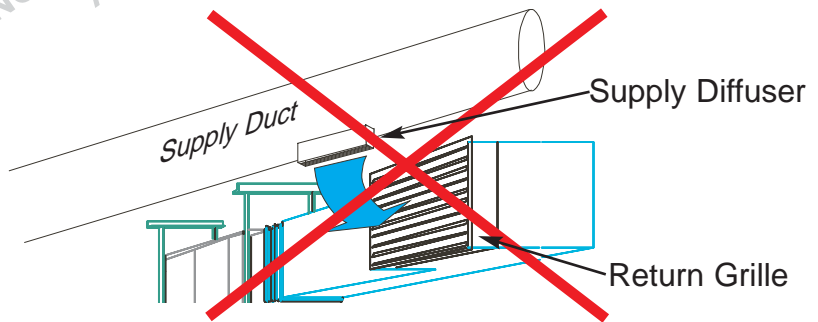
Unless special arrangements were made at time of sale, **do not** blow air directly at a pool. Doing so can increase the evaporation rate.

BUILDING CONSTRUCTION



NOTE: Overhead diffusers shown. Also applies to floor diffusers.

Never position a supply diffuser such that supply air will be drawn into the return grille. Doing so may result in erroneous sensor readings and mode oscillation.

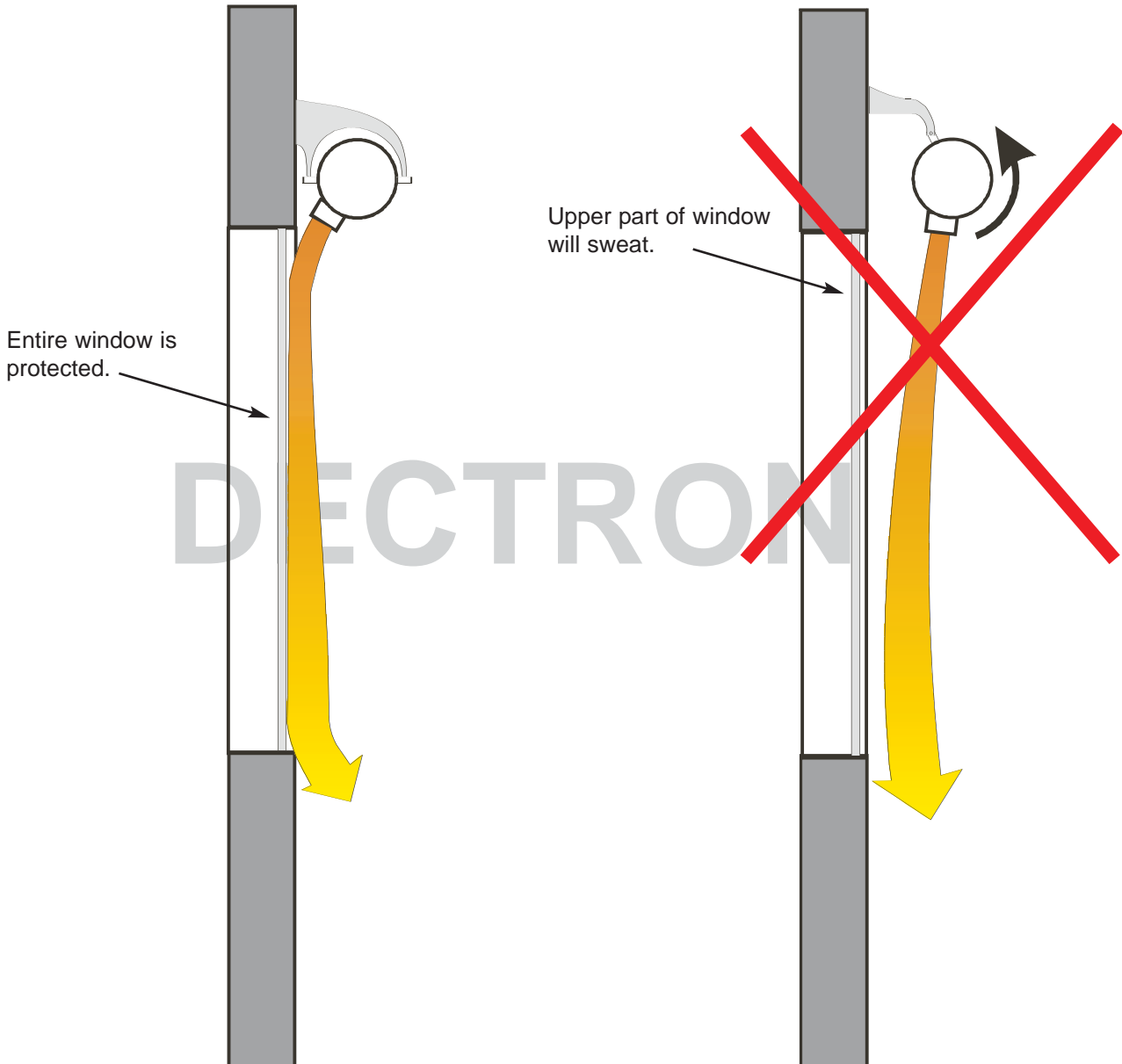


Fabric Duct

Where fabric duct is used, it should have a two-row support system, or have other means of preventing rotation.

Fabric duct with a loose single-row support system tends to rotate away from the window when supply air is flowing. This allows the supply air to miss the upper part of the window.

BUILDING CONSTRUCTION



DECTRON

Pool-Chemical Storage Facility

Building Construction

BUILDING CONSTRUCTION

NOTICE

Risk of corrosion. Can cause property damage.

Pool chemicals are very corrosive and can cause severe property damage. Read and follow these instructions.

Chemical fumes will escape from containers and damage all metal equipment. The chemical storage space should be well ventilated to the outdoors. Where an exhaust fan is used, a differential-pressure switch should cause an alarm if the door is left open or if the fan fails.

Doors should not open from the chemical-storage space into a mechanical-equipment room or into the natatorium. If such interior doors must be installed, they should be gasketed and equipped with a reliable automatic closer.

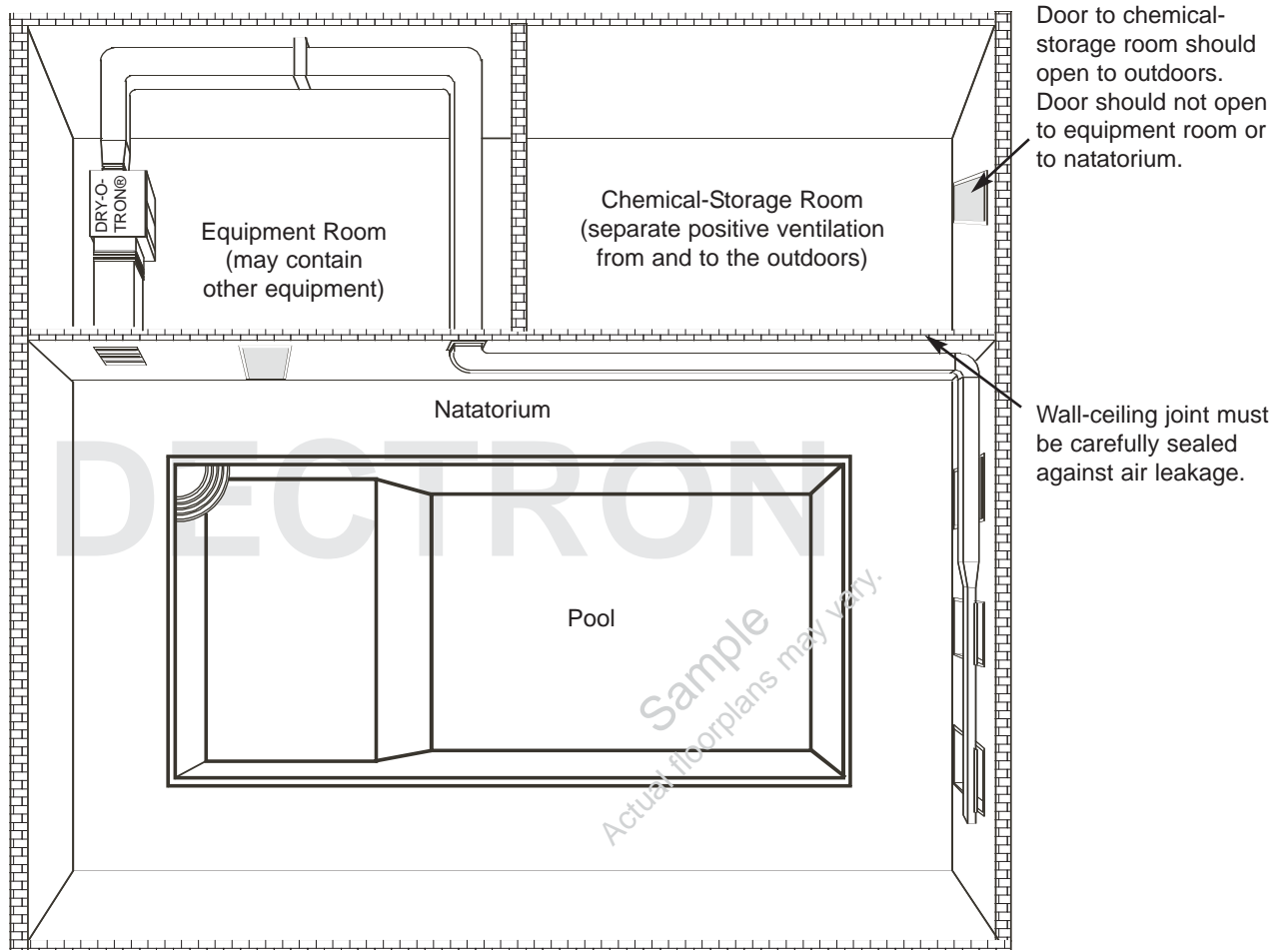
There should be no ducts, grilles, or other openings that connect the chemical-storage space to the natatorium. Otherwise, the proper negative pressure on the natatorium will draw in fumes from the stored chemicals.

If the chemical storage room is part of the natatorium building, the room should have a sealed and impervious ceiling to prevent fumes from reaching other parts of the building.

Pool chemicals **must** be stored in a space other than that in which a DRY-O-TRON® is installed. There should be no ducts, grilles, gaps, or other openings between the chemical-storage space and a space containing a DRY-O-TRON®.

Chemical fumes entering a space where combustion devices are located may be a code violation - consult your local code-enforcement authorities.

Chemical fumes entering the natatorium will cause (a) breathing difficulties with some patrons and (b) corrosion of all exposed metal equipment.



Data subject to change without notice.

Dectron, Inc. March 2012

Building Construction

Pool-Water Chemistry

BUILDING CONSTRUCTION

NOTICE

Risk of corrosion. Can cause property damage.

Pool chemicals are very corrosive and can cause severe property damage. Read and follow these instructions and all applicable codes.

Pool water quality is not only a health and comfort problem, it also affects the performance of mechanical equipment.

The owner/operator of the natatorium is responsible for maintaining proper pool-water chemistry. Water treatment instructions **MUST** be obtained from the pool equipment or pool chemical supplier. There are also excellent books and videos available on this subject.

IMPORTANT!

Failure to maintain proper chemistry in the pool water will result in scale formation and/or corrosion which may void the DRY-O-TRON® warranty.

Some Basics

Δ Foul odors in the pool area

The powerful, stinging smell that is often associated with indoor pools is that of chloramines, not excessive chlorine. The presence of excessive chloramines indicates a need for corrective action. The smell is actually a symptom of under-chlorination which can result in high levels of bacteria, fungi, viruses etc.

Maintaining proper chlorine levels and constant pH levels will eliminate the foul odors. Airborne chloramines also have a strong affinity to pure water such as condensate. Stagnant condensate in walls and on windows can accumulate considerable amounts of chloramines which make the condensate acidic and corrosive. The prevention of condensation

coupled with proper pool water treatment will reduce this problem.

Δ pH level

High pH level (alkaline range) enhances scale formation which damages the pool water heaters. With low pH levels the water is acidic and corrosive. Metal parts in pumps and water heaters may be damaged.

Proper pool water management will help ensure the long life for which your pool equipment has been designed.

Pool-water testing should include (at minimum) monitoring and recording:

- Δ pH
- Δ Total alkalinity
- Δ Free (available) chlorine
- Δ Combined chlorine
- Δ Calcium hardness
- Δ Water temperature

Corrosion

Unbalanced pool-water chemistry will lead to health problems and deterioration of the building, and mechanical and electrical equipment. Conversely, a well maintained pool with proper water treatment and sufficient make-up air will offer a healthy environment and will not cause damage to the equipment.

Dectron has taken all commercially feasible precautions to protect the DRY-O-TRON® units against corrosion caused by **accidentally** high levels of chemicals. This means that the equipment should be resistant to unbalanced pool water (high or low pH level) and airborne oxidizing agents such as chloramines for a short period of time.

Major corrosion protection features are:

- Δ Cupro-nickel tubing of pool water heater circuit
- Δ HyPoxy® coated fins on dehumidifying and reheat coil
- Δ Use of plastic, cadmium plated, brass and/or stainless steel hardware wherever possible
- Δ High-quality painted cabinet

Pool owners can further protect their investment by following these simple guidelines for the entire system design:

1. provide an adequate amount of make-up air,
2. install and maintain an automatic pool-water treatment system, and
3. provide quality training for the maintenance personnel.

DRY-O-TRON® units should be serviced by qualified Dectron-trained technicians.

Pool Water Chemistry Problems	Effect
Too little chlorine	Excessive release of chloramines resulting in foul odors and high levels of bacteria, fungi, viruses etc.
High pH or high total alkalinity	Scale formation in the water heaters, pipes etc.
Low pH or low total alkalinity	Corrosive water damages metal components such as water heaters

Pool Water Chemistry Parameters (Refer to ANSI/APSP Guidelines)						
	Pools, Waterparks			Spas		
	Mini- mum	Desirable Range	Not to Exceed	Mini- mum	Desirable Range	Not to Exceed
pH	7.2	7.4 - 7.6	7.8	7.2	7.4 - 7.6	7.8
Alkalinity	60	80 - 100 PPM	180 PPM	60	80 - 100 PPM	180 PPM
Free Chlorine	1.0	1.0 - 4.0 PPM	4.0 PPM	2.0	2.0 - 4.0 PPM	4.0 PPM
Combined Chlorine	0	0 PPM	0.2 PPM	0	0 PPM	0.5 PPM
Dissolved Solids	N/A	N/A	1500 PPM*	N/A	N/A	1500 PPM*
Calcium Hardness	150	200 - 400 PPM	1000 PPM	100	150 - 250 PPM	800 PPM

For salt-water pools, contact Dectron before exceeding 3000 ppm salt concentration.

*1500 ppm over startup value

Data subject to change without notice.

Some units may be equipped with a remote pumped-glycol cooler called a DryCooler. In this case, refer to [Appendix M1 - DryCooler](#).

Some units may have gas-fired boilers. In this case, refer to [Appendix H6](#), [H7](#), or [H8](#) (depending on capacity) for special requirements.

Some units may have gas-fired furnaces. In this case, refer to [Appendix H2 HTCO Furnaces](#) or to [Appendix H9 TEGA Furnaces](#) for special requirements.

Some units may be intended for use in a natatorium. In this case refer to sections in this manual concerning natatorium use. You may also request and refer to [Appendix P1](#).

Some units may be equipped with communication devices for use with Building Management systems. In this case, request and refer to:

[Appendix C1 - Modbus](#)

[Appendix C2 - BACnet PTP](#)

[Appendix C3 - LONtalk](#)

[Appendix C5 - MMI](#)

[Appendix C6 - LANLink2](#) (html, BACnet IP, BACnet Ethernet)

Some units may be intended for use with shared sensors for coordinated operation. In this case, refer to [Appendix C7 - Shared Sensor Adapter](#) for special requirements.

Where units must be stored for longer than two months, refer to [Appendix M4 - Unloading and Storage](#) for special requirements.

Building Construction

Checklist

BUILDING CONSTRUCTION

Confirm that a continuous vapor retarder is specified. See **Building Construction - Moisture Migration.**

your initials

Confirm that the windows are specified as being glazed to the inside. See **Building Construction - Door and Window Design.**

your initials

Confirm that the supply diffusers will project air from close to and at a sharp angle to all exterior windows, doors, or other surfaces that might reach dewpoint. See **Building Construction - Air Distribution.**

your initials

Confirm that space heating will be available at all times. See **Building Construction - Space Heater Availability.**

your initials

Confirm that the outdoor-air intake (if any) will not be from any forbidden zones. (See **Building Construction - Outdoor-Air Intake.**)

your initials

For indoor air handlers, confirm that the air handler will be located in a space where it will not be exposed to corrosive gases emanating from a swimming pool or spa. See (See **Building Construction - Air Handler Location.**)

your initials

For indoor air handlers, confirm that the air handler will not be installed in the same space where pool chemicals are stored, or in any space that connects to any such storage space. (See **Building Construction - Air Handler Location.**)

your initials

Confirm that sufficient space is allowed around the DRY-OTRON® unit for installation and service. (See **Building Construction - Air Handler Location - Working Clearances.**)

your initials

For overhead installations, confirm that there will be sufficient and safe service access, sufficient bracing, etc. (See **Building Construction - Air Handler Location - Overhead.**)

your initials

Confirm that the location of a remote condenser (if any) will allow sufficient airflow clearance all the way around it, and sufficient and safe service clearance. (See **Building Construction - Remote Condenser Location.**)

your initials

Confirm that the locations of the air handler and of the remote condenser (if any) are such as will not require connecting tube lengths greater than specified in the submittal or on the unit nameplate. (See **Building Construction - Maximum Tube Length.**)

your initials

Confirm that the duct specifications and the location of the air handler will allow the minimum straight duct lengths near the unit. (See **Building Construction - Minimum Straight Duct.**)

your initials

Confirm that the location of the return grille is not near a spa, hot tub, etc. (See **Building Construction - Spa/Return-Grille Placement.**)

your initials

Confirm that the placements of the return grille and the supply diffusers are such as to allow proper airflow over windows and doors, and across the pool. (See **Building Construction - Air Distribution.**)

your initials

Confirm that ducts exposed to outdoor air will not sweat inside the building. See **Building Construction - Duct Insulation.**

your initials

Confirm that any duct-mounted smoke detectors or other electronics will not be subject to condensed moisture. See **Building Construction - Fire/Smoke Detectors.**

your initials

Date _____

Model No. _____

Serial No. _____

Ref. No. _____

Name _____

Tel. _____

Contents Receiving, Unloading, Lifting, and Locating

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LIFTING AND LOCATING

NOTICE

**Risk of injury.
Risk of property damage.**

The information presented in this section represents Dectron's best effort as of the time of issue. This information should be considered in receiving, unloading, transporting, and installing the equipment. Dectron does not warrant that this information is complete for any particular application.

Where any steps are not clear, Dectron offers technical assistance at 1-800-667-6338 or 1-800-676-2566.

Follow all applicable safety rules and regulations. Where any recommendations in this manual conflict with legal requirements, the legal requirements take precedence.

Dectron, Inc. does not engage in transportation services or material-handling services. All costs, risks, and responsibilities of safety, transportation, handling, moving, damage prevention, etc., are borne by others.

Lifting and Locating

Safety Warnings

! WARNING

Risk of top-heavy units tipping over. Can cause property damage, injury, or death.

Some units and some ancillary equipment may be top-heavy or may be shipped in crates that are top heavy. Follow the instructions in the **Lifting and Locating** section, along with all appropriate standards and procedures.

Vertical units may be top-heavy even after removal from shipping materials. Follow the instructions in the **Lifting and Locating** section, along with all appropriate codes and procedures.

! WARNING

Risk of crushing. Can cause injury or death.

Large, heavy equipment can cause crushing. Do not allow any part of your body to be under crates or equipment at any time. Use only lifting equipment and devices that are rated for the load. Secure all lifting straps, slings, spreaders, etc., to prevent accidental dropping.

Follow the instructions in this manual and all other applicable codes, standards, and safety procedures.

! CAUTION

Risk of contact with fasteners, splinters, broken shipping materials, and sharp edges. Can cause injury.

Shipping crates may break during shipping, causing sharp-pointed pieces. Wooden shipping crates may have splinters.

Boxes and crates may have fasteners with exposed ends.

Other sharp edges may be present.

Only qualified persons with safety headgear, gloves, safety glasses, safety shoes, and other protective equipment should lift or move the unit, remove shipping crate or other shipping material, or otherwise handle the unit prior to installation.

! WARNING

Risk of contamination of breathing air. Can cause injury or death.

Follow the instructions in this manual and all applicable codes.

NOTICE

Risk of damage from forklift. Can cause property damage.

Follow the instructions in this manual and all applicable procedures to prevent damage to equipment when lifting with a forklift.

NOTICE

Risk of damage from improper storage. Can cause property damage.

If the unit must be stored before installation, request, read, and follow the instructions in Appendix M4, Storing Units.

Lifting and Locating

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LIFTING AND
LOCATING

Lifting and Locating

Select Air Handler Location

Refer to the unit nameplate as shown below.

Note the unit model number on the nameplate.

Units with a model number beginning in the letter "D" must be installed indoors, protected from the weather, direct sunlight, and freezing temperatures. These units must be located in a room with an air-temperature range of 70°F (21°C) to 90°F (32°C) and a relative-humidity range of 10% to 80%.

Units with a model number beginning with the letter "R" may be installed indoors or outdoors. "R" units do not have the above temperature and humidity limitations.

NOTE: In this discussion, "i", "xxx", "sss", and "v" are placeholders. Your nameplate will have the proper values for your unit.

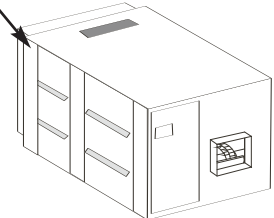
Model Nomenclature:

iXXX-SSS-V

D = indoor cabinet
R = outdoor cabinet

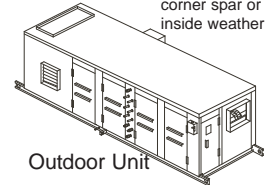
Nominal moisture removal capacity in lbs./hr.

Name plate on corner



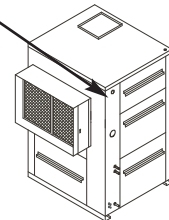
Horizontal Indoor Unit

Name plate on corner spar or inside weather door



Outdoor Unit

Name plate on corner



Vertical Indoor Unit

Dectron DRY-O-TRON®

MODEL #: _____
SERIAL #: _____

ELECTRICAL RATING: 460 V ac, 3 ph, 60 Hz

COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
PUMP MOTOR	HP	FLA
ENTHALPY MOTOR	HP	FLA
ELECTRIC HEATER	KW	A

Max. L.A.T. (°F) _____

SERVICE POWER _____
SPACE HEATING COIL _____ PSIG Max.

MCA A MAX. FUSE/CKT. BKR. * A
*NACR type per NEC

R-22 FACTORY CHARGE _____ lbs

AIR VOLUME _____ CFM
BELT SIZE _____

WIRING DIAGRAM _____

REFRIGERANT DESIGN PRESSURES: HIGH/LOW 300/150 PSIG

FABRIQUÉ AU CANADA / MADE IN CANADA

Dectron REF.: _____

POOL # 1:	RP	POOL # 3:	RP
E.W.T.:	°F	E.W.T.:	°F
POOL # 2:	RP	POOL # 4:	RP
E.W.T.:	°F	E.W.T.:	°F
AIR TEMP.:	°F	R.H.:	%

R-22 TOTAL SYSTEM CHARGE: _____ lbs
MAX. LENGTH OF REF. LINES (ONE WAY) BETWEEN D.O.T. & REMOTE CONDENSER: _____ ft

AIR COOLED COND. MODEL #: _____
HOT GAS: _____ in
LIQUID: _____ in

If assistance is needed, have model, serial number, and Ref. number (below) before calling.

Ref number

LIFTING AND LOCATING

Outdoor Air Intake Clearances

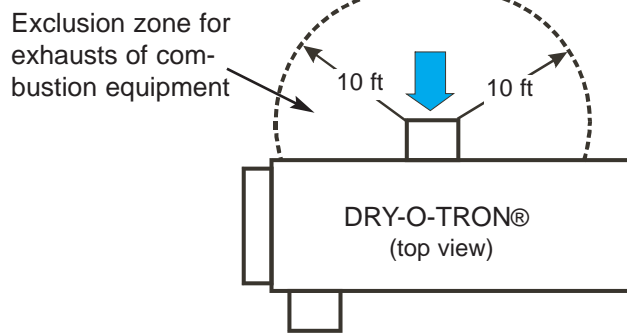
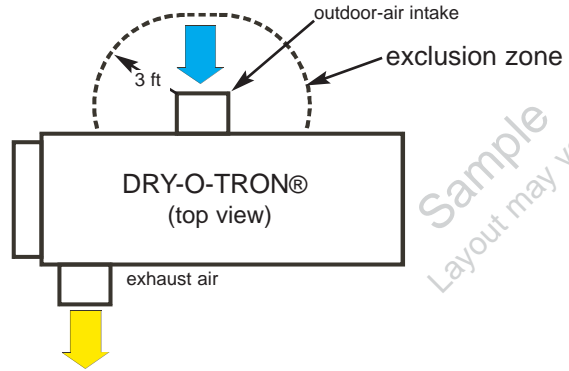
Lifting and Locating



WARNING

Risk of contamination of breathing air. Can cause injury or death. Follow the instructions in this manual and all applicable codes.

- For outdoor units with hooded air intakes, allow at least 3 ft (1 m) of clear space around the hood for smooth intake airflow.
- Intake air hoods should be suitably separated from such sources of contamination as drain vents, laundry vents, and burner flues. See appropriate codes and standards.
- Do not locate the unit in such a way that the exhaust from a cooling tower or other machinery will be drawn into its intake.

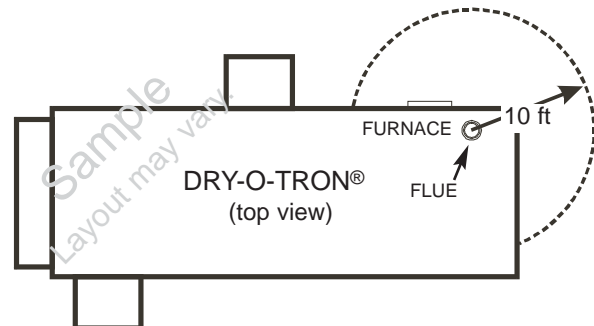
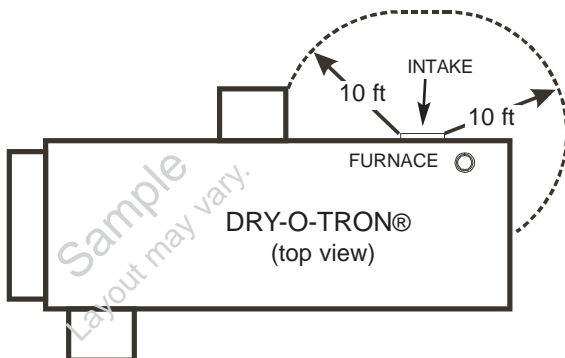
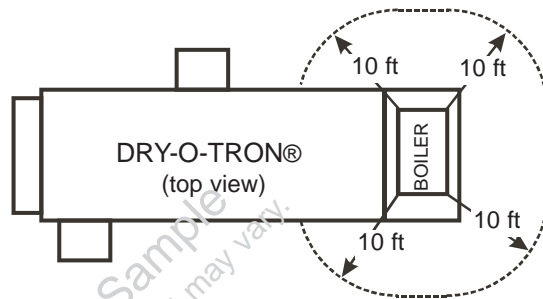


- Some units may be equipped with gas-fired boilers or gas-fired furnaces.

Where this is the case, no building-air intake should be located closer to the flue than shown. Refer to fuel-gas codes.

To insure clean combustion air, no exhaust air from the building or exhausts of other equipment should be located any closer to the air intake than shown.

See also Appendices H6, H7, or H8 for boilers or Appendices H2 or H9 for furnaces.



DECTRON

Sample Layout may vary.

Sample Layout may vary.

Sample Layout may vary.

Sample Layout may vary.

Sample Layout may vary.

Lifting and Locating

Minimum Service Clearances

! WARNING



Risk of falling. Can cause injury or death.

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling. Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

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

1. Indoor units may not work correctly if the equipment-room temperature goes below 70°F (21°C).
2. The location must not contain corrosive-chemical storage, or connect to any space that contains corrosive-chemical storage.
3. The location must not be in a natatorium or spa room, or any space where the exterior of the unit would be exposed to chloramines outgassing from a pool.
4. There are other requirements for suitability - see other pages in this section.

Allow working clearances as shown below. Inadequate working spaces may compromise workplace safety. Inadequate working spaces may preclude proper maintenance, such as filter and belt replacement. Inadequate working space may prevent component replacement should that become necessary.

Spacing requirements are also subject to applicable electrical and mechanical codes. This is particularly true where optional built-in electrical disconnects are provided. Check with your local code-enforcement authorities.

Where access doors are hinged, all doors must be able to open at least 90°.

For units with hooded air intakes allow at least 3 feet (1 meter) of clear space around the hood for smooth intake airflow. Intake air hoods should be suitably separated from such sources of contamination as drain vents and burner flues. See appropriate codes and standards.

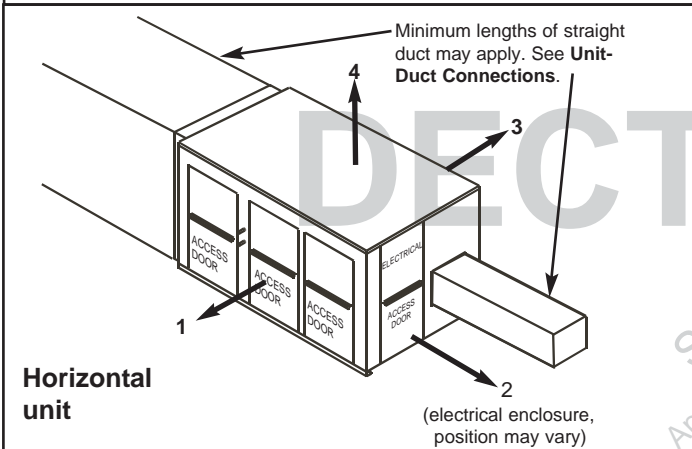
Some horizontal units may have condensate-drain connections on the bottom of the unit. Clearances and pipe connections should be completed before the unit is actually placed.

LIFTING AND LOCATING

Service Clearances

HORIZONTAL UNITS				
Minimum Service Access ^a ft (m)	1	2 ^b	3	4
010 through 030	2 (0.6)	3 (1)	2 (0.6)	3 (1)
040 through 062	3 (1)	3 (1)	3 (1)	3 (1)
080 through 808	5 (1.5)	3 (1)	4 (1.2)	3 (1)

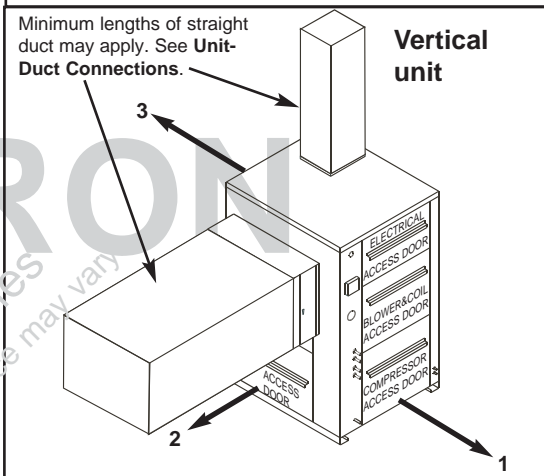
a - Access doors must be able to open to at least 90°.
b - (Canada) 1 meter
 (USA) 3 ft for 230V, 3.5 ft for 460V units or per NEC Table 110.26(A)(1), whichever is greater.



VERTICAL UNITS

Minimum Service Access ^a ft (m)	1 ^b	2	3
010 through 030	3 (1)	2 (.6)	1.5 (.5) ^c
040 through 062	3 (1)	2 (.6)	2(.6)
080 through 152	4 (1.2)	3 (1)	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 Table 110.26(A)(1), whichever is greater.
c - recommended



Data subject to change without notice.

Door Clearances

Lifting and Locating

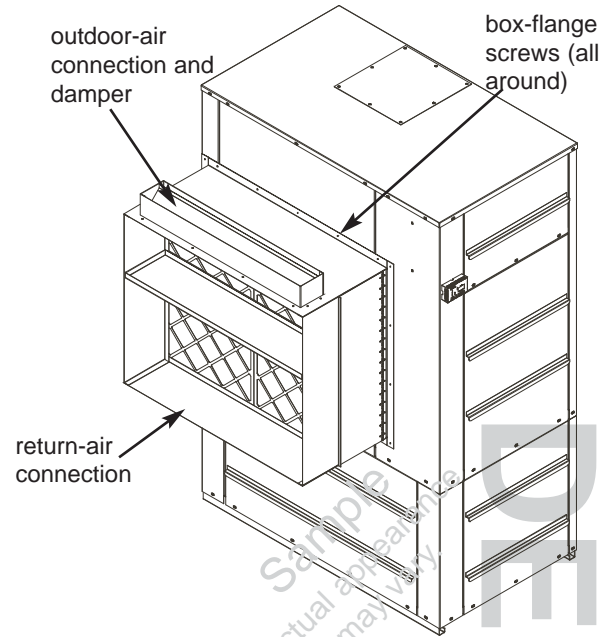
In some installations, a unit may have to go through a narrow door to reach the final destination.

For units with vertical cabinets, the filter box can be temporarily removed to reduce the overall width.

If the outdoor-air damper has an electric actuator, the wires must be located and disconnected. Mark the wires for proper re-connection.

Remove and retain the box-flange screws to remove the filter box. Carefully remove the filter box -

- a) taking care not to damage any heat exchanger fins,
- b) taking care not to damage any exposed sensors, and
- c) taking care not to damage the filter box.



In some cases, a humidity and/or temperature sensor may protrude slightly from the remaining cabinet. If necessary, remove and retain its bracket-mounting screws, and reposition the sensor and bracket to maximize clearance.

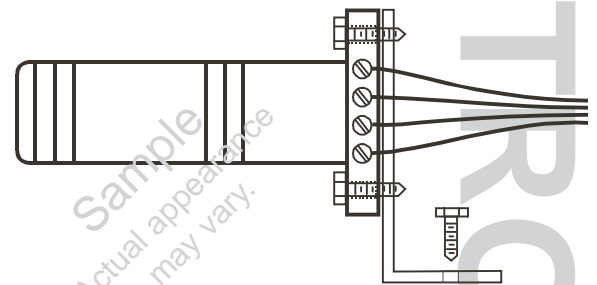
Tape cardboard over the exposed heat-exchanger fins. It is important not to allow the fins to be bent. Should fins become bent, use extreme care while straightening them to prevent scratching the film coating on each fin.

After the doorway has been passed:

1. Remove the cardboard.
2. Remount the sensor(s) as necessary.
3. Reconnect any motorized-damper actuator wires.
4. Remount the filter box, using all box-flange screws.

NOTE: Take care not to cross-thread the screws.

NOTE: It may be necessary to seal or tape the flange.



Temporary disassembly of filter boxes by methods described in the DRY-O-TRON® owners manual does not affect the DRY-O-TRON® warranty, except that:

1. The cost of labor required to dis-assemble and re-assemble parts, components, and/or assemblies is not covered by the warranty.
2. The cost of repair or replacement due to any loss or damage to the filter box, filters, dampers, actuators, sensors, heat exchangers, wiring, fasteners, or other affected parts or assemblies resulting from such dis-assembly and/or re-assembly, whether functional or cosmetic, is not covered by the warranty.

LIFTING AND LOCATING

Lifting and Locating

Door Clearances

In some installations, a unit may have to go through a short door to reach the final destination.

For indoor units with horizontal cabinets, outdoor-air filter boxes may be mounted on top of the unit, as shown below, or may be shipped separately. The filter box can be temporarily removed to reduce the overall height.

NOTE: The outdoor-air filter box may ship separately.

If the outdoor-air filter box includes an electrically operated damper, the wires may be left disconnected from the factory. In this case, the wires will be marked for connection in the field. If the wires were connected at the factory, they must be located and disconnected. Mark the wires for re-connection.

Remove and retain the box-flange screws to remove the filter box. Carefully remove the filter box.

After the doorway has been passed:

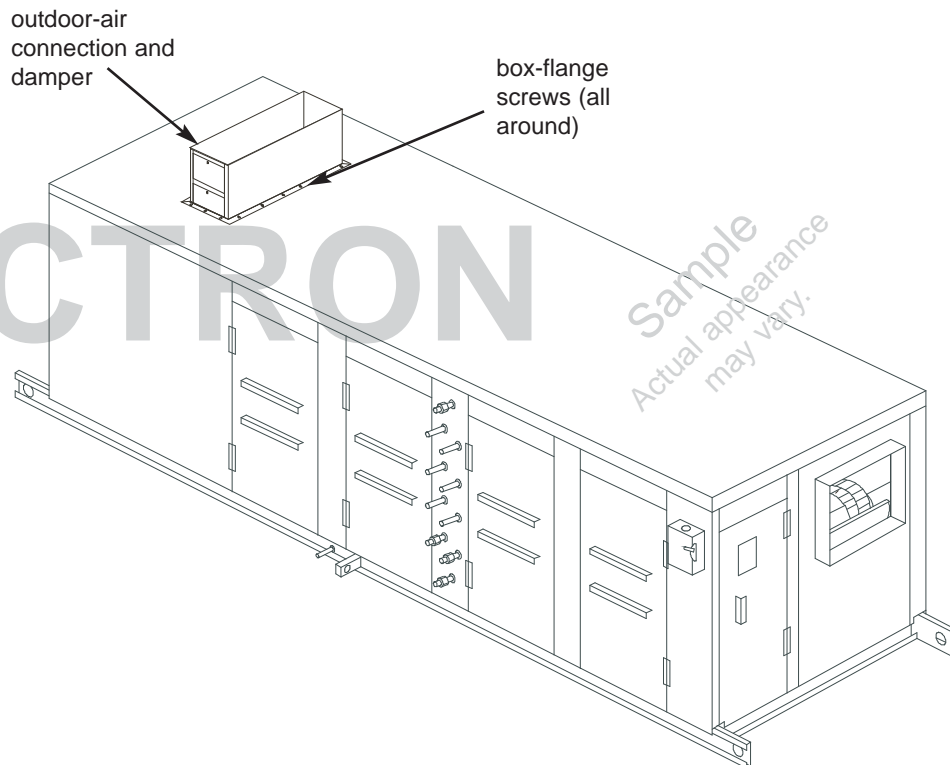
1. Remount the filter box, using all box-flange screws. New caulk may be required.

NOTE: Take care not to cross-thread the screws.

NOTE: It may be necessary to seal or tape the flange.

2. Reconnect actuator wires as necessary.

NOTE: Units so equipped must have the outdoor-air filter box installed. Do not allow outdoor air to enter the return duct of an operating unit.



Temporary disassembly of filter boxes by methods described in the DRY-O-TRON® owners manual does not affect the DRY-O-TRON® warranty, except that:

1. The cost of labor required to dis-assemble and re-assemble parts, components, and/or assemblies is not covered by the warranty.
2. The cost of repair or replacement due to any loss or damage to the filter box, filters, dampers, actuators, sensors, heat exchangers, wiring, fasteners, or other affected parts or assemblies resulting from such dis-assembly and/or re-assembly, whether functional or cosmetic, is not covered by the warranty.

Data subject to change without notice.

Dectron, Inc. March 2012

Unit Support & Vibration Isolation

Lifting & Locating

WARNING

Risk of structural collapse. Can cause property damage, injury, and death.
All supporting structures should be designed and built by qualified persons only.

All units must be supported to maintain the straightness of the frames and to prevent binding of access doors or panels.

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

IMPORTANT!

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

IMPORTANT!

Where seismic mounts are used, care must be taken to prevent strains on conduits, refrigeration tubes, water tubes, or condensate tubes.

All horizontal units should be uniformly supported along the side rails. Where this is not possible, the following minima apply:

Horizontal units size 050 and smaller should at least be supported at the corners and middle as shown at right. More supports may be required to maintain straightness.

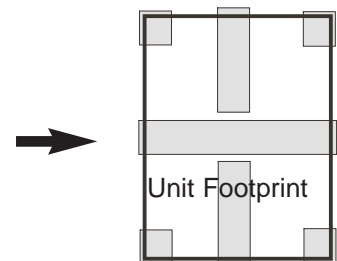
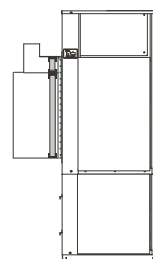
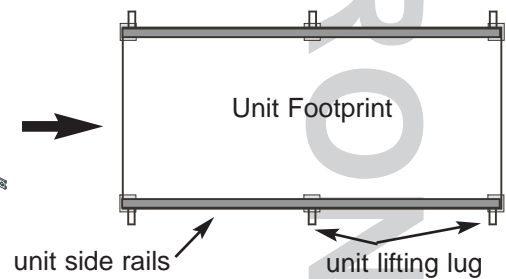
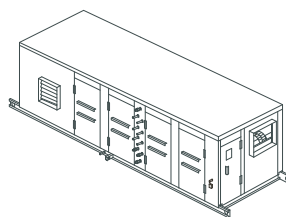
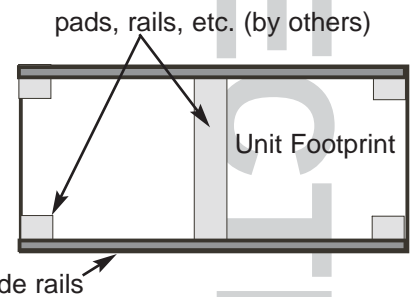
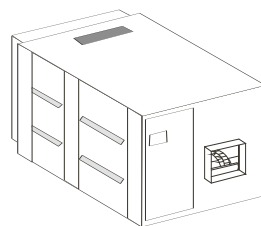
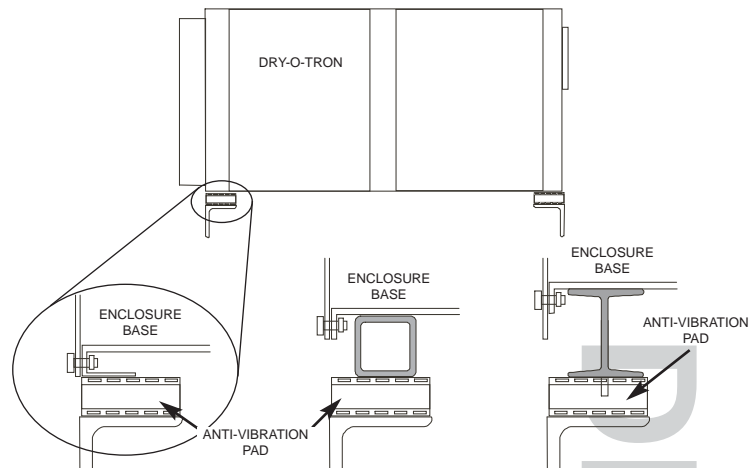
Where units must be supported from overhead, any supports must not interfere with service access as described on a previous page.

Horizontal units size 060 and larger with lifting lugs should at least be supported under the frames near each lifting lug. More supports may be required to maintain straightness.

Vertical units should at least be supported at each corner and along the midlines, as shown at right. More supports may be required to maintain straightness.

All units should be supported on a steady surface. Where mounted above grade, the unit should be firmly attached to an adequate supporting structure. Outdoor units must be firmly fastened to prevent movement even in high winds.

Where large units must be installed overhead, provide suitable under-base support with a service mezzanine. The support must include horizontal stabilization. See section **Lifting & Locating - Overhead Air Handler**.



LIFTING AND LOCATING

Lifting and Locating

Air Handler

Underside Piping

NOTICE**Risk of leaking water. Can cause property damage.**

This product requires a free-flowing drain. Freezing or other abnormal conditions could cause leakage or overflow. Do not locate this product above any equipment that could be damaged by water.

Bottom Condensate Drain Connection(s)

Note: Units with the SmartSaver® heat-recovery option may have more than one condensate drain.

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 unit (which is under negative pressure) and to assure proper drainage of the condensate. Failure to do so will cause the drain pan to overflow.

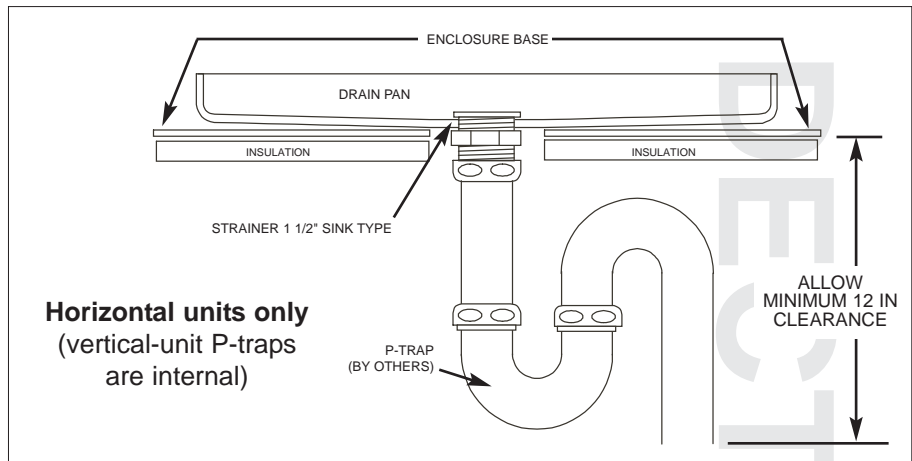
On vertical units, the internal P-trap is factory-installed.

Use schedule 40 PVC or standard ABS plastic drainage pipe and slope the condensate drain line in the direction of flow at least 1/4 inch per foot (0.2cm/m). The drain line must discharge through an air gap to a vented non-freezing point.

When a unit is used in a natatorium, Dectron recommends that the condensate be returned to the swimming pool if local laws permit. Independent tests have shown that condensate from a DRY-O-TRON® unit is safe (these reports are available from Dectron). The amount of water returned to the pool over an entire year is approximately equal to the entire swimming pool water volume!

The ideal way to return the condensate to the pool water system is gravity drainage to the nearest skimmer or surge tank (if so equipped). If the unit is located below the pool water surface a condensate pump is required (available from Dectron with rated maximum pump head of 9 feet and shut-off pressure of 13 feet -- if higher lift is required a more powerful pump must be supplied by others). The Dectron condensate pump and tank comes complete with a high-level limit-switch which must be connected to an alarm. The alarm should notify personnel of a problem with condensate removal.

If a condensate pump is used, it must have sufficient pump head to overcome vertical lift, check valve cracking pressure, and water pressure if pumped into a pressurized pipeline. When connecting to a pressurized pipeline, a check valve and normally-closed solenoid valve should be installed in the condensate pump discharge line, with the valve only opening during pump operation. Do not connect the condensate drain to a pipe with negative pressure.

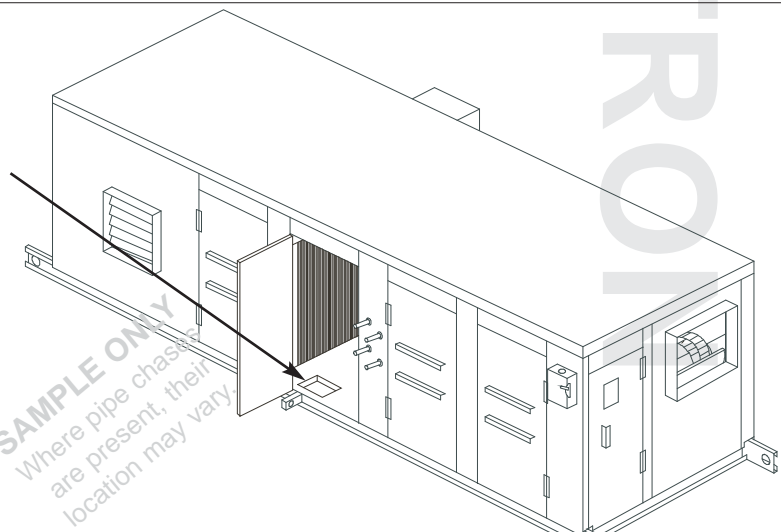
**Underside Pipe Chases**

Some units may have pipe chases in the base of the unit. These chases may be intended to enclose conduits, heating-water pipes, steam pipes, etc.

In this case, locate the chase and arrange any required connections before setting the unit.

IMPORTANT: Use the included chase cap to assist in sealing any pipe chases. Air must not be allowed to move through a chase.

IMPORTANT: In some cases, pipes chases may be subject to fire-stopping requirements. Consult applicable codes.



Overhead Installation Air Handler

Lifting and Locating

WARNING



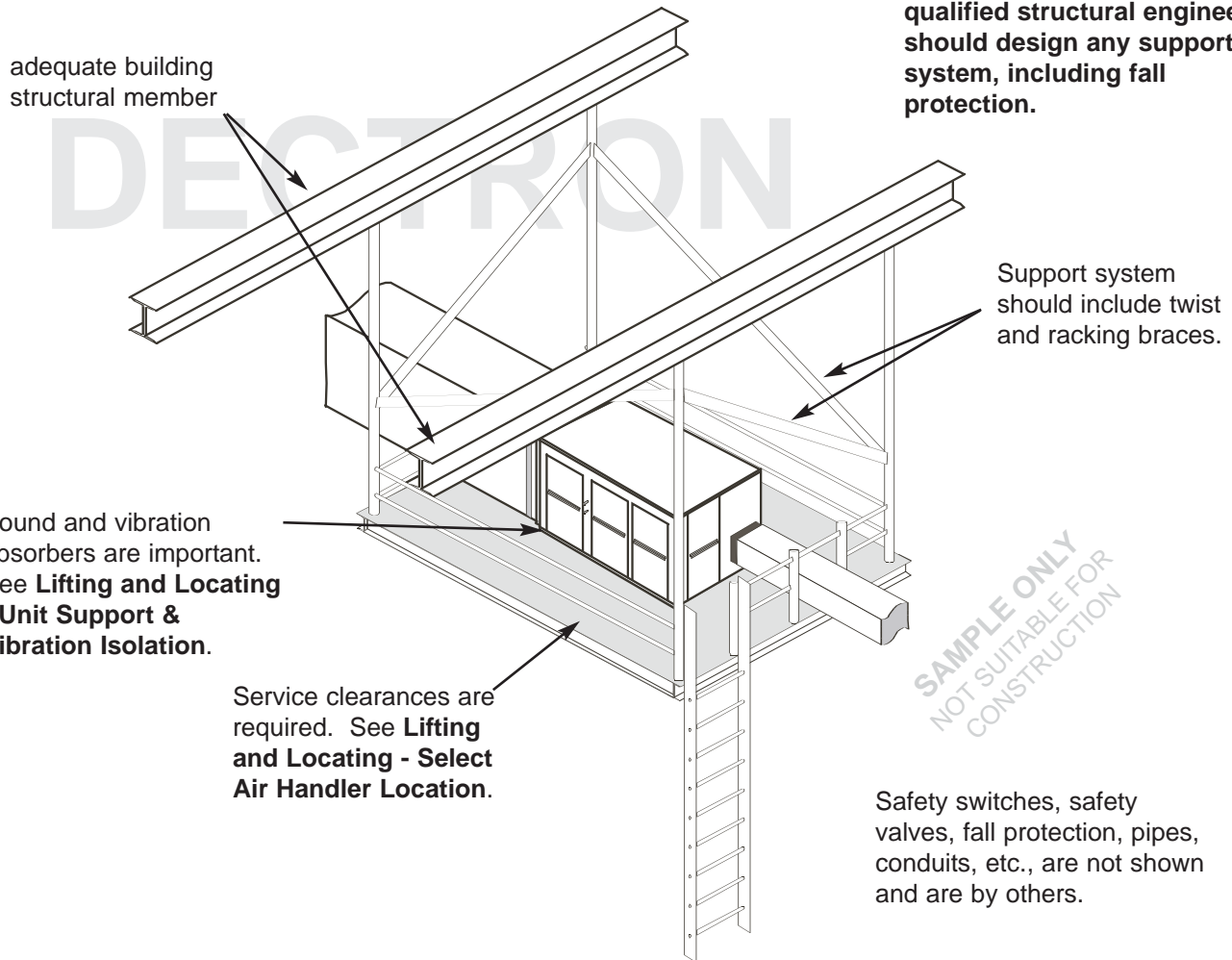
Risk of falling. Can cause injury or death.

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling. Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

If the air handler unit must be located overhead, then:

1. The space **must not** contain corrosive-chemical storage, or connect to any space that contains corrosive-chemical storage.
2. The space **must not** include a natatorium or spa room, or any space where the exterior of the unit would be exposed to chloramines outgassing from a pool.
3. A mezzanine floor should be constructed to allow the minimum service access. (See earlier page.)
4. **Minimum straight lengths of duct are required.** See **Installation - Ducting** on subsequent page.

NOTICE This diagram is for illustration only, and is not suitable for any particular purpose. A qualified structural engineer should design any support system, including fall protection.



LIFTING AND LOCATING

Lifting and Locating

Lifting Air Handler

NOTICE

Risk of damage from forklift. Can cause property damage.

Follow the instructions in this manual and all applicable procedures to prevent damage to equipment when lifting with a forklift.

Units Not Provided With Lifting Eyes Only

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.

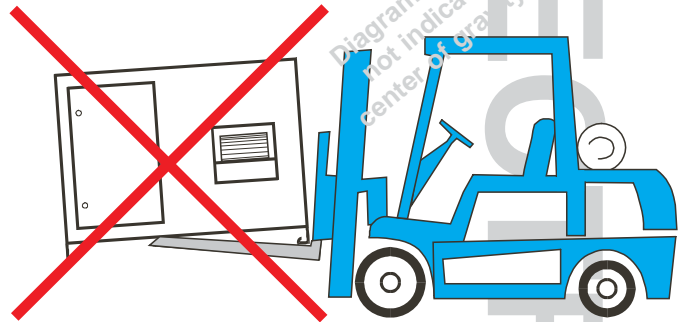
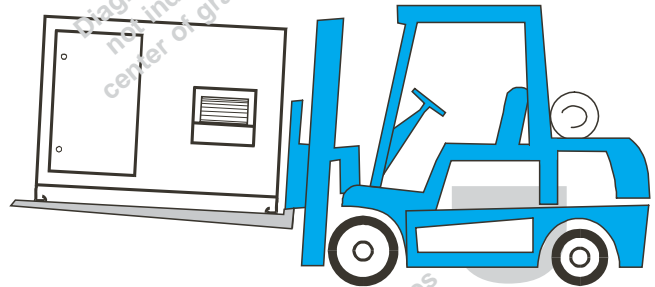
Your unit has been factory tested for proper operation. Inspect the unit carefully upon arrival.

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.

Forklift, pads, restraints, etc., are by others.

Where units are not provided with lifting eyes, it may be possible to lift with a forklift. **Do not use a forklift on units provided with lifting eyes.**

1. If the unit shipped on a wooden pallet, lift the unit with the pallet. Be sure the forks go all the way under the pallet.
2. If the unit did not ship on a pallet, look for fork pockets made into the unit frame. The lift forks must engage all four fork pockets, where fork pockets are present.
3. If the unit did not ship on a pallet, and there are no fork pockets, then the lift forks must engage the side rails of both sides of the unit.



NOTICE

Never attempt to lift a unit with forks that do not go all the way under the side rails.

Attempting to do so will damage the base of the unit and may cause component mis-alignment, tube leaks, and other handling damage.

NOTICE

Lift with forks at the indicated points only.

NOTICE

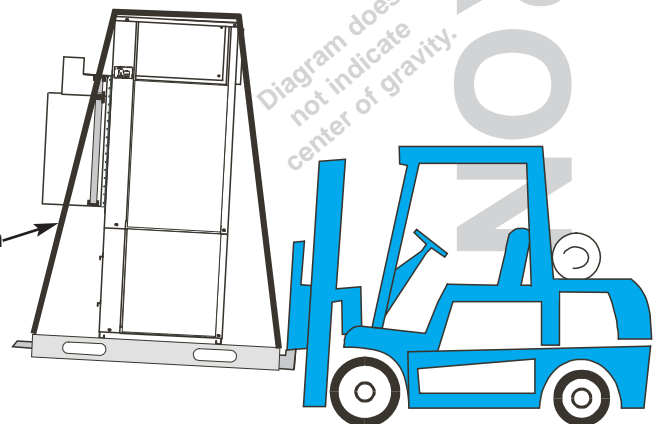
Units with vertical cabinets may be top-heavy. Restrain the unit to prevent tipping.

tie-down

NOTICE

Where vertical units will have optional supply-air ports, changes may be required before the unit is placed.

See **Installation - Pre-Assembly.**



LIFTING AND LOCATING

Lifting Air Handler

Lifting and Locating

! WARNING



Risk of crushing. Can cause injury or death.

Large, heavy equipment can cause crushing. Do not allow any part of your body to be under crates or equipment at any time. Use only lifting equipment and devices that are rated for the load. Secure all lifting straps, slings, spreaders, etc., to prevent accidental dropping.

Follow the instructions in this manual and all other applicable codes, standards, and safety procedures.

Units Provided With Lifting Eyes

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.

Where units are provided with lifting eyes, **lift only with the lifting eyes.**

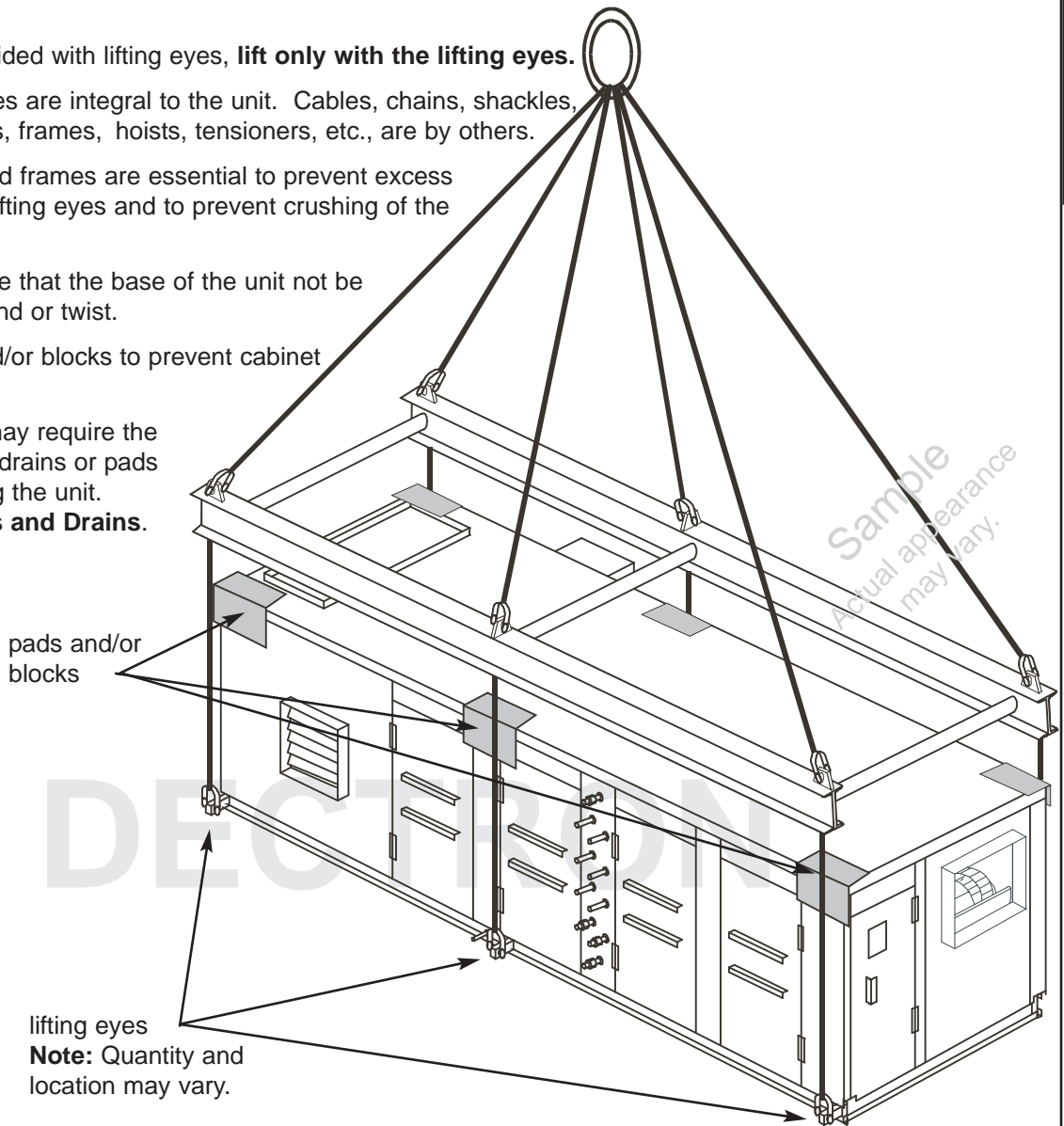
NOTE: The lifting eyes are integral to the unit. Cables, chains, shackles, clevises, pads, frames, hoists, tensioners, etc., are by others.

NOTE: Spreaders and frames are essential to prevent excess force on the lifting eyes and to prevent crushing of the cabinet.

NOTE: It is imperative that the base of the unit not be allowed to bend or twist.

NOTE: Use pads and/or blocks to prevent cabinet damage.

NOTE: Some units may require the placement of drains or pads before placing the unit. See **Isolators and Drains.**



lifting eyes
Note: Quantity and location may vary.

Data subject to change without notice.

Dectron, Inc. March 2012

Lifting and Locating

Remote Condenser or DryCooler Location

Vertical-Airflow Condensers

The length of the tubes connecting a remote air-cooled condenser to the DRY-O-TRON® **must not** exceed that shown on the DRY-O-TRON® nameplate (See **Product Description - Unit Nameplate.**)

Select a suitable location for the condenser, where (a) it will not be subject to damage from traffic, falling ice, or vandalism, (b) it will not be in the vicinity of steam, hot air, or kitchen or fume exhausts, and (c) where airflow will not be impeded by accumulations of ice and snow. Any supporting structure must be suitable for the weight of the condenser. Allow at least twice the width of the condenser fan of clear space around the condenser for smooth intake airflow 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 airflow.



NOTE 1: The condenser should be mounted level to within ¼ bubble. Shim as necessary.

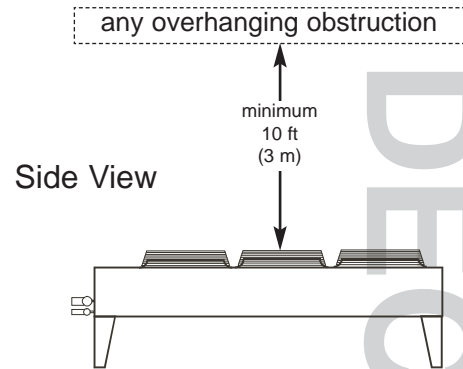
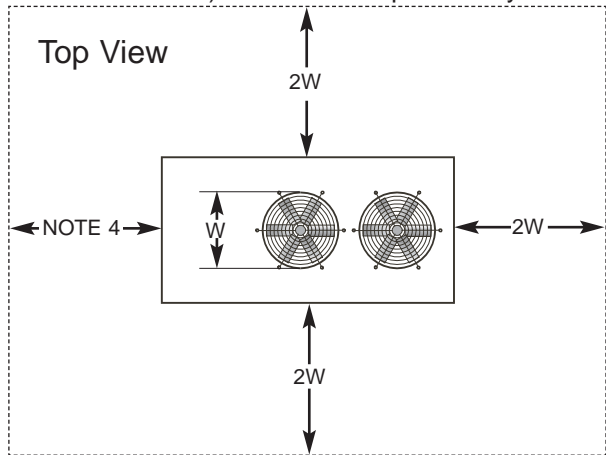
NOTE 2: The condenser legs should be bolted to the supporting structure.

NOTE 3: Vertical-airflow condensers cannot be mounted horizontally.

NOTE 4: The clearance in front of the electrical enclosure must be the greatest of:

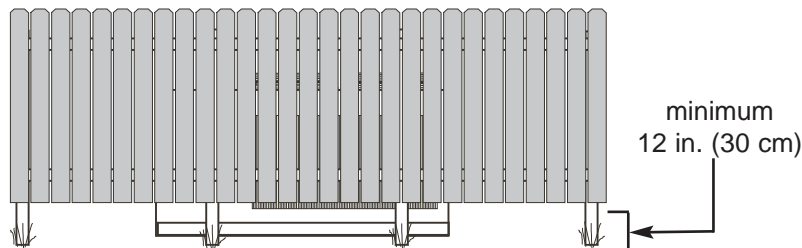
- a) twice the width of a fan, or
- b) (Canada) the greater of 1 meter or the distance specified by CEC 2-238, or
- c) (U.S) the greater of 36 inches (230V condensers), 42 inches (460V condensers), or the distance specified by NEC 110-26, or
- d) the distance specified by other applicable code.

LIFTING AND LOCATING



The condenser should **not** be enclosed within a solid fence or wall, or in a pit, since such structures promote recirculation of air. If a solid 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.

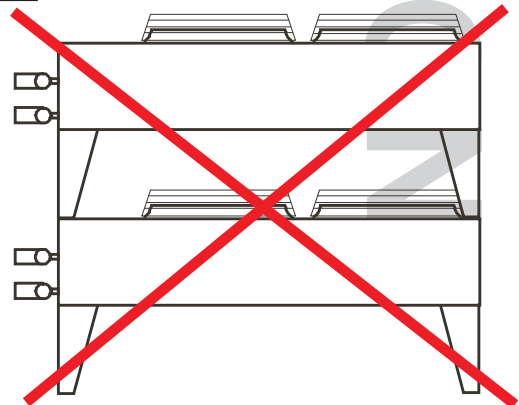
Vegetation under a fence must be kept short.



NOTE: Vertical-airflow condensers cannot be mounted for horizontal airflow.

NOTE: Do not install vertical-airflow condensers without the legs. Do not shorten the legs.

Never stack vertical-airflow condensers.



Horizontal-Airflow Condensers

The length of the tubes connecting the remote air-cooled condenser to the DRY-O-TRON® **must not** exceed that shown on the DRY-O-TRON® nameplate (See **Product Description - Unit Nameplate.**)

Select a suitable location for the condenser, where (a) it will not be subject to damage from traffic, falling ice, or vandalism, (b) it will not be in the vicinity of steam, hot air, or kitchen or fume exhausts, and (c) where airflow will not be restricted. Any supporting structure must be suitable for the weight of the condenser. Allow clear space as shown below. Spacing requirements are also subject to applicable electrical codes.



Do not point the fans of a horizontal air-flow condenser within 60° of the direction of the prevailing wind.

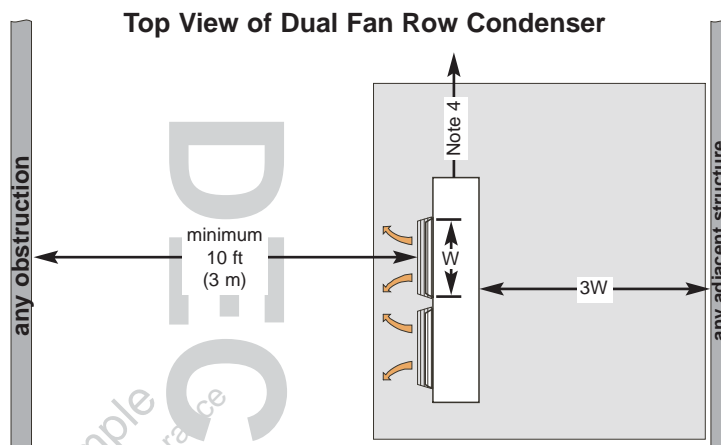
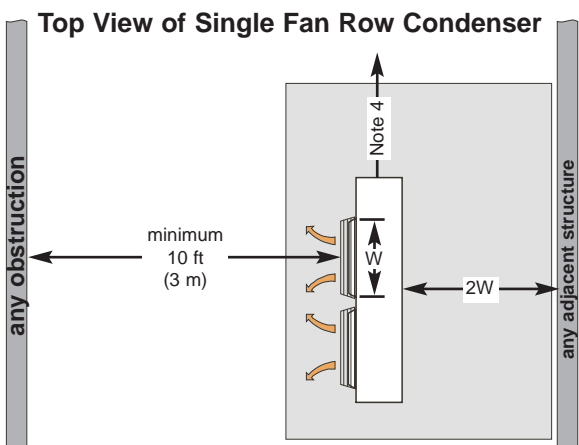
NOTE 1: The condenser should be mounted level to within ¼ bubble. Shim as necessary.

NOTE 2: The condenser legs should be bolted to the supporting structure.

NOTE 3: Horizontal-airflow condensers cannot be mounted vertically.

NOTE 4: The clearance in front of the electrical enclosure must be the greatest of:

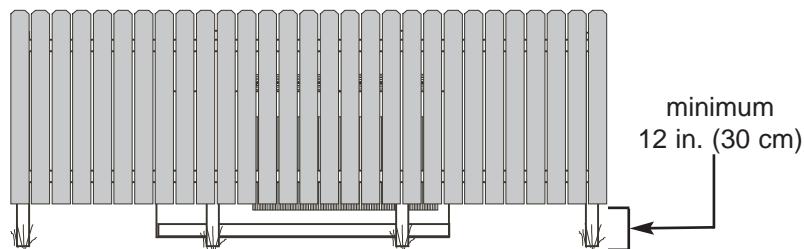
- a) (Canada) the greater of 1 meter or the distance specified by CEC 2-238, or
- b) (U.S) the greater of 36 inches (230V condensers), 42 inches (460V condensers), or the distance specified by NEC 110-26, or
- c) the distance specified by other applicable code.



LIFTING AND LOCATING

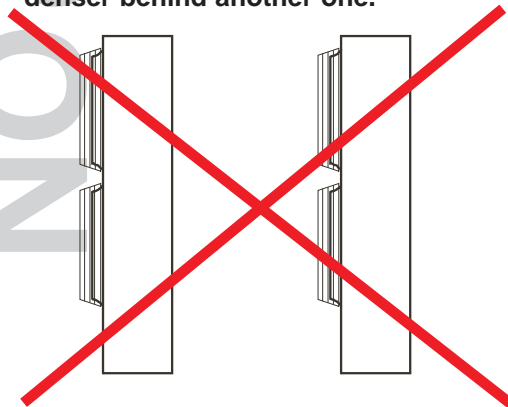
The condenser should **not** be enclosed within a solid fence or wall, or in a pit, since such structures promote recirculation of air. If a solid fence or wall must be installed, it must not extend lower than 12 inches (30 cm) above grade. Fences lower than 12 inches above grade may cause recirculation of heated air and a corresponding reduction in performance.

Vegetation under a fence must be kept short.



NOTE: Horizontal-airflow condensers cannot be mounted for vertical airflow.

Never place a horizontal airflow condenser behind another one.



Lifting and Locating

Remote Condenser

Vibration Isolation

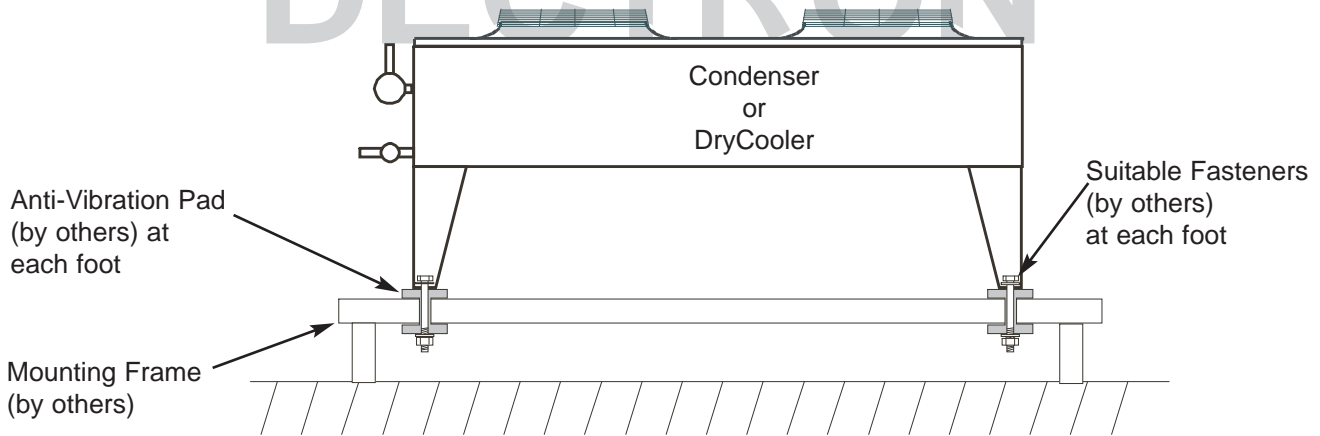
A remote condenser or DryCooler must be mounted level to within 1/4 bubble. Do not remove or shorten the legs.

The feet must be secured to the mounting surface to prevent movement in high winds. Where seismic mounting is used, care must be taken to prevent strains on the condenser or DryCooler or on connecting tubes or conduits.

Where a remote condenser or DryCooler is mounted to a building surface, suitable pads (by others) should be used to prevent the transmission of noise and/or vibration into the building.



LIFTING AND LOCATING



Sample
Number of legs and brackets may vary.
Other appearance may vary.

Lifting Remote Condenser

Lifting and Locating

! WARNING



Risk of crushing. Can cause injury or death.

Large, heavy equipment can cause crushing. Do not allow any part of your body to be under crates or equipment at any time. Use only lifting equipment and devices that are rated for the load. Secure all lifting straps, slings, spreaders, etc., to prevent accidental dropping.

Follow the instructions in this manual and all other applicable codes, standards, and safety procedures.

NOTICE

Risk of damage from forklift. Can cause property damage.

Follow the instructions in this manual and all applicable procedures to prevent damage to equipment when lifting with a forklift.

Some units may not have a remote condenser.

Some outdoor units may come with the condenser already mounted to the unit base.

Some units may have a remote DryCooler. In this case, please refer to Dectron OM [Appendix M1-DryCooler](#).

Condensers Without Lifting Eyes Only

IMPORTANT!

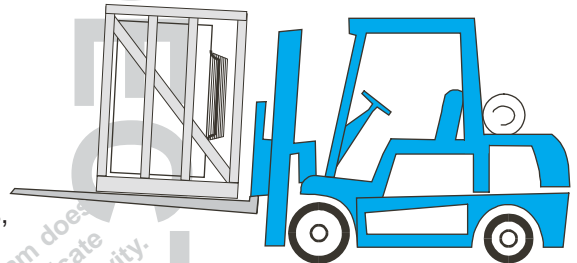
Inspect your unit immediately for shipping damage. Claims for shipping damage must be made with the shipping company. Dectron is not responsible for shipping damage.

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.

NOTE: It is imperative that the base of the condenser not be allowed to bend or twist.

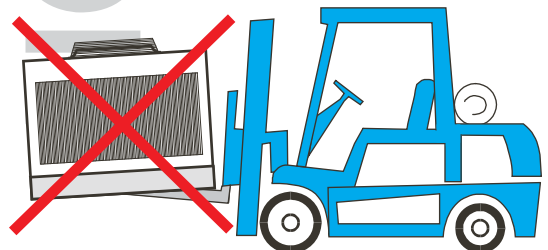
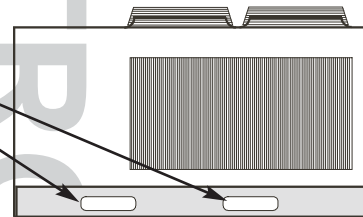
NOTE: Use pads and/or blocks to prevent cabinet and/or heat-exchanger damage.

Some condensers may ship separately in a crate. In this case, unload the condenser in its crate.



Forklift, pads, restraints, etc., are by others.

Some condensers may have fork pockets in the base side rails. Do not attempt to lift this type of condenser with a forklift unless the forks completely engage all four fork pockets.



Forks **must** engage all fork pockets.

LIFTING AND LOCATING

Lifting and Locating

Lifting Remote Condenser

**WARNING****Risk of crushing. Can cause injury or death.**

Large, heavy equipment can cause crushing. Do not allow any part of your body to be under crates or equipment at any time. Use only lifting equipment and devices that are rated for the load. Secure all lifting straps, slings, spreaders, etc., to prevent accidental dropping.

Follow the instructions in this manual and all other applicable safety procedures.

Condensers With Lifting Brackets

Some units may not have a remote condenser.

Some outdoor units may come with the condenser already mounted to the unit base.

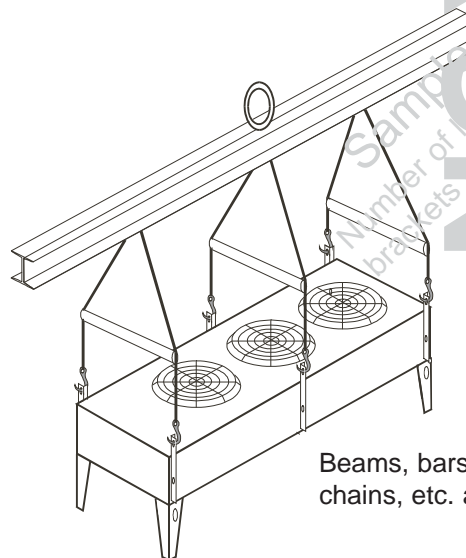
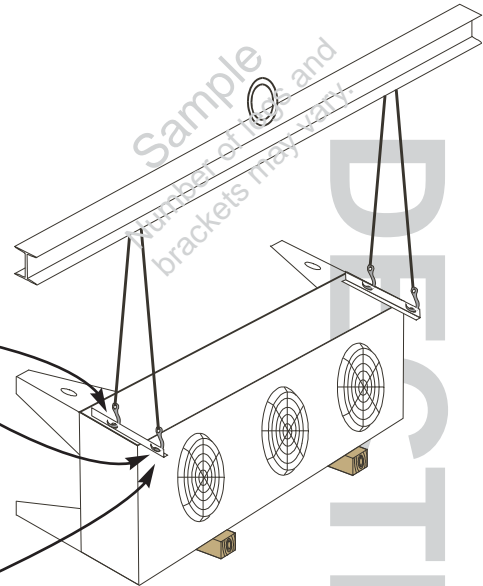
Some units may have a remote DryCooler. In this case, please refer to Dectron OM [Appendix M1-DryCooler](#).

If you suspect the unit was damaged in transit, immediately notify the freight carrier and file a claim with the carrier.

CAUTION: If the condenser is not equipped with fork pockets, do **not** handle the condenser with a forklift - the heat exchanger is exposed to damage if the forks are under the condenser.

CAUTION: Be very careful not to bend or damage the exposed heat-exchanger fins.

1. Unload from the truck with chains hooked to the eyes of all the lifting brackets on top, as shown at right.
2. For horizontal-airflow units, lift to final location. For vertical-airflow units, continue with steps below.
2. Carefully set the condenser on wooden blocks on level ground.
3. Locate the remaining legs and associated hardware, included.
4. Attach all the legs.
5. Change the rigging to the outboard lifting eyes. Carefully tilt the condenser over onto its legs. Be very careful not to damage the exposed heat-exchanger fins.
6. Attach the remaining lifting brackets.
7. Using spreader bars (by others) and the outboard eyes of all lifting brackets, lift to final location. Maintain chain/cable tensions to prevent bending or bowing of the condenser.



Beams, bars, cables, chains, etc. are by others.

Lift evenly using all lifting eyes. Do not allow bending or bowing of the condenser.

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INSTALLATION

NOTICE

Risk of injury.
 Risk of property damage.
 Risk of uncontrolled condensation. **Can cause property damage.**

The information presented in this section represents Dectron's best effort as of the time of issue. Compliance with the requirements and recommendations in this section should produce a successful installation.

Where any steps are not clear, Dectron offers technical assistance at 1-800-667-6338 or 1-800-676-2566.

Dectron does not warrant that this information is complete for any particular application. In some cases job-specific requirements may cause factory modifications which may not appear in this section. Such modifications will be documented in addenda.

Follow all applicable safety rules and regulations, and all applicable codes. Where any recommendation in this manual conflicts with legal requirements, the legal requirements take precedence.

Dectron, Inc. does not engage in installation contracting. All costs, risks, and responsibilities of safety, handling, moving, damage prevention, and unit installation are borne by others.

Data subject to change without notice.

! WARNING**Risk of electric shock. Can cause injury or death.**

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING**Risk of explosive pressure release. Can cause injury or death.**

This product contains refrigerant liquid and vapor under high pressure. Some installation and service procedures could expose personnel to the risk of explosive discharge. Some installation and service procedures could expose personnel to the risk of frostbite from release of refrigerant.

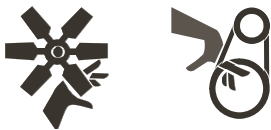
Reclaim refrigerant to reduce the pressure to atmospheric before working on pipes, valves, heat exchangers, compressors, pressure switches, etc.

Once opened, do not close any manual refrigerant valves that might isolate refrigerant from the relief valve. If necessary, install relief valves (by others).

! WARNING**Risk of top-heavy units tipping over. Can cause property damage, injury, or death.**

Some units and some ancillary equipment may be shipped in crates that are top heavy. Follow the instructions in the **Lifting and Locating** section, along with all appropriate codes and procedures.

Vertical units may be top-heavy even after removal from shipping materials. Follow the instructions in the **Lifting and Locating** section, along with all appropriate codes and procedures.

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

! WARNING**Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

Safety Warnings

Installation

 **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.

 **WARNING****Risk of suffocation.**

Improper handling of refrigerants and refrigerant hoses can allow release of refrigerant gases. In a confined space, these heavier-than-air gases may accumulate and displace oxygen, leading to suffocation.

Confirm adequate ventilation before proceeding.

 **WARNING****Risk of contamination of breathing air. Can cause injury or death.**

Application of this product may involve the intake of outdoor air. The point of intake must be carefully chosen to prevent intake of contaminants.

Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants.

Follow the instructions in this manual and all applicable codes.

 **CAUTION****Risk of contact with hot surfaces. Can cause injury.**

This product contains surfaces which can cause burn injury.

The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Compressor crankcase heaters can be extremely hot at any time electrical power is applied.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts.

 **CAUTION****Risk of contact with hot surfaces. Can cause injury.**

Brazing of tubes produces temperatures that can cause blistering and burns.

Wear protective clothing (safety glasses, gloves, sleeves, etc.) while working on these parts.

NOTICE**Risk of leaking water. Can cause property damage.**

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow.

Uncontrolled water can cause expensive damage to buildings and other equipment.

Do not locate this product above any equipment that could be damaged by water.

NOTICE**Risk of uncontrolled condensation. Can cause property damage.**

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

Read and follow the instructions in this manual. Optional material will be noted as being optional. All other material should be considered as important to the proper function of the product.

Installation

Component Overview

1. Outdoor air filter & manual damper

- Optional motorized damper actuator
- Seven-day time clock

2. Pool water isolation valves (by others)**3. P-Trap and Condensate Drain (by others)**

- Must be installed and filled with water
- Condensate can be returned to the pool via the skimmer (consult local codes)
- Failure to install the P-trap will cause the drip pan to overflow and flood areas beneath the DRY-O-TRON®.
- Optional side connection available

4. Water flow meter (by others)**5. Pool Water Connection (by others)**

- Water-circuit components must be of non-corrosive material.
- Pool-water piping must be the same size as the connection on the DRY-O-TRON®.
- Increase the pipe size if the DRY-O-TRON® and the by-pass (throttling) valve are more than 10 feet apart.

6. Air Conditioning (OPTIONAL)

- Pipe must be same size as the connection on the DRY-O-TRON®.
- Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.
- Optional water-cooled or dry-cooler heat rejection.

7. Pressure/Temperature Ports (by others)

- Ideal for measuring pressure drop across the water heater
- Remote mount sensors (Optional)

8. Flexible Duct Connection (by others)

- For vibration isolation
- For attenuation of sound due to vibration
- Required on any return, supply, outdoor air, and exhaust connections to the DRY-O-TRON®

9. Duct Heater (by others)

- Size to cover the pool-enclosure heat losses and the outdoor-air load
- Optional unit-mounted electric, hot-water, steam, gas boiler or furnace
- Controlled by the DRY-O-TRON®'s microprocessor

10. Operator Panel

- Mounted on the electrical panel door
- Optional remote mounting (by others)

11. Refrigerant Access Valves

- Service gauge connection
- Refrigerant charging access
- Upper valve is head pressure
- Lower valve is suction pressure
- Compressor oil-pressure port may also be present.

12. Automatic Chemical Feeder (by others)

- Must be located in the main pool return line downstream of the DRY-O-TRON® and all auxiliary equipment to prevent corrosion and equipment deterioration

13. Auxiliary Water Heater controlled by the DRY-O-TRON® (by others)

- Should be located downstream of the DRY-O-TRON® and before the automatic chemical feeder

NOTE: An auxiliary pool-water heater is recommended for all installations.

NOTE: An auxiliary pool-water heater is required for natatoriums with DRY-O-TRON® units having more than 15% makeup air or having the Economizer, Intelligent Energy Saver, or EconoPurge options.

NOTE: An auxiliary pool-water heater is required for pools in which

- the water is exposed to outdoor conditions (such as a swim-through pool), or
- the water is kept at a higher temperature than the room air, or
- uninsulated pool walls are exposed to outdoor conditions.

14. Throttling Ball Valve (circuit setter, by others)

- Install at lowest point in the discharge line
- Adjust water flow until the outlet water temperature is 12 to 20°F above the inlet water temperature during water heating.

15. Water Pressure Switch (may be unit-mounted)

Inhibits water heating mode during main filter backwash or in case of insufficient water flow

16. By-Pass Valve (by others)

- Throttle to force water through the DRY-O-TRON® when the recommended secondary circulating pump is not used

17. Secondary Circulating Pump (by others)

- Must be suitable for pool water
- Secondary circulating pump selection for an OPEN system and :
 - Δ DRY-O-TRON® flow rate
 - Δ Total pressure drop including: DRY-O-TRON®, external piping, valve pressure drop and elevation difference between the pool water surface and the DRY-O-TRON®
- Use dielectric couplings for water pump connections
- Pump must stop during backwash

18. Water Pressure Switch (by others)

- Stops the secondary circulating pump
 - Δ During main filter backwash
 - Δ In case of insufficient water flow in the pool water filter loop

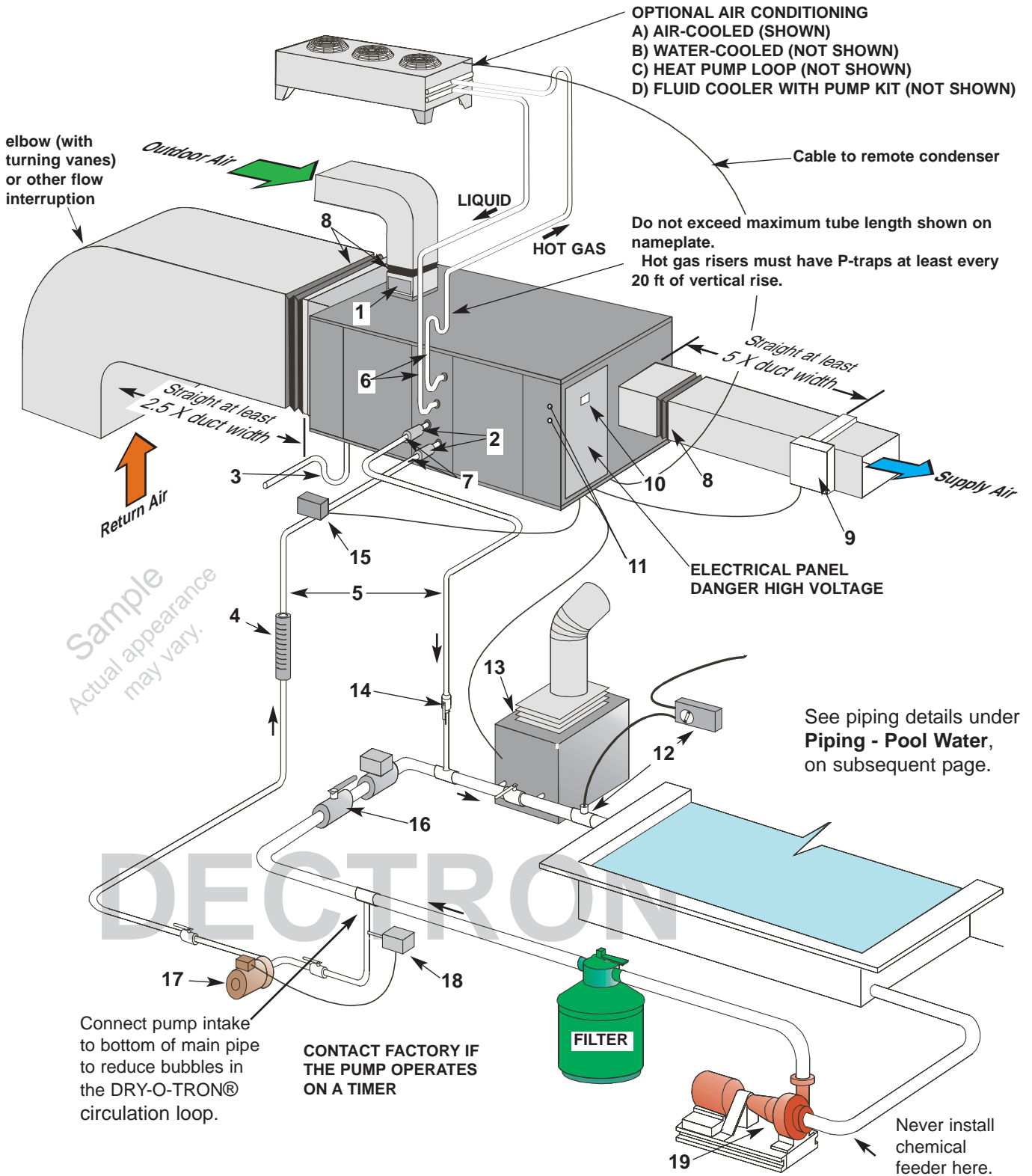
19. Main Filter Pump (by others)

- Usually sized for pool water filtration and sanitation only
- **CAUTION:** Secondary circulating pump is required if the main filter pump cannot produce the additional flow required by the DRY-O-TRON® at the necessary pressure.
- Pumps controlled by timers: contact factory for suggested piping detail.

