Dectron

DRY-O-TRON®

Owner's Manual

FOR MODELS

DS	DSV	DB	RS	RB
042	042	042	042	042
062	062	062	062	062
082	082	082	082	082
100	100	100	100	100
102		102	102	102
120		120	120	120
122		122	122	122
150		150	150	150
152		152	152	152
162		162	162	162
182		182	182	182
202		202	202	202
242		242	242	242
282		282	282	282
362		362	362	362
482		482	482	482
562		562	562	562

With DOTICS CONTROLLERS
OP-393 and OP-7 DISPLAYS

For future reference, write your model number* here _____

write your serial number* here _____

write your ref number* here _____

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

NOTE:

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

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

To the Owner:

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

Contents

DRY-O-TRON® 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 fully factory tested before shipment.

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

Product Description

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 fully 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 pool 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 Fully heats the pool water
- 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 environment 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 and 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.

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 start-up 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. A built-in minimum water heating mode guards against wide fluctuations in pool water temperature by continuously supplying heat to the pool water to help offset evaporative heat loss.

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. DRY-O-TRON® DB and RB units (with economizer section) come with a built-in mixing box for the introduction of up to 100% make-up air during cooling mode.

Product description

Features

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.

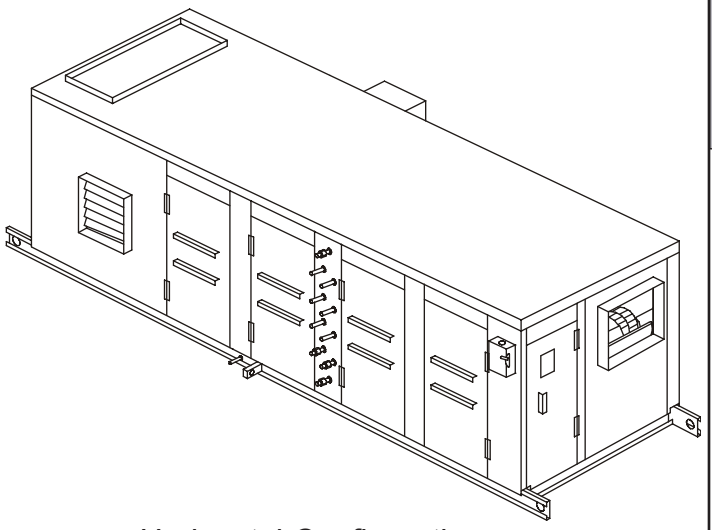
Δ DS series DRY-O-TRON® units are supplied with heat exchangers, air filter(s), and all controls.

Δ An optional outdoor air intake system includes an automatic damper to stop the outdoor air flow during unoccupied periods.

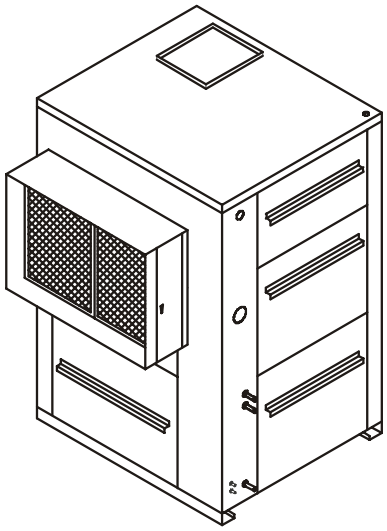
Δ A microprocessor control system automatically determines the proper operating mode, based on conditions and occupation. A simple connection to building management systems is available.

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 chiller matches the system capacity to the load. Energy consumption is always minimized.