Component Overview

Installation

DRY-O-TRON® Energy Recycling Indoor Pool Environment Control



INSTALLATION

Installation

Preparation

Note: Before proceeding, tape a paper or plastic sheet over all components in the electrical enclosures. This is essential to protect the components from metal chips produced during installation. Remove the sheet before applying power.

List of recommended equipment and tools:

NOTE: This list may not be comprehensive for any particular job. Use your judgement.

- Safety glasses
- Lockout/tagout equipment, as appropriate
- Dectron owners manual
- Pen (for filling out forms)
- Paper (for making notes)
- Plastic trash bag, kraft paper, etc. (to cover controls while conduit is being installed)
- Duct tape (to tape plastic over controls)
- Knife (to cut duct tape, trim bushes and grass around remote condenser, if any)
- Tape measure
- Flashlight
- Spirit level
- Flat screwdrivers
- Phillips screwdrivers
- Needle-nose pliers
- Open-end or combination wrenches, socket wrenches
- Allen wrenches, including 1/4" and 5/16"
- Metric Allen wrenches
- Volt - Ohm meter
- Clip-on ampmeter
- Pack of 10kohm 1/4W resistors, (e.g. Radio Shack 271-1335)
- Refrigerant gauges, manifold, hoses
- Vacuum pump
- Electronic micron-level vacuum gauge (Compound bourdon-tube gauges on manifolds are not even close to adequate.)
- At least two schraeder-valve core-removal vacuum adapters
- Refrigerant scale
- Adequate refrigerant as specified on unit nameplate and in submittal
- Remote-reading electronic thermometer with probe and minimum 6-foot cable
- Brazing torch, fuel, etc., flux, filler rod, sandpaper, tube brush
- Nitrogen (or other inert gas) tank, regulator, delivery hose
- Tube cutter
- Tube and fittings adequate to install air-cooled condenser, if any
- Pipe and fittings adequate to install condensate drain
- Pipe-joint compound
- Bucket (to pour water into condensate pan)
- Wire and cable as needed
- Belt tension gauge
- (optional, recommended) Refrigerant recovery machine and tanks
- (optional, recommended) Alligator-clip jumper wires
- (optional) Drill and bits, including masonry bits for wall anchors, if needed
- (optional) Wall anchors and screws, as needed
- (optional) Hoists, lifts, etc., as needed
- (optional) Extension cords
- (optional) Stepladder and other ladders, etc., as needed
- (optional) Dectron submittal or other sales documents
- (optional) Torque wrench, with sockets and other wrenches, as needed
- (optional) Torque screwdriver (for electrical connections)

Pre-Assembly

Installation

NOTICE

Optional Equipment - Some units may have hoods to prevent the entry of rain, ice, snow, etc. Such hoods, if any, may be shipped separately.

Optional Equipment - Some units may have outdoor-air preheaters by Dectron. Such heaters, if any, may be shipped separately.

On units having hoods, duct ports, or outdoor-air preheaters, these devices and any associated dampers and actuators may ship separately. Where this is the case, these must be installed first.

NOTICE

Risk of property damage.

Install hoods as shown. Do not install hoods upside down.

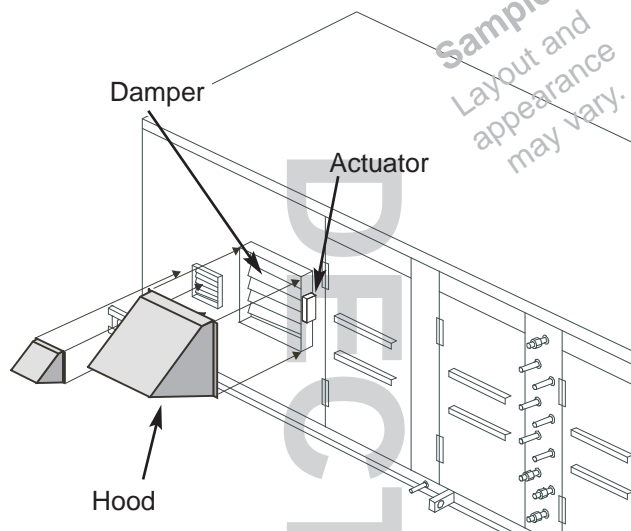
Set the heater or damper/actuator assembly on sawhorses or other sturdy platform near the unit. Locate and splice the wires in the assembly to the corresponding wires in the unit. Be sure to match the wire numbers.

Note that it may be difficult to repair wiring after a duct or hood is installed.

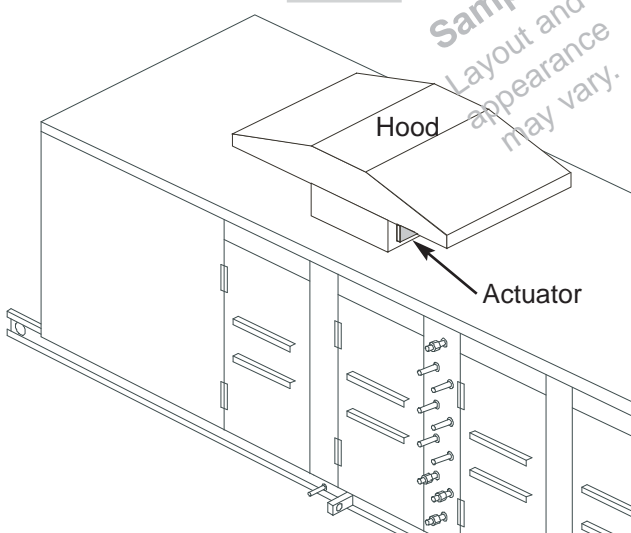
Slide the assembly into place, securing it with screws and sealant.

NOTE: Use care with screw selection and placement to prevent interference with damper movement in any part of its stroke.

After these assemblies are wired and mounted, attach any hood with screws and sealant. Duct attachment will be covered later.



Sample Layout and appearance may vary.



Sample Layout and appearance may vary.

INSTALLATION

On units having top hoods, the hood and its associated pre-heater, dampers, and actuators may ship separately. Where this is the case, the damper/actuator assembly must be installed first.

Locate and splice wires in the assemblies to the corresponding wires in the unit. Be sure to match the wire numbers.

Note that it may be difficult to repair wiring after the hood is installed.

Secure the assemblies with screws and sealant.

Move the hood into place, securing it with screws and sealant.

NOTE: Use care with screw selection and placement to prevent interference with damper movement in any part of its stroke.

Installation

Pre-Assembly

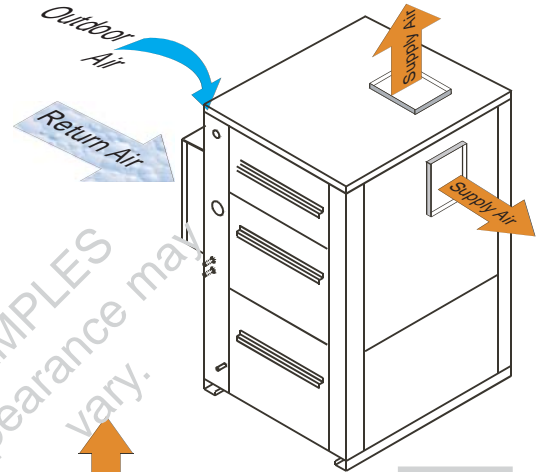
NOTICE Optional Equipment - Some vertical units may have selectable supply-air discharge ports.

The standard supply-air discharge for vertical units (model DSV-xxx) is vertically upward.

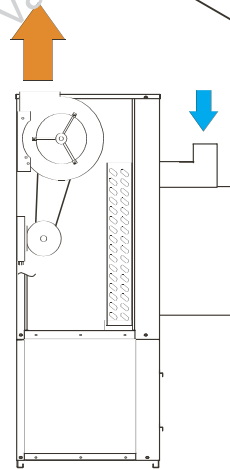
Some vertical units may have ports allowing supply air to exit through the top or right side. Where this is the case, select the best port for the installation. It may be possible to eliminate an otherwise-required duct elbow near the unit. Cover the unused port with the blank cover.

Other adjustments, including adjustments to the blower, may be necessary. Open the front-middle access panel and/or the rear-top access panel to view the blower arrangements. Be sure air will flow in the proper direction.

The standard supply-air outlet is vertically upward, as shown at right. View is from the side opposite the controller.



SAMPLES Appearance may vary.



DECTRON

Changing to optional side-outlet on vertical units.

! WARNING



Risk of electric shock. Can cause injury or death.

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

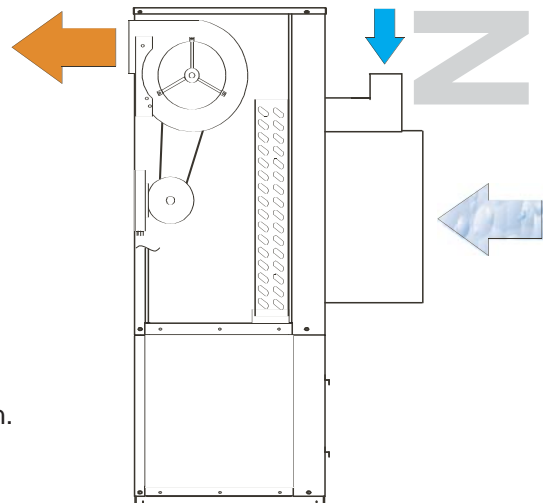
The unit controller does **not** disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

The optional supply-air outlet is out one side, as shown below. View is from the side opposite the controller.

NOTICE Any change must be done before the unit is positioned, ducted, installed, or wired.

To change the blower supply-air outlet in the field:

1. Loosen the belt using the slide-base adjustment screw.
2. Remove the belt.
3. Unbolt the blower from its mounting brackets.
4. Move the blower pulley to the other side of the blower.
5. Remove the horizontal-discharge cover plate.
6. Bolt the cover plate over the old opening.
7. Relocate the mounting brackets as required.
8. Attach the blower to its mounting brackets in the horizontal position.
9. Install an appropriately sized belt, align and re-tension.
10. Install rubberized gasket around blower opening.



INSTALLATION

Pre-Assembly

Installation

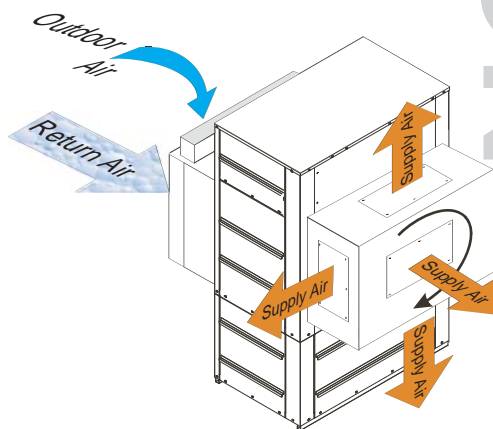
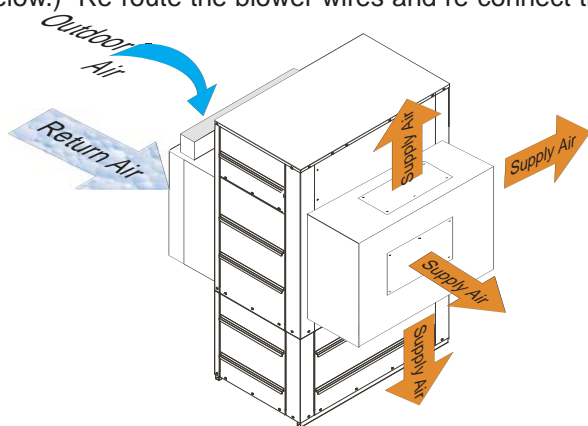
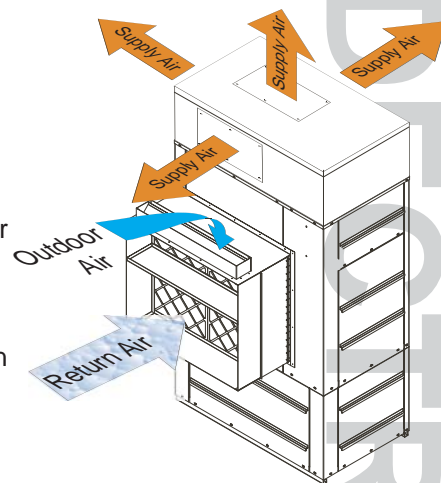
Some vertical units may be equipped with a plenum blower. In this case, there may be several ports for supply air. Choose the port (or ports) that allows the best duct routing. Close the other ports with the included covers.

The plenum of some vertical units may be removable. This may facilitate moving the unit through tight clearances.

To remove the plenum, open the access panel and disconnect the motor or the variable-frequency drive (if so equipped). Remove and retain the mounting screws. Carefully remove the plenum, setting it aside in a protected area.

When the unit is in its final position, re-assemble the plenum, fastening it in place with the mounting screws. Re-connect and torque the wires to the blower or drive.

It may be possible to re-locate the plenum of some vertical units for more choices of supply-air direction. In this case, remove the plenum as described above. Remove the side panel and use it to close the top of the unit. Mount the plenum where the side panel was. (See the illustrations below.) Re-route the blower wires and re-connect them.



INSTALLATION

DECTRON

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INSTALLATION

Air Distribution

Installation

NOTICE

Risk of uncontrolled condensation. Can cause property damage.

Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

Δ Prevent Condensation

The quantity of supply air and the air velocity from the air distribution system must be sufficient to blanket areas of low R-values, especially exterior glass components, with warm, dry air.

The design goal is to keep all surfaces at least 5°F above the room dew-point temperature. (See table below.) In order to prevent condensation, supply air must be blown directly onto the entire surface of the glass using linear diffusers.

For windows mounted high on walls, supply air must be directed at the glass surface from close range (register throws less than twelve inches to the closest portion of the glass). Air quantity and velocity must be large enough to blanket the entire glass surface with warm dry supply air. Pool rooms with a number of high windows on the wall and/or skylights should have a perimeter type air distribution located high up as well.

Where installed for a natatorium:

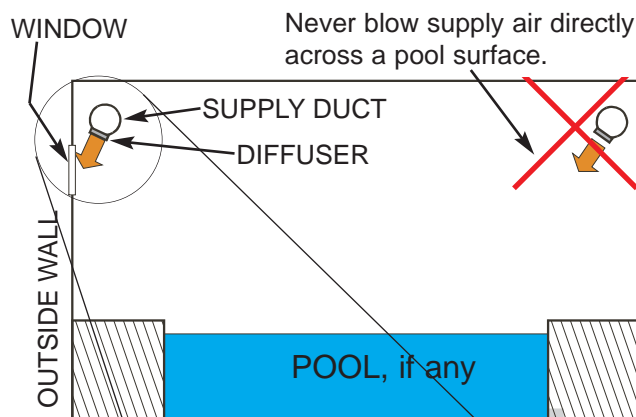
Δ Reduce evaporation

Do not blow supply air directly across the pool surface or wet deck. The air velocity directly above and close to the pool water surface should be in the 10 to 50 feet per minute range. Higher air velocities can increase the evaporation rate of the pool, greatly reducing humidity control efficiency and increasing energy consumption.

Δ Improve bather comfort

Due to wind chill, bather comfort is also increased by keeping air velocity near the pool as low as possible, (subject to above requirements) especially for swimmers just leaving the pool water.

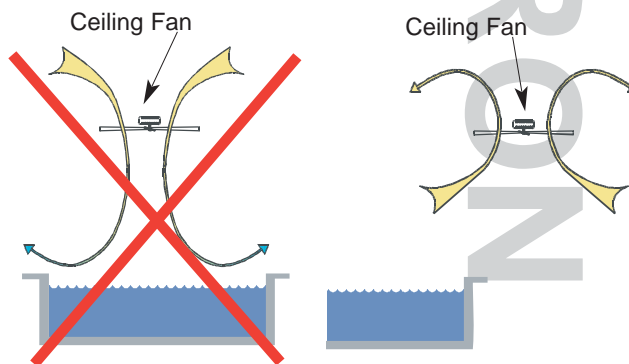
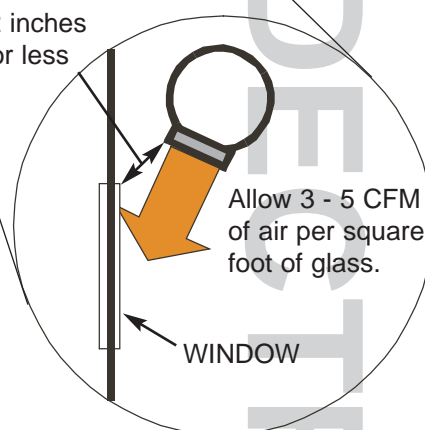
Δ If a ceiling fan is used in a natatorium, locate it over the pool deck only and use up-flow operation. Other operation may greatly increase pool evaporation.



Never blow supply air directly across a pool surface.

12 inches or less

Direct air at windows at a sharp angle. See "Coanda Effect" in ASHRAE Fundamentals.



INSTALLATION

Recommended Minimum Temperatures for Interior Surfaces

Relative Humidity %	Room Dry Bulb Temperature °F				
	72	76	80	84	88
	Recommended Interior Surface Temperature to Prevent Condensation (°F)				
40	51	55	59	62	65
50	57	61	65	68	72
60	62	66	70	73	77

Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Air Distribution

Under-floor Supply-Air Distribution

Where the supply diffusers will be in or just above the floor, they should be primarily along any exterior walls and directed toward windows, doors, or other surfaces that might cool below room-air dew point. Allow 3 to 5 CFM per square foot (15 - 26 l/s per square meter) of exterior glass covered.

In this case the return grille should be located 8 to 15 ft. (2.5 to 4.5 m) up an interior wall.

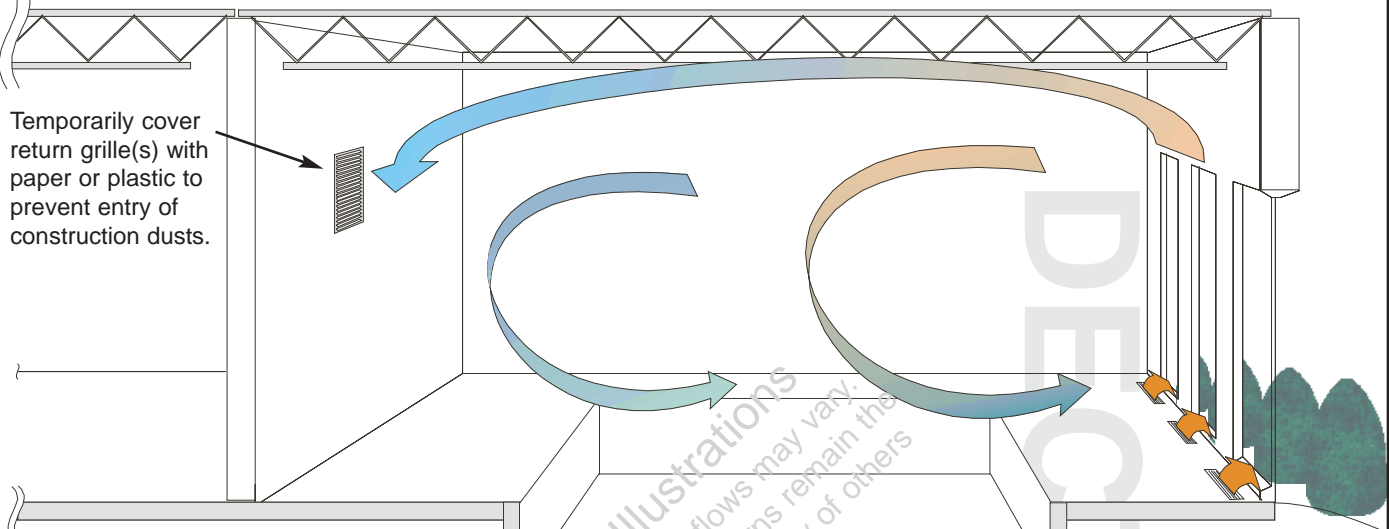
Air speeds over a pool surface should be 10 to 50 FPM (0.05 to 0.25 m/s) in heating mode. Note that temperature and humidity buoyancy effects should be considered. Dectron offers computerized analysis of airflows.

For tall or very tall windows, complex supply-diffuser placements may be necessary. See **Installation - Air Distribution** and **Installation - Ducts** in this manual for further considerations.

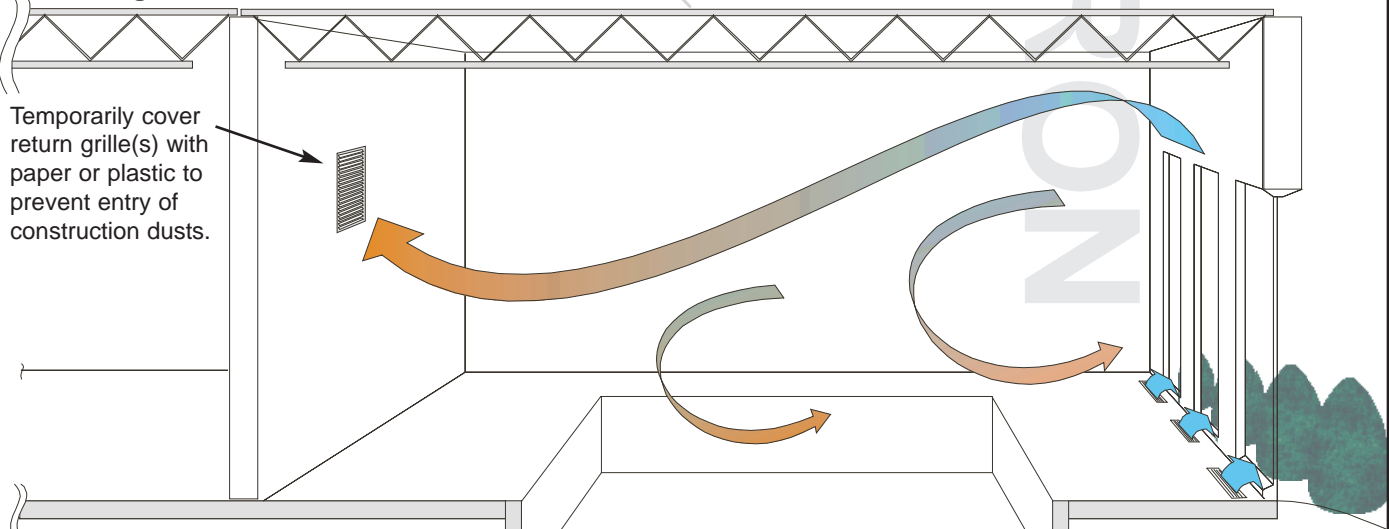
High ceilings or large room dimensions may require more than one return grille.

For units equipped with the Purge feature, see **Appendix M6 - Purge** for further considerations.

Heating Mode



Cooling Mode



INSTALLATION

Illustrations
Actual flows may vary.
Flow patterns remain the
responsibility of others

Data subject to change without notice.

Air Distribution

Installation

Overhead Supply-Air Distribution

Where the supply diffusers will be overhead, they should be primarily along any exterior walls and directed toward windows, doors, or other surfaces that might cool below room-air dew point. Allow 3 to 5 CFM per square foot (15 - 26 l/s per square meter) of exterior glass covered.

In this case the bottom of the return grille should be located 8 to 15 ft. (2.5 to 4.5 m) up an interior wall.

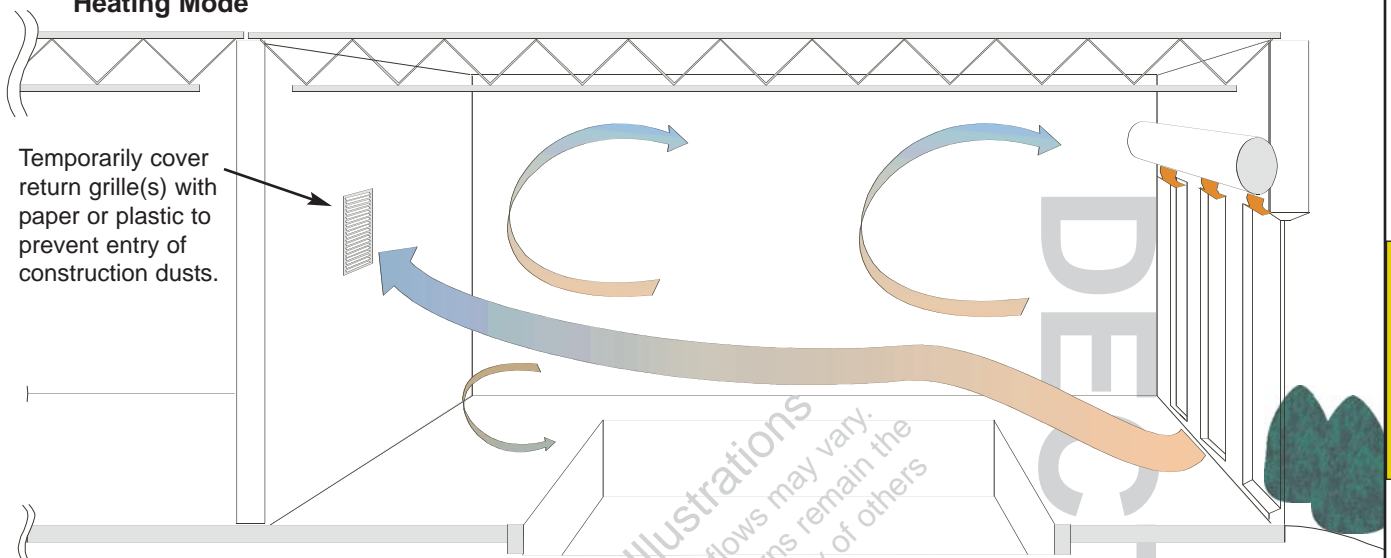
Air speeds over a pool surface should be 10 to 50 FPM (0.05 to 0.25 m/s) in heating mode. Note that temperature and humidity buoyancy effects should be considered. Dectron offers computerized analysis of airflows.

For tall or very tall windows, complex supply-diffuser placements may be necessary. See **Installation - Air Distribution** and **Installation - Ducts** in this manual for further considerations.

High ceilings or large room dimensions may require more than one return grille.

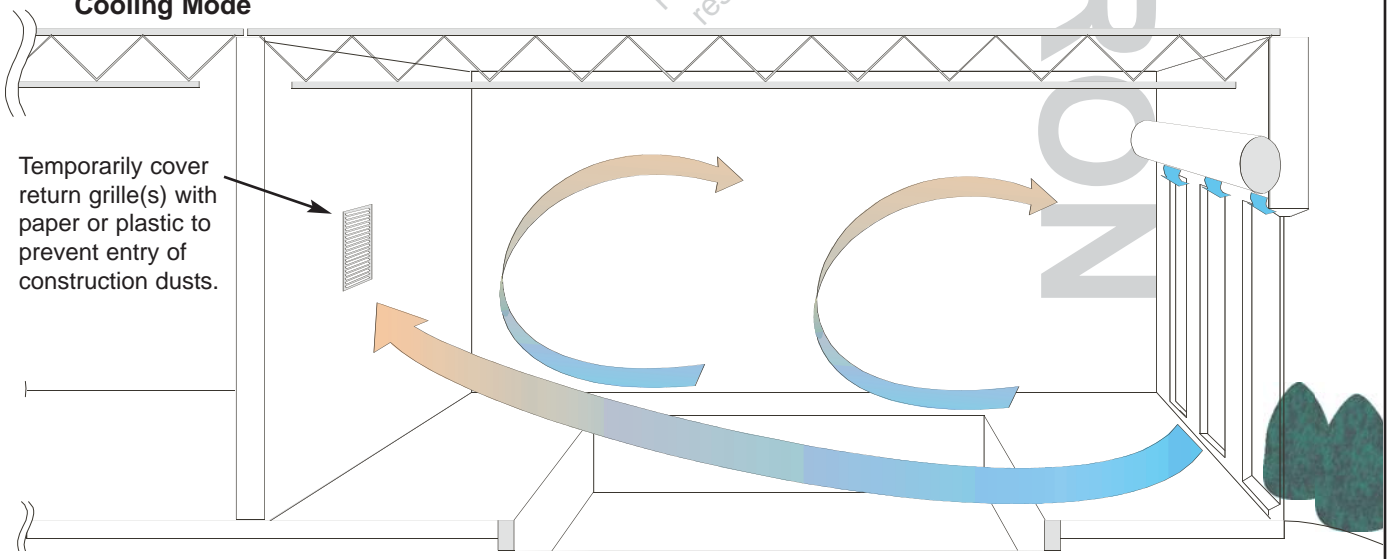
For units equipped with the Purge feature, see **Appendix M6 - Purge** for further considerations.

Heating Mode



INSTALLATION

Cooling Mode



Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Air Distribution

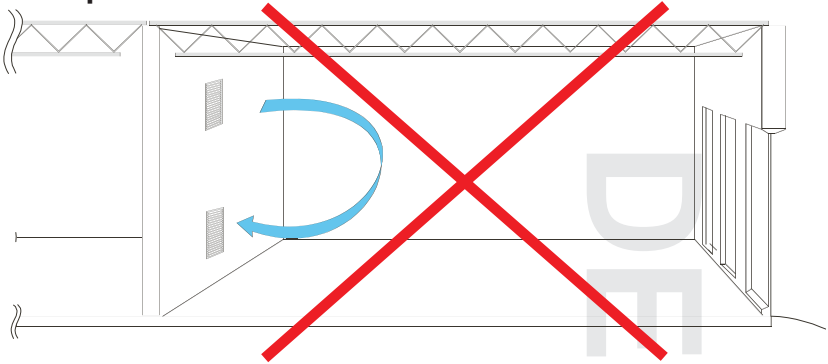
Supply Diffusers

Examples of Mis-Directed Air

Lack of proper ducting can lead to shorted airflows. In the example at right, the supply air projects a short distance into the room and is drawn back into the return grille.

This leaves the exterior walls and windows with no protection against condensation.

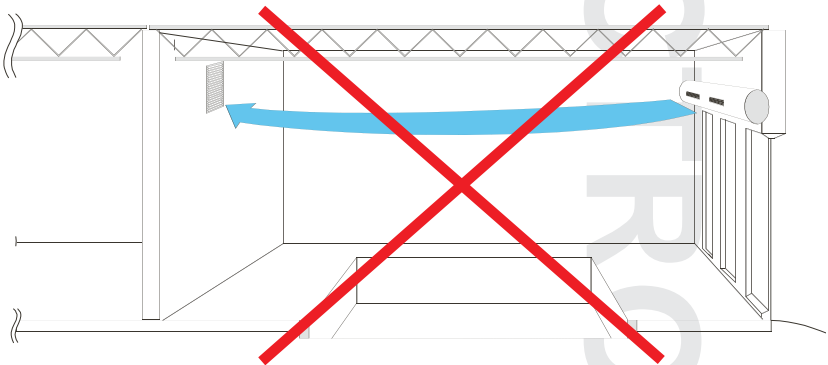
The DRY-O-TRON® controller will detect the supply air entering the return and will erroneously conclude that the cooling and/or dehumidification demand is completed.



In the example at right, the supply air projects across the top of the room and is drawn into the return grille.

This leaves the exterior walls and windows with no protection against condensation.

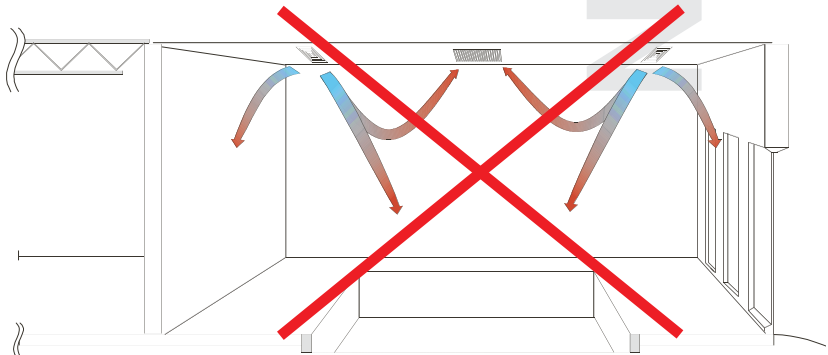
The quality of the air at the pool surface will suffer.



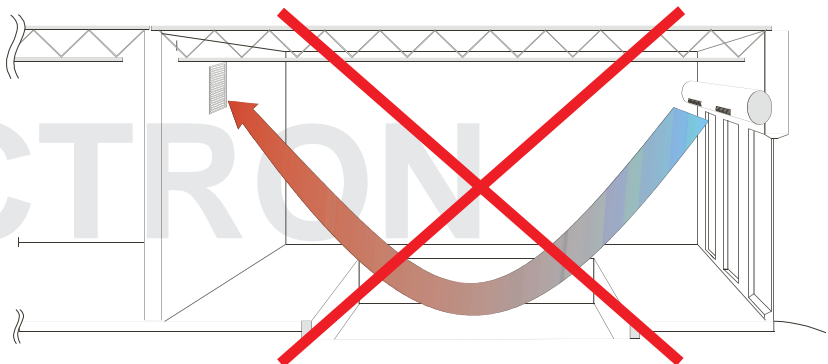
In the example at right, having both the supply diffusers and the return grille in the ceiling causes a large part of the supply air to be directed back into the return grille, leading to unexpected operation.

A large amount of supply air is being directed toward the pool, where it will elevate the evaporation rate.

Only a fraction of the supply air reaches the windows, which are the most likely surfaces for condensation.

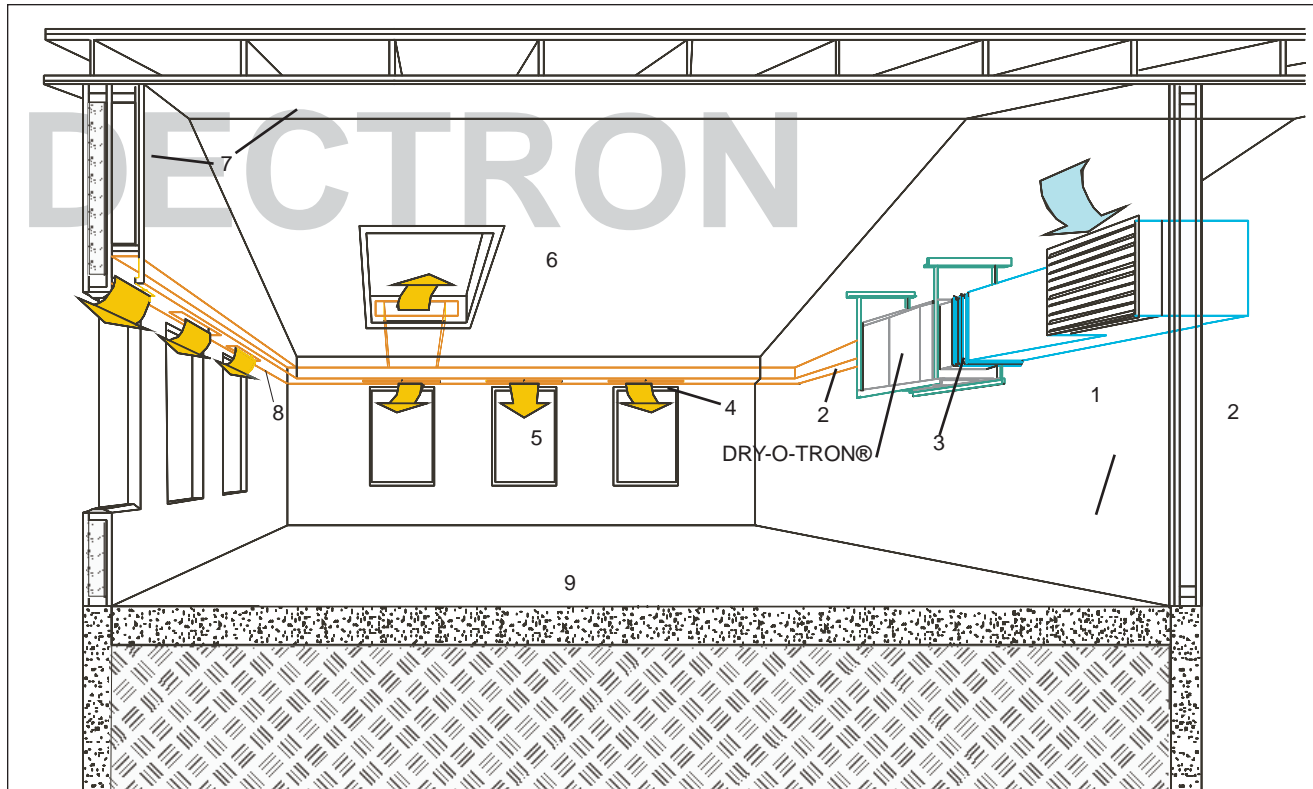


In the example at right, the supply air is directed at the pool surface. The resulting air speed at the water surface will increase the evaporation rate. The increase may lead to uncontrolled humidity levels.



INSTALLATION

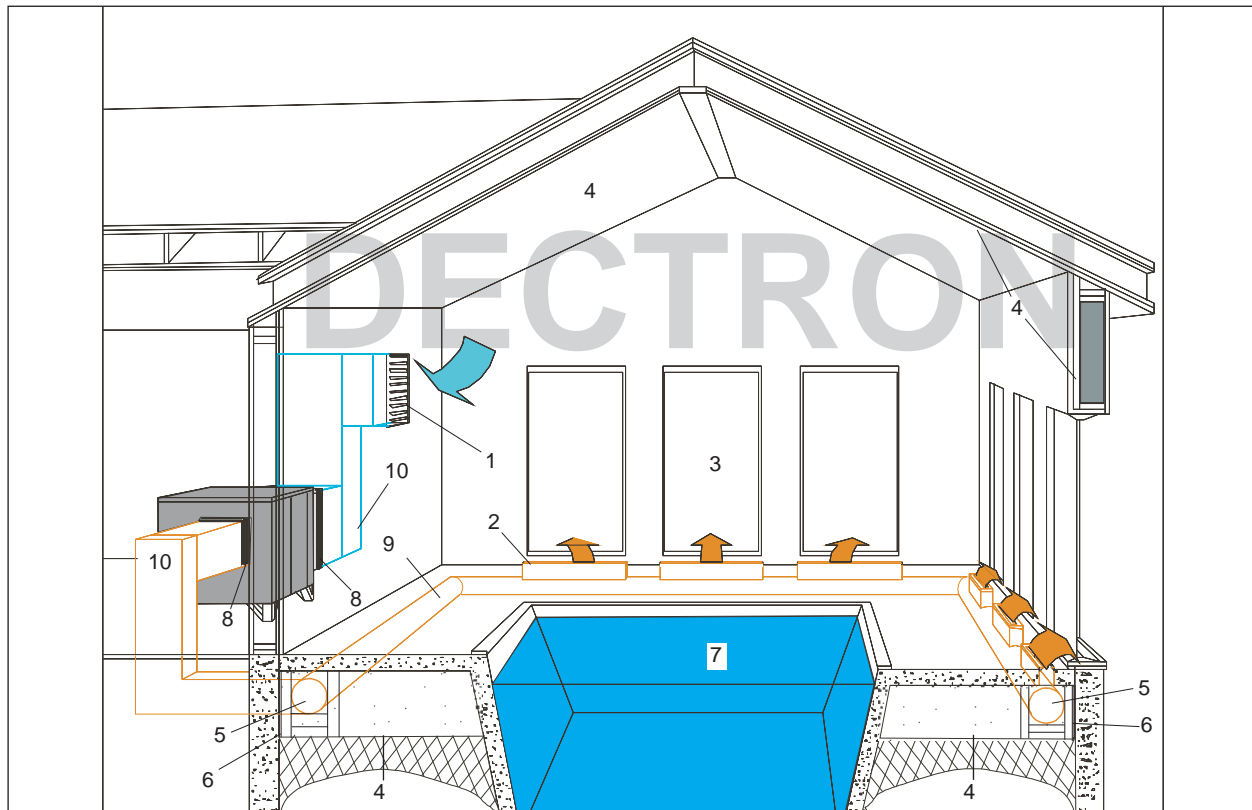
Data subject to change without notice.



1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) above the floor. Arrange for suitable air distribution. Arrange to prevent accidental blockage.
2. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (Also see the guidelines in **Standard Practice for Ducts.**)
3. Always install flexible duct connections at the unit.
4. Linear diffusers must cover entire width of window.
5. Blanket entire window with supply air.
6. Skylights are not recommended since condensation on skylights is difficult to control.
7. A vapor barrier in all walls and ceilings is necessary. **Dehumidification will not prevent the condensation of liquid water inside cold walls.**
8. Direct air at glass surfaces from close range for glass mounted high on walls.
9. Do not direct air over pool surface.
10. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
11. See other requirements elsewhere in this section.

INSTALLATION

Installations with sliding glass doors and/or windows set low in the wall should use under-floor perimeter supply air distribution with the supply air directed vertically upward along the glass surfaces. This configuration allows high air velocity and large air volumes.



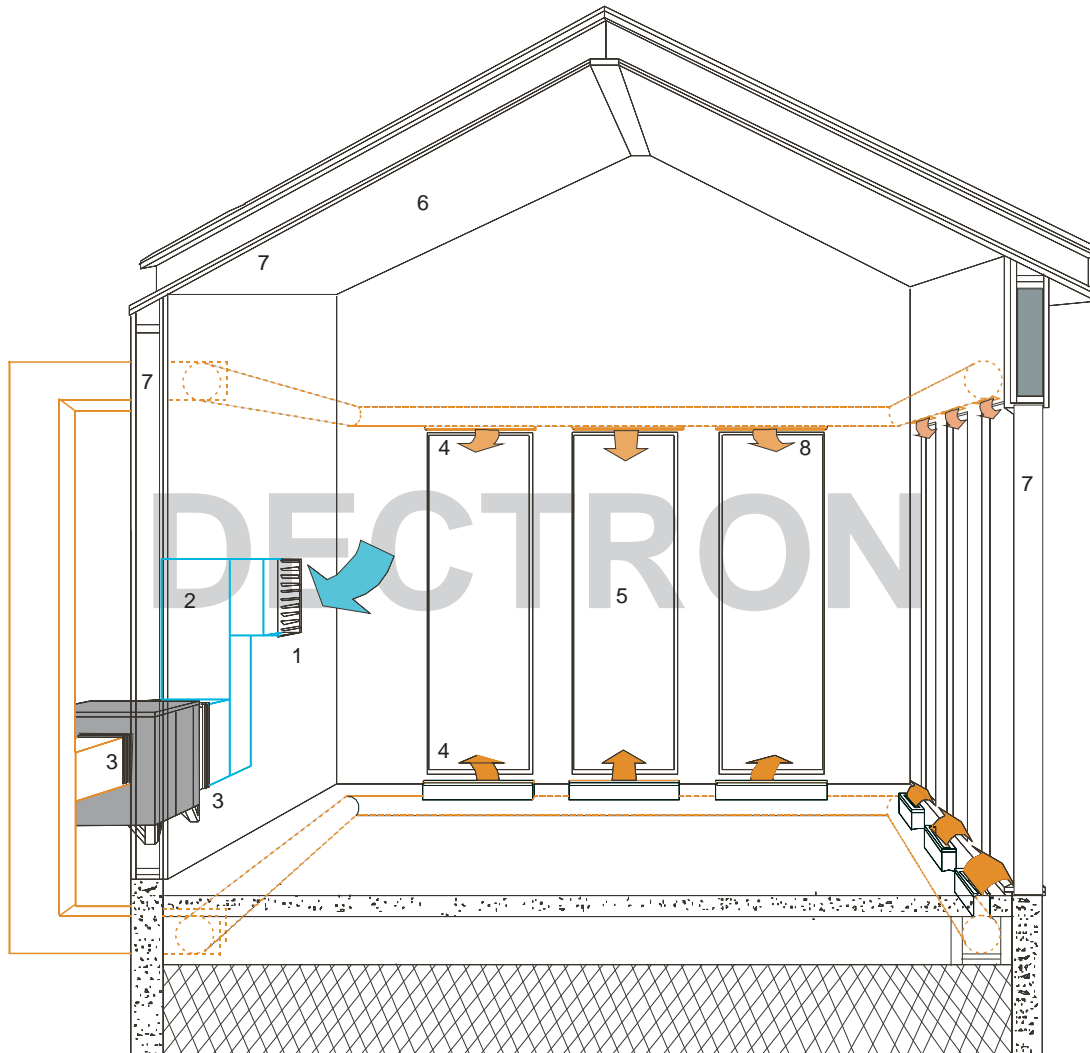
1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) up an interior wall. Allow for proper air circulation and arrange to prevent blocking of the inlet. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (See also **Installation - Duct Design** guidelines.)
2. Diffusers must be linear and must cover the entire width of each window.
3. Blanket each entire window with supply air.
4. A vapor barrier in all walls and ceilings is necessary. **Dehumidification will not prevent the condensation of liquid water inside cold walls.**
5. Where duct is installed below the floor, use PVC-coated round metal duct.
6. Duct installed beneath the floor should be insulated with styrofoam insulation.
7. Do not direct air over the pool water surface.
8. Always install flexible duct connections at the unit.
9. Under-floor perimeter air distribution for low windows should be installed.
10. Install 90° elbow and use acoustic insulation up to elbow only to eliminate air movement noise (see also Duct Design guidelines)
11. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
12. See other requirements elsewhere in this section.

Tall Windows

Air Distribution

Installation

Tall windows may require supply air to be directed toward them from both top and bottom.



1. Locate the return air inlet 8 to 15 ft. (2.5 to 4.5 m) up an interior wall for proper air circulation and to prevent blocking of the inlet. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (See also **Installation - Duct Design** guidelines.)
2. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (Also see the guidelines in **Unit-Duct Connections** and **Standard Practice for Ducts**.)
3. Always install flexible duct connections at the unit.
4. Linear diffusers must cover entire width of window.
5. Blanket entire window with supply air. Tall windows may require diffusers at top and bottom.
6. Skylights are not recommended since condensation on skylights is difficult to control.
7. A vapor barrier in all walls and ceilings is necessary. **Dehumidification will not prevent the condensation of liquid water inside cold walls.**
8. Direct air at glass surfaces from close range for glass mounted high on walls.
9. When installed for a natatorium, do not direct air over pool surface.
10. Temporarily cover return grille(s) with paper or plastic to prevent entry of construction dusts.
11. See other requirements elsewhere in this section.

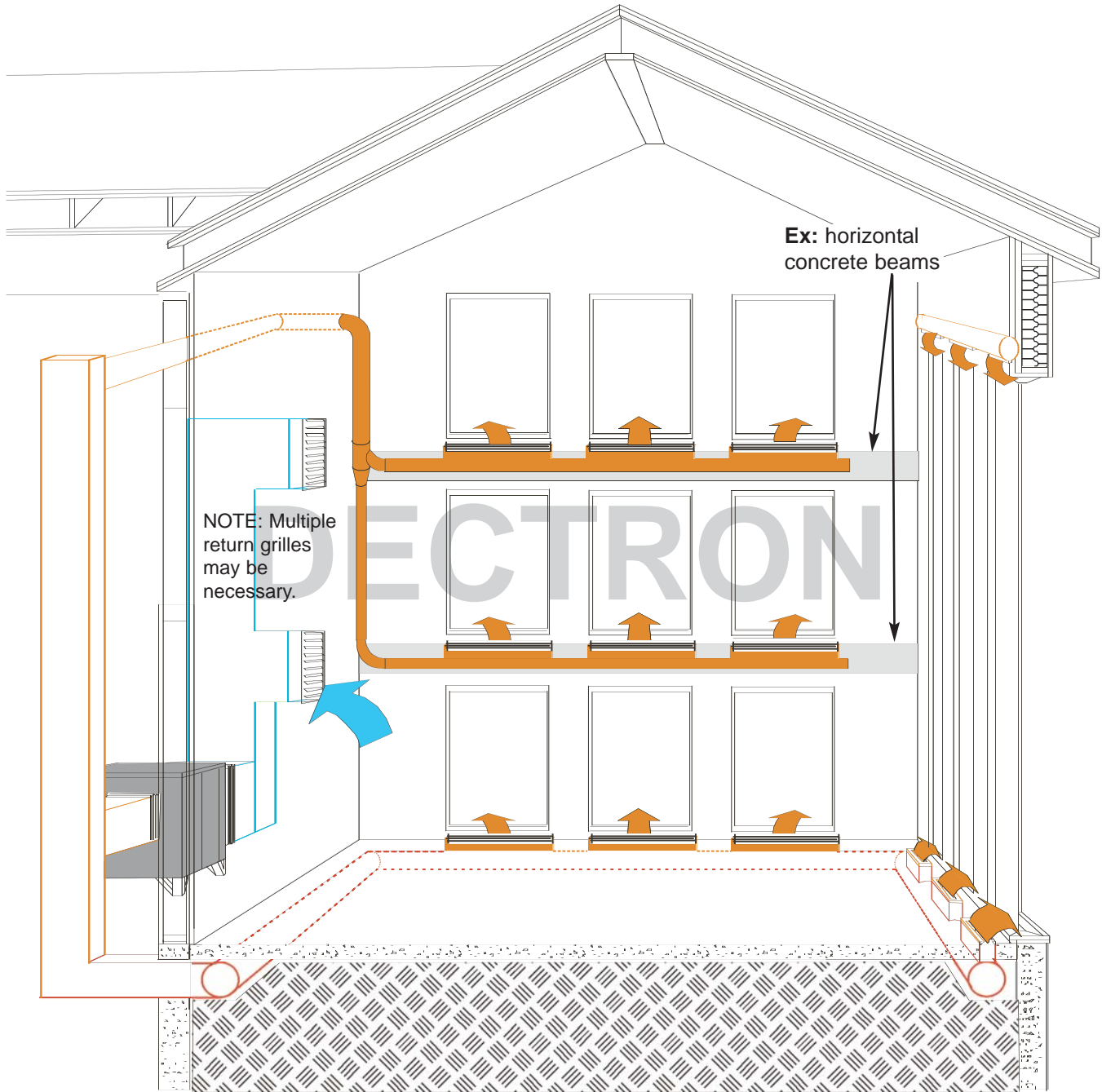
INSTALLATION

Multiple Distribution for Very Tall Windows or Windows with Cross-Members

Installations with a) very tall windows, or b) windows separated by beams, or c) windows with wide interior frames may require multiple ducts and diffusers to assure air distribution that covers all window surfaces. Multiple return grilles may also be required.

Also see other requirements elsewhere in this section.

INSTALLATION



Supply Diffusers

Air Distribution

Installation

Direct 3 - 5 CFM of supply air per square foot (15 - 26 l/s per square meter) of glass to all exterior windows and doors, or other surfaces that might reach dew point.

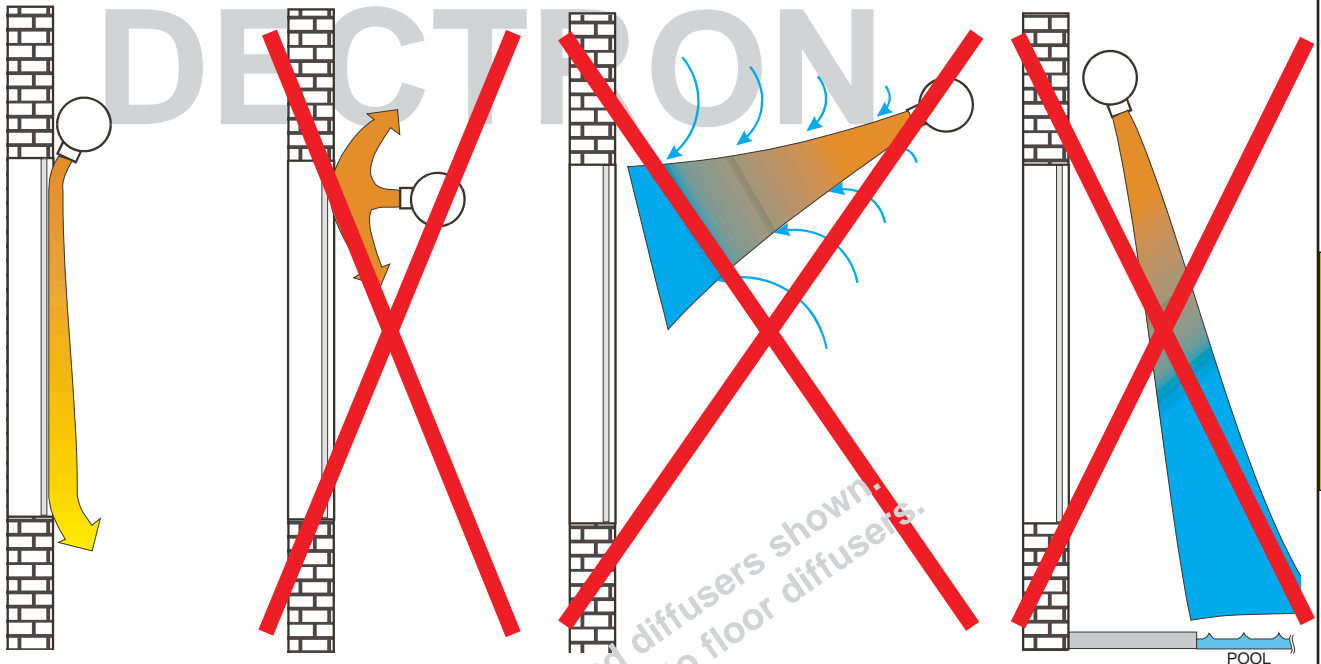
Do place diffusers as close to the cold surface as possible, preferably within 12 inches (25 mm).

Do direct the air at the sharpest angle possible so the air will follow the surface. See "Coanda Effect" in ASHRAE Fundamentals.

Do not direct supply air at a wide angle to the surface. Larger surfaces (like windows) will not be completely covered.

Do not use long throws. The resulting supply air mixed with room air will not prevent the windows from sweating.

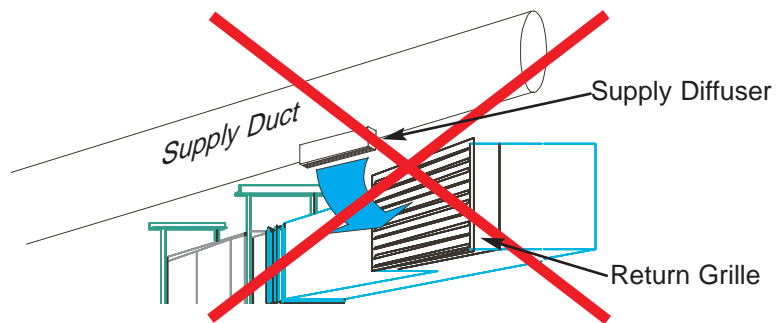
Unless special arrangements were made at time of sale, **do not** blow air directly at a pool. Doing so can increase the evaporation rate drastically.



NOTE: Overhead diffusers shown. Also applies to floor diffusers.

INSTALLATION

Never position a supply diffuser such that supply air will be drawn into the return grille. Doing so may result in erroneous sensor readings and mode oscillation.

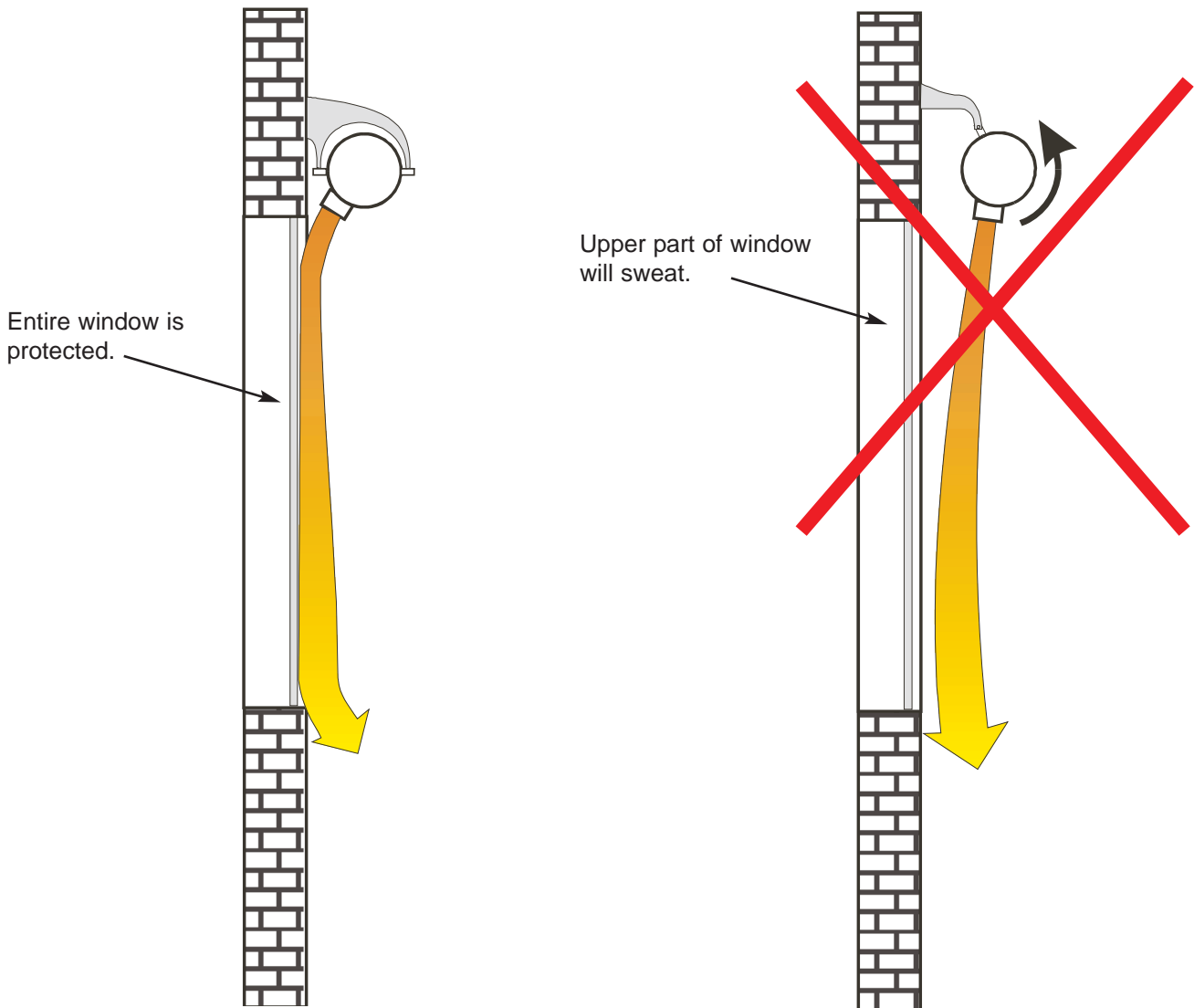


DECTRON

Where fabric duct is used, it should have a two-row support system, or have other means of preventing rotation.

Because of the necessary one-sided slots, fabric duct with a loose single-row support system tends to rotate away from the window when supply air is flowing. This allows the supply air to miss the upper part of the window.

INSTALLATION



Special Requirements Ducts Installation

Some options may have special duct requirements.

If your unit is equipped with the optional **SmartSaver** feature, refer to Dectron OM Appendix M3 - SmartSaver.

If your unit is equipped with the optional **economizer** feature, refer to Dectron OM Appendix M5 - Economizer.

If your unit is equipped with the optional **Purge** feature, refer to Dectron OM Appendix M6 - Purge.

All units:

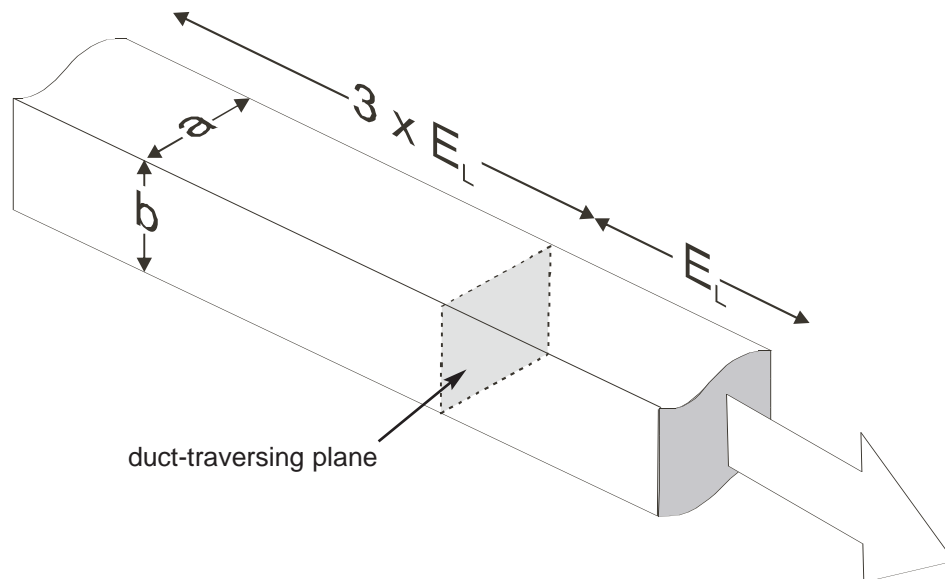
This is not a convenience air conditioner - it is a process dehumidifier. Proper airflow is essential.

Be sure to arrange sections of the **supply duct**, the **outdoor-air intake duct** (if any), and the **exhaust-air duct** (if any) for airflow measurement. The traversing plane for airflow measurement should be accessible and

1. full-sized, unbranched, and straight for at least three effective duct diameters upstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater, and
2. full-sized, unbranched, and straight for at least one effective duct diameter downstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater.

For this purpose, the effective duct diameter E_L is given by

$$E_L = \sqrt{4ab / \pi}$$



Leave a tag on the unit electrical enclosure specifying the location of the duct traversing plane.

INSTALLATION

Installation Ducts Standard Practice for Ducts

RETURN DUCT

WRONG

The air will not be evenly distributed over the evaporator.

2.5 W or more

Turning Vanes

RIGHT

Always install vibration isolator. Vanes and straight length allow air to flow evenly.

RETURN DUCT

WRONG

The air will not be evenly distributed over the evaporator.

Always install vibration isolator.

Turning Vanes

RIGHT

Vanes and straight length allow air to flow evenly.

30° or more

WRONG

Air cannot follow this steep angle.

20° or less

RIGHT

Air can follow this transition.

SUPPLY DUCT

WRONG

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

Always install flexible duct connection.

5W or more

W

RIGHT

Sufficient straight length allows proper airflow. Flexible duct connection absorbs vibration.

Window set to outside

WRONG

Air cannot reach the lower part of the window.

Window set to inside

Δ Linear grills with volume control.
Δ Register with double deflection and volume control.

RIGHT

Dry air reaches all the window.

Data subject to change without notice.

INSTALLATION

IMPORTANT!

This unit is not a convenience air conditioner - it is a **process dehumidifier**, which has been carefully sized to balance the required dehumidification load.

To be sure that the load will be balanced, it is essential to deliver the correct amount of air evenly distributed over the heat exchangers. Ductwork can have a marked effect on performance.

- Failure to set the airflow rates to within 10% of the specified values will result in performance reduction.
- 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 your Dectron representative 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 airflow below the minimum acceptable value.
- Select grilles, registers, and diffusers for low static pressure loss, required throw, and specified airflow. If the unit is to be used in a natatorium, choose hardware resistant to deterioration due to chemicals in the pool enclosure.

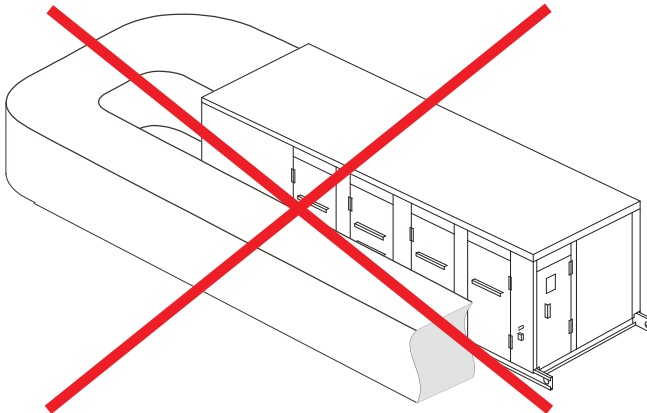
Δ Duct material

- The unit is suitable for use with any duct material, subject to the requirements of this section and standard practice. Standard galvanized steel duct is recommended. Use external duct insulation where necessary. If insulation must be used inside the ducts, use only **moisture-resistant** types.
- Where located in areas below room temperature, ductwork must be insulated on the outside with 2- inch fiber glass 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.

Arrange all ducts so as to leave adequate working clearance and access to the unit. See **Lifting and Locating - Select Air Handler Location**.



Standard Requirements Ducts Installation

The table below is only a guideline for standard sea-level supply airflows and external static pressure drops. Refer to the submittal data or to the unit nameplate for actual requirements.

Model Size	Supply-air (CFM)	ESP I.W.C.	Supply blower (HP)
010	1000	0.5	1
		1.0	1
015	1200	0.5	1
		1.0	1
020	2000	0.5	1.5
		1.0	1.5
030	3000	0.5	2
		1.0	2
040	3800	0.5	3
		1.0	3
050	4800	0.5	3
		1.0	5
060	5500	0.5	5
		1.0	5
080	6500	1.0	5
		2.0	7.5
100	8200	1.0	7.5
		2.0	10
120	11000	1.0	7.5
		2.0	10
150	13500	1.0	10
		2.0	15
160	15000	1.0	15
		2.0	15
180	16000	1.0	15
		2.0	15
200	19000	1.0	15
		2.0	20
240	20000	1.0	20
		2.0	20
280	25000	1.0	20
		2.0	25
360	32000	1.0	25
		2.0	30
480	40000	1.0	30
		2.0	40
560	50000	1.0	40
		2.0	50
800	65000	1.0	60

*Guideline Only
Use submittal data
or nameplate data.*

INSTALLATION

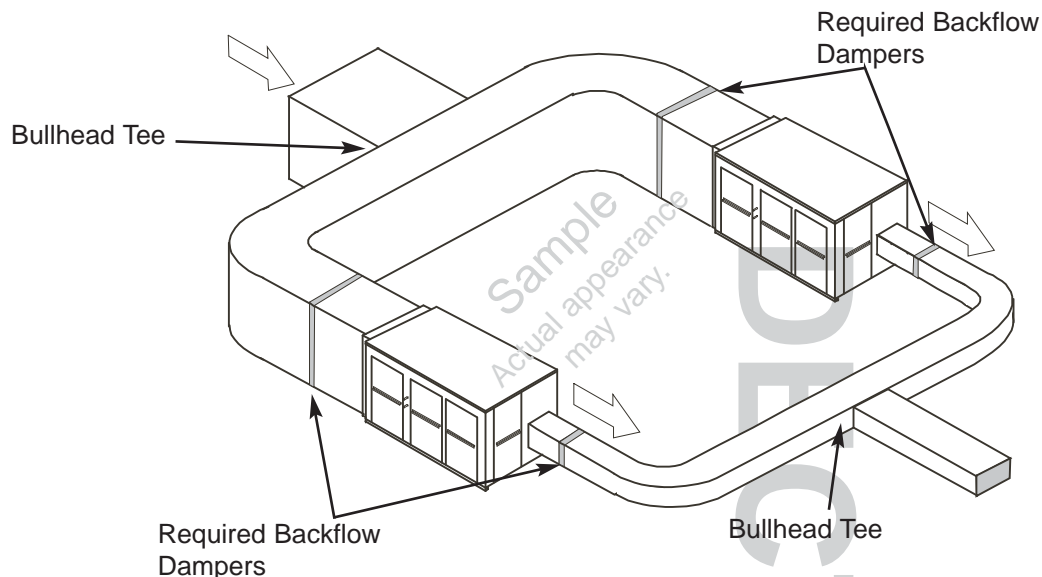
Installation

Ducts

Multiple Units

NOTICE Optional Equipment - Multiple units in parallel is an optional arrangement.

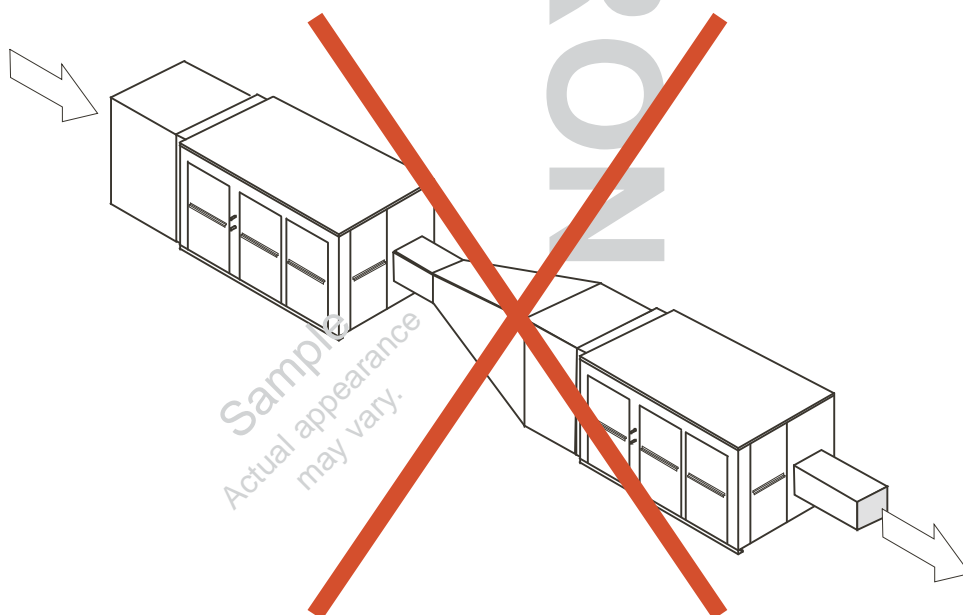
Where two or more DRY-O-TRON® units must be used for the same room, they should be installed in parallel, or have separate duct systems. Where two or more units share a duct, install dampers in the return and supply ducts to prevent backflow should one unit be off for maintenance.



Required heaters, vibration isolators, supports, etc., are not shown.

INSTALLATION

Do not duct two or more DRY-O-TRON® units in series, unless so instructed in writing by Dectron.



Return Duct

Ducts

Installation

WARNING Risk of carbon-monoxide poisoning. Can cause death.

Never install an unducted unit in the same space with combustion equipment. The resulting low room pressure could cause flue downdrafts.

NOTICE Risk of property damage.

NOTE: If it is to be used as a natatorium dehumidifier, do not install a dehumidifier in a return-air plenum room. Corrosive chemicals in the air may shorten the life of the electrical components.

If a plenum room is absolutely necessary, the user should carefully maintain pool-water chemistry. Chemicals should never be stored in a plenum room, or any room containing mechanical or electrical equipment. Outdoor air should never enter a plenum room.

NOTE: Where ducts are to be insulated, use only moisture-resistant insulation. High moisture levels can cause failure of fiber adhesives.

NOTE: Do not install a duct heater in the return duct.

NOTE: Do not allow any air other than room air to enter the return duct. Do not allow outdoor air or air mixed with outdoor air to enter the return duct.

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

IMPORTANT!

Allow straight length in the return duct as shown.

This straight length must be the same size as the connection on the unit. 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.

NOTE: For units with return-plenum boxes, the minimum straight length for the return duct is five times the lesser dimension of the return-duct connection. See **Product Description - Available Air Connections.**

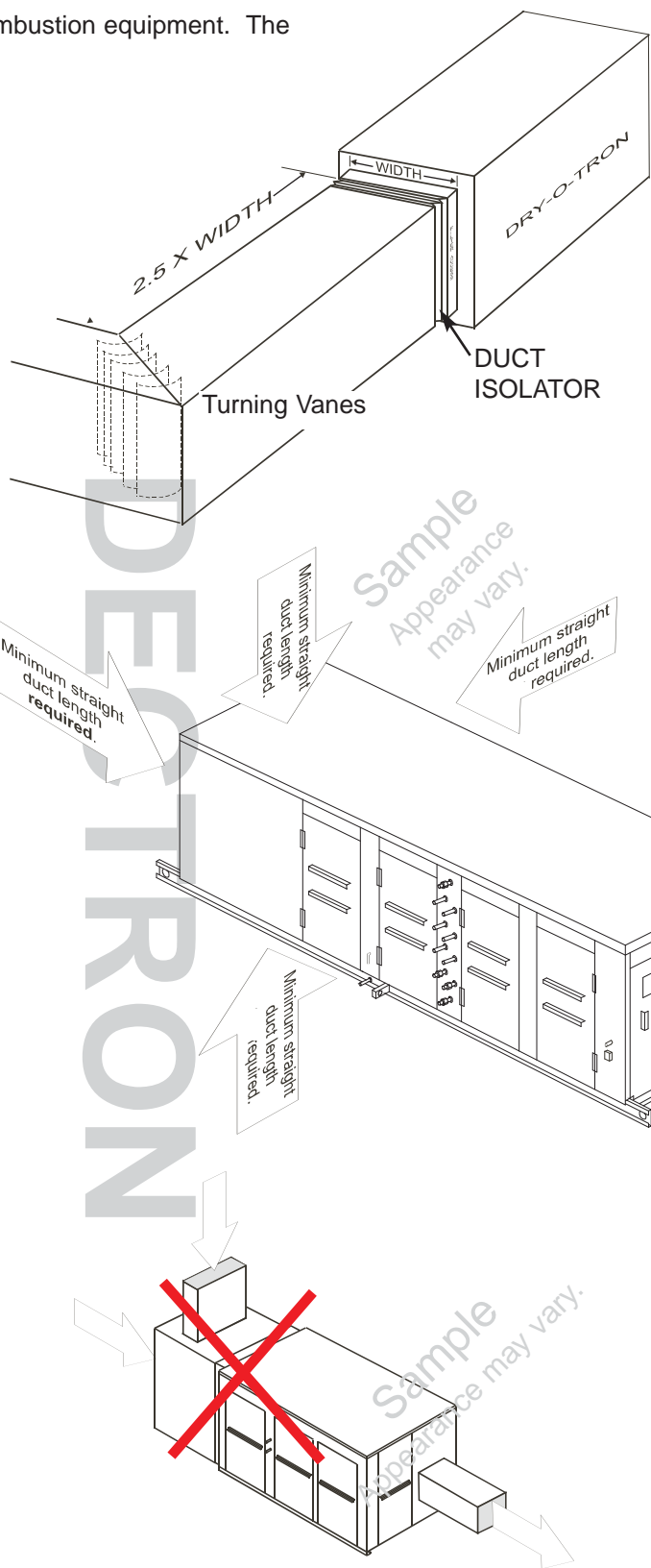
IMPORTANT!

Do not connect an outdoor-air intake to the return duct. Do not allow outdoor air to mix with return air.

IMPORTANT!

Temporarily cover the return grille with paper or plastic to prevent concrete or plaster dust from entering the return duct. This cover should be removed after all such dusts have been cleaned up and removed.

Horizontal Units



INSTALLATION

Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Ducts

Return Duct

Vertical Units

WARNING Risk of carbon-monoxide poisoning.
Can cause death.

Never install an unducted unit in the same space with combustion equipment. The resulting low room pressure could cause flue downdrafts.

NOTICE Risk of property damage.

NOTE: If it is to be used as a natatorium dehumidifier, do not install a dehumidifier in a return-air plenum room. Corrosive chemicals in the air may shorten the life of the electrical components.

If a plenum room is absolutely necessary, the user should carefully maintain pool-water chemistry. Chemicals should never be stored in a plenum room, or any room containing mechanical or electrical equipment.

Outdoor air must never enter a plenum room.

NOTE: Where ducts are to be insulated, use only moisture-resistant insulation. High moisture levels can cause failure of fiber adhesives.

NOTE: Do not install a duct heater in the return duct.

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

IMPORTANT!

Allow straight length in the return duct as shown.

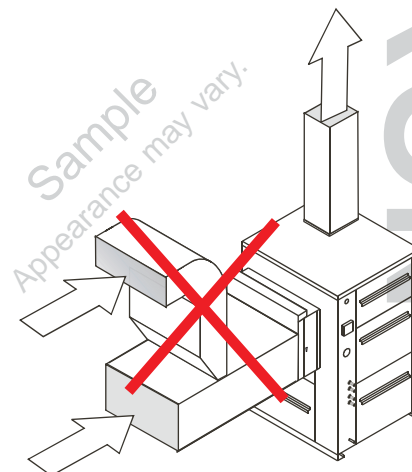
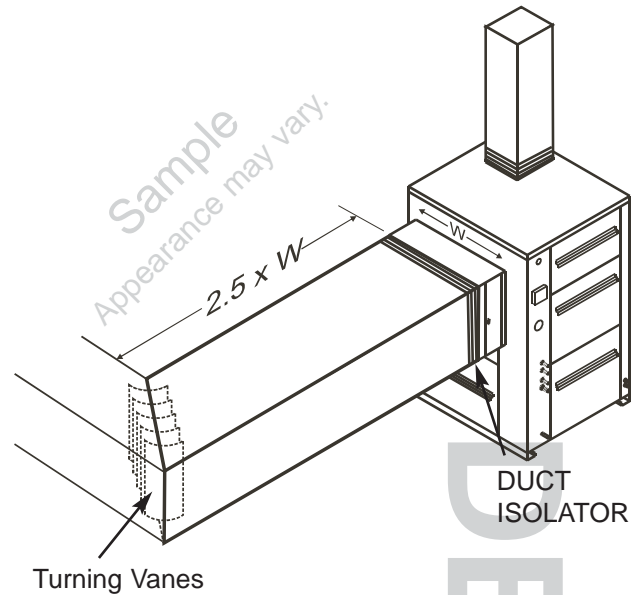
This straight length must be the same size as the connection on the unit. There should be no elbows, transitions, offsets, or other flow interruptions closer than 2.5 X WIDTH of the return-duct opening.

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

IMPORTANT!

Temporarily cover the return grille with paper or plastic to prevent concrete or plaster dust from entering the return duct. This cover should be removed after all such dusts have been cleaned up and removed.

NOTE: Do not allow any air other than room air to enter the return duct. Do not allow outdoor air or air mixed with outdoor air to enter the return duct.



Return Duct

Ducts

Installation

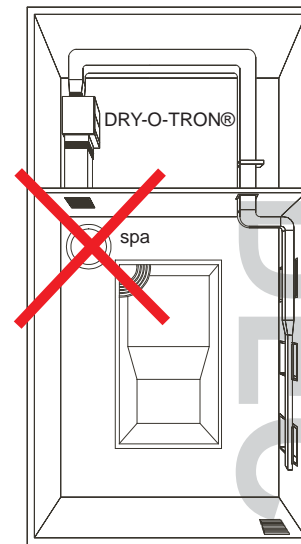
NOTICE Risk of unit and property damage.

Return Grille Location

The return grille of a DRY-O-TRON® must be located far from a spa or hot tub.

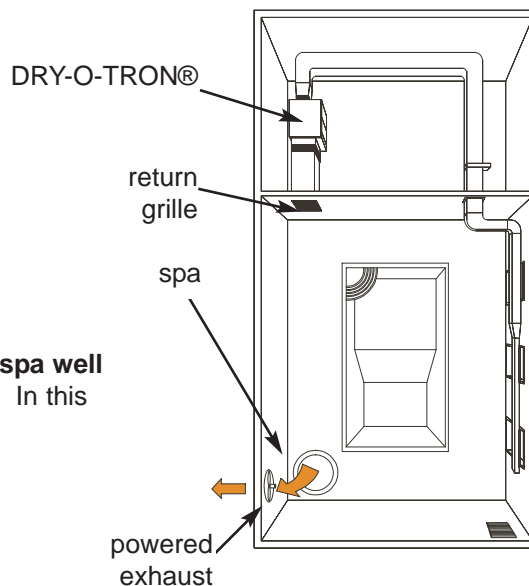
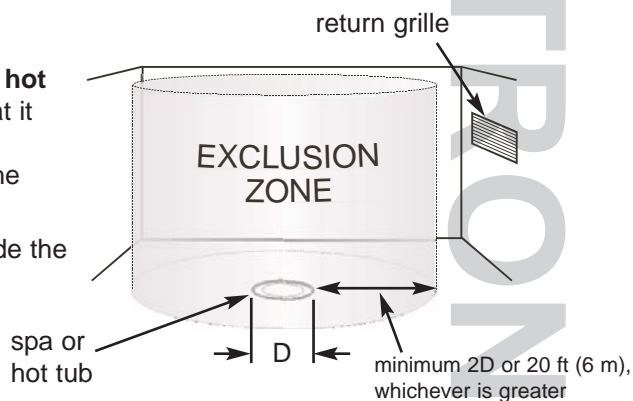
The temperature and agitation of spas increases the rate of production of corrosive chloramine gases. Chloramines are corrosive to most metals found in buildings, electrical systems, and HVAC equipment.

Also, over time oxidized human skin oils will irrevocably foul the return duct and damage the DRY-O-TRON®. Oxidized oils cannot be removed by washing.



Locate the return-air grille(s) as far away from a spa or hot tub as possible. At minimum install the return grille so that it will be more than twice the width of a spa or 20 ft. (6 m.) (whichever is greater) horizontally away from the edge of the spa or hot tub.

Never install a return grille above a spa or hot tub, or inside the imaginary cylinder marked "Exclusion Zone" at right.



IMPORTANT!

The better solution is to locate the return grille and the spa well away from each other and exhaust the air above the spa. In this case, the spa-exhaust system should be by others.

INSTALLATION

Installation

Ducts

Return Duct

NOTICE Risk of unit damage.
Do not allow construction dusts to enter a unit.

COVER RETURN GRILLE DURING CONSTRUCTION.

IMPORTANT!

Unless the ductwork is to be installed after all construction dusts have been removed, care should be taken to prevent dust from entering the ducts, **especially the return duct**. If concrete or plaster dusts are allowed to enter the unit, they may permanently bind to the coil surfaces, reducing airflow and heat transfer. **Filters will not prevent this.**

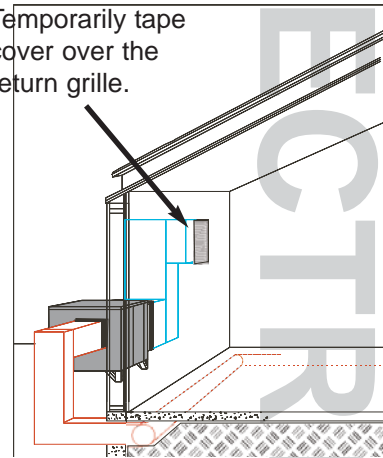
If concrete, plaster work, or cleanup will be ongoing after the return duct is installed, tape paper or plastic sheeting over the return grille(s) to prevent dust from entering the duct. The DRY-O-TRON® **must be OFF** until all dusts are removed. Remove the cover only after all concrete and plaster work is complete and the dusts have been cleaned up and removed.

Do not operate the unit when dusts are present or while the grille cover is still in place.

Important!

Never use the DRY-O-TRON® as a construction-site dehumidifier, cooler, or heater. Do not operate the unit while construction dusts are present.

Temporarily tape cover over the return grille.



Supply Duct

Ducts

Installation

Supply Duct Near Unit

Refer to AMCA¹ guidelines for system-effect considerations.

To prevent unexpected reduction of airflow, a section of the supply duct should be full-sized and straight as it leaves the blower. This section should be straight for a distance of at least five times the blower width. There should be no elbows, transitions, offsets, turning vanes, duct heaters, or other flow interruptions closer than 5 X the width (W) of the blower.

NOTE: On special order, Dectron may be able to provide bottom-, top-, or side-discharge blowers, and/or reversed blower rotation. Minimum straight duct lengths still apply.

NOTE: Minimum straight supply-duct lengths are not required for units equipped with plenum blowers for supply air.

All installations should have space heat available year-round.

At some sites, the heating requirement may be met by external duct heaters (by others). To prevent hot spots and the resulting heater failures, locate the heater at least 5 times the duct width downstream from the blower, or from any airflow interruptions such as elbows and transitions.

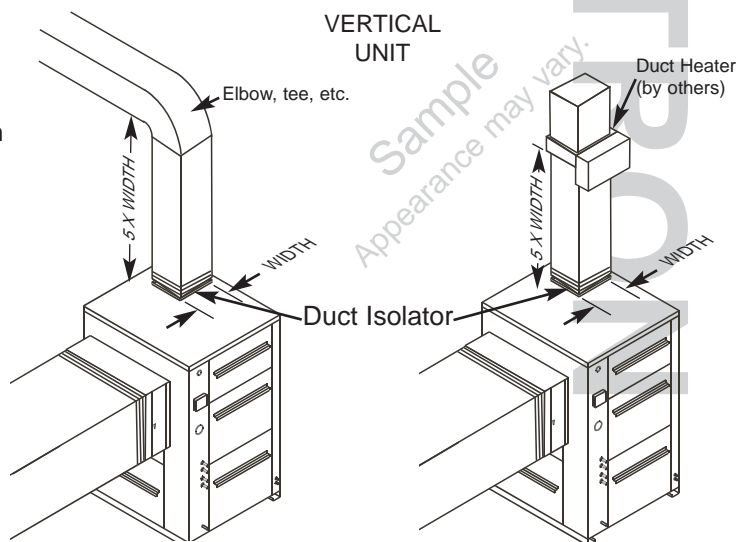
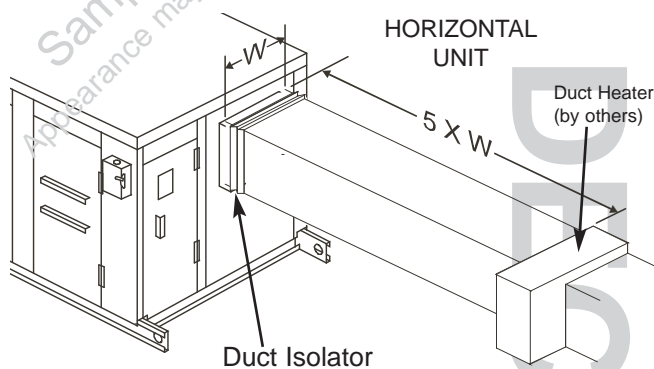
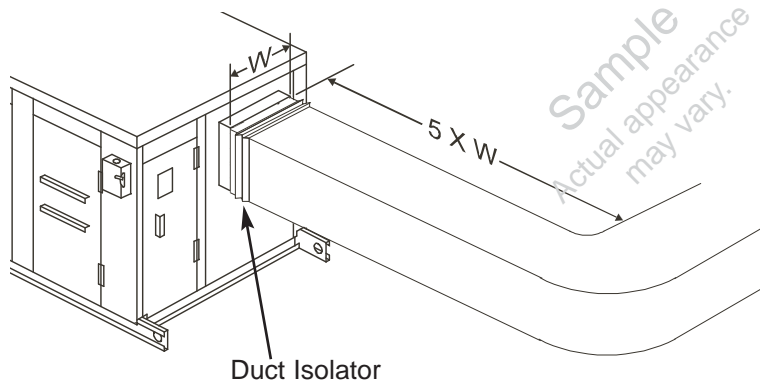
On special order, for some models Dectron may be able to provide special close-coupled duct heaters that do not require the minimum straight length of duct. The minimum straight length before an elbow, tee, offset, transition, or other flow interruption will still apply.

NOTE: The basic DRY-O-TRON® does not produce significant heat - it recycles heat. A dedicated space heater must be ordered with the unit or must be provided by others. When ordered with the unit, the heater may be inside the cabinet.

NOTE: Building heat losses are calculated by others and consequently space heaters are sized by others. **Dectron does not select space-heater capacities.**

NOTE: Allowing the pool to heat the air may cause the pool-water evaporation rate to increase drastically.

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



INSTALLATION

Supply Duct Near Unit Special Duct Heaters

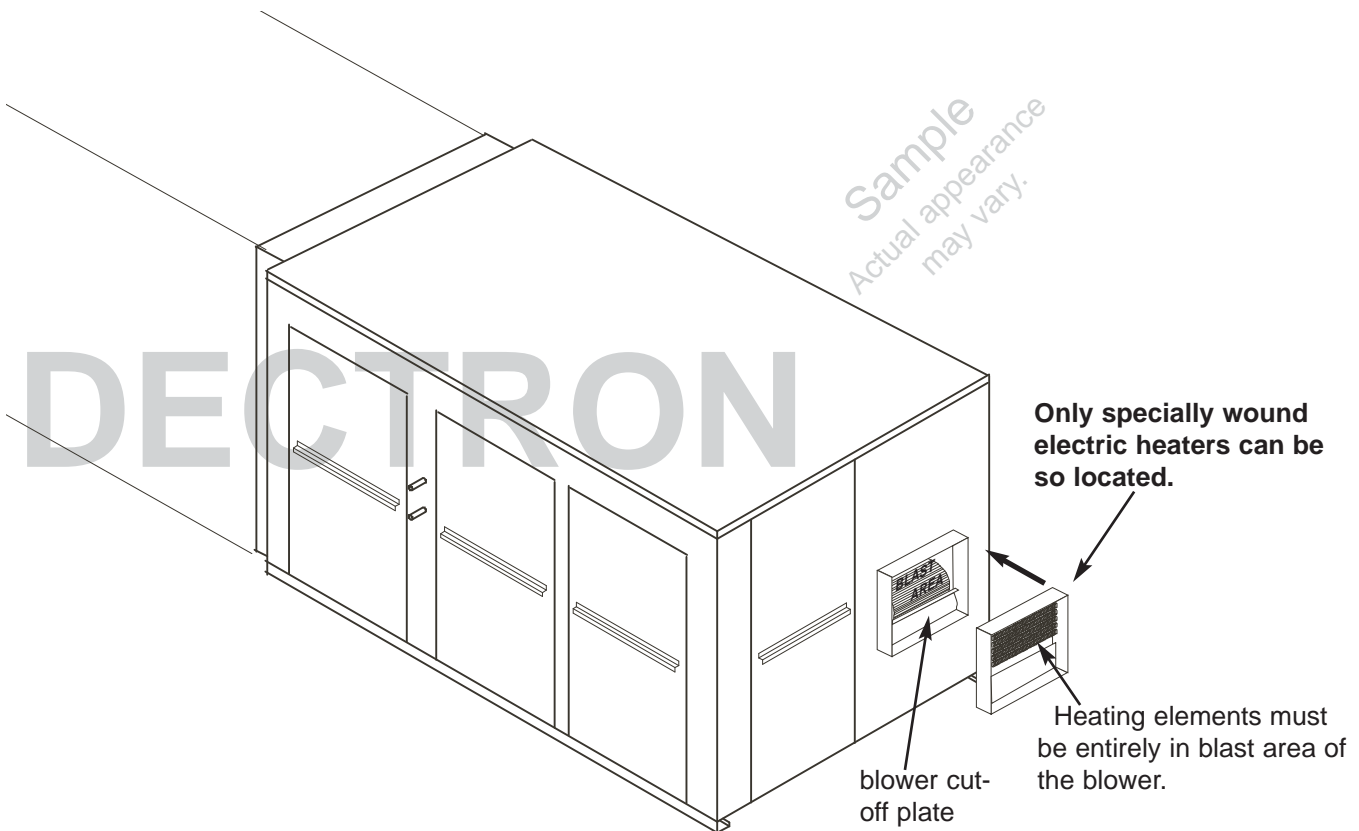
NOTICE Risk of property damage.
Ordinary uniformly wound duct heaters will overheat when installed too close to a blower.

NOTICE Optional Equipment

Some units of some models may ship with a specially designed electric duct heater that requires no straight duct length between it and the blower. Such heater may ship separately.

If the special duct heater ships separately, it must be installed in the field. If the heater is to be installed closer than five duct diameters to the blower, then the orientation of the heater is important.

The heating elements must be arranged so that all of them are in the blast area of the blower, above the blower cut-off plate.



NOTE: Some blowers may be oriented differently. In this case, the orientation of the heater follows the orientation of the blower.

Outdoor Air

Ventilation

Installation

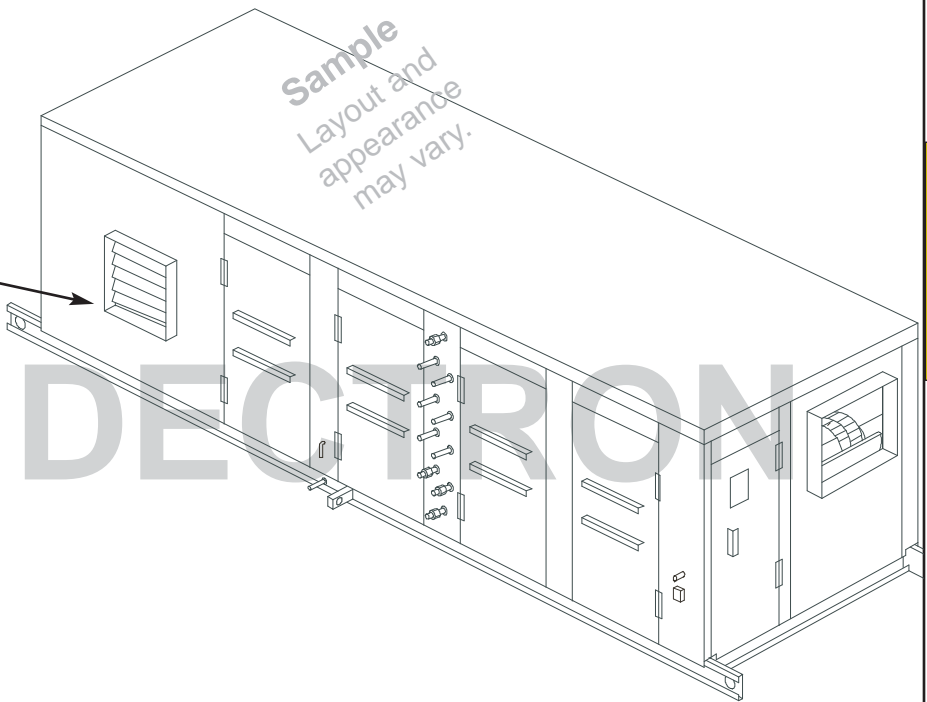
NOTICE Optional Equipment

Some options may have special ventilation-duct requirements.

If your unit is equipped with the optional SmartSaver feature, refer to Dectron OM Appendix M3 - SmartSaver.

If your unit is equipped with the optional economizer feature, refer to Dectron OM Appendix M5 - Economizer.

If your unit is equipped with the optional Purge feature, refer to Dectron OM Appendix M6 - Purge.



NOTICE Optional Equipment

Some units may have motorized damper sections that ship separately. In this case, the damper section(s) must be installed in the field.

Note that these motorized damper sections may require the connection of several wires at the time of section installation. Refer to **Installation-Wiring**.

Some damper vanes may open outward. **Installed ducts must not interfere with the opening of any dampers.**

NOTICE Optional Equipment

Units without the SmartSaver option may require outdoor-air preheaters, which may be by others or may be by Dectron. If supplied by Dectron, such preheater may ship separately. If so, the preheater should be assembled now. Be sure that damper operation is not blocked. See second page following.

INSTALLATION

Installation

Ducts

Ventilation

NOTICE Optional Equipment**Ventilation, Method 1**

This ventilation method is not subject to the minimum temperatures or maximum flow rates for entering outdoor air listed elsewhere in this manual, since the outdoor air does not enter the unit. In this case, heater sizes and maximum flow rates are determined by others.

The mechanical system must ensure that adequate ventilation, including the introduction of outdoor air, is provided according to the applicable building codes. The quality of the indoor air is extremely important to ensure user comfort.

Make-up air requirements should conform to ASHRAE Standard 62.1-2004 or its latest revision.

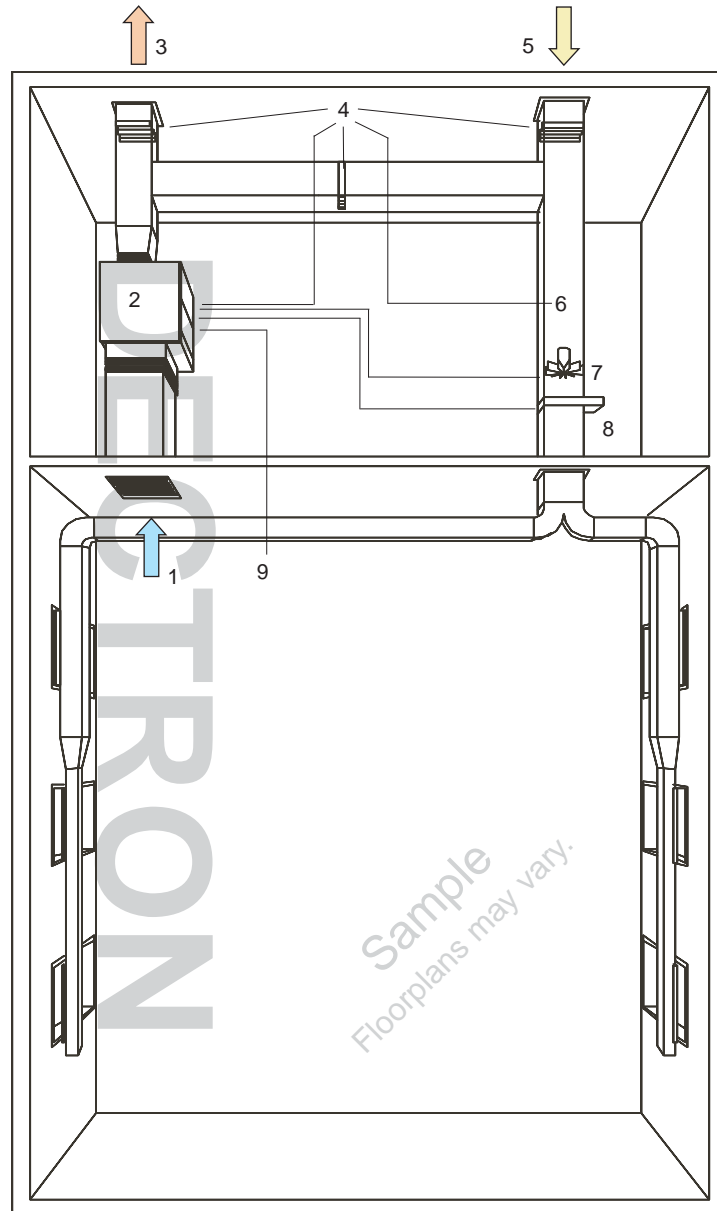
DRY-O-TRON® units are available in a number of configurations which will easily accept the introduction of controlled quantities of outdoor air. Some units are equipped with a standard make-up air intake (may ship separately) which will allow up to 15% (30% with air-conditioning option) outdoor air. Units with the economizer option come with a built-in mixing box for the introduction of up to 100% make-up air during cooling mode.

Standard units can also be used with external mixing boxes and damper arrangements. Some units may have control contacts for ventilation systems by others. Some units may have a 24VAC/80VA power supply for ventilation to operate the damper motors.

During outdoor-air ventilation modes the moisture load in the room will vary according to the outdoor air conditions.

IMPORTANT!

All outdoor air inlets must have a separate air filter.



1. Return air
2. DRY-O-TRON® as return air blower
3. Exhaust air
4. Modulating damper control, (Sizes 080 and larger)
Power supply for ventilation
5. Make-up air (provide air filters)
6. Modulating thermostat (by others)
7. Supply blower (by others)
8. Auxiliary space heater (by others) controlled by DRY-O-TRON®
9. Space temperature and humidity sensed and controlled by DRY-O-TRON®

Ventilation

Ducts

Installation

NOTICE Risk of unit damage. Risk of building damage from water leakage.
Apply the requirements applicable to your unit. Do not confuse options.

For installations where outdoor air enters the unit, the maximum allowable outdoor-air-intake flow rate is determined on page **Installation - Ducts - Airflow Rates**, earlier in this section. That information is important to sizing ducts and heaters.

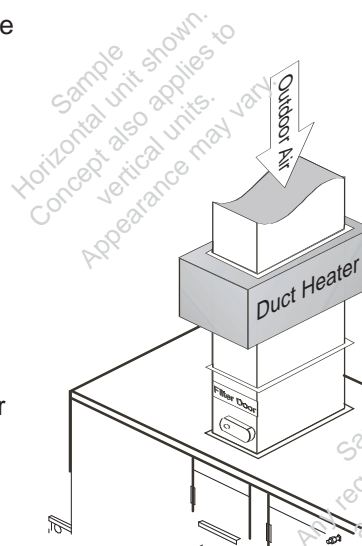
For units **without** the Economizer, Purge, or SmartSaver options, the minimum temperature for outdoor air entering the unit is 32°F (0°C).

For units **with** the SmartSaver option, the minimum temperature for outdoor air entering the unit during normal occupied periods is -20°F (-28°C).

For units **with** the Economizer or Purge options, the minimum temperature for outdoor air entering the unit during normal occupied periods is 32°F (0°C). The minimum temperature for outdoor air entering the unit during Economizer or Purge mode is -20°F (-28°C).

Where outdoor temperatures may go below the minimum temperature, the incoming outdoor air must be pre-heated to at least the minimum temperature **before it enters the unit**. Any such heater must be sized to heat the maximum amount of outdoor air to the required minimum value, even with the lowest likely outdoor temperature. Failure to do so could cause unexpected condensation and other problems.

Where the above temperatures cannot be achieved, any outdoor-air intake will require a separate outdoor-air intake system (by others). Separate systems must not change the pressure or flow in ducts connected to the unit, must not deliver outdoor air to the return duct, and must not allow mixed air to enter the unit return duct.



DECTRON

INSTALLATION

Installation

Ducts

Ventilation

NOTICE Optional Equipment Ventilation, Method 2

Some DRY-O-TRON® units may be factory equipped for the direct intake of makeup air. Outdoor air must be filtered before entering the DRY-O-TRON® unit.

NOTE: For units without the air-conditioning option, outdoor air should be heated (by others) to room temperature before entering a unit.

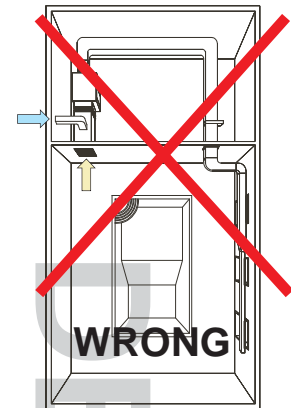
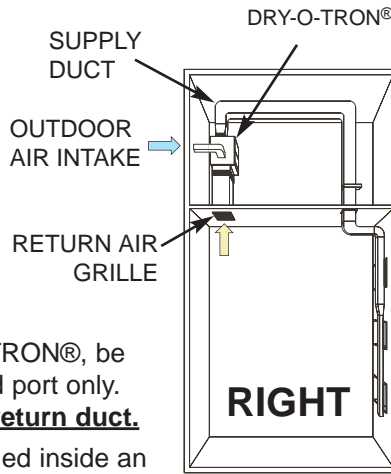
NOTE: Maximum allowable outdoor-air flow rates are determined on page **Installation - Ducts - Airflow Rates.**

Where outdoor air is supplied to the DRY-O-TRON®, be sure to connect the makeup air to the identified port only.

Never connect an outdoor air intake to the return duct.

NOTE: If fibrous duct insulation must be installed inside an outdoor-air intake duct, use only moisture-resistant types. High relative humidity can cause failure of the fiber adhesive.

NEVER BRING OUTDOOR AIR INTO THE RETURN DUCT.



INSTALLATION

The volumetric exhaust-air flow rate should be 110% of the outdoor-air intake flow rate. This maintains a slight negative pressure on the space and reduces moisture movement from the natatorium into the rest of the building.

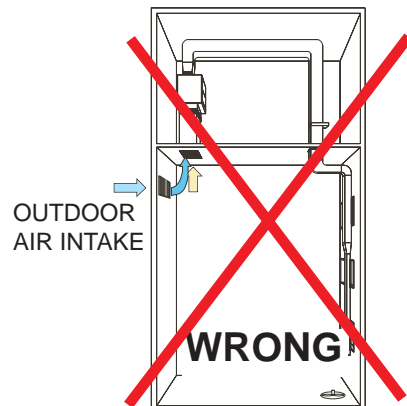
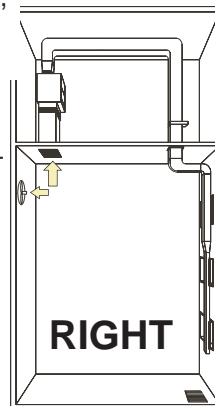
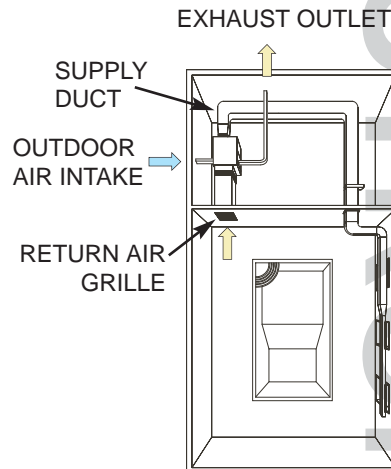
Some DRY-O-TRON® units may be equipped with both makeup-air intake and exhaust-air outlet. In this case connect the outdoor air and exhaust air ducts to the identified ports only. **Never connect an outdoor air intake to the return duct.** Locate the exhaust-duct outlet far from the intake-duct inlet.

Outdoor air should always enter through a hood, cap, or gooseneck in order to prevent the entry of rain, snow, etc. A screen should be provided to exclude birds, leaves, insects, etc.

Some facilities may already have separate ventilation systems by others. In this case, the DRY-O-TRON® can control ventilation as needed.

Where ventilation is by others, arrange makeup air to enter the room far away from the DRY-O-TRON® return duct grille.

Never allow outdoor air or air mixed with outdoor air to enter the return grille.



↑ OUTDOOR AIR INTAKE

↓ EXHAUST OUTLET

Ventilation

Ducts

Installation

NOTICE Optional Equipment

Outdoor-Air Intake Duct (if any) Near Unit

Indoor units may be supplied with outdoor air via a duct. Where this is the case, use only the outdoor-air connection provided. **Never connect an outdoor-air intake duct to the return duct.**

NOTE: Outdoor air intake points should be well away from any exhausts, vent, flues, etc. The intake should be protected against the entry of rain or other precipitation and screened against birds, insects, leaves, etc.

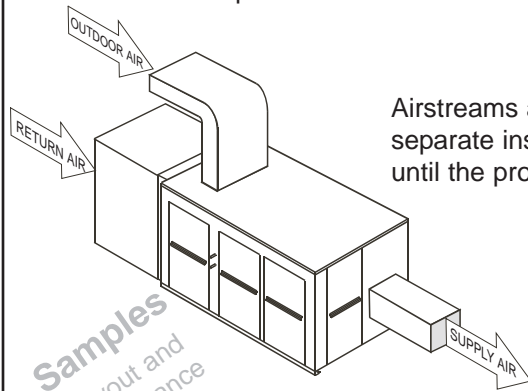
NOTE: Outdoor air must be filtered and balanced.

NOTE: There are requirements for minimum temperatures of entering outdoor air. Any required heaters (by others) are not shown.

NOTE: For indoor units with the Economizer option, the Intelligent Energy Saver option, or the Purge option, the outdoor-air intake duct must be sized for 100% of the nameplate value AIR VOLUME.

NOTE: During cold weather, the temperature of an outdoor-air intake duct may go below the dew point of any indoor air around the duct. Insulate and apply vapor retarders as needed.

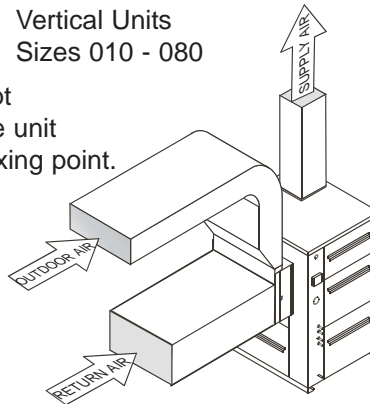
NOTE: Some units may have dampers to close off one or more ducts. Use care to assemble ducts so that these dampers will not be obstructed in any part of their cycle. Any hoods over the outdoor-air intakes and exhaust-air ports of outdoor units must be assembled to allow proper damper movement.



Airstreams are kept separate inside the unit until the proper mixing point.

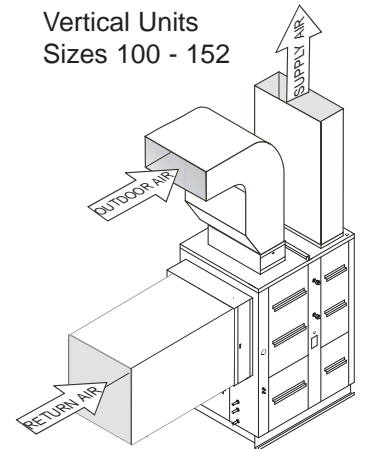
Samples
Layout and
appearance
may vary.

RIGHT



Vertical Units
Sizes 010 - 080

RIGHT



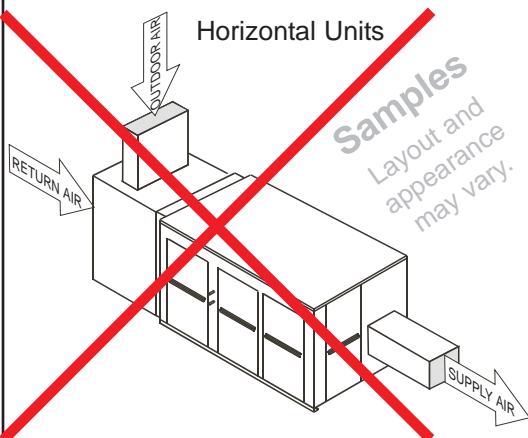
Vertical Units
Sizes 100 - 152

RIGHT

INSTALLATION

NOTE: Outdoor air should never be introduced into the return-air duct. Such introduction will lead to unexpected results.

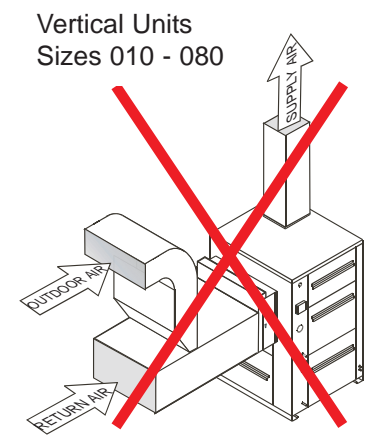
WRONG



Horizontal Units

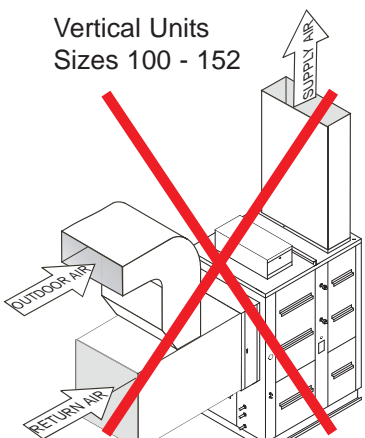
Samples
Layout and
appearance
may vary.

WRONG



Vertical Units
Sizes 010 - 080

WRONG



Vertical Units
Sizes 100 - 152

Ducting Checklist

Installation

A copy of this checklist should be left with the unit.

Supply diffusers are arranged to wash any building surface (usually exterior) that might reach dewpoint.

your initials

Minimum straight lengths of duct at full blower-width size were installed at the blower-outlet connection to minimize system effect and other airflow problems.

your initials

For units without the air-conditioning option, where outdoor air may be colder than room air, duct heaters (by others) have been arranged in outdoor-air intake ducts to warm the air to room-air temperature before it enters the unit.

your initials

Return grille is opposite the supply diffusers and is not near a spa or hot tub.

your initials

Flexible duct connectors are installed between the unit and all connected ducts.

your initials

Ducts are sized for the specified air flow rates and do not exceed maximum external pressure drops.

your initials

Outdoor-air is not delivered into the return-air duct.

your initials

Arrangements have been made to exhaust 110% as much air volume from the room as is being brought in.

your initials

Any fabric duct is held by dual-rail supports or is otherwise restrained from rotating.

your initials

No concrete, plaster, or other construction dusts or spills are present inside the ducts.

your initials

Ducts carrying air that may go below the dew point of the surrounding air have been covered with insulation and vapor retarder.

your initials

For units equipped with the optional SmartSaver feature, the duct instructions of Dectron OM Appendix M3 - SmartSaver have been followed.

your initials

A paper or plastic sheet has been installed over the return grille to prevent dust from settling inside the duct.

your initials

For units equipped with the optional economizer feature, the duct instructions of Dectron OM Appendix M5 - Economizer have been followed.

your initials

Duct heaters (if any, by others) are installed more than 5 duct diameters downstream from the blower, unless labeled for closer installation.

your initials

For units with the air-conditioning option but without the SmartSaver option, where outdoor air may be colder than 32°F (0°C), duct heaters (by others) have been arranged in outdoor-air intake ducts to warm the air to at least 32°F (0°C) before it enters the unit.

your initials

For units equipped with the optional Purge feature, the duct instructions of Dectron OM Appendix M6 - Purge have been followed.

your initials

For units with the air-conditioning option and with the SmartSaver option, where outdoor air may be colder than -20°F (-28°C), duct heaters (by others) have been arranged in outdoor-air intake ducts to warm the air to at least -20°F (-28°C) before it enters the unit.

your initials

Minimum straight lengths of duct at full filter-box size were installed at the filter-box connection to produce even airflow across the heat exchangers, and to minimize energy losses.

your initials

Date: _____

Model No. _____

Serial No. _____

Ref. No. _____

Name _____

Tel. _____

Checklist prepared by: _____

INSTALLATION

Installation

Piping

Warnings

 **WARNING****Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling. Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

 **WARNING****Risk of contamination of breathing air. Can cause injury or death.**

Unexpected release of refrigerants can contaminate breathing air. Take precautions to insure adequate clean air.

 **CAUTION****Risk of frostbite. Can cause injury.**

Contact with leaking refrigerant can cause frostbite. Wear protective clothing and safety goggles.

 **CAUTION****Risk of contact with sharp edges, flying chips. Can cause injury.**

Cutting of tubes can produce flying chips and sharp edges. Wear gloves, safety glasses, and other protective equipment as appropriate. Debur sharp edges after cutting.

 **CAUTION****Risk of contact with hot surfaces. Can cause injury.**

Joining tubes by brazing produces hot surfaces. Wear gloves, safety glasses, and other protective equipment as appropriate. Allow parts to cool before handling.

 **WARNING****Risk of explosive depressurization. Can cause injury or death.**

Do not open, cut, or heat tubes or refrigeration devices until pressure has been relieved to atmospheric pressure.

 **DANGER****Risk of explosion. Can cause injury or death.**

Shielding gas for brazing should be commercial dry nitrogen, carbon dioxide (CO₂), or other non-reactive gas. **Do not use oxygen. Do not use any fuel gas.**

To prevent the build-up of pressure, remove the cores from the access valves in the condenser tubes inside the unit, and limit the flow of gas. Use only enough shielding gas to force the air out of the tubes.

Warnings

Piping

Installation

NOTICE

Risk of leaking water. Can cause property damage.

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow.

Uncontrolled water can cause expensive damage to buildings and equipment. Do not locate this product above any equipment that could be damaged by water.

NOTICE

Risk of uncontrolled condensation. Can cause property damage.

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

INSTALLATION

Installation

Piping

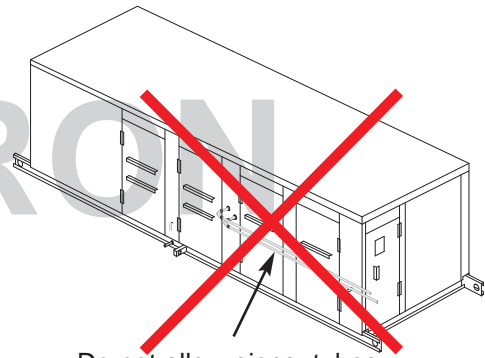
General

Required Clearances

Ducts, pipes, tubes, conduits, etc., must be arranged not to obstruct access to the unit or to its internal parts. All doors and/or panels must be accessible and must be able to open to at least 90°. The minimum working clearances must be maintained. (See section **Lifting & Locating - Select Air Handler Location.**)

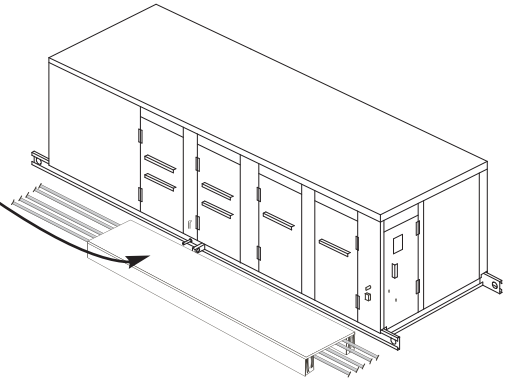
Unless specified for single-side access, there are access doors and/or panels

- a) horizontal unit - front and back sides, electrical panel
- b) vertical unit size 010 - 030 - front, left side
vertical unit size 040 and up - front, back, left side



Do not allow pipes, tubes, conduits, etc., to obstruct access panels or doors.

Pipes, conduits, etc., should not be routed along the floor near a unit. Where this must be done, construct a working platform (by others) to allow access without damage.

**NOTICE** Optional Equipment**Special Requirements for Optional Equipment**

Optional equipment may have special piping requirements.

If your unit is equipped with the optional DryCooler feature, request and refer to Dectron OM Appendix M1 - DryCooler.

If your unit is equipped with the optional Heatco gas furnace, request and refer to Dectron OM Appendix H2 - HTCO Furnace.

If your unit is equipped with the optional TEGA gas furnace, request and refer to Dectron OM Appendix H9 - TEGA Furnace.

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 122-322), request and refer to Dectron OM Appendix H6 - Raypak 1000.53E HiDelta Boilers 122-322.

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 302B - 902B), request and refer to Dectron OM Appendix H7 - Raypak 1000.501C HiDelta Boilers 302B-902B.

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 992B-2342B), request and refer to Dectron OM Appendix H8 - Raypak 1000.511B HiDelta boilers 992B-2342B.

Refrigerant

Piping

Installation

WARNING

Risk of frostbite, contamination of breathing air, and suffocation. Can cause injury or death.

Installation of this product may involve an extension (by others) of one or more relief-valve outlet tubes. Check with the local code-enforcement authority for requirements. Where required, follow these instructions and those in the applicable codes.

WARNING

Risk of explosive depressurization. Can cause injury or death. Do not heat relief valves.

NOTICE Optional Equipment

RELIEF TUBE

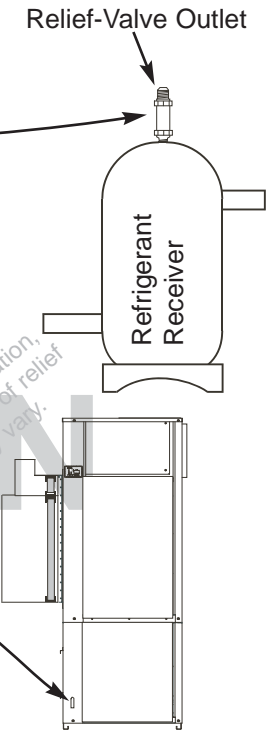
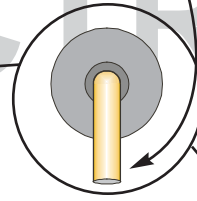
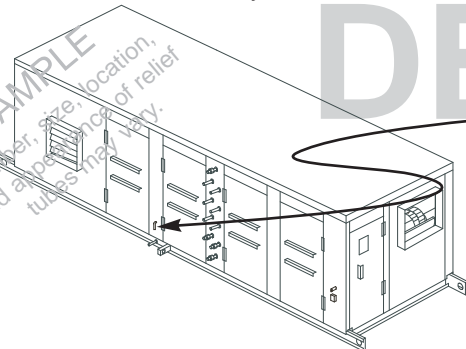
Some units have refrigerant-relief valves that open to control pressures in the event of a critical emergency.

Where this is the case, some smaller units may not have relief-valve outlet tubes and thus may deliver refrigerant to the interior of the unit. Should it be necessary to add relief-valve outlet tubes, use tubing at least as large as the outlet size of the relief valve.

In other units, relief valves may be equipped with outlet tubes that deliver any expelled refrigerant to a point outside the unit cabinet. The end of the outlet tube is usually located low on the cabinet and is bent downward to prevent the entry of foreign materials. There may be more than one such relief tube.

SAMPLE
Number, size, location,
and appearance of relief
tubes may vary.

DECTRON
Number, size, location,
and appearance of relief
tubes may vary.



INSTALLATION

In some cases where units are installed indoors, the relief-valve outlet tube may be required to be extended outdoors. Consult the local code-enforcement authorities.

Ex: Note the total refrigerant charge given on the unit nameplate.

If the refrigerant quantity exceeds the allowable amount for the space, the relief-valve outlet tube may have to be extended.

In this case, the extension tube should not be smaller than the original relief tube. There may be other requirements for sizing the relief-tube extension. Consult relevant codes and your local code-enforcement authorities.

The relief tube should terminate at a point at least 15 feet (4.6 m) above grade and at least 20 feet (6.1 m) from any window, exit, air intake, or ventilation opening. The end of the relief tube should be protected from clogging by insects, insect nests, or other foreign materials. There may be other requirements for terminating the tube.

Consult your local codes or your local code-enforcement authorities for relief-tube extension requirements. Where codes, ordinances, and the findings of your local code-enforcement authorities are more restrictive than these recommendations, the codes, ordinances, and official findings take precedence over these recommendations.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Dectron DRY-O-TRON ®	
MODEL #:	
SERIAL #:	
REF. #:	
ELECTRICAL RATING:	480 V ac, 3 ph, 60 Hz
COMPRESSOR:	120 FLA
COMPRESSOR:	120 FLA
COMPRESSOR:	120 FLA
BLOWER MOTOR:	120 FLA
FAN MOTOR:	120 FLA
ENTRANCE MOTOR:	120 FLA
ELECTRIC HEATER:	120 FLA
SERVICE POWER:	120 V, 1.5 A, 1.75 P
WIRING DIAGRAM:	120 V, 1.5 A, 1.75 P
WATER:	120 V, 1.5 A, 1.75 P
R-22 FACTORY CHARGE:	120 V, 1.5 A, 1.75 P
R-22 TOTAL SYSTEM CHARGE:	120 V, 1.5 A, 1.75 P
AIR VOLUME:	120 V, 1.5 A, 1.75 P
BELT SIZE:	120 V, 1.5 A, 1.75 P
WIRING DIAGRAM:	120 V, 1.5 A, 1.75 P
AIR TEMP:	120 V, 1.5 A, 1.75 P
MAX. LENGTH OF REF. LINES (ONE WAY) BETWEEN I.S.T. & REMOTE CONDENSER:	120 V, 1.5 A, 1.75 P
AIR COOLED COND. MODEL #:	120 V, 1.5 A, 1.75 P
HOT GAS LIQUID:	120 V, 1.5 A, 1.75 P
REFRIGERANT DESIGN PRESSURES: HIGH/LOW 300/150 PSIG	
COMPLIES TO ANSI/UL STD 1995	
CERTIFIED TO ITS DESIGN	
CSD 2 INT. 228	
ZURBORG ALUMINUM WORK PRODUCTS	

Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Piping

Refrigerant

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY

REMOVING TUBE CAPS

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

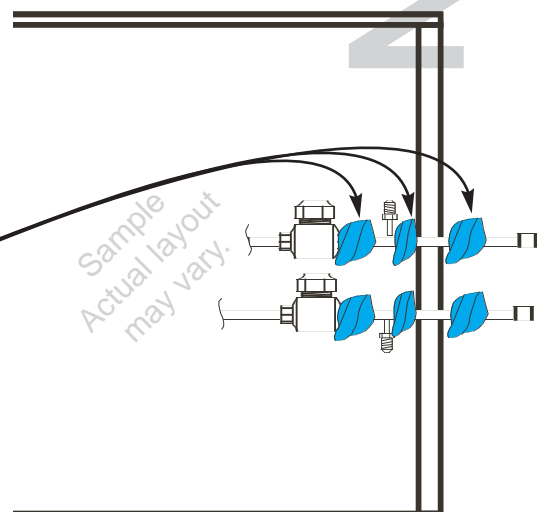
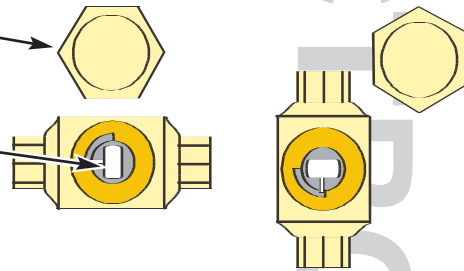
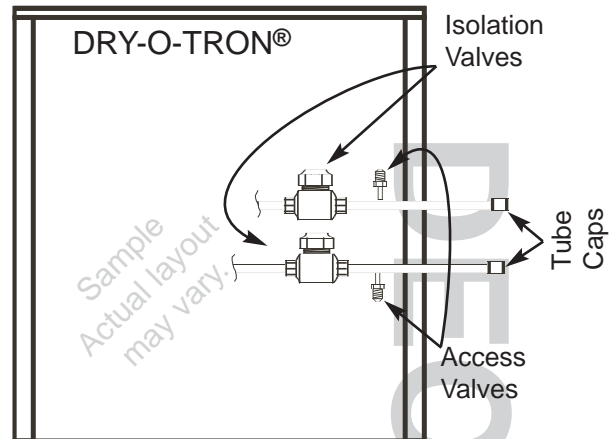
Units with the air-cooled air-conditioning option ship with capped tube stubs protruding from the unit cabinet.

NOTE: Some units may have several pairs of tubes to be connected to the remote condenser(s). Only one pair is shown here.

NOTE: It is important to identify the correct tubes for the circuit. Labels are applied to the cabinet to identify the tubes. Do not cross the circuits.

To remove the tube caps follow these steps:

1. Open the appropriate access door or panel.
2. Locate the isolation valves for the tubes. Remove the valve caps by unscrewing them. Retain the caps and any cap gaskets or O-rings.
3. Be sure the isolation valves are closed. The stem flats should be at right angles to the tube.
4. Locate the access valves for the tubes. (See above.)
5. Remove and retain the access-valve caps and any O-rings.
6. Check that there is no pressure inside the tube stubs. If there is pressure it may be necessary to reclaim the contents. The contents may be refrigerant mixed with air, and thus may not be suitable for re-use.
7. Remove and retain the access-valve cores.
8. Remove the tube caps with a tube cutter. To prevent metal chips getting inside the tube, do not use a saw. If the tube caps are to be heated for removal, the tube grommets, access valves, and isolation valves must be protected from heat by wrapping the tubes with wet towels or by applying a commercial heat-trapping compound.



Refrigerant

Piping

Installation

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY
ASSEMBLING CONDENSER TUBES

NOTICE Optional Equipment

NOTICE Risk of property damage. Where remote condenser is present, follow the instructions in this manual and in all applicable codes.

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:

Use only clean copper tube. Never allow dirt, water, 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 or replaced.

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.

Vertical-lift hot-gas tubes should be segmented into lifts of not more than 20 feet (9 m) with P-traps between each segment. The total lift for one

hot-gas tube should not exceed 50 feet (15 m).

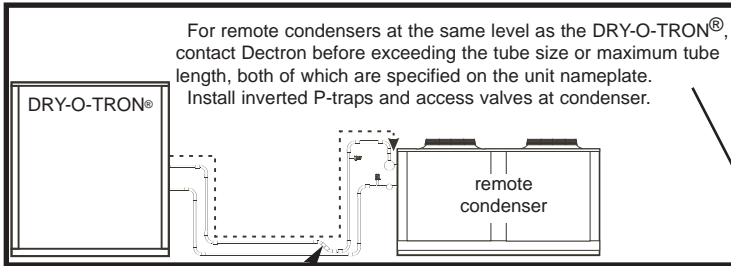
IMPORTANT:

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

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

Further piping details are discussed on following pages.

Brazing requirements are discussed on a following page.



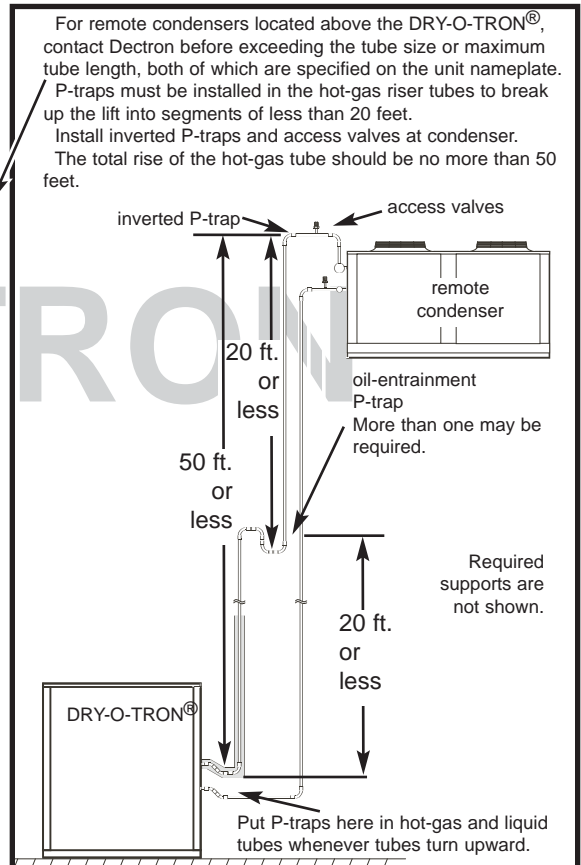
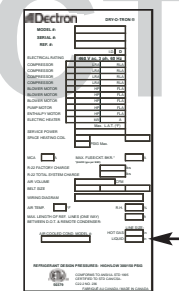
Whenever hot-gas tubes go upward for more than 3 feet (1 m), install a P-trap at the bottom.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.

Horizontal tube runs should slope downward in the direction of flow at least 1/4" per 10 ft. (0.2cm/m).

All tubes, pipes, conduits, etc., must be separately supported by others. Do not apply a torque or axial load to the unit tube connections.

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



INSTALLATION

Installation

Piping

Refrigerant

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY ASSEMBLING CONDENSER TUBES

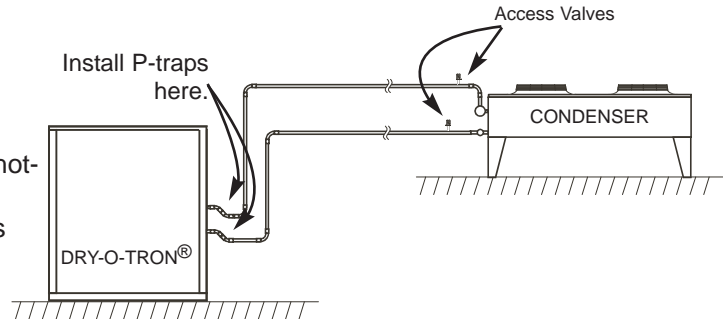
NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

Brazing requirements are discussed on a subsequent page.

Where tubes must turn upward, install a P-trap in the hot-gas tube. If the tubes turn upward at the unit, install a P-trap in each tube at the DRY-O-TRON® cabinet. This will help with oil circulation and will help prevent condensation inside the unit during cold weather.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.

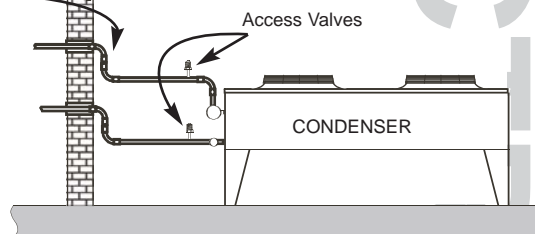


Where condenser tubes penetrate an exterior wall, an immediate drop of at least one tube width will usually suffice to prevent condensation and/or icing inside the building.

Applicable codes may have more stringent requirements, such as pipe insulation.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.



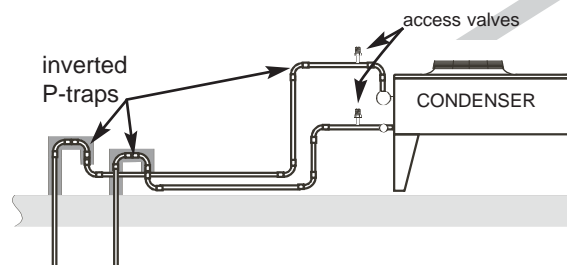
To prevent condensation or icing on vertical tubes, put P-traps on the cold side of the building surface, as near the surface as possible. It may be necessary to insulate the exposed vertical section.

Applicable codes may have more stringent requirements, such as increased pipe insulation.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.

Further piping details are discussed on following pages.



UNITS WITH AIR-COOLED AIR CONDITIONING ONLY
ASSEMBLING CONDENSER TUBES

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

PARALLEL CONDENSERS*

* **NOTE:** This applies to two separate condensers serving one refrigeration circuit. This is not the same as a two-circuit unit requiring one condenser per circuit.

NOTE: Brazing requirements are discussed on a following page.

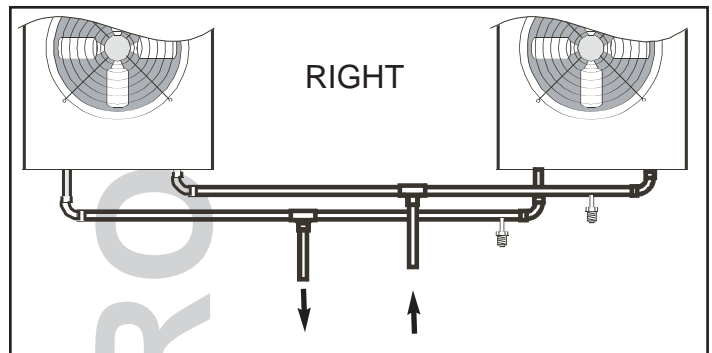
The refrigeration circuits of some units may require two condensers in parallel.

Where condensers in parallel are required, keep the piping pressure drops equal to insure even flow. Maintain minimum separation of condensers as previously stated.

See **Lifting and Locating - Select Remote Condenser Location.**

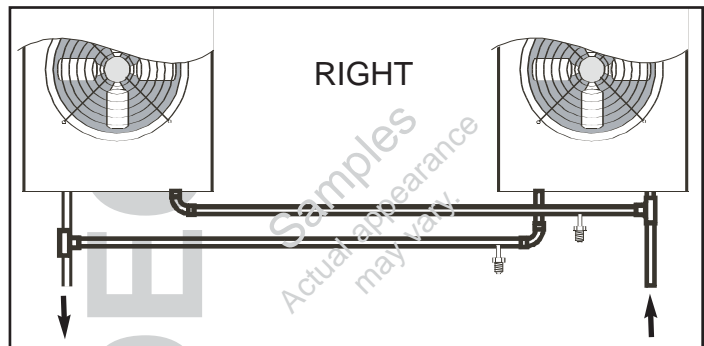
Only one set of tubes shown.

Pipe Supports (not shown) Do not allow a condenser to support extended tubes, valves, pumps, or other components. Use external supports (by others). Supports must be so arranged as to prevent torques or axial or radial forces from being applied to the condenser tube stubs. Other code requirements may also apply.

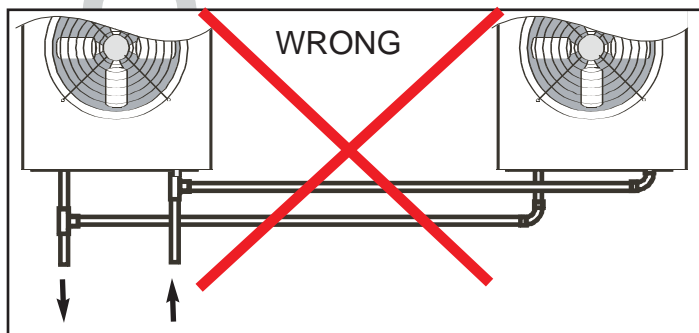


Only one set of tubes shown.

Pipe Supports (not shown) Do not allow a condenser to support extended tubes, valves, pumps, or other components. Use external supports (by others). Supports must be so arranged as to prevent torques or axial or radial forces from being applied to the condenser tube stubs. Other code requirements may also apply.



Only one set of tubes shown.
Concept applies to all tubes.



Further piping details are discussed on following pages.

INSTALLATION

Installation

Piping

Refrigerant

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY ASSEMBLING CONDENSER TUBES

NOTICE **Optional Equipment.** Where an air-cooled condenser(s) is present, follow the instructions in this manual and in all applicable codes.

BRAZING

Brazing tubes while they contain air will produce damaging copper-oxide scale inside the tube.

Before beginning to braze tubes, set up an arrangement like the one illustrated below. A small flow of shielding gas will purge the air out of the tubes, and protect them from scaling.

! DANGER

Risk of explosion. Can cause injury or death.

The shielding gas should be commercial dry nitrogen, carbon dioxide (CO₂), or other non-reactive gas. **Do not use oxygen. Do not use any fuel gas.** To prevent the build-up of pressure, remove the cores from the access valves in the condenser tubes, and limit the flow of gas. Use only enough shielding gas to force the air out of the tubes.

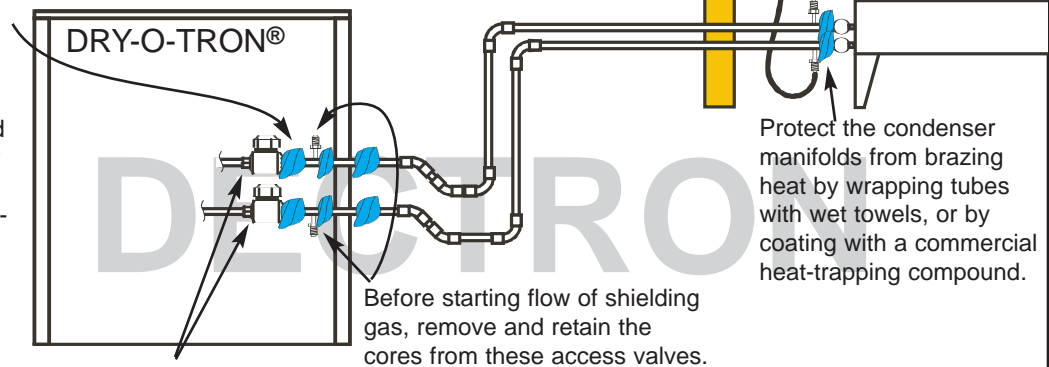
Protect the tube grommets and the internal valves from brazing heat by wrapping tubes and valves with wet towels, or by coating with a commercial heat-trapping compound.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

NOTE: Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown.

Use commercial dry nitrogen, carbon dioxide, or other dry inert gas.

**WARNING: DO NOT USE OXYGEN.
DO NOT USE ANY FUEL GAS.**



Isolation valves should remain closed.

! CAUTION

Risk of contact with hot surfaces. Can cause injury.

Joining tubes by brazing produces hot surfaces. Wear gloves, safety glasses, and other protective equipment as appropriate. Allow parts to cool before handling.

Beginning at the joints nearest the shield-gas fill point, braze the copper tube joints using an AWS¹ BCuP filler.

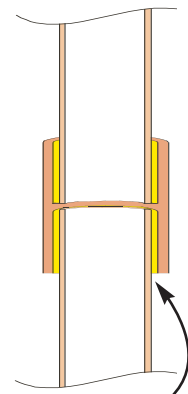
If flux must be used, use only enough flux to braze. Excess flux can contaminate the refrigeration system and damage components.

When brazing is complete, stop the flow of shield gas and replace the cores and caps of all access valves.

IMPORTANT:

Check carefully for leaks. If leak testing must be done by nitrogen-pressure decay, do not allow the nitrogen pressure to exceed the refrigerant saturation pressure or bubble-point pressure at the lowest temperature possible during the test.

1. American Welding Society
550 N.W. LeJeune Road
Miami, Florida 33126
USA
www.aws.org



Filler should penetrate entire brazing socket by capillary action.

Refrigerant Piping Installation

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY
ASSEMBLING CONDENSER TUBES

NOTICE **Optional Equipment.** Where air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

CAUTION

Risk of contact with hot surfaces. Can cause injury.

Tubes may be hot during operation. Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

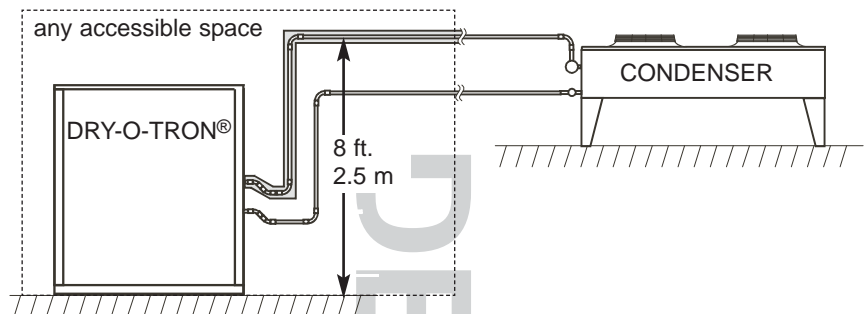
Brazing requirements are discussed on a previous page.

Tube insulation does not affect operation. However, the temperature of hot-gas tubes may exceed 180°F (82°C) during normal operation. Where accidental contact might occur, or unless otherwise exempted, hot-gas tubes should be insulated to 8 feet (2.5 m) above grade. Consult applicable codes.

Applicable codes may have more stringent requirements, and take precedence.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.

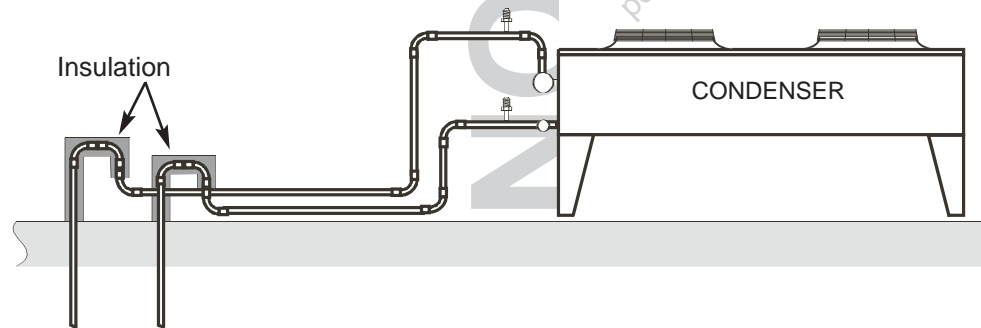


To prevent condensation or icing on refrigerant tubes that penetrate a building roof, put P-traps on the cold side of the building surface, as near the surface as possible. It may be necessary to insulate the exposed vertical section and the tops of the P-traps.

Applicable codes may have more stringent requirements, and take precedence.

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Some DRY-O-TRON® units may have several pairs of tubes to the remote condenser. Only one pair of tubes is shown here.



DRY-O-TRON®
 Samples Only
 Actual appearance may vary.
 Other tube arrangements are possible, some of which may require insulation.

INSTALLATION

Installation

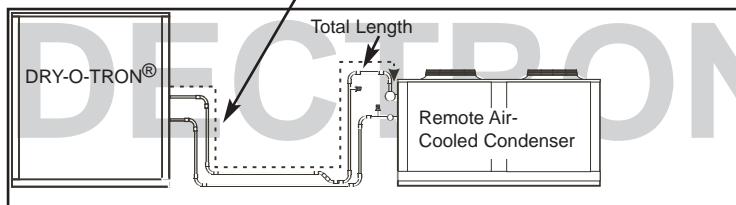
Piping

Refrigerant

Determine Refrigerant Charge to be Added Units with Air-Cooled Air Conditioning Only

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

1. Using a tape measure, measure the total one-way length of the tubes connecting the unit to the remote condenser.



2. Write the measured length into **BOX A** here and on page **Installation - Piping - Refrigerant - Oil Charging**.

BOX A

3. If the total measured length is equal to the nameplate maximum, proceed to step A4. Otherwise, proceed to step B4.



A4. If the tubes connecting the unit to a remote air-cooled condenser have the O.D. specified on the unit nameplate, proceed to step A5. Otherwise, proceed to step B4.

B4. Consult the Dectron Service Department at 1-800-667-6338.

A5. The original total system charge is labeled "TOTAL SYSTEM CHARGE".

TOTAL SYSTEM CHARGE

B5. If Dectron provides a new pre-determined oil charge, write that value here.

OIL TO BE ADDED

A6. The amount of refrigerant provided by Dectron (if any) is labeled "FACTORY CHARGE".

FACTORY CHARGE

Copy this value into OIL TO BE ADDED on third page following

A7. Subtract FACTORY CHARGE from TOTAL CHARGE, and enter the difference in ADD THIS AMOUNT.

ADD THIS AMOUNT

B6. If Dectron provides a new TOTAL SYSTEM CHARGE, enter that value above and write the new TOTAL SYSTEM CHARGE on the side of the unit, near the nameplate.

A8. Prepare to add the amount of refrigerant shown in ADD THIS AMOUNT.

B7. Subtract FACTORY CHARGE from the value in **BOX B** and enter the difference in **BOX C**.

A9. Go to next page.

B8. Prepare to add the amount of refrigerant shown in ADD THIS AMOUNT.

B9. Go to next page.

INSTALLATION

Refrigerant

Piping

Installation

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

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

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

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

- (1) Set up an arrangement like the one shown below, with vacuum pump, electronic vacuum gauge, refrigerant, and refrigerant scale, all by others.
- (2) Using core-removal adapters, (by others) temporarily remove the access-valve cores.
- (3) Evacuate the condenser and tubes.

IMPORTANT:
The remote condenser and the tubes connecting it to the DRY-O-TRON® must be evacuated to a pressure below 250 microns of mercury as measured by an electronic vacuum gauge.

Compound gauges as found on refrigeration manifolds are not adequate. Do not attempt to use a manifold compound gauge to determine evacuation pressure.

To insure a correct reading, install the electronic vacuum gauge far away from the vacuum pump.

- After proper evacuation:
- (4) Weighing the amount added, break the vacuum with as much liquid refrigerant as possible.
 - (5) Open the condenser isolation valves (2 per circuit) located inside the DRY-O-TRON®. (See next page.)

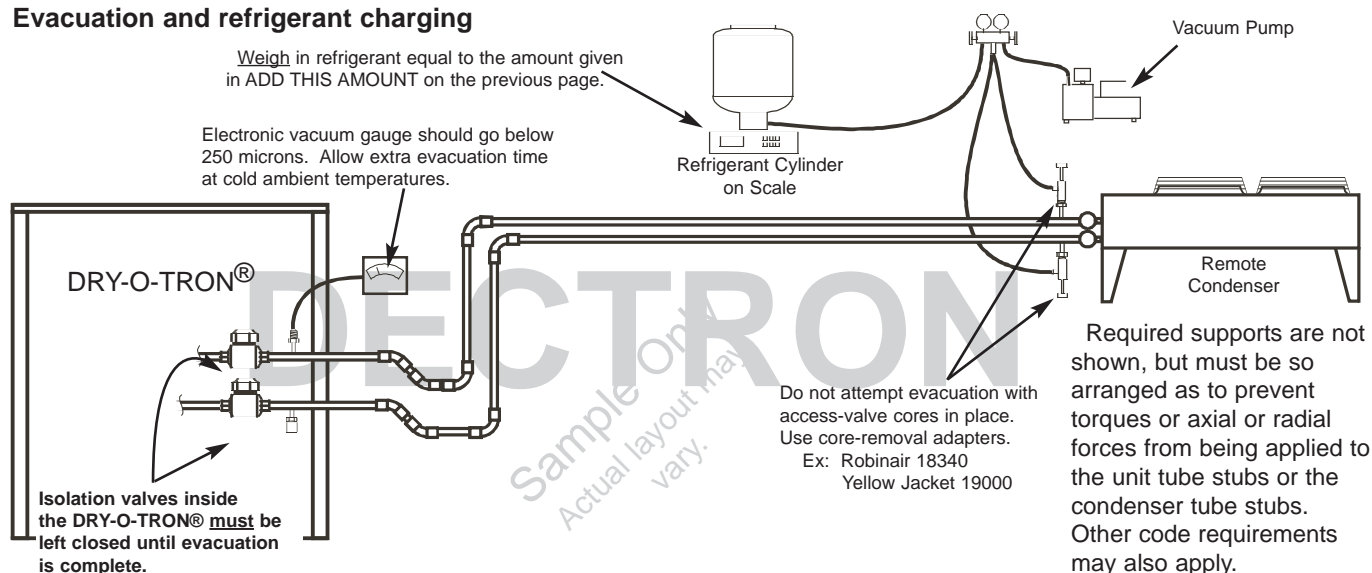
CAUTION: Once these valves have been opened, they should not be closed again unless 1 pound (500g) of refrigerant is reclaimed from the condenser and into the receiver (or the pressure is reduced below 10 PSIG (69kPa)) immediately after closing the valves.

- (6) Locate and open the refrigerant-receiver isolation valves (2 per circuit). (See next page.)

CAUTION: Once these valves have been opened, they should not be closed again unless 1/2 pound (250g) of refrigerant is reclaimed from the filter-drier and into the receiver (or the pressure is reduced below 10 PSIG (69 kPa)) immediately after closing the valves.

- (7) Pump refrigerant into the remote condenser access valves until the entire weight given in **BOX E** of the preceding page has been added. If necessary, a refrigerant pump or a refrigerant-recovery machine may help.
- (8) Replace valve cores.

Evacuation and refrigerant charging



INSTALLATION

Installation

Piping

Refrigerant

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY
OPENING ISOLATION VALVES

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

NOTE: Some units may have several pairs of tubes to be connected to the remote condenser(s). Only one pair is shown here.

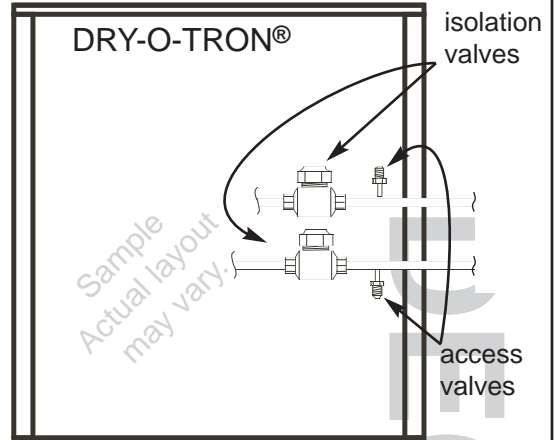
NOTE: It is important to identify the correct tubes for the circuit. Labels are applied to the cabinet to identify the tubes. Do not open the wrong valves.

NOTE: Some valves may have a tag marked "DO NOT ADJUST". Do **NOT** adjust any such valves.

To open the isolation valves, follow these steps:

1. Open the appropriate access door or panel.
2. Locate the isolation valves for the tubes. Remove the valve caps by unscrewing them. Retain the caps and seals.

NOTE: Some isolation valves may have dowel pins and stops to limit their range of movement. Where this is the case, be careful to turn the valve stem only 90° in the proper direction.



WARNING Risk of explosive depressurization. Can cause injury or death.

Once these valves have been opened, they should **not** be closed again unless 1 pound (500g) of refrigerant is reclaimed from the condenser or the pressure is reduced below 10 PSIG immediately after closing the valves.

3. Open the isolation valves by turning the valve stems 90° in the proper direction.
4. Locate the receiver(s) for the circuit.

NOTE: Some units have two or more circuits, each of which may have one or more receivers. It is important to identify the correct receiver(s).

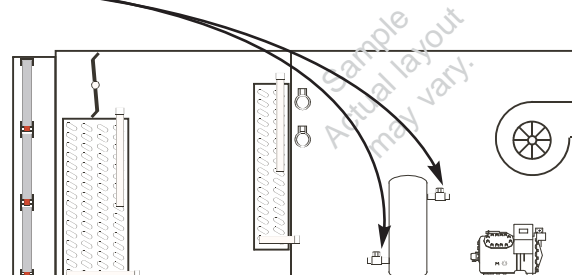
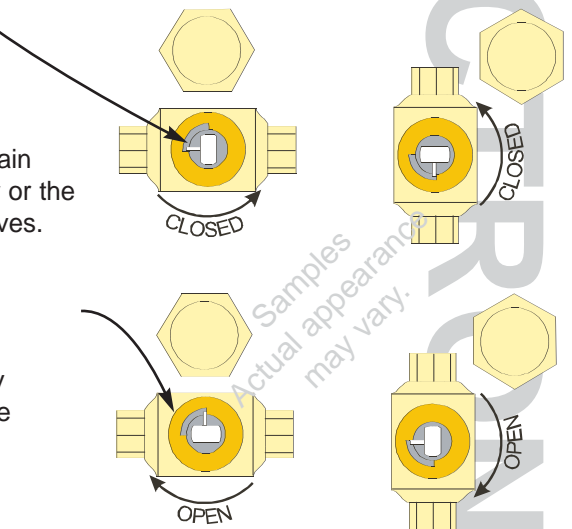
WARNING Risk of explosive depressurization. Can cause injury or death.

Once these valves have been opened, they should **not** be closed again unless 1/2 pound (250g) of refrigerant is reclaimed from the filter-drier or the pressure is reduced below 10 PSIG immediately after closing the valves.

5. Open the receiver-inlet and receiver-outlet valves, as shown in step 3.

CAUTION: Once these valves have been opened, they should **not** be closed again unless 1/2 pound (250g) of refrigerant is reclaimed from the filter-drier or the pressure is reduced below 10 PSIG immediately after closing the valves.

The refrigeration circuit is now open to the remote condenser.



INSTALLATION

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

Refrigerant

Piping

Installation

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY ADDING PRE-DETERMINED AMOUNT OF OIL

NOTE: If a pre-determined amount of oil was not specified by Dectron, skip this page.

NOTICE **Optional Equipment.** Where an air-cooled condenser is present, follow the instructions in this manual and in all applicable codes.

WARNING

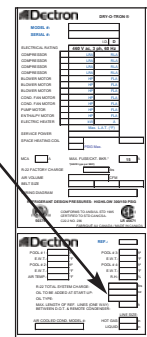
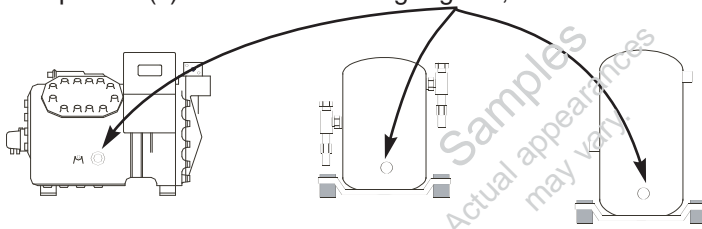


Risk of flying liquids, gases, particles. Can cause eye injury.

This task may involve risk of exposure to flying materials which can cause eye injury. Always wear protective safety glasses or goggles, as appropriate.

Examine the compressor(s).

If the compressor(s) has an oil-level sight glass, then there will be no pre-determined amount of oil to add at startup.

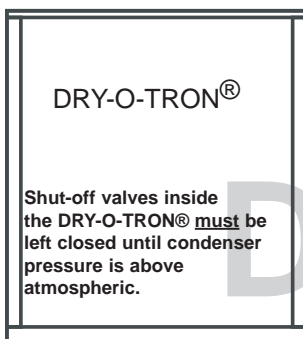


In this case, skip to next page.

If the compressor(s) does **not** have an oil-level sight glass, then the unit nameplate will have a predetermined amount of oil to add at startup. Copy that amount into the box at right.

OIL TO BE ADDED

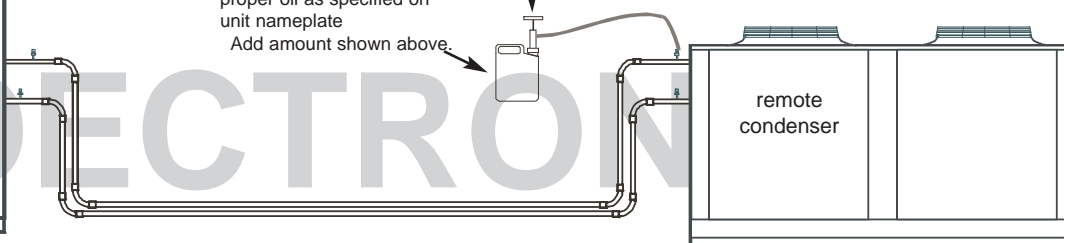
INSTALLATION



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

oil pump
Ex: Robinair 14388
Nu-Calgon 4814-0

proper oil as specified on unit nameplate
Add amount shown above.



Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Installation Refrigerant-Piping Checklist

All refrigerant joints, both factory- and field-installed, have been checked for leaks. Examples include, but are not limited to unions, flanges, threaded connections, braze and solder joints, etc.

your initials

NOTICE Optional Equipment. Where an air-cooled condenser is present, inspect and verify these conditions. Leave a copy of the checklist with the unit.

All pipes and tubes (by others) are arranged so as not to block service access to the unit.

your initials

During brazing, the interiors of refrigerant tubes were protected by flooding with an inert gas.

your initials

For units with air-cooled air conditioning, any specified amount of oil has been added.

your initials

For units with air-cooled air conditioning, the maximum external tube length specified on the unit nameplate has not been exceeded.

your initials

During brazing, valves were protected from overheating by wrapping with wet towels or by other means.

your initials

For units with air-cooled air conditioning, the tube sizes specified on the unit nameplate were used to connect the unit to the remote condenser.

your initials

During brazing, adequate heat was applied to allow the brazing filler to penetrate all joints completely.

your initials

For units with air-cooled air conditioning, the remote condenser is not located below the DRY-O-TRON®, unless Dectron has been consulted.

your initials

For units with air-cooled air conditioning, the hot-gas tube(s) have been insulated as appropriate to prevent accidental contact.

your initials

P-traps have been provided (by others) at the specified locations.

your initials

For units with air cooled air conditioning, the remote condenser and the connecting tubes were evacuated to a pressure below 250 microns of mercury, as measured by an electronic micron-level vacuum gauge.

your initials

All refrigerant tubes (by others) have been sloped downward in the direction of flow.

your initials

For units with air-cooled air conditioning, the condenser isolation valves have been opened.

your initials

All refrigerant tubes (by others) are supported (by others) so as not to apply any torque or radial or axial loads on the DRY-O-TRON® or on the remote condenser, if any.

your initials

For units with air-cooled air conditioning, the correct amount and type of refrigerant has been added.

your initials

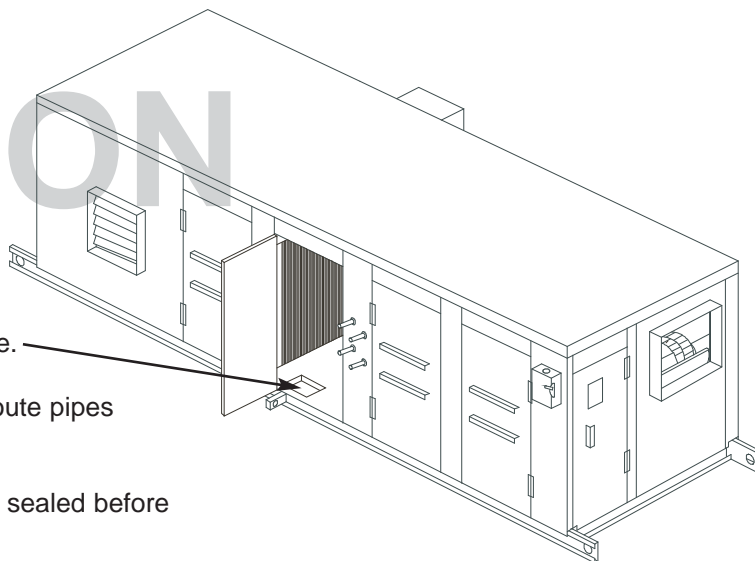
Where refrigerant tubes penetrate a building surface, sloping or drops have been provided to prevent condensation or icing inside the building.

your initials

Date: _____
Model No. _____
Serial No. _____
Ref. No. _____
Name _____
Tel. _____

INSTALLATION

DECTRON



Some units may be equipped with a pipe chase.

Where this is the case, it may be possible to route pipes through the chase into the building.

IMPORTANT! Pipe chases must be closed and sealed before installation is complete.

IMPORTANT! In some cases, pipe chases may be subject to fire-stopping requirements. Consult local codes and the local code-enforcement authority.

INSTALLATION

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INSTALLATION

Water- or Fluid-Cooled A/C Piping Installation

UNITS WITH WATER-COOLED OR FLUID-COOLED AIR CONDITIONING ONLY FLOW-SWITCH INSTALLATION

NOTICE **Optional Equipment.** Where the unit has water-cooled air conditioning, follow the instructions in this manual and in all applicable codes.

NOTE: Some units may be provided with a DryCooler. In this case, refer to Appendix M1.

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 Flow Switch
The flow switch (see field wiring diagram) must be installed. See details below and on following pages.
NOTE: The maximum fluid pressure should not exceed 140 PSI (0.98 MPa).
NOTE: Refer to information shipped with flow switch.

INSTALLATION

Pre-Assembly of Flow Switch

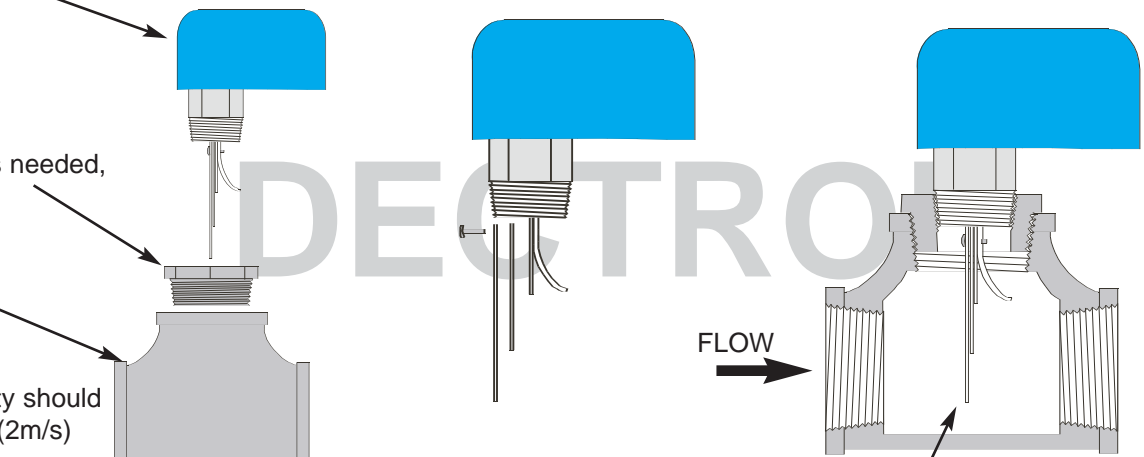
Flow switch (supplied by Dectron, may require installation by others)

Bushing, as needed, by others

Pipe Tee, by others

Flow velocity should be 6.5 ft/s (2m/s) or less.

Flow switch has three paddles, two of which can be removed, as needed, for proper fit in pipe tee.



Bottom of flow-switch paddle must have adequate clearance for smooth operation.

Installation Piping Water- or Fluid-Cooled A/C

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

NOTICE **Optional Equipment.** Where the unit has water-cooled air conditioning, follow the instructions in this manual and in all applicable codes.

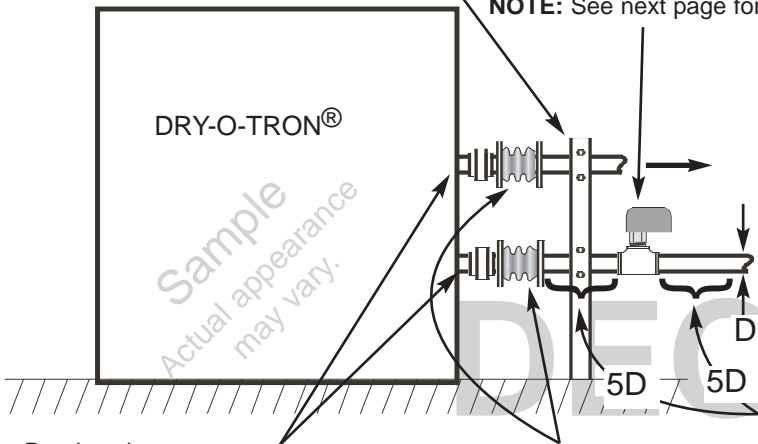
All tubes, pipes, conduits, etc., must be separately supported by others. Supports must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Water-flow switch (supplied by Dectron, installed by others) screws 1/2" (12 cm) into a pipe tee (by others).
NOTE: The switch may be factory installed, in which case no installation is needed.
NOTE: Pipe locations may vary. See labels on unit.
NOTE: Directional arrow on flowswitch body must correspond to direction of flow.
NOTE: When testing for leaks, do not apply more than 140 PSI to the flow switch.
NOTE: See next page for pressure drops and required flow rates.

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

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

The minimum straight length on each side of the flow switch is 5 times the pipe diameter.



Port locations may vary. See the unit port labels:
 WATER IN
 WATER OUT

Install flexible connectors to prevent the application of torques or axial loads to the DRY-O-TRON® connections.

INSTALLATION

NOTE: See next page for required flows.

NOTE: Installing the flow switch in a pipe that is not horizontal may change the expected set point ranges.

NOTE: Installing the flow switch other than paddles-down may change the expected set-point ranges.

Pipe NPT	Paddle	Min. Adjust.		Max. Adjust.		Max. Flow	
		GPM	L/min	GPM	L/min	GPM	L/min
1"	1	4.8	18	11.9	45	19	72
1¼	1	44	43	26	100	31	120
1½	1	17	63	35	135	43	163
2	1+2	13	50	39	150	69	264
	1	40	151	58	220	69	264
2½	1+2	28	105	93	355	114	432
	1	94	356	95	360	114	432
3	1+2+3	27	100	59	225	161	612
	1+2	60	226	127	480	161	612
	1	127	481	134	510	161	612
4	1+2+3	53	200	101	385	276	1044
	1+2	102	386	216	820	276	1044
	1	217	821	230	870	276	1044
5	1+2+3	93	350	157	594	426	1613
	1+2	157	595	334	1265	426	1613
	1	334	1266	355	1342	426	1613
6	1+2+3	140	530	221	836	599	2268
	1+2	221	837	470	1780	599	2268
	1	471	1781	499	1890	599	2268

Data subject to change without notice.

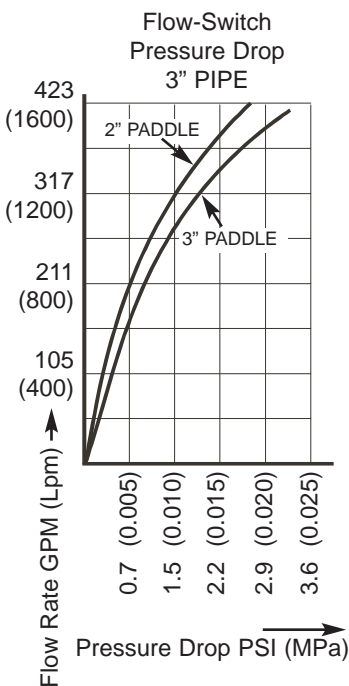
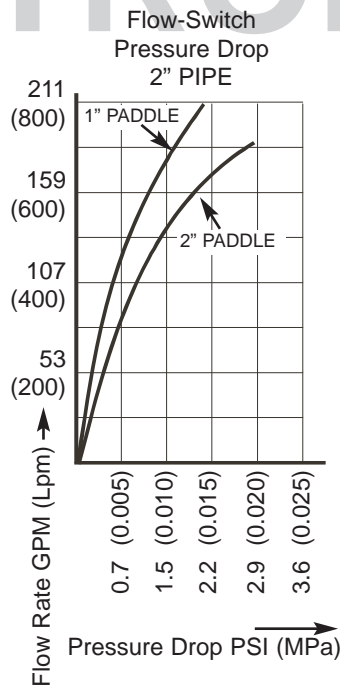
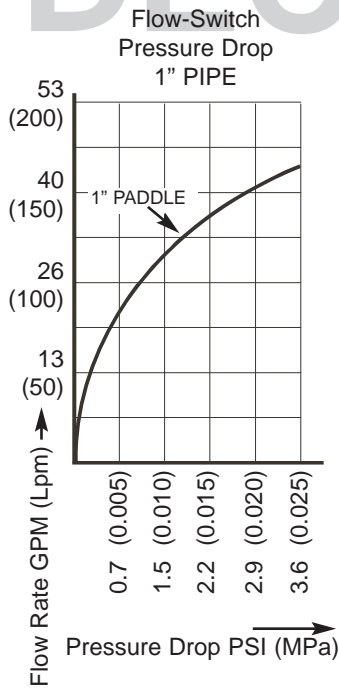
Water- or Fluid-Cooled A/C

Piping

Installation

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

NOTICE **Optional Equipment.** Where the unit has water-cooled air conditioning, follow the instructions in this manual and in all applicable codes.



CONDENSER-WATER FLOW (water-cooled air-conditioning units only)

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

DryCooler FLUID FLOW (DryCooler-option only)

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

Other requirements apply. Refer to Appendix M1.

Unit Size	Flow GPM (Lpm) Water @ 90°F (32°C)	Unit Size	Flow GPM (Lpm) 50% Eth. Glycol Solution @ 110°F (43°C)
010	6 (23)	010	8 (30)
015	6 (23)	015	10 (38)
020	8.5 (32)	020	14 (53)
030	15 (57)	030	20 (76)
040	20 (76)	040	28 (106)
042	17 (64)	042	28 (106)
050	20 (76)	050	36 (136)
060	30 (114)	060	45 (170)
062	30 (114)	062	40 (151)
080	40 (151)	080	54 (204)
082	40 (151)	082	56 (212)
100	40 (151)	100	73 (276)
102	40 (151)	102	73 (276)
120	60 (227)	120	94 (356)
122	60 (227)	122	94 (356)
150	60 (227)	150	107 (405)
152	80 (303)	152	107 (405)
162	80 (303)	162	127 (481)
182	80 (303)	182	145 (549)
202	100 (379)	202	160 (606)
242	120 (454)	242	178 (674)
282	140 (530)	282	210 (795)
362	140 (530)	362	276 (1045)
482	240 (909)	482	375 (1420)
562	280 (1060)	562	437 (1654)

INSTALLATION

Installation

Piping

Heating

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

NOTICE **Optional Equipment.** Where the unit has water-cooled air conditioning, follow the instructions in this manual and in all applicable codes.

NOTE: Unless otherwise noted, rated heating capacity with hot-water or glycol heat exchangers requires the fluid temperature to be between 160°F (71°C) and 180°F (82°C). Flow rates should be within of the amount specified in the unit submittal.

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

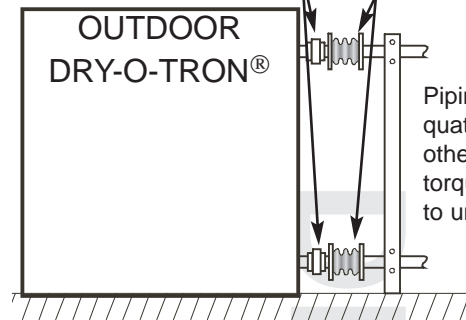
All tubes, pipes, conduits, etc., must be separately supported by others. Supports must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

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 brazed, the inside of the tube must be protected from oxidation during brazing by flooding the tube with an inert gas such as nitrogen, argon, or carbon dioxide.

Connections to Heating Fluid System (by others)
Port locations may vary. See the unit labels.
Flexible Connectors



Piping must be adequately supported (by others). Do not apply torques or axial loads to unit pipes

INSTALLATION

! DANGER

Risk of explosion. Can cause injury or death.

The shielding gas should be commercial dry nitrogen, carbon dioxide (CO₂), or other non-reactive gas. **Do not use oxygen. Do not use any fuel gas.**

! CAUTION

Risk of contact with hot surfaces. Can cause injury.

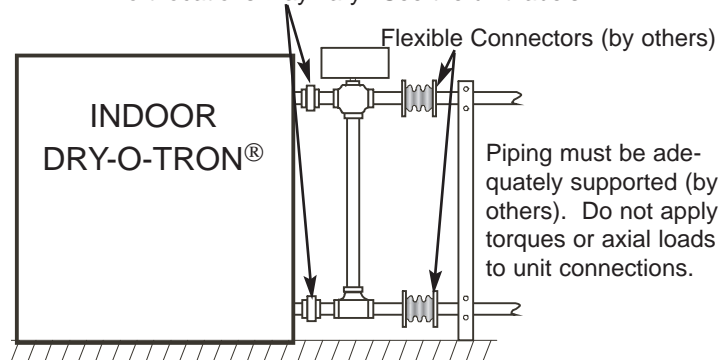
Joining tubes by brazing produces hot surfaces. Wear gloves, safety glasses, and other protective equipment as appropriate. Allow parts to cool before handling.

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.

Connections to heating fluid system (by others)
Port locations may vary. See the unit labels.



Piping must be adequately supported (by others). Do not apply torques or axial loads to unit connections.

Condensate Drain

Piping

Installation

NOTICE Risk of leaking water. Can cause property damage.

This product requires a free-flowing drain. Product operates year-round. Freezing or other abnormal conditions could cause leakage or overflow.

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 internal P-traps that are factory-installed.

For long runs or possible unintentional traps, a vent 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 non-freezing point. Where installed for a natatorium, condensate may be returned to the pool for water savings, or it may be sent to a drain. Check local codes for allowable procedures. Expect many gallons of water per hour, year-round.

Δ Pipe Support

All tubes, pipes, conduits, etc., must be separately supported by others. Do not apply a torque or axial load to the unit tube stubs.

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 blowers. 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. Bottom-drain arrangements may have to be made before the unit is placed.

NOTE: Units with the SmartSaver® heat-recovery option may have more than one condensate drain. Refer to Appendix M3.

NOTE: Units with the gas furnace option may have more than one condensate drain. Refer to appendices H2 or H9.

NOTE: The unit can be expected to operate year-round. Depending on conditions, bottom drains may have to be protected against freezing.

NOTE: Any required drain vents may not be shown here.

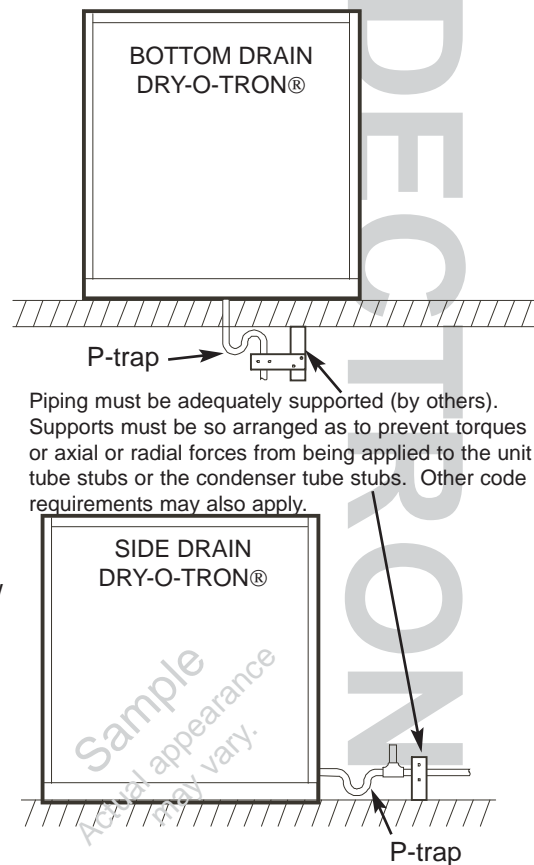
Some DRY-O-TRON® units have side condensate drains. Use the same pipe materials and methods used for bottom condensate drains.

NOTE: Since the unit operates year-round, side drains on outdoor units must be protected against freezing where freezing is possible. This may require heat-tracing and insulation. Condensate must be delivered to a non-freezing point.

NOTE: For locations that may experience outdoor temperatures below freezing, select a non-freezing point of discharge for condensate since the unit operates year round. Even the smallest units will release hundreds of pounds of condensate per day.

Where outdoor temperatures below freezing may occur, releasing condensate onto a roof is not recommended.

NOTE: Any required drain vents may not be shown here.



INSTALLATION

Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Piping

Pool Water

IMPORTANT!

The pool-water heater in the DRY-O-TRON® unit can only function properly when the specified water flow is assured.

The size of the supply and return water pipes must be at least the same as the connection size on the DRY-O-TRON®. Selection of pumps and other components is by others.

As a general rule, piping going to and from the DRY-O-TRON® should be kept at least 2 to 3 inches apart to prevent heat transfer between the lines.

Supports:

Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

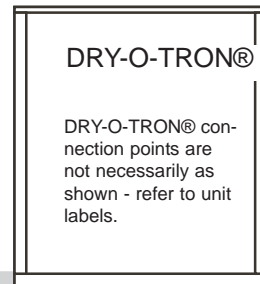
Materials:

The pool water leaving the DRY-O-TRON® never exceeds 120 °F, which allows the use of non-metallic piping (Sch. 40 CPVC is recommended where allowed). Cast iron, carbon steel, galvanized steel and standard PVC pipe are not recommended for heated pool water service.

Salt-water pools -

- Δ Contact Dectron before retrofitting an existing unit to salt water.
- Δ Contact Dectron before exceeding 3000 ppm salt concentration.
- Δ Use suitable plastic pipe only. Do not use copper tube, iron pipe, etc.
- Δ Maintain proper flow rates.

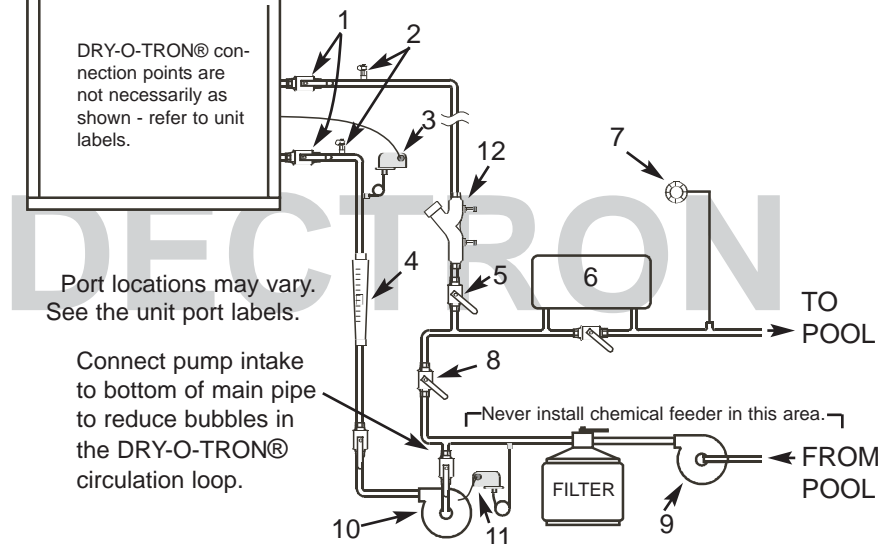
1. **Pool water isolation valves**
2. **Pressure / temperature ports** (by others) are ideal for measuring the pressure drop across the DRY-O-TRON®.
3. **Pool water pressure switch** (may be factory installed) detects the presence of pool water flow.
4. **Pool water flow meter** (by others) is ideal for setting the pool-water flow rate. Either a flow meter or a balancing valve (12) is required.



Port locations may vary. See the unit port labels.

Connect pump intake to bottom of main pipe to reduce bubbles in the DRY-O-TRON® circulation loop.

Also see Installation - Component Overview.



All models have 6 PSI (or less) water pressure drop. For flow rates see **Startup - Pre-startup Adjustments**.