Horizontal Configuration



Vertical Configuration

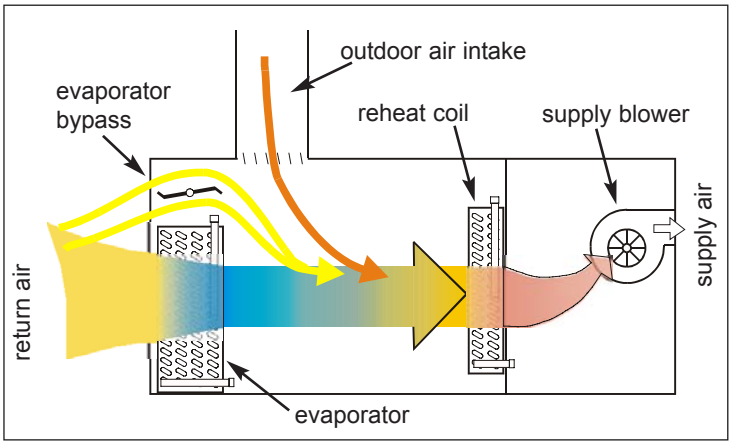
Basic DRY-O-TRON®

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 air flow rate, or up to 35% if the unit has the air conditioning option.

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



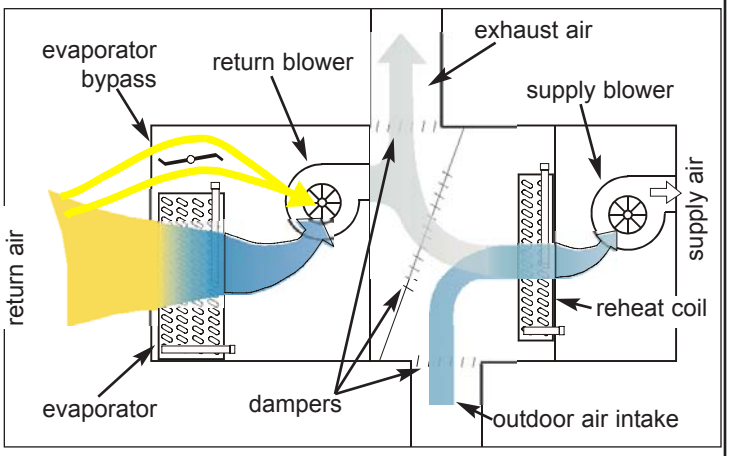
DRY-O-TRON® with Economizer

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

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

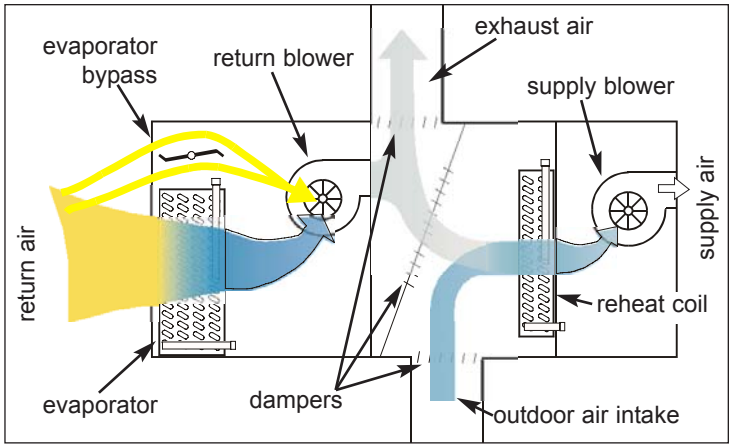
Under normal conditions the outdoor air intake flow rate can be up to 15% (or up to 35% with air conditioning option) of the total supply air flow rate. In order to maintain a negative pressure on the natatorium, the exhaust air flow rate should be 110% of the outdoor air intake flow rate.

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



DRY-O-TRON® with Intelligent Energy Saver®

The Intelligent Energy Saver® economizer reduces the amount of energy required for cooling and for dehumidification by using a proportionally 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.