5. **Throttling ball valve** (by others) (A balancing valve (12) is preferred.) (Throttling valve (5) is not needed if balancing valve (12) is used.)
 - should be installed in the lowest point of the water return line
 - is used to adjust the water flow
6. **Auxiliary pool water heater** (optional or by others), **controlled by the DRY-O-TRON®**. This must be installed downstream of the DRY-O-TRON®.
7. **Chemical feeder** (by others) The chemical injection point must be downstream of all other equipment to prevent corrosion and equipment deterioration. **The injection point must be downstream of the DRY-O-TRON®.**
8. **Bypass valve** (by others) It is strongly suggested that the secondary circulating pump (10) be installed. If it is not installed, it may be possible to throttle the bypass valve (8) to force water through the DRY-O-TRON®.
9. **MAIN FILTER PUMP** (by others) This pump may be sized for filtration and sanitation only. **Caution: The secondary circulation pump (10) is required if the main filter pump cannot supply**

the additional pressure and flow for the DRY-O-TRON®.

Some main filter pumps may be controlled by timers. In this case, consult Dectron for a suggested piping modification.

10. **Secondary circulating pump** (by others) Select this pump for
 - compatibility with pool water
 - ability to deliver the DRY-O-TRON® flow rate against the elevation of the DRY-O-TRON® above the pool surface, and the total pressure drop (PD), including pressure drop of the DRY-O-TRON® heat exchanger, external piping, valves, etc.
11. **Pressure switch** (by others) stops secondary pump during filter backwashing.
12. **Water balancing valve** (by others) is used to set the pool-water flow rate. Balancing valve is required if no flow meter is used.

Pool Water

Piping

Installation

Units must have a constant pool-water flow rate within $\pm 10\%$ of the values below. Either a flowmeter (by others) or a balancing valve (by others) is required to set the pool-water flow correctly.

Unit Size	Standard Pool-Water Flows GPM (Lpm)	
	without built-in auxiliary pool heater	with built-in auxiliary pool heater
	010	6 (23)
015	6 (23)	12 (46)
020	6 (23)	12 (46)
030	8.5 (32)	17 (64)
040	9.5 (36)	19 (72)
042	12 (45)	24 (90)
050	15 (57)	30 (114)
060	20 (76)	40 (151)
062	17 (64)	34 (129)
080	20 (76)	40 (151)
082	17 (64)	34 (129)
100	20 (76)	40 (151)
102	26 (98)	52 (197)
120	20 (76)	40 (151)
122	30 (114)	60 (227)
150	40 (151)	80 (303)
152	40 (151)	80 (303)
162	40 (151)	80 (303)
164	34 (129)	68 (257)
182	40 (151)	80 (303)
184	52 (197)	104 (394)
202	40 (151)	80 (303)
204	52 (197)	104 (394)
242	60 (227)	120 (454)
244	60 (227)	120 (454)
282	80 (303)	160 (606)
284	80 (303)	160 (606)
362	80 (303)	160 (606)
364	80 (303)	160 (606)
368	104 (394)	208 (787)
402	120 (454)	240 (909)
404	120 (454)	240 (909)
408	120 (454)	240 (909)
482	120 (454)	240 (909)
484	104 (394)	208 (787)
488	120 (454)	240 (909)
562	160 (606)	320 (1211)
564	160 (606)	320 (1211)
568	160 (606)	320 (1211)
804	240 (909)	480 (1817)
808	240 (909)	480 (1817)

NOTE: Unit-specific flow rates take precedence.

INSTALLATION

Data subject to change without notice.

Installation

Piping

Pool Water

NOTICE Risk of leaking water. Can cause property damage.

Application of this product involves water circulating under pressure. Follow the instructions in this manual and those in all applicable codes.

Units With Rubber-Hose Water Connections

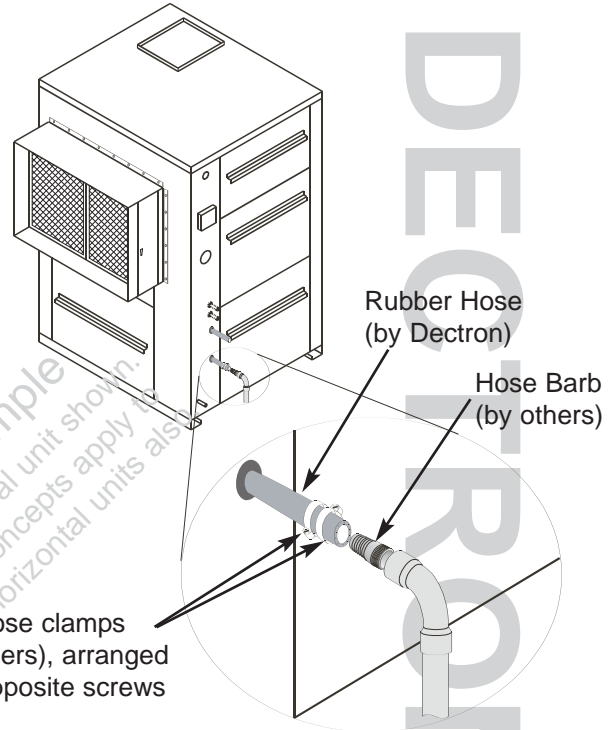
Some units may be equipped with rubber hoses for connection to the pool-water circulation system. See previous page.

Where this is the case, adapt the hose to the piping with a suitably sized hose barb (by others) fully inserted into the hose. Hose barbs should be plastic or other material suitable for pool-water.

Clamp the hose to the barb with two hose clamps, with the adjustment screws on opposite sides of the hose. See illustration at right.

NOTE: Illustration is for one pipe. Two pipes are required for each pool connected.

Route all piping so as not to interfere with service access to the unit. Do not block access panels.



Units With Plastic Water Connections

Some units may be equipped with plastic pipe stubs for connection to the pool-water circulation system.

Where this is the case, connect as usual for that type of pipe. Include a union and a flexible joint as described on the next page.

Route all piping so as not to interfere with service access to the unit. Do not block access panels.

INSTALLATION

Pool Water

Piping

Installation

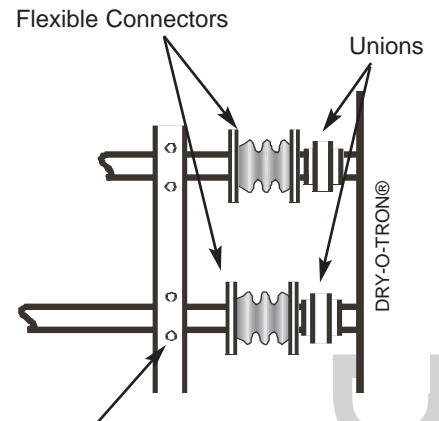
NOTICE Risk of leaking water. Can cause property damage. Application of this product involves water circulating under pressure. Follow the instructions in this manual and those in all applicable codes.

Supports:

All tubes, pipes, conduits, etc., must be separately supported by others. Required supports are not shown, but must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

Where rigid pipe is used, use a flexible connector to prevent the application of torques to the unit's pipe stubs.

NOTE: Units with rubber-hose connections (by Dectron) do not require flexible connectors or unions. Piping support (by others) is required.



Piping must be adequately supported (by others). Do not apply torques or axial loads to unit pipes

Some units may have pool-water pressure switches factory-mounted inside the cabinet. Where this is the case, the only requirement is adjustment, which is discussed in the Startup section of this manual.

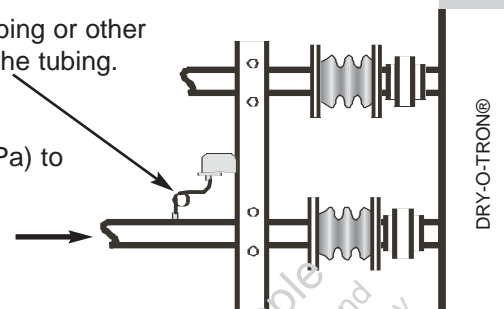
For other units, the pressure switch(es) may ship separately. Where this is the case, the pressure switch must be mounted, piped, and wired.



Follow the mounting instructions included with the pressure switch. To minimize vibration on the switch, mount the bracket to a suitable surface. Note that the bracket can be turned as needed.

Pipe the pressure switch to the pool-water inlet pipe, using plastic tubing or other material suitable for use with pool water. Leave an un-kinked loop in the tubing.

When checking for leaks, do not apply more than 150 PSIG (1034 kPa) to the pressure switch.



Sample Locations and appearance may vary.

INSTALLATION

Installation Water / Fluid Piping Checklist

A copy of this checklist should be left with the unit.

Confirm that the tightness of all mechanical water/fluid joints, both factory- and field-installed, have been checked.

your initials

Confirm that all water/fluid joints and connections have been checked for leaks.

your initials

Confirm that all pipes connected to the DRY-O-TRON®, remote condenser, or remote DryCooler are properly supported near the units.

Supports and flexible joints must be so arranged as to prevent torques or axial or radial forces from being applied to the unit tube stubs or the condenser tube stubs. Other code requirements may also apply.

your initials

For units with water-cooled or fluid-cooled air conditioning, exclusive of units with the optional DryCooler,

a) confirm that the flowswitch (supplied by Dectron, installed by others) has been properly installed.

your initials

b) confirm that the tubes have been properly installed and supported so as not to apply a torque or axial load to the unit tube stubs.

your initials

c) confirm that the pipes, tubes, pumps, expansion tanks, etc., are sized to provide the specified temperature and flow rate.

your initials

For indoor units with hot-water, hot-glycol, or steam heating coils internal to the unit,

a) confirm that the heating diverting valve has been properly installed.

your initials

b) confirm that adequate piping supports and flexible joints have been provided (by others) to prevent the application of any torque or axial loads to the unit connections.

your initials

c) confirm that any pipes, tubes, pumps, expansion tanks, etc. (by others) are sized to provide the specified temperature and flow rate.

your initials

For units with the optional SmartSaver feature, confirm that any required condensate drain for the SmartSaver has been provided. (See Appendix M3.)

your initials

Regarding condensate drains -

a) confirm that the condensate P-trap is installed and filled with water.

your initials

b) confirm that the condensate pipe slopes downward away from the unit at least 1/4" per foot of run.

your initials

c) confirm that condensate will be delivered to an appropriate non-freezing location.

your initials

For outdoor units with side drains, and for other units as needed, confirm that the condensate drain pipe is protected from freezing temperatures, and/or reliably heat-traced as necessary.

your initials

For sites requiring a condensate pump, confirm that the pump will handle the expected amount of condensate.

your initials

For units with pool-water connections,

a) confirm that any automatic chemical feeder is not upstream of the DRY-O-TRON®.

your initials

b) confirm that any auxiliary pool-water heater is not upstream of the DRY-O-TRON®.

your initials

c) confirm that the pipe supplying pool water to the unit emerges from the bottom of the circulating-loop pipe.

your initials

d) confirm that isolation valves have been provided in the pool-water piping.

your initials

e) confirm that a single-purpose valve has been provided to set the pool-water flow rate.

your initials

f) confirm that adequate piping supports and flexible joints have been provided (by others) to prevent the application of any torque or axial loads to the unit connections.

your initials

g) confirm that adequate pool-water flow will be available for the DRY-O-TRON®. A booster pump may be required.

your initials

h) confirm that the pool-water pressure switch has been mounted and piped (may be unit mounted).

your initials

For units with options covered by listed appendices, confirm that the piping requirements found in those appendices have been accomplished.

your initials

Date: _____
Model No. _____
Serial No. _____
Ref. No. _____
Name _____
Tel. _____

INSTALLATION

General

Wiring

Installation

! WARNING

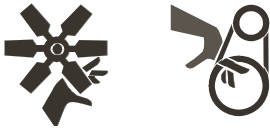


Risk of electric shock. Can cause injury or death.

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller **does not disconnect** electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

! WARNING



Risk of falling. Can cause injury or death.

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

! CAUTION

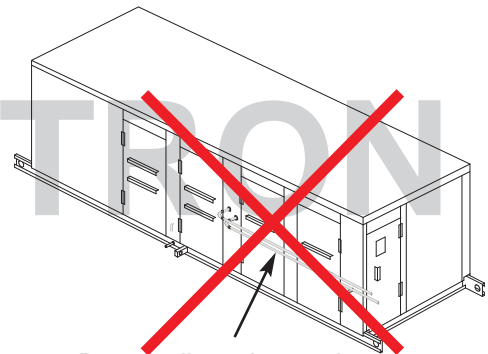
Risk of contact with sharp edges, flying chips. Can cause injury.

Drilling and cutting of cabinets and conduits can produce flying chips and sharp edges. Wear gloves, safety glasses, and other protective equipment as appropriate. Debur sharp edges after cutting.

Required Clearances

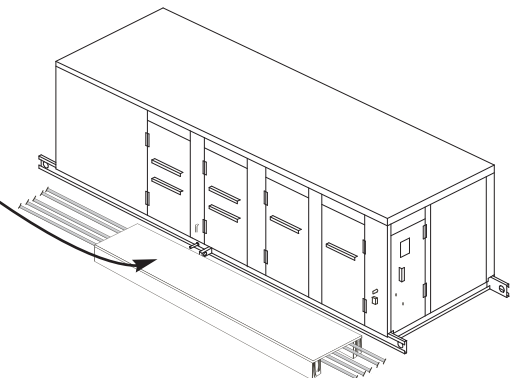
Ducts, pipes, tubes, conduits, etc., must be arranged not to obstruct access to the unit or to its internal parts. All doors and/or panels must be accessible and must be able to open to at least 90°. The minimum working clearances must be maintained. (See section **Lifting & Locating - Select Air Handler Location.**)

Unless specified for single-side access, there are access doors and/or panels on all sides.



Do not allow pipes, tubes, conduits, etc., to obstruct access panels or doors.

Pipes, conduits, etc., should not be routed along the floor near a unit. Where this must be done, construct a working platform (by others) to allow access without damage.



INSTALLATION

Installation

Wiring

General

NOTICE Optional Equipment.

Where options include those listed below, refer to the stated manual appendix for proper installation procedures.

Optional equipment may have special wiring requirements.

If your unit is equipped with the optional Modbus communications feature, refer to [Dectron OM Appendix C1 - Modbus](#).

If your unit is equipped with the optional BACnet PTP communications feature, refer to [Dectron OM Appendix C2 - BACnet PTP](#).

If your unit is equipped with the optional LONtalk® FTT-10A communications feature, refer to [Dectron OM Appendix C3 - LONtalk](#).

If your unit is equipped with the optional Man-Machine Interface feature, refer to [Dectron OM Appendix C5 - MMI](#).

If your unit is equipped with the optional http, BACnet Ethernet, or BACnet IP communications features, refer to [Dectron OM Appendix C6 - LANLink2](#).

If your units are equipped for optional group operation via shared sensors, refer to [Dectron OM Appendix C7 - Shared Sensor Adapter](#).

If your unit is equipped with the optional Heatco gas furnace, refer to [Dectron OM Appendix H2 - HTCO Furnace](#).

If your unit is equipped with the optional TEGA gas furnace, refer to [Dectron OM Appendix H9 - TEGA Furnace](#).

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 122-322), refer to [Dectron OM Appendix H6 - Raypak 1000.53E HiDelta Boilers 122-322](#).

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 302B - 902B), refer to [Dectron OM Appendix H7 - Raypak 1000.501C HiDelta Boilers 302B-902B](#).

If your unit is equipped with an optional Raypak Hi-Delta gas boiler (models 992B-2342B), refer to [Dectron OM Appendix H8 - Raypak 1000.511B HiDelta boilers 992B-2342B](#).

If your unit is equipped with the optional DryCooler feature, refer to [Dectron OM Appendix M1 - DryCooler](#).

If your unit has the optional SmartSaver® feature, refer to [Dectron OM Appendix M3 - SmartSaver](#).

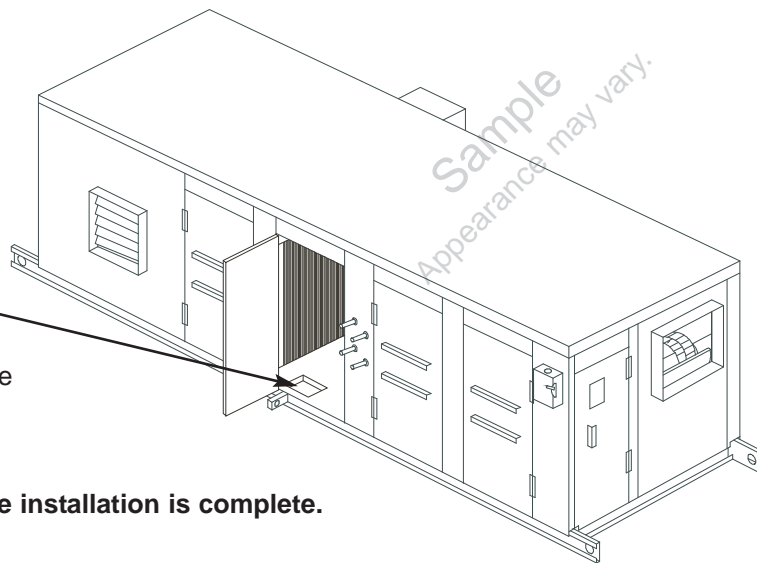
If your unit has the optional Economizer feature, refer to [Dectron OM Appendix M5 - Economizer](#).

If your unit has the optional Purge feature, refer to [Dectron OM Appendix M6 - Purge](#).

General

Wiring

Installation



Some units may be equipped with a pipe chase.

Where this is the case, it may be possible to route conduits through the chase into the building.

IMPORTANT!

Pipe chases must be closed and sealed before installation is complete.

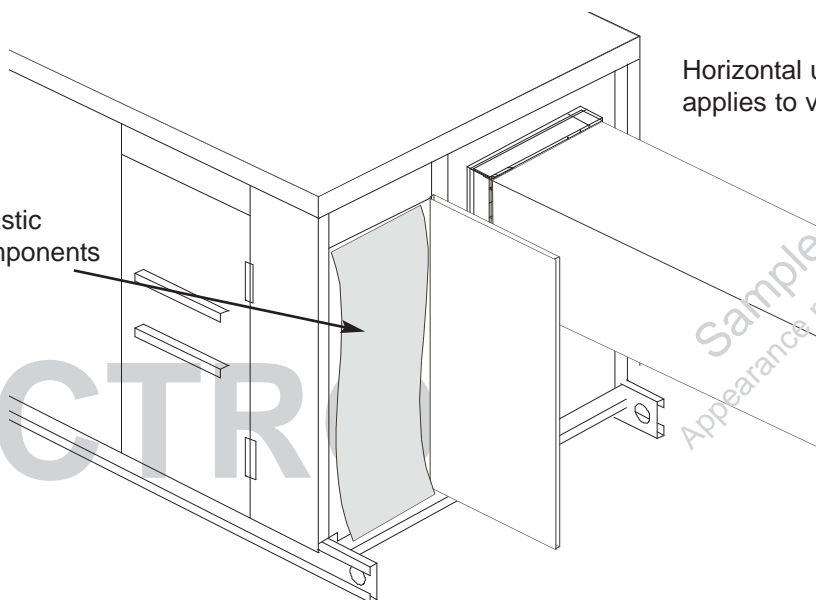
IMPORTANT!

Temporarily cover all control components in the electrical enclosure with paper or plastic sheet before drilling or sawing the enclosure. Tape the sheet carefully at the top.

Failure to install this temporary cover could allow metal chips to enter electrical components, resulting in failure.

IMPORTANT!

Remove the temporary cover before applying electric power.



Horizontal unit shown. Concept applies to vertical units also.

temporary paper or plastic cover for electrical components

DECTRON

Installation

Wiring

Power

! WARNING**Risk of stray voltage.**

Ground the unit using the grounding lug provided.

For natatorium usage, ground to the same grounding system used for other electrical devices associated with the circulation of pool water.

For natatorium usage, system bonding may also be required. Consult local codes.

NOTICE Risk of insulation failure. Risk of conduit damage.

Seal all conduits attached to dehumidifiers. Failure to do so could allow water to build up inside conduits. Failure to do so could allow the transport of corrosive agents through conduits.

NOTICE Risk of overheating electrical connections.

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.

NOTICE Risk of overheating motors.

The unit complies with NEMA MG-1 and other standards for applied voltage. The applied average voltage should be within $\pm 10\%$ of the nameplate voltage. See ANSI C84.1. Phase voltages must be balanced within 2%.

NOTICE Risk of incorrect control voltage for 208V units.

For 208/230V units, a minimum of 187V is required for compressor starting at locked-rotor current (see NEMA MG-1).

The motors of a 230V unit are designed to run on 208V also. Some units may require that the 208V primary tap on the control transformer be connected and the 230V tap be disconnected and insulated. Some units may require a 208V transformer. See the wiring diagram for the unit.

NOTICE Risk of failure to start.

Use properly sized wire. Refer to the unit nameplate for electrical ratings. Select minimum wire sizes according to applicable codes, with allowance for voltage drops. **Unit terminal voltage should be within $\pm 10\%$ of nameplate value under all conditions, including compressor starting.**

NOTICE Risk of compressor damage. Risk of failure to start.

(three-phase units only)

Insure the proper 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.

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.

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

Power

Wiring

Installation

WARNING



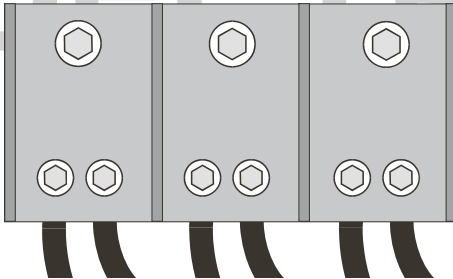
Risk of electric shock. Can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

Connect input power here.

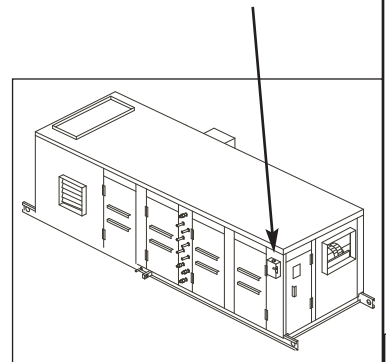
Use copper wire only. Torque all connectors per NEC 110-14, UL486A, or relevant code.

Conduit seals are required. See previous notes.



3Φ shown. 1Φ will have two lugs only.

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



After power wiring is complete, and when safe to do so, turn on the branch-circuit disconnect switch. In some cases the blower may start.

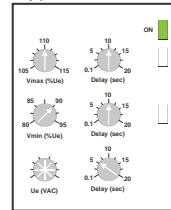
Some DRY-O-TRON® units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase sequence.

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. (See subsequent page.) Correct as necessary.

Type 1 monitor



Type 2 monitor



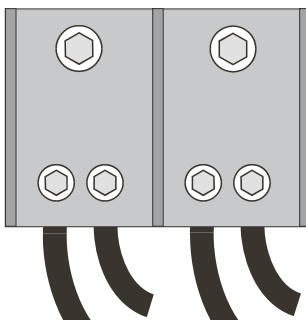
Some units may be equipped with separately wired circuits for service light(s) and service convenience receptacle(s). In this case, connect a separate 115VAC / 15A / 1Φ branch circuit to the service power lugs as shown. Refer to the unit wiring diagram. A ground-fault circuit interrupter may be required. Consult relevant codes.

Place a label on the electrical enclosure and on all access panels or doors that open to the service light and/or convenience receptacles stating that more than one disconnect is required to disconnect all electric power.

Connect input power here.

Use copper wire only. Torque all connectors per NEC 110-14, UL486A, or relevant code.

Conduit seals are required. See previous page.



INSTALLATION

Installation

Wiring

Power

! WARNING



Risk of electric shock. Can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

Some units may be equipped with separately wired circuits for an electric heater. In this case, connect a separate branch circuit as specified on the unit nameplate or in the unit submittal data to the heater power lugs as shown. Refer to the unit wiring diagram.

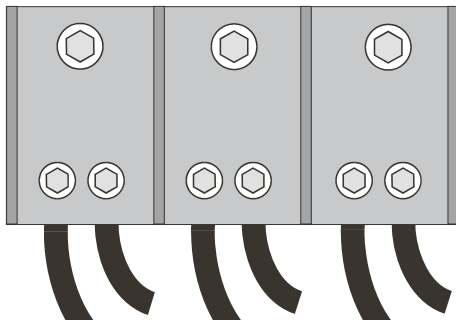
A ground-fault circuit interrupter may be required. Consult relevant codes.

Place a label on the electrical enclosure on all access panels or doors that open to the heater stating that more than one disconnect is required to disconnect all electric power.

Connect input power here.

Use copper wire only. Torque all connectors per NEC 110-14, UL486A, or relevant code.

Conduit seals are required. See previous page.



3Φ shown.
1Φ will have two lugs only.



INSTALLATION

Units with remote air-cooled condensers only

! WARNING



Risk of electric shock. Can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING



Risk of burns, impacts, and other injury. Can cause injury or death. Risk of property damage.

If fan rotation is to be checked, enable the fans only by installing a jumper between terminals C1 and I1 and/or between C2 and I2. **Never** push in a contactor with a finger or with a tool.

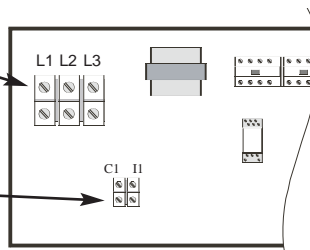
Some installations may incorporate remote air-cooled condensers. Where this is the case, wire the condenser as shown in the condenser wiring diagram.

Connect input power here.

Use copper wire only. Torque all connectors per NEC 110-14, UL486A, or relevant code.

For rotation testing, if any, jumper C1 to I1 and/or C2 to I2 only.

Never push a contactor by hand.



Power

Wiring

Installation

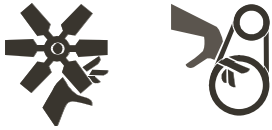
UNITS WITH VOLTAGE MONITOR ONLY



Risk of contact with moving parts. Can cause injury or death.

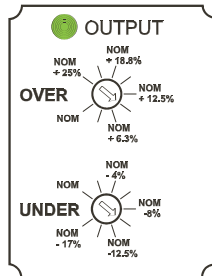
This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

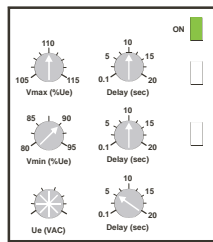


Identify the type of voltage monitor present.

TYPE 1



TYPE 2



For TYPE 2 monitors, skip to next page.

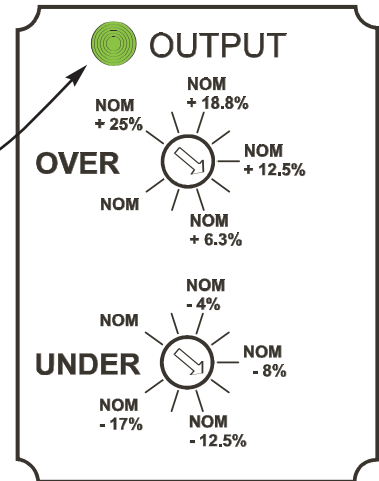
Type 1 Voltage Monitor

After power wiring is complete, and when safe to do so, 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. Be sure that the knob(s) are set correctly.

The over-voltage setting should be at nominal voltage plus 10%.

The under-voltage setting should be at nominal voltage minus 10%.



INSTALLATION

Installation

Wiring

Power

Type 2 Voltage Monitor

Be sure the Vmax time delay is set to 10 seconds.

Be sure that Vmax is set to 110%. Higher values may allow overheating of internal motors.

Do not adjust the voltage monitor without the explicit instructions from Dectron.

Be sure the Vmin time delay is set to 10 seconds.

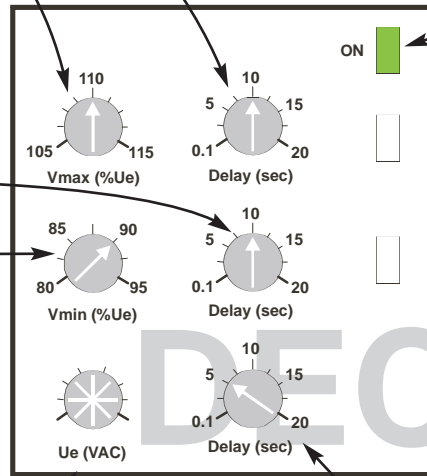
Be sure that Vmin is set to 90%. Lower values may allow overheating of internal motors.

Do not adjust the voltage monitor without explicit instructions from Dectron.

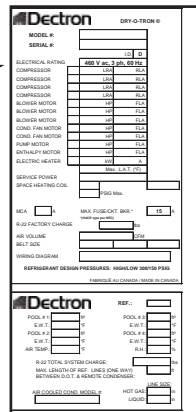
Be sure that Ue is set to the nominal voltage shown on the Dectron nameplate.

When the branch circuit voltages are correct, the green ON LED should be on.

If it is not on, or is flashing, see the following page for more details.



DECTRON



Be sure the Ue time delay is 5 seconds or less.

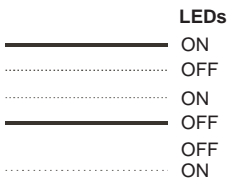
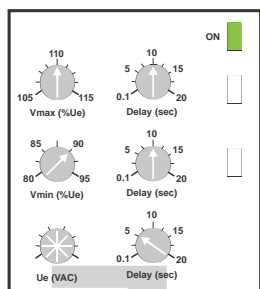
INSTALLATION

Power

Wiring

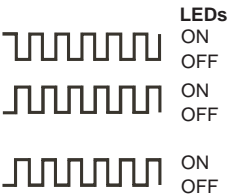
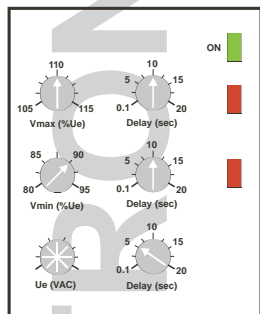
Installation

UNITS WITH TYPE 2 VOLTAGE MONITOR ONLY



Normal

When the green LED is on steady, the voltage is within normal range, all phase voltages are present, and the phase sequence is correct. No action is needed.

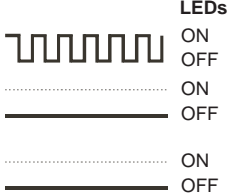
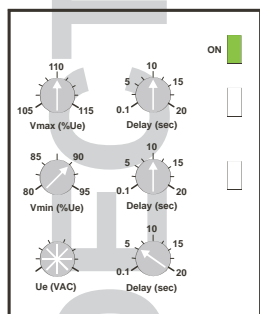


Incorrect Phase Sequence

When the green LED alternates with both red LEDs, the branch-circuit phase sequence is wrong, and the DRY-O-TRON® cannot operate.

Disconnect electrical power from the branch circuit, follow all safety procedures, and remove any two branch-circuit conductors from the input lugs. Exchange their places and re-connect. Tighten as appropriate. Do not change any factory-installed wires.

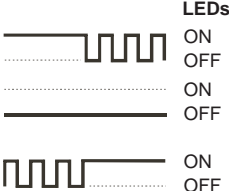
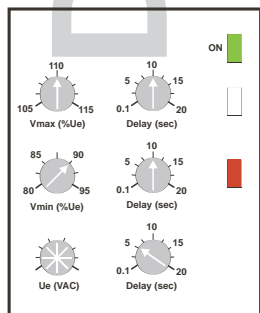
Following all safety procedures, re-apply electrical power. The voltage monitor should be normal as shown above.



Phase Loss

When the green LED is flashing and both red LEDs are off, the branch circuit does not have all three phases, and the DRY-O-TRON® cannot operate.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

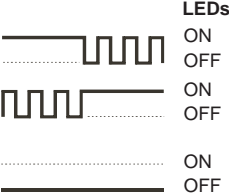
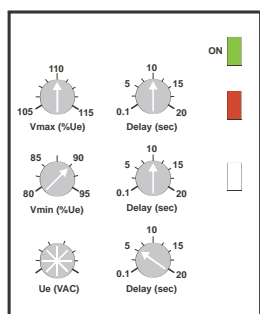


Incoming Voltage Below Minimum Allowable

When the green LED is flashing and the lower red LED is on, the incoming voltage is too low, and the DRY-O-TRON® cannot operate.

Voltages below this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.



Incoming Voltage Above Maximum Allowable

When the green LED is flashing and the upper red LED is on, the incoming voltage is too high, and the DRY-O-TRON® cannot operate.

Voltages above this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

INSTALLATION

Installation

Wiring

Power

Where DRY-O-TRON® units are mounted outdoors, it is best **NOT** to mount electrical disconnect switches or circuit breakers on the DRY-O-TRON® cabinet, because the resulting holes allow rainwater to be drawn into the insulated walls by the pressures inside the unit.

Where such mounting must be done, use care to seal all penetrations to stop the movement of air and water vapor. Caulk around the top and sides of such devices to keep rainwater water from getting behind them.

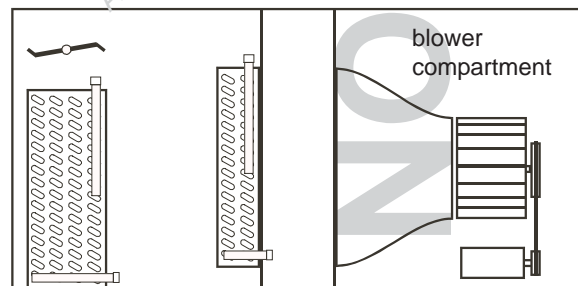
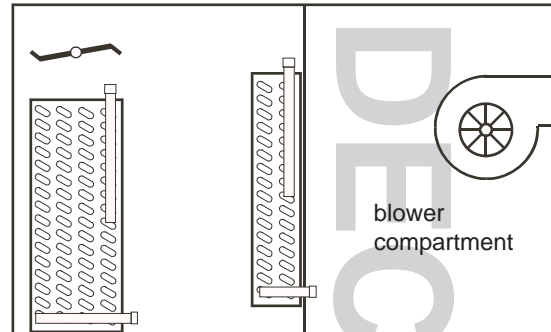
All conduits entering outdoor units should be sealed.

Units with housed blowers, as shown at right, may have strong negative air pressures inside the unit cabinet, including inside the electrical enclosure. Rainwater may be drawn into a disconnect box that is exposed to this negative pressure.

In some situations, fumes from chemical storage or combustion products from boilers, etc., may be drawn into the DRY-O-TRON® unit from remote locations via the conduit system. This **MUST** be prevented.

Units with economizers have the letter "B" in their model designations, e.g. "RB120". Depending on air balancing, economizer units with housed supply-air blowers may have a positive air pressure in the supply-blower compartment. A conduit seal is required to prevent condensation throughout the conduit system.

Units with plenum-type supply-air blowers will have a strong positive air pressure inside the blower compartment. There may also be a strong positive pressure inside the electrical enclosure. A conduit seal is required to prevent condensation throughout the conduit system.



Sample
Actual appearance
may vary.

DRY-O-TRON

Optional Remote Display

The communication system between the controller and a remote display (if any) is based on ANSI/IEEE RS-485. For best results, proper RS-485 wiring and splicing methods should be used. These include, but are not limited to the use of shielded RS-485 cable ($Z_0=120\Omega$, e.g. Belden 7202A), the use of connectors designed for RS-485, minimized untwist of conductors, etc.

In some cases, shorter lengths of cable may allow approximations to RS-485 methods. These methods are shown on the following pages. Methods for longer cables will work for shorter cables also.

All conduits connected to a dehumidifier should be sealed.

NOTE: Any remote display must be located in a space where it will not be exposed to the natatorium atmosphere or to the fumes from stored chemicals. Do not locate it in the same space where chemicals are stored.

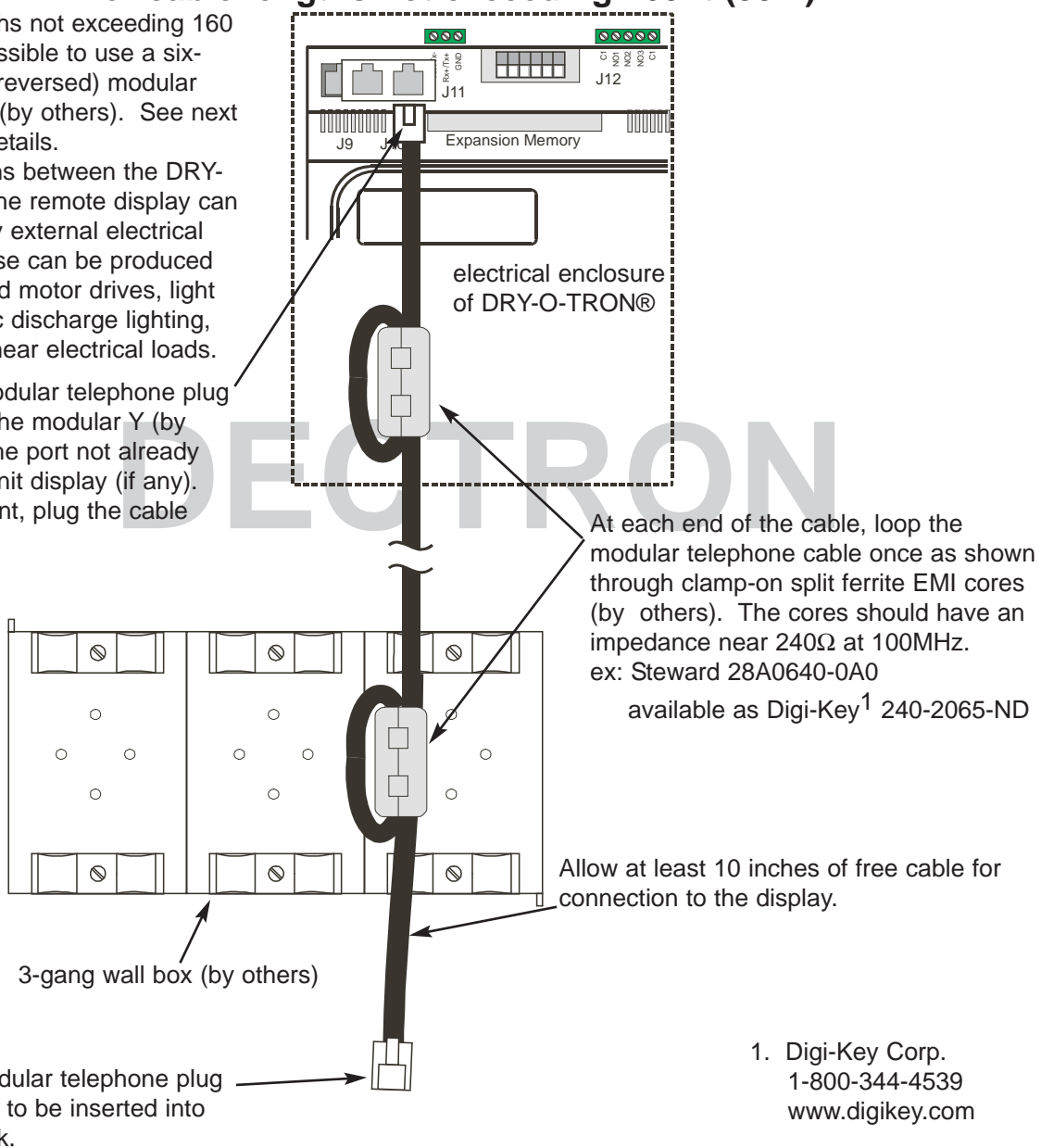
For cable lengths not exceeding 160 ft (50m) -

For cable lengths not exceeding 160 ft. (50m), it is possible to use a six-conductor data (reversed) modular telephone cable (by others). See next page for cable details.

Communications between the DRY-O-TRON® and the remote display can be interrupted by external electrical noise. Such noise can be produced by variable speed motor drives, light dimmers, electric discharge lighting, and other non-linear electrical loads.

Insert 6P6C modular telephone plug (by others) into the modular Y (by Dectron). Use the port not already used for the in-unit display (if any).

If no Y is present, plug the cable into J10.



At each end of the cable, loop the modular telephone cable once as shown through clamp-on split ferrite EMI cores (by others). The cores should have an impedance near 240Ω at 100MHz.
ex: Steward 28A0640-0A0
available as Digi-Key¹ 240-2065-ND

Allow at least 10 inches of free cable for connection to the display.

1. Digi-Key Corp.
1-800-344-4539
www.digikey.com

INSTALLATION

Data subject to change without notice.

Optional Remote Display

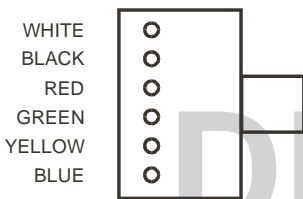
Assembling data (reversed) modular telephone cable

Note that the lock tabs of the plugs are on opposite sides of the cable. (Colors are for example only, colors may vary by cable vendor.)

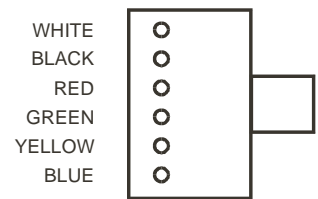
TOP VIEW



END VIEW

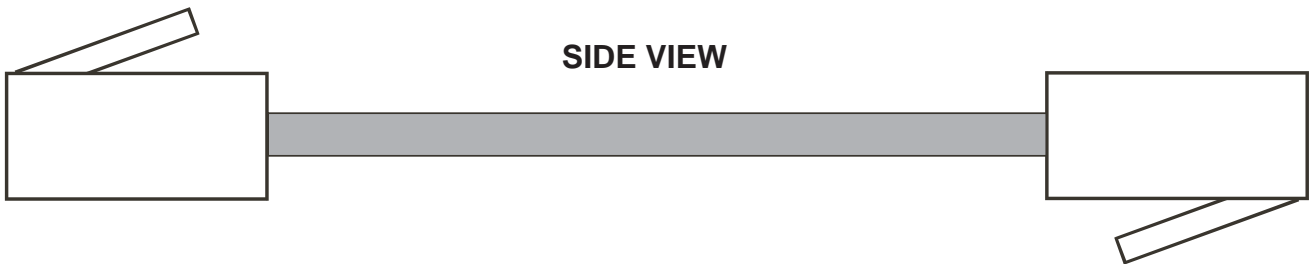


END VIEW

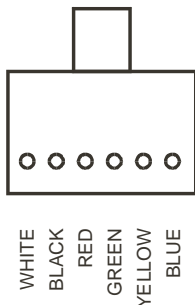


DECTRON

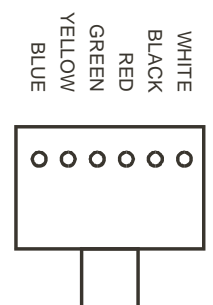
SIDE VIEW



END VIEW



END VIEW



INSTALLATION

Control Signals

Wiring

Installation

Insert 6P6C modular telephone plug (by others) into the modular Y (by Dectron). Use the port not already used for the in-unit display (if any).

Loop the modular telephone cable once as shown through clamp-on split ferrite EMI core (by others). The cores should have an impedance near 240Ω at 100MHz.

ex: Steward 28A0640-0A0 available as Digi-Key⁴ 240-2065-ND

Short six-conductor data (reversed) modular telephone cable (by others). See previous page for cable details.

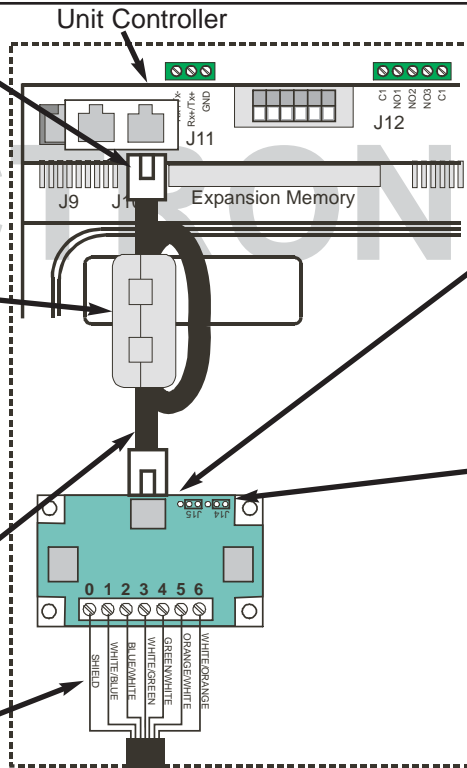
Keep pairs together. **DO NOT SPLIT PAIRS.** Minimize untwist.

Minimum 24 AWG copper 3-pair shielded RS-485 cable, $Z_0 = 120\Omega$
ex: Belden³ 7202A
Maximum length 650 ft (200m)

Keep pairs together. **DO NOT SPLIT PAIRS.** Minimize untwist.

Where TCONN6J000 (shown) is used, jumpers J14 and J15 must be on pins 1 & 2 as shown.

Short six-conductor data (reversed) modular telephone cable (by others). See previous page for cable details. Allow at least 10 inches of free cable for connection to the display. The six-pin modular telephone plug (by others) is to be inserted into the display jack.



Optional Remote Display
For cable lengths not exceeding 650 ft (200m) -

Modular cable to round cable adapter, (by others), two required
Ex: Carel¹ TCONN6J000 (shown)
Ex: Leviton 40276-I, (not shown) available as Grainger² 5C381

Where TCONN6J000 (shown) is used, jumpers J14 and J15 must be on pins 1 & 2 as shown.

Cable conductor-terminal assignment			
terminal	function	cable pair	conductor
0	GND	SHIELD	
1	+VRL (~30Vdc)	1	A
2	GND	1	B
3	Rx/Tx-	2	A
4	Rx/Tx+	2	B
5	GND	3	A
6	+VRL (~30Vdc)	3	B

INSTALLATION

Clamp-on split ferrite EMI core (by others), as above.

1. CAREL USA LLC
Ph: (717) 664-0500
Fax: (717) 664-0449
www.carelusa.com
2. USA
W.W. Grainger
Ph: 1-888-361-8649
www.grainger.com
- Canada
Acklands Grainger
Ph: 1-800-668-8989
www.acklandsgrainger.com
3. Belden
Ph: 314-854-8000
www.belden.com
4. Digi-Key Corp.
1-800-344-4539
www.digikey.com

Data subject to change without notice.

Installation

Wiring

Control Signals

Optional Remote Display
For cable lengths not
exceeding 1640 ft (500m) -
Consult factory for longer
cable requirements.

Loop the modular telephone cable once
as shown through clamp-on split ferrite
EMI cores (by others). The cores
should have an impedance near 240Ω
at 100MHz.

ex: Steward 28A0640-0A0
available as Digi-Key 4
240-2065-ND

Minimum 24 AWG copper 1-pair
shielded RS-485 cable,
Z₀ =120Ω

ex: Belden³ 7200A
Maximum length 1640 ft (500m)

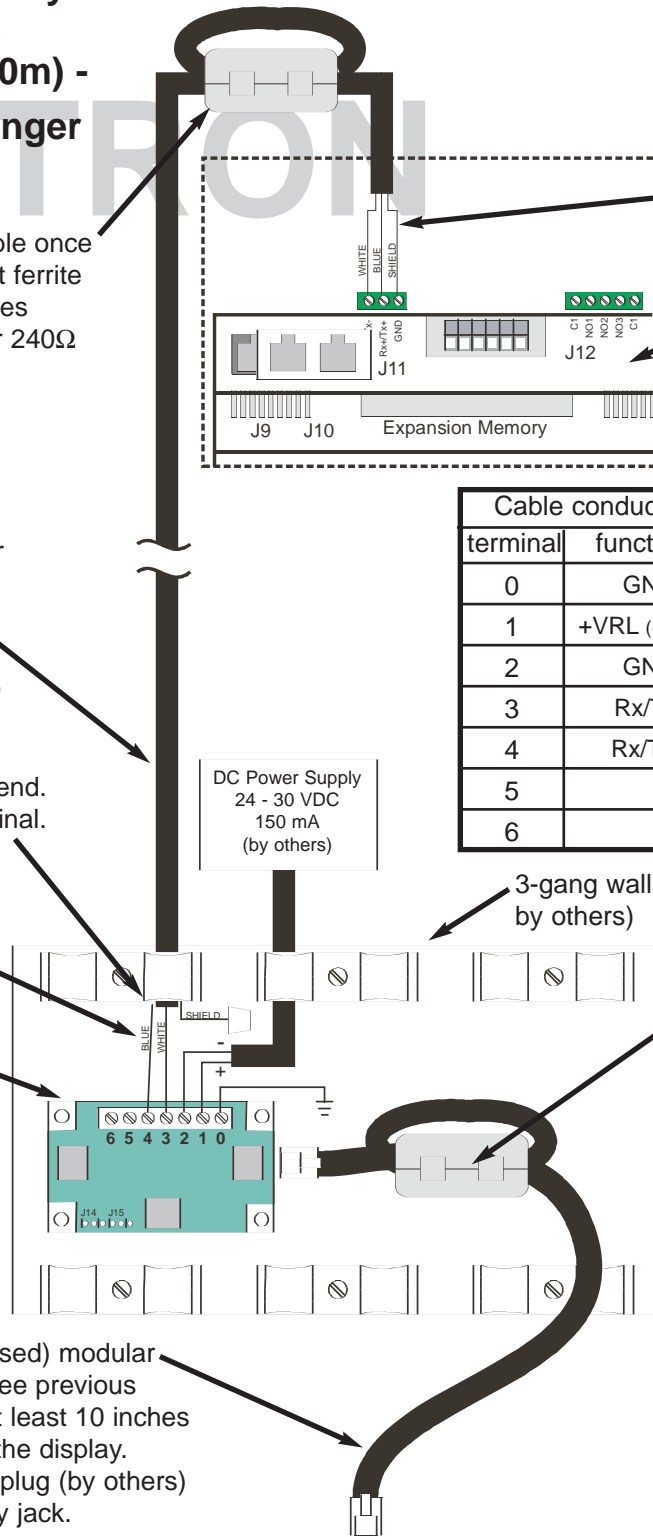
Insulate shield at this end.
Do not connect shield to a terminal.

Keep pair together.
DO NOT SPLIT PAIRS.
Minimize untwist.

Modular cable to round cable
adapter, (by others), one required
Ex: Carel¹ TCONN6J000 (shown)
Ex: Leviton 40276-I, (not shown)
available as Grainger² 5C381

Where TCONN6J000 (shown) is
used, jumpers J14 and J15 must
be on pins 1 & 2 as shown.

Short six-conductor data (reversed) modular
telephone cable (by others). See previous
page for cable details. Allow at least 10 inches
of free cable for connection to the display.
The six-pin modular telephone plug (by others)
is to be inserted into the display jack.



Keep pair together.
**DO NOT SPLIT
PAIRS.**
Minimize untwist.

Unit Controller

Cable conductor-terminal assignment			
terminal	function	cable pair	conductor
0	GND		
1	+VRL (~30Vdc)		
2	GND		
3	Rx/Tx-	1	A
4	Rx/Tx+	1	B
5			
6			

Clamp-on split ferrite EMI
core (by others), as
above.

1. CAREL USA LLC
Ph: (717) 664-0500
Fax: (717) 664-0449
www.carelusa.com

2. USA
W.W. Grainger
Ph: 1-888-361-8649
www.grainger.com

Canada
Acklands Grainger
Ph: 1-800-668-8989
www.acklandsgrainger.com

3. Belden
Ph: 314-854-8000
www.belden.com

4. Digi-Key Corp.
1-800-344-4539
www.digikey.com

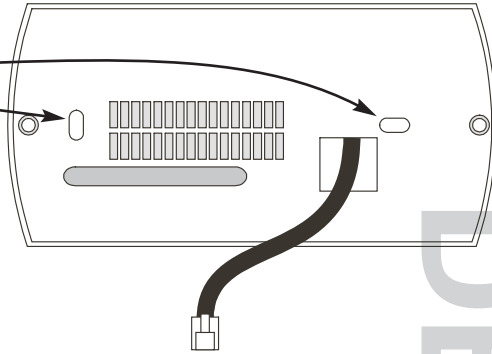
Optional Remote Controller Display, if any

NOTICE Risk of component failure.

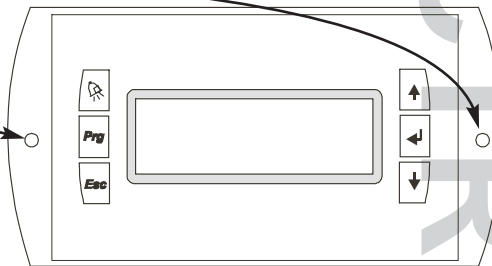
Where used, a remote display must be located in a space where it will not be exposed to the natatorium atmosphere or to the fumes from stored chemicals. Do not locate it in the same space where chemicals are stored. Do not locate it in direct sunlight.

Remove the display from its box. Refer to the instructions included. Separate the display into its three pieces.

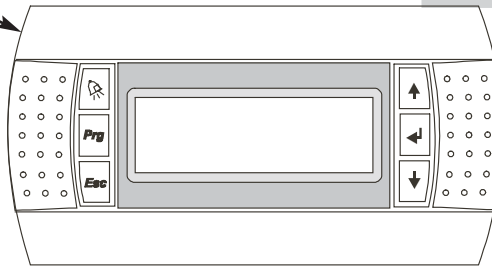
Thread the end of the cable through the hole in the sub-base as shown. Using care to maintain level, screw the sub-base to the wall box here.



Connect the cable to the modular telephone jack on the back of the display. Screw the display to its sub-base here.



Snap the front cover over the display.



NOTE: The display may show "NO LINK" if the DRY-O-TRON® is powered. This is normal, and will be corrected under the **STARTUP** section.

INSTALLATION

Installation

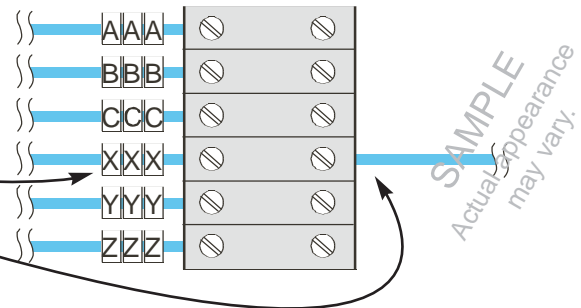
Wiring

Control Signals

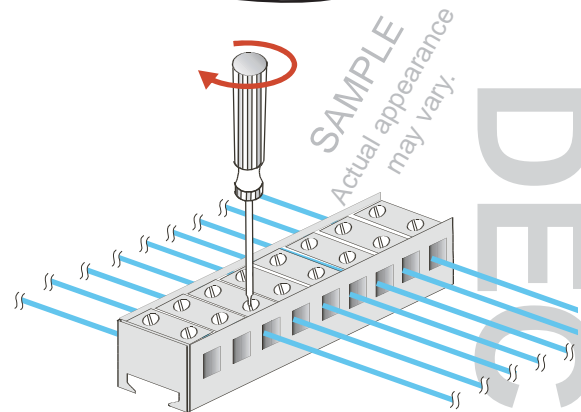
A field-wiring terminal strip is provided. Terminals are identified by the factory-attached wire numbers.

Ex: Instructions state to connect a field-installed wire to terminal XXX.

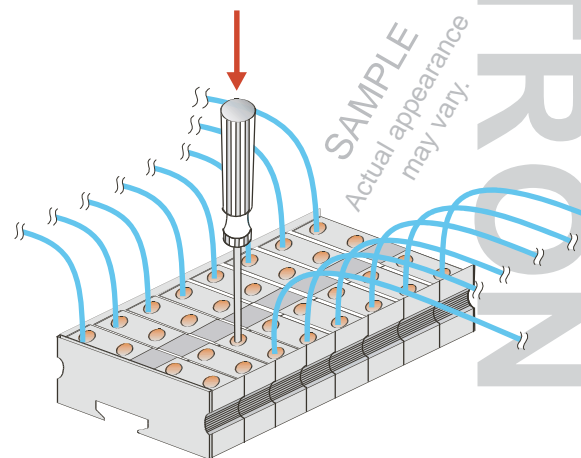
1. Find wire numbers XXX.
2. Connect wire on the matching terminal.



Some field-wiring terminal strips may have box-lug terminals. In this case, insert a stripped wire into the lug and tighten the screw.

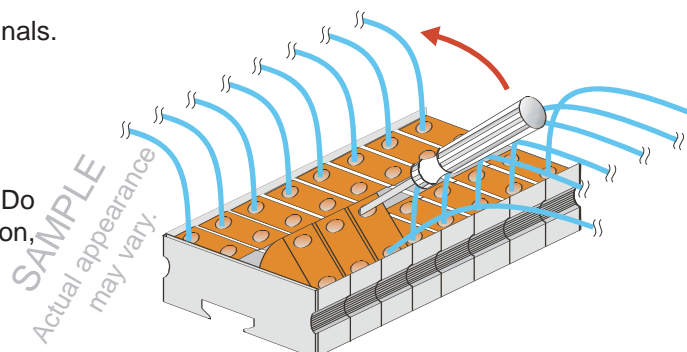


Some field-wiring terminal strips may have spring terminals. In this case, insert a small screwdriver into the release port, then insert a stripped wire into the wire port. Hold the wire in place and remove the screwdriver.



Some field-wiring terminal strips may have IDC terminals. In this case, insert the end of a wire into the wire port. Insert a small screwdriver, Allen wrench, etc., into the other port and turn the plastic cam as shown.

These terminal strips are suitable for use with 22 - 16 AWG having uncoated PVC or PE insulation. Do not use coated PVC or PE insulation. Do not use Teflon, Tefzel, Kynar, Kapton, Silicone Rubber, or Hypalon insulation.



Control Signals

Wiring

Installation

OPTIONAL EXTERNAL ON/OFF SPACE HEATERS

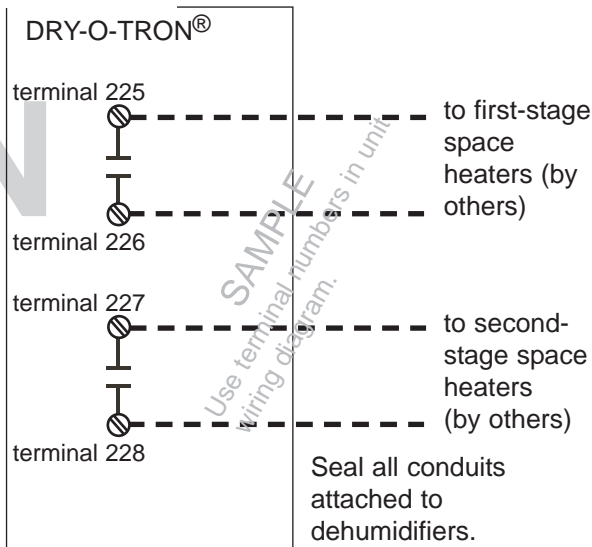
NOTICE Optional equipment
 Risk of building damage.
 All installations must have space heat available year-round. Failure to control space temperature can lead to unexpected changes in evaporation rate and humidity.

In the case of external ON/OFF space heaters, the space-heater controls must be wired to the DRY-O-TRON® controls (see unit field-wiring diagram in the unit information package). For ON/OFF controls, the installer must arrange the connections so that a dry-contact switch closure in the DRY-O-TRON® will enable the space heater. When the dry contacts are open, the space heater should be disabled.

NOTE: External space heaters should be provided with a airflow-proving switch (by others).

If possible the heater should be divided into as many stages as there are ON/OFF heating outputs on the DRY-O-TRON®. This will help in tuning the system to prevent over- and under-shooting of space temperature.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



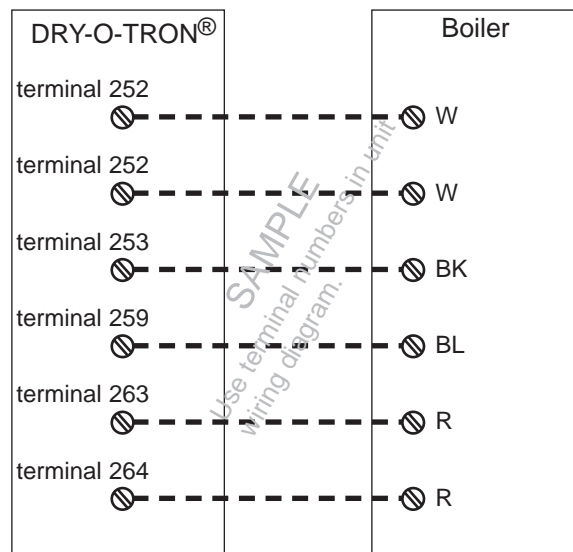
Similar circuits are used for any other space heaters. See the unit field-wiring diagram in the unit information package.

OPTIONAL REMOTE GAS BOILER

NOTICE Risk of building damage.
 All installations must have space heat available year-round. Failure to control space temperature can lead to unexpected changes in evaporation rate and humidity.

Some units may be equipped to control a remote Raypak gas boiler for space and/or auxiliary pool heating. Where this is the case, connect the boiler controls as shown at right.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



Seal all conduits attached to dehumidifiers.

Similar circuits are used for any other space heaters. See the unit field-wiring diagram in the unit information package.

INSTALLATION

Installation

Wiring

Control Signals

OPTIONAL EXTERNAL-VALVE PROPORTIONAL SPACE HEATERS (BY DECTRON)

NOTICE Risk of building damage.

All installations need space heat to be available year-round. Failure to control space temperature can lead to unexpected changes in evaporation and humidity.

Space-heaters must be wired to and controlled by the DRY-O-TRON® unit (see unit field-wiring diagram in unit information package).

The proportional space-heating output is rated 2 - 10VDC at 10mA, direct acting. The load impedance should not be less than 1kΩ. Do not overload this output.

The output voltage range can be modified in the field for 0-10VDC at 10mA, and/or for reverse action. Contact Dectron for instructions.

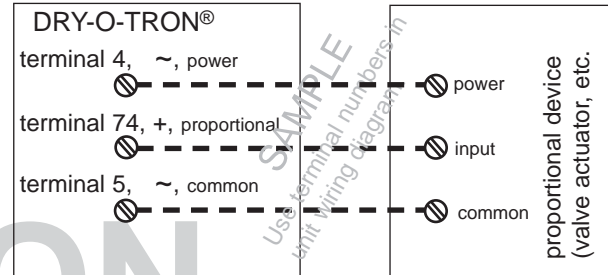
NOTE: External space heaters should be provided with an airflow-proving switch (by others).

Some indoor units may be equipped with proportional hot-water or steam heaters, where the heat exchanger is inside the unit and the control valve is outside the unit.

In this case, the valve assembly may ship separately and require installation in the field.

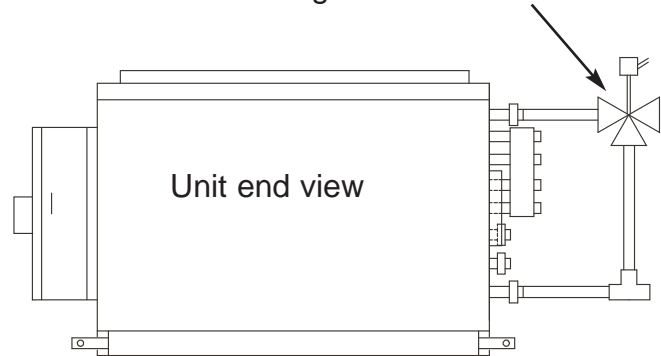
After the tube unions have been made up tight, connect the three wires numbered as shown in the diagram to the numbered wires from the valve actuator.

Match wire numbers.



Seal all conduits attached to dehumidifiers.

Location of Heating Valve on Indoor Units



INSTALLATION

OPTIONAL REMOTE PROPORTIONAL CONTROL FOR SPACE-HEATERS (BY OTHERS)

NOTICE Risk of building damage.

All installations need space heat to be available year-round. Failure to control space temperature can lead to unexpected changes in evaporation and humidity.

Space-heaters must be wired to and controlled by the DRY-O-TRON® unit (see unit field-wiring diagram in unit information package).

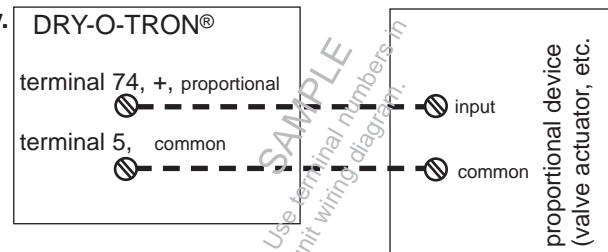
The proportional space-heating output is rated 2 - 10VDC at 10mA, direct acting. The load impedance should not be less than 1kΩ. Do not overload this output.

The output voltage range can be modified in the field for 0-10VDC at 10mA, and/or for reverse action. Contact Dectron for instructions.

NOTE: External space heaters should be provided with an airflow-proving switch (by others).

Some units may be equipped to control remote proportional space heater by others. Where this is the case wire as shown at right.

Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



Seal all conduits attached to dehumidifiers.

Control Signals

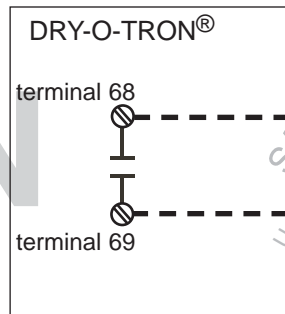
Wiring

Installation

OPTIONAL FAN-INTERLOCK OUTPUT

Some DRY-O-TRON® units may have a fan interlock output coincident with blower operation.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



Use terminal numbers in unit wiring diagram.

Contacts are closed while supply blower runs.

Seal all conduits attached to dehumidifiers.

INSTALLATION

Installation

Wiring

Control Signals

POOL#1 AUXILIARY WATER HEATER

Note: An auxiliary pool-water heater is recommended for all installations.

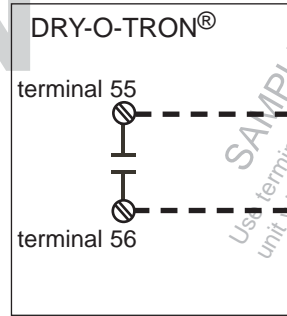
Note: An auxiliary pool-water heater is required for natatoriums in which

- (a) The outdoor-air intake rate is more than 15% of the DRY-O-TRON® supply-air flow rate.
- (b) The DRY-O-TRON® has the Economizer, Intelligent Energy Saver, or EconoPurge options.
- (c) The pool water is exposed to outdoor conditions (such as a swim-through pool).
- (d) The pool water is kept at a higher temperature than the room air.
- (e) The pool(s) has uninsulated pool walls which are exposed to outdoor conditions.

Some DRY-O-TRON® units may be equipped with a built-in auxiliary pool-water heater. In this case the wiring and controls are arranged at the factory.

Some installations may use an auxiliary pool-water heater by others. In this case the auxiliary pool-water heater controls must be wired to the DRY-O-TRON® controls (see unit wiring diagram in unit information package). The installer must arrange the connections so that a dry-contact switch closure in the DRY-O-TRON® will enable the auxiliary pool-water heater.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



To the enable input of auxiliary pool#1 water heater (by others).

Seal all conduits attached to dehumidifiers.

POOL#2 AUXILIARY WATER HEATER

Note: An auxiliary pool-water heater is recommended for all installations.

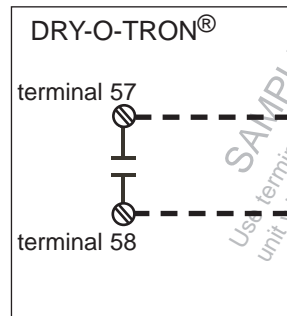
Note: An auxiliary pool-water heater is required for natatoriums in which

- (a) The outdoor-air intake rate is more than 15% of the DRY-O-TRON® supply-air flow rate.
- (b) The DRY-O-TRON® has the Economizer, Intelligent Energy Saver, or EconoPurge options.
- (c) The pool water is exposed to outdoor conditions (such as a swim-through pool).
- (d) The pool water is kept at a higher temperature than the room air.
- (e) The pool(s) has uninsulated pool walls which are exposed to outdoor conditions.

Some DRY-O-TRON® units may be equipped with a built-in auxiliary pool-water heater. In this case the wiring and controls are arranged at the factory.

Some installations may use an auxiliary pool-water heater by others. In this case the auxiliary pool-water heater controls must be wired to the DRY-O-TRON® controls (see unit wiring diagram in unit information package). The installer must arrange the connections so that a dry-contact switch closure in the DRY-O-TRON® will enable the auxiliary pool-water heater.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



To the enable input of auxiliary pool#2 water heater (by others).

Seal all conduits attached to dehumidifiers.

INSTALLATION

Control Signals

Wiring

Installation

OPTIONAL REMOTE CONDENSER OR DRYCOOLER

Some DRY-O-TRON® units may be provided with an air-cooled condenser or a DryCooler. In this case the remote air-cooled condenser controls or the DryCooler controls must be wired to the DRY-O-TRON® controls (see unit wiring diagram). The remote condenser or the DryCooler has its own power supply so there is a dry-contact switch closure to enable the remote condenser or the DryCooler.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.

In some cases the size of the control wire may have to be increased to allow for contactor inrush. See the chart at right.

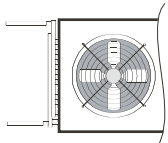
Some condenser control transformers may not be rated for Class 2 wiring methods. (See NEC Art. 725, CEC Art. 16.) In this case, use Class 1 wiring methods.

In some cases temperature switches inside the remote condenser or the DryCooler may have to be adjusted. See **Startup - Adjustments**.

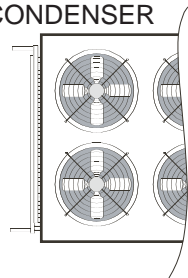
Condenser control wire size (AWG)

wire length (ft)	Number of fan contactors controlled by one circuit					
	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

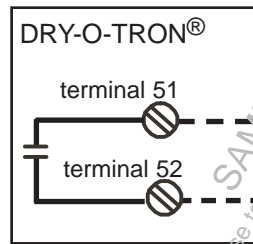
ONE-ROW CONDENSER



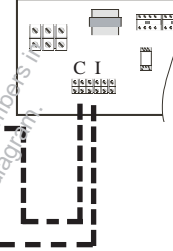
TWO-ROW, SINGLE-CIRCUIT CONDENSER



OR

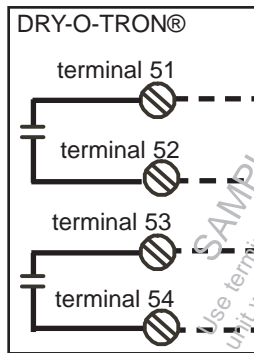
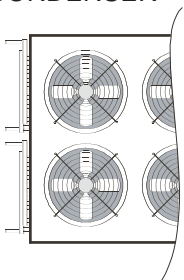


Remote Condenser

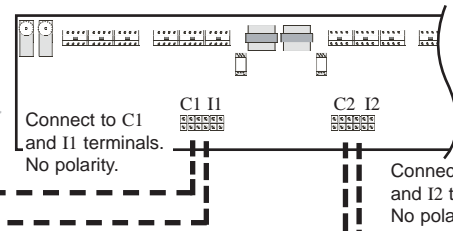


Connect to C and I terminals. No polarity. Seal all conduits attached to dehumidifiers.

TWO-ROW, DUAL CIRCUIT CONDENSER

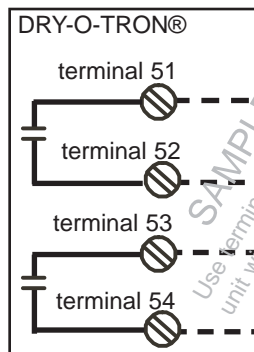
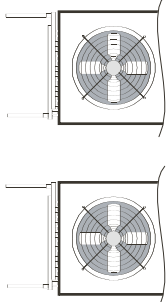


Remote Condenser

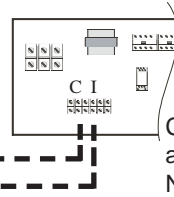


Connect to C1 and I1 terminals. No polarity. Connect to C2 and I2 terminals. No polarity. Seal all conduits attached to dehumidifiers.

TWO SEPARATE CONDENSERS

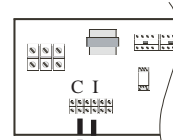


Remote Condenser for refrigerant circuit #1



Connect to C and I terminals. No polarity.

Remote Condenser for refrigerant circuit #2



Seal all conduits attached to dehumidifiers.

Data subject to change without notice.

Dectron, Inc. March 2012

Installation

Wiring

Control Signals

OPTIONAL REMOTE PUMP FOR COOLING WATER / FLUID CIRCULATION

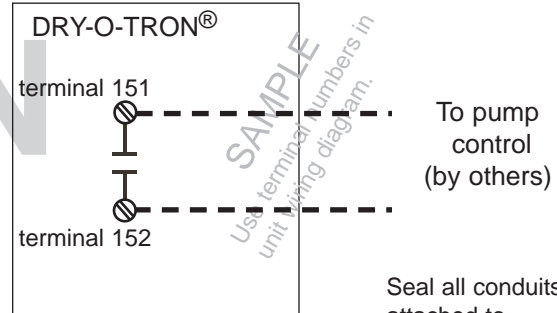
(BY OTHERS)

Some units may be equipped for the control of a remote pump (by others) which circulates water or glycol fluid to cool the air-conditioning system.

In this case, connect the pump control as shown in the unit wiring diagram or as shown at right.

Refer to unit wiring diagram.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage for ventilation, except with the option "Power Supply for Ventilation". Do not attempt to use an internal DRY-O-TRON® power source unless the option "Power Supply for Ventilation" is present.



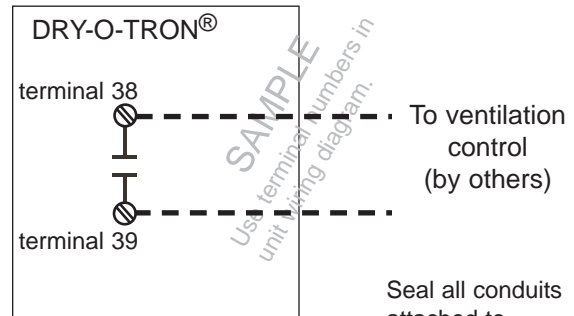
Seal all conduits attached to dehumidifiers.

OPTIONAL REMOTE VENTILATION

(BY OTHERS) (POWER BY OTHERS)

Some units may be equipped for the control of a ventilation system by others. Unless the optional ventilation power supply was ordered, the ventilation system must have its own power supply so that a circuit closure will enable ventilation.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage for ventilation, except with the option "Power Supply for Ventilation". Do not attempt to use an internal DRY-O-TRON® power source unless the option "Power Supply for Ventilation" is present.



Seal all conduits attached to dehumidifiers.

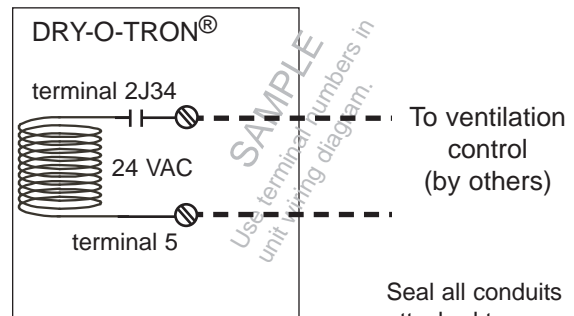
OPTIONAL REMOTE VENTILATION

(BY OTHERS) (OPTIONAL POWER BY DECTRON)

Some units may be equipped with a line-item option called "Power Supply for Ventilation", where up to 80 VA at 24 VAC is made available for the control of a ventilation system (by others).

In this case, there will be a 24VAC ventilation signal derived from the internal control-power system of the unit.

NOTE: The electrical power supply for the "Power Supply for Ventilation" option is not suitable for Class 2 wiring methods.



Seal all conduits attached to dehumidifiers.

INSTALLATION

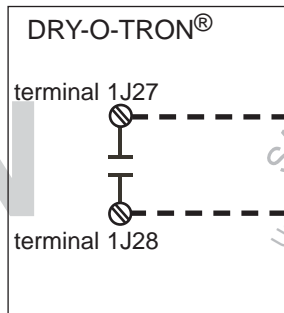
Control Signals

Wiring

Installation

GENERAL ALARM

DRY-O-TRON® units are provided with an output for a general alarm. A dry-contact switch closure is provided to trigger an alarm (by others) in the event of a condition that prevents the normal operation of the unit. The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



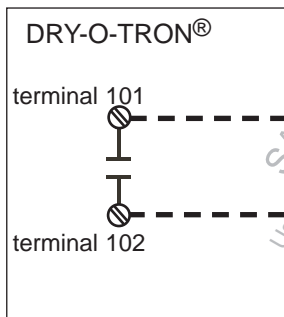
SAMPLE
Use terminal numbers in unit wiring diagram.

Contacts close to enable general alarm (by others).

Seal all conduits attached to dehumidifiers.

DIRTY-FILTER ALARM (OPTIONAL)

Some DRY-O-TRON® units may have an optional alarm to indicate that the pressure drop across the return-air filters is excessive, indicating dirty filters. A dry-contact switch closure is provided to trigger an alarm (by others) in the event of excessively dirty filters. The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



SAMPLE
Use terminal numbers in unit wiring diagram.

Contacts close to enable dirty-filter alarm (by others).

Seal all conduits attached to dehumidifiers.

FIRESTAT CONNECTION

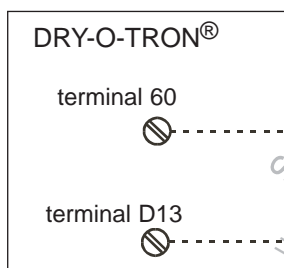


WARNING

Risk of improper fire/smoke response.

For units requiring a firestat interlock, remove the jumper between the firestat inputs or as shown on the unit wiring diagram. In the jumper's place substitute an isolated normally closed switch closure from the fire alarm (by others).

If the fire alarm is triggered, the resulting open circuit between these terminals will cause the DRY-O-TRON® to execute an orderly shutdown, including blowers.



SAMPLE
Use terminal numbers in unit wiring diagram.

Firestat or smoke detector switch opens on alarm.

Seal all conduits attached to dehumidifiers.

INSTALLATION

Installation

Wiring

Control Signals

OPTIONAL OUTDOOR AIR-TEMPERATURE SENSOR (IF ANY)

Some units may have an outdoor air-temperature sensor.

NOTICE Risk of operational mode failure.

Units with the Economizer, EconoPurge, and/or the Intelligent Energy Saver option must have the outdoor-air temperature sensor.

For some units, the remote outdoor air-temperature sensor may ship uninstalled, and thus must be installed in the field.

NOTICE Risk of component damage.

Sensor must be properly installed.

Select a location for the sensor that will be:

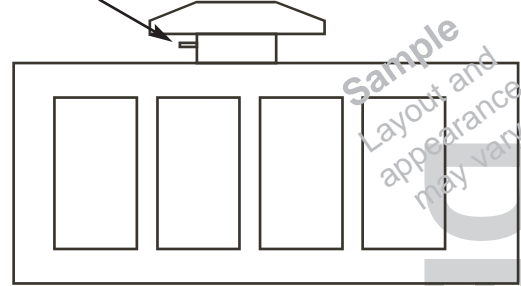
1. always in representative outdoor air,
2. out of direct sunlight during all seasons and all times of day
3. out of other abnormal temperature conditions such as ventilation exhaust streams,
4. protected from rain, sleet, ice, etc.,
5. within 350 ft (106 m) of the DRY-O-TRON®, and
6. protected against damage or vandalism.

Route the cable to avoid sources of electrical noise. Wire the sensor as shown on the unit field-wiring diagram in the unit information package. Connect any cable shields at the DRY-O-TRON® end only.

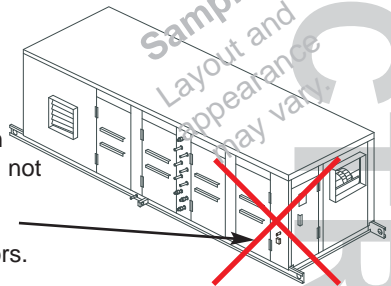
Seal all conduits attached to dehumidifiers.

If an outdoor temperature sensor is unexpectedly connected or disconnected in the field, the controller configuration may have to be changed.

possible location on outdoor units

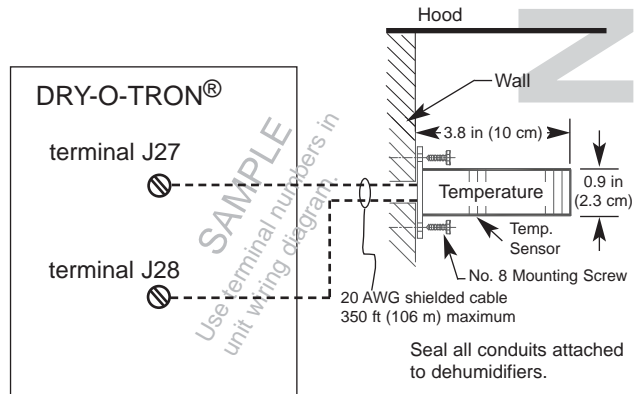


The side of an outdoor unit is not an adequate location for outdoor sensors.



Install outdoor sensors where they will **NOT** be damaged and will **NOT** be exposed to rain or direct sunlight.

INSTALLATION



Control Signals

Wiring

Installation

OPTIONAL OUTDOOR-AIR RELATIVE-HUMIDITY SENSOR (IF ANY)

Some installations may have the outdoor relative-humidity sensor.

NOTICE Risk of operational mode failure.
Units with the Intelligent Energy Saver option must have the outdoor-air relative-humidity sensor.

For these installations, the transmitter may ship uninstalled, and thus must be installed in the field.

NOTICE Risk of component damage.
Sensor must be properly installed.

Select a suitable location for the transmitter, preferably near the temperature sensor.

Select a location for the transmitter that will be:

1. always in representative outdoor air
2. out of direct sunlight during all seasons and times of day
3. out of other abnormal temperature or humidity conditions such as ventilation exhaust streams, boiler exhausts, etc.
4. protected from rain, sleet, ice, etc.,
5. within 350 ft (106 m) of the DRY-O-TRON®, and
6. protected against damage or vandalism.

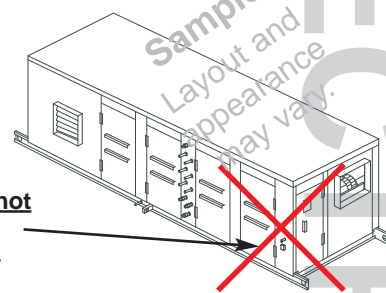
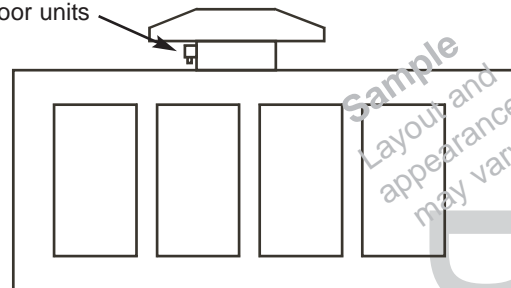
Seal all conduits connected to dehumidifiers.

Install the transmitter vertically as shown. **The sensor element must be oriented downward.** A hood may be required to protect the transmitter from rain.

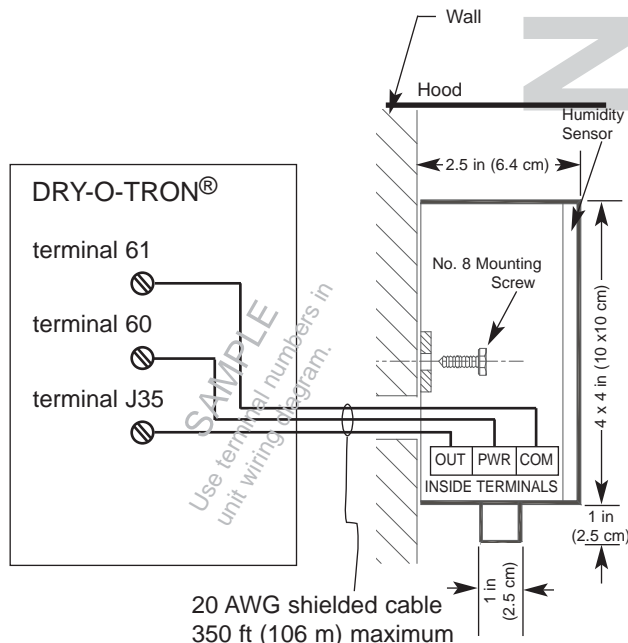
Wire the transmitter as shown on the unit field-wiring diagram in the unit information package. Route the cable to avoid sources of electrical noise.

If an outdoor humidity sensor is unexpectedly connected or disconnected in the field, the controller configuration may have to be changed.

possible location on outdoor units



Install outdoor sensors where they will **NOT** be damaged and will **NOT** be exposed to rain or direct sunlight.



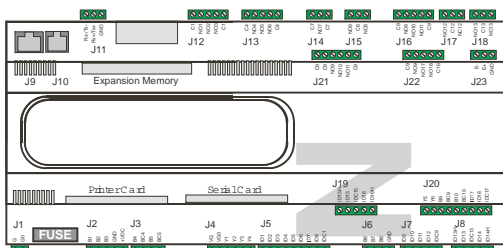
Seal all conduits attached to dehumidifiers.

INSTALLATION

Outdoor relative-humidity transmitters may have to be configured in the field.

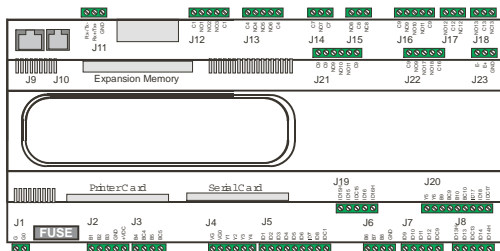
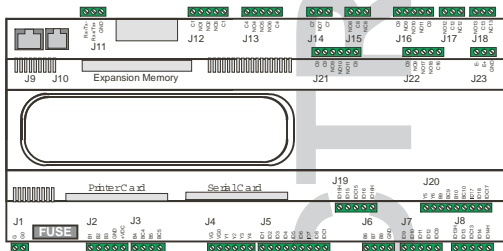
To do this, it is first necessary to determine the type of controller extension, if any. Using the diagrams below, determine if the controller has an extension and, if so, which type.

No Extension



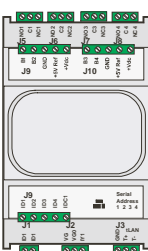
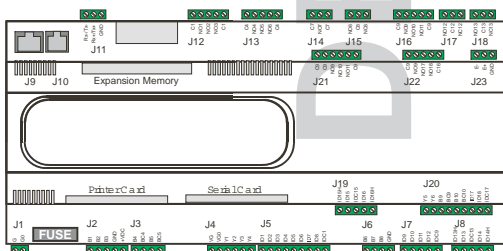
If your controller looks like this, enter 10V in the box below and skip to the next page.

Double-Controller Extension



If your controller looks like this, then enter 10V in the box below and skip to the next page.

PCOE Extension



Main Controller

PCOE extension module

If your controller has a PCOE extension module, then refer to the unit wiring diagram supplied with the unit.

Determine if the outdoor RH transmitter is connected to the main controller or to the PCOE extension module.

If the outdoor RH transmitter connects to the main controller, then enter 10V in the box below and skip to the next page.

If the outdoor RH transmitter connects to the PCOE extension module, then enter 5V below and go to the next page.

My outdoor-air RH sensor voltage is

V.

Control Signals

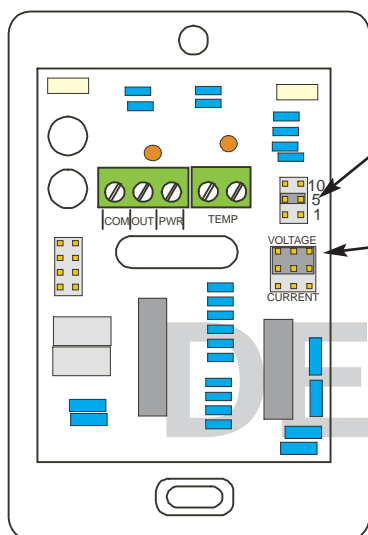
Wiring

Installation

From previous page, the outdoor-air RH sensor voltage is V.

5V

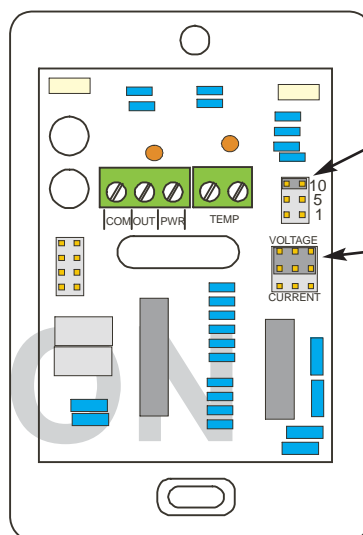
10V



Set pin jumper to 5.

Set pin jumper to VOLTAGE.

Outdoor RH Transmitter Board



Set pin jumper to 10.

Set pin jumper to VOLTAGE.

Outdoor RH Transmitter Board

INSTALLATION

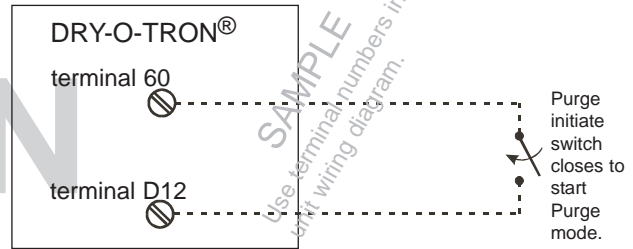
Installation

Wiring

Control Signals

OPTIONAL PURGE INITIATION SWITCH

Purge mode may be initiated through the unit controller interface (See **Operation - Interface Map.**) or by a remote-mounted pushbutton switch (by others). If a remote switch is desired, the installer may connect a normally-open momentary push-button switch at a convenient location. Purge mode begins when the switch is pressed and released.

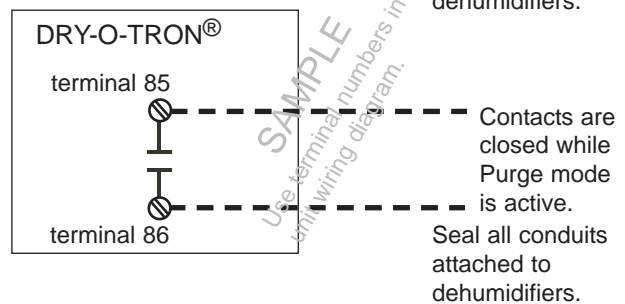


Seal all conduits attached to dehumidifiers.

OPTIONAL PURGE STATUS

Units with the Purge-mode option may be provided with an optional isolated switch-closure output that closes during Purge mode.

The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.

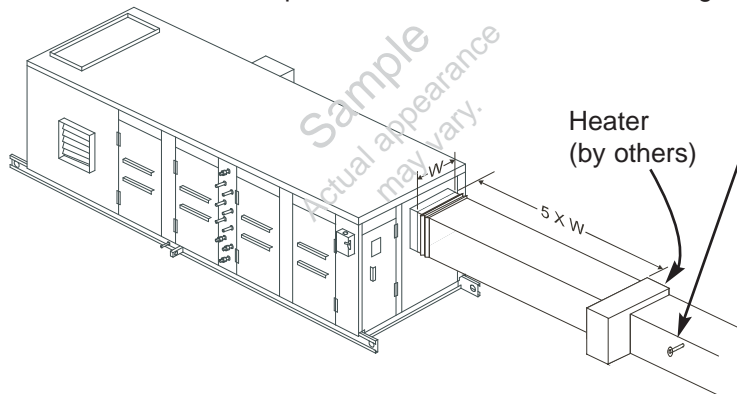


Seal all conduits attached to dehumidifiers.

OPTIONAL PURGE-MODE SUPPLY-SENSOR INSTALLATION

Some DRY-O-TRON® units may be provided with the optional Purge mode (see **Product Description**). In this case, there is the further option of having the space heater inside the DRY-O-TRON® or having the DRY-O-TRON® control a space heater provided by others.

Where the space heater is provided by others but controlled by the DRY-O-TRON®, a supply-air temperature sensor may be required downstream of the space heater. Consult the unit wiring diagram.

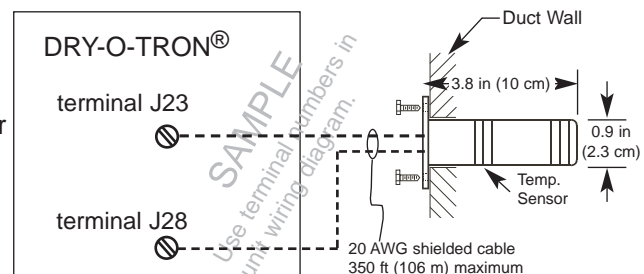


For Purge mode with external heaters, locate any required remote supply-air temperature sensor downstream of the heater.

NOTE: External space heaters should be provided with an airflow-proving switch.

PURGE MODE SUPPLY-SENSOR CONNECTION

For Purge units where the space heater is provided by others but controlled by the DRY-O-TRON®, the supply-air sensor should be connected to the DRY-O-TRON as shown in the unit wiring diagram.



Seal all conduits attached to dehumidifiers.

Units Equipped for Pool-Water Heating Only

Units of size 040 and larger may have pool-water pressure switches factory-mounted and wired inside the cabinet. Where this is the case, the only requirement is adjustment, which is discussed in the Startup section of this manual.

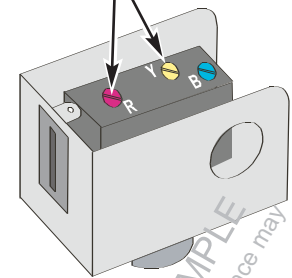


SAMPLE Appearance may vary.

For smaller units and some other units, the pressure switch(es) may ship separately. Where this is the case, the pressure switch should have been installed under **Installation - Piping - Pool Water**. If it was not done, return to that section and complete the task.

Locate the pool-water pressure switch(es). If the switches are factory-installed, no wiring is necessary. If not, proceed with the steps below.

Remove the cover from the pressure switch. Insert an abrasion-protection and strain-relief fitting into the 1/2" knockout. Route a two-conductor cable through the strain relief and connect the conductors to the red and yellow terminals of the pressure switch.

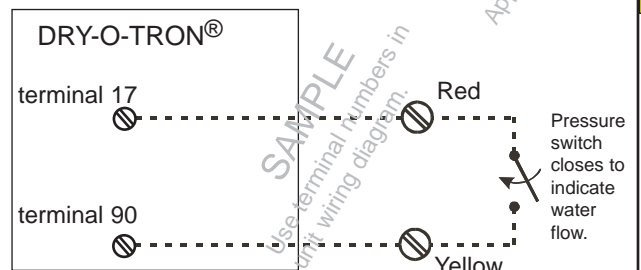


SAMPLE Appearance may vary.

INSTALLATION

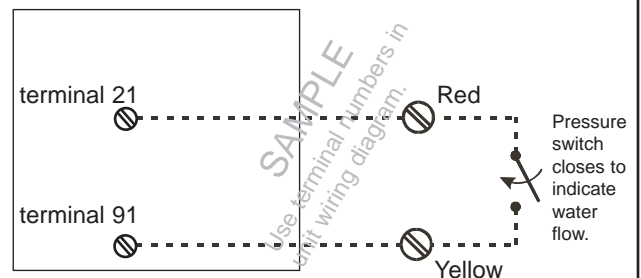
POOL#1 WATER PRESSURE SWITCH

The presence of pool-water flow is detected by a pressure switch. For some units, this switch may ship separately. Install the switch as shown under **Installation - Piping**. Wire the switch as shown here.



POOL#2 WATER PRESSURE SWITCH

Some units may be equipped with provisions to heat a second pool or spa. The presence of water flow is detected by a pressure switch. For some units, this switch may ship separately. Install the switch as shown under **Installation - Piping**. Wire the switch as shown here.



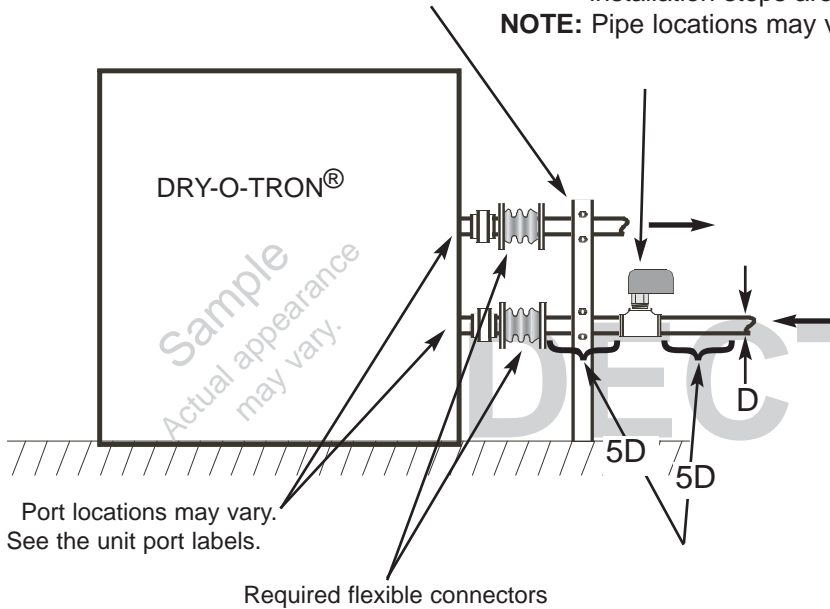
Some installations may have more than two pools connected to the unit. Where this is the case, refer to the unit-wiring diagram and repeat the above steps as necessary.

Units with Water-Cooled Air Conditioning Only

The water-flow switch (supplied by Dectron, installed by others) screws 1/2" (12 cm) into a pipe tee (by others) in the inlet-water pipe.

NOTE: The switch may be factory installed, in which case no installation steps are required.

NOTE: Pipe locations may vary.



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

Unless the DRY-O-TRON® unit has a control output for cooling-water flow, the water or fluid flow must be constant. Any pumps, fans, cooling towers, etc., must be enabled whenever the DRY-O-TRON® unit is enabled.

INSTALLATION

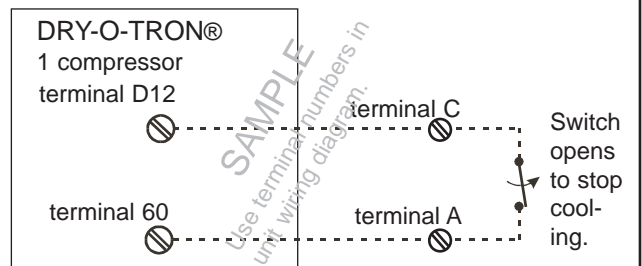
OPTIONAL WATER FLOW-SWITCH INPUT

For units with water- or fluid-cooled air conditioning, remove the jumper between terminals 60 and

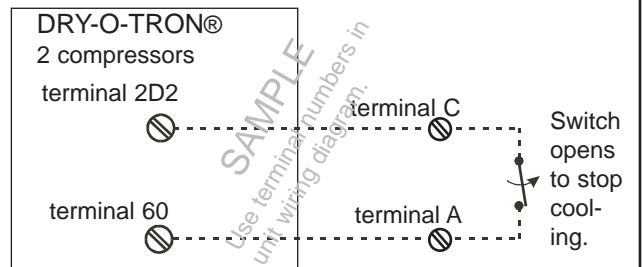
- (a) terminal D12 for single-compressor units,
- (b) terminal 2D2 for two-compressor units, or
- (c) as shown on the unit wiring diagram.

In the jumper's place substitute the output of the fluid flow switch (supplied by Dectron, possibly installed by others).

An open circuit between these terminals will cause the DRY-O-TRON® to execute an orderly shutdown, including blowers.



Seal all conduits attached to dehumidifiers.



Seal all conduits attached to dehumidifiers.

Control Signals

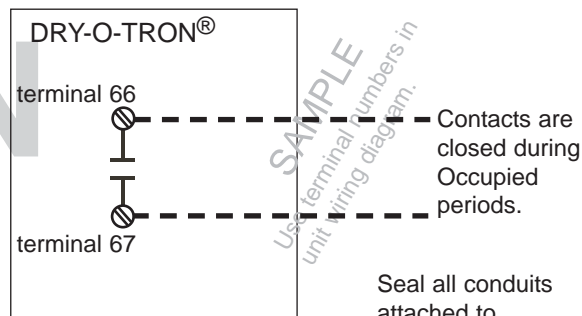
Wiring

Installation

OPTIONAL OCCUPIED-PERIOD OUTPUT

Some DRY-O-TRON® units may have an isolated switch-closure output that closes during occupied periods.

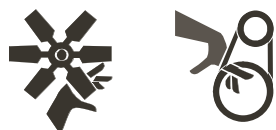
The DRY-O-TRON® dry contacts are rated 5A at 24VAC 60Hz. Do not overload these outputs. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



Seal all conduits attached to dehumidifiers.

REMOTE BLOWER SWITCH INPUT

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Where service tasks might expose a person to moving parts or other stored energy, **opening the remote-blower switch input is not a sufficient safeguard.**

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

NOTICE Risk of building damage.

Risk of condensation on unprepared surfaces.

Risk of freezing damage.

Risk of biological fouling.

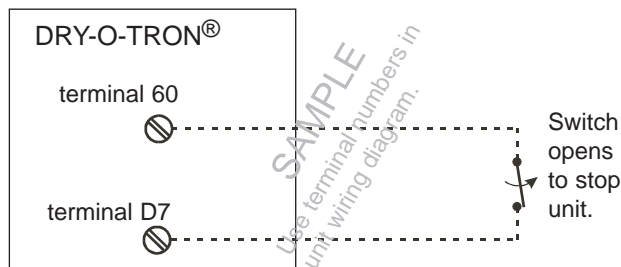
Risk of unit damage.

NOTE: Be very careful when using this input. Do not stop the unit except briefly for service as long as the humidity load is present. Stopping the unit while the humidity load is present may lead to condensation of water inside the building or inside the unit, with resulting water damage.

NOTE: Do not use this input to stop the unit during un-occupied periods.

For units requiring a remote blower switch, remove the jumper between terminals 60 and D7, or as shown on the unit wiring diagram. In the jumper's place substitute an isolated normally-closed switch closure (by others).

An open circuit between these terminals will cause the DRY-O-TRON® to execute an orderly shutdown, including blowers.

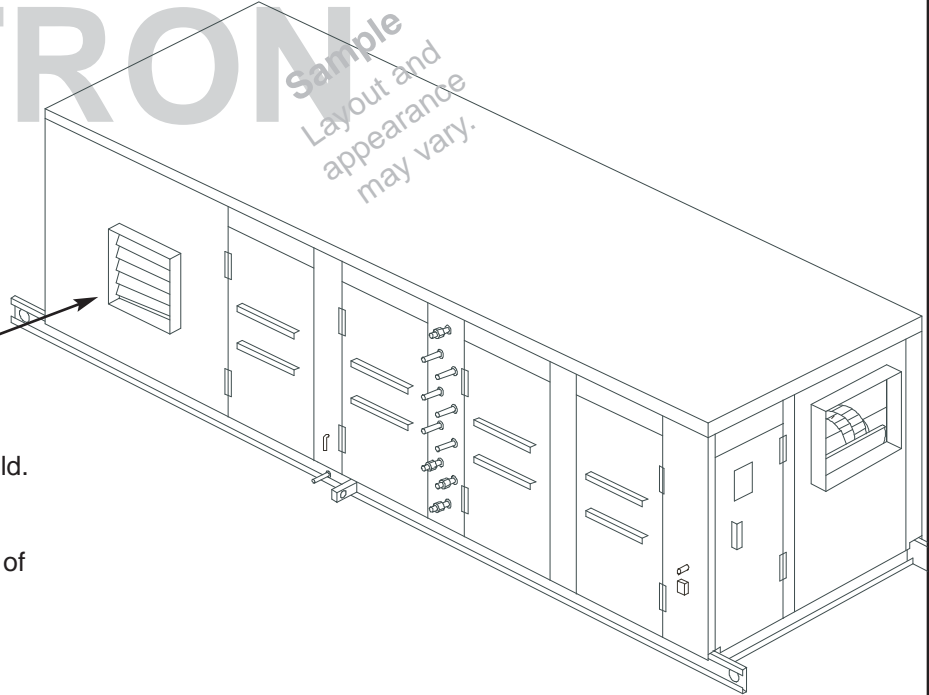


Seal all conduits attached to dehumidifiers.

INSTALLATION

DECTRON

Sample Layout and appearance may vary.



Some units may have motorized damper sections that ship separately. In this case, the damper section(s) must be installed in the field.

Note that these motorized damper sections may require the connection of several wires at installation.

Match wire numbers and splice together carefully.

INSTALLATION

! WARNING

Risk of fire and smoke propagation.

Pipe chases, where present, **must be sealed** around the pipes, conduits, etc. A metal cap is provided with the unit to assist with closure.

In some cases, pipes chases may be subject to fire-stopping requirements. Consult applicable codes and the local code-enforcement authority.

NOTICE Risk of unexpected air flows and pressurizations.

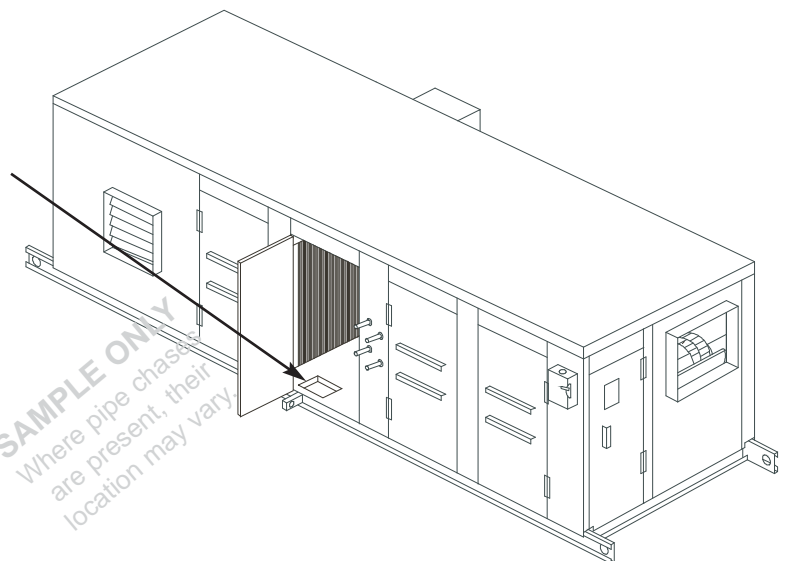
Air must not be allowed to flow through a pipe chase. Such air flow could lead to contamination of air and to unexpected pressurization of spaces. A pipe chase must be sealed.

Underside Pipe Chases

Some units may have pipe chases in the base of the unit. These chases may be intended to enclose conduits, heating-water pipes, steam pipes, etc.

IMPORTANT: Use the included chase cap to assist in sealing any pipe chases. Air must not be allowed to move through a chase.

IMPORTANT: In some cases, pipes chases may be subject to fire-stopping requirements. Consult applicable codes.



Wiring Checklist

Wiring

Installation

A copy of this checklist should be left with the unit.

Confirm that any required wiring specified on the unit-specific field-wiring diagram has been accomplished.

your initials

For units equipped for optional group operation via shared sensors, confirm that connections described in Dectron OM Appendix C7 - Shared Sensor Adapter have been accomplished.

your initials

For units equipped with the optional DryCooler feature, confirm that connections described in Dectron OM Appendix M1 - DryCooler have been accomplished.

your initials

For units equipped with the optional Modbus communications feature, confirm that connections described in Dectron OM Appendix C1 - Modbus have been accomplished.

your initials

For units equipped with the optional Heatco gas furnace, confirm that connections described in Dectron OM Appendix H2 - HTCO Furnace have been accomplished.

your initials

For units equipped with the optional SmartSaver® feature, confirm that connections described in Dectron OM Appendix M3 - SmartSaver have been accomplished.

your initials

For units equipped with the optional BACnet PTP communications feature, confirm that connections described in Dectron OM Appendix C2 - BACnet PTP have been accomplished.

your initials

For units equipped with the optional TEGA gas furnace, confirm that connections described in Dectron OM Appendix H9 - TEGA Furnace have been accomplished.

your initials

For units equipped with the optional Economizer feature, confirm that connections described in Dectron OM Appendix M5 - Economizer have been accomplished.

your initials

For units equipped with the optional LONtalk® FTT-10A communications feature, confirm that connections described in Dectron OM Appendix C3 - LONtalk have been accomplished.

your initials

For units equipped with an optional Raypak Hi-Delta gas boiler (models 122-322), confirm that connections described in Dectron OM Appendix H6 - Raypak 1000.53E HiDelta Boilers 122-322 have been accomplished.

your initials

For units equipped with the optional Purge feature, confirm that connections described in Dectron OM Appendix M6 - Purge have been accomplished.

your initials

For units equipped with the optional Man-Machine Interface feature, confirm that connections described in Dectron OM Appendix C5 - MMI have been accomplished.

your initials

For units equipped with an optional Raypak Hi-Delta gas boiler (models 302B - 902B), confirm that connections described in Dectron OM Appendix H7 - Raypak 1000.501C HiDelta Boilers 302B-902B have been accomplished.

your initials

For units equipped with the optional http, BACnet Ethernet, or BACnet IP communications features, confirm that connections described in Dectron OM Appendix C6 - LANLink2 have been accomplished.

your initials

For units equipped with an optional Raypak Hi-Delta gas boiler (models 992B-2342B), confirm that connections described in Dectron OM Appendix H8 - Raypak 1000.511B HiDelta boilers 992B-2342B have been accomplished.

your initials

Date: _____
 Model No. _____
 Serial No. _____
 Ref. No. _____
 Name _____
 Tel. _____

INSTALLATION

Installation

Wiring

Wiring Checklist

A copy of this checklist should be left with the unit.

Confirm that the unit is connected to a branch circuit with voltages which will always be within ±10% of the unit-nameplate value.

your initials

For outdoor units, confirm that all conduits connected to the unit have been sealed.

your initials

Confirm that the unit is connected to a branch circuit with the proper current ratings, as specified on the unit nameplate.

your initials

For units with the optional remote controller display, confirm that the wiring has been done using the materials and methods specified in this manual.

your initials

Confirm that only copper wire was used to power the unit.

your initials

For units with fire/smoke alarm inputs, confirm that the input has been properly wired and that the circuit has been tested.

your initials

Confirm that branch-circuit and feeder (if any) wiring were sized to allow at least the minimum voltage during compressor starting.

your initials

Confirm that all applicable sensor and control-signal circuits have been connected as described in this manual.

your initials

Confirm that all power-lug screws, including factory-tightened ones, were checked for tightness and proper torque.

your initials

Confirm that any outdoor relative-humidity transducer has been installed with the sensor pointing downward.

your initials

Confirm that the unit and any remote condenser, DryCooler, etc., have been properly grounded.

your initials

For units with air-cooled air conditioning, confirm that the proper control-wire sizes have been used to enable the remote condenser or DryCooler.

your initials

Confirm that electrical components were covered during installation to protect against drill chips, etc.

your initials

For units having extension modules on the controllers, confirm that any remote transducers have been configured for the correct signals.

your initials

For 3Φ units, confirm that all three phases are present, balanced within 2%, and that the phase sequence is correct.

your initials

For units equipped with service light and receptacle, confirm that a suitable branch circuit has been properly connected to the service-power lugs.

your initials

Date: _____

Model No. _____

Serial No. _____

Ref. No. _____

Name _____

Tel. _____

INSTALLATION

Testing, Adjusting, and Balancing

T.A.B.

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NOTICE

Risk of property damage.

This unit is not a convenience air conditioner - it is a process dehumidifier that is closely sized to the expected load. Any errors in installation, balancing, or startup will be obvious in operation.

Improper flows may result in damage to the equipment, unexpected condensation in the building leading to damage, or monetary losses due to failure to reclaim energy. The flows must be measured and set within 10% of the stated values.

NOTICE

The information presented in this section represents Dectron's best effort as of the time of issue. Compliance with the requirements and recommendations in this section should produce a correct airflow.

Where any steps are not clear, Dectron offers technical assistance at 1-800-667-6338 or 1-800-676-2566.

Dectron does not warrant that this information is complete for any particular application. In some cases job-specific requirements may cause factory modifications which may not appear in this section. Such modifications will be documented in addenda.

Follow all applicable safety rules and regulations, and all applicable codes. Where any recommendation in this manual conflicts with legal requirements, the legal requirements take precedence.

Dectron, Inc. does not engage in Test, Adjust, and Balance contracting. All costs, risks, and responsibilities of testing, adjusting, and balancing are borne by others.

Data subject to change without notice.

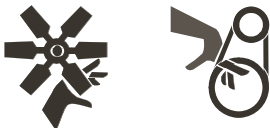
Dectron, Inc. March 2012

T.A.B.

! WARNING**Risk of electric shock. Can cause injury or death.**

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller **does not disconnect electrical energy from the unit**, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

! WARNING**Risk of pinching or crushing. Can cause injury.**

Depending on the size of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury by pinching or crushing.

Access doors and panels are under a strong negative pressure when the blower(s) is running. Opening doors may be difficult. Closing doors must be done with a tool to prevent hands from being caught.

! WARNING**Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

! CAUTION**Risk of contact with hot surfaces. Can cause injury.**

This product contains surfaces which can cause burn injury.

The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Compressor crankcase heaters can be extremely hot at any time electrical power is applied.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts.

NOTICE**Risk of leaking water. Can cause property damage.**

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow.

Uncontrolled water can cause expensive damage to buildings and other equipment.

Do not locate this product above any equipment that could be damaged by water.

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T.A.B.

T.A.B.

Check Air Filters

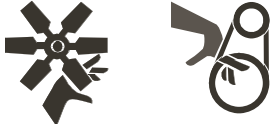
HORIZONTAL UNITS - SEE SUBSEQUENT PAGE FOR VERTICAL UNITS



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.



CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE

NOTE: The number and location of air filters depends on unit size, options, etc.

If your unit has the Chloraguard® option, other filters will be described in [Appendix M2](#).

If your unit has the SmartSaver® option, other filters will be described in [Appendix M3](#).

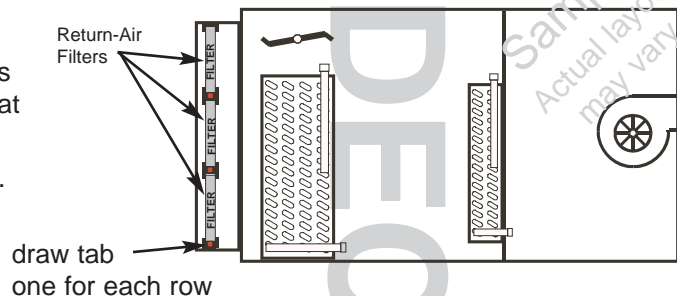
If your unit has the Economizer option, other filters will be described in [Appendix M5](#).

If your unit has the Purge option, other filters will be described in [Appendix M6](#).

This list may not be inclusive of all options. There are many combinations of options. Use judgment to be sure all air filters have been located.

Basic horizontal units may have return-air filters just before the cooling coil. Use draw tabs or lift-out frames to remove all filters, then replace them. This assures that all filters are present.

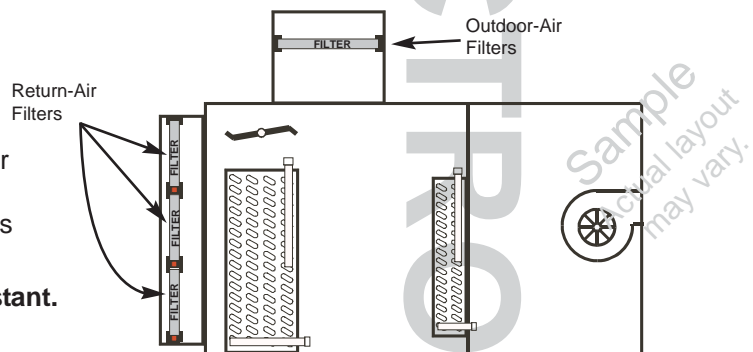
The size and number of filters and draw tabs may vary.



Some horizontal units may have a connection for outdoor-air intake, as shown. Use draw tabs to remove all filters, then replace them. This assures that all filters are present.

Filters for outdoor air must be moisture resistant.

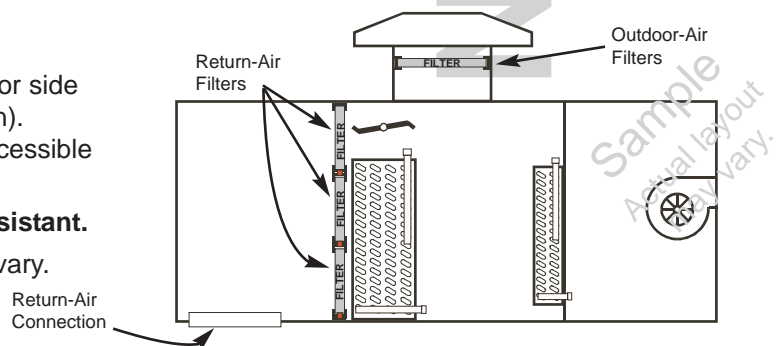
The size and number of filters and draw tabs may vary.



Some horizontal units may have bottom, top, or side return-air connection (bottom connection shown). Such units may have lift-out return-air filters accessible through a door.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

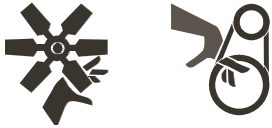


Check Air Filters

T.A.B.

HORIZONTAL UNITS - SEE SUBSEQUENT PAGE FOR VERTICAL UNITS

! WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

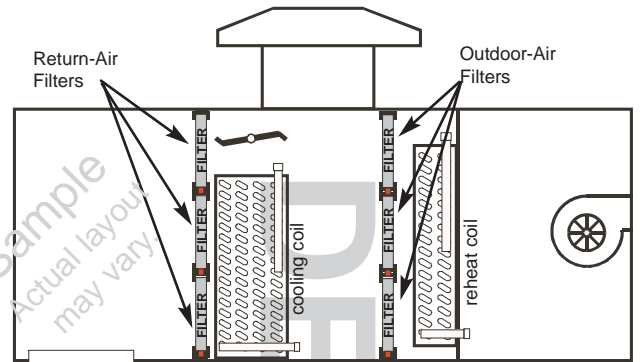
Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Some horizontal units may have the optional Purge mode feature. In this case, there will be a set of filters for outdoor air located upstream of the reheat coil. Most such units have lift-out return-air filters accessible through a door.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

Refer to [Appendix M6](#).



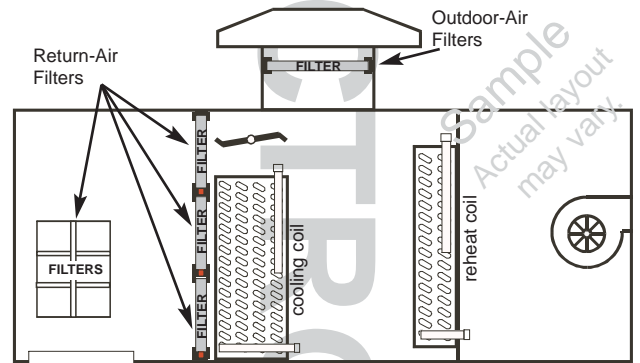
Some horizontal units may have the optional SmartSaver® feature. In this case, there will be two sets of filters for return air as shown. Most such units have lift-out return-air filters accessible through a door.

There will also be a set of filters for outdoor air as shown. These filters may be lift-out or may have draw tabs.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

Refer to [Appendix M3](#).



T.A.B.

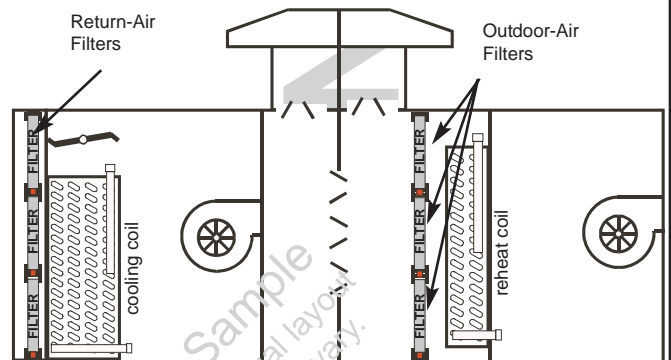
Some horizontal units may have the optional economizer feature. In this case, there will be a set of filters for return air as shown. These filters may be lift-out or may have draw tabs.

There will also be a set of filters for outdoor air as shown. These filters may be lift-out or may have draw tabs.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

Refer to [Appendix M5](#).



T.A.B.

Check Air Filters

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

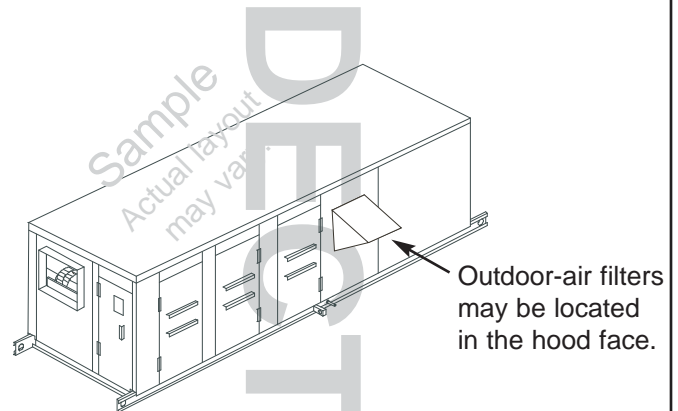
This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Some horizontal outdoor units may have side hoods for outdoor-air intake. In this case the outdoor-air filters may be located under the hood.

Filters for outdoor air must be moisture resistant.

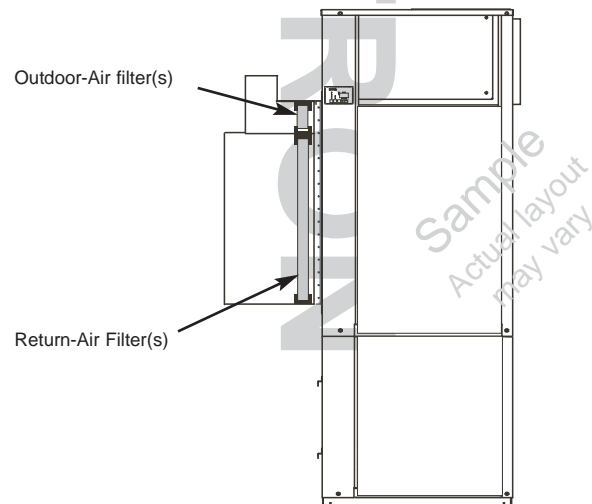
The location, size, and number of filters may vary.



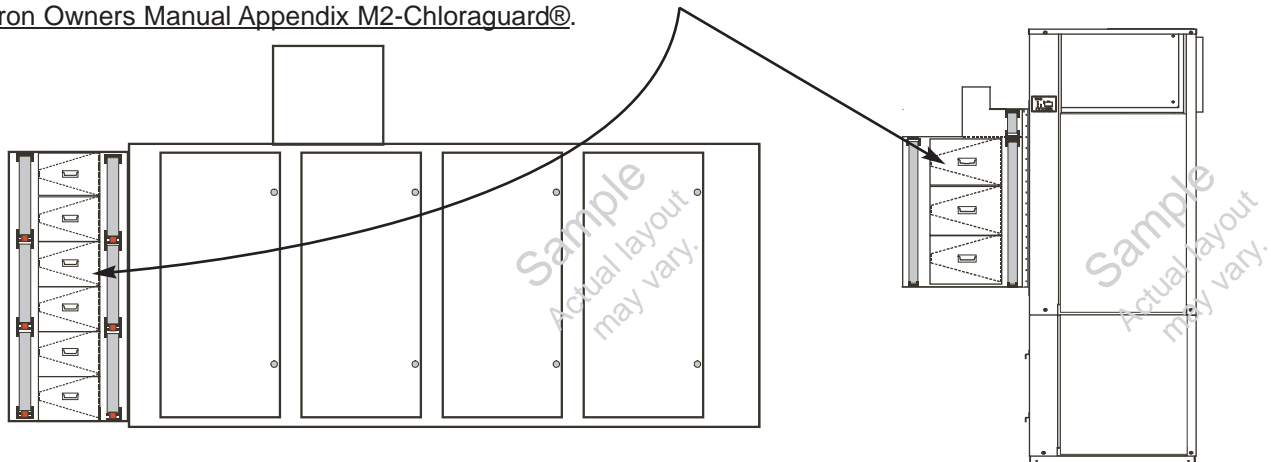
Vertical units have the outdoor-air filter directly above the return-air filter, as shown.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.



Some units may be provided with an optional gas-phase filter, such as Chloraguard®. In this case, refer to [Dectron Owners Manual Appendix M2-Chloraguard®](#).



Remove Shipping Blocks

T.A.B.

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

NOTICE Risk of property damage.

Some units may ship with shipping blocks and/or other temporary restraints inside the unit. If these shipping blocks and restraints are not removed prior to starting the blower, they may come loose and damage parts of the unit and/or parts of the duct system.

Some units may ship with wooden spacer blocks to maintain component positions during shipping. Open the unit access panels or doors and remove any wooden blocks.

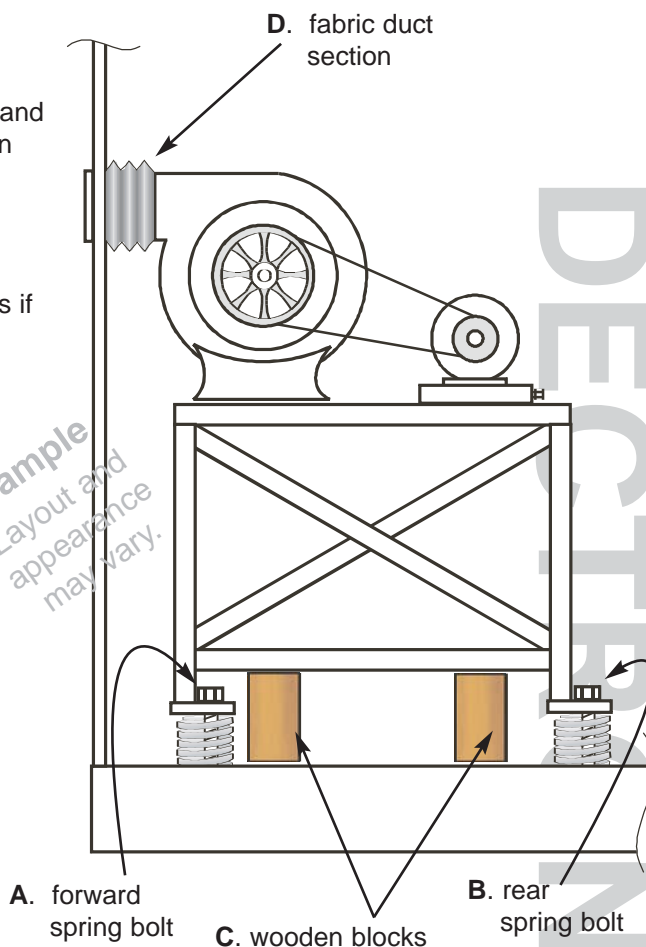
Where wire or plastic wraps are used to hold the wooden blocks in place, remove them also. Do **not** leave loose materials inside the unit.

NOTE: Do not remove any perforated-channel braces or other metal braces unless specifically instructed to do so.

Some units may have optional spring-mounted blower frames, as shown here.

In this case, loosen the pair of forward spring bolts (A) and the pair of rear spring bolts (B), then remove any wooden shipping blocks (C). Do **not** leave any loose materials inside the unit.

Adjust the spring bolts (A) and (B) to keep slack in the fabric duct section (D). Use shims under the rear springs if necessary.



T.A.B.

Remove all loose materials from the inside of the unit.

T.A.B.

Check Blower Belts

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

NOTICE

Never open a sheave to remove, install, or adjust a belt - use the belt tensioning screw only. Only a qualified air-balance technician or HVAC technician should change sheave settings.

NOTICE

There may be more than one blower. All belts and sheaves must be checked.

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,

$$D = S \times 1/64$$

$$D = 32\text{in} \times 1/64 = 1/2 \text{ in.}$$

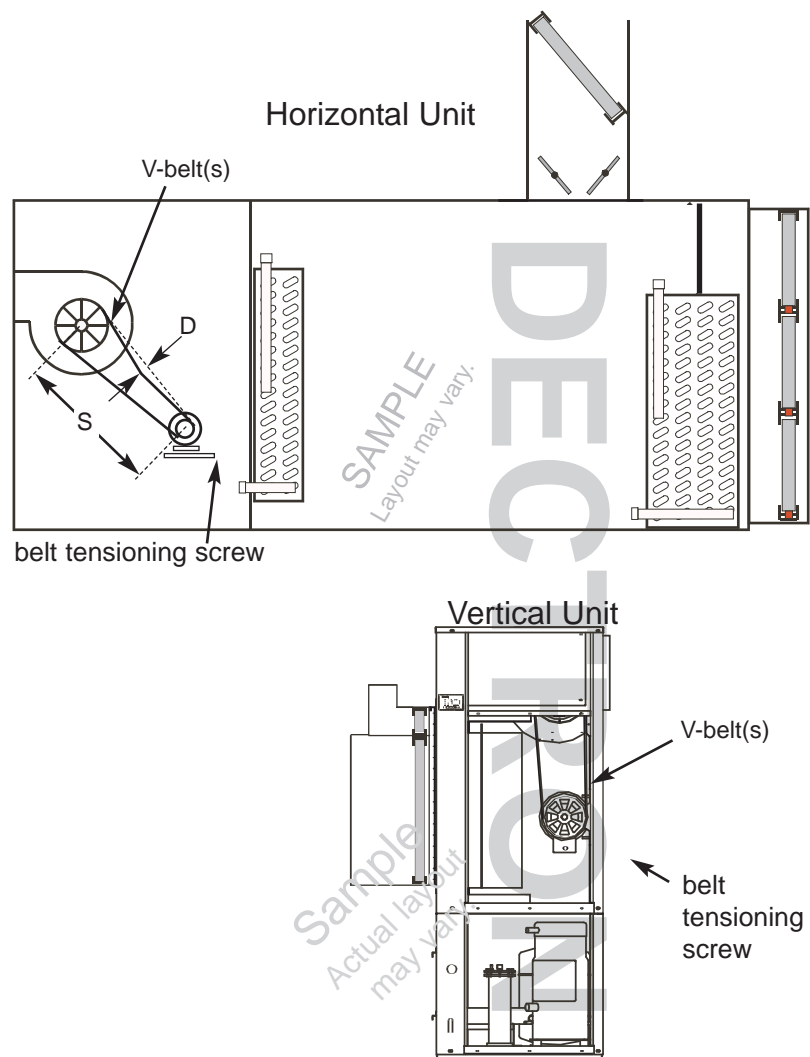
Measure the diameter of the smaller sheave.

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.

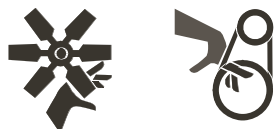
Adjust the belt tension until the measured force necessary to produce the 1/2 inch deflection is about 6.3 pounds.



Check Blower Belts

T.A.B.

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

V-Belt Tensioning

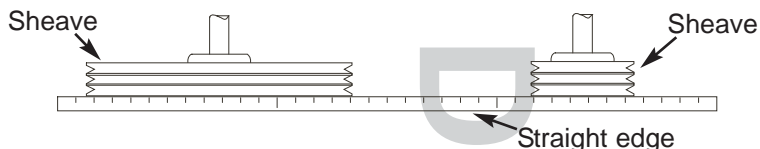
Belt size	Small sheave diameter (in)	Deflection force (lbs.)		
		Initial Installation	Re-tensioning	
			Max.	Min.
A	3.0 - 3.4	3.3	2.9	2.2
	3.6 - 4.2	3.5	3.1	2.4
	4.6 - 6.0	3.7	3.3	2.5
B	4.6 - 5.4	6.0	5.1	4.0
	5.6 - 7.4	6.3	5.5	4.2
	8.6 - 9.4	6.6	5.7	4.4
C	7.0 - 8.5	13.2	11.5	8.8
	9.0 - 12.0	13.9	12.1	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.

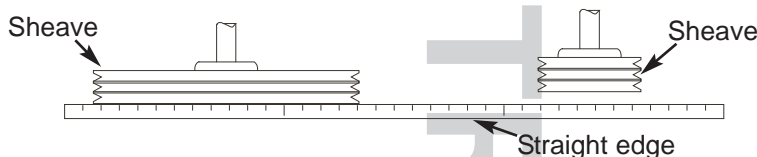
When removing or replacing belts, always relieve the belt tension to position the belts. Severe belt damage and reduction of belt life can be caused by

1. prizing a belt onto a sheave, or
2. walking a belt onto a sheave.

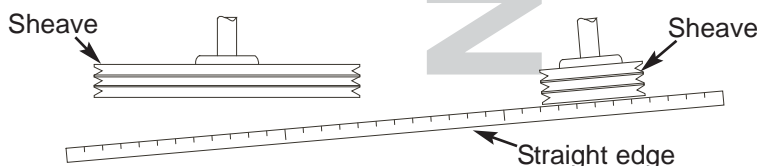
Belt sheaves must be properly aligned, as shown below.



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.



Data subject to change without notice.

T.A.B.

T.A.B. Check Ducts and Refer to Appendices

1. For end-return units, confirm that the the return duct has the minimum straight length of full-sized duct (see **Installation - Unit- Duct Connections**).
2. Confirm that the supply duct has the minimum straight length (see **Installation - Unit-Duct Connections**).
3. Confirm that all ducts have been sized and installed correctly to limit the external static pressure to no more than the specified amount.
4. Confirm that all grilles and diffusers are unobstructed.
5. Confirm that all construction dust and debris has been removed from the ducts.
6. Confirm that any fire dampers are open.

SmartSaver option:

If your unit has the SmartSaver® feature, refer to owners manual [Appendix M3](#) for air-balancing procedures.

Economizer option:

If your unit has the economizer feature, the nameplate model will have the letter "B", e.g. "DBH-242". If so, refer to owners manual [Appendix M5](#) for air-balancing procedures.

Purge option:

If your unit has the Purge feature and/or the EconoPurge® feature, refer to owners manual [Appendix M6](#) for air-balancing procedures.

If your unit does not have the SmartSaver, economizer, or Purge options, then follow the instructions on the next page.

Determine Damper Types

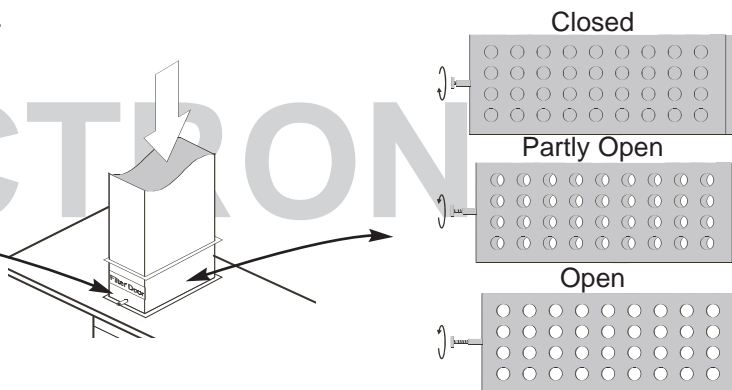
T.A.B.

Determine the type of outdoor-air adjustment -

In some cases, outdoor-air intake may be by others.

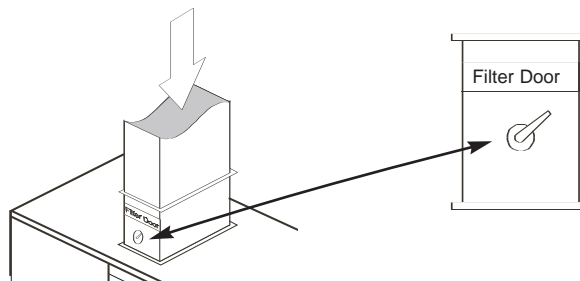
Some units may have sliding perforated plates. An electrically operated vane damper may also be present.

To adjust the perforated plates, turn the adjusting screw counter-clockwise to increase the outdoor air intake, per the instructions on following pages.

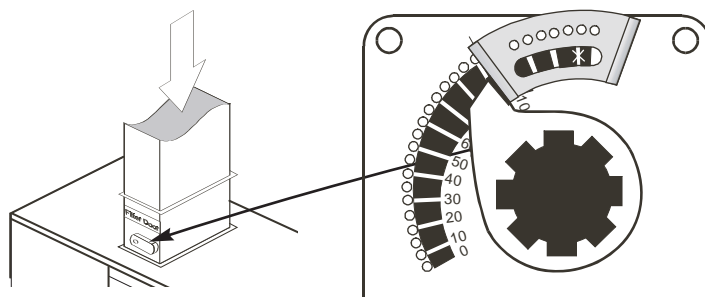


Some units may have a manually adjusted vane damper. In this case, loosen the wing nut, adjust the damper lever, and tighten the wing nut, per instructions on following pages.

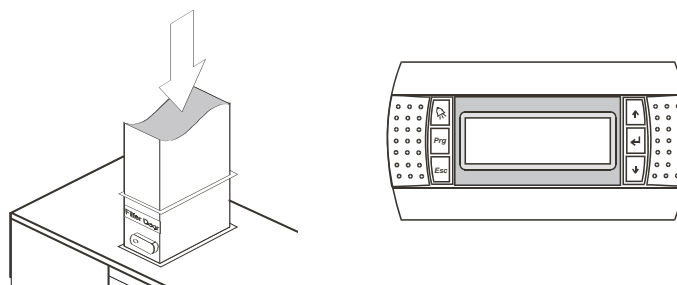
NOTE: Any covers are not shown.



Some units may have a two-wire electrically operated vane damper. In this case, set a screw stop at the correct position on the actuator to limit the maximum damper opening, per the instructions on following pages.



Some units may have a three-wire electrically operated vane damper. In this case, the damper position will be set in software. For units with economizer or Purge options, refer to the instructions in the Purge or economizer appendices.



T.A.B.

T.A.B.

Prepare to Run Blower(s)

WARNING

Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

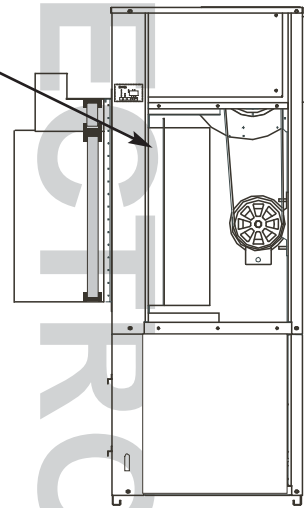
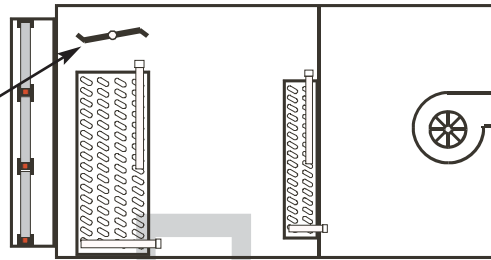
Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.



Confirm that all air filters are clean and in place.

Taking care not to overflow the drain pan, pour a bucket of water into the evaporator drain pan. Be sure the condensate drain system works. Look for leaks in the condensate-drain piping.

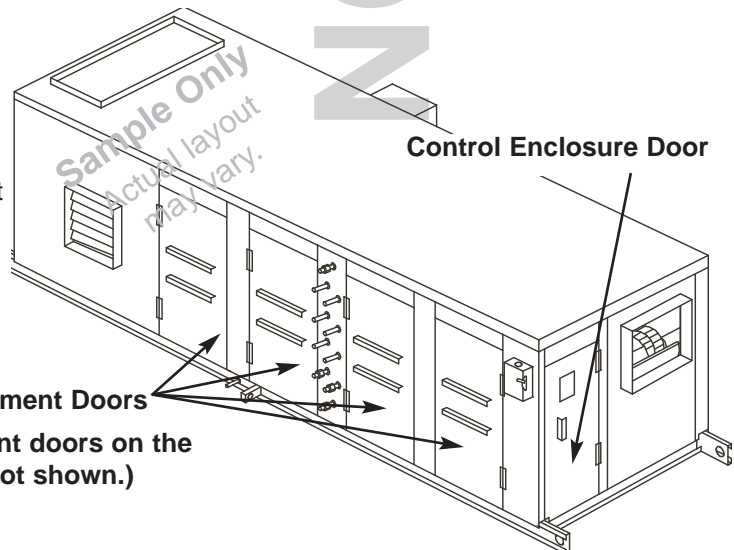
If the evaporator-bypass damper is manually operated, be sure it is completely open.



CLOSE AND LATCH ALL AIR-COMPARTMENT DOORS AND ACCESS PANELS.

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

When the blower starts (instructions on subsequent page), 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.



T.A.B.

Apply Electric Power

T.A.B.

NOTICE Risk of failure to operate.

Before a compressor is operated, the supply-duct airflow must be measured and set by a qualified air-balancing technician. Airflow must be measured with all air-side access doors closed. Airflow must be set and confirmed before the refrigeration system is adjusted.

NOTICE Risk of permanent heat-exchanger damage leading to compressor damage.

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

! WARNING



Risk of electric shock. Can cause injury or death.

Exposed electric terminals may be present inside electrical and control enclosures. Only persons qualified to work with exposed line-voltage terminals should be allowed to open the unit electrical enclosure. All others should disconnect the branch circuit, and lockout and tagout sources of electric energy before opening covers. Follow all safety regulations.

! WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts. Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

See high-voltage warning above.
See moving-parts warning above.

1. If practical and safe to do so, turn on the branch-circuit disconnect switch. On some units the blower may start immediately.
2. If there is an overload device for the blower(s) in the unit electrical enclosure, move the overload switch to the RUN position. On some units the blower may start immediately.

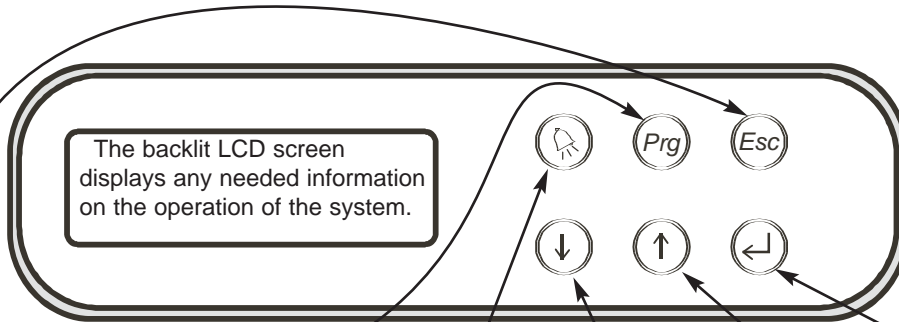
T.A.B.

T.A.B.

Controller Interface

NOTE: Do not mount a controller interface where it may come into contact with air from the natatorium or from the chemical-storage area.

NOTE: If the screen remains blank after electric power is applied to the unit, see next page.



Esc is used to return to previous interface levels.

While in the default screen, press the Prg button to display the program version. If an alarm is being displayed, press Prg to access HELP screens.

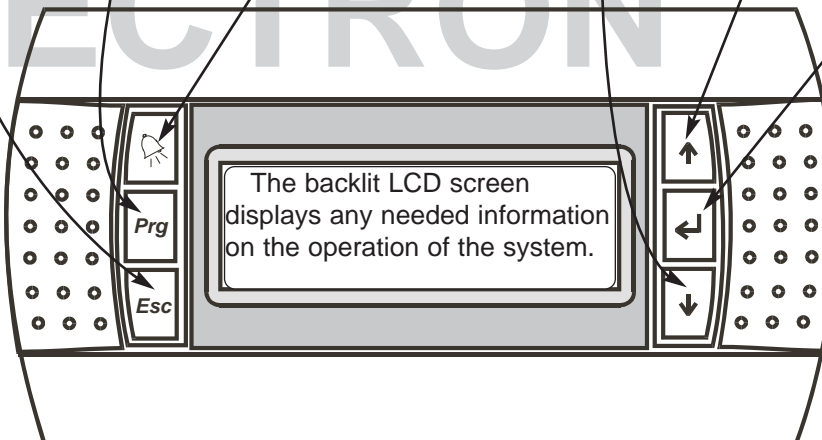
Light bulb icon is used to access the list of alarm conditions, if any exist.

Down arrow is used to scroll downward through screens and to decrease settings.

Up arrow is used to scroll upward through screens and to increase settings.

Left arrow is used to navigate around the screen and to accept inputs.

DECTRON



T.A.B.

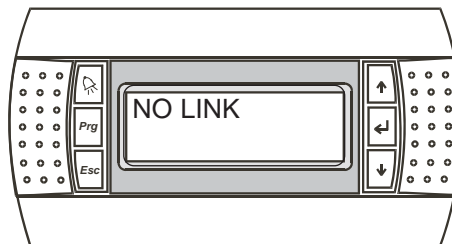
Controller Interface

T.A.B.

Controller display(s) may show the message "NO LINK". Where this is the case, the display addresses must be set.

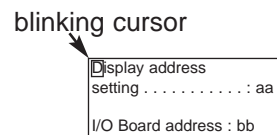
NOTE: The addresses listed below apply only to standard independent units and their controller interfaces.

If your unit or interface is part of a group that includes the optional Shared-Sensors Adapter then follow the addressing instructions in Appendix C7.

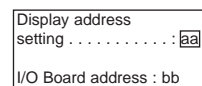


1. If safe to do so, turn on the electric power to the unit.
If the display shows "Humidity" and other information, no further addressing action is needed. If not, proceed to step 2.

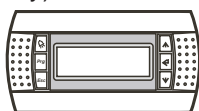
2. Simultaneously press and hold the ↑, ↓, and ↵ buttons for at least five seconds. The screen at right will appear, where **aa** and **bb** are numbers.
NOTE: If **aa** = 0, the text "I/O Board address" will not appear.



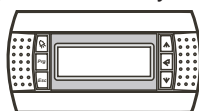
3. Press ↵. The cursor will move to **aa**, as shown.



4. Determine the interface address.
For units made before October 2011,
aa = 0 unless otherwise instructed by Dectron
Go to step 5.
For units made after October 2011, **aa** should be determined as shown here:
(If any) located on unit. (If any) located away from unit.

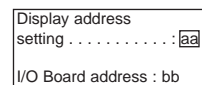


Address = 02

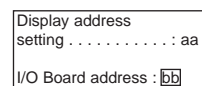


Address = 03

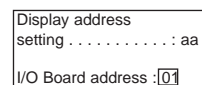
5. Press ↑ or ↓ until **aa** equals the address selected in step 4.



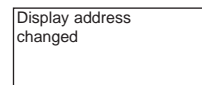
6. Press ↵. The cursor will move to **bb**, as shown at right.
NOTE: If **aa** = 0, the text "I/O Board address" will not appear.



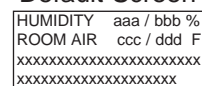
7. If **aa** = 0, the text "I/O Board address" will not appear.
If **aa** ≠ 0, press ↑ or ↓ until **bb** equals 01.



8. Press ↵. The screen at right appears briefly, followed by the unit default screen.



Default Screen

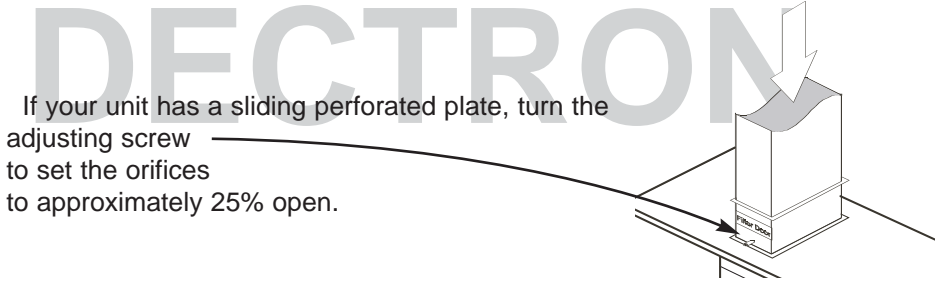


T.A.B.

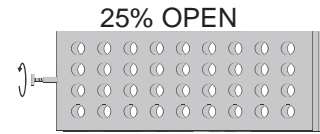
T.A.B.

Air Dampers

For units with the economizer or Purge options, use the airflow-adjustment procedures in the appropriate manual appendix. Otherwise follow the instructions below.

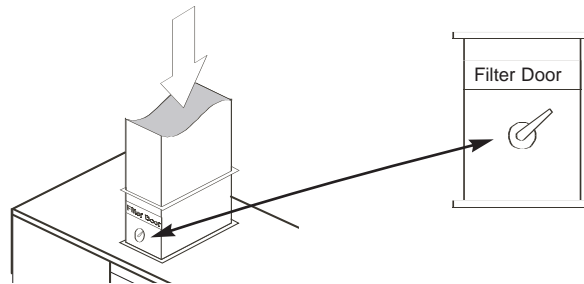


If your unit has a sliding perforated plate, turn the adjusting screw to set the orifices to approximately 25% open.



If your unit has a manually adjusted vane damper, loosen the damper lever's wing nut, open the damper to approximately 25%, and tighten the wing nut.

NOTE: Any covers are not shown.



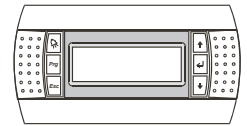
If your unit has only an electrically operated damper for air throttling, then follow these instructions:

Using the controller-interface map below, access the OCCUPIED SELECTION screen.

Press \downarrow to move the cursor to the second line.

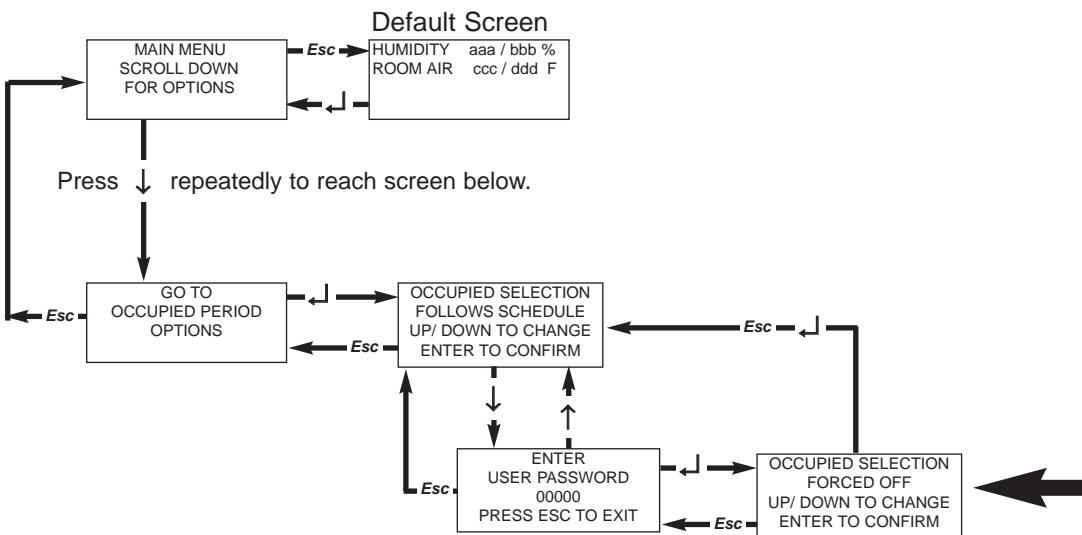


Press \uparrow or \downarrow to change the second line to FORCED OFF. Press \downarrow again to register the change.



If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 1793 or just 17.

T.A.B.



If this screen does not appear, check that the unit has an electrically operated damper for outdoor-air intake. If not, the screen above will not appear, and all adjustments are manual. In some cases, outdoor-air intake may be by others.

Air Dampers

T.A.B.

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Some units have only electrically operated dampers for controlling outdoor-air intake. For units with the economizer or Purge options, use the airflow-adjustment procedures in the appropriate manual appendix.

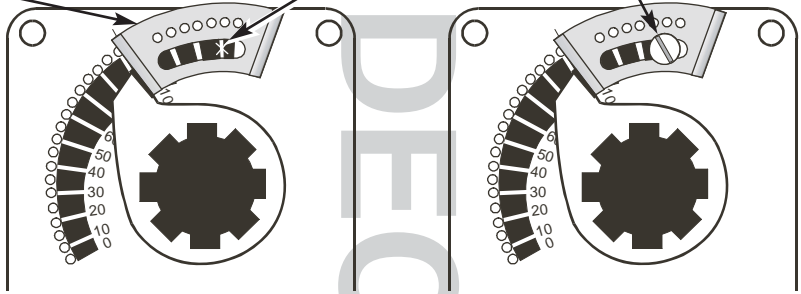
Otherwise:

Place a mechanical stop adapter on the actuator of the outdoor-air intake damper. Approximately 25% open will do for a first approximation. The actual position will vary according to duct pressure drops and other issues. The final position will be determined by trial and error.

Place a stop adapter to block the OUTDOOR AIR damper from opening beyond the required position.

*Samples Only
Actual appearance may vary.*

Press the attaching screw through the label at a line marked with an X. Tighten the screw.

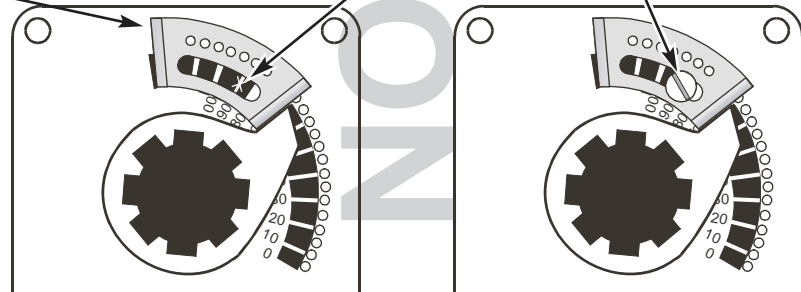


Actuators may be arranged for clockwise or counter-clockwise rotation.

Press the attaching screw through the label at a line marked with an X. Tighten the screw.

Place a stop adapter to block the OUTDOOR AIR damper from opening beyond the required position.

*Samples Only
Actual appearance may vary.*

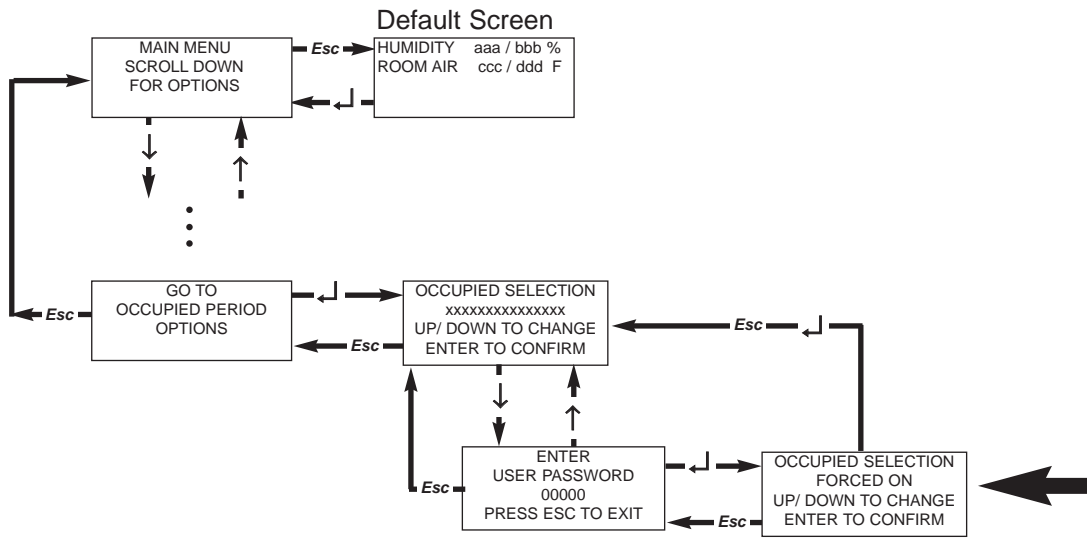
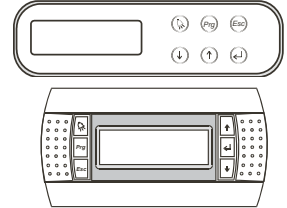


T.A.B.

For units with built-in outdoor-air intake dampers -

Temporarily open outdoor-air damper to normal occupied-period position.

Using the controller-interface map below, access the OCCUPIED SELECTION screen.
 Press \downarrow to move the cursor to the second line.
 Press \uparrow or \downarrow to change the second line to FORCED ON. Press \downarrow again to register the change.
 If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 1793 or just 17.



Allow two minutes for the dampers to move to their new positions.
 Confirm that the outdoor-air intake damper(s) is in the correct position.

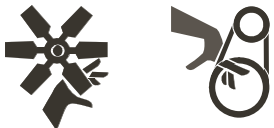
T.A.B.

Enable Blower(s)

T.A.B.

NOTICE Risk of permanent heat exchanger damage leading to compressor damage. Never run the blower without the filters in place. Regardless of filters, never run the blower when construction dust is present. The resulting damage is not covered by the Dectron warranty.

WARNING



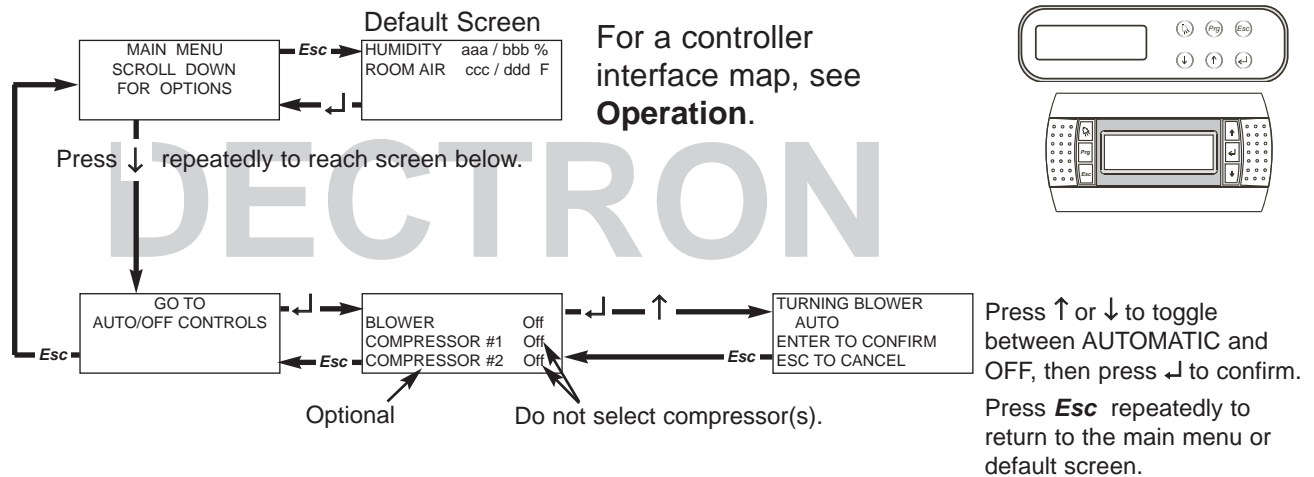
Risk of contact with moving parts. Can cause injury or death.
 This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.
 Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

WARNING



Risk of pinching or crushing. Can cause injury.
 Depending on the size of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury by pinching or crushing.
 Access doors and panels are under a strong negative pressure when the blower(s) is running. Opening doors may be difficult. Closing doors must be done with a tool to prevent hands from being caught.

Follow the steps below to start the blower. If prompted for a password on units made before 4/2005, enter 1793. For units made after 4/2005, enter 17 or 1793.



Note the direction of rotation of the blower wheel. Refer to the following page for proper rotation direction.
 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 unit input lugs. Torque the connectors as specified in the NEC or other relevant electrical code.

NOTICE Risk of unit damage. Do not move any factory-installed wires.

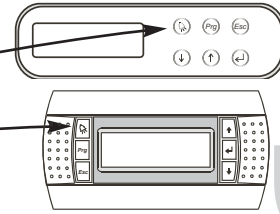
If the blower does not run at all, check the controller ALARM messages, per the following page. If one of the messages is VOLTAGE FAILURE, see following pages.

T.A.B.

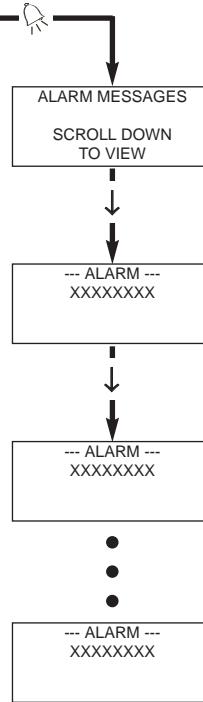
T.A.B.

Enable Blower(s)

If the supply blower fails to run, check the controller interface.



If the alarm button is illuminated, press it to see the current alarm(s). Press ↓ repeatedly to see all current alarms¹.



! WARNING



Risk of electric shock. Can cause injury or death. Exposed electric terminals may be present inside electrical and control enclosures. Only persons qualified to work with exposed line-voltage terminals should be allowed to open the unit electrical enclosure. Follow all safety regulations.

VOLTAGE FAILURE

If the alarm VOLTAGE FAILURE appears, then the unit is equipped with a voltage monitor, which prevents operation in the event of over-voltage, under-voltage, phase loss, or phase-sequence reversal. (See following pages.) In this case, a person qualified to work with exposed line-voltage electric terminals should determine which failure condition is present, and correct as necessary. Continuous operation with voltages greater than 110% of nameplate voltage or less than 90% of nameplate voltage may damage motorized equipment. Where this is the case, consult an electrician for corrective measures. Operation with a missing phase may damage motorized three-phase equipment. Correct any missing phase. Phase-sequence reversal will cause three-phase motors to turn backward.

! WARNING

Risk of electric shock. Can cause injury or death. Disconnect, lock, and tag all sources of electric energy before disconnecting any wires. Where phase-sequence reversal is indicated, a qualified person should interchange any two branch-circuit wires.

NOTICE

Risk of unit damage. Do not alter any factory-installed wires.

- 1. For an explanation of an alarm, press **Prg** while the alarm message is being displayed. For a list of alarm messages, see **Operation - Alarm Messages**.

T.A.B.

DECTRON

Voltage Monitor

T.A.B.

UNITS WITH VOLTAGE MONITOR ONLY



Risk of electric shock. Can cause injury or death.



Exposed electric terminals may be present inside electrical and control enclosures. Access to the voltage monitor (if any) may require opening the electrical enclosure. Only persons qualified to work with exposed line-voltage terminals should be allowed to open the unit electrical enclosure. Follow all safety regulations.



Risk of contact with moving parts. Can cause injury or death.

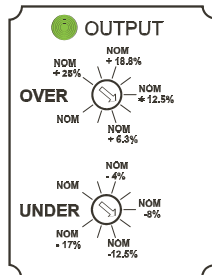


This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

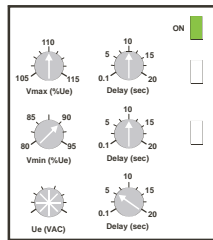
Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Identify the type of voltage monitor present.

TYPE 1



TYPE 2



For TYPE 2 monitors, skip to next page.

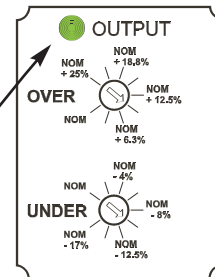
Type 1 Voltage Monitor

After power wiring is complete, and when safe to do so, 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. Be sure that the knob(s) are set correctly.

The over-voltage setting should be at nominal voltage plus 10%.

The under-voltage setting should be at nominal voltage minus 10%.



Data subject to change without notice.

Dectron, Inc. March 2012

T.A.B.

UNITS WITH TYPE 2 VOLTAGE MONITOR ONLY

Be sure the Vmax time delay is set to 10 seconds.

Be sure that Vmax is set to 110%. Higher values may allow overheating of internal motors.

Do not adjust the voltage monitor without explicit instructions from Dectron.

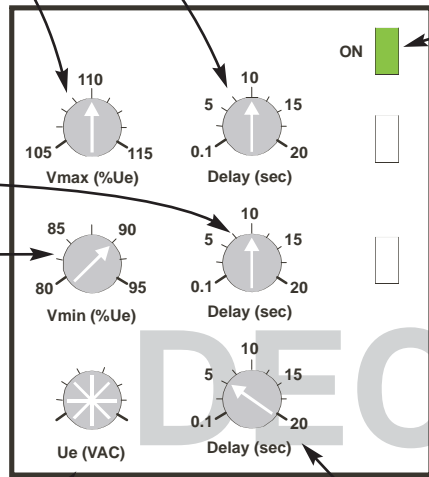
Be sure the Vmin time delay is set to 10 seconds.

Be sure that Vmin is set to 90%. Lower values may allow overheating of internal motors.

Do not adjust the voltage monitor without explicit instructions from Dectron.

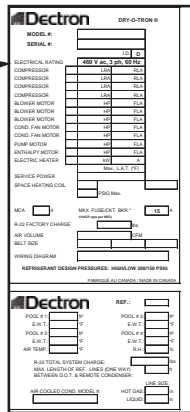
When the branch circuit voltages are correct, the green ON LED should be on.

If it is not on, or is flashing, see the following page for more details.



Be sure that Ue is set to the nominal voltage shown on the Dectron nameplate.

Be sure the Ue time delay is 5 seconds or less.

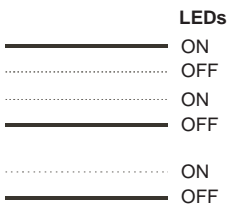
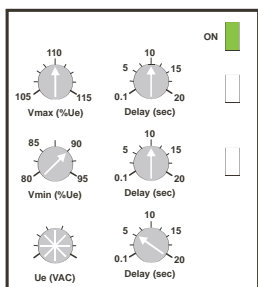


T.A.B.

Voltage Monitor

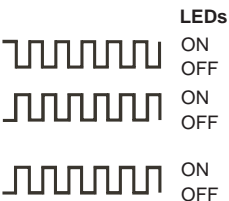
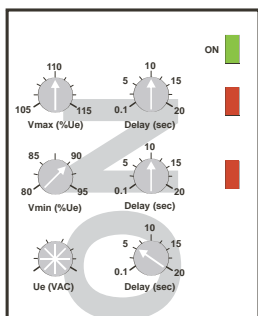
T.A.B.

UNITS WITH TYPE 2 VOLTAGE MONITOR ONLY



Normal

When the green LED is on steady, the voltages are within normal range, all voltages are present, and the phase sequence is correct. No action is needed.

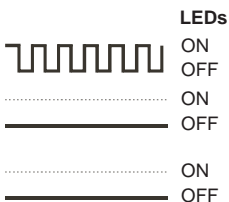
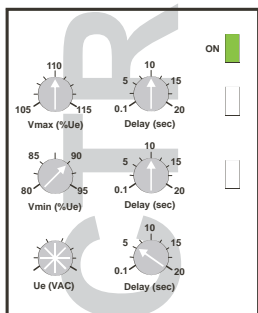


Incorrect Phase Sequence

When the green LED alternates with both red LEDs, the branch-circuit phase sequence is wrong, and the DRY-O-TRON cannot operate.

Disconnect electrical power from the branch circuit, follow all safety procedures, and remove any two branch-circuit conductors from the input lugs. Exchange their places and re-connect. Tighten as appropriate. Do not change any factory-installed wires.

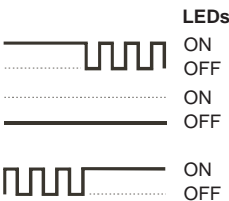
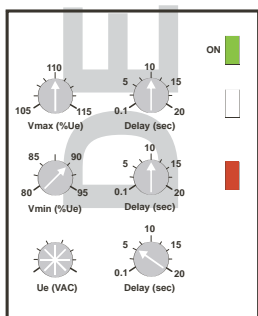
Following all safety procedures, re-apply electrical power. The voltage monitor should be normal as shown above.



Phase Loss

When the green LED is flashing and with both red LEDs are off, the incoming branch circuit does not have all three phases, and the DRY-O-TRON cannot operate.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

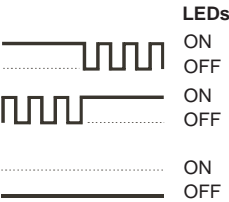
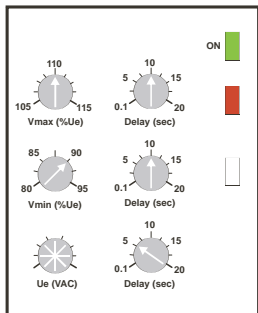


Incoming Voltage Below Minimum Allowable

When the green LED is flashing and the lower red LED is on, the incoming voltage is too low, and the DRY-O-TRON cannot operate.

Voltages below this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.



Incoming Voltage Above Maximum Allowable

When the green LED is flashing and the upper red LED is on, the incoming voltage is too high, and the DRY-O-TRON cannot operate.

Voltages above this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

T.A.B.

T.A.B.

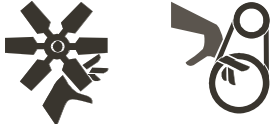
Check Blower Rotation

! WARNING

Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

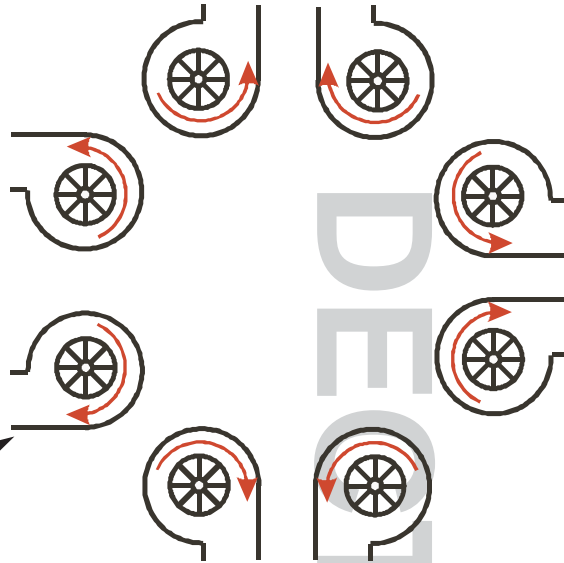


Prepare to adjust airflow -

CAUTION: Never touch or approach a blower, belts, or sheaves while the branch circuit is powered. Personal injury could result.

Some units may have blowers with housings called "scrolls". In this case, the blower-wheel rotation should be as shown here.

Choose the picture at right which appears most like your blower. Be sure the rotation is as shown.



Scroll

! WARNING

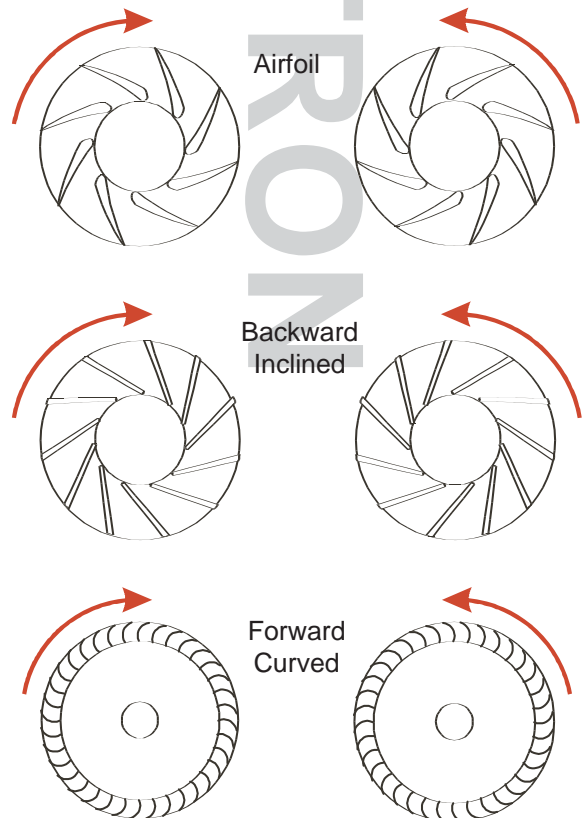
Risk of contact with swinging doors. Can cause injury.

Where plenum blowers are present the blower compartment may be pressurized. Unlocking a door while the blower is turning could allow the door to swing open violently.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

CAUTION: Never touch or approach a blower, belts, or sheaves while the branch circuit is powered. Personal injury could result.

Some blowers on some units may have plenum blowers, which do not have scrolls. In this case, compare the tilt of the vanes on the blower wheel to the diagrams at right. The direction of rotation should be as shown here.



Airfoil

Backward Inclined

Forward Curved

T.A.B.

Optional Blower-Mount Isolators

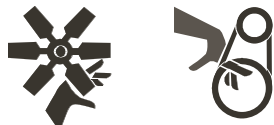
T.A.B.

WARNING

Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.



Units with optional spring-mounted blower(s) only

Adjust the mounting springs to float without putting tension on the fabric duct section.

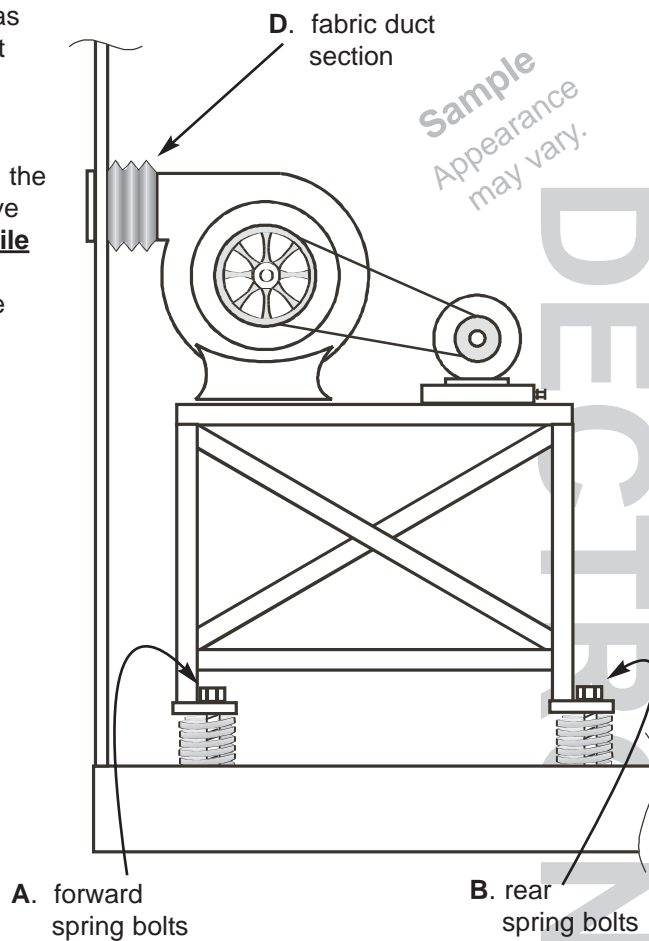
NOTICE Risk of unit damage.

Excessive force on the flexible duct section can cause it to tear.

Some units may have spring-mounted blower frames, as shown here. When the blower is running, reaction thrust may cause the fabric duct section to become tightly stretched.

Adjust the spring-bolt pairs (A) and (B) to keep slack in the fabric duct section (D). The fabric duct section must have slack forward and backward as well as left and right, **while the blower is running**. It may be necessary to use magnetic-base dial gages or other methods to determine blower-running position while access doors are closed.

Use shims under the springs as necessary.



T.A.B.

T.A.B. Locate Airflow Measurement Points

Locate airflow measurement planes.

This is not a convenience air conditioner - it is a process dehumidifier. Proper airflow is essential.

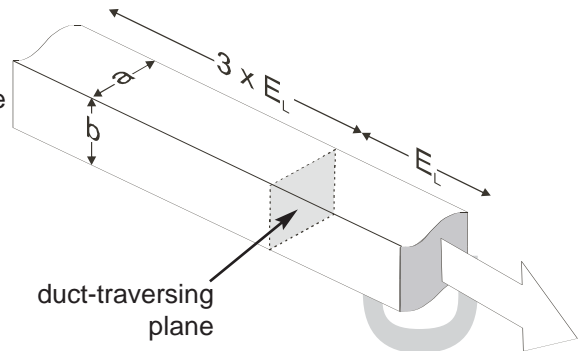
Supply-air flow should be calculated from a duct traverse, per ANSI/ASHRAE 111-2008 or other applicable procedure.

Locate sections of the supply duct, the outdoor-air intake duct (if any), and the exhaust-air duct (if any) for airflow measurement. The traversing plane for airflow measurement should be accessible and

1. full-sized, unbranched, and straight for at least three effective duct diameters upstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater, and
2. full-sized, unbranched, and straight for at least one effective duct diameter downstream of the traversing plane, or per ASHRAE 111-2008, whichever is greater.

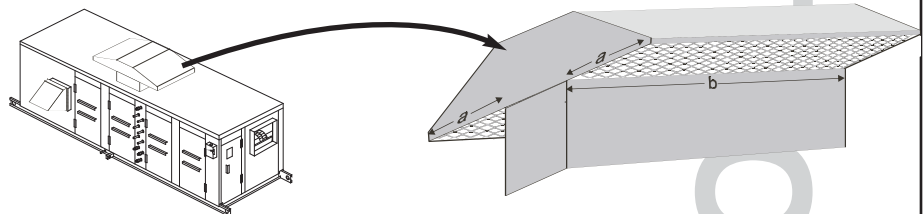
For this purpose, the effective duct diameter E_L is given by

$$E_L = \sqrt{4ab / \pi}$$



Outdoor-air-intake flow and exhaust-air flow should be calculated from a duct traverse, where ducts are available.

Some outdoor units have top hoods for outdoor-air intake. In this case, measure air speed at several points across the bird screen, using a rotating-vane anemometer per ANSI/ASHRAE 111-2008 or other applicable procedure. The cross-sectional area will be twice the dimension **a** times dimension **b**.

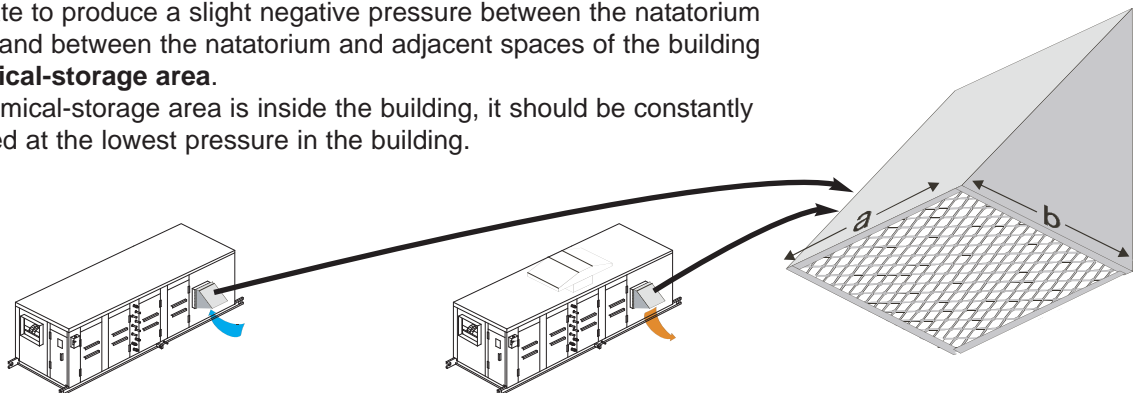


Outdoor-air-intake flow and exhaust-air flow should be calculated from a duct traverse, where ducts are available.

Some outdoor units may have side hoods instead of ducts. In this case, measure air speed at several points across the bird screen, using a rotating-vane anemometer per ANSI/ASHRAE 111-2008 or other applicable procedure. The cross-sectional area will be dimension **a** times dimension **b**.

If reliable side-hood exhaust-air speeds cannot be determined, adequate results can be obtained by adjusting the exhaust-air flow rate to produce a slight negative pressure between the natatorium and the outdoors, and between the natatorium and adjacent spaces of the building **except any chemical-storage area**.

NOTE: If the chemical-storage area is inside the building, it should be constantly maintained at the lowest pressure in the building.