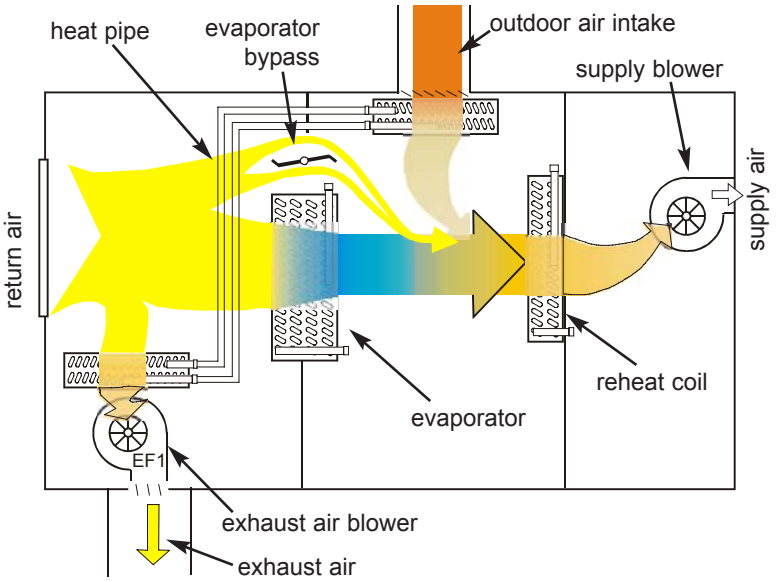
DRY-O-TRON® with SmartSaver®

The SmartSaver® exchanges heat from the exhaust air to the incoming outdoor air to save heating energy.

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

Under normal conditions, up to 30% of the total supply air can be pre-heated outdoor air. The exhaust air flow rate should be 110% of the outdoor air intake flow rate.

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.



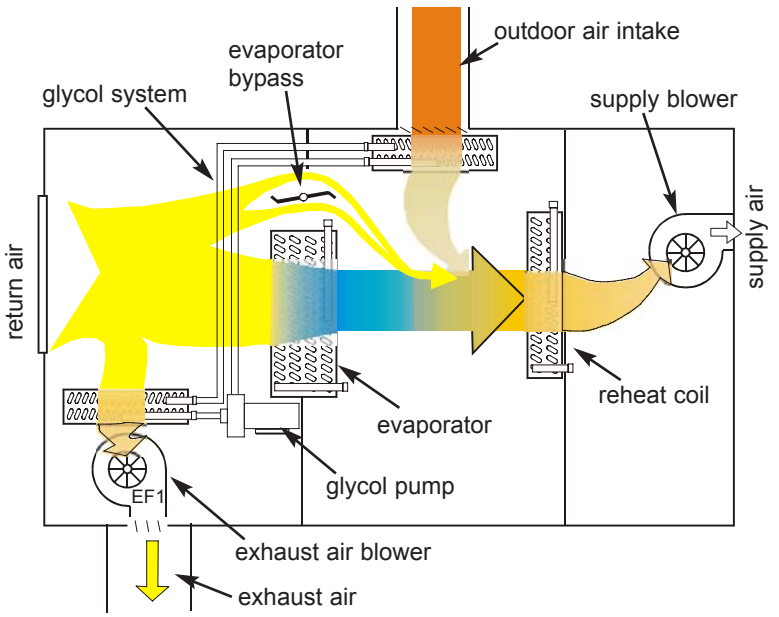
DRY-O-TRON glycol SmartSaver®

The SmartSaver® exchanges heat from the exhaust air to the incoming outdoor air to save heating energy.

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

Under normal conditions, up to 30% of the total supply air can be pre-heated outdoor air. The exhaust air flow rate should be 110% of the outdoor air intake flow rate.

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.



DRY-O-TRON® with Purge Mode

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

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

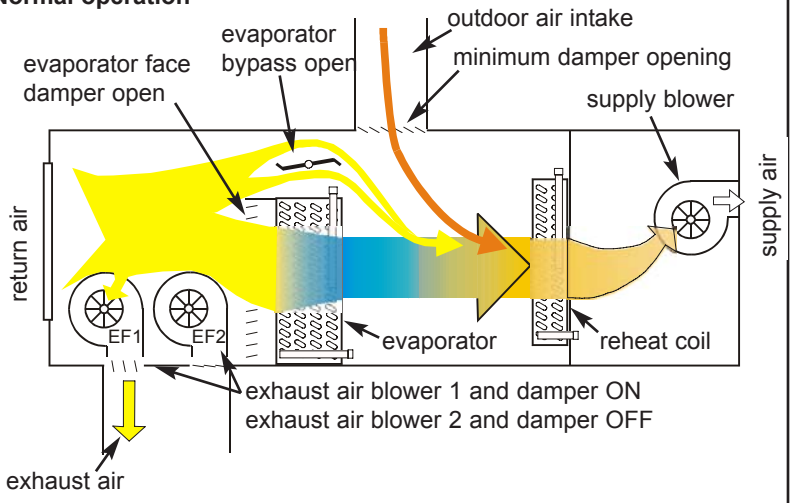
Under normal conditions, up to 15% of the total supply air (or up to 35% with air conditioning option) can be outdoor air. The exhaust air flow rate should be 110% of the outdoor air intake flow rate.

On receipt of a manual input from the operator,

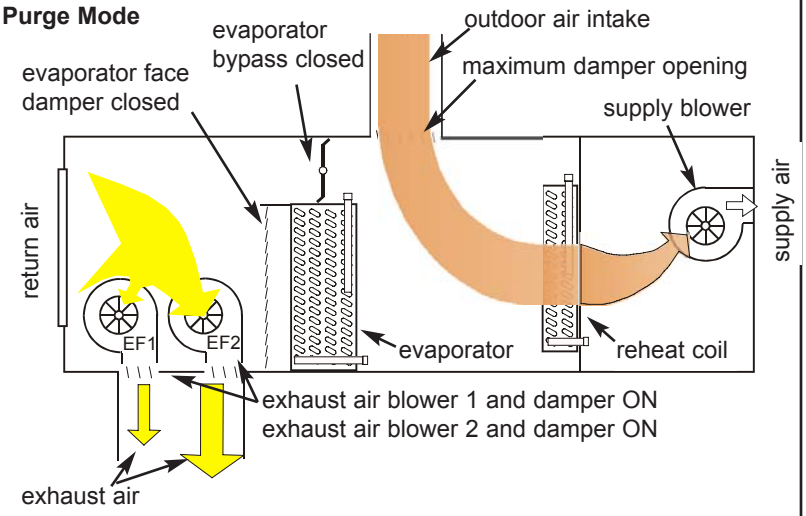
1. the refrigeration system is stopped,
2. the supply blower continues to run,
3. the face dampers over the evaporator close,
4. the evaporator bypass damper closes,
5. the outdoor air intake damper opens completely,
6. the dampers for blower EF2 open, and
7. EF2 (the larger exhaust blower) comes ON.

This features is usually designed to exhaust one room volume of air in 15 minutes. To change the time, consult Dectron or a Dectron-certified technician.