Determine Outdoor-Air Intake Rate

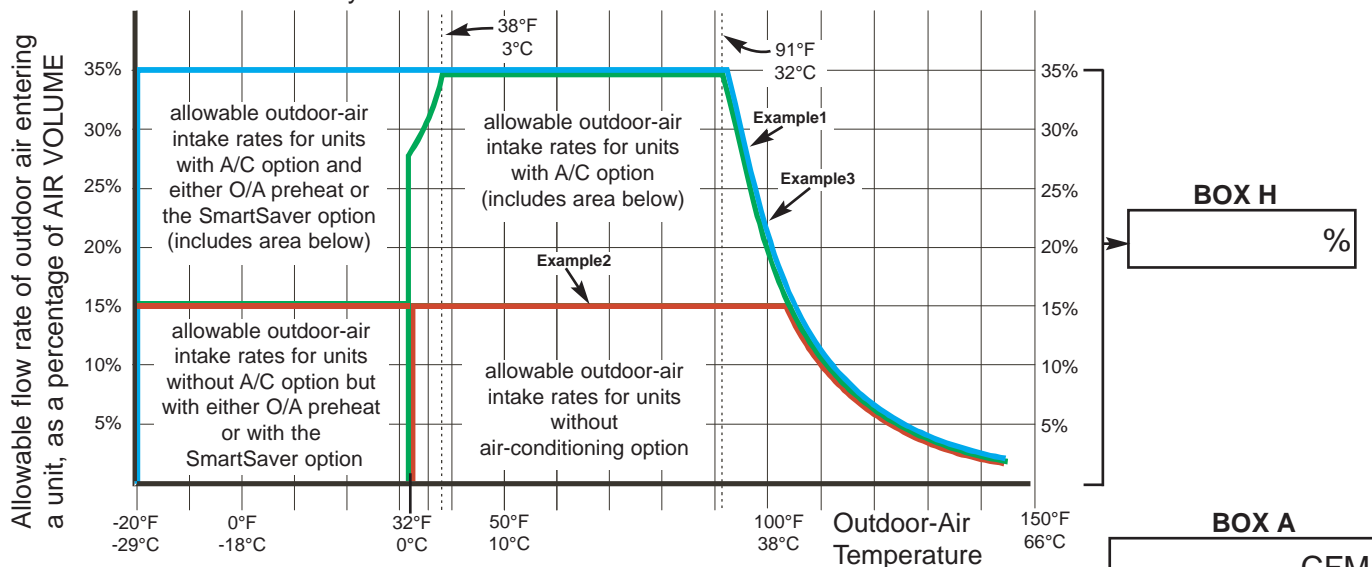
T.A.B.

NOTICE

Risk of unit damage. Risk of building damage from water leakage.
Apply the requirements applicable to your unit. Do not confuse options.

Determine Airflow Rates

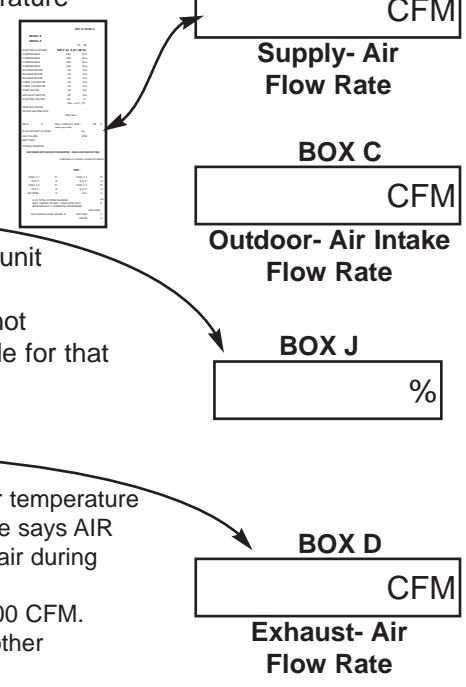
- Note that only units with outdoor-air intake ports can accept outdoor air. **Outdoor air must never enter a return duct.**
- Note that outdoor air may have to be heated (by others) before entering a unit.
- On the chart below, draw a vertical line from the lowest expected outdoor air temperature that will enter the unit.
- On the chart below, draw a vertical line from the highest expected outdoor air temperature that will enter the unit.
- Determine if the unit has the air-conditioning option. Using the correct curve in the chart below, select the lowest allowable percentage of outdoor air for the curve between the low and high temperatures.
 - Example1:** For A/C mode and entering outdoor-air temperatures between 40°F and 97°F, the lowest percentage is 25%.
 - Example2:** For no A/C mode and entering outdoor-air temperatures between 32°F and 95°F, the lowest percentage is 15%.
- Enter this lowest value for your conditions in **BOX H**.



- Copy your nameplate value AIR VOLUME into **BOX A** at right.
- Copy the desired outdoor-air intake rate for occupied periods from the project specifications into **BOX C** at right.
- Multiply the value in **BOX C** times 100 and divide by the value in **BOX A**. Enter the result in **BOX J**.

$$(\text{BOX C}) \times 100 \div (\text{BOX A}) = \text{BOX J}$$
- If the value in **BOX J** is less than or equal to the value in **BOX H**, then a unit equipped with outdoor-air intake will suffice for that amount of outdoor air. If the value in **BOX J** is greater than the value in **BOX H**, or if the unit is not equipped with an outdoor-air intake, then other arrangements must be made for that amount of outdoor air flow. **Do not attempt to exceed the maximum.**
- Multiply the value in **BOX C** by 1.1. Enter this value in **BOX D**.

$$(\text{BOX C}) \times 1.1 = \text{BOX D}$$



Example3: A unit with A/C option is installed at a site where the minimum outdoor air temperature is 35°F and the maximum outdoor temperature is 102°F. The unit nameplate says AIR VOLUME is 3000 CFM. The job specifications call for 700 CFM of outdoor air during occupied periods.
BOX H would be 19%. **BOX A** would be 3000 CFM. **BOX C** would be 700 CFM. **BOX J** would be 23%. Twenty-three percent is larger than 19%, therefore other arrangements must be made to bring in that amount of outdoor air.

Data subject to change without notice.

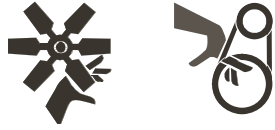
T.A.B.

T.A.B. Test, Adjust, and Balance Airflows

WARNING

Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.



Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

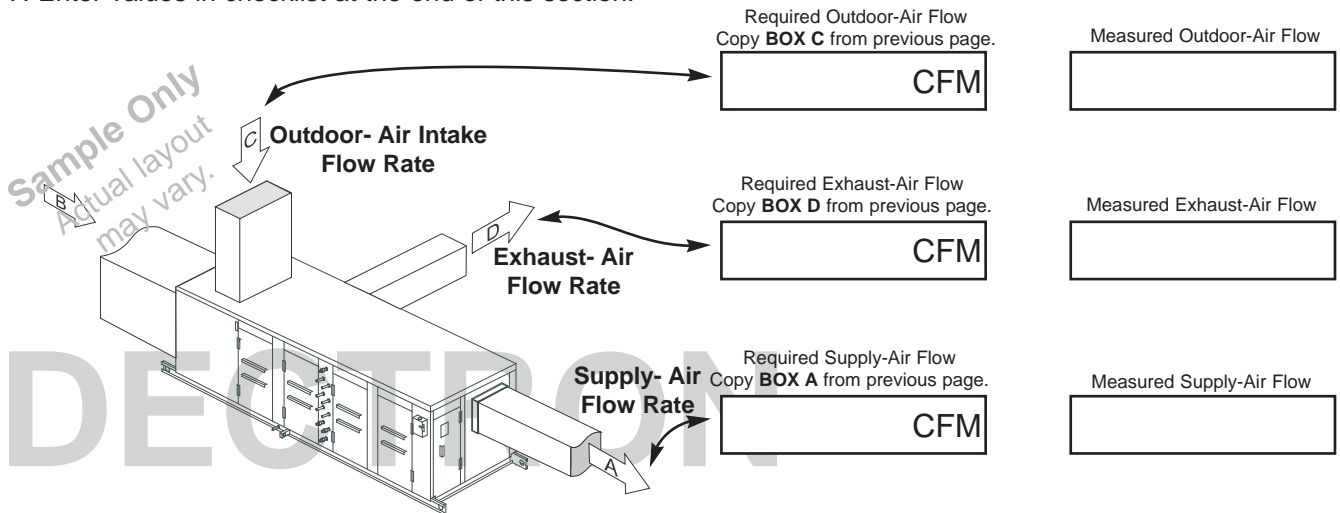
Refer to ANSI / ASHRAE Standard 111-2008.

The following procedure does not apply to units with the Economizer feature(see [Appendix M5](#)) or the Purge feature (see [Appendix M6](#)).

If the exhaust system (if any) is by others, then the exhaust airflow should not be allowed to interfere with the unit airflow or with the air-balancing effort.

- Following all appropriate safety procedures, adjust blower speed as necessary to cause supply airflow **A** to be within $\pm 10\%$ of the value in **BOX A**. Note that blower current is not an adequate measure of airflow. Do not exceed maximum speed of blower. Do not exceed maximum current of blower motor.
NOTE: Some blower motors may be part-winding start (2 contactors). In this case, measure the total blower-motor current, not the part-winding current. Do not confuse part-winding with Y- Δ start (3 contactors).
- Adjust outdoor volumetric airflow **C** to be approximately equal to the value shown in **BOX C**. To do this, temporarily disconnect power from the unit and move the outdoor-air damper stop (see previous page), then re-connect power. Measure airflow **C** and repeat as necessary.
NOTE: For outdoor units with hooded intakes, see notes on following page.
- Some units may be equipped with an optional exhaust blower. In this case, adjust exhaust volumetric airflow **D** to the value shown in **BOX D**. Note that blower current is not an adequate measure of airflow.
NOTE: For outdoor units with hooded exhausts, see notes on second page previous.
- If the exhaust system (if any) is by others, adjust the exhaust volumetric airflow to approximately 110% of air flow **C** to maintain a slight negative pressure on the space.
- Confirm that supply airflow **A** is still equal to the nameplate value within $\pm 10\%$. Correct as necessary. Do not exceed maximum speed of blower. Do not exceed maximum current of blower motor.
NOTE: Some blower motors may be part-winding start. In this case, measure the total blower-motor current, not the part-winding current.
- Airflow A and airflow C (if any) and airflow D (if any) must be correct at the same time.** Check again to be sure. If any airflow is not correct, correct it as necessary and check all airflows again. If all airflows are correct, proceed to next page.
- Enter values in checklist at the end of this section.

T.A.B.



Data subject to change without notice.

Dectron, Inc. March 2012

Set Pool-Water Flows

T.A.B.

For proper pool-heating, standard units must have a constant pool-water flow rate within $\pm 10\%$ of the values shown.

NOTE: Unit-specific requirements take precedence. Check other documents for any special requirements.

1. Run main pool pump **1** (by others).
2. Adjust auxiliary pool-pump suction pressure switch **2** (if any)(by others), so that it closes when the pool-filter flow is above 3/4 of rated flow, and opens when pool-filter flow is below 1/4 of rated flow.
3. Run auxiliary pool pump **3** (if any)(by others). If pump 3 is not present, valve **4** must be adjusted to produce the rated flow in the unit. Consult with the person responsible for pool filtration.
4. Using either
 - a) flowmeter **5** and throttle valve **7**, or
 - b) balancing valve **6**, (by others, whichever is present) adjust the pool-water flow per the chart shown or other Dectron document.

NOTE: An auxiliary pool heater may be by others or may be provided by Dectron. Where by Dectron, it may be built onto the unit.

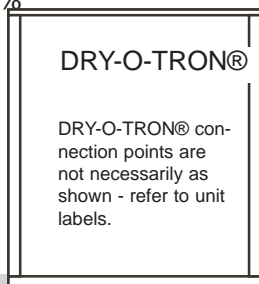
5. Mark the adjusting devices as having been set.
6. Fill in the appropriate boxes below and in the checklist at the end of this section.
7. Repeat these steps for any subsequent pools connected to the unit.

Measured Pool1-Water Flow

Measured Pool2-Water Flow

Measured Pool3-Water Flow

Measured Pool4-Water Flow



NOTICE Risk of unit damage.

Excessive flow rates can damage heat exchangers. Inadequate flow rates can cause failure to operate and can damage heat exchangers.

Unit Size	Standard Pool-Water Flows GPM (LPM)		Unit Size	Standard Pool-Water Flows GPM (LPM)	
	without built-on auxiliary pool heater	with built-on auxiliary pool heater		without built-on auxiliary pool heater	with built-on auxiliary pool heater
010	6 (23)	12 (46)	202	40 (151)	80 (303)
015	6 (23)	12 (46)	204	52 (197)	104 (394)
020	6 (23)	12 (46)	242	60 (227)	120 (454)
030	8.5 (32)	17 (64)	244	60 (227)	120 (454)
040	8.5 (32)	17 (64)	282	80 (303)	160 (606)
042	12 (45)	24 (90)	284	80 (303)	160 (606)
050	15 (57)	30 (114)	362	80 (303)	160 (606)
060	20 (76)	40 (151)	364	80 (303)	160 (606)
062	17 (64)	34 (129)	368	104 (394)	208 (787)
080	20 (76)	40 (151)	402	120 (454)	240 (909)
082	17 (64)	34 (129)	404	120 (454)	240 (909)
100	20 (76)	40 (151)	408	120 (454)	240 (909)
102	26 (98)	52 (197)	482	120 (454)	240 (909)
120	20 (76)	40 (151)	484	104 (394)	208 (787)
122	30 (114)	60 (227)	488	120 (454)	240 (909)
150	40 (151)	80 (303)	562	160 (606)	320 (1211)
152	40 (151)	80 (303)	564	160 (606)	320 (1211)
162	40 (151)	80 (303)	568	160 (606)	320 (1211)
164	34 (129)	68 (257)	804	240 (909)	480 (1817)
182	40 (151)	80 (303)	808	240 (909)	480 (1817)
184	52 (197)	104 (394)			

T.A.B.

T.A.B. Set Optional Cooling-Water Flow

! WARNING



Risk of electric shock. Can cause injury or death.

Exposed electric terminals may be present inside electrical and control enclosures. Access to the voltage monitor (if any) may require opening the electrical enclosure. Only persons qualified to work with exposed line-voltage terminals should be allowed to open the unit electrical enclosure. Follow all safety regulations.

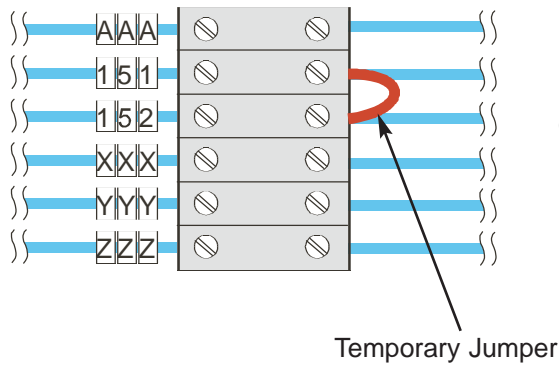
Units with Water-Cooled Air-Conditioning Only

Locate the field-wiring terminal strip in the unit electrical enclosure.

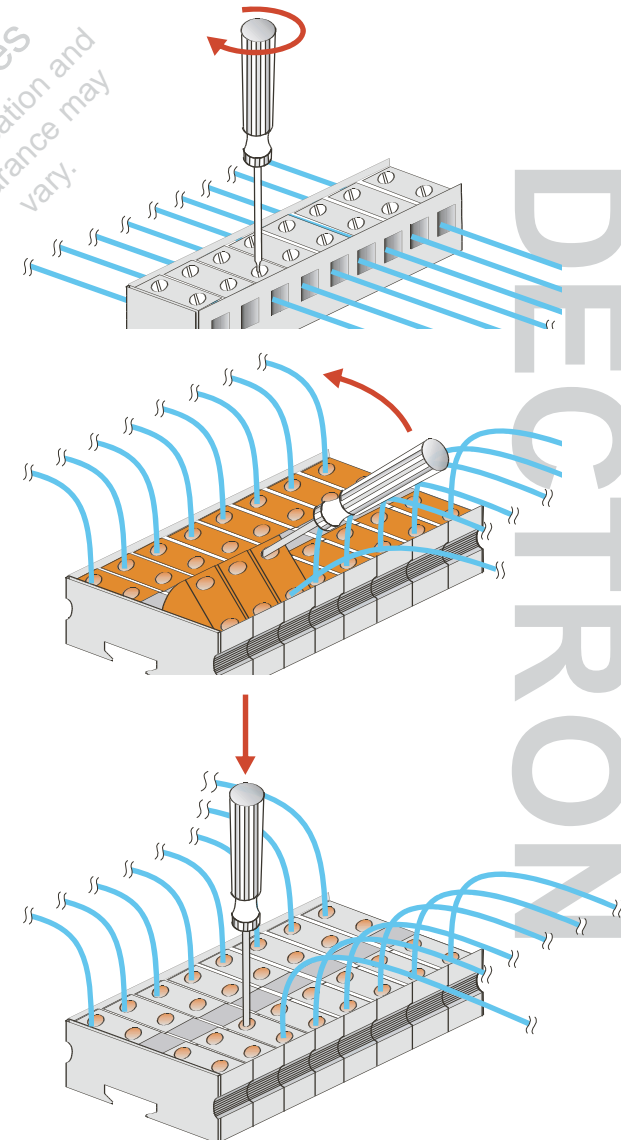
Refer to the unit wiring diagram. Determine the wire numbers for the cooling-water-pump output, e.g. 151 and 152.

On the field-wiring terminal strip, locate those wires and jumper them together. There are several possibilities for terminal strip styles - see diagrams below.

The presence of the jumper should bring on the cooling-water pump, open necessary valves, etc.



*Samples
Actual location and
appearance may
vary.*



DECTRON

T.A.B.

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

Set Optional Cooling-Water Flow

T.A.B.

CONDENSER FLUID FLOW - units with water-cooled air conditioning only

Units with optional water-cooled air conditioning must have a constant flow of water that is at or below 90°F. Where this cannot be achieved, contact Dectron. Contact Dectron before changing to any fluid other than water.

NOTE: Some sites may require cooling even during cool weather. Water flow must be available at all times.

Note the size of the unit from the unit nameplate.

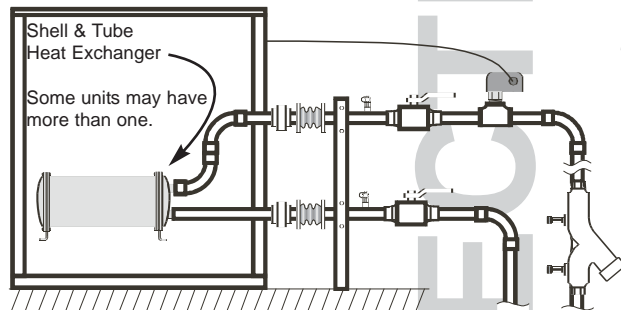
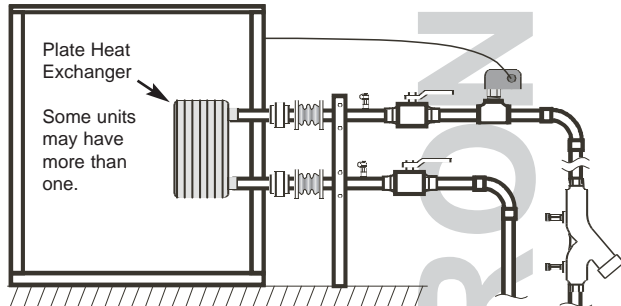
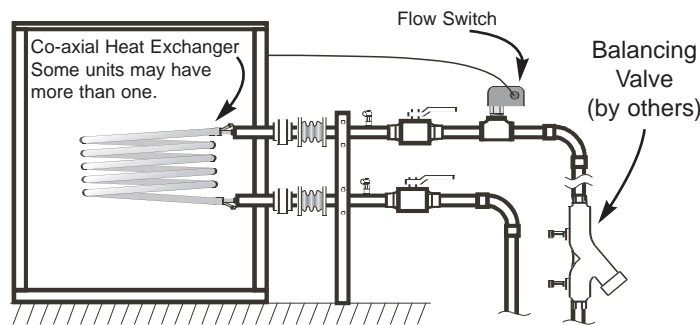
Determine the type of cooling heat exchanger from the diagrams below.

NOTE: Do not confuse pool heat exchangers with cooling heat exchangers.

Determine the water flow rate from the table shown here.

NOTICE Risk of unit damage.

Excessive flow rates can damage heat exchangers. Inadequate flow rates can cause failure to operate.



Measured Cooling-Water (if any) Flow

DECTRON
Samples
Appearance
may vary.

DECTRON
Samples
Appearance
may vary.

Size	Co-axial HX GPM (LPM) Water @ 90°F (32°C)	Plate HX GPM (LPM) Water @ 90°F (32°C)	Shell & Tube HX GPM (LPM) Water @ 90°F (32°C)
010	6 (23)		
015	6 (23)		
020	8.5 (32)	8 (30)	
030	15 (57)	10 (38)	
040	20 (76)	15 (57)	
042	17 (64)	16 (61)	
050	20 (76)	20 (76)	
060	30 (114)	20 (76)	
062	30 (114)	20 (76)	
080	40 (151)	30 (114)	
082	40 (151)	30 (114)	
100	40 (151)	40 (151)	
102	40 (151)	40 (151)	
120	60 (227)	50 (189)	
122	60 (227)	50 (189)	
150	60 (227)	60 (227)	
152	80 (303)	60 (227)	
162	80 (303)	70 (265)	
164	80 (303)	60 (227)	
182	80 (303)	80 (303)	
184	80 (303)	80 (303)	
202		80 (303)	100 (379)
204		90 (341)	100 (379)
242		100 (379)	120 (454)
244		100 (379)	120 (454)
282		120 (454)	140 (530)
284		120 (454)	160 (606)
362		160 (606)	140 (530)
364		160 (606)	160 (606)
368		160 (606)	160 (606)
402		180 (681)	190 (719)
404		180 (681)	200 (757)
408		180 (681)	200 (757)
482		120 (454)	240 (909)
484		200 (757)	240 (909)
488		200 (757)	240 (909)
562		240 (909)	280 (1060)
564		240 (909)	280 (1060)
568		240 (909)	320 (1211)
804		360 (1363)	380 (1438)
808		360 (1363)	400 (1514)

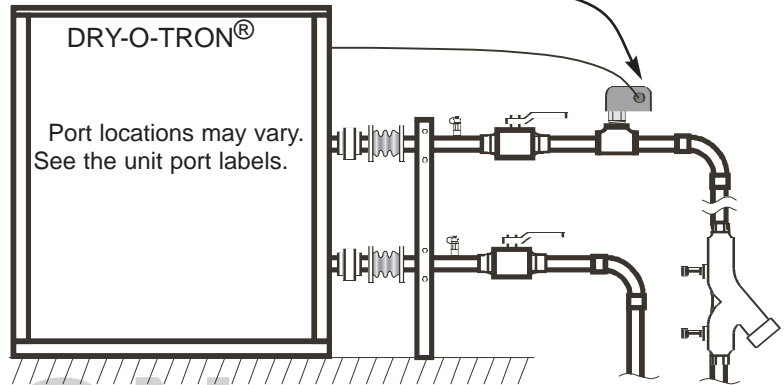
T.A.B.

Data subject to change without notice.

T.A.B. Set Optional Cooling-Water Flowswitch

Units Equipped for Water-Cooled Air Conditioning Only

Locate the cooling-water flow switch.



Sample
Actual location and
appearance may
vary.

DECTRON

Remove and retain the flowswitch cover.
Do not allow objects to fall onto the inner workings.



NOTE: Do not turn this screw without expressed instructions from Dectron. Adjust the flow switch using only this set-point adjustment screw. Do not turn any other screws. Do not bend frames.

NOTE: For adjustment ranges, see table in **Installation-Piping- Water- or Fluid-Cooled A/C.**

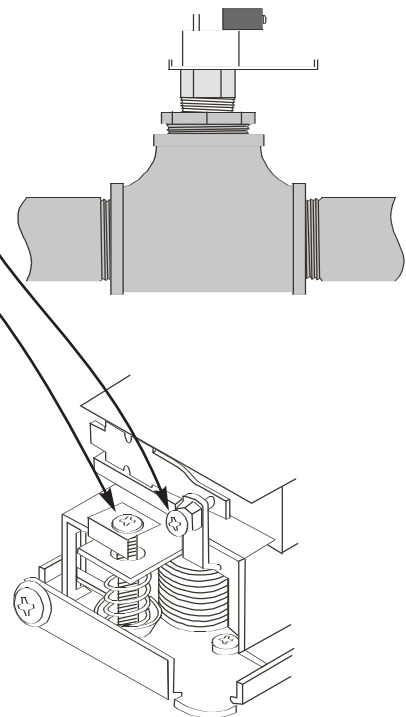
Establish the proper flow rate. See previous page.

CAUTION: If the set-point adjustment screw is turned too far counter-clockwise, there will be a point of slightly increased resistance to turning. **Beyond this point the screw will break off.**

Adjust the flow switch setpoint-adjustment screw until the contacts (**C** and **A**) close reliably for proper flow. Turning the screw clockwise raises the set point. Turning the screw counter-clockwise lowers the set point.

Test the function of the flow switch several times by starting and stopping the flow. Be sure that flow closes the switch contacts (**C** and **A**) reliably and that loss of flow breaks the switch contacts (**C** and **A**) reliably.

Replace the flow switch cover. If possible and safe to do so, leave the cooling water flowing.



Remove the jumper that was installed on third page previous.

Set Optional DryCooler Flow

T.A.B.

! WARNING



Risk of electric shock. Can cause injury or death.

Exposed electric terminals may be present inside electrical and control enclosures. Access to the voltage monitor (if any) may require opening the electrical enclosure. Only persons qualified to work with exposed line-voltage terminals should be allowed to open the unit electrical enclosure. Follow all safety regulations.

Units with DryCooler-Cooled Air-Conditioning Only

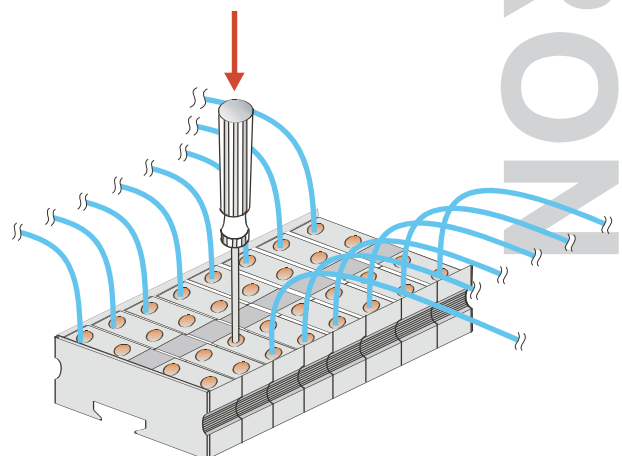
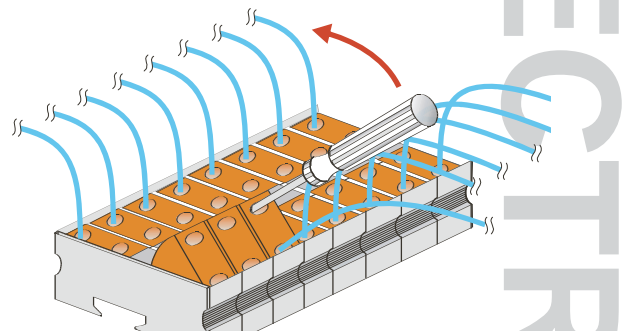
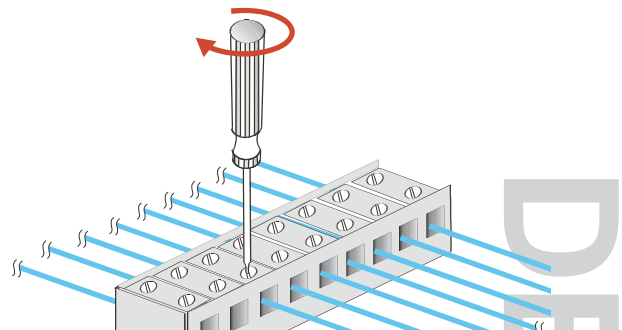
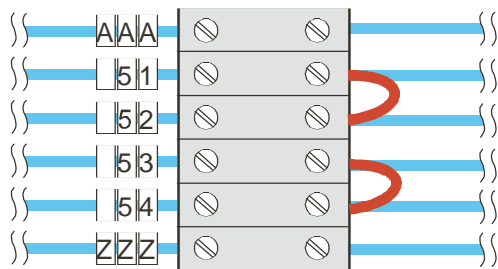
Request and refer to Appendix M1 DryCooler.

Locate the field-wiring terminal strip in the unit electrical enclosure.

Refer to the unit wiring diagram. Determine the wire numbers for the DryCooler output, e.g. 51 and 52. Some units may have a second pair of wires, e.g. 53 and 54.

On the field-wiring terminal strip, locate those wires and jumper the pairs together. There are several possibilities for terminal strip styles - see diagrams below.

The presence of the jumper(s) should bring on the DryCooler.



*Samples
Actual location and
appearance may
vary.*

DECTRON

T.A.B.

T.A.B.**Set Optional DryCooler Flow****CONDENSER FLUID FLOW** - units with Dry-Cooler-cooled air conditioning only

Some units may be equipped with an optional DryCooler heat exchanger. In this case, instead of an outdoor condenser there will be a pumped-glycol loop connecting the unit to an outdoor fan-coil.

During cooling modes, units with DryCoolers require the glycol flow rates shown here.

Request and refer to [Appendix M1 DryCooler](#).

NOTICE Risk of unit damage.

Excessive flow rates can damage heat exchangers.
Inadequate flow rates can cause failure to operate and can damage heat exchangers.

Size	GPM (Lpm) Glycol
010	8(30)
015	10 (38)
020	14 (53)
030	20 (76)
040	28 (106)
042	28 (106)
050	36 (136)
060	45 (170)
062	40 (151)
080	54 (204)
082	56 (212)
100	73 (276)
102	73 (276)
120	94 (356)
122	94 (356)
150	107 (405)
152	107 (405)
162	127 (481)
164	112 (424)
182	145 (549)
184	146 (553)
202	160 (606)
204	167 (632)
242	178 (674)
244	188 (712)
282	210 (795)
284	214 (810)
362	276 (1045)
364	290 (1098)
368	292 (1105)
402	320 (1211)
404	320 (1211)
408	334 (1264)
482	375 (1420)
484	376 (1423)
488	376 (1423)
562	437 (1654)
564	420 (1590)
568	428 (1620)
804	640 (2423)
808	640 (2423)

Measured DryCooler Circuit 1 (if any)-Water Flow

Measured DryCooler Circuit 2 (if any)-Water Flow

Measured DryCooler Circuit 3 (if any)-Water Flow

Measured DryCooler Circuit 4 (if any)-Water Flow

Remove the jumper(s) installed on first page previous.

DECTRON

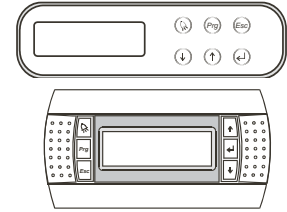
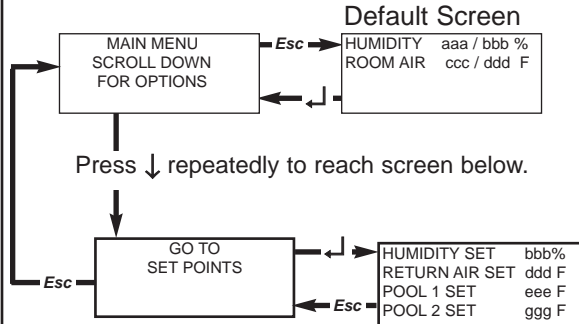
T.A.B.

Set Optional Heating-Water or Steam Flow

T.A.B.

Some units may have optional hot-water or steam space heaters built in. Where the hot water or steam is supplied by others, it is necessary to adjust the maximum flow.

To set the maximum flow, it is first necessary to put the unit into full heating mode. This is done by temporarily changing the room-air temperature set point to a high value.



BOX A

Copy the value of the room-air temperature set point **ddd** here.

For a controller interface map, see **Operation**.

Press **↓** repeatedly to move the cursor to the **ddd** position.
Press **↑** repeatedly to change the room-temperature set point to 99°F (37°C).

If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 1793 or just 17.

Press **↓** repeatedly to move the cursor to the top left corner of the screen.

WARNING

Risk of scalding. Can cause injury.

Do not open any drains until pressures and temperatures are minimized.

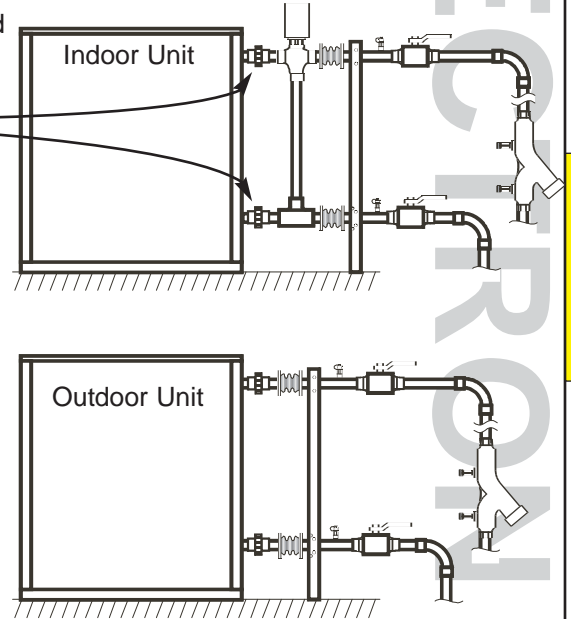
Be sure that the water or fluid temperature is near 180°F (82°C), and not less than 160°F (71°C), unless otherwise specified by Dectron.

Note the size of the connections on the unit.

Adjust the flow rate to achieve the desired maximum space-heating rate. Do not exceed the water flows shown here:

Connection Size	Maximum Flow
1 1/8" O.D. or 1" NPT	16 GPM (60 l/m)
1 3/8" O.D. or 1 1/4" NPT	26 GPM (98 l/m)
1 5/8" O.D. or 1 1/2" NPT	36 GPM (136 l/m)
2 1/8" O.D. or 2" NPT	65 GPM (246 l/m)
2 5/8" O.D. or 2 1/2" NPT	101 GPM (382 l/m)
3 1/8" O.D.	144 GPM (545 l/m)
4 1/8" O.D.	250 GPM (946 l/m)
5 1/8" O.D.	460 GPM (1741 l/m)

NOTICE Risk of unit damage. Risk of failure to operate. Excessive flow rates can damage heat exchangers. Inadequate flow rates can cause failure to operate.



T.A.B.

When the flows and temperatures are properly set, mark the adjusting device as having been set. Write the flow rate here.

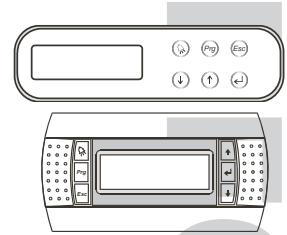
Return to the controller interface as above and return the room-temperature set point to the value recorded above.

T.A.B. Return Occupied Selection to Clock

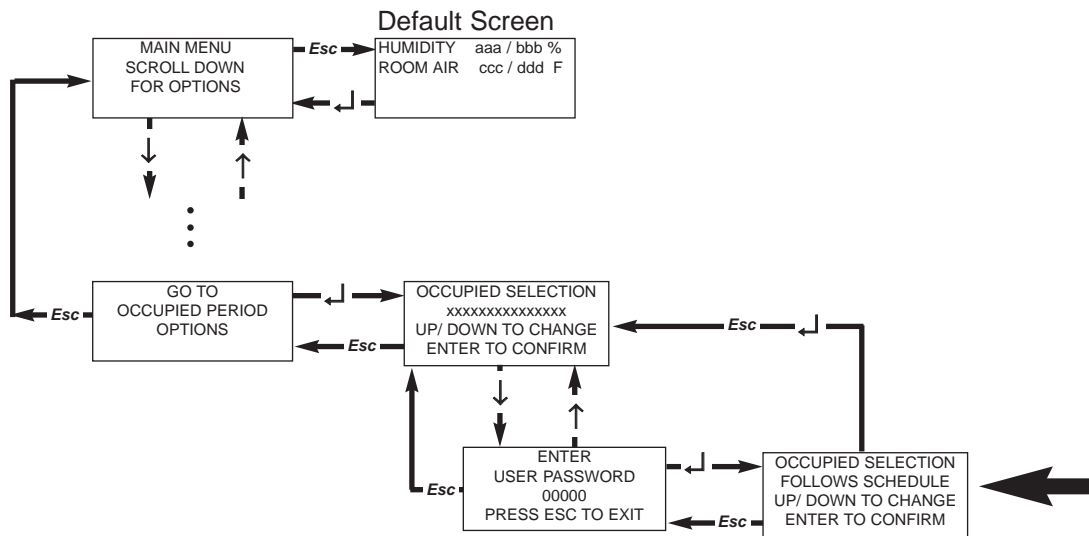
Using the controller-interface map below, access the OCCUPIED SELECTION screen. Press \downarrow to move the cursor to the second line.

Press \uparrow or \downarrow to change the second line to FOLLOWS SCHEDULE. Press \downarrow again to register the change.

If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 1793 or just 17.



DECTRON



T.A.B.

Stop Blowers

T.A.B.

WARNING



Risk of contact with moving parts. Can cause injury or death.

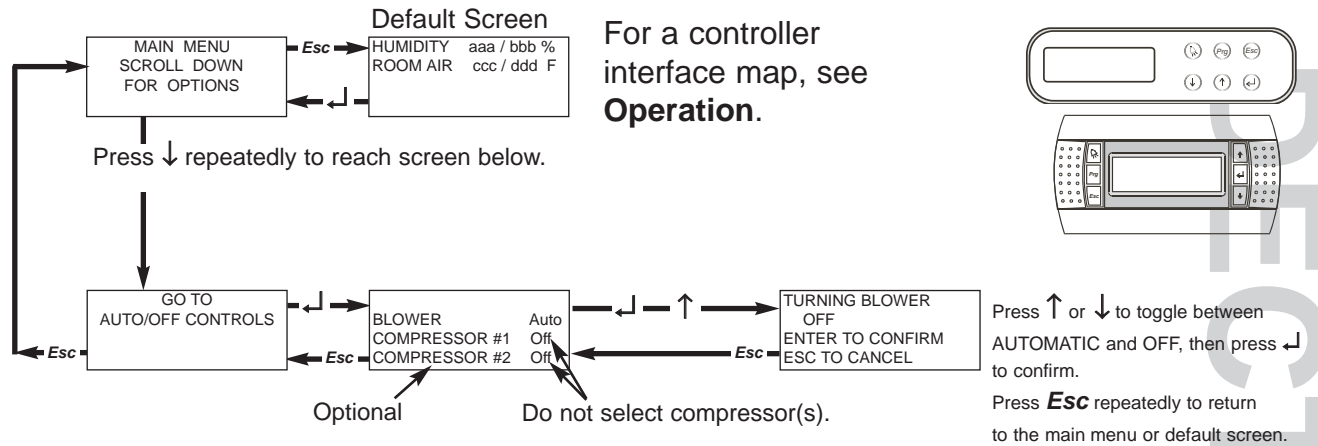
This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

The following method of stopping the blower does not substitute for an approved lockout/tagout procedure.

If it is desired to stop the blower at this point, follow the steps below. If prompted for a password on units made before 4/2005, enter 1793. For units made after 4/2005, enter 17 or 1793.

CAUTION: This method does not substitute for an approved lockout/tagout procedure.



If possible and safe to do so, leave the electrical power connected to the unit and leave the blower overload ON. This will allow the compressor crankcase heater(s) to function. The crankcase heaters must be on continuously for at least 12 hours before the compressors are started.

T.A.B.

T.A.B.

Checklist

Confirm that blowers were not operated with construction dust present in the space or in the unit ducts. _____ your initials

Confirm that all air filters were clean and in place during airflow measurements. _____ your initials

Confirm that all shipping blocks were removed prior to operating the supply-air blower. _____ your initials

Confirm that all blower belts (if any) were properly aligned and tensioned during airflow measurements. _____ your initials

Confirm that all ducts, diffusers, grilles, dampers, etc., were unobstructed during all airflow measurements. _____ your initials

For units with the SmartSaver, economizer, or Purge options, confirm that procedures given in the appropriate Dectron manual appendix were followed. _____ your initials

Confirm that all damper stops (if any) are set. _____ your initials

Confirm that blower voltages and currents are within tolerance per the unit nameplate. _____ your initials

Confirm that all blowers turn in the correct direction. _____ your initials

The supply-air flow was measured to be [] CFM . _____ your initials

The outdoor-air intake flow was measured to be [] CFM . _____ your initials

The exhaust-air flow was measured to be [] CFM . _____ your initials

Pool 1 water flow (if any) through the unit was measured to be [] GPM (l/m) . _____ your initials

Pool 2 water flow (if any) through the unit was measured to be [] GPM (l/m) . _____ your initials

Pool 3 water flow (if any) through the unit was measured to be [] GPM (l/m) . _____ your initials

Pool 4 water flow (if any) through the unit was measured to be [] GPM (l/m) . _____ your initials

For units with water-cooled air conditioning, the cooling-water flow was measured to be [] GPM (l/m) . _____ your initials

For units with DryCooler-cooled air conditioning, the glycol flow was measured to be [] GPM (l/m) . _____ your initials

For units with hot-water or steam space heat, the space-heating capacity was measured to be [] BtuH (kW) . _____ your initials

Confirm that all temporary jumpers have been removed. _____ your initials

Leave a copy of this checklist with the unit.

Date: _____
 Model No. _____
 Serial No. _____
 Ref. No. _____
 Name _____
 Tel. _____

T.A.B.

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NOTICE

Risk of unit damage.

Applying an incorrect voltage can cause damage to important parts of the unit. Be sure the branch-circuit voltage to be applied to the unit corresponds to the rated voltage stated on the unit nameplate.

NOTICE

Risk of unit damage.

Compressor crankcase heaters must be ON for at least 12 hours before enabling a compressor. Any damage resulting from a failure to allow this heat-up time is not covered by the Dectron warranty.

NOTICE

Risk of property damage.

This unit is not a convenience air conditioner - it is a process dehumidifier that is closely sized to the expected load. Any errors in installation, balancing, or startup will be obvious in operation.

NOTICE

The information presented in this section represents Dectron's best effort as of the time of issue. Compliance with the requirements and recommendations in this section should produce a proper startup of the equipment.

Where any steps are not clear, Dectron offers technical assistance at 1-800-667-6338 or 1-800-676-2566.

Dectron does not warrant that the information herein is complete for any particular application. In some cases job-specific requirements may cause modifications which may not appear in this section. Such modifications will be documented in addenda.

Follow all applicable safety rules and regulations, and all applicable codes. Where any recommendation in this manual conflicts with legal requirements, the legal requirements take precedence.

Dectron, Inc. does not engage in Startup contracting. All costs, risks, and responsibilities of properly starting the equipment are borne by others.

Dectron does offer on-site factory personnel to supervise of the startup process. There is a fee for this service. See details later in this section.

Data subject to change without notice.

Dectron, Inc. March 2012

STARTUP

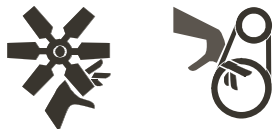
Startup

Safety Warnings

! WARNING**Risk of electric shock. Can cause injury or death.**

Some startup procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does **not** disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some startup procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

! WARNING**Risk of flying liquids, gases, particles. Can cause eye injury.**

Many tasks involve risk of exposure to flying materials which can cause eye injury. Always wear protective safety glasses or goggles, as appropriate.

! WARNING**Risk of blistering. Can cause injury.**

Some surfaces inside an operating unit may be at elevated temperatures. The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Compressor crankcase heaters can be extremely hot at any time electrical power is applied.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts. Use gloves and other protective equipment to prevent injury.

! WARNING**Risk of pinching or crushing. Can cause injury.**

Depending on the size of this product, some startup procedures could expose personnel to the risk of injury by pinching or crushing.

Access doors and panels are under a strong negative pressure when the blower(s) is running. Opening doors may be difficult. Closing doors must be done with a tool to prevent hands from being caught.

! WARNING**Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some startup procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

Safety Warnings

Startup

 **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.

 **WARNING****Risk of suffocation.**

Improper handling of refrigerants and refrigerant hoses can allow release of refrigerant gases. In a confined space, these heavier-than-air gases may accumulate and displace oxygen, leading to suffocation.

Confirm adequate ventilation before proceeding.

 **WARNING****Risk of contamination of breathing air. Can cause injury or death.**

Application of this product may involve the intake of outdoor air. The point of intake must be carefully chosen to prevent intake of contaminants.

Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants.

Follow the instructions in this manual and all applicable codes.

 **WARNING****Risk of explosive pressure release. Can cause injury or death.**

This product contains refrigerant liquid and vapor under high pressure. Some installation and service procedures could expose personnel to the risk of explosive discharge. Some startup procedures could expose personnel to the risk of frostbite from release of refrigerant.

Reclaim refrigerant to reduce the pressure to atmospheric before working on pipes, valves, heat exchangers, compressors, pressure switches, etc.

Once opened, do not close any manual refrigerant valves that might isolate refrigerant from the relief valve. If necessary, install relief valves (by others).

NOTICE**Risk of uncontrolled condensation. Can cause property damage.**

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

Read and follow the instructions in this manual. Optional material will be noted as being optional. All other material should be considered as important to the proper function of the product.

NOTICE**Risk of leaking water. Can cause property damage.**

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow. Uncontrolled water can cause expensive damage to buildings and other equipment. Do not locate this product above any equipment that could be damaged by water.

Startup

Pre-Startup Adjustments

! WARNING

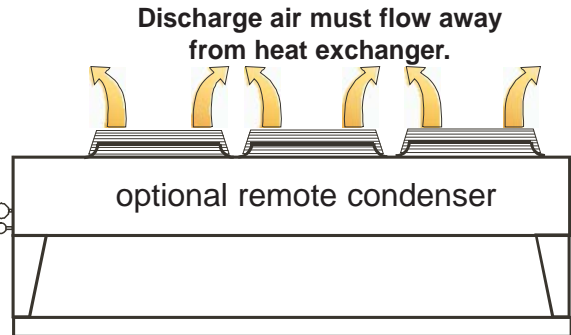


Risk of contact with moving parts. Can cause injury or death.
Do not attempt to defeat the fan guards. Do not insert foreign objects through fan guards.

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 airflow away from the heat exchanger.

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.**



! WARNING



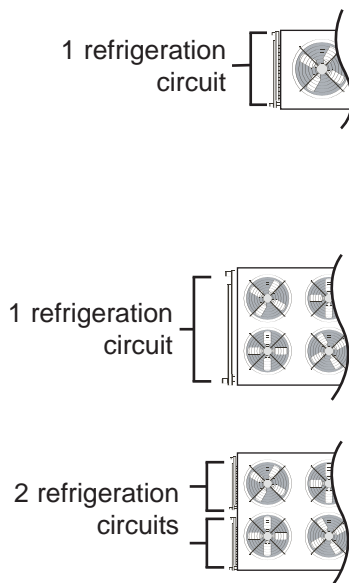
Risk of electric shock. Can cause injury or death.
Exposed electric terminals may be present inside electrical and control enclosures. Disconnect the branch circuit, and lockout and tagout sources of electric energy before opening covers. Follow all safety regulations.

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

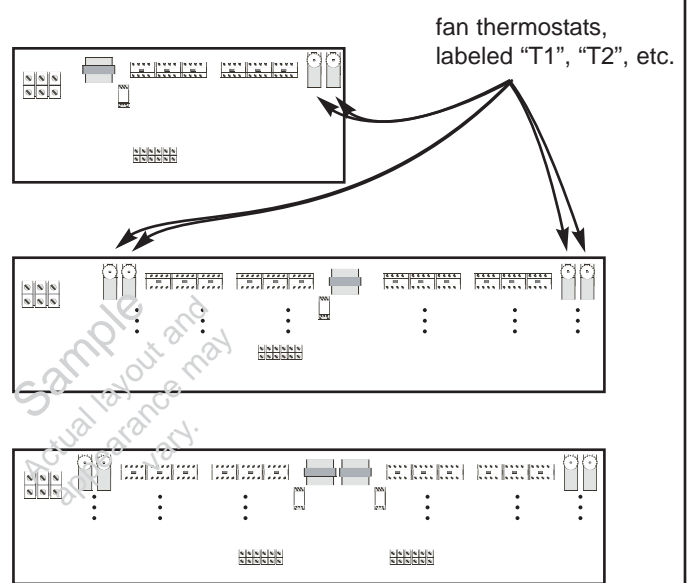
Units with optional air-cooled air conditioning will have a remote condenser. Some remote condensers may have more than one fan. Condensers with multiple fans have a minimum number of fans that run continuously whenever the DRY-O-TRON® is in cooling mode. Any other fans will be controlled by thermostats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

Pre-Startup Adjustments

Startup

		THERMOSTAT SETTINGS											
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
1 refrigeration circuit		70											
1 refrigeration circuit		65	70										
1 refrigeration circuit		60	65	70									
1 refrigeration circuit		60	65	70	75								
1 refrigeration circuit		60	65	70	75	80							
1 refrigeration circuit		55	60	65	70	75	80						
1 refrigeration circuit		65	70										
2 refrigeration circuits		65	65	70	70								
1 refrigeration circuit		60	65	70									
2 refrigeration circuits		60	60	65	65	70	70						
1 refrigeration circuit		60	65	70	75								
2 refrigeration circuits		60	60	65	65	70	70	75	75				
1 refrigeration circuit		60	65	70	75	80							
2 refrigeration circuits		60	60	65	65	70	70	75	75	80	80		
1 refrigeration circuit		55	60	65	70	75	80						
2 refrigeration circuits		55	55	60	60	65	65	70	70	75	75	80	80

DECTRON

STARTUP

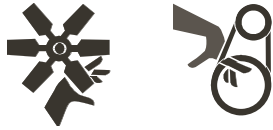
Data subject to change without notice.

Startup

Pre-Startup Adjustments

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.



Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

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. Where present, these valves must be opened before attempting to operate the compressor(s). Do not open these valves until the compressor crankcase heaters have been turned on.
2. Depending on the type of unit, there may be refrigerant receivers. Where present, receivers on each circuit will have two isolation valves. These valves must be opened before attempting to operate the compressor(s).

! WARNING**Risk of explosive depressurization. Can cause injury or death.**

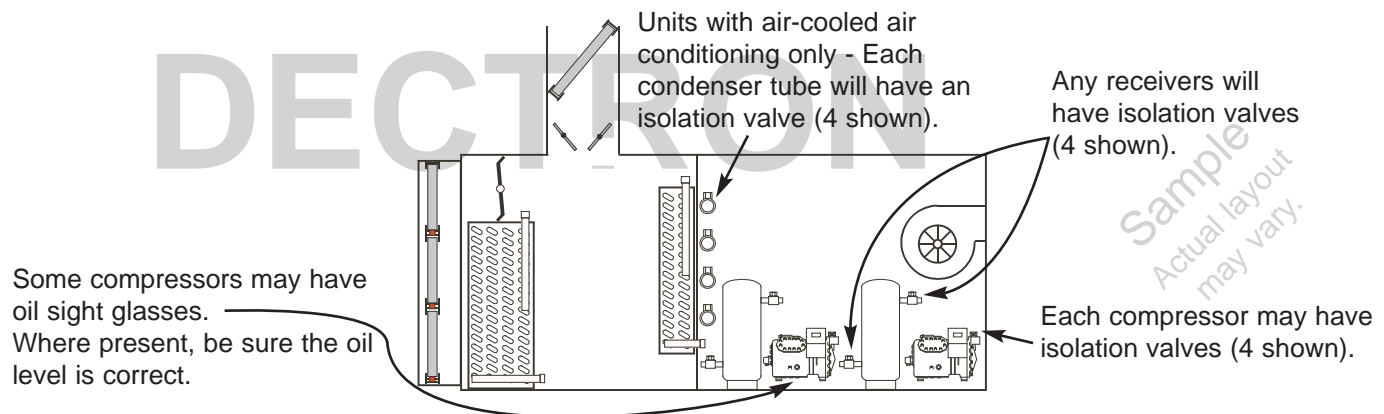
Once these valves have been opened, they should not be closed again unless 1/2 pound (250g) of refrigerant is reclaimed from the filter-drier and into the receiver (or the pressure is reduced below 10 PSIG (69 kPa)) immediately after closing the valves.

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

! WARNING**Risk of explosive depressurization. Can cause injury or death.**

Once these valves have been opened, they should not be closed again unless 1 pound (500g) of refrigerant is reclaimed from the condenser and into the receiver (or the pressure is reduced below 10 PSIG (69kPa)) immediately after closing the valves.

4. Do not adjust any other manual valves at this time.



Some compressors may have oil sight glasses.

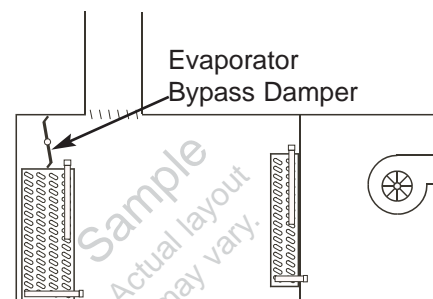
Where present, be sure the oil level is correct.

EVAPORATOR BYPASS DAMPER(S)

Some units may have manual evaporator-bypass dampers. In this case the damper must be closed completely¹ as long as the room temperature is below 78°F (25.6°C). If the room temperature at startup is above 78°F (25.6°C), a manual evaporator-bypass damper should be fully open.

1. **Exception:** For DSV units size 040 and larger, the minimum setting is 35% open.

On other units the evaporator-bypass damper will be electrically operated. Except for vertical units size 040 and larger, it should close for evaporator-leaving-air temperatures below a preset value. For DSV units size 040 and larger, confirm that the minimum damper opening is 35% open.



Pre-Startup Adjustments

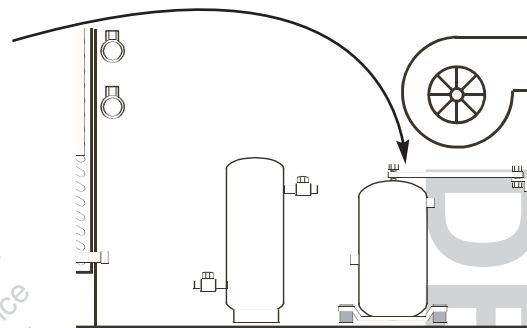
Startup

Some units may ship with wooden spacer blocks to maintain component positions during shipping. Open the unit access panels or doors and remove any wooden blocks.

Where wire or plastic wraps are used to hold the wooden blocks in place, remove them also. Do not leave loose materials inside the unit.

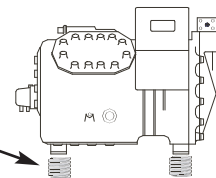
NOTE: Do not remove any perforated-channel braces unless specifically instructed to do so.

Some units may ship with a metal brace restraining the top of the compressor(s). Inspect the compressors and remove any top braces.

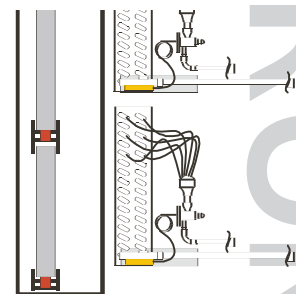


*Samples
Appearance
may vary.*

Some units may ship with compressor mounting springs compressed. Where this is the case, loosen the bolts just enough to allow the compressor(s) to float on the springs.



Refrigerant distributor tubes may be touching after shipment. Operating the unit with tubes touching each other can lead to refrigerant leaks. Inspect all the distributor tubes and gently separate them so that they do not touch. If necessary, separate them with plastic spiral wrap, rubber strips, silicone caulk, etc.



Carefully test all refrigerant tubes, refrigerant components, and tube joints (including factory joints) for leaks, using a reliable electronic leak detector. Repair all leaks as necessary.

STARTUP

Startup

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 space heat is available and that the room temperature can be held near nameplate value.

your initials

Confirm that the walls and ceiling have been adequately insulated and have a proper vapor barrier (see Building - Moisture Migration).

your initials

Confirm that any windows are installed and so constructed as to allow proper airflow over the glass (see Building - Moisture Migration).

your initials

Natatoriums only--

Confirm that the pool has been filled and that the pool water chemistry is as specified by the Association of Pool and Spa Professionals (see Natatorium - Pool Water Chemistry).

your initials

Confirm that the pool operator has been made aware of the need for proper maintenance of the pool water chemistry.

your initials

For indoor DRY-O-TRON® units, confirm that chemicals are not stored in the same room with the DRY-O-TRON®, or in any space that connects to the DRY-O-TRON® room other than by a gasketed door.

your initials

Confirm that pool chemicals are not stored in the pool room or in any space that connects to the pool room other than by a gasketed door.

your initials

For water parks, etc., confirm that all pumped water features can be operated on demand.

your initials

Air Distribution

Confirm that all ducts have been sized and installed correctly to limit the external static pressure to no more than the specified amount at full rated flow. See Installation - Ducts.

your initials

Confirm that no construction dust or other debris is in the return duct or the outdoor-air intake duct (if any).

your initials

Confirm that no construction dust or other debris will be drawn into the return duct or the outdoor-air intake duct (if any).

your initials

Confirm that the plastic or paper covers over all return grille(s) have been removed.

your initials

Confirm that all grilles and diffusers are unobstructed.

your initials

Confirm that air distribution is arranged to cause proper flow in all parts of the space. See Installation - Air Distribution.

your initials

Confirm that air distribution is arranged to cover all surfaces that might reach dew point. See Installation - Air Distribution.

your initials

Confirm that arrangements have been made for any tall or very tall windows. See Installation - Air Distribution.

your initials

Confirm that supply diffusers are arranged to deliver air to windows, doors, or other possibly cold surfaces at a sharp angle and from a short distance. See Installation - Air Distribution - Supply Diffusers.

your initials

For fabric duct, confirm that the duct is supported in such a way that it will not rotate. See Installation - Air Distribution - Fabric Duct.

your initials

Confirm that ducts that might go below the dew point of the surrounding air have been properly insulated. See Installation - Ducts - Ventilation - Outdoor-Air Intake Duct.

your initials

Natatoriums Only

For installations with spas or hot tubs, confirm that the return grille is far away from the spa or hot tub. See Installation - Ducts - Return Duct.

your initials

Confirm that air does not blow directly on the pool surface.

your initials

Date: _____

Model No. _____

Serial No. _____

Ref. No. _____

Name _____

Tel. _____

Completed by _____ Ph. () _____ - _____

Data subject to change without notice.

Dectron, Inc. March 2012

STARTUP

Pre-Startup Checklist

Startup

Piping

Confirm that pipes, conduits, etc., will not interfere with the opening of access doors or panels. See **Installation - Piping - General.**

Confirm that any external refrigerant tubes are installed in compliance with the recommendations of this manual and published standards. See **Installation - Piping - Refrigerant.**

For air-cooled units, confirm that refrigerant piping is installed and free of leaks.

For air-cooled units, confirm that remote-condenser tubes have the outside diameters specified on the unit nameplate.

For air-cooled units, confirm that the remote condenser and its connecting tubes have been evacuated as described in this manual. See **Installation - Piping - Adding Refrigerant.**

For air-cooled units, confirm that the condenser tubes are not longer than specified on the nameplate.

For air-cooled units, confirm that the hot-gas riser tubes (if any) are properly trapped. (See **Installation - Piping - Refrigerant.**)

For air-cooled units, confirm that the correct amount of refrigerant (if any) has been added. See **Installation - Piping - Adding Refrigerant.**

Date: _____
Ref. No. _____
Model No. _____
Serial No. _____

Completed by _____ Ph. () _____ - _____

For air-cooled units, confirm that the correct amount of oil (if any) has been added. See **Installation - Piping - Oil Charging.**

Confirm that the refrigerant-relief tube (if any) on indoor units has been extended and terminated as appropriate. See **Installation - Piping - Refrigerant - Relief Tube.**

For units with water-cooled air conditioning, confirm that the pipes for cooling water have been installed per published standards and the recommendations in this manual. See **Installation - Piping - Water- or Fluid-Cooled A/C.**

Units with water-heat, glycol-heat, or steam-heat only: Confirm that the pipes for heating water have been installed per published standards and the recommendations in this manual. See **Installation - Piping - Heating.**

Confirm that the heating fluid system (if any) is installed and free of leaks.

Confirm that the condensate drain has been installed per published standards and the recommendations in this manual. See **Installation - Piping - Condensate Drain.**

Confirm that the condensate drain has been tested by pouring a bucket of water into it. See **Installation - Piping - Condensate Drain.**

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

Confirm that pool-water piping (if any) has been installed per published standards and the

recommendations of this manual. See **Installation - Piping - Pool Water.**

For units with boilers or furnaces, confirm that the fuel gas is supplied between 7" W.C. and 14" W.C., or at a special pressure specified at time of order.

For units with boilers or furnaces, confirm that the fuel gas piping is correctly sized. Confirm that all special piping arrangements specified in appropriate appendices have been made. See **Installation - Piping - General.**

Remote Condenser or Dry-Cooler®

Confirm that the condenser or Dry-Cooler® is located properly for good airflow (see **Installation-Locate Condenser**).

Confirm that the voltage to be applied corresponds to that specified on the nameplate and NEMA MG-1.

Confirm that the remote condenser or Dry-Cooler is properly grounded.

Confirm that only copper conductors are connected to the input lugs.

Confirm that the fan cycling thermostats (if any) are adjusted. (See **Startup - Pre-Startup Adjustments.**)

Confirm that the condenser top and side clearances are at least as large as specified in **Installation-Locate Condenser.**

Confirm that no dirt, leaves, or other debris will be drawn into the heat exchangers.

Confirm that any shipping blocks, spacers, or retainers have been removed.

your initials

your initials

your initials

your initials

your initials

your initials

your initials

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STARTUP

Startup

Pre-Startup Checklist

Wiring

Confirm that the voltage to be applied to the unit is within ±10% of the rated voltage stated on the unit nameplate and to the other requirements of **Installation - Wiring - Power**.

your initials

For units with air-cooled air conditioning, confirm that the voltage applied to the remote condenser corresponds to that specified on the condenser nameplate.

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 **Setup - Airflow**.

your initials

Confirm that all conduits entering units have been sealed. See **Installation - Wiring - Power** and **Installation - Wiring - Control Signals**.

your initials

For units with optional remote controller displays, confirm that the remote displays are wired per the recommendations in this manual. See **Installation - Wiring - Control Signals - Optional Remote Display**.

your initials

Confirm that all control signals are wired per published standards and the recommendations in this manual. See **Installation - Wiring - Control Signals**.

your initials

Confirm that any special wiring has been accomplished per the instructions in any applicable appendix. See **Installation - Wiring - Special**.

your initials

Ducts

For end-return units, confirm that the the return duct 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

For units with outdoor air intakes, confirm that the intake duct is properly connected (see **Installation - Air Distribution - Ventilation**).

your initials

For units with an outdoor air intake, confirm that the intake hood is unobstructed.

your initials

Confirm that outdoor air will be heated as necessary to assure that all outdoor air entering the unit will be above 32°F (0°C). See **Installation - Minimum Outdoor-Air Temperature**.

your initials

Confirm that the ventilation-duct procedures specified in this manual and in the appropriate appendices have been applied. See **Installation - Ducts - Ventilation**.

your initials

Confirm that the outdoor air intake duct (if any) is not brought into the unit's return duct. See **Installation - Air Distribution - Ventilation**.

your initials

For units with duct-mounted heaters, confirm that the heater is no closer than 5 times the width of the duct to the DRY-O-TRON®.

your initials

Date: _____
Model No. _____
Serial No. _____
Ref. No. _____
Name _____
Tel. _____

STARTUP

Pre-Startup Checklist

Startup

Test, Adjust, and Balance

Confirm that the balance report shows all airflows to be within ±10% of the required values. See **Test, Adjust, Balance**.

your initials

Confirm that the balance report shows pool-water flow(s) is within ±10% of the required value(s). See **Test, Adjust, Balance**.

your initials

For water-cooled units, confirm that the balance report shows cooling-water flow within ±10% of the required values. See **Test, Adjust, Balance**.

your initials

For units equipped with a Dry-Cooler, confirm that the balance report shows glycol flow within ±10% of the required values. See **Test, Adjust, Balance**.

your initials

For units equipped with hot-water or steam heat, confirm that the balance report shows flow within ±10% of the required values. See **Test, Adjust, Balance**.

your initials

Confirm that the T.A.B. checklist is completely and suitably filled out. See **Test, Adjust, Balance**.

your initials

Unit preparation

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

your initials

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 all blower belts are properly aligned and tensioned. See **Test, Adjust, Balance**.

your initials

Confirm that all blowers turn in the correct direction. See **Test, Adjust, Balance**.

your initials

For units with an outdoor air intake, confirm that the intake hood is unobstructed.

your initials

Confirm that the air heat exchangers are clean.

your initials

Confirm that all air filters are clean and in place. See **Test, Adjust, Balance**.

your initials

For units with manual cooling-coil bypass dampers:

If the room temperature is 78°F or less, confirm that the cooling coil bypass damper is fully closed.

your initials

If the room temperature is greater than 78°F, confirm that the cooling coil bypass damper is fully open.

your initials

Confirm that power has been applied to the crankcase heaters for at least 12 hours.

your initials

Confirm that any dampers, actuators, hoods, etc., shipped separately are properly installed. See **Installation - Pre-Assembly**.

your initials

Other

For units with pool-heating, confirm that the pool circulating pump and any booster pump are running.

your initials

For units with pool-heating and auxiliary pool heaters, confirm that all settings allow pool heating when so commanded by the unit.

your initials

For units with duct heaters by others, confirm that all settings allow space heating when so commanded by the unit.

your initials

For units with hot-water or steam space heat, confirm that all settings allow space heating when so commanded by the unit.

your initials

For units with gas furnaces or gas boiler space heat, confirm that all settings allow space heating when so commanded by the unit.

your initials

For units with water-cooled air conditioning, confirm that cooling water will be immediately available when commanded by the unit.

your initials

For units with air-cooled air condenser(s) or DryCooler(s), confirm that the device is powered and ready to operate.

your initials

Date: _____
 Model No. _____
 Serial No. _____
 Ref. No. _____
 Name _____
 Tel. _____

STARTUP

Startup

Pre-Startup Adjustments

! WARNING



Risk of electric shock. Can cause injury or death.

Exposed electric terminals may be present inside electrical and control enclosures. Disconnect the branch circuit, and lockout and tagout sources of electric energy before opening covers. Follow all safety regulations.

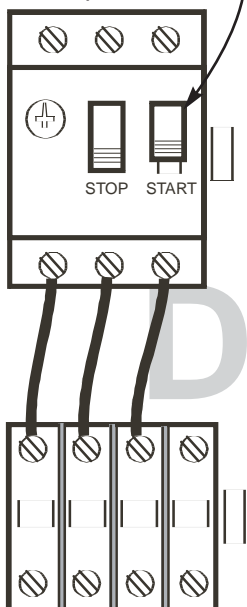
On some units, the motors have internal overload protectors. On other units, motor protection involves external overload protectors in the electrical enclosure. Using the unit wiring diagram, determine if the blowers and/or compressors have external overload protectors in the electrical enclosure.

If so, locate the overloads for each blower and for each compressor. Units with optional built-on boilers or optional pumped SmartSavers may also have overloads for glycol pumps.

Where external overload protectors are present, select the type of protector below and follow the instructions for that type. Other protector types are possible.

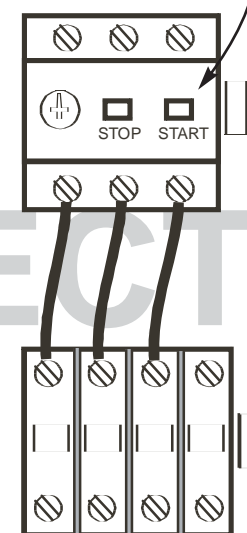
To enable the motor or to reset the overload protector, press START.

To disable a motor, press STOP.



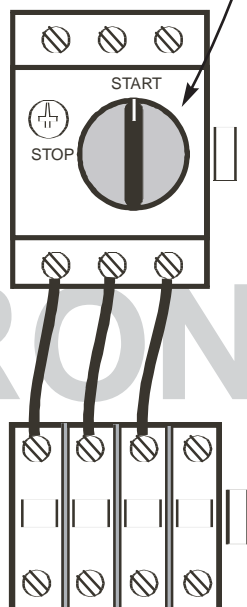
To enable the motor or to reset the overload protector, press START.

To disable a motor, press STOP.

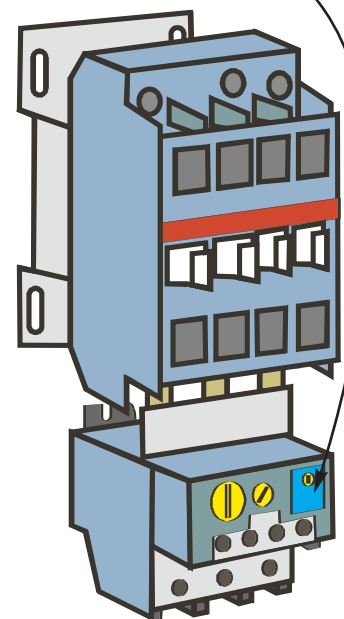


To enable the motor or to reset the overload protector, turn the knob clockwise to the START position.

To disable a motor, turn the knob to the STOP position.



To enable the motor or to reset the overload protector, push in the blue button.



STARTUP

NOTICE Risk of unit damage.

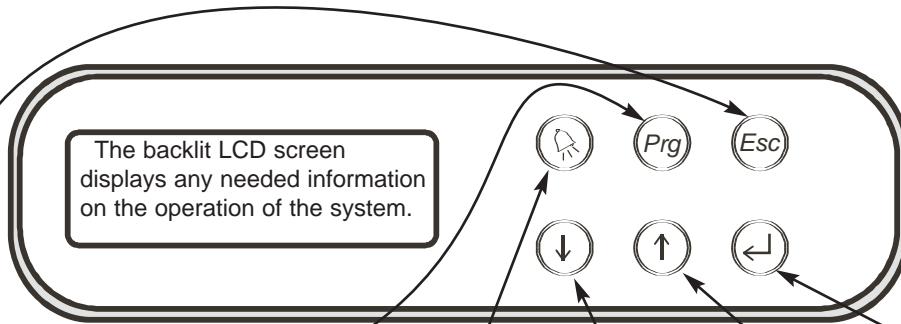
Call Dectron before changing the trip points.

Controller Interface

Startup

NOTE: Do not mount a controller interface where it may come into contact with air from the natatorium or from the chemical-storage area.

NOTE: If the screen remains blank after electric power is applied to the unit, see next page.



ESC is used to return to previous interface levels.

While in the default screen, press the **Prg** button to display the program version. If an alarm is being displayed, press **Prg** to access HELP screens.

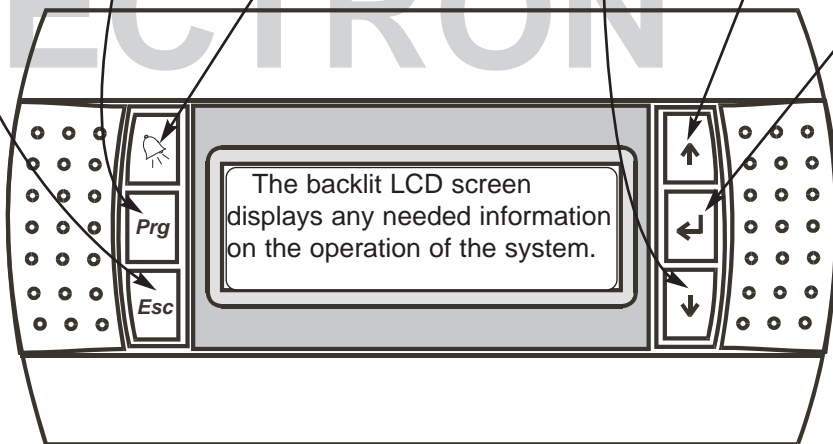
is used to access the list of alarm conditions, if any exist.

is used to scroll downward through screens and to decrease settings.

is used to scroll upward through screens and to increase settings.

is used to navigate around the screen and to accept inputs.

DECTRON



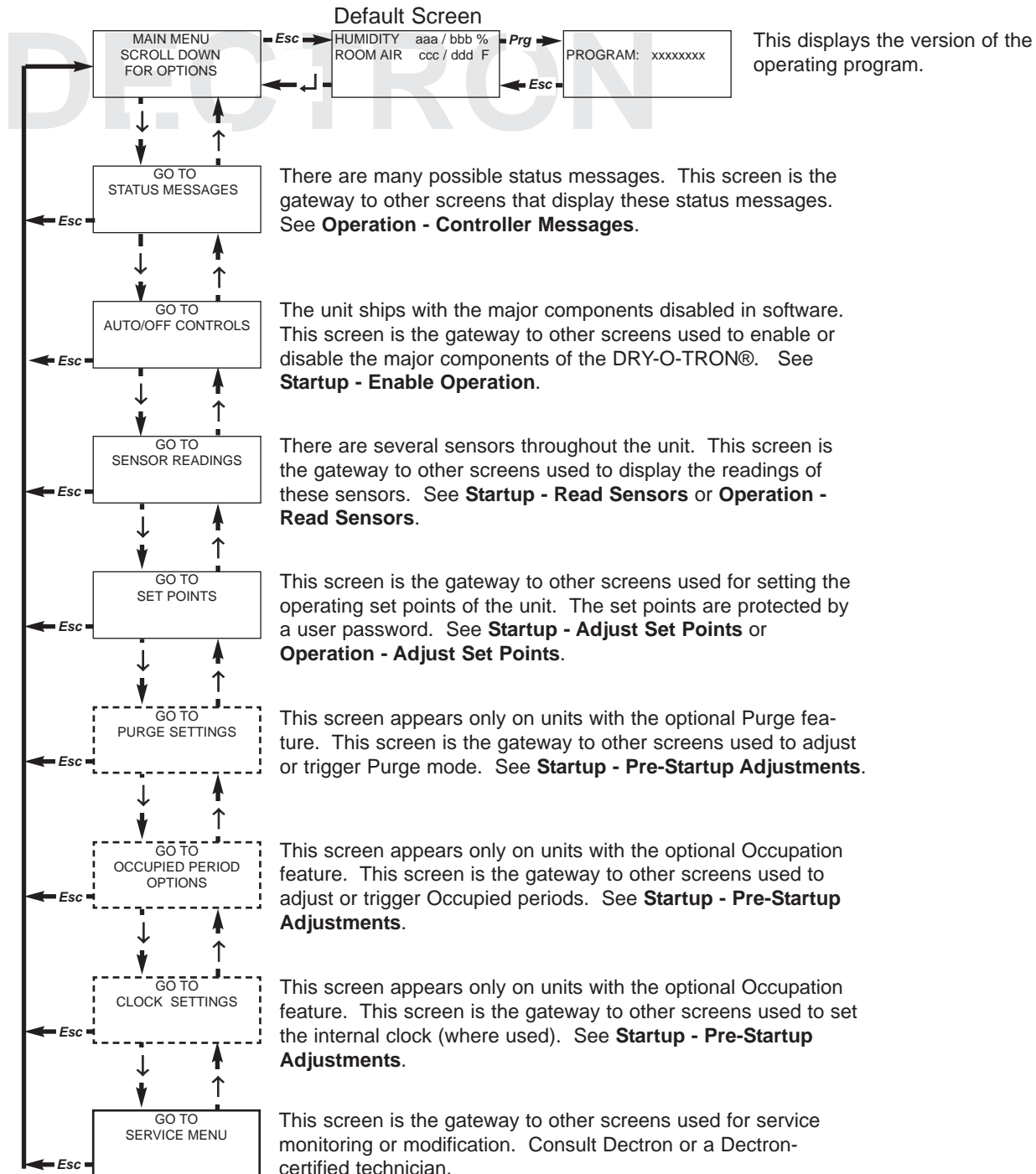
STARTUP

Startup

Controller Interface

NOTE: In the images and the discussion, "aa", "bb", "cc", "dd", and "xxxxxxx" are placeholders. Your screen will actually show the current values for your unit.

NOTE: For a controller interface map, see **Operation**.



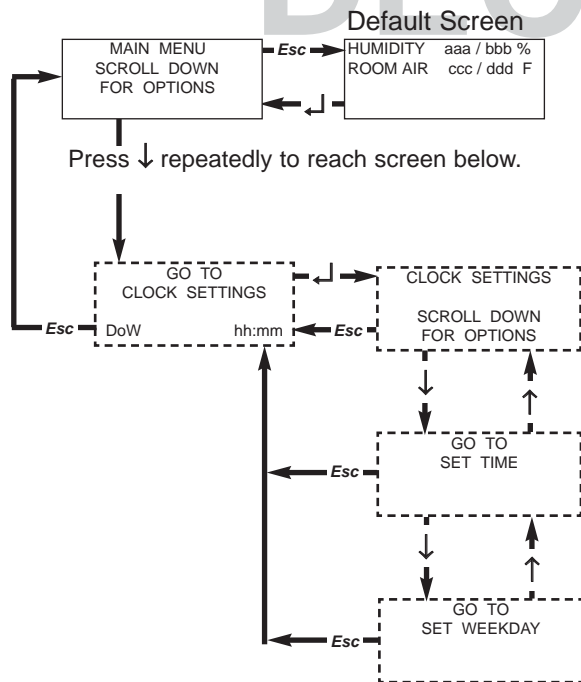
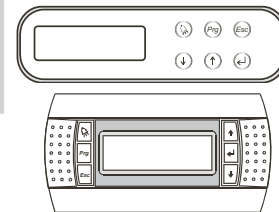
Set Internal Clock

Startup

Some units may use an internal seven-day time clock to increase outdoor air intake during Occupied periods. In this case the clock must be set for local time.

All times are 24-hour (military) times. Ex: 6:30PM = 18:30.

NOTE: In the images and the discussion, "aa", "bb", "cc", "dd", "hh", "mm", and "n" are placeholders. Your screen will actually show the current values for your unit.



For a controller interface map, see **Operation**.

Press **←** once, then press **↑** or **↓** to change the hour.

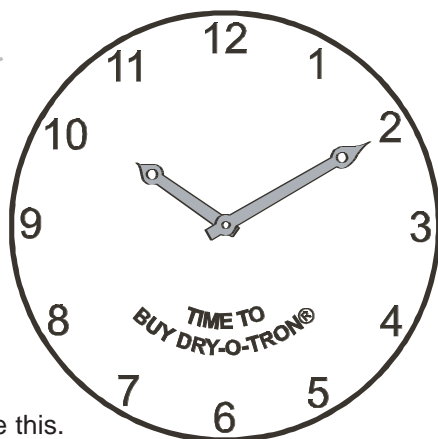
Press **←** again, then press **↑** or **↓** to change the minutes.

Press **←** once, then press **↑** or **↓** to change the number of the day of the week. These numbers are

- 1 = Monday
- 2 = Tuesday
- 3 = Wednesday
- 4 = Thursday
- 5 = Friday
- 6 = Saturday
- 7 = Sunday

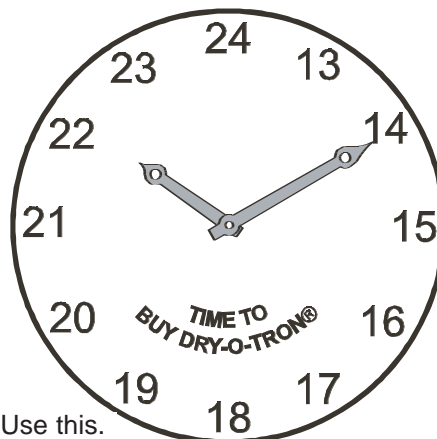
*Sample
Actual times
may vary.*

MIDNIGHT TO NOON



Use this.
→ 10:10
10:10 A.M.

NOON TO MIDNIGHT



Use this.
→ 22:10
10:10 P.M.

Startup

Set Occupied Periods

NOTICE Risk of failure to bring in outdoor air during occupied periods.

For units with electrically operated outdoor-air dampers, outdoor-air is only taken in during occupied periods. Outdoor-air intake requires definition of occupied periods. Unless otherwise specified in the submittal data, exhaust function (if any) requires definition of occupied periods.

NOTICE Units are shipped with no occupied periods defined.

Some units may use an internal seven-day time clock controlling the intake of outdoor air during Occupied periods. In this case the times of the occupied periods must be set as shown here.

NOTE: The clock is based on 24-hour (military) time. See **Startup - Set Internal Clock**, first page previous.

If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 17 or 1793.



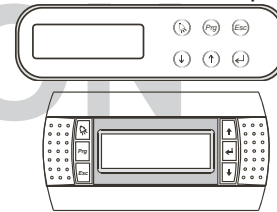
Press ↓ repeatedly to reach screen below.



For a controller interface map, see **Operation**.

NOTE: In the images and the discussion, "aa", "bb", "cc", "dd", "ee", "gg", "hh", "ii", "kk", "nn", "pp", and "rr" are placeholders. Your screen will actually show the current values for your unit.

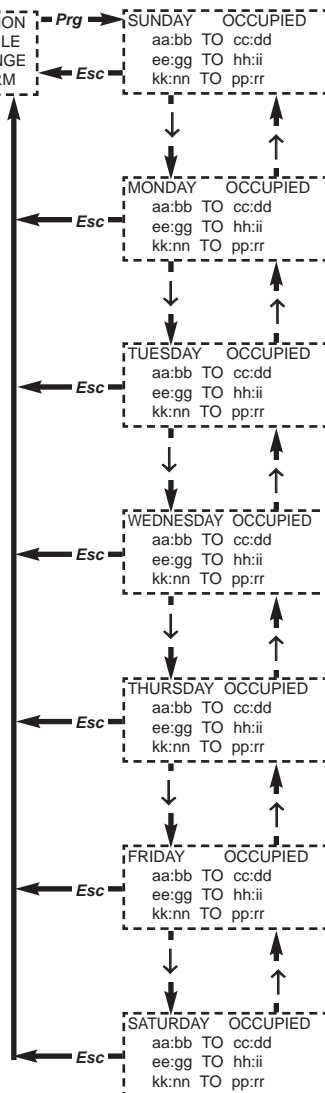
NOTE: Units ship with all values set to 00. This means that no outdoor air will be brought in until occupied periods are defined, as shown on this page.

**Note: 24-hour time only**

Each day of the week can have up to three periods of occupation. In the screens at left, aa = hour of beginning of first occupied period, bb = minute of beginning of first occupied period, cc = hour of end of first occupied period, dd = minute of end of first occupied period.

ee = hour of beginning of second occupied period, gg = minute of beginning of second occupied period, hh = hour of end of second occupied period, ii = minute of end of second occupied period.

kk = hour of beginning of third occupied period, nn = minute of beginning of third occupied period, pp = hour of end of third occupied period, rr = minute of end of third occupied period.



For each day, press ↓ as necessary to move the cursor to the desired value. Press ↑ or ↓ to change the value.

To move to the next day, press ← repeatedly to move the cursor to the top left corner of the screen, then press ↓ to move to the screen of the next day.

Press **Esc** to return to previous screens. If an occupied period is not necessary, set beginning hour, beginning minute, ending hour, and ending minute to zero.

This page intentionally left blank.

STARTUP

Startup

Prepare to Adjust Expansion Valve(s)

➔ **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 here.

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

⚠ WARNING



Risk of contact with moving parts. Can cause injury or death.

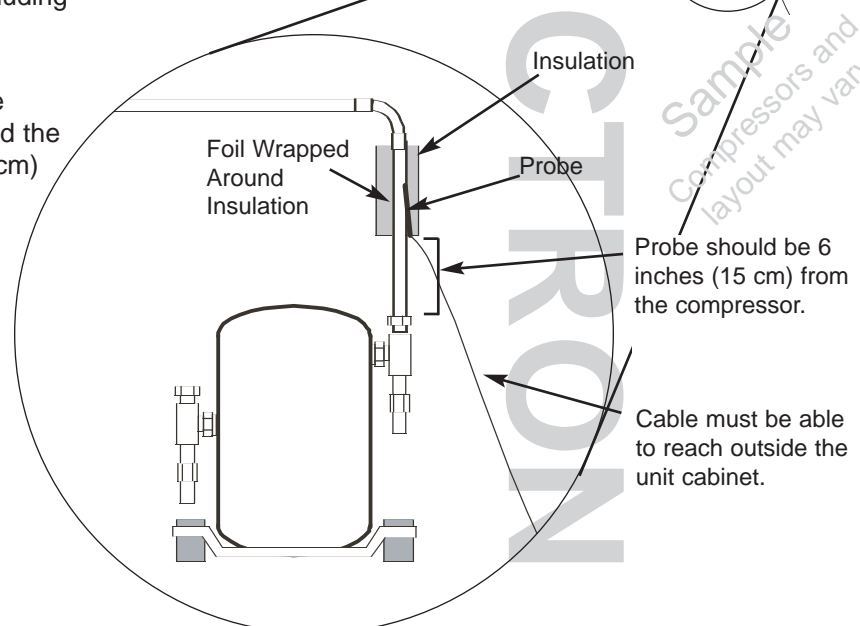
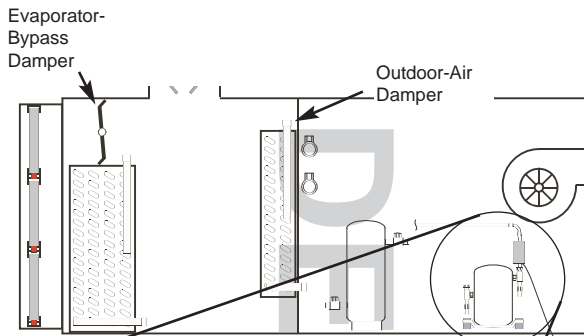
This product contains rotating parts and V-belt drives. Do not approach any moving parts while electric power is applied to unit. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

1. 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.**
2. Be sure that the airflows have been adjusted as described previously in this section.
3. Be sure that the room temperature and relative humidity are near the values shown on the unit nameplate. (See **Product Description - Unit Nameplate**).
4. If the evaporator-bypass damper is manually operated, be sure that it is fully open.

If the unit model number ends in "2", e.g. DS042, RB282, there will be two refrigeration circuits. Identify the compressor(s), CLP switches (see unit wiring diagram), and expansion valve(s) associated with each circuit. Such components may ship already marked with circuit numbers.

The methods of expansion-valve adjustment apply to all circuits present.

5. Locate the compressor for the circuit being adjusted.
6. Attach the probe of a remote-reading electronic thermometer (by others) to the compressor-discharge tube approximately 6 inches from the compressor shell. The thermometer should have a range including 100 to 250°F (38 - 120°C).
7. Wrap 1/2 inch (1cm) thick insulation around the tube-probe assembly. The insulation should go all the way around the tube, and extend at least 3 inches (8 cm) along the tube on both sides of the probe end.
8. Wrap the insulation with foil or foil-backed tape. Close the foil tightly (especially the ends) against the turbulent airflow that will form inside the cabinet.



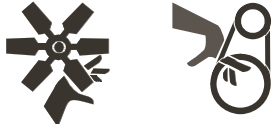
GO TO NEXT PAGE.

STARTUP

Prepare to Adjust Expansion Valve(s)

Startup

WARNING



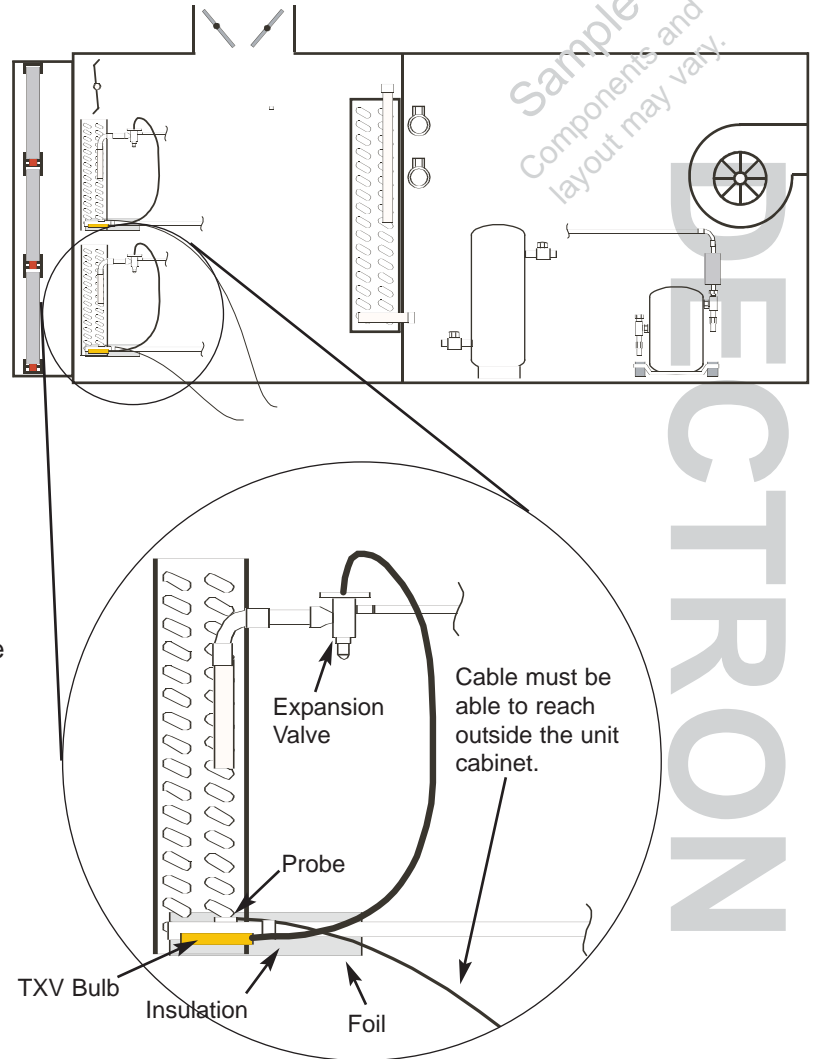
Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Do not approach any moving parts while electric power is applied to unit. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

If there are two or more expansion valves **for each refrigeration circuit**, then follow the steps below. Otherwise, skip to next page.