Normal operation



Purge Mode



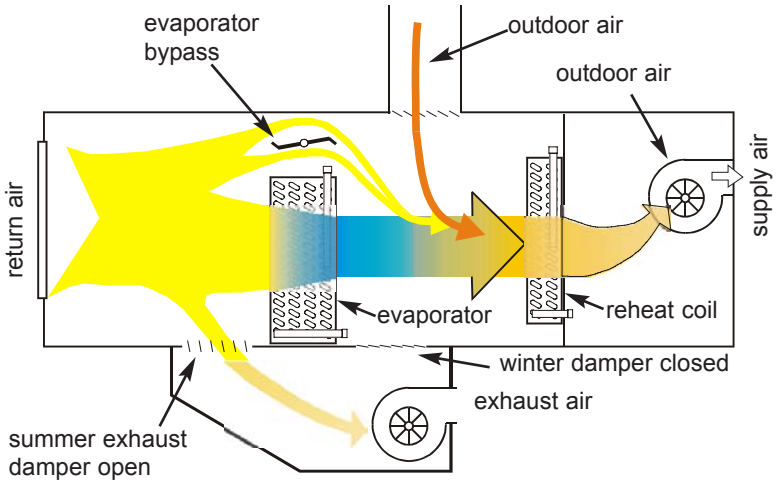
DRY-O-TRON® with EconoSaver®

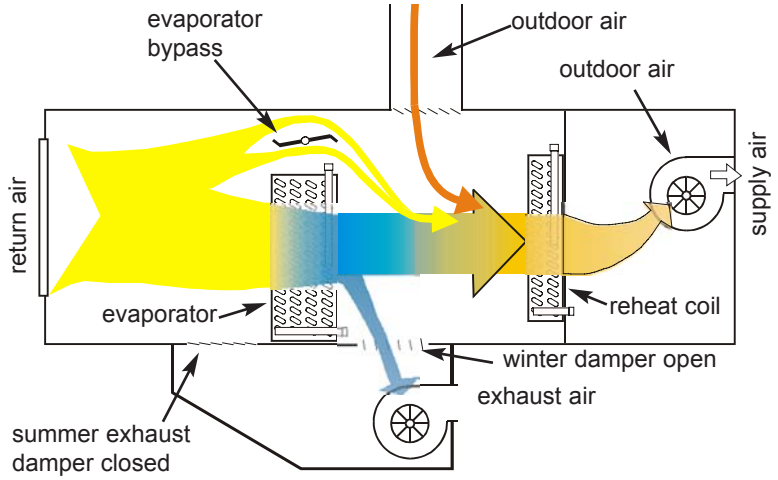
The EconoSaver® reduces the amount of energy needed for heating by recovering heat with the refrigeration system.

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 the air conditioning option) of the total supply air flow rate.

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.





Product Description Unit Nameplate

CSA and ETL Label

Model Nomenclature:

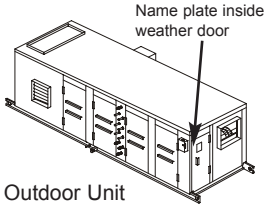
ixx-sss-vvp

- i: D = indoor cabinet; R = outdoor cabinet
- x: A2 = low to medium temperature dehumidifier; A5 = medium to high temperature dehumidifier; B = major air-flow option; K = 100% outdoor air dehumidifier; S = natatorium dehumidifier
- sss: nominal moisture removal capacity in lbs./hr.
- vv: nominal voltage; 20 = 208 - 230VAC; 40 = 460VAC
- p: phase; 1 = single phase; 3 = three phase

Name plate on corner

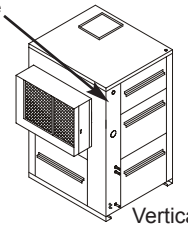
Horizontal Indoor Unit

Name plate inside weather door



Outdoor Unit

Name plate on corner



Vertical Indoor Unit

Dectron

DRY-O-TRON ®

MODEL #:

SERIAL #:

I.D. D

ELECTRICAL RATING			
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.	

OUTDOOR USE / UTILISATION EXTÉRIEURE

MCA A MAX. FUSE/CKT. BKR.* A

R-22 FACTORY CHARGE lbs

AIR VOLUME CFM

BELT SIZE

WIRING DIAGRAM

DOWTHERM SR-1 Ethylene Glycol (or equivalent)
Mixed for -30°F (-34°C)
Space Heating System Charge: US Gallons

REFRIGERANT DESIGN PRESSURES: HIGH/LOW 300/150 PSIG

COMFORMS TO UL STD 1995
CERTIFIED TO STD CAN/CSA-C22.2 NO. 236

50379

Dectron

REF.:

POOL # 1:	ft²	POOL # 3:	ft²
E.W.T.:	°F	E.W.T.:	°F
POOL # 2:	ft²	POOL # 4:	ft²
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

LINE SIZE:

AIR COOLED COND. MODEL #:

HOT GAS: in

LIQUID: in

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

Component specifications.

Outdoor units may be used indoors or outdoors. Indoor units may be used indoors only.

Replace with belt of same type and size when necessary.

Important branch circuit information

Ref number

Units with gas boiler packages use a 50% (by volume) solution of Dowtherm SR-1 heat transfer fluid and de-ionized water. Any substitutions must be compatible with Dowtherm SR-1 and the conditions of use. Refer to the fluid specifications for mixing ratios.

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

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

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.

Moisture Migration

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

Δ 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). Any building surface below this dew point temperature will condense water 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.

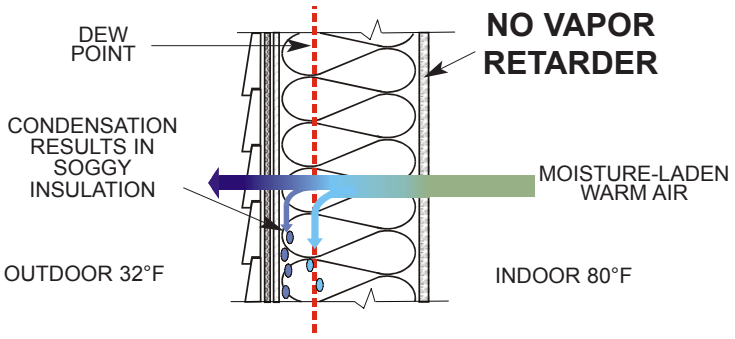
Failure to install the vapor retarder properly will result in condensation forming in the structure with all the consequent damages.

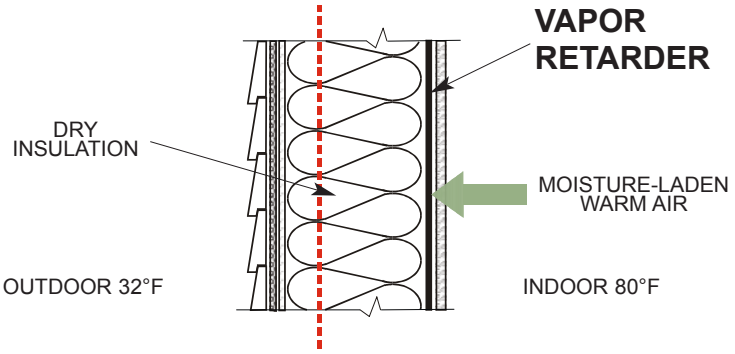
Δ Window Design

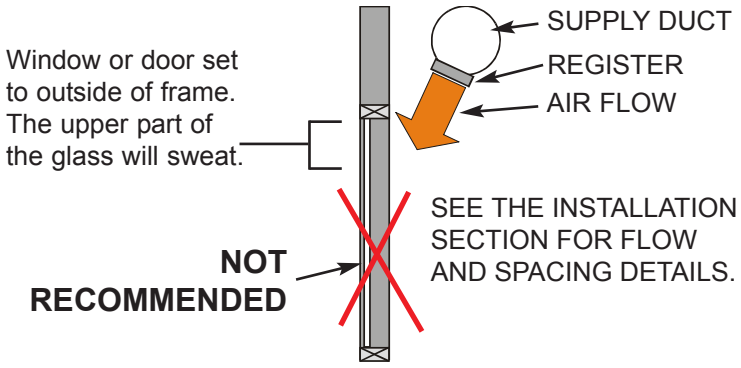
Special attention must be paid to the exterior glass components such as windows and patio doors. Due to their low insulation values, windows are usually the building element with the lowest inside surface temperature. Even a triple pane window can have an inside surface temperature below the room dew point.

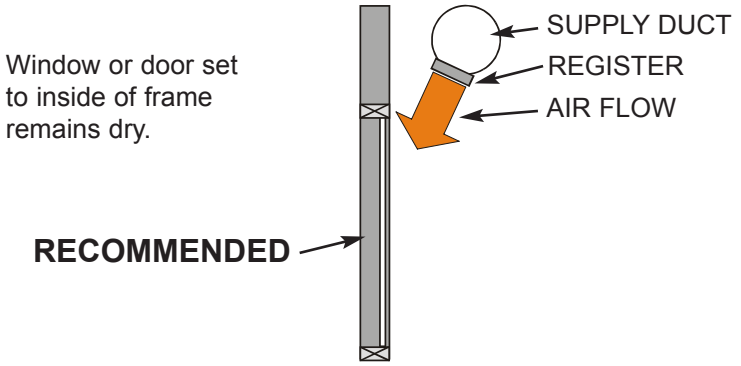
The entire surface area of exterior windows MUST be blanketed with warm supply air from the perimeter air distribution system to raise the window's inside surface temperature above the dew point to prevent condensation. Windows must be designed to allow unobstructed air movement on the inside surface. 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.

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, as a direct air supply is very difficult to achieve.