- 8a. Attach the probes of remote-reading electronic thermometers to the evaporator-suction tubes 6 to 18 inches from the evaporators. The thermometers should have a range including 32 to 80°F (0-27°C).
- 8b. Wrap 1/2 inch (1cm) thick insulation around the tube-probe assembly. The insulation should go all the way around the tube, and extend at least 3 inches (8 cm) along the tube on both sides of the probe.
- 8c. Wrap the insulation with foil or foil-backed tape. Close the foil tightly (especially the ends) against the turbulent airflow that will form inside the cabinet.
- 8d. Route the probe cables through the door or access panel to allow temperatures to be read with the unit running.

GO TO NEXT PAGE.



Startup

Prepare to Adjust Expansion Valve(s)


WARNING
**Risk of electric shock. Can cause injury or death.**

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller **does not disconnect** electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

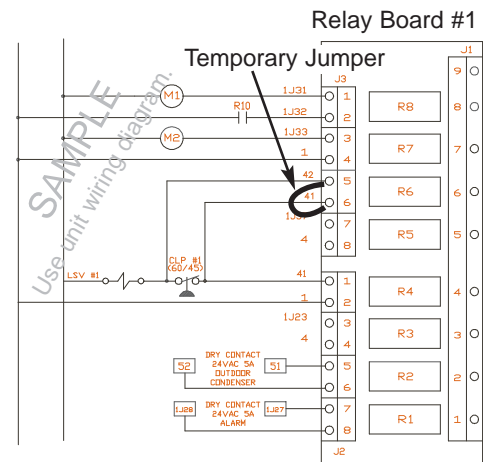
9. Refer to the unit wiring diagram. Identify the liquid-line solenoid valve and CLP switch associated with the circuit being adjusted.

NOTE: If the unit model number ends in "2", e.g. DS042, there will be two refrigeration circuits, with two sets of components.

If the unit model number ends in "4", e.g. DS284, there will be four refrigeration circuits, with four sets of components.

If the unit model number ends in "8", e.g. RS488, there will be eight refrigeration circuits, with eight sets of components.

10. In the unit control enclosure, place a temporary jumper across the pressure switch labeled "CLP" as shown. Where more than one refrigeration circuit is present, be sure to identify the correct CLP switch.
11. Close all access panels or doors. Start the unit per the instructions given in **Startup - Enable Operation**.



The expansion valve(s) will be adjusted after the compressor is started, on a subsequent page.

Check / Add Oil

Startup

! WARNING

Risk of flying liquids, gases, particles. Can cause eye injury.

This task may involve risk of exposure to flying materials which can cause eye injury. Always wear protective safety glasses or goggles, as appropriate.



! WARNING

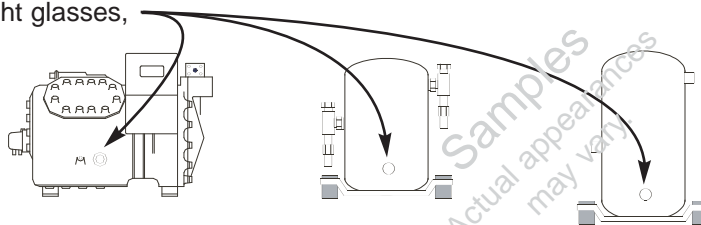
Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Do not approach any moving parts while electric power is applied to unit. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.



For units without oil-level sight glasses, any needed additional oil was added under "Add Pre-Determined Amount of Oil" on a previous page.

For units with oil-level sight glasses,



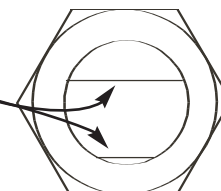
the oil level must be monitored carefully during the startup phase.

Be sure that the room temperature is within 4°F (2.2°C) and the relative humidity is within 10% of the unit-nameplate values. Check the oil level

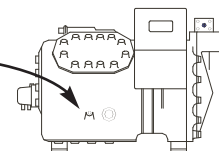
1. 30 minutes after starting the compressor,
2. each hour for the four (4) hours after starting the compressor ,
3. before leaving for the day, and
4. on the second startup day.

Add or remove oil to keep the level as near the middle of the sight glass as possible, and in any case between 1/8 and 3/4 full.

NOTICE Risk of compressor damage.
DO NOT OVERFILL OR UNDERFILL.



For semi-hermetic compressors, oil can be added through the oil fill plug. Use standard procedures per compressor manufacturers.



For scroll compressors and hermetic reciprocator compressors, add oil through the low-pressure convenience access valve, mounted on the unit cabinet.

The oil may appear slightly foamy until 30 minutes after the expansion valve is properly adjusted. After the expansion valve(s) is adjusted, the oil should not appear foamy. If the oil appears to be foaming after 30 minutes of operation after the expansion valve is adjusted, contact Dectron.

STARTUP

Startup

Enable Operation

IMPORTANT!

This energy recycling dehumidification system has been tested under design conditions at the factory.

Start-up 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 factory in order to register and validate the warranty. A copy can be faxed to the factory office at 514-334-9184.

NOTICE Risk of equipment damage.

Do NOT turn on the electric power unless the branch-circuit voltage matches that specified on the unit nameplate.

NOTICE Risk of equipment damage.

Indoor units require a minimum equipment-room temperature of 70°F (21°C). Units may not start reliably at lower equipment-room temperatures. Contact Dectron if this temperature cannot be maintained.

NOTICE Risk of equipment damage.

Unless otherwise stated in the unit submittal data, the unit requires a minimum temperature of 78°F (25.6°C) in the space it serves for proper operation of the refrigeration system(s). Before enabling a compressor, allow the blower and space heater to raise the space temperature above 78°F (25.6°C).

NOTICE Risk of equipment damage.

Where compressors are equipped with oil-level sight glasses, the oil level should be monitored closely during the first 10 hours of operation.

IMPORTANT!**Heating, Cooling, or Dehumidifying Construction Sites****NOTICE** Risk of equipment damage. Risk of property damage.

The DRY-O-TRON® unit is not a convenience air conditioner. Its capacity is matched to the expected load. Any damage to the unit and any performance reduction due to abuse or improper installation will be obvious once the building begins normal use.

Never use the unit to heat, cool, or dehumidify a construction site. The air coils must be protected from construction dusts until all construction dusts have been removed from the space, from the return duct, and from the outdoor-air intake (if any). Construction dusts bind to the cooling coil permanently and cannot be removed. Once bound, the dusts reduce heat transfer and airflow rate.

Filters will not prevent this.

The resulting performance reduction and possible component damage are **not** covered by the Dectron warranty.

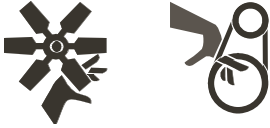
Enable Operation

Startup

WARNING

Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.



Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

WARNING

Risk of pinching or crushing. Can cause injury.

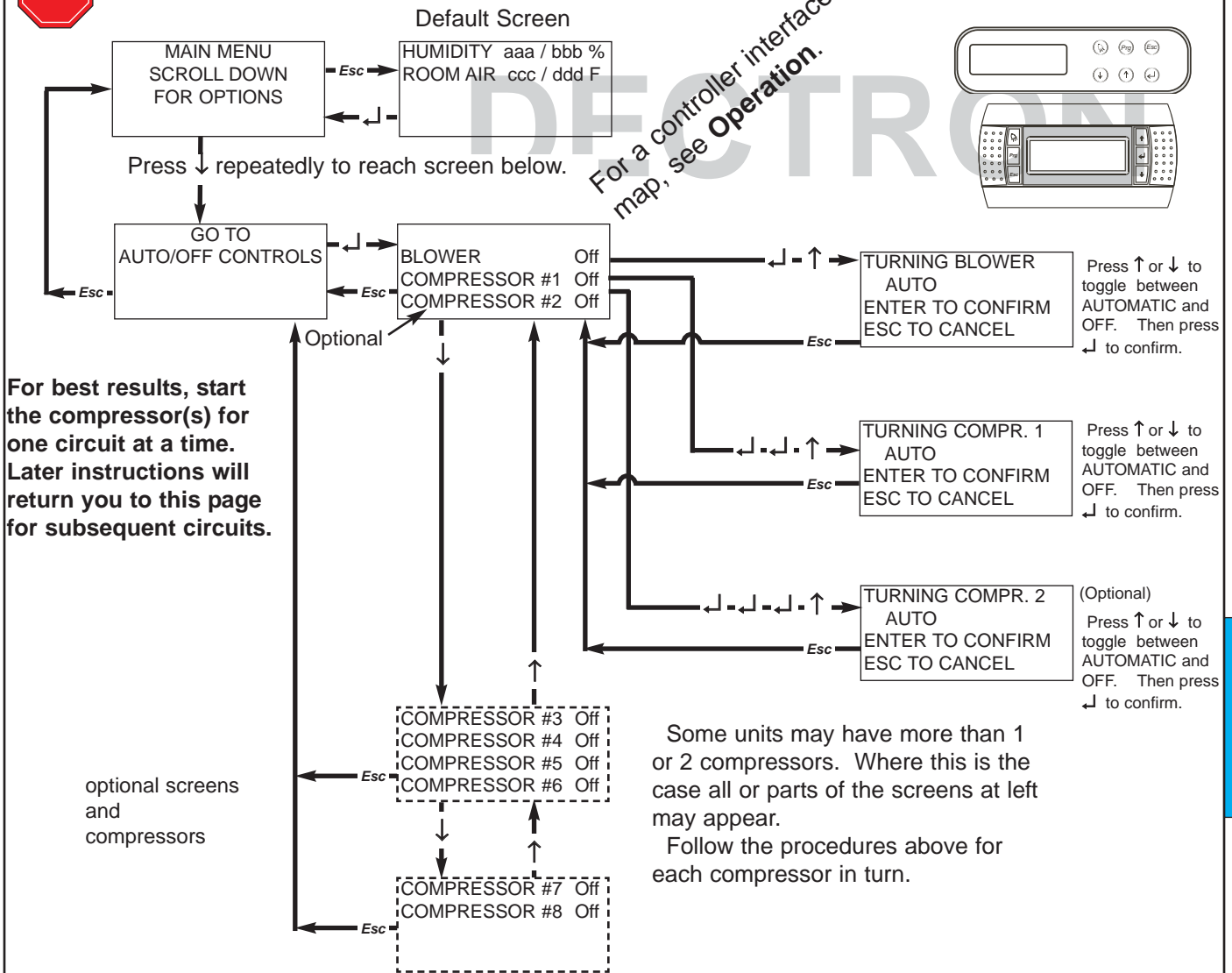
Access doors and panels are under a strong negative pressure when the blower(s) is running. Opening doors may be difficult. Closing doors must be done with a tool to prevent hands from being pinched or crushed.



NOTE: Close all doors and/or access panels before starting the blower.



DO NOT PROCEED UNLESS THE CRANKCASE HEATER HAS BEEN ON FOR AT LEAST 12 HOURS.



STARTUP

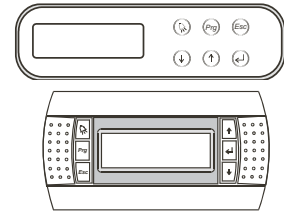
Startup

Enable Operation

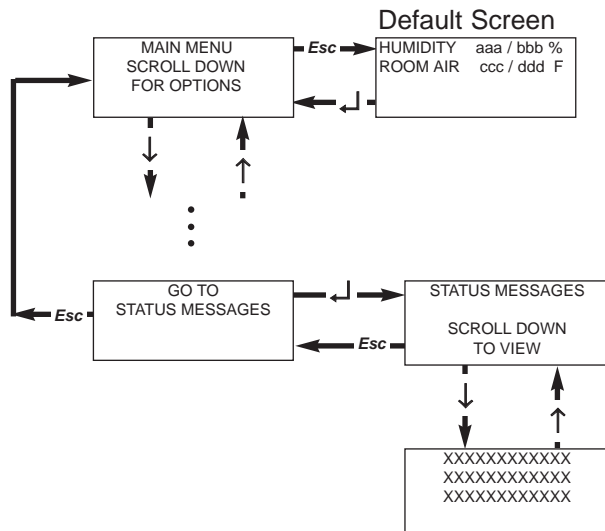
Check Status

To check the current status messages, use the controller-interface map below access the STATUS MESSAGES screen.



Press  or  to view all the status messages



DECTRON



NOTE: In the images and the discussion, “aaa”, “bbb”, “ccc”, “ddd”, and “xxx” are placeholders. Your screen will actually show the current values for your unit.

Press  or  as necessary to see all the status messages.

Refer to the following page for a list of status messages and their meanings. Some units may have special status messages. In this case, refer to the Sequence of Operation supplied with the unit.

Press **Esc** repeatedly to return to the main menu or the default screen.

If a compressor does not start:

1. **IMPORTANT!** The room conditions must be approximately as shown on the unit nameplate.
2. Check that the software compressor enable is actually set to AUTO.
3. Check that the compressor-overload device (if any) is ON.
4. Check STATUS MESSAGES (next page) to be sure that
 - 4a. the blower is ON, and
 - 4b. the Firestat is in the normal condition.
5. Correct the above as necessary.

If the compressor still does not start, temporarily change the set points (third page following) to cause it to do so.

NOTE: Air-compartment access doors or panels must remain closed while the compressor(s) is running, except briefly for expansion-valve adjustment.

NOTE: The evaporator pressure may not be stable for a few minutes. This is normal. If instability persists, it should be corrected when the expansion valve is adjusted (see following instructions).

Check Status

Enable Operation

Startup

STATUS MESSAGES

SCROLL DOWN
TO VIEW

Press ↓ repeatedly to view any of the following Status messages that apply at the moment.

NOTE: In the list below the letter "X" is a placeholder for a number referring to a particular refrigeration circuit. On your screen the appropriate number will appear rather than the "X".

- A/C ON - The Air-Conditioning feature is operating.
- AIR HEATING CALL - The temperature of the room is below set point minus offset minus differential.
- ASCT X ON - The minimum OFF time for compressor X has not elapsed.
- AUX. AIR HEATING ON STAGE 1 - First stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 2 - Second stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 3 - Third stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 4 - Fourth stage auxiliary air heating is ON.
- BLOWER ON - Blower is operating.
- BLOWER REMOTE SWITCH OFF - The blower is turned off by remote manual input.
- BLOWER TURNED OFF - See **Startup - Enable Operation**.
- COMPRESSOR X EMERGENCY SWITCH OFF - The manual ON/OFF switch is OFF.
- COMPRESSOR X PUMPDOWN - Compressor X is preparing to shut down.
- COMPRESSOR X TURNED OFF - See **Startup - Enable Operation**.
- COOLING CALL - The temperature of the room is above set point plus offset plus differential.
- DEHUMIDIFICATION CALL - The relative humidity of the room is above set point plus differential.
- DEHUMIDIFICATION ON - One or more compressors are operating.
- EVAPORATOR DAMPER CLOSED - The evaporator bypass damper is closed to divert air to the evaporator.
- ECONOMIZER ON - The Economizer feature is operating.
- GAS BOILER ON - The gas boiler on units so equipped is operating.
- LEAD LAG ON - Compressor 2 is first stage.
- MANUAL RESET REQUIRED - A fatal alarm has occurred. See **Operation - Start, Stop, Reset**.
- MAXIMUM EXHAUST BLOWER ON - The maximum amount of room air is being exhausted.
- MINIMUM EXHAUST BLOWER ON - The standby amount of room air is being exhausted.
- OCCUPIED PERIOD - Time-of-day is defined as that in which people are usually present.
- OIL RETURN MODE X ON - Refrigerant is being diverted through the outdoor condenser for oil return.
- PLEASE WAIT... Compressor X will auto reset - A possibly fatal alarm is being analyzed.
- POOL 1 AUX ON - An auxiliary heater is heating pool 1 water.
- POOL 2 AUX ON - An auxiliary heater is heating pool 2 water.
- POOL 1 HEATING CALL - The temperature of pool 1 water is below set point minus differential.
- POOL 2 HEATING CALL - The temperature of pool 1 water is below set point minus differential.
- POOL 1 HEATING ON - Water from pool 1 is being heated.
- POOL 2 HEATING ON - Water from pool 2 is being heated.
- PURGE MODE ON - Room air is being exhausted to dilute superchlorination gases.
- VENTILATION ON - Cooling or dehumidification by ventilation is enabled in the event of compressor failure or no air-conditioning option.
- ZERO REHEAT ON - Supply air temperature is limited to the return air temperature.

STARTUP

Startup

Set Point Adjustment

DECTRON

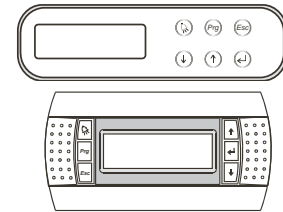
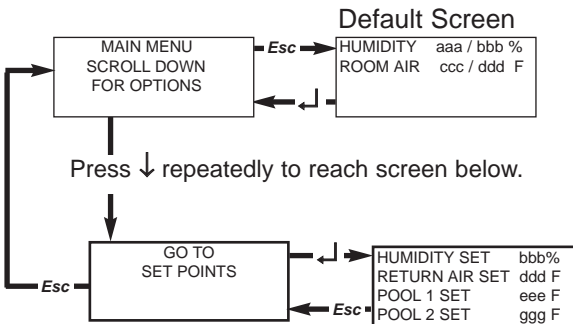
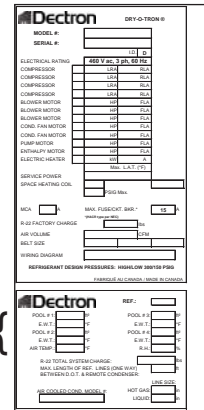
During startup, set points may have to be changed in order to produce required operating modes.

It is important to return all set points to the values specified on the unit nameplate before the startup is complete.

Each unit is carefully sized to match the expected load, as specified in the original order. Attempting to operate the unit at conditions that are not near the nameplate values can have unexpected results.

The operating set points are viewed and adjusted as shown below. If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 17 or 1793.

To clear the password, select YES when prompted to log off.



Press ← to move the cursor around the screen.

aaa is the present indoor relative humidity.

bbb% is the relative humidity set point. If a change is desired, press ← as needed to move the cursor to **aaa%**, then press ↑ or ↓ to change the set point.

ccc is the present room air temperature.

ddd F is the room air temperature set point. If a change is desired, press ← as needed to move the cursor to **ddd F**, then press ↑ or ↓ to change the set point.

eee F is the pool #1 temperature set point. If a change is desired, press ← as needed to move the cursor to **eee F**, then press ↑ or ↓ to change the set point.

ggg F is the pool #2 temperature set point (optional). If a change is desired, press ← as needed to move the cursor to **ggg F**, then press ↑ or ↓ to change the set point.

NOTE: In the image above and the discussion at right, “bbb”, “ddd”, “eee”, and “ggg” are placeholders.

Your screen will actually show the set points originally ordered for your unit.

NOTE: The text “Pool 2 Set . . . gggF” is optional and may not appear on all units.

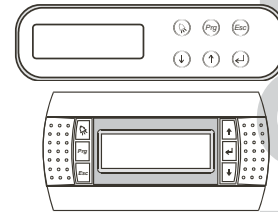
For a controller interface map, see **Operation**.

Read Sensors

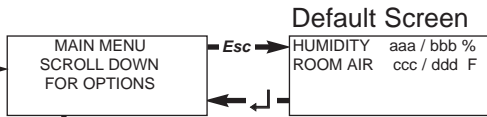
Startup

The values of some sensor signals are displayed on the default screen. To read all sensors, follow the steps below.

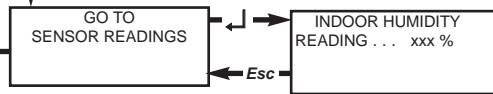
NOTE: In the images and the discussion below, "aaa", "bbb", "ccc", "ddd", and "xxx" are placeholders. Your screen will actually show the current values for your unit.



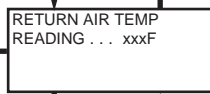
For a controller interface map, see **Operation**.



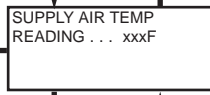
Press **J** repeatedly to reach screen below.



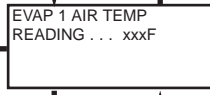
This screen displays the relative humidity of the room air, as measured at the return duct



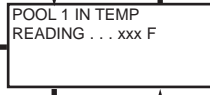
This screen displays the temperature of the room air, as measured at the return duct



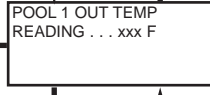
This screen displays the temperature of the supply air, as measured at the DRY-O-TRON® supply blower.



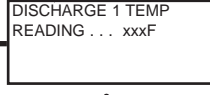
This screen displays the temperature of the air leaving the evaporator of the first refrigeration circuit.



This screen displays the temperature of the pool #1 water entering the DRY-O-TRON®.



This screen displays the temperature of the pool #1 water leaving the DRY-O-TRON®.



This screen displays the temperature of the hot refrigerant gas leaving the #1 compressor. This is important to a proper startup. See **Startup - TXV Adjustment**.

⋮
to other readings

This is a sample. The order and number of sensor screens may vary, depending on options ordered.

DECTRON

STARTUP

Startup

Adjust Expansion Valve(s)

1. Be sure the compressor(s) of the circuit being adjusted is running. If not, return to **Startup - Enable Operation**.
2. If the unit does not operate in dehumidification mode (status message DEHUMIDIFY ON, see **Operation - Controller Messages**.), then temporarily decrease the humidity set point to cause it to do so. (See **Startup - Adjust Set Points**)
3. Be sure that the refrigerant sight glass is completely full of liquid, with no bubbles. If bubbles are present, return to step 1 or contact Dectron.

4. Determine the type of refrigerant from the unit nameplate. 



5. Check that the refrigerant condenser pressure is in one of the following ranges:

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

6. Allow the unit to run in dehumidification mode for at least 20 minutes, then read the compressor discharge-gas temperature using the remote-reading thermometer (by others) set up under **Prepare to Adjust Expansion Valve**. The temperature 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)

7. (a) If the compressor discharge-gas temperature is too low, close the expansion valve(s) 1/2 turn at a time, allowing at least 15 minutes between adjustments, until the compressor discharge-gas temperature is in the proper range for the compressor type.
(b) If the compressor discharge-gas temperature is too high, open the expansion valve(s) 1/2 turn at a time, allowing at least 15 minutes between adjustments, until the compressor discharge-gas temperature is in the proper range for the compressor type.
(c) Where each refrigeration circuit has two or more expansion valves, adjust the expansion valves together as much as possible. Complete the adjustments by referring to the previous page, and, using the thermometer probes discussed there, adjust the associated expansion valves to keep the average expansion-valve-bulb temperatures as near the same as possible, while meeting the requirements of (a) and (b) above.
8. 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-gas temperature is in the correct range for the type of compressor.

Adjust Expansion Valve(s)

Startup

! WARNING



Risk of electric shock. Can cause injury or death.

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

1. Refer to the unit wiring diagram. Identify the liquid-line solenoid valve and CLP switch associated with the circuit being adjusted.

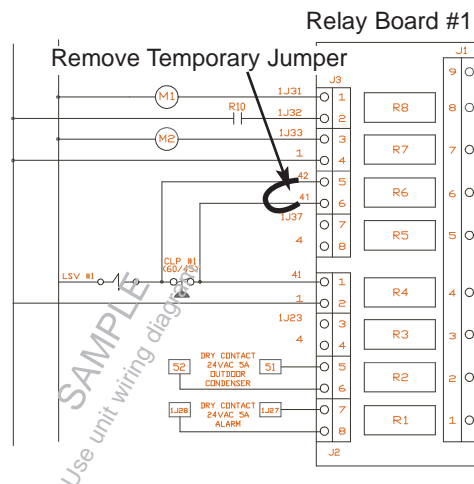
NOTE: If the unit model number ends in "2", e.g. DS042, there will be two refrigeration circuits, with two sets of components.

If the unit model number ends in "4", e.g. DS284, there will be four refrigeration circuits, with four sets of components.

If the unit model number ends in "8", e.g. RS488, there will be eight refrigeration circuits, with eight sets of components.

2. In the unit control enclosure, remove the temporary jumper across the pressure switch labeled "CLP" as shown. Where more than one refrigeration circuit is present, be sure to identify the correct CLP switch.

3. Close all covers.



STARTUP

Startup

Check Discharge Sensor


WARNING
Risk of blistering. May cause injury.

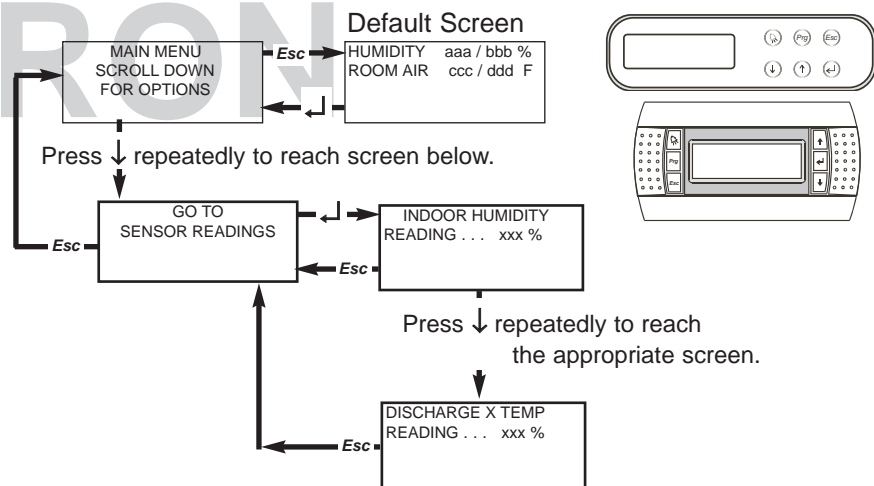
Some surfaces inside a unit may be at elevated temperatures. Use gloves and other protective equipment to prevent injury.



NOTE: In the images and the discussion below, “aaa”, “bbb”, “ccc”, “ddd”, and “xxx” are placeholders. Your screen will actually show the current values for your unit.

1. Check the calibration of the unit's compressor-discharge gas temperature sensor by following the interface map shown at right.

The indicated temperature should agree with the reading of the installer's thermometer within 10°F (4°C). If it does not, be sure your thermometer is accurate, then contact Dectron if necessary.



2. Replace the expansion-valve caps.
3. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
4. **IMPORTANT:** Remove the temporary jumper wire across the CLP switch.
5. Close the access panels or doors.
6. If the unit has more than one refrigeration circuit and not all of the circuits have yet been adjusted, repeat pages **Prepare to Adjust Expansion Valve(s)** through **Check Discharge Sensor** for other refrigeration circuits.

Adjust Pool-Water Pressure Switch

Startup

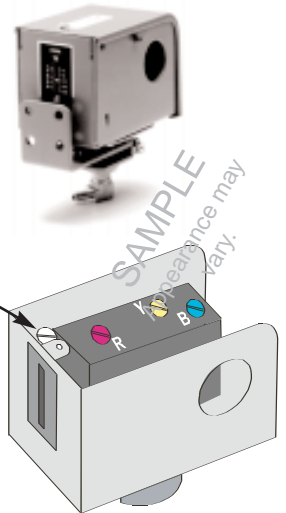
The pool-water flow rate(s) (if any) must be near the values shown in **Startup - Pre-Startup Adjustments - Flow Rates**.

DECTRON

Adjust the water-pressure switch(es):

The pool-water pressure switch informs the unit controller that flow is present. To adjust a pressure switch -

1. Establish the proper flow rate. See above.
2. Turn the pressure-switch adjusting screw clockwise until the pressure-switch contacts (red-yellow) open. The DRY-O-TRON® controller will show a low-flow alarm.
3. Slowly turn the pressure-switch adjusting screw counter-clockwise until the pressure-switch contacts (red-yellow) just make, then turn the screw an additional 1/2 turn counter-clockwise.
4. Stop the pump and confirm that the pressure switch opens.
5. Re-adjust as necessary for proper operation.
6. Test the function of the switch several times by starting and stopping the flow. Be sure that flow closes the switch contacts (**red** and **yellow**) reliably and that loss of flow breaks the switch contacts (**red** and **yellow**) reliably.
7. Replace the switch cover. If possible and safe to do so, leave the pool water flowing.
8. Repeat as necessary for other pool-water pressure switches (if any).

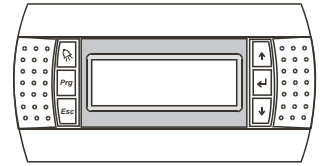


STARTUP

Startup

Adjust Pool Heating

Where units are connected for pool-water heating, the unit must have a constant pool-water flow rate within $\pm 10\%$ of the recommended values (See **T.A.B.**). Either a flowmeter (by others) or a balancing valve (by others) is required to set the pool-water flow correctly. Check the pool-water flow rate or the Balancing report.



1. Temporarily adjust set points to cause the unit to operate in dehumidification and pool-heating mode. Allow 15 minutes of operation before proceeding.

2. Using the interface map at right, note the temperatures of the inlet pool water and the outlet pool water.

3. Compute the pool-water temperature difference when the unit is in pool-heating mode. Enter the temperature difference in BOX A.

4. Go to step 5 if the temperature difference is between 10°F (5.5°C) and 20°F (11°C), with the optimum at 12°F (6.7°C). Otherwise, locate the valve assembly for the correct pool-water heat exchanger.

If Valve **B** is not present, skip to step 5.

If Valve **B** is present, call Dectron at 1-800-667-6338 or 1-800-676-2566.

5. Temporarily adjust set points to cause the unit to stop pool-heating mode and operate in dehumidification mode only. Allow 10 minutes of operation before proceeding.

6. Compute the pool-water temperature difference when the unit is in dehumidification mode without pool-heating mode. Enter the temperature difference in BOX B.

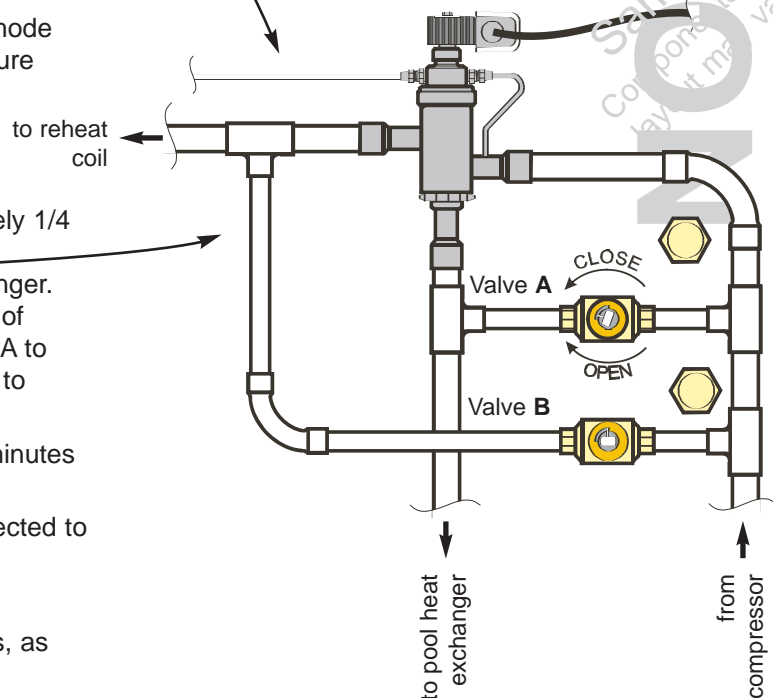
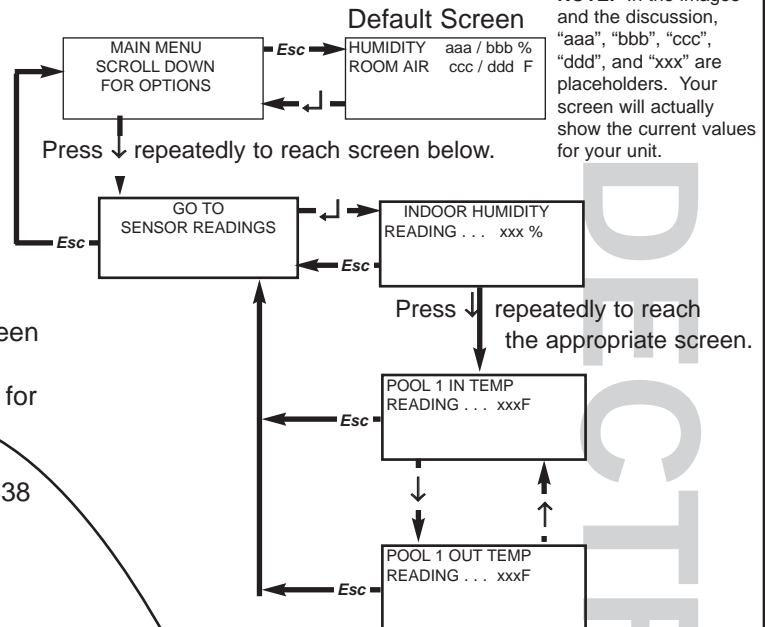
7. The value in BOX B should be greater than zero and equal to or less than approximately 1/4 of the value in BOX A. If not, locate the valve assembly for the correct pool-water heat exchanger. If Valve **A** is not present, skip to **END** at bottom of page. If Valve **A** is present, slightly close Valve **A** to decrease the temperature difference, or open it to increase the temperature difference.

8. If Valve **A** was adjusted in step 7, allow 10 minutes of operation, then return to step 6.

9. Repeat steps 1 - 8 for any other pools connected to the unit.

10. Re-install valve caps.

11. Return the set points to their original values, as specified on the unit nameplate. See **Product Description - Unit Nameplate**.

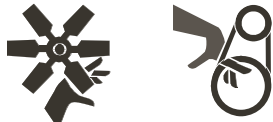


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STARTUP

Startup

Adjustments

WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Do not approach any moving parts while electric power is applied to unit. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

IMPORTANT!

Once the pool water and room air have reached design conditions, final adjustments must be made. Return to the installation at this point and follow the instructions below.

For units without motorized bypass damper, the bypass damper must be fully open once the room temperature is above 78°F.

The chart below shows approximate temperatures inside the DRY-O-TRON®.

The pool-water-heater discharge temperature is given as an approximate guide only and can vary with pool heater size.

Adjust all temperature and relative humidity set points to design conditions (see **Operation - Set Points** for detailed instructions). Design conditions can be found on the unit nameplate.

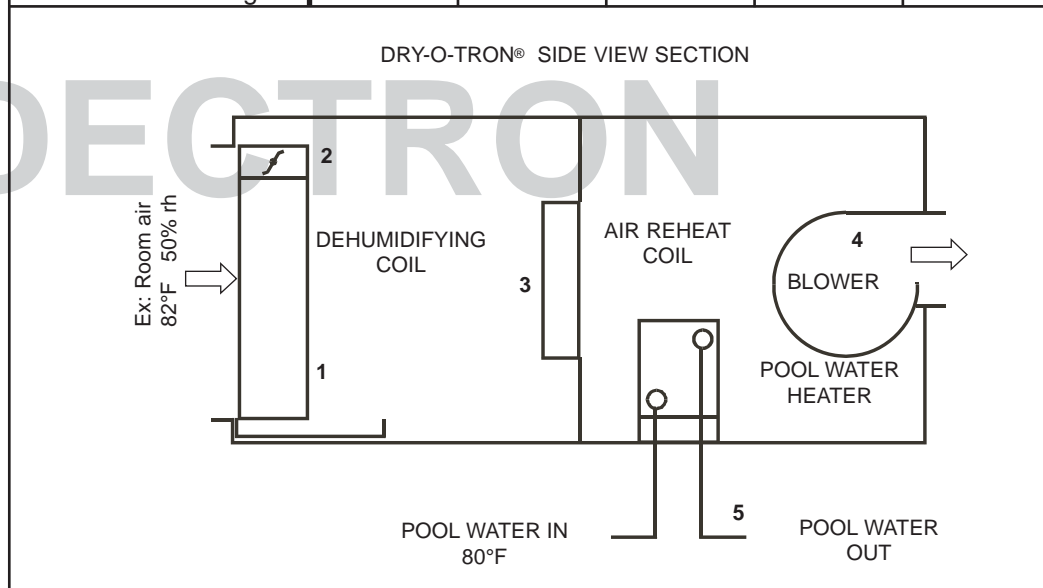
IMPORTANT!

After final adjustments are made, ensure that the Start-up Report and Warranty Registration form is completely filled in and a copy returned to the Dectron factory to register the warranty.

Leave the Owner's Manual and the completed start-up form with the DRY-O-TRON®.

Standard Operating Temperature Differences (°F)

Temperature Point #	1	2	3	4	5
Dehumidification	50	82	66	95	84
Pool Heating	47	82	65	82	96
Space Cooling	50	82	66	72	84
Space Cooling and Pool Water Heating	47	82	65	72	96



Check Pressures

Startup



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:

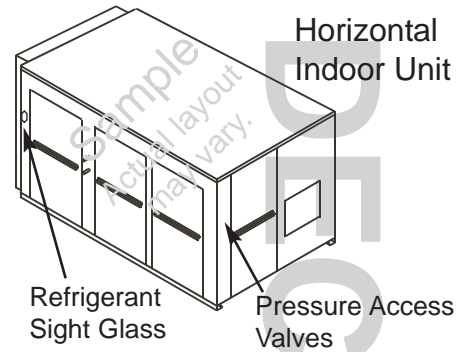
a) The refrigerant sight glass should be full of liquid. There should be no bubbles.

b) The evaporator pressure should be between:

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

c) The condenser pressure should be between:

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

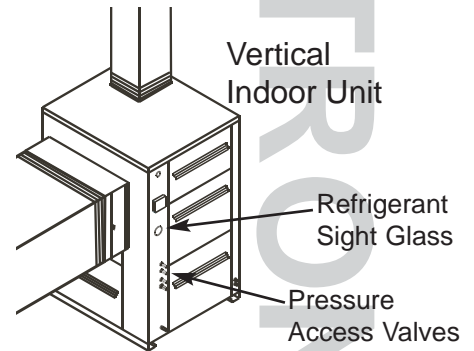


Note: Units with multiple refrigeration circuits will have multiple sight glasses, suction-access valves, and discharge-access valves.

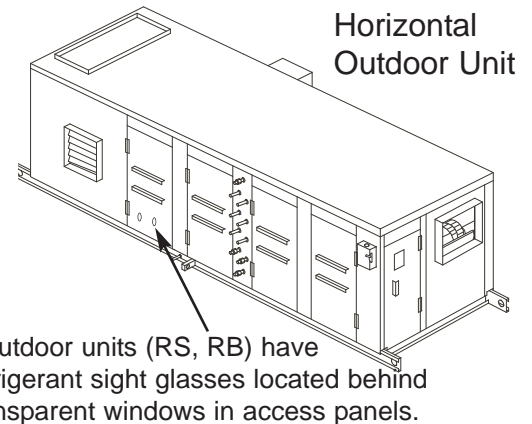
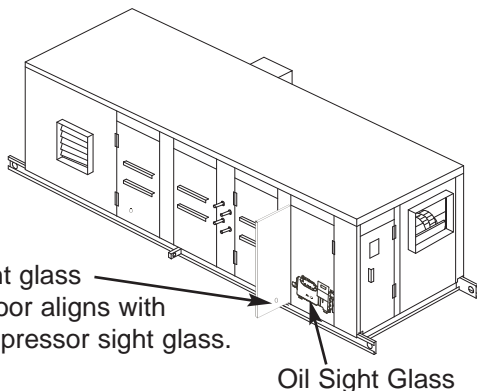
d) Some units may have compressor oil-pressure access valves. The pressure on any oil-pressure access valve should be no less than 25 PSI above evaporator pressure.

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)



Data subject to change without notice.

Dectron, Inc. March 2012

Startup

The Start-up Report and Warranty Registration form must be completed and a copy must be sent directly to Dectron within one week of starting a compressor.

NOTE: Some compressors and electric motors may have part-winding start or Y-Δ start. In this case, the compressor currents to be recorded are the total phase currents, not the currents for each individual winding.

The startup form can be faxed to Dectron at 1-514-334-9184.

Dectron provides training for installers and service technicians for a nominal fee. Contact the Dectron service department for details, or download the information at <http://dot-library.dyndns.org>.

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 start-up, he or she supports and trains the contractor as the contractor does the start-up. 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 all pages 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,
3. provide any necessary equipment such as hand tools, instruments, pumps, ladders, etc., and
4. make available as necessary any other personnel necessary to the startup, such as pool, plumbing, and electrical contractors.

NOTE: 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,
pool not filled,
water features not operable, etc.

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

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

Warranty void unless this form is completed and submitted within 1 week after startup.

Begin with the unit turned OFF. See safety warnings on a previous page.

Installation Name:

Installation Address:

Dectron Representative Firm:

page 1 of 4

Yes	Proper air distribution:	<input type="checkbox"/>	Condensate drain installed:	<input type="checkbox"/>	Startup checklists complete:	<input type="checkbox"/>
No	Proper duct design:	<input type="checkbox"/>	Condensate drain tested:	<input type="checkbox"/>	Blower rotation on 3-phase motors correct:	<input type="checkbox"/>
N/A	Proper ventilation provided:	<input type="checkbox"/>	Condensate pump (if any) installed properly:	<input type="checkbox"/>	Airflow and blower speed adjusted:	<input type="checkbox"/>
	Vapor retarder installed properly:	<input type="checkbox"/>	Branch-circuit disconnect switch installed:	<input type="checkbox"/>	Refrigerant charge OK:	<input type="checkbox"/>
	Chemicals stored in the Mechanical Room:	<input type="checkbox"/>	Remote condenser (if any) installed properly:	<input type="checkbox"/>	Fault codes displayed on operator panel:	<input type="checkbox"/>
	Adequate service access provided:	<input type="checkbox"/>	Remote operator panel (if any) installed properly:	<input type="checkbox"/>	Set points are at design conditions:	<input type="checkbox"/>
	Vibration isolation provided:	<input type="checkbox"/>	Outdoor temperature sensor (if any) installed properly:	<input type="checkbox"/>	Bypass damper open in room temp. > 78° F:	<input type="checkbox"/>
	Flex duct installed at Inlet and Outlet of DRY-O-TRON®:	<input type="checkbox"/>	Wire connections checked for tightness:	<input type="checkbox"/>	Measured Airflow: <input type="text"/> cfm	

See unit nameplate for the following information:

Unit Model:	Unit Serial #:	Unit Ref #:
Supply Airflow: <input type="text"/> CFM	Supply Blower Belt Size (if any) <input type="text"/>	Return Blower Belt Size (if any) <input type="text"/>
	Min. Exh. Blower Belt Size (if any) <input type="text"/>	Max. Exh. Blower Belt Size (if any) <input type="text"/>

For units with air-cooled air conditioning only:

Maximum Allowable Length of Tubes: ft.

See unit nameplate.

	Cir. 1		Cir. 2	Cir. 3	Cir. 4	Cir. 5	Cir. 6	Cir. 7	Cir. 8
Hot-Gas Tube Size(s) (O.D.)	<input type="text"/>	if any →	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Liquid Tube Size(s) (O.D.)	<input type="text"/>	if any →	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

See compressor nameplate(s) for the following information:

if any	Comp 1 Model #	Comp 1 Serial #
	Comp 2 Model #	Comp 2 Serial #
	Comp 3 Model #	Comp 3 Serial #
	Comp 4 Model #	Comp 4 Serial #
	Comp 5 Model #	Comp 5 Serial #
	Comp 6 Model #	Comp 6 Serial #
	Comp 7 Model #	Comp 7 Serial #
	Comp 8 Model #	Comp 8 Serial #

Data subject to change without notice.

Dectron, Inc. March 2012

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Startup

Warranty Registration

Unit Ref. Number

See safety warnings on a previous page.

Page 2 of 4

- Check here and skip to next section if there is no remote condenser.
- Check here and skip to next section if condenser is factory-assembled to unit.
- Check here and skip to next section if there is no DryCooler.

	L1 - L2	L2 - L3 (3Φ only)	L3 - L1 (3Φ only)	Nameplate Voltage
Optional Condenser or DryCooler Voltage (V) (when running)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Optional outdoor air-cooled condenser(s) (if any) location: Above D-O-T Below D-O-T Same level as D-O-T

Measured Refrigerant-Tube Size(s)
Connecting Unit to Remote Condenser:

		if any						
	Circuit 1	Cir. 2	Cir. 3	Cir. 4	Cir. 5	Cir. 6	Cir. 7	Cir. 8
Hot Gas O.D. (in.)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Liquid O.D. (in.)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tube Length (ft.)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

See safety warnings on a previous page. Close all access doors and panels. Be sure the O/A damper is in Occupied-Period position. Start the supply blower. Note that other blowers may start also. After 3 minutes of blower operation, record the following:

	L1 - L2	L2 - L3 (3Φ only)	L3 - L1 (3Φ only)	Nameplate
Supply-Blower Voltage (V) (when running)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

		if any						
	#1	#2	#3	#4	#5	#6	#7	#8
Supply-Blower Current(s) (A) (when running)	L1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	(3Φ only) {	L2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
		L3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Nameplate Supply-Blower Current (A)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

See safety warnings on a previous page. Adjust set points to cause all compressors to operate in dehumidification (only) mode. For compressors with part-winding or Y-Δ start, record the total phase currents. After 5 minutes of operation, record the following:

	L1 - L2	L2 - L3 (3Φ only)	L3 - L1 (3Φ only)	Nameplate
Compressor Voltage (V) (when all running)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

		if any						
	#1	#2	#3	#4	#5	#6	#7	#8
Compressor Current(s) (A) (when all running)	L1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	(3Φ only) {	L2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
		L3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Nameplate	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

Data subject to change without notice.

STARTUP

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

Warranty Registration Startup

NOTE: To obtain adequate readings, a delay of ten (10) minutes is required after every operation or adjustment.

	Standby (Blowers Only)	Dehumidification Only	Dehumidification With Pool-1 Heat	Dehumidification With Pool-2 Heat	Cooling Only	Page 3 of 4		
Entering-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Unit Ref. Number		
Leaving-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Room Humidity %	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Pool-1 Inlet Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Pool-1 Outlet Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Pool-2 Inlet Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Pool-2 Outlet Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Outdoor-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
Condenser Pressure (PSIG) (By Compressor #)		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	See safety warnings on a previous page.		
	Suction Pressure (PSIG) (By Compressor #)		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	
		Oil Gauge Pressure (if available) (PSIG) (By Compressor #)		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>
			Sight Glass Clear (Yes, No, or N/A) (By Compressor #)		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>
Average TX Valve Bulb Temperature (°F) (By Compressor #)					1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>
	Compressor Discharge-Gas Temperature (°F) (By Compressor #)			1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>
		Temperature of Air Leaving Cooling- Coil (°F) (By Compressor #)		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>		1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>	1 <input type="text"/> 5 <input type="text"/> 2 <input type="text"/> 6 <input type="text"/> 3 <input type="text"/> 7 <input type="text"/> 4 <input type="text"/> 8 <input type="text"/>

Data subject to change without notice.

Dectron, Inc. March 2012

STARTUP

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Owner's Manual

Startup

Warranty Registration

NOTE: To obtain adequate readings, a delay of ten (10) minutes is required after every operation or adjustment.

	Space Heating	Units with Exhaust Blowers Only Exh. ON	Units With Purge Mode Only Purge	Units With Economizer Only
Entering-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Heated-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Room Humidity %	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Outdoor-Air Temp. °F	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Outdoor-Rel. Hum. %	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Boiler Pump (if any) (if in unit) Current (A)	<input type="text"/>			
Electric Heater (if any) Average Current (A)	<input type="text"/>			
Electric Heater (if any) Average Voltage (V)	<input type="text"/>			
Supply-Blower Voltage (with heater ON) (V)	<input type="text"/>			
Occupied-Period Exhaust Blower Current (A)		L1 <input type="text"/> L2 (3Φ) <input type="text"/> L3 (3Φ) <input type="text"/>		
		Nameplate <input type="text"/>		
Purge-Blower (if any) Current (A)			L1 <input type="text"/> L2 (3Φ) <input type="text"/> L3 (3Φ) <input type="text"/>	
			Nameplate <input type="text"/>	
Return Blower (if any) Current (A)				L1 <input type="text"/> L2 (3Φ) <input type="text"/> L3 (3Φ) <input type="text"/>
				Nameplate <input type="text"/>

Page 4
of 4

Unit Ref.
Number

See safety warnings on a previous page.

Comments:

Form completed by:

Company name:

Date:

Telephone:

Staple copies of the completed and signed four-page Warranty Registration Form together.

Attach copies of the completed and signed air-balance and water-balance reports.

Attach copies of the completed and signed Pre-Startup Checklist.

Attach any desired further comments or explanatory material. Send all of the above to:

DECTRON INC.
4300 Poirier Boulevard
Montreal, QC.
H4R 2C5
Canada
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Data subject to change without notice.

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OPERATION

Operation

Safety Warnings

! WARNING**Risk of electric shock. Can cause injury or death.**

Some operation and maintenance procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some operation and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit unless ductwork or a screen is installed at each blower outlet.

! WARNING**Risk of flying liquids, gases, particles. Can cause eye injury.**

Some operation and maintenance procedures involve risk of exposure to flying materials which can cause eye injury. Always wear protective safety glasses or goggles, as appropriate.

! WARNING**Risk of blistering. Can cause injury.**

Some surfaces inside an operating unit may be at elevated temperatures. The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Compressor crankcase heaters can be extremely hot at any time electrical power is applied.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts. Use gloves and other protective equipment to prevent injury.

! WARNING**Risk of pinching or crushing. Can cause injury.**

Depending on the size of this product, some operation and maintenance procedures could expose personnel to the risk of injury by pinching or crushing.

Access doors and panels are under a strong negative pressure when the blower(s) is running. Opening doors may be difficult. Closing doors must be done with a tool to prevent hands from being caught.

! WARNING**Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some operation and maintenance procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.

Safety Warnings

Operation

**WARNING****Risk of contamination of breathing air. Can cause injury or death.**

Application of this product may involve the intake of outdoor air. The point of intake must be carefully chosen to prevent intake of contaminants.

Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants.

Follow the instructions in this manual and all applicable codes.

NOTICE**Risk of uncontrolled condensation. Can cause property damage.**

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

Read and follow the instructions in this manual. Optional material will be noted as being optional. All other material should be considered as important to the proper function of the product.

NOTICE**Risk of leaking water. Can cause property damage.**

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow. Uncontrolled water can cause expensive damage to buildings and other equipment. Do not locate this product above any equipment that could be damaged by water.

NOTICE**Risk of unit damage.**

This product uses refrigerant and oil. If the unit has been without electric power for more than two days, a period of 12 hours with electric power applied is required before operating the compressors again. This is necessary to allow compressor crankcase heaters to heat the compressor oil, thus reducing the concentration of refrigerant dissolved in the oil.

NOTICE**Risk of unit damage.**

If service or repair requires the closing of manual refrigerant valves, follow the procedures in **Service-Closing Manual Valves**.

Operation

Maintenance

The following steps are important to the proper function and long life of the unit.

Every Month

See subsequent task descriptions for safety warnings, etc.

► Check the Air Filters

- All units have return-air filters. The unit cannot work properly with dirty filters. Units with outdoor-air intakes must have filters for the outdoor-air intake also. Units with the Economizer, Purge, or EconoPurge options may have filters before the reheat coil also.
- All dirty filters should be replaced with identical new filters. Filters for outdoor air should be moisture resistant.
- Some units may have airflow options as described in Product Description at the front of this manual. For these options, refer to filter requirements in the appropriate manual appendix.
- Units with boilers may have an intake-air filter. This filter should be checked and cleaned even in cooling season.
- **Do not operate the unit for any amount of time without all filters in place.**

► Check the compressor(s) oil level, if compressor(s) is equipped with an oil-level sight glass.

► Check the lubrication schedules for the blower(s) and motor(s). Lubricate as appropriate.

► Check the belt(s) on all blower(s)

- Check for excessive wear. Be sure the belt(s) will operate another month.
- Check the blower-belt tension and alignment. Belts should not be so loose as to cause increased slip, nor so tight as to cause excessive shaft-bearing wear. **CAUTION: Never open a sheave to remove, install, or adjust a belt - use the belt tensioning screw only. Only a qualified technician should change sheave settings.**

► Check that the temperature and humidity set points are near those specified on the unit nameplate.

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

► For units with air-cooled air conditioning or DryCooler air conditioning, check for free airflow in the remote heat exchanger.

- Clean any trash or leaves that might interfere with proper airflow.
- Remove any vegetation or other material that might interfere with airflow at the bottom, sides, or top.

► Eliminate chemical fumes

- For indoor units, remove all pool chemicals from the DRY-O-TRON® equipment room.
- For all units, remove all pool chemicals from any space that allows fumes to leak into the natatorium or other space served by the DRY-O-TRON®.
- For all units, be sure the pool-chemistry agrees with accepted standards and recommendations of this manual.

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.

► 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.
- In the event of significant differences from the above values, contact Dectron for corrective actions.
- The refractive index should be 1.38.
- The specific gravity should be 1.08.

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

In the event of an extended shutdown, contact Dectron for a copy of Appendix M4 - Storing Units.

Data subject to change without notice.

Dectron, Inc. March 2012

Maintenance

Operation

Each year, photostat this page and the following page and post them near the unit for use by maintenance personnel.

Use the maintenance list from the preceding page and the task descriptions from subsequent pages to accomplish each maintenance task, then record that accomplishment in the maintenance record.

Initial each completion box.

YEAR	Date											
_____		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Space Temperature		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Space Temperature Set Point		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Space Humidity		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Space Humidity Set Point		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 1 Temperature		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 1 Temperature Set Point		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 2 Temperature		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 2 Temperature Set Point		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 1 pH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 1 Combined Chlorine		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 2 pH		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pool 2 Combined Chlorine		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment room and all connecting rooms clear of all chemicals?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Model _____ **Serial Number** _____

OPERATION

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Operation Maintenance Maintenance Record

YEAR	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Date	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Air filters clean and in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Unit not exposed to chemical fumes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Set points near nameplate values?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Blower belt wear and tension OK?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Condensate drain-pan clean?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Remote heat-exchanger clean?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Remote heat-exchanger fans OK?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Compressor oil levels OK (where possible)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Sight glass clear?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Compressor discharge temperature NOTE: Compressors 2 through 8 are optional and may not be present on all units.	Compressor #1 _____ °F Compressor #2 _____ °F <input type="checkbox"/> Compressor #3 _____ °F Compressor #4 _____ °F Compressor #5 _____ °F Compressor #6 _____ °F Compressor #7 _____ °F Compressor #8 _____ °F	Compressor #1 _____ °F Compressor #2 _____ °F <input type="checkbox"/> Compressor #3 _____ °F Compressor #4 _____ °F Compressor #5 _____ °F Compressor #6 _____ °F Compressor #7 _____ °F Compressor #8 _____ °F
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Electrical terminals tight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Heat-transfer fluid OK?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Electric motors lubricated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Blower bearings OK and greased?	For specific schedules, see Operation-Maintenance-Blower Lubrication										<input type="checkbox"/>	<input type="checkbox"/>
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Air-side heat-transfer coils clean?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Model _____ **Serial Number** _____

OPERATION

Air Filters

Maintenance

Operation

! WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

! WARNING



Risk of falling. Can cause injury or death.

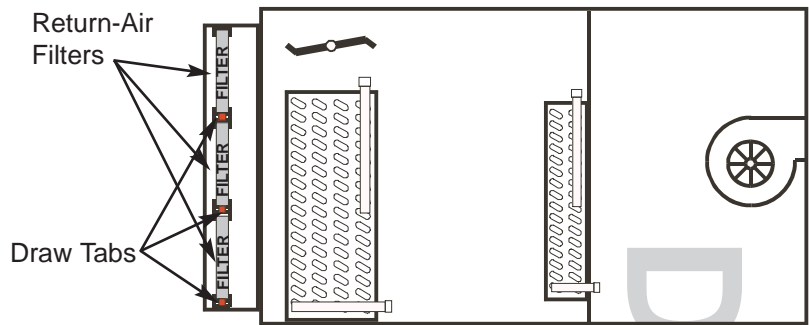
Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.

Use fall-protection equipment as appropriate.

CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE

Basic horizontal units may have return-air filters just before the cooling coil. Use draw tabs (if any) to remove all filters, then replace them. This assures that all filters are present.

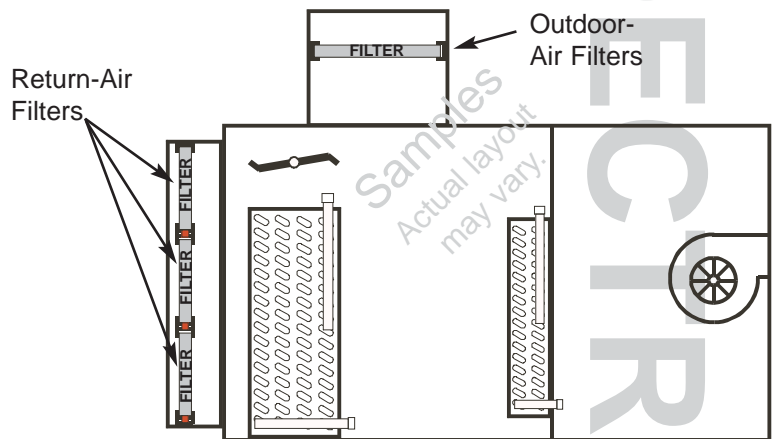
The size and number of filters and draw tabs may vary.



Some horizontal units may have a connection for outdoor-air intake, as shown. Use draw tabs to remove all filters, then replace them. This assures that all filters are present.

Filters for outdoor air must be moisture resistant.

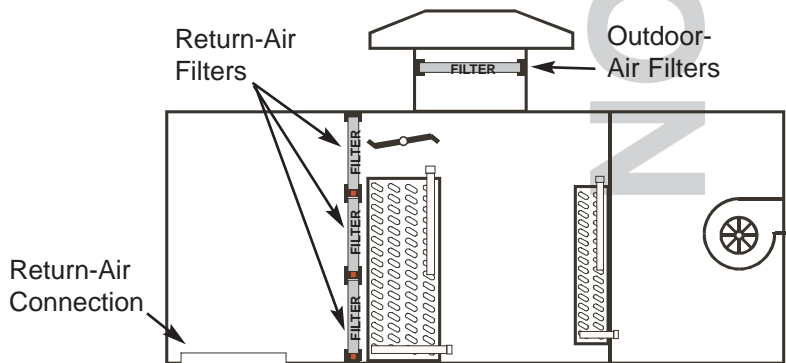
The size and number of filters and draw tabs may vary.



Some horizontal units may have bottom return-air connection, as shown. Most such units have lift-out return-air filters accessible through a door.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.



Data subject to change without notice.

Dectron, Inc. March 2012

Operation

Maintenance

Air Filters

! WARNING

See safety warnings on previous page.

CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE, con't.

Some horizontal units may have the optional Purge-mode feature. In this case, there will be a set of outdoor-air filters located upstream of the reheat coil. Most such units have lift-out return-air filters accessible through a door. Refer to [Appendix M6](#).

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

Some horizontal units may have the optional SmartSaver® feature. In this case, there will be a two sets of filters for return air as shown. Most such units have lift-out return-air filters accessible through a door.

There will also be a set of filters for outdoor air as shown. These filters may be lift-out or may have draw tabs.

Filters for outdoor air must be moisture resistant.

The location, size, and number of numbers of filters may vary.

Some horizontal units may have the optional economizer feature. In this case, there will be a set of filters for return air as shown. These filters may be lift-out or may have draw tabs.

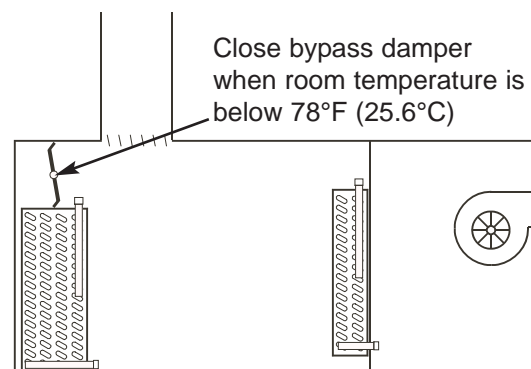
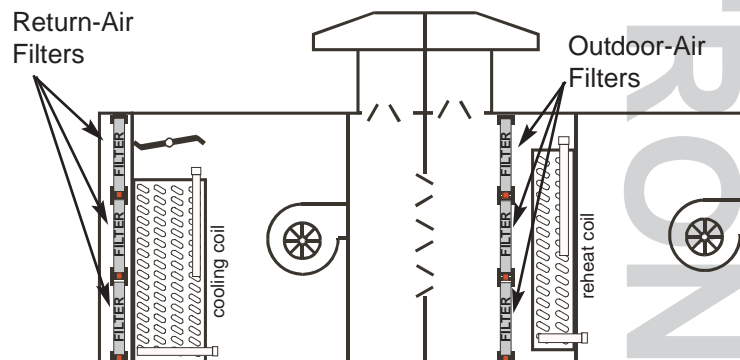
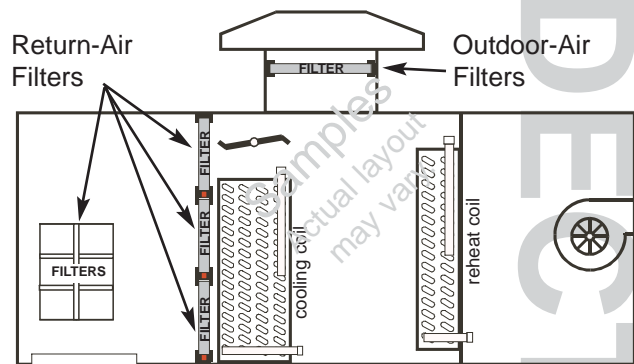
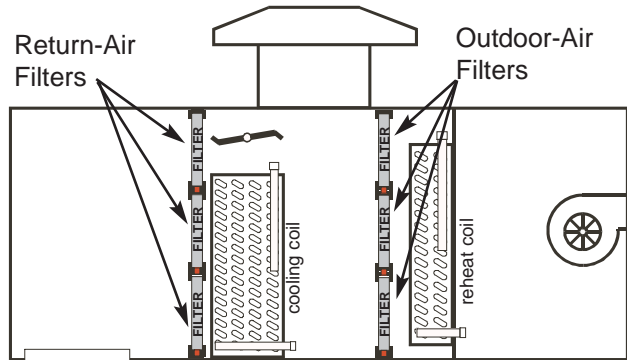
There will also be a set of filters for outdoor air as shown. These filters may be lift-out or may have draw tabs.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

Units with manual evaporator bypass damper only

Some units may have manual evaporator-bypass dampers. In this case the damper must be closed completely as long as the room temperature is below 78°F (25.6°C). If the room temperature at startup is above 78°F (25.6°C), a manual evaporator bypass damper should be fully open.



Air Filters

Maintenance

Operation



WARNING

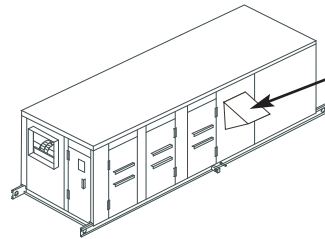
See safety warnings on previous page.

CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE, con't.

Some horizontal outdoor units may have side hoods for outdoor-air intake. In this case the outdoor-air filters may be located under the hood.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.



Outdoor filters may be located in the hood face.

VERTICAL UNITS

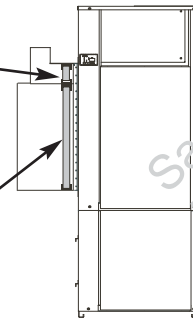
Vertical units have the outdoor-air filter directly above the return-air filter, as shown.

Filters for outdoor air must be moisture resistant.

The location, size, and number of filters may vary.

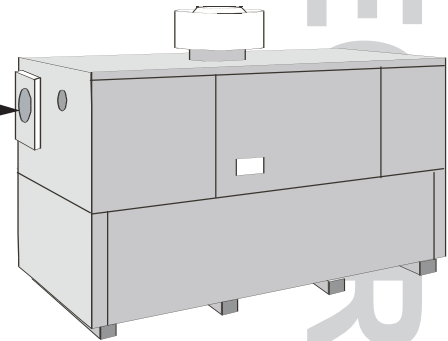
Outdoor-Air Filter(s)

Return-Air Filter(s)

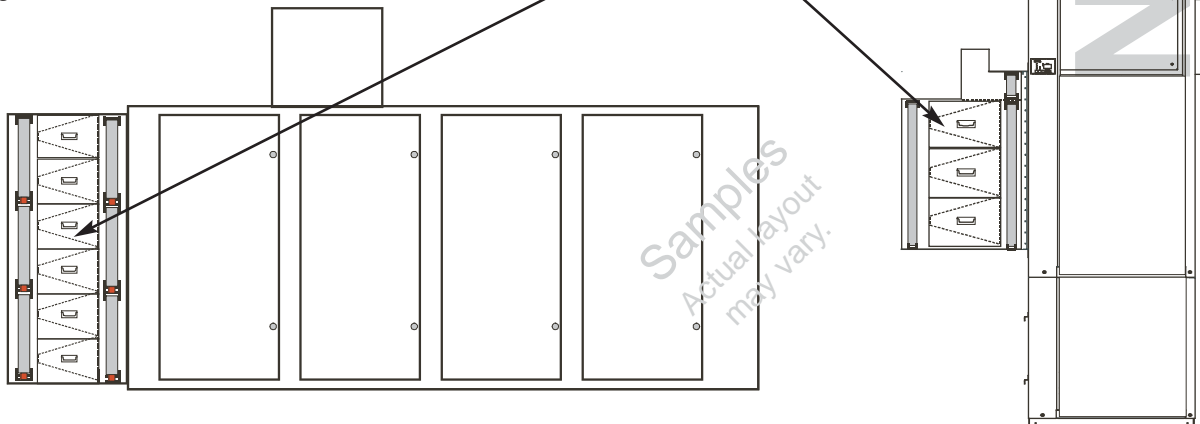


UNITS WITH BUILT-IN BOILERS

Combustion-air filters should be checked. Heat may be required at any time.



Some units may be provided with the optional Chloraguard® filter. In this case, refer to Appendix M2 - Chloraguard®.



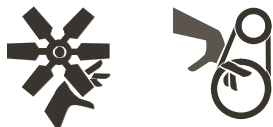
Data subject to change without notice.

Dectron, Inc. March 2012

Operation

Maintenance

Blower Belts

! WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

NOTICE

Never open a sheave to remove, install, or adjust a belt - use the belt tensioning screw only. Only a qualified air-balance technician or HVAC technician should change sheave settings.

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,
 $D = S \times 1/64$
 $D = 32\text{in} \times 1/64 = 1/2 \text{ in.}$

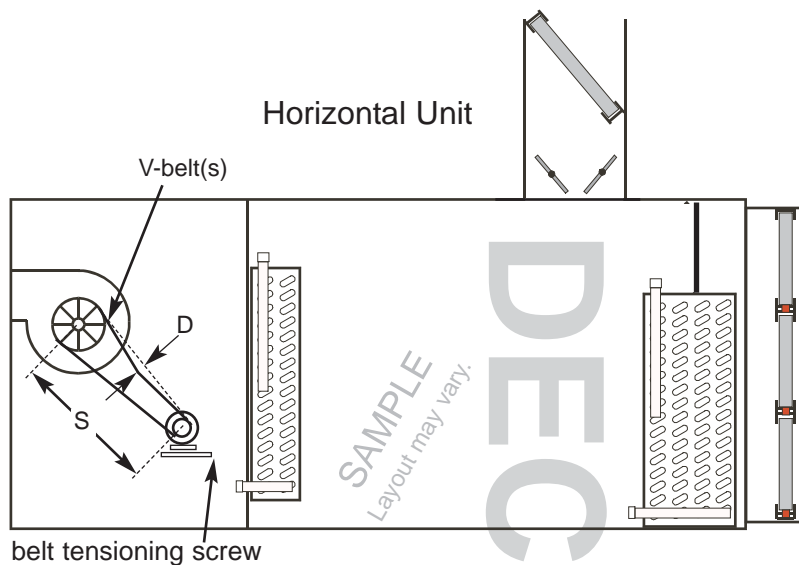
Measure the diameter of the smaller sheave.

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

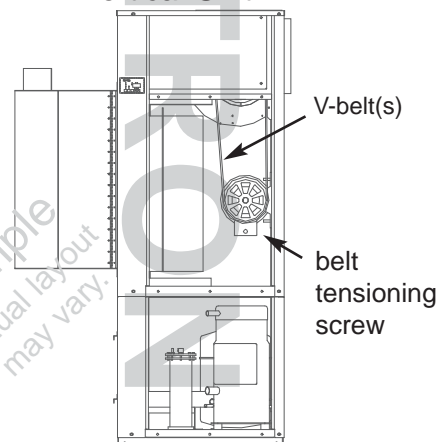
Adjust the belt tension to cause the force needed to produce the deflection D to be near that shown in the table on the next page.

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.



Vertical Unit

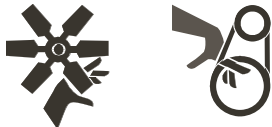


Blower Belts

Maintenance

Operation

! WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

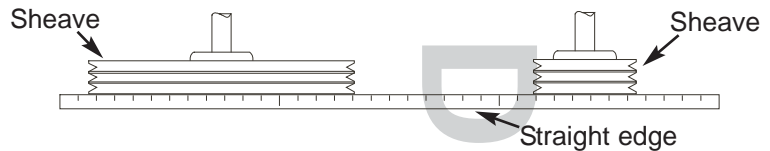
V-Belt Tensioning

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

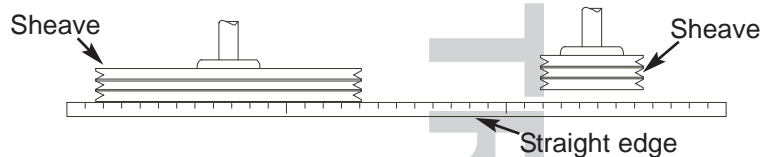
Where sheaves carry more than one belt, never replace only one belt. If any belt must be replaced, replace all the belts with new ones. When replacing multiple belts use only new belts from the same manufacturer and the same lot number, or use matched belts. Failure to do this will result in severe belt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

When removing or replacing belts, always relieve the belt tension to position the belts. Severe belt damage and reduction of belt life can be caused by prising or walking a belt onto a sheave.

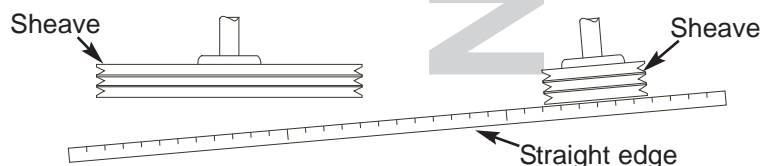
Belt sheaves must be properly aligned, as shown below.



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

Maintenance

Motor Lubrication

WARNING**Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.

Some smaller motors may be permanently lubricated. Other electric motors may have grease fittings and grease outlet plugs. Use the lubricating instructions provided on the motor nameplate or in accompanying documents. If no instructions are available, then until the proper instructions can be obtained

- a) use Shell Dolium R or Chevron SRI grease, and
- b) once per year use the following instructions:

1. Be sure the electric power to the unit is OFF, locked out, and tagged out.
2. Clean all grease fittings or plugs to remove any paint, dirt, or dust.
3. Clean any dirt or old grease from around a grease outlet plug.
4. Remove and retain the grease outlet plug. Do not allow it to become dirty.
5. Use a small clean round brush to clean out any hardened grease that may have accumulated in the grease outlet.
6. Does the motor have a grease fitting or a screw-plug for adding grease?

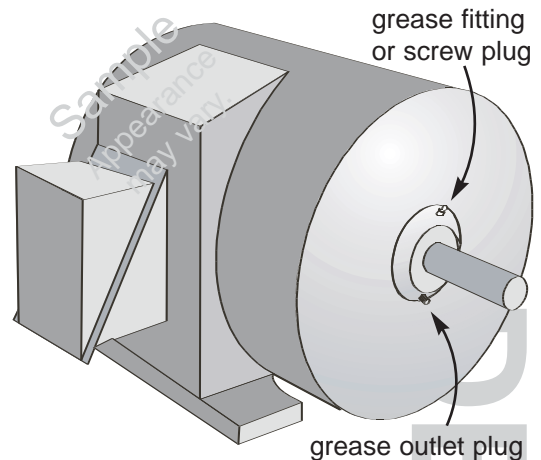
Grease Fitting

- 6a. NEMA 215 Frame and smaller - add 1 or 2 gun strokes
NEMA 254 -365 Frame - add 2 or 3 gun strokes
NEMA 404 Frame and larger - add 3 or 4 gun strokes
Stop if grease begins to come out of the grease outlet or around the shaft. Do not over-grease. Do not get grease on belts.
- 6b. Wipe off any excess grease.
- 6c. If possible, put a plastic cap over the grease fitting to keep it clean.

Screw Plug

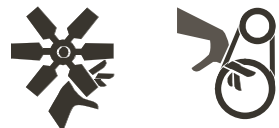
- 6a. Remove grease plug.
- 6b. NEMA 215 Frame and smaller - add a 2 or 3-inch string of grease
NEMA 254 Frame and larger - add a 3 to 5-inch string of grease
- 6c. Wipe off any excess grease. Do not get grease on belts.
- 6d. Re-install grease plug.

7. Repeat steps 1-9 for the bearing at the other end of the shaft.
8. Close all doors and access panels and, if safe to do so, allow the motor to run at full load for about 30 minutes.
9. Again be sure the electric power to the unit is OFF, locked out, and tagged out.
10. Wipe off any excess grease that has appeared on the outside of the motor or shaft.
11. Clean and re-install the grease outlet plug.
12. If safe and practical to do so, return the motor to operation.



Blower Lubrication Maintenance Operation

WARNING



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Some smaller blowers may be permanently lubricated. Other blowers may have bearings that have grease fittings or oil ports and require lubrication. Where this is the case, use the lubricating instructions provided on the blower nameplate or in accompanying documents. If no instructions are available, then until the proper instructions can be obtained

- a) Use a high-quality NLGI No. 2 or No. 3 multipurpose ball-bearing grease with rust inhibitors and anti-oxidant additives. Examples are:
 Shell - Alvania No. 2
 Gulf - Gulfcrown No. 2
 Mobil - Mobilith AW2 / Mobilith SHC100
 American - Rykon Premium 2
- b) Follow the schedule below, based on size and speed of blower shaft.

Initial Relubrication Schedule
 Ball Bearing Pillow Blocks Number of Months Between Lubrications

Speed (RPM)	500	1000	1500	2000	2500	3000	3500	4000	4500
Shaft Diameter									
1/2" through 1 1/16"	6	6	5	3	3	2	2	2	1
1 5/16" through 2 7/16"	6	5	4	2	2	1	1	1	1
2 1/16" through 2 5/16"	5	4	3	2	1	1	1		
3 7/16" through 3 15/16"	4	3	2	1	1	1			

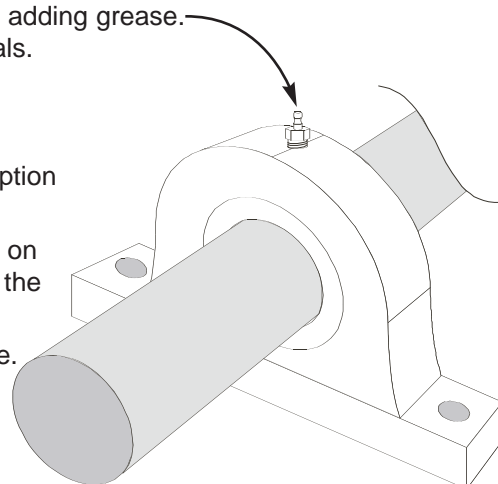
1. Be sure the electric power to the unit is OFF, locked out, and tagged out.
2. Clean all grease fittings or plugs to remove any paint, dirt, or dust.
3. If possible and safe to do so, slowly turn the blower by hand while adding grease.
4. Add grease just until a small amount of grease oozes from the seals.
5. Repeat for the bearing on the other end of the shaft.
6. When safe an practical to do so, return the blower to operation.

NOTE: Some units have more than one blower. See Product Description for suggested search locations.

NOTE: The frequency of lubrication may have to be changed, based on hours of operation, temperature, surrounding conditions, and the condition of the purged grease.

NOTE: Grease the bearings before an extended shutdown or storage.

NOTE: During an extended shutdown, rotate the blower shaft monthly.



OPERATION

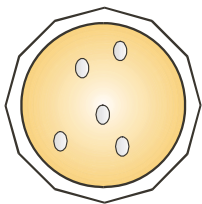
Operation

Check Refrigerant Level

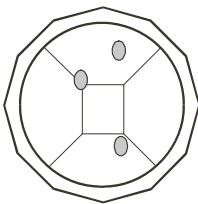
Maintenance

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

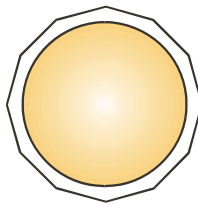
If bubbles or droplets are noted, contact Dectron or a Dectron-certified technician.



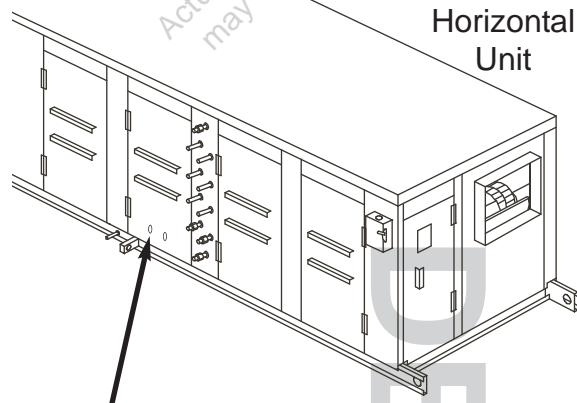
Bubbles in the sight glass indicate problems such as a possible loss of refrigerant.



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

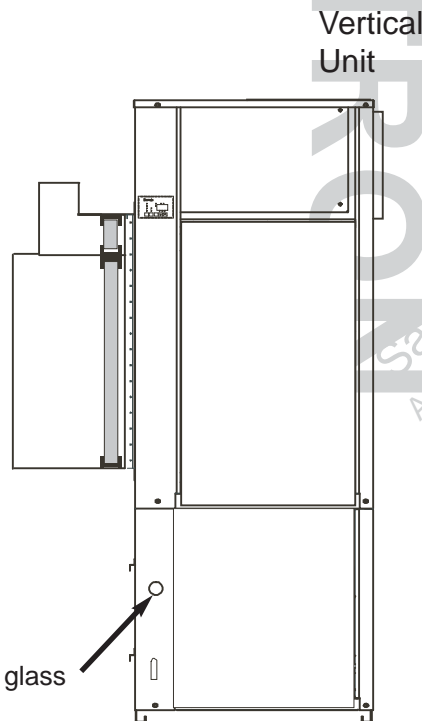


After 15 minutes of compressor operation, the sight glass should be clear and full of liquid refrigerant.



Horizontal Unit

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



Vertical Unit

sight glass

OPERATION

Owner's Manual DSH/DSV/RSH/DBH/RBH Series Dehumidifier

Maintenance

Check Oil Level

Operation

WARNING

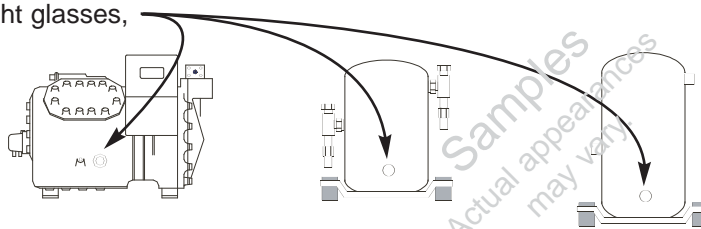


Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Do not approach any moving parts while electric power is applied to unit. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

For units without oil-level sight glasses, oil levels cannot be checked.

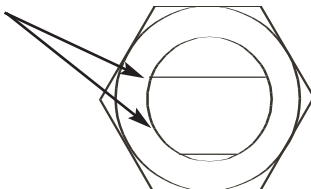
For units with oil-level sight glasses,



the oil level must be monitored as part of schedule maintenance.

Be sure that the room temperature is within 4°F (2.2°C) and the relative humidity is within 10% of the unit-nameplate values. Check the oil level after 30 minutes of compressor operation.

The oil level should be as near the middle of the sight glass as possible, and in any case between 1/4 and 3/4 full.



If the oil level is incorrect after 30 minutes of compressor operation, contact a Dectron-certified technician.

NOTICE **Risk of compressor damage.**
DO NOT OVERFILL OR UNDERFILL.

The oil may appear foamy until 30 minutes after the expansion valve is properly adjusted. After the valve is adjusted, the oil should not appear foamy. If the oil appears to be foaming after 30 minutes of operation after the expansion valve is adjusted, contact Dectron.

Dectron

OPERATION

Operation

Fire/Smoke Alarm Testing

Some DRY-O-TRON® units may be connected to fire/smoke alarms, which may be tested periodically. In this case, activation of the alarm will cause an immediate shut-down of the unit. Activation of the fire/smoke alarm may also cause fire dampers (by others) or other devices to close.

After the test, and when safe to do so, restarting the unit requires:

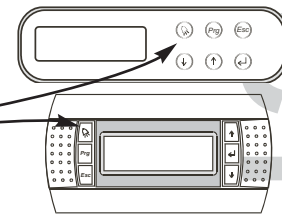
For units with automatic fire/smoke-alarm reset

1. Reset the fire/smoke alarm system (by others). Be sure that the alarm's isolated output to the DRY-O-TRON® is closed.
2. Confirm that any fire dampers or fire doors are back to the normal operating position.
3. The unit should re-start automatically.

For units with manual fire/smoke-alarm reset

1. Reset the fire/smoke alarm. Be sure that the alarm's isolated output to the DRY-O-TRON® is closed.
2. Confirm that any fire dampers or fire doors are back to the normal operating position.
3. Reset the DRY-O-TRON® unit as shown below.

The alarm button will be illuminated. Press it to see the current alarm(s). Press ↓ repeatedly to see any other current alarms.



ALARM MESSAGES
SCROLL DOWN
TO VIEW

--- ALARM ---
Firestat

MANUAL RESET
REQUIRED
ENTER TO RESET

If prompted for a password, enter 1793 for units made before April 2005. For units made after April 2005, enter 17 or 1793.

PERFORMING
MANUAL RESET
ENTER TO CONFIRM
ESC TO CANCEL

Display returns.

Reset

The message "MANUAL RESET REQUIRED" may appear. Follow the instructions on screen to accomplish a manual reset.

Press ↵ to initiate the resetting process.

Note: Not all alarms require manual reset.

Press ↵ to proceed with the resetting process.

Press **Esc** to cancel the resetting process.

Check Discharge Temps. Maintenance Operation



Risk of contact with hot surfaces. Can cause injury.

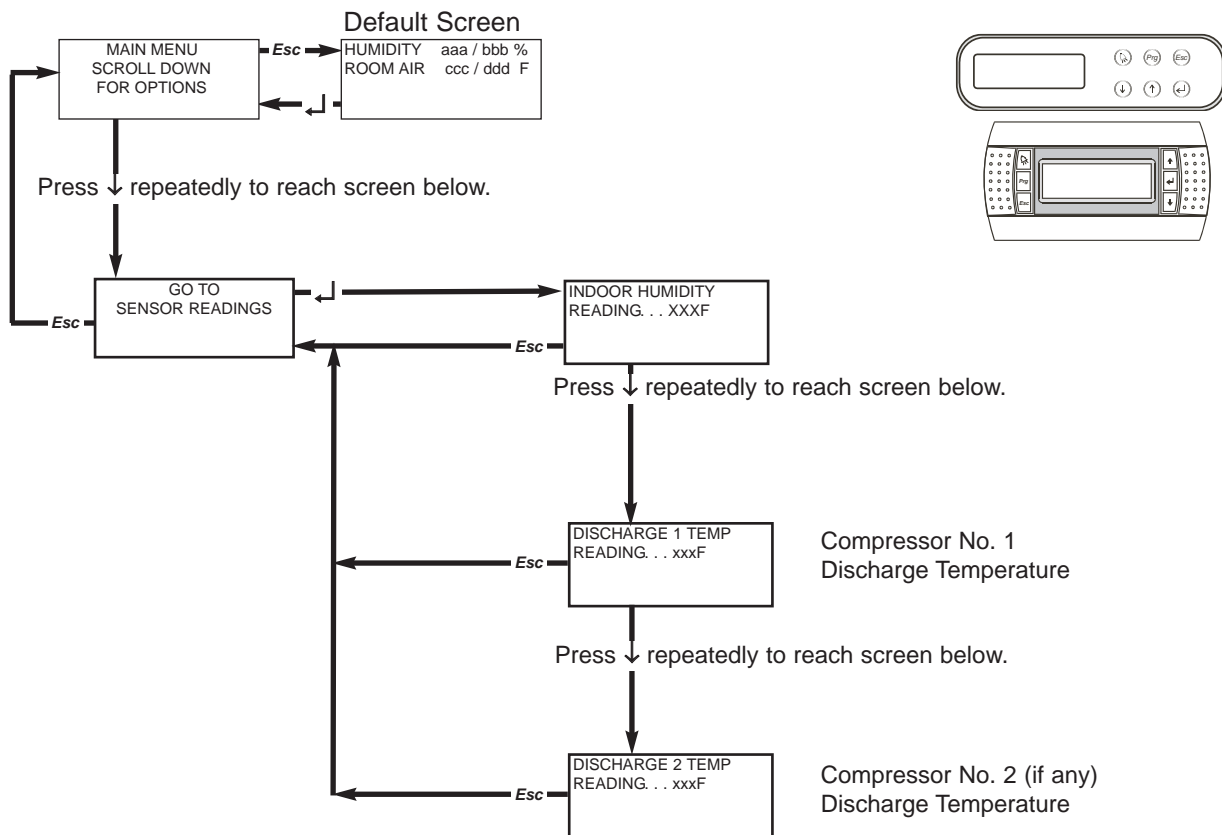
This product contains surfaces which can cause burn injury. The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts.

1. Determine the type of refrigerant from the unit nameplate.
2. Allow the unit to run in pool-heating mode for at least 20 minutes, then read the compressor discharge-gas temperature. The temperature 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)

NOTE: In the images and the discussion below, “aaa”, “bbb”, “ccc”, “ddd”, and “xxx” are placeholders. Your screen will actually show the current values for your unit.



Data subject to change without notice.

Operation

Maintenance

Check Drain Pans


WARNING
Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

Do not operate the unit until ductwork or a screen is installed at each blower outlet.



Horizontal units may have one or more drain pans to collect condensate and deliver it to the drains.

Drain pans should be checked to be sure they drain completely and to be sure material is not accumulating.

Drain pans may collect dirt or other foreign materials.

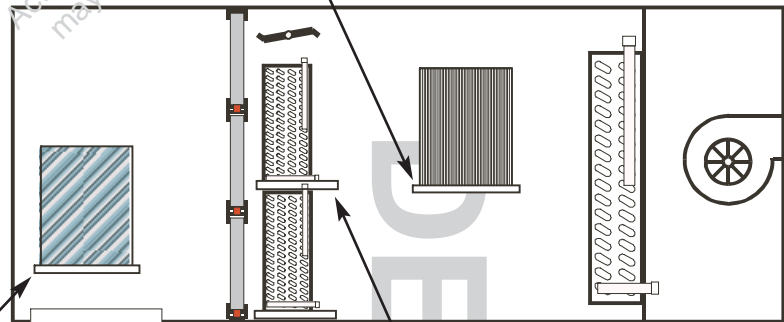
Keep them clean by washing them out as necessary. Be sure the condensate drain works.

Units with the SmartSaver option will have a drain pan under the exhaust heat exchanger.

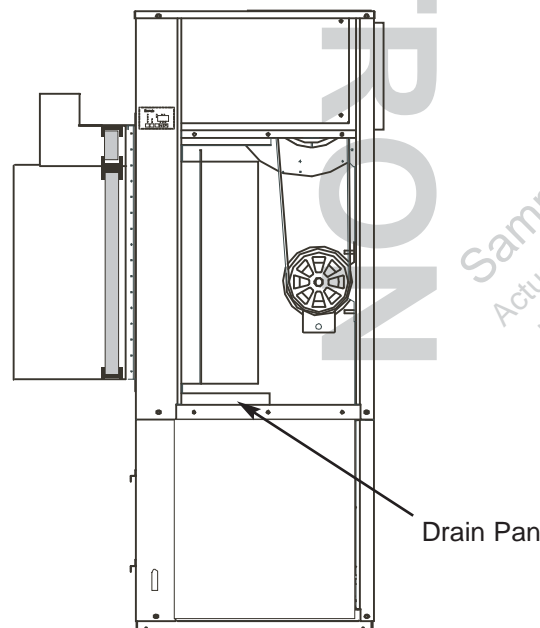
Vertical units have a drain pan to collect condensate and deliver it to the drains.

The drain pan should be checked to be sure it drains completely and to be sure material is not accumulating.

Units with the pumped-glycol SmartSaver option may have a drain pan under the intake-air heat exchanger.



All horizontal units will have a drain pan(s) under the cooling heat exchanger(s).



Drain Pan

Pool Chemistry

Maintenance

Operation

NOTICE Risk of unhealthy conditions. Risk of unit damage. Risk of property damage.

Chemical Storage

Pool chemicals should be stored either out-of-doors or in a room dedicated to chemical storage only. **Pool chemicals should never be stored in a mechanical or electrical equipment room.**

A chemical-storage room should be:

1. completely separate from the natatorium building, or
2. completely sealed from the rest of the building and openly ventilated to the outdoors, or
3. constantly maintained at the lowest air pressure in the building with a chemical-duty exhaust blower.

Where storage-room exhaust blowers are used, monthly maintenance **must** include checking the blower. Such blowers usually last a short time due to the chemical fumes. A room-pressure switch should be used to cause an alarm if the exhaust blower fails or if the storage-room door fails to close.

No metal equipment, including pipes, tubes, conduit, ducts, etc., should enter a chemical storage room. Concrete, including mortar, should be sealed.

Chemicals should never be stored in the same room with combustion appliances such as boilers and heaters. Pool chemicals entering a flame produce strong acids which damage the flues. Damaged flues are unsafe to operate.