Natatorium Pool Water Chemistry

Pool water quality is not only a health and comfort problem, it also affects the performance of the 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 not the smell of too much chlorine in the water, but of chloramines. The presence of chloramines indicates that there is insufficient chlorine in the pool. The smell is actually a symptom of underchlorination 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 condensate 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.

Maintaining proper pH levels between 7.2 and 7.6 will help ensure the long life your pool equipment has been designed for.

Pool water test kits must be able to accurately monitor:

- **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.

Although it stands to reason that every pool operator does the utmost to create and maintain the optimum environment for patrons and equipment, mishaps do occur. It has been found that inaccurate pool chemical treatment or even chemical spills have exposed swimmers and equipment to abnormal chemical levels.

Dectron does not wish to comment on the health effects of airborne chemicals. We do know that once the corrosion process has started on metals, it is very difficult to stop or retard this process.

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: provide an adequate amount of make-up air, install and maintain an automatic pool water treatment system and provide quality training for the maintenance personnel. DRY-O-TRON units should be serviced by qualified Dectron-trained technicians.

Pool Water Chemistry Problems

Problem	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 (from National Pool & Spa Institute)

	Pools		Whirlpools	
	Desirable Range	Not to Exceed	Desirable Range	Not to Exceed
pH	7.4 - 7.6	N/A	7.4 - 7.6	N/A
Alkalinity	80 - 100 PPM	N/A	80 - 100 PPM	N/A
Free Chlorine	2.0 - 3.0 PPM	N/A	3.0 - 4.0 PPM	N/A
Combined Chlorine	0 PPM	0.1 PPM	0 PPM	0.1 PPM
Dissolved Solids	100 - 300 PPM	1500 PPM	100 - 300 PPM	1500 PPM
Total Hardness	225 - 250 PPM	N/A	175 - 275 PPM	N/A

Data subject to change without notice.

Unpacking and locating

Installation

Important!

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

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

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

Δ Storage

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

Δ Unpacking

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

Important!

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

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

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

Allow at least three feet (1 meter) of service access space on all four sides of the unit. Spacing requirements are also subject to applicable electrical codes. For units with hooded air intakes allow at least 3 feet (1 meter) of clear space around the hood for smooth intake air flow.

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

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

Δ Lifting

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

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

Δ Mechanical Room

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

Δ Chemical Storage

A separate, ventilated space at negative pressure MUST be provided for pool chemicals. **Do not store chemicals in the mechanical room, or in any space that is ventilated into the natatorium! Check your local codes.**

Δ Completing

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

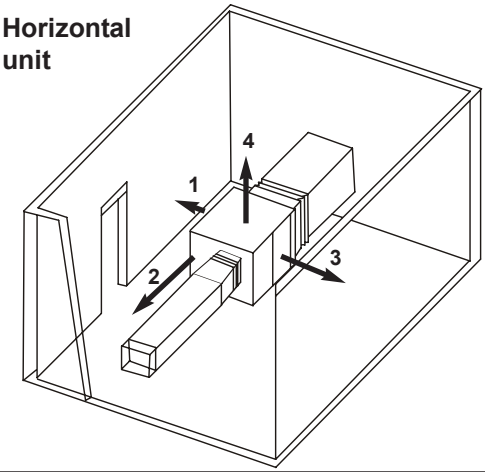
INSTALLATION

Minimum Service Access[a] ft (m)

	1	2	3	4
DS042 - DS062	3 (1)	3[b] (1)	3 (1)	3 (1)
DS080 - DS562	5 (1.5)	3[b] (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 exhibit 110-7, whichever is greater.

Horizontal unit

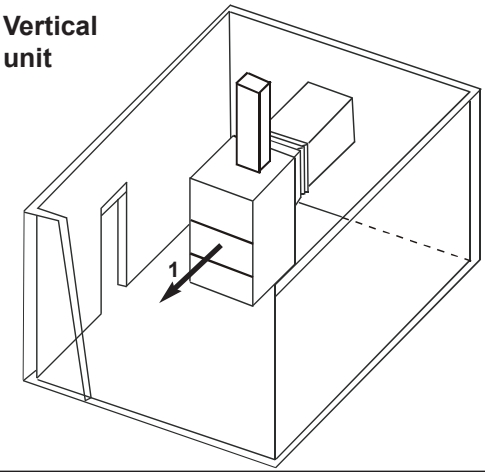


Minimum Service Access[a] ft (m)

	1
DSV042-DSV100	3[b] (1)

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

Vertical unit



Data subject to change without notice.