Pool Chemistry

Fortunately, keeping pool chemistry correct for health considerations also keeps it correct for limiting corrosion of metal equipment. The best solution is to:

1. control the level of ammonia in the pool by maintaining the proper level of free chlorine, and
 2. control the levels of corrosive air-borne chloramines by controlling the level of combined chlorine in the pool.
- Therefore, it is important to determine both the free chlorine and the combined chlorine in the pool at each test.

Chloramines released into the air by super-chlorination should be removed by the ventilation system, or by the optional Purge mode on a DRY-O-TRON® so equipped (see [Appendix M6](#)). Only dehumidifiers equipped with the optional Chloraguard® filter (see [Appendix M2](#)) are able to remove chloramines from recirculated air.

Pool Water Chemistry Problems Related to Dehumidifiers

Effect

Too little chlorine	Excessive release of chloramines resulting in foul odors and high levels of bacteria, fungi, viruses etc.
High pH or high total alkalinity	Scale formation in the water heaters, pipes etc.
Low pH or low total alkalinity	Corrosive water damages metal components such as water heaters

Pool Water Chemistry Parameters Related to Dehumidifiers (Refer to ANSI/APSP Guidelines.)

For salt-water pools, contact Dectron before exceeding 3000 ppm salt concentration.

	Pools, Waterparks			Spas		
	Minimum	Desirable Range	Not to Exceed	Minimum	Desirable Range	Not to Exceed
pH	7.2	7.4 - 7.6	7.8	7.2	7.4 - 7.6	7.8
Alkalinity	60	80 - 100 PPM	180 PPM	60	80 - 100 PPM	180 PPM
Free Chlorine	1.0	1.0 - 4.0 PPM	4.0 PPM	2.0	2.0 - 4.0 PPM	4.0 PPM
Combined Chlorine	0	0 PPM	0.2 PPM	0	0 PPM	0.5 PPM
Dissolved Solids	N/A	N/A	1500 PPM*	N/A	N/A	1500 PPM*
Calcium Hardness	150	200 - 400 PPM	1000 PPM	100	150 - 250 PPM	800 PPM

*1500 over startup value

Data subject to change without notice.

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Operation Heating and Cooling Availability

Heating Availability

Room-temperature control is an important part of humidity control.

The dehumidifier capacity is matched to the rated pool-evaporation rate. The pool-evaporation rate will increase if

1. the pool temperature remains the same while room temperature is decreased, or
2. the pool temperature is increased while the room temperature remains the same.

Space heat must be under the control of the DRY-O-TRON®. All installations must have space heat available year-round. The DRY-O-TRON® will command only enough heat to keep the evaporation rate within a workable range.

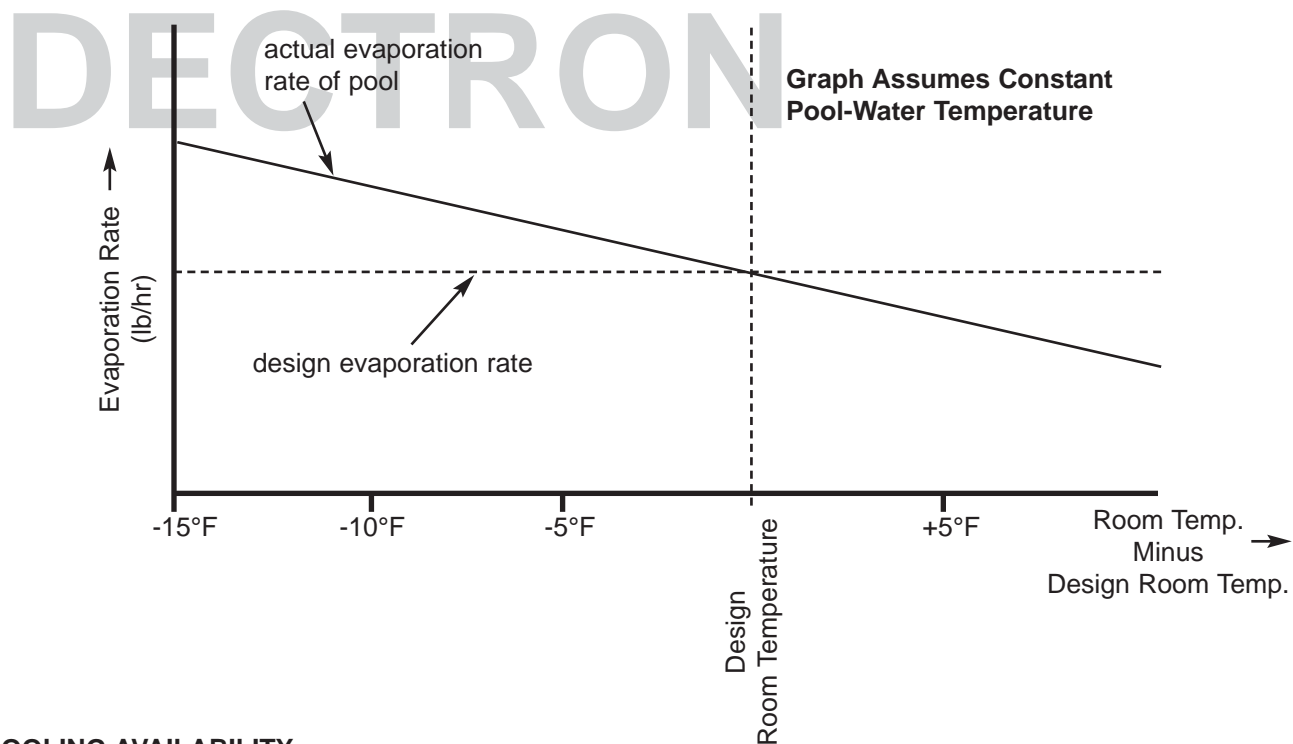
NOTE: Where space heaters are by others, the space heaters must heat the supply air. Do not install a heater in the return duct.

NOTE: Attempting to heat the air with the pool will increase the evaporation rate.

NOTE: For units with hot-water or hot-glycol space heaters by Dectron, unless otherwise noted, full heating capacity requires the water or fluid temperature to be between 160°F (71°C) and 180°F (82°C).

NOTE: Unless equipped with a space heater, the DRY-O-TRON® does not produce significant heat - it recycles heat. A dedicated space heater must be ordered with the unit or provided by others.

NOTE: Building heat losses are calculated by others and consequently are sized by others. Dectron does not select space-heater capacities.



COOLING AVAILABILITY

Where the DRY-O-TRON® unit has the cooling option and any required cooling water or other fluid is provided by others, it is essential that the cooling water or fluid be available at any time the DRY-O-TRON® may be operating.

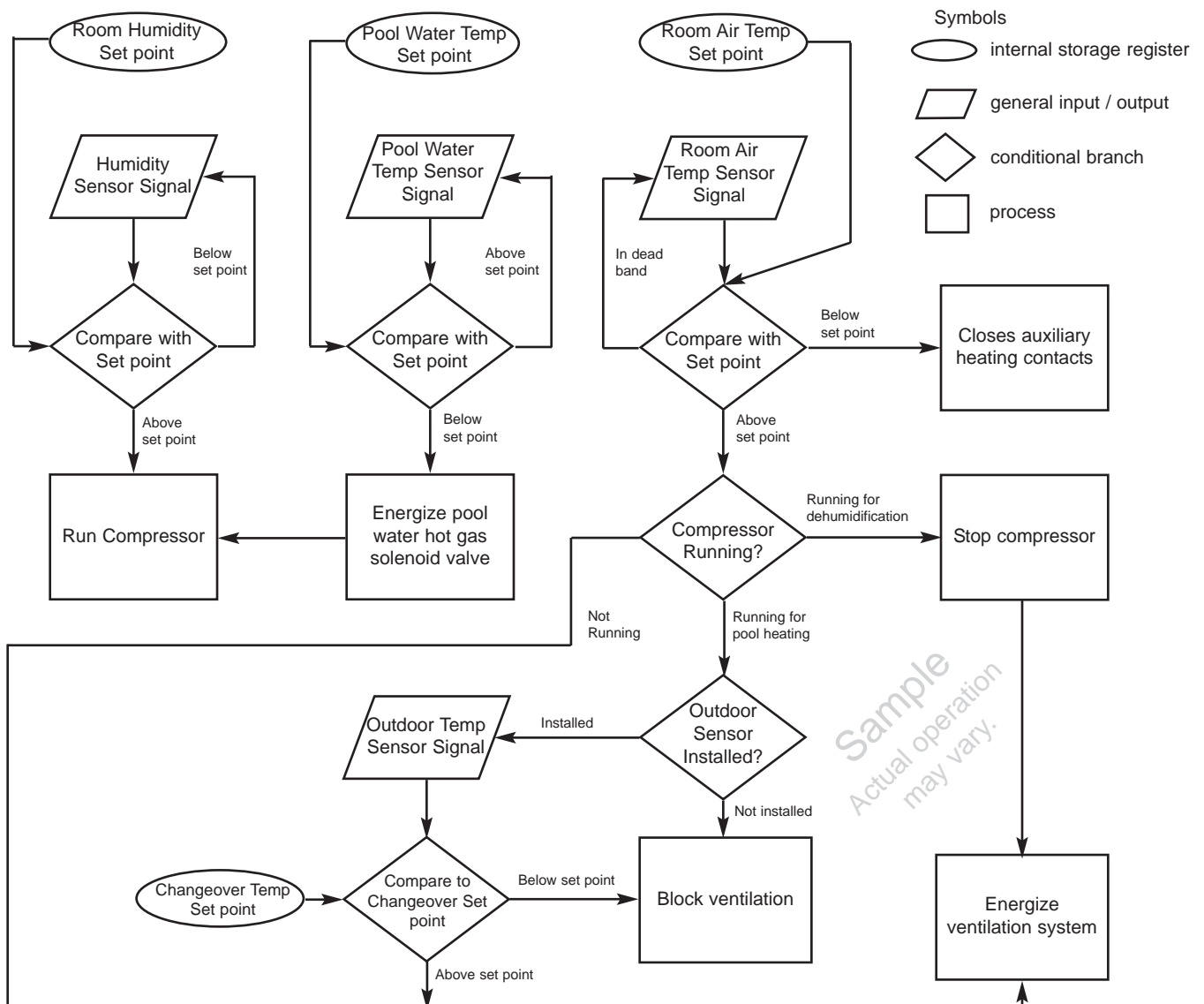
Do not turn off cooling water or fluid based on time-of-day, time-of-year, outdoor temperature, or other considerations.

Logical Flow Chart

Operation

- Δ Dehumidification - On a call for dehumidification only, the DRY-O-TRON® operates in minimum water heating mode.
- Δ Cooling - On a call for cooling, the DRY-O-TRON® is stopped even when dehumidification is called for. Ventilation signals are activated to open outdoor air dampers, controlled by the modulating supply-air thermostat (supplied by others).
- Δ Pool Water Heating without Outdoor Air Sensor - Pool water temperature is maintained by minimum and maximum water heating modes. On a call for pool water heating, the DRY-O-TRON® operates in maximum water-heating mode. If the system is in cooling mode when pool water heating is called for then the system reverts to air recirculation during the maximum water heating period to accelerate the pool water heating process and keep humidity low.
- Δ Pool Water Heating with Outdoor Air Sensor - Pool water temperature is maintained by minimum and maximum water heating modes. On a call for pool water heating, the DRY-O-TRON® operates in maximum water-heating mode. If the system is in cooling mode when pool water heating is called for and the outdoor air temperature is lower than the changeover set point, then the system reverts to air recirculation during the maximum water heating period to accelerate the pool water heating process and keep humidity low. If the system is in cooling mode when pool water heating is called for and the outdoor air temperature is higher than the changeover set point, then ventilation continues during maximum pool water heating. There will be an increase in air temperature through the unit. This is especially noticeable on double blower units.
- Δ Space Heating - On a call for space heating, the DRY-O-TRON® operates as above for dehumidification and pool water heating. The auxiliary space heating system is activated by contacts provided.

Units Without Air Conditioning



Sample
Actual operation
may vary.

OPERATION

Operation

Logical Flowchart

Δ Dehumidification

On a call for dehumidification only, DRY-O-TRON® operates in dehumidification with minimum water-heating mode.

Δ On a call for cooling

The A/C hot gas solenoid valve is energized and the outdoor condenser fan is operating. The DRY-O-TRON® runs in air-conditioning mode.





Δ Pool Water Heating

Pool water temperature is maintained by minimum and maximum water heating modes. On a call for pool water heating, the pool water hot gas solenoid valve is energized. The DRY-O-TRON® operates in maximum water-heating mode.

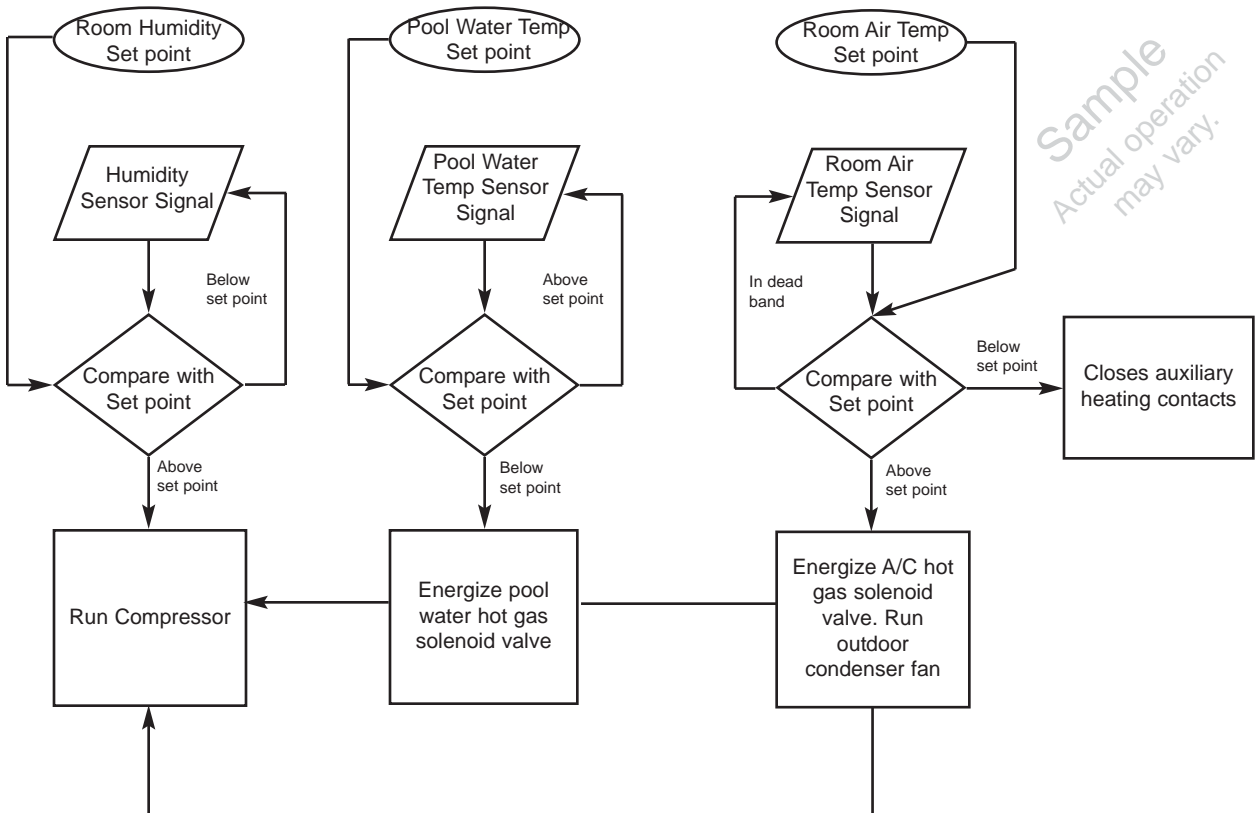
Δ Space Heating

On a call for space heating, the DRY-O-TRON® operates as above for dehumidification and pool-water heating. In addition, the auxiliary space heating system is activated by contacts provided.

Symbols

-  internal storage register
-  general input / output
-  conditional branch
-  process

Units With Air Conditioning



OPERATION

Logical Flowchart

Operation

Δ Dehumidification

On a call for dehumidification only, the DRY-O-TRON® operates in minimum water-heating mode.

Δ Pool-Water Heating

On a call for pool water heating, the auxiliary pool-water heater operates to provide maximum pool water heating. The DRY-O-TRON® will only heat pool water during a concurrent dehumidification-demand mode and/or cooling-demand mode.





Δ Space Cooling

On a call for cooling, the air conditioning hot gas solenoid valve is energized and the outdoor condenser fan is operating. The DRY-O-TRON® runs in air-conditioning mode.

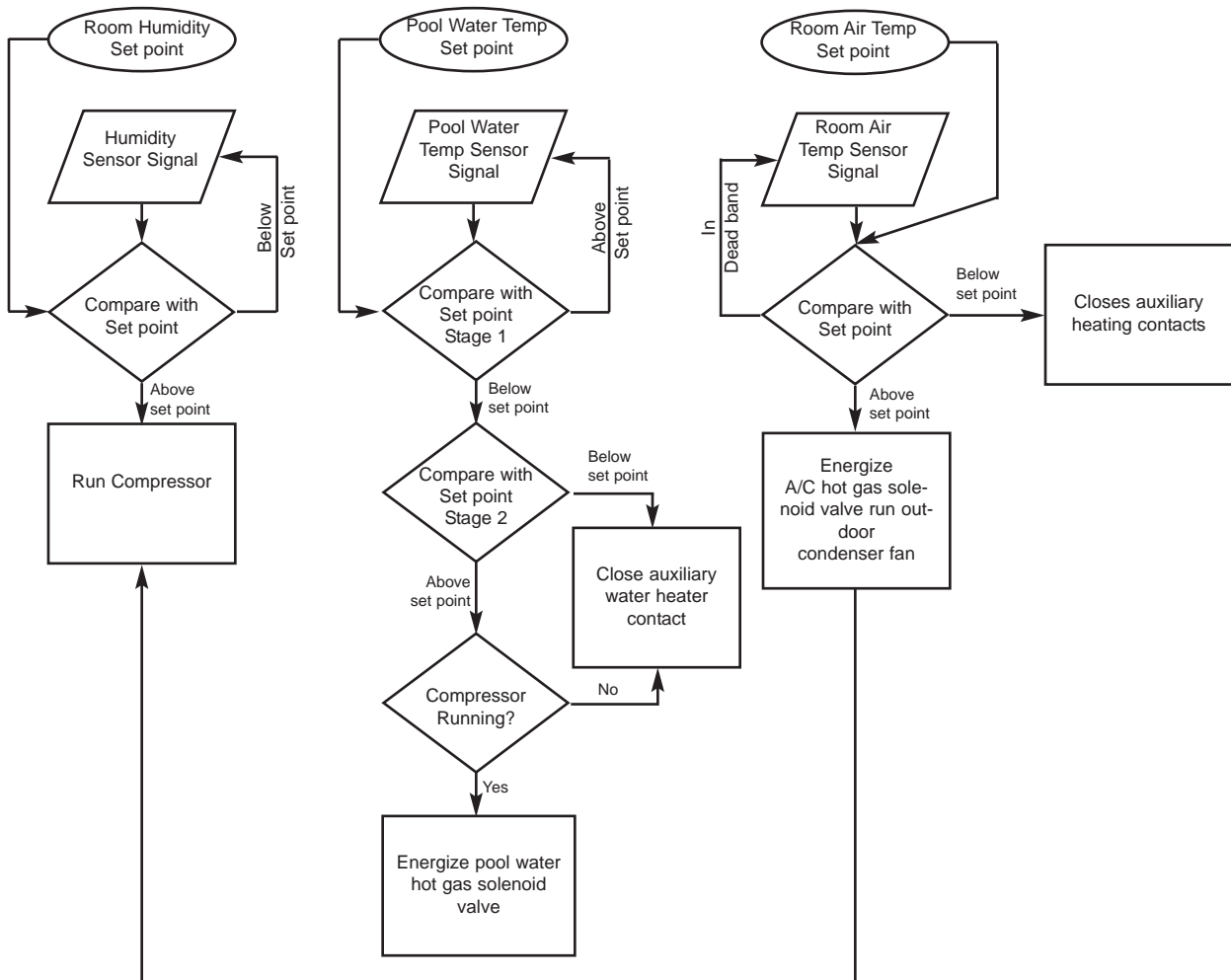
Δ Space Heating

On a call for space heating, the DRY-O-TRON® operates as above for dehumidification and pool water heating. The auxiliary space-heating system is activated by contacts provided.

Symbols

-  internal storage register
-  general input / output
-  conditional branch
-  process

Units With Air Conditioning and Auxiliary Pool Heating



Setup

DECTRON

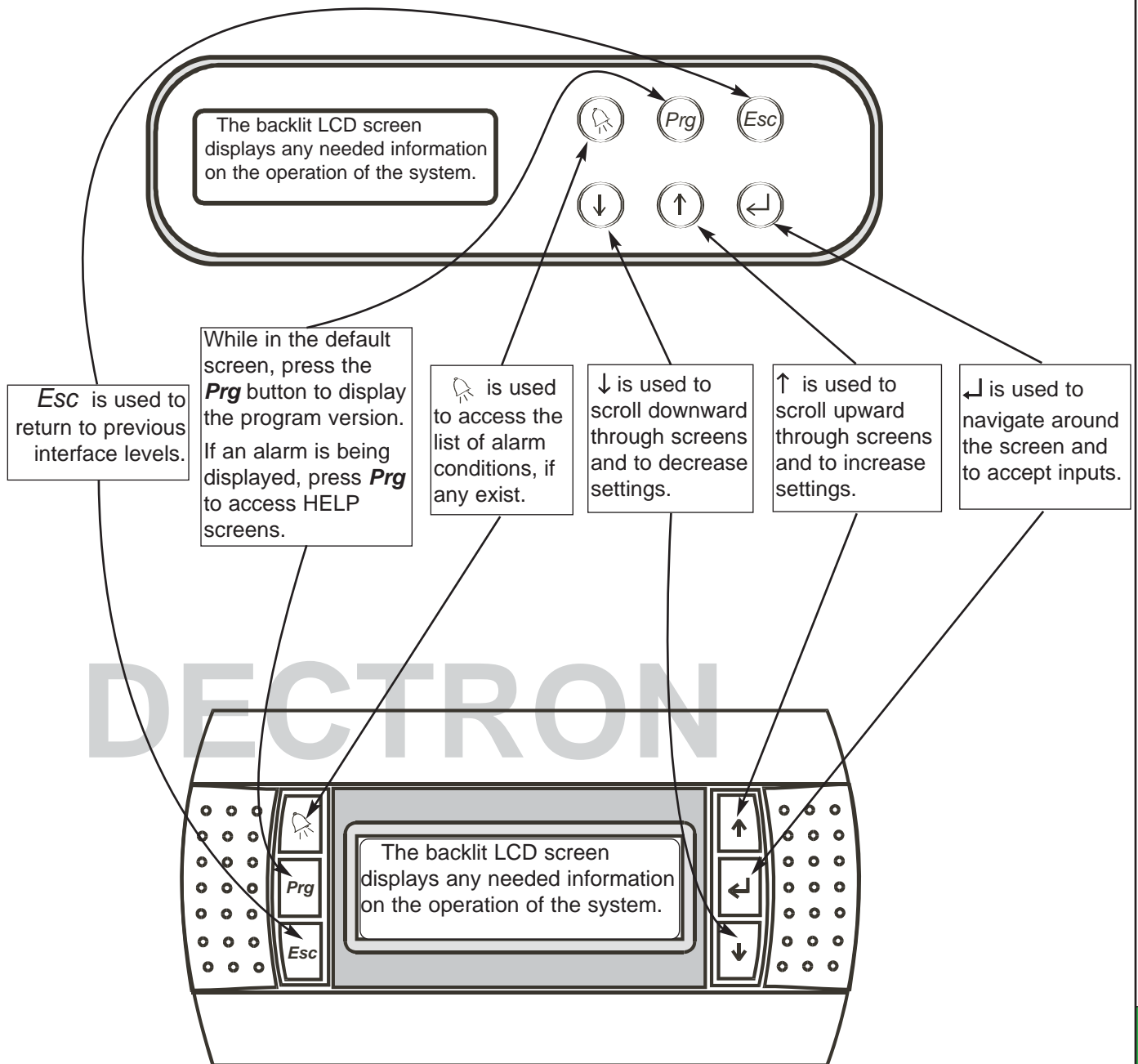
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Supervisaire[®] Controller Interface

Operation

NOTE: Do not mount a controller interface where it may come into contact with air from the natatorium or from the chemical-storage area.

NOTE: If the screen remains blank after electric power is applied to the unit, see next page.



DECTRON

OPERATION

OPERATION

NOTE: In the images and the discussions, "aaa", "bbb", "ccc", "ddd", and "xxx" are placeholders. Your screen will actually show the current values for your unit.

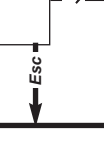
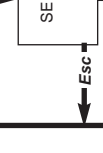
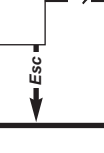
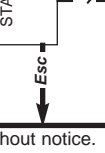
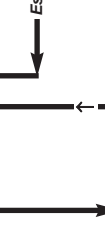
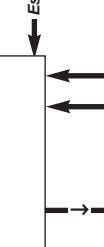
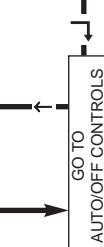
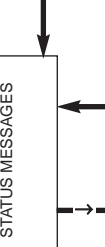
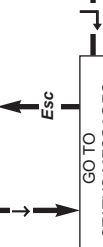
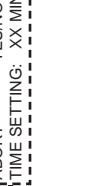
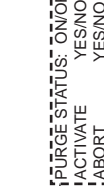
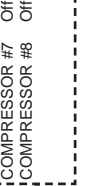
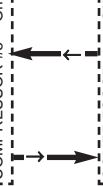
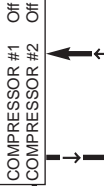
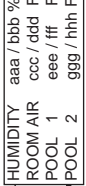
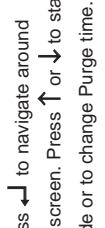
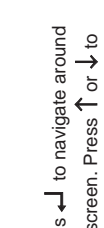
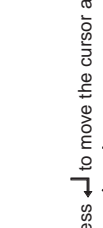
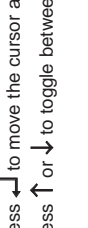
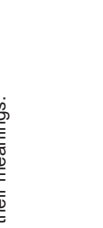
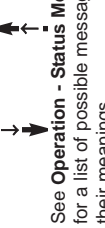
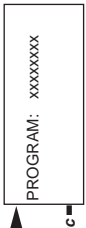
NOTE:

Screens shown in dashed lines are optional and may not appear on all units.

Note: If User Password is requested, enter 1793 for units made before April 2005, and 17 or 1793 for units made after April 2005.

See **Operation - Status Messages** for a list of possible messages and their meanings.

Default Screen



Data subject to change without notice.

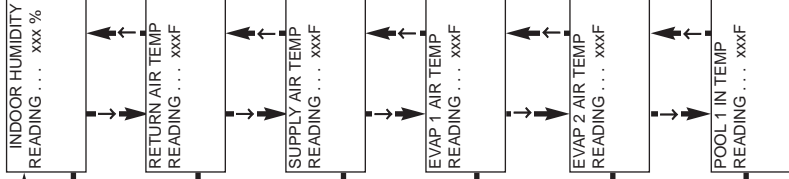
DS Series
Supervisaire® User
Interface Map
JH 2012

In the event of a failure, the button will illuminate. Press it to view the ALARM screen.



Alarm messages will be displayed. See **OPERATION - CONTROLLER DIAGNOSTICS**.

Sensors displayed and order of display may vary depending on options.



NOTICE: Risk of uncontrolled condensation.

Risk of property damage. Set points should be kept at rated values. If they must be changed, set points must be changed together. See subsequent page for details.


Press Esc to navigate around the screen. Press Esc to change set points. (POOL 2 SET is Optional.)

Press Esc to navigate around the screen. Press Esc to start Purge mode or to change Purge time.

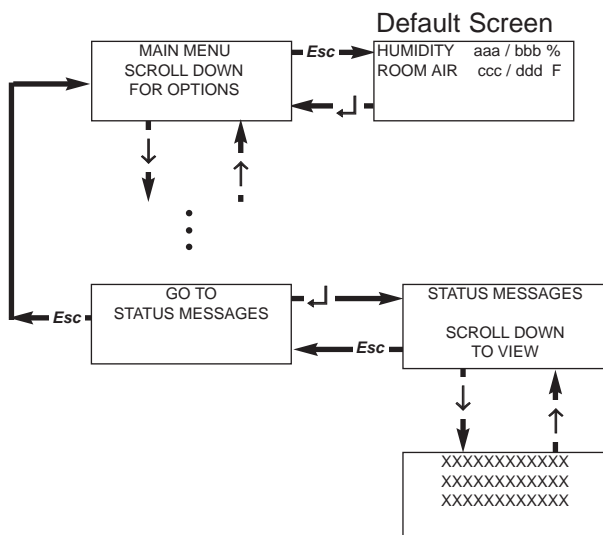
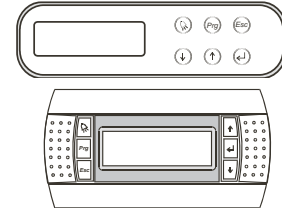
Operation

Read Status Messages



If it is desired to check the current status messages, using the controller-interface map below access the STATUS MESSAGES screen.

Press  or  to view all status messages.

DECTRON



NOTE: In the images and the discussions, “aaa”, “bbb”, “ccc”, “ddd”, and “xxx” are placeholders. Your screen will actually show the current values for your unit.

Press  or  as necessary to see all the status messages.

Refer to the following page for a list of status messages and their meanings. Some units may have special status messages. In this case, refer to the Sequence of Operation supplied with the unit.

Press **Esc** repeatedly to return to the main menu or the default screen.

Read Status Messages

Operation

STATUS MESSAGES

SCROLL DOWN TO VIEW

Press ↓ repeatedly to view any of the following Status messages that apply at the moment.

NOTE: In the list below the letter "X" is a placeholder for a number referring to a particular refrigeration circuit. On your screen the appropriate number will appear rather than the "X".

- A/C ON - The Air-Conditioning feature is operating.
- AIR HEATING CALL - The temperature of the room is below set point minus offset minus differential.
- ASCT X ON - The minimum OFF time for compressor X has not elapsed.
- AUX. AIR HEATING ON STAGE 1 - First stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 2 - Second stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 3 - Third stage auxiliary air heating is ON.
- AUX. AIR HEATING ON STAGE 4 - Fourth stage auxiliary air heating is ON.
- BLOWER ON - Blower is operating.
- BLOWER REMOTE SWITCH OFF - The blower is turned off by remote manual input.
- BLOWER TURNED OFF - See **Startup - Enable Operation.**
- COMPRESSOR X EMERGENCY SWITCH OFF - The manual ON/OFF switch is OFF.
- COMPRESSOR X PUMPDOWN - Compressor X is preparing to shut down.
- COMPRESSOR X TURNED OFF - See **Startup - Enable Operation.**
- COOLING CALL - The temperature of the room is above set point plus offset plus differential.
- DEHUMIDIFICATION CALL - The relative humidity of the room is above set point plus differential.
- DEHUMIDIFICATION ON - One or more compressors are operating.
- EVAPORATOR DAMPER CLOSED - The evaporator bypass damper is closed to divert air to the evaporator.
- ECONOMIZER ON - The Economizer feature is operating.
- GAS BOILER ON - The gas boiler on units so equipped is operating.
- LEAD LAG ON - Compressor 2 is first stage.
- MANUAL RESET REQUIRED - A fatal alarm has occurred. See **Operation - Start, Stop, Reset.**
- MAXIMUM EXHAUST BLOWER ON - The maximum amount of room air is being exhausted.
- MINIMUM EXHAUST BLOWER ON - The standby amount of room air is being exhausted.
- OCCUPIED PERIOD - Time-of-day is defined as that in which people are usually present.
- OIL RETURN MODE 1 ON - Refrigerant is being diverted through the outdoor condenser for oil return.
- OIL RETURN MODE 2 ON - Refrigerant is being diverted through the outdoor condenser for oil return.
- PLEASE WAIT... Compressor X will auto reset - A possibly fatal alarm is being analyzed.
- POOL 1 AUX ON - An auxiliary heater is heating pool 1 water.
- POOL 2 AUX ON - An auxiliary heater is heating pool 2 water.
- POOL 1 HEATING CALL - The temperature of pool 1 water is below set point minus differential.
- POOL 2 HEATING CALL - The temperature of pool 1 water is below set point minus differential.
- POOL 1 HEATING ON - Water from pool 1 is being heated.
- POOL 2 HEATING ON - Water from pool 2 is being heated.
- PURGE MODE ON - Room air is being exhausted to dilute superchlorination gases.
- VENTILATION ON - Cooling or dehumidification by ventilation is enabled in the event of compressor failure or no air-conditioning option.
- ZERO REHEAT ON - Supply air temperature is limited to the return air temperature.

OPERATION

Operation

Set-Point Adjustment

NOTICE Risk of unit damage.

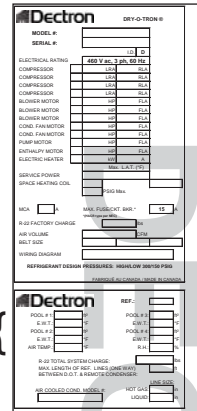
Unless the unit submittal data specifies special operating conditions, do not attempt to operate the unit at a space temperature below 78°F (25.6°C). See further instructions below.

NOTICE Risk of uncontrolled evaporation.

Improper changes to air and water temperatures can profoundly affect the rate of pool evaporation. See further instructions below.

Set points should be kept near the values that appear on the unit nameplate.

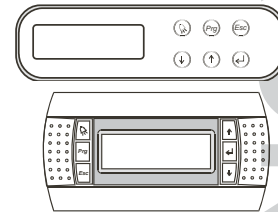
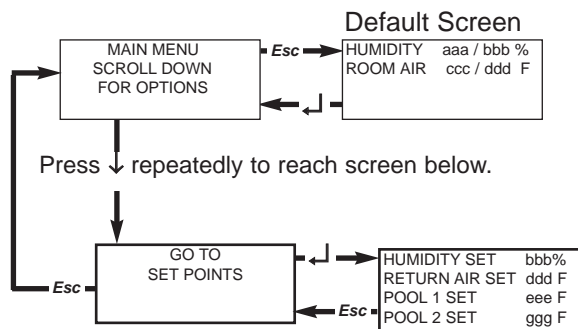
Each unit is carefully sized to match the expected load, as specified in the original order. Attempting to operate a unit far from rated conditions can have unexpected results, such as excessive evaporation, condensation in unexpected locations, and other problems. If set points must be changed, air-temperature set point and water-temperature set point must be changed together.



NOTE: Unless the unit submittal data specifies special operating conditions, do not attempt to operate the unit at a space temperature **below 78°F (25.6°C)**.

The operating set points are viewed and adjusted as shown below. If asked for a password, enter 1793 for units made before April 2005. For units made since April 2005, enter 17 or 1793.

To clear the password, select YES when prompted to log off.



Press ← to move the cursor around the screen.

aaa is the present indoor relative humidity.

bbb% is the relative humidity set point. If a change is desired, press ← as needed to move the cursor to **aaa%**, then press ↑ or ↓ to change the set point.

ccc is the present room air temperature.

ddd F is the room air temperature set point. If a change is desired, press ← as needed to move the cursor to **ddd F**, then press ↑ or ↓ to change the set point.

eee F is the pool #1 temperature set point. If a change is desired, press ← as needed to move the cursor to **eee F**, then press ↑ or ↓ to change the set point.

ggg F is the pool #2 temperature set point. If a change is desired, press ← as needed to move the cursor to **ggg F**, then press ↑ or ↓ to change the set point.

NOTE: In the image above and the discussion at right, “bbb”, “ddd”, “eee”, and “ggg” are placeholders.

Your screen will show the set points for your unit.

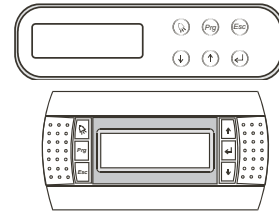
NOTE: The test “Pool 2 Set . . . gggF” is optional and may not appear on all units.

Read Sensors

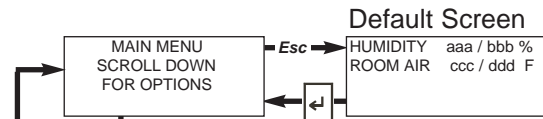
Operation

The values of some sensor signals are displayed on the default screen, as at right. To read all sensors, follow the steps below.

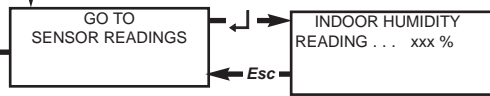
NOTE: In the images and the discussion below, "aaa", "bbb", "ccc", "ddd", and "xxx" are placeholders. Your screen will actually show the current values for your unit.



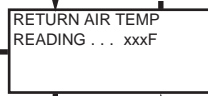
DECTRON



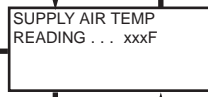
Press ↓ repeatedly to reach screen below.



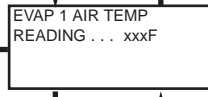
This screen displays the relative humidity of the room air, as measured at the return duct



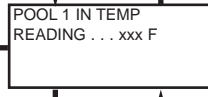
This screen displays the temperature of the room air, as measured at the return duct



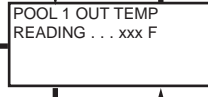
This screen displays the temperature of the supply air, as measured at the DRY-O-TRON® supply blower.



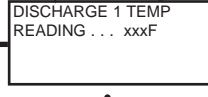
This screen displays the temperature of the air leaving the evaporator of the first refrigeration circuit.



This screen displays the temperature of the pool #1 water entering the DRY-O-TRON®.



This screen displays the temperature of the pool #1 water leaving the DRY-O-TRON®.



This screen displays the temperature of the hot refrigerant gas leaving the #1 compressor. This is important to a proper startup. See **Startup - TXV Adjustment**.

⋮
to other readings

This is a sample. The order and number of sensor screens may vary, depending on options ordered.

OPERATION

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-Day 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-day 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:

- △ 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.
- △ Parts that wear out due to normal usage, such as air filters, belts, fuses and refrigerant.
- △ Products that have been moved from the location where they were first installed.
- △ Any portion of the system not supplied by Dectron Inc.
- △ Products on which the model and/or serial number plates have been removed or defaced.
- △ Products on which payment is in default.
- △ 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.
- △ Products operated without clean, properly installed air filters.
- △ 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.

Warranty

Terms of Limited Warranty

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

Optional Third- to Fifth-Year Compressor Warranty

Optional Third- to Tenth-Year Compressor Warranty

Under these warranties 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. These extended compressor warranties are subject to all the terms of the standard DRY-O-TRON® warranty but apply to the compressor only.¹ Purchase of either of these extended warranties must be made before shipment of the unit.

¹ Does not cover labor costs.

Optional Third- to Fifth-Year Coil Warranty

Optional Third- to Tenth-Year Coil Warranty

Under these warranties a new or re-built air heat exchanger will be supplied at Dectron Inc.'s expense, F.O.B. factory, provided the failed heat exchanger is returned to the factory with transportation prepaid. These extended coil warranties are subject to all the terms of the standard DRY-O-TRON® warranty but apply to the air heat exchangers listed in a) through g) only.² Purchase of either of these extended warranties must be made before shipment of the unit.

² Does not cover labor costs.

- a) air cooling coil
- b) air reheat coil
- c) optional hot-water space-heating coil
- d) optional hot-glycol space-heating coil
- e) optional steam space-heating coil
- f) optional SmartSaver® evaporator
- g) optional SmartSaver® condenser

Optional Third- to Fifth-Year Major-Component Warranty

Optional Third- to Tenth-Year Major-Component Warranty

Under these warranties a new or re-built component will be supplied at Dectron Inc.'s expense, F.O.B. factory, provided the failed component is returned to the factory with transportation prepaid. These extended component warranties

are subject to all the terms of the standard DRY-O-TRON® warranty but apply to the components listed in a) through f) only.³ Purchase of either of these extended warranties must be made before shipment of the unit.

- a) motor starters⁴
- b) fan motor(s)⁴
- c) water heat exchangers⁵
- d) solenoid valves and solenoids⁴
- e) blower fan and fan housings^{7, 8, 9}
- f) variable-frequency drives^{4, 7, 8}

³ Does not cover labor costs.

⁴ where applied per nameplate and submittal specifications

⁵ where operated per specified water flow rates and water chemistry

⁷ where operated per the service requirements of the manual

⁸ where installed and operated per chemical-storage and water-chemistry recommendations of the manual

⁹ Blower bearings, blower belts, blower sheaves and blower-motor sheaves are not covered.

Optional Delayed Start-Up Warranty

Under this warranty upon expiry of the initial 30-day 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. Purchase of this extended warranty must be made before shipment of the unit.

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Roswell, GA 30075
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1-800-676-2566
Fax: 770-649-0243

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Troubleshooting

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! WARNING**Risk of electric shock. Can cause injury or death.**

Some installation and service procedures could expose personnel to the risk of electric shock. Electric shock can cause injury or death.

The unit controller does not disconnect electrical energy from the unit, even in the OFF condition. Use only approved devices (e.g. locking safety switch), to disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Follow all applicable safety regulations.

**! WARNING****Risk of explosive pressure release. Can cause injury or death.**

This product contains refrigerant liquid and vapor under high pressure. Some installation and service procedures could expose personnel to the risk of explosive discharge. Some installation and service procedures could expose personnel to the risk of frostbite from release of refrigerant.

Reclaim refrigerant to reduce the pressure to atmospheric before working on pipes, valves, heat exchangers, compressors, pressure switches, etc.

Once opened, do not close any manual refrigerant valves that might isolate refrigerant from the relief valve. If necessary, install relief valves (by others).

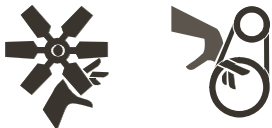
! WARNING**Risk of top-heavy units tipping over. Can cause property damage, injury, or death.**

Vertical units may be top-heavy. Do not attempt to move without proper equipment.

**! WARNING****Risk of contact with moving parts. Can cause injury or death.**

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.

**! WARNING****Risk of falling. Can cause injury or death.**

Depending on the size and location of this product, some installation, service, and maintenance procedures could expose personnel to the risk of injury or death by falling.

Designs should include adequate service and maintenance access. Use fall-protection equipment as appropriate.



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 **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.

 **WARNING****Risk of suffocation.**

Improper handling of refrigerants and refrigerant hoses can allow release of refrigerant gases. In a confined space, these heavier-than-air gases may accumulate and displace oxygen, leading to suffocation.

Confirm adequate ventilation before proceeding.

 **WARNING****Risk of contamination of breathing air. Can cause injury or death.**

Application of this product may involve the intake of outdoor air. Do not store any contaminants near the point of intake.

Application of this product may involve air-handling equipment, e.g. ducts, cabinets, plenums, etc., which operate below atmospheric pressure. Such equipment must be carefully located and installed to prevent the intake of contaminants.

Follow the instructions in this manual and all applicable codes.

 **CAUTION****Risk of contact with hot surfaces. Can cause injury.**

This product contains surfaces which can cause burn injury.

The compressor, refrigerant-discharge tubes, and heat exchangers can become extremely hot during operation.

Compressor crankcase heaters can be extremely hot at any time electrical power is applied.

Turn off the unit and allow time for these parts to cool before working inside the unit cabinet. Wear protective clothing (gloves, sleeves, etc.) while working on these parts.

NOTICE**Risk of leaking water. Can cause property damage.**

This product may use circulating water under pressure.

This product requires a free-flowing drain.

Freezing or other abnormal conditions could cause leakage or overflow.

Uncontrolled water can cause expensive damage to buildings and other equipment.

Maintain all drains and piping systems to prevent leaks and overflows.

NOTICE**Risk of uncontrolled condensation. Can cause property damage.**

This product is intended to control relative humidity and temperatures. Improper design, installation, and/or operation can lead to uncontrolled condensation of water, with associated property damage.

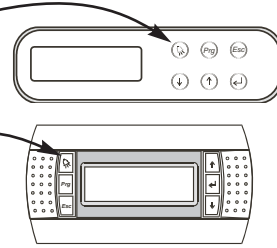
Read and follow the instructions in this manual.

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Alarms

Dectron has a list of contractors who have been trained by Dectron to install and service this product. Please call 1-800-676-2566 or 1-800-667-6338 to find the contractor nearest your site.



If the alarm button is illuminated, press it to see the current alarm(s). Press ↓ repeatedly to see all current alarms.

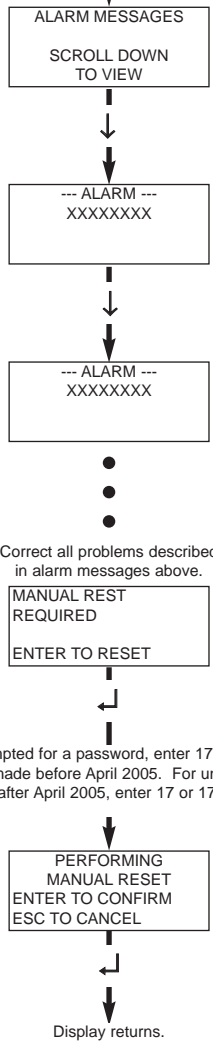
To get an explanation of an alarm, first get the alarm on screen. Press **Prg** to get the explanation.

For a list of alarm messages, see **Operation - Alarm Messages**.

Reset

If the message "MANUAL RESET REQUIRED" appears among the unit status messages, follow the instructions on screen to accomplish a manual reset.

NOTE: Only certain specific alarms require manual reset. Other alarms are automatic reset when the problem is corrected.



Press ↓ to initiate the resetting process.

Note: Not all alarms require manual reset.

Press ↓ to proceed with the resetting process.

Press **Esc** to cancel the resetting process.

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Alarms Troubleshooting Service

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
A/C LOW WATER FAULT	Reduction of cooling water flow. Water pressure switch incorrectly adjusted.	<ul style="list-style-type: none"> • Be sure the correct water flow is present. • Adjust switch. See section Startup - Adjust Flow Switches.
BLOWER OVERLOAD	Cabinet doors left open Excessive airflow Overload device manual switch is OFF Blower motor current too high Unexpected open switch circuit Defective overload device	<ul style="list-style-type: none"> • Close all cabinet doors. Reset overload. • Be sure airflow is as specified on unit nameplate. Check switch position visually. <ul style="list-style-type: none"> • Press the OFF switch, then press the ON switch. Check that the blower motor current is not higher than the unit nameplate value. <ul style="list-style-type: none"> • Adjust the branch circuit voltage to the nameplate value ±10%. • Adjust the blower sheaves to produce design airflow. Check for loose terminals on overload device auxiliary switch. <ul style="list-style-type: none"> • Tighten as necessary Check for continuity of overload device auxiliary switch <ul style="list-style-type: none"> • Replace as necessary Replace overload device as necessary. Contact Dectron or your Dectron representative for referral to a Dectron-certified technician.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>COMPRESSOR X HIGH PRESSURE FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Manual isolation valves not opened at installation</p> <p>Loss of cooling water on water-cooled units</p> <p>Loss of airflow in remote condensers on air-cooled units</p> <p>Improperly adjusted pressure control valve(s)</p> <p>Return air temperature too high</p> <p>Fouled or damaged reheat coil</p> <p>Excess refrigerant</p> <p>Defective high pressure switch</p>	<ul style="list-style-type: none"> • Be sure all isolation valves are opened. • 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. • 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 airflow interruptions near the remote condenser. See Installation - Locate Remote Condenser. • Be sure the remote condenser is clean. • Consult Dectron or a Dectron-certified technician. • 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. • 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. • This will be most common in warm weather. Be sure the total refrigerant charge corresponds to the amount shown on the unit nameplate. • Consult Dectron or a Dectron-certified technician.

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Alarms Troubleshooting Service

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>COMPRESSOR X HIGH DISCHARGE FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Improperly adjusted refrigerant expansion valve(s) Excessive return airflow Inadequate refrigerant Defective temperature sensor</p>	<ul style="list-style-type: none"> • Consult Dectron or a Dectron-certified technician. • Contact an air-balance service to be sure the airflow is within tolerance. • With the compressor running, check for bubbles in the sight glass(es). If bubbles are present contact Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician.
<p>COMPRESSOR X LOW DISCHARGE FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Improperly adjusted refrigerant expansion valve(s) Inadequate return airflow Improperly adjusted pressure control valve(s)</p>	<ul style="list-style-type: none"> • Consult Dectron or a Dectron-certified technician. • Contact an air-balance service to be sure the airflow is within tolerance. • Consult Dectron or a Dectron-certified technician.
<p>COMPRESSOR X LOW PRESSURE FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Manual isolation valves not opened at installation Inadequate refrigerant charge Low room air temperature Low room humidity Inadequate return airflow Clogged refrigerant filter-drier Improperly adjusted pressure control valves Defective refrigerant expansion valve Defective pressure switch</p>	<ul style="list-style-type: none"> • Be sure all manual isolation valves are open. • The refrigerant sight glasses must be completely full whenever the compressor has been running for at least ten minutes. If this is not the case, consult Dectron or a Dectron-certified technician. • Be sure set points correspond to those shown on unit nameplate. Be sure room heater is working properly. • Be sure set points correspond to those shown on unit nameplate. Be sure outdoor makeup airflow rate is not excessive. • Contact an air-balance service to be sure the airflow is within tolerance. • Consult Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>COMPRESSOR X OIL FAILURE, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Low oil level in compressor crankcase</p> <p>Excessive compressor wear</p> <p>Compressor oil pump failure</p> <p>Compressor oil pressure switch failure</p>	<ul style="list-style-type: none"> • 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. • Consult Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician. • Oil pressure should be more than 10 PSI above evaporator pressure. • Consult Dectron or a Dectron-certified technician.
<p>COMPRESSOR X OVERHEAT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>Applied voltage out of tolerance or out of balance</p> <p>Low oil level in compressor crankcase</p> <p>Evaporator pressure too low or hot gas bypass valve open too long (when so equipped).</p> <p>Defective refrigerant expansion valve</p> <p>Defective compressor overheat detector</p>	<ul style="list-style-type: none"> • A qualified person should be sure that the average applied voltage is within $\pm 10\%$ of the nameplate value and that the individual phase voltages are within $\pm 1\%$ of the average voltage (See NEMA MG-1). • See "OIL PRESSURE FAILURE" above • Be sure the evaporator pressure does not operate below 55 PSI for significant periods. Be sure HGBV is properly adjusted. • Consult Dectron or a Dectron-certified technician. • Consult Dectron or a Dectron-certified technician.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COOLING PERFORMANCE ALARM	A minimum temperature difference across the evaporator has not been produced after ten minutes of refrigeration.	<ul style="list-style-type: none"> • Be sure the associated refrigerant sight glass is full. No droplets should be visible on the inside of the sight glass. No bubbles should be visible in the sight glass after ten minutes of operation. • Be sure the return airflow rate is as specified. • Be sure all manual isolation valves are fully open. • Be sure the refrigerant filter-drier is not clogged. • Be sure the refrigerant expansion valve is properly adjusted. • Be sure the pressure control valves have not been adjusted. Contact Dectron or a Dectron-certified technician.
DISCHARGE X SENSOR FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.	The signal from the compressor discharge temperature sensor is out of range.	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the controller and check the resistance of the sensor and cable combination. Compare to the chart at the end of this section. If the resistance is outside the allowable range, disconnect the cable from the sensor and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together and be sure the cable resistance is less than 5 ohms. If either condition fails, replace cable. Compare the resistance of the sensor itself to the sensor resistance chart. Replace sensor if necessary. Connect sensor and cable to controller.
DIRTY FILTERS	The signal from the filter differential pressure sensor indicates dirty filters. Defective sensor or wires.	<ul style="list-style-type: none"> • Install clean filters. • Check for continuity.

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Alarms Troubleshooting Service

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>EVAPORATOR X SENSOR FAULT, where "X" is a placeholder. Your display will actually show a number associated with a particular refrigeration circuit.</p>	<p>The signal from the evaporator leaving air temperature sensor is out of range.</p>	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the controller and check the resistance of the sensor and cable combination. Compare to the chart at the end of this section. <p style="margin-left: 20px;">If the resistance is outside the allowable range, disconnect the cable from the sensor and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together and be sure the cable resistance is less than 5 ohms. If either condition fails, replace cable.</p> <p style="margin-left: 20px;">Compare the resistance of the sensor itself to the sensor resistance chart. Replace sensor if necessary.</p> <p style="margin-left: 20px;">Connect sensor and cable to controller.</p>
<p>EXPANSION MODULE COMMUNICATION FAILURE</p>	<p>Cable or addressing problem</p>	<ul style="list-style-type: none"> • Consult Dectron or a Dectron-certified technician.
<p>FIRESTAT ALARM</p> <p>Where so equipped, the DRY-O-TRON® will shut down.</p>	<p>Fire or smoke present</p> <p>Fire alarm (by others) has been tested but not completely reset</p> <p>Broken fire alarm wiring (by others)</p> <p>Shorted fire alarm wiring (by others)</p>	<ul style="list-style-type: none"> • Be sure there is no fire. • Contact your fire alarm technician. • Contact your fire alarm technician. • Contact your fire alarm technician.
<p>FREEZESTAT ALARM</p> <p>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.</p>	<p>Heating fluid (water or steam) too cold</p> <p>Inadequate flow of heating fluid (water or steam)</p> <p>Excessive outdoor airflow rate</p> <p>Outdoor air temperature unexpectedly low.</p> <p>Return air filters too dirty</p> <p>Defective freezestat</p>	<ul style="list-style-type: none"> • 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 freezestat trips.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
GAS BOILER ALARM	A general failure of an associated gas boiler supplied by Dectron.	<ul style="list-style-type: none"> • Consult the boiler manual.
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	<ul style="list-style-type: none"> • 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 $\pm 10\%$ of the nameplate value and that the individual phase voltages are within $\pm 1\%$ of the average voltage (See NEMA MG-1). Reset overload.
HUMIDITY SENSOR FAULT Humidity sensor signal is out of range.	Sensor cable disconnected Sensor cable broken or shorted Defective sensor	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the sensor and from the controller and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together at the sensor end and be sure the cable resistance is less than 5 ohms. If either condition fails, replace the cable. Compare the output signal of the sensor itself to the expected value. Replace sensor if necessary. Connect sensor and cable to controller.
MAX. EXHAUST BLOWER OVERLOAD (Purge mode equipped units) The motor protection device for the larger exhaust air blower has tripped.	Excess Maximum Exhaust airflow rate Applied voltage out of tolerance or out of balance	<ul style="list-style-type: none"> • Be sure the Maximum Exhaust airflow rate is as specified. Excess airflow can overload some blowers. • A qualified person should be sure that the average applied voltage is within $\pm 10\%$ of the nameplate value and that the individual phase voltages are within $\pm 1\%$ of the average voltage (See NEMA MG-1). Reset overload.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>MIN. EXHAUST BLOWER OVERLOAD (Purge mode equipped units)</p> <p>The motor protection device for the smaller exhaust air blower has tripped.</p>	<p>Excess Minimum Exhaust airflow rate</p> <p>Applied voltage out of tolerance or out of balance</p>	<ul style="list-style-type: none"> • Be sure the Minimum Exhaust airflow rate is as specified. Excess airflow can overload some blowers. • A qualified person should be sure that the average applied voltage is within $\pm 10\%$ of the nameplate value and that the individual phase voltages are within $\pm 1\%$ of the average voltage (See NEMA MG-1). Reset overload.
<p>OUTDOOR HUMIDITY SENSOR FAULT Outdoor humidity sensor (where so equipped) signal is out of range.</p>	<p>Sensor cable disconnected</p> <p>Sensor cable broken or shorted</p> <p>Defective sensor</p>	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the sensor and from the controller and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together at the sensor end and be sure the cable resistance is less than 5 ohms. If either condition fails, replace the cable. <p>Compare the output signal of the sensor itself to the expected value. Replace sensor if necessary. Connect sensor and cable to controller.</p>
<p>OUTDOOR TEMPERATURE SENSOR FAULT</p> <p>The signal from the outdoor air temperature sensor is out of range.</p>	<p>Sensor cable disconnected</p> <p>Sensor cable broken or shorted</p> <p>Defective sensor</p>	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the controller and check the resistance of the sensor and cable combination. Compare to the chart at the end of this section. If the resistance is outside the allowable range, disconnect the cable from the sensor and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together and be sure the cable resistance is less than 5 ohms. If either condition fails, replace cable. <p>Compare the resistance of the sensor itself to the sensor resistance chart. Replace sensor if necessary. Connect sensor and cable to controller.</p>

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>POOL 1 IN SENSOR FAULT or POOL 2 IN SENSOR FAULT</p> <p>The signal from the inlet pool water temperature sensor is out of range.</p>	<p>Sensor cable disconnected</p> <p>Sensor cable broken or shorted</p> <p>Defective sensor</p>	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the controller and check the resistance of the sensor and cable combination. Compare to the chart at the end of this section. <p>If the resistance is outside the allowable range, disconnect the cable from the sensor and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together and be sure the cable resistance is less than 5 ohms. If either condition fails, replace cable.</p> • Compare the resistance of the sensor itself to the sensor resistance chart. Replace sensor if necessary. <p>Connect sensor and cable to controller.</p>

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>POOL 1 LEAVING WATER TOO HOT or POOL 2 LEAVING WATER TOO HOT</p> <p>The temperature of the water returning to the pool has exceeded 120°F. The unit will shut down.</p>	<p>Inadequate pool water flow rate</p> <p>Pool water temperature too high</p>	<ul style="list-style-type: none"> • Be sure the pool water flow rate is as specified in this manual. • Be sure the pool water set point is as specified. • Be sure the pool water heating solenoid valve closes. Check the solenoid valve signal. Replace the valve as necessary.
<p>POOL 1 LOW WATER FAULT or POOL 2 LOW WATER FAULT</p> <p>The flow detection pressure switch circuit is open. Pool water heating is inhibited.</p>	<p>Inadequate pool water flow rate</p> <p>Pool water pressure switch is not adjusted</p> <p>Defective pool water pressure switch.</p>	<ul style="list-style-type: none"> • Be sure the pumps are working. • Be sure the valves are in the correct position. • Check and set water flow rate as discussed in Startup - Adjustments. • Set as discussed in Startup - Adjustments. • Set as discussed in Startup - Adjustments. If the switch cannot be adjusted, contact Dectron for a replacement.
<p>POOL 1 OUT SENSOR FAULT or POOL 2 OUT SENSOR FAULT</p> <p>The signal from the inlet pool water temperature sensor is out of range.</p>	<p>Sensor cable disconnected</p> <p>Sensor cable broken or shorted</p> <p>Defective sensor</p>	<ul style="list-style-type: none"> • Be sure the sensor cable is properly connected to both the sensor and the controller. • Disconnect the cable from the controller and check the resistance of the sensor and cable combination. Compare to the chart at the end of this section. If the resistance is outside the allowable range, disconnect the cable from the sensor and be sure the resistance of the cable is above 1 million ohms. Connect the ends of the cable wires together and be sure the cable resistance is less than 5 ohms. If either condition fails, replace cable. • Compare the resistance of the sensor itself to the sensor resistance chart. Replace sensor if necessary. Connect sensor and cable to controller.

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ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>POOL 1 PERFORMANCE ALARM or POOL 2 PERFORMANCE ALARM</p> <p>The pool water temperature difference is less than 8°F after 5 minutes of heating.</p>	<p>Pool water flow rate too high</p> <p>Pool water temperature sensors not calibrated</p> <p>Loss of refrigeration capacity</p> <p>Pool heating diverting valve not functioning</p>	<ul style="list-style-type: none"> • Be sure the pool water flow rate is as specified. • Consult Dectron or a Dectron-certified technician. • Be sure the refrigerant sight glass is full. There should be neither bubbles nor droplets. • Consult Dectron or a Dectron-certified technician.
<p>POWER FAILURE</p> <p>The voltage monitor circuit is open.</p>	<p>Input voltage out of range</p> <p>Input voltage phase rotation reversed</p> <p>One or more phases of the input voltage are missing</p> <p>For 460 V units, there is a crack in the socket of the voltage monitor</p> <p>Defective voltage monitor</p>	<ul style="list-style-type: none"> • A qualified person should be sure that the average applied voltage is within $\pm 10\%$ of the nameplate value and that the individual phase voltages are within $\pm 1\%$ of the average voltage (See NEMA MG-1). <ul style="list-style-type: none"> • Note that the input voltage can go below nominal $\pm 10\%$ at the moment of compressor startup. A qualified person should measure the input voltage at the moment of compressor startup. • A qualified person should interchange any two wires of the branch circuit. Do not move any factory-installed wires. • A qualified person should determine that all phases are present. Check fuses and/or circuit breakers. • A qualified person should inspect the socket. Replace as necessary. • Consult Dectron or a Dectron-certified technician.

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Alarms

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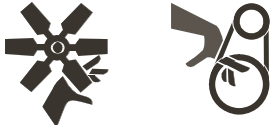
UNITS WITH VOLTAGE MONITOR ONLY



Risk of contact with moving parts. Can cause injury or death.

This product contains rotating parts and V-belt drives. Some installation, service, and maintenance procedures could expose personnel to the risk of injury or death from contact with these parts.

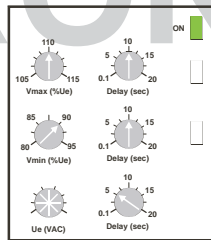
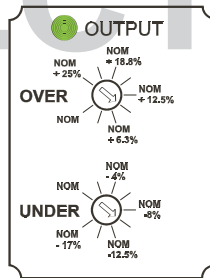
Using only approved devices (e.g. locking safety switch), disconnect, lockout, and tagout all sources of electrical energy before working inside the unit cabinet. Allow adequate time for rotating parts to stop. Follow all applicable safety regulations.



Identify the type of voltage monitor present.

TYPE 1

TYPE 2



For TYPE 2 monitors, skip to next page.

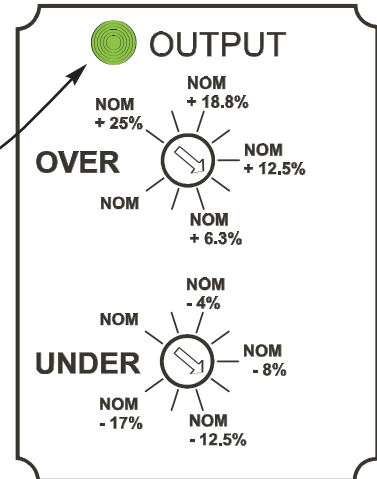
Type 1 Voltage Monitor

After power wiring is complete, and when safe to do so, 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. Be sure that the knob(s) are set correctly.

The over-voltage setting should be at nominal voltage plus 10%.

The under-voltage setting should be at nominal voltage minus 10%.



UNITS WITH TYPE 2 VOLTAGE MONITOR ONLY

Be sure the Vmax time delay is set to 10 seconds.

Be sure that Vmax is set to 110%. Higher values may allow overheating of internal motors.

Do not adjust the voltage monitor without the explicit instructions from Dectron.

Be sure the Vmin time delay is set to 10 seconds.

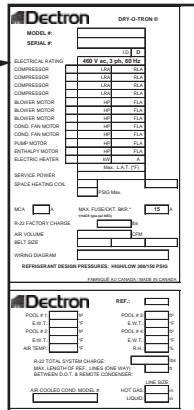
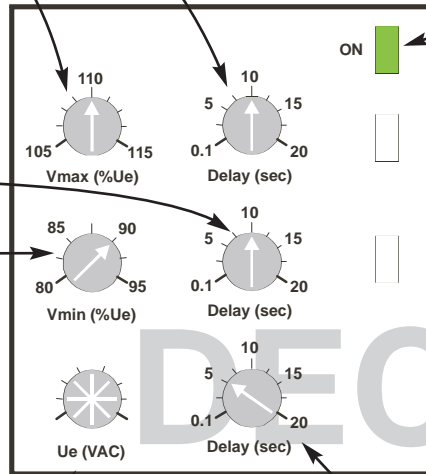
Be sure that Vmin is set to 90%. Lower values may allow overheating of internal motors.

Do not adjust the voltage monitor without explicit instructions from Dectron.

Be sure that Ue is set to the nominal voltage shown on the Dectron nameplate.

When the branch circuit voltages are correct, the green ON LED should be on.

If it is not on, or is flashing, see the following page for more details.

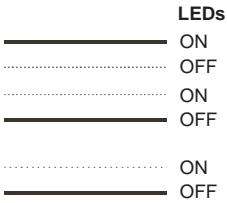
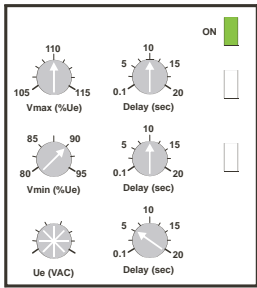


Be sure the Ue time delay is 5 seconds or less.

Alarms

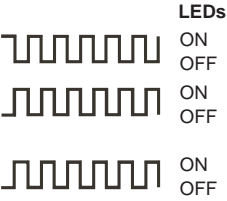
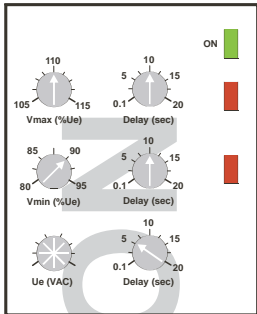
Troubleshooting

Service



Normal

When the green LED is on steady, the voltages are within normal range, all voltages are present, and the phase sequence is correct. No action is needed.

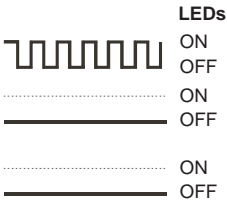
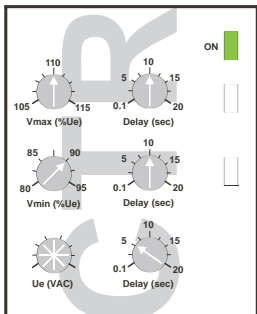


Incorrect Phase Sequence

When the green LED alternates with both red LEDs, the incoming branch circuit phase sequence is wrong, and the DRY-O-TRON cannot operate.

Disconnect electrical power from the branch circuit, follow all necessary and proper safety procedures, and remove any two branch-circuit conductors from the input lugs. Exchange their places and reconnect. Tighten as appropriate.

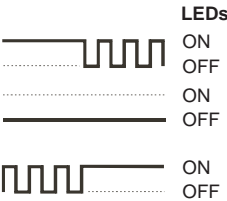
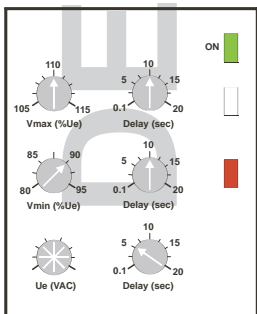
Following all safety procedures, re-apply electrical power. The voltage monitor should be normal as shown above.



Phase Loss

When the green LED is flashing and with both red LEDs are off, the incoming branch circuit does not have all three phases, and the DRY-O-TRON cannot operate.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

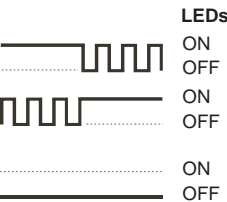
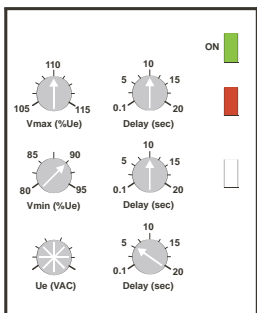


Incoming Voltage Below Minimum Allowable

When the green LED is flashing and the lower red LED is on, the incoming voltage is too low, and the DRY-O-TRON cannot operate.

Voltages below this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.



Incoming Voltage Above Maximum Allowable

When the green LED is flashing and the upper red LED is on, the incoming voltage is too high, and the DRY-O-TRON cannot operate.

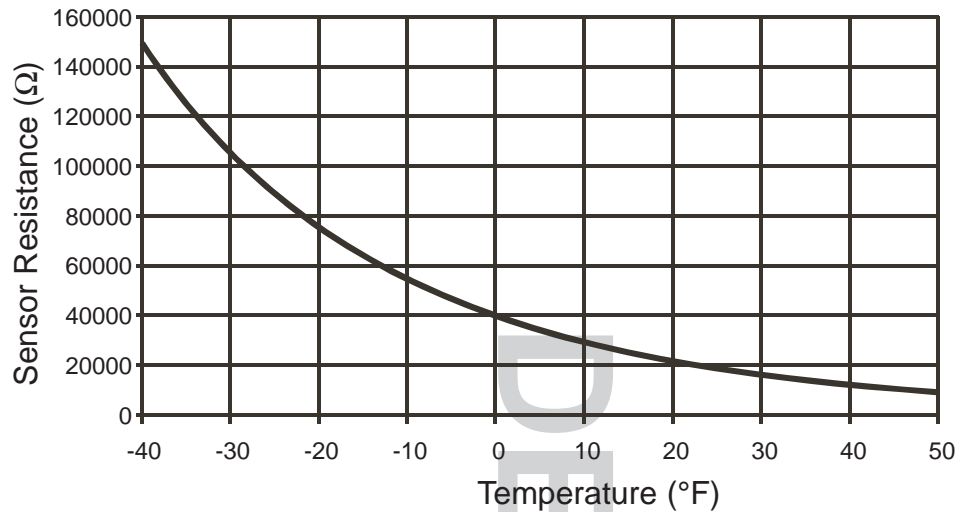
Voltages above this level will result in motor overheating. Do not adjust the voltage monitor without explicit instructions from Dectron.

Have a qualified electrician fix the problem and re-apply electrical power. The voltage monitor should be normal as shown above.

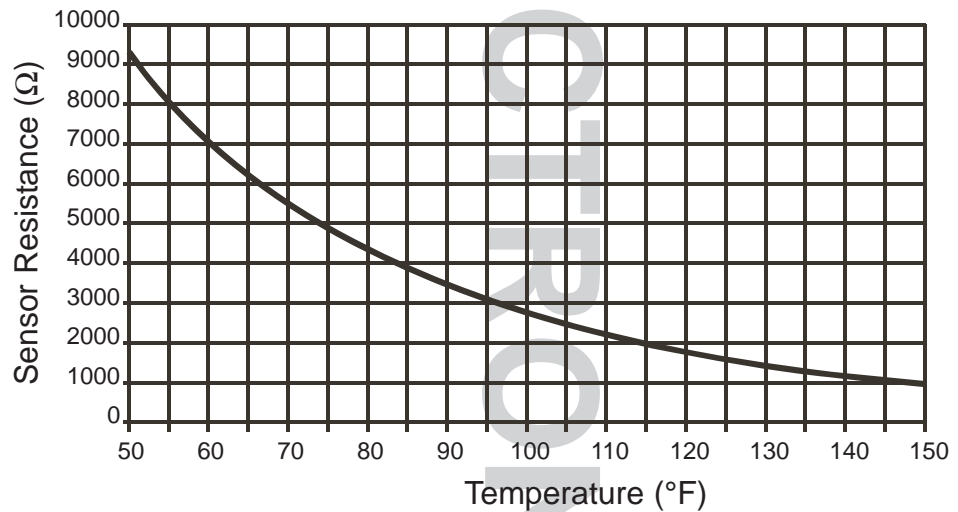
Service

Temperature Sensors

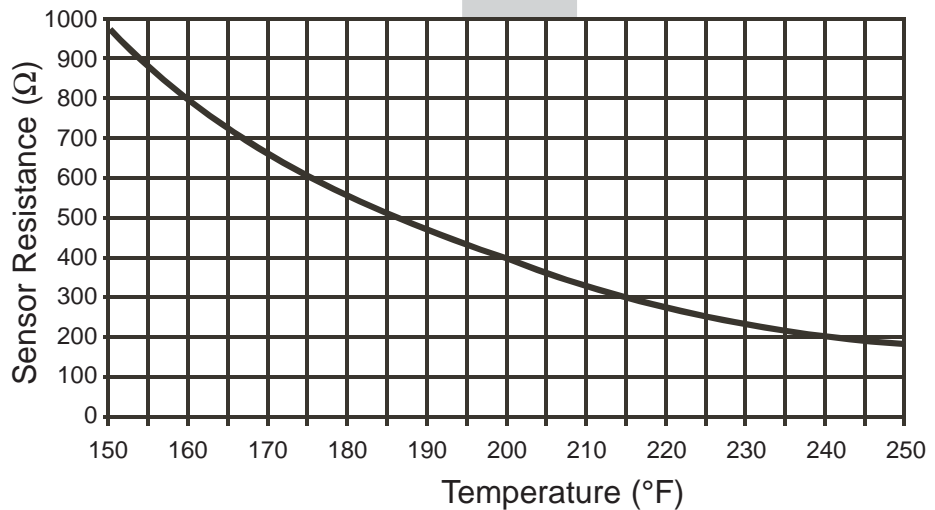
Use this chart for the temperature range -40°F to 50°F.



Use this chart for the temperature range 50°F to 150°F.



Use this chart for the temperature range 150°F to 250°F.



DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Service

Diagnostics - Mechanical

Problems not indicated by Supervisaire® Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
Unit not cooling (continued)	<p>Wrongly adjusted head pressure bypass valve (ORI-6 5/8) (continued)</p> <p>Closed isolation valves for outdoor condenser</p> <p>Defective relay on S5 relay board</p> <p>Room load exceeds the cooling capacity of the unit</p>	<p>4. To adjust this valve, close it completely and then open it one turn.</p> <ul style="list-style-type: none"> • Replace defective valve. <p>Check position of ball valves.</p> <ul style="list-style-type: none"> • Open valves. <p>Check whether the A/C three-way valve is energized.</p> <ul style="list-style-type: none"> • Replace defective relay. <p>Check the air temperature differential through the DRY-O-TRON®.</p> <ul style="list-style-type: none"> • If the differential is 8°F - 10°F (4.5°C - 5.5°C) the unit is cooling properly.
<p>Compressor will not start</p> <p>Check controller status messages.</p>	<p>No demand</p> <p>Anti-short-cycle timer prevents startup for 3 minutes.</p> <p>Compressor overload is turned off or has tripped (three-phase units only)</p> <p>Compressor thermal protector is open</p> <p>Open water-pressure switch circuit</p> <p>Loose control or power wiring</p> <p>Water exit temperature above 120°F</p>	<ul style="list-style-type: none"> • Adjust the set points to the values on the unit nameplate. <p>Wait.</p> <ul style="list-style-type: none"> • Turn the overload on (where so equipped). • Allow one hour for compressor to cool. • Check circuit continuity. Check for water flow. Check pressure switch adjustment. • Check for electrical continuity under load. • Check the water flow rate. • Clear the fault code.

Data subject to change without notice.

Diagnostics-Mechanical

Service

Problems not indicated by Supervisaire[®] Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>Compressor will not start (continued)</p>	<p>Compressor crankcase full of liquid refrigerant</p> <p>Low voltage may cause failure to start (Long inadequately-sized branch circuit conductors may cause low voltage at inrush.)</p> <p>Defective start capacitor (single phase units only)</p> <p>Defective capacitor relay (single phase units only)</p> <p>Defective contactor</p> <p>Defective compressor</p>	<ul style="list-style-type: none"> • Be sure the crankcase heater has been warm for at least 12 hours prior to starting the compressor. • Use adequate branch circuit conductors. Consult Dectron for the use of a hard-start kit (single phase units only). • Consult Dectron for recommendations. • Replace capacitor. • Replace relay. • Check that the contactor is getting power. • Replace contactor. • Check compressor for shorts, open windings, and locked rotor. • Replace compressor.
<p>High humidity in the space</p>	<p>Incorrect duct design can produce stratification of room air.</p> <p>Incorrect duct design can cause improper evaporator air velocity.</p> <p>Incorrect duct design can reduce airflow below operating range.</p> <p>Incorrect blower speed can cause improper total airflow.</p>	<p>See the Installation section of this manual for proper duct design.</p> <ul style="list-style-type: none"> • Correct duct design as necessary. <p>See the Installation section of this manual for proper duct design.</p> <ul style="list-style-type: none"> • Correct duct design as necessary. <p>See the Installation section of this manual for proper duct design.</p> <ul style="list-style-type: none"> • Correct duct design as necessary. <p>Assure proper total airflow by testing.</p> <ul style="list-style-type: none"> • Adjust blower speed as appropriate.

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Dectron, Inc. March 2012

DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Service

Diagnostics - Mechanical

Problems not indicated by Supervisaire[®] Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>High humidity in the space (continued)</p>	<p>Dirty air filters can seriously reduce the total airflow.</p> <p>Room air temperature being too high can reduce the dehumidification effect.</p> <p>Insufficient refrigerant can reduce the refrigeration effect. Excessive length of tube connecting to remote condenser (if so equipped) can cause refrigerant undercharge.</p> <p>Excessive amounts of refrigerant can reduce the refrigeration effect.</p> <p>Air-side clogging of the air reheat heat exchanger can reduce total airflow and heat transfer.</p> <p>Reduced heat transfer of a remote air-cooled condenser (if so equipped) can cause excessive condenser pressure.</p> <p>Non-condensable gases in the refrigeration system can reduce the refrigeration effect.</p> <p>Closed manual shut-off valves can reduce the refrigeration effect.</p> <p>Clogged filter-driers can reduce the refrigeration effect.</p>	<ul style="list-style-type: none"> • Be sure that the unit is always operated with clean air filters. • Adjust set point to range stated on unit nameplate. • Be sure there are no bubbles in the sight glass under any conditions. • Be sure the right amount of refrigerant is present. • Be sure the unit is only operated with clean filters in place. Always filter any outdoor air brought into the unit. If used in a natatorium do not locate the return grille near a spa or hot tub. • Be sure the remote condenser is clean and the fans are operating properly in cooling mode. • Always evacuate to 250 microns of mercury or better. • Be sure all manual valves that should be open are open. • If bubbles are visible in the sight glass, measure the liquid temperature on either side of the filter drier. A drop of more than 2°F is unacceptable. • Replace the liquid line filter-drier.

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Dectron, Inc. March 2012

Diagnostics-Mechanical

Service

Problems not indicated by Supervisaire® Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>Room temperature too low</p>	<p>Set point too low</p> <p>Excessive outdoor-air intake</p> <p>Failure of auxiliary duct heater (by others)</p> <p>There is no space heater or space heater has inadequate capacity.</p>	<ul style="list-style-type: none"> • Adjust set points to values shown on unit nameplate. • Adjust outdoor intake rate to no more than 15% of total airflow. • Verify proper heater operation. Correct as necessary. • The DRY-O-TRON® does not produce significant heat - it recycles heat. A dedicated space heater must be ordered with the unit or provided by others. <p>NOTE: Building heat losses are calculated by others and consequently are sized by others. Dectron does not select space-heater capacities.</p>
<p>Room temperature too high</p>	<p>Set point too high</p> <p>Excessive outdoor-air intake</p> <p>Outdoor condenser dirty or fan(s) not operating</p> <p>Auxiliary duct heater ON with no heating demand</p> <p>Air-conditioning diverting valve stuck</p>	<ul style="list-style-type: none"> • Adjust set points to values shown on unit nameplate. • Adjust outdoor intake rate to no more than 15% of total airflow. • Be sure heat exchangers are clean. Assure fan operation. • Verify proper heater operation. Correct as necessary. <p>The three-way valve may be jammed:</p> <ol style="list-style-type: none"> 1. Force the suspect valve to operate and check for changes in operating temperatures and pressures. If no changes occur, then the valve is completely jammed and must be replaced. 2. If the unit runs fine in A/C, trips on high pressure in dehumidification mode, and also runs with higher than normal pressures in A/C alone, then the three-way valve is not shifting completely out of air conditioning. (This is assuming that no other cause for a high pressure trip can be found.) <ul style="list-style-type: none"> • Replace the defective valve.

Data subject to change without notice.

Dectron, Inc. March 2012

Diagnostics-Mechanical

Service

Problems not indicated by Supervisaire® Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
Low compressor oil pressure (continued)	Low oil level in crankcase	<ul style="list-style-type: none"> • Check for and correct any refrigerant leaks. Assure that proper steps have been taken to assure oil return. See installation diagram.
Low condenser pressure	<p>Room air temperature too low</p> <p>Room humidity too low</p> <p>Pool temperature too low</p> <p>ORI valve (water heating intensity) incorrectly set</p> <p>Insufficient refrigerant in system</p>	<ul style="list-style-type: none"> • Adjust set point to value shown on unit nameplate. • Adjust set point to value shown on unit nameplate. • Assure that outdoor air intake is not excessive. • Reduce water flow rate slightly until a reasonable temperature is achieved. • Turn the valve adjustment counter-clockwise until spindle is flush with housing. Turn the valve clockwise approximately 7.5 turns. The condenser pressure will depend on the refrigerant. Refer to chart in Startup section. • Add refrigerant to eliminate bubbles in the sight glass in all modes.
High suction pressure	<p>Room air temperature above normal can cause an increased load on the evaporator.</p> <p>Room relative humidity above normal can cause increased load on the evaporator.</p> <p>A closed evaporator-bypass damper can cause high air velocities in the evaporator.</p> <p>Improper duct design can cause high air velocities in the evaporator.</p> <p>Excessive total airflow can cause high air velocities in the evaporator.</p>	<ul style="list-style-type: none"> • Adjust set point to value shown on unit nameplate. • Adjust set point to value shown on unit nameplate. • Open the bypass damper whenever the room air temperature is above 78°F. • See the Installation section of this manual. Correct duct design as necessary. • Set total airflow by test to the value shown on unit nameplate.

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DSH/DSV/RSH/DBH/RBH Series Dehumidifier Owner's Manual

Service

Diagnostics - Mechanical

Problems not indicated by Supervisaire[®] Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
High suction pressure (continued)	A worn or damaged compressor may produce less refrigerant pumping.	<ul style="list-style-type: none"> • Compare compressor current to value shown on value shown on unit nameplate.
Evaporator icing	<p>Dirty air filters reduce airflow</p> <p>Low room temperature</p> <p>Low airflow</p> <p>Low refrigerant charge</p> <p>Improper duct design</p>	<ul style="list-style-type: none"> • Replace dirty filters. • Adjust set points to value shown on unit nameplate. • Close evaporator-bypass damper when air is below 78°F. • Assure blower turns proper direction (three-phase units only). • Assure blower belt tension is right. • Add refrigerant to eliminate bubbles in the sight glass in all modes. • See the Installation section of this manual for proper design.
Excessive noise	<p>Lack of unit support isolators allows vibration to be transmitted to floors, etc.</p> <p>Lack of duct isolators allows vibration to be transmitted to the ducts.</p> <p>Loose blower belts and/or pulleys can produce unexpected noise.</p> <p>Improperly closed access panels can produce a whistling noise as air leaks into the cabinet.</p> <p>An incorrectly set expansion valve can cause liquid refrigerant flood back to the compressor with accompanying noise.</p>	<ul style="list-style-type: none"> • See the Installation section of this manual for proper design. • See the Installation section of this manual for proper design. • Check blower belts and pulleys for proper tension and alignment. • Be sure that all panels are closed tightly and that all gaskets are in place. • Adjust the expansion valve to produce at least 160°F compressor discharge gas temperature.

Data subject to change without notice.

Diagnostics-Mechanical

Service

Problems not indicated by Supervisaire[®] Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
<p>Excessive noise (continued)</p>	<p>Liquid refrigerant in crankcase can cause excessive noise on startup.</p> <p>Failure of a blower bearing can produce a rumbling noise.</p>	<ul style="list-style-type: none"> • Be sure that the compressor crankcase heater is functioning. Allow at least 12 hours for the crankcase heater to warm up before initial startup. • Examine blower bearing for play or looseness. Replace as necessary.
<p>Unit runs continuously (no damage will result)</p> <p>NOTE: The blower is intended to run 100% of the time.</p> <p>NOTE: Each compressor has a minimum run time of 20 minutes.</p> <p>NOTE: Failure to pump down will stop the compressor and produce an alarm message.</p>	<p>Set points are out of range</p> <p>Heavy pool use can cause the water evaporation rate to increase dramatically.</p>	<ul style="list-style-type: none"> • Adjust set points to values shown on unit nameplate. • Conditions will return to normal after peak use subsides. • Be sure the original design activity factor has not been exceeded. This can be changed by the addition of water features (fountains, slides, etc.) or by changing the number of people using the facility, or by changing the activities the people engage in.
<p>Auxiliary air heating system stays on</p>	<p>Relay failure</p>	<ul style="list-style-type: none"> • This is indicative of a relay failure on the S5 board. Adjust the set points to be sure there is no heating demand. Check that the control voltage to the heating relay (see unit wiring diagram) is zero. If heat remains on, replace the relay.
<p>Corrosion or clogging of heat exchangers</p>	<p>Missing or dirty filters</p>	<ul style="list-style-type: none"> • Replace as needed.

Data subject to change without notice.

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Service

Diagnostics - Mechanical

Problems not indicated by Supervisaire® Controller

SYMPTOM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
Evaporator pressure oscillates more than 8 PSIG for more than 15 minutes after compressor starts	Compressor-discharge gas is too cold.	<ul style="list-style-type: none"> Adjust expansion valve(s). See Startup - Adjust Expansion Valve. <p>NOTE: Oscillation for 10 minutes after compressor starts is normal.</p>
Condenser pressure oscillates more than 5 PSIG	Normal for up to 3 minutes after compressor starts	<ul style="list-style-type: none"> If oscillation continues more than 10 minutes after compressor starts, contact Dectron or a Dectron-certified technician.

Data subject to change without notice.

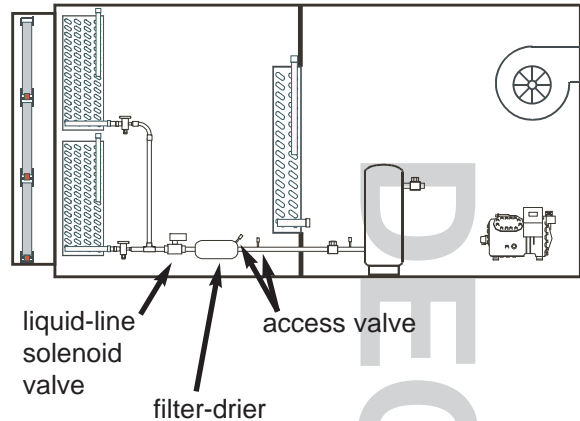
Closing Manual Valves

Service

Units with Liquid-line Solenoid Valves

Some units may have liquid-line solenoid valves. Should one of these units need service that requires closing the receiver-outlet isolation valve, follow these steps:

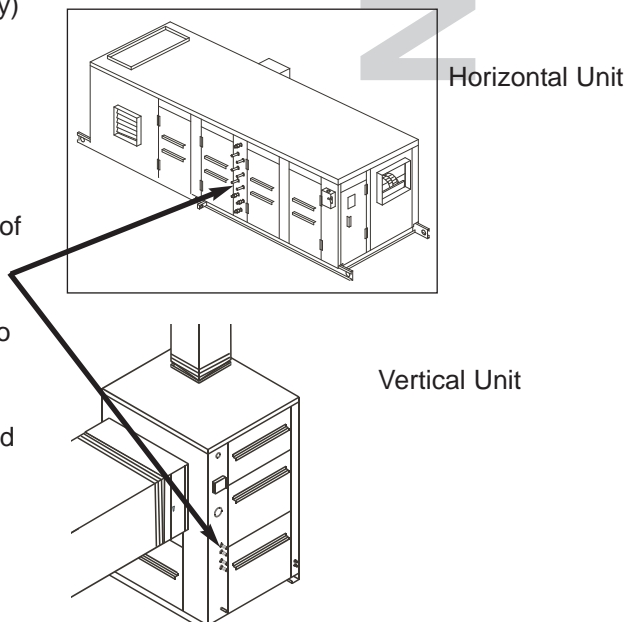
1. Locate the refrigerant liquid line associated with the circuit to be serviced.
2. There will be an access valve either in the filter-drier itself, or in the tube near the filter drier.
3. Set up a refrigerant reclaim machine (by others) on the access valve. Prepare to reclaim 1/2 pound of refrigerant.
4. Close the receiver-outlet isolation valve associated with the circuit to be serviced.
5. Immediately reclaim refrigerant from the liquid line filter-drier. One-half pound (by weight) or a reduction in pressure to less than 10 PSIG should be adequate.
This will allow any remaining liquid refrigerant to expand without damaging components.
6. If refrigerant is removed from the system, retain it for return to the unit after service is complete.



Units with the Air-Cooled Air Conditioning Option Only

Should it be necessary to isolate the remote condenser (if any) from the unit, follow these steps:

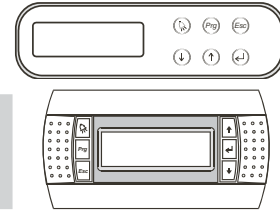
1. Some units may have multiple refrigeration circuits. Determine which circuit must be isolated.
2. Determine which refrigerant-tubes on the unit connect that circuit to the remote condenser. These tubes are labelled.
3. Locate the remote-condenser access valves for the tubes of the circuit in question.
4. Set up a refrigerant-reclaim machine (by others) on the remote-condenser access valves for the circuit. Prepare to remove at least one pound of refrigerant, by weight.
5. There will be a manual isolation valve just inside the unit cabinet behind each tube. Close the two valves associated with the circuit.
6. Immediately reclaim one pound of refrigerant (by weight). This will provide enough volume for the remaining refrigerant to expand without damaging components.
7. Retain the reclaimed refrigerant for return to the unit after the service is complete.





Service



Adjust Display Contrast

Over time, or in some adverse lighting situations, it may become necessary to adjust the contrast of the LCD display. To maximize LCD life, use only the minimum amount of contrast necessary.



DECTRON

To increase the contrast, simultaneously press and hold the  and **Prg** and  buttons until the contrast is correct.

To decrease the contrast, simultaneously press and hold the  and **Prg** and  buttons until the contrast is correct.