Installation Isolators and Drain

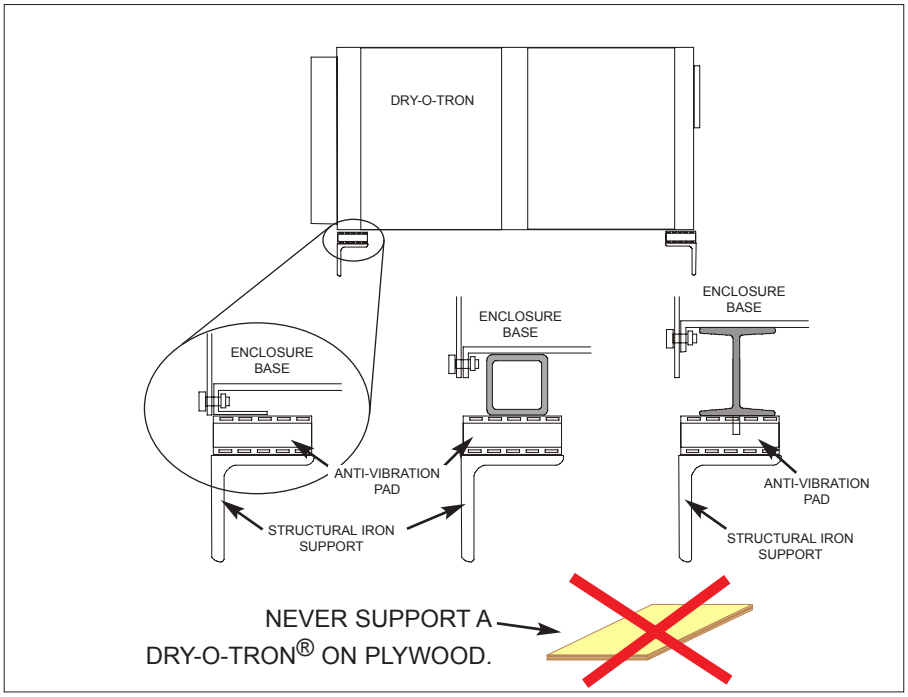
Sound and Vibration Elimination

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

IMPORTANT!

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

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



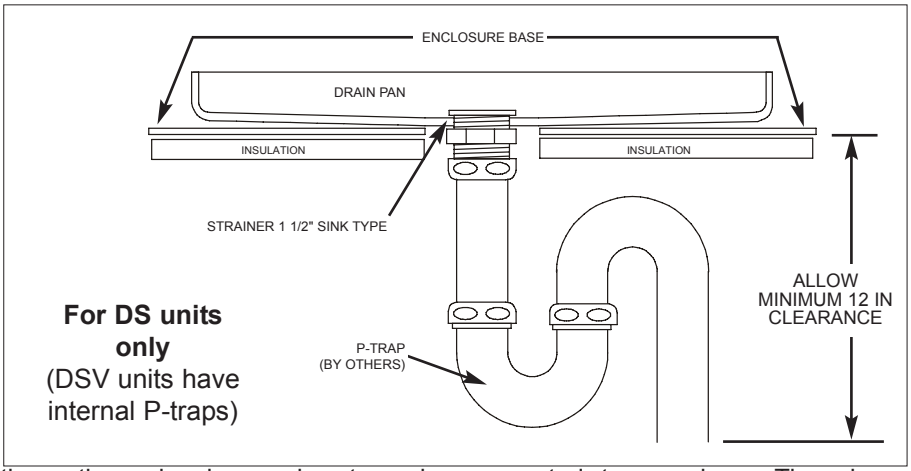
Condensate Drain Connection

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

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

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

Dectron recommends that the condensate be returned to the swimming pool as long as local laws permit. Independent tests have shown that condensate from a DRY-O-TRON® unit is perfectly 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!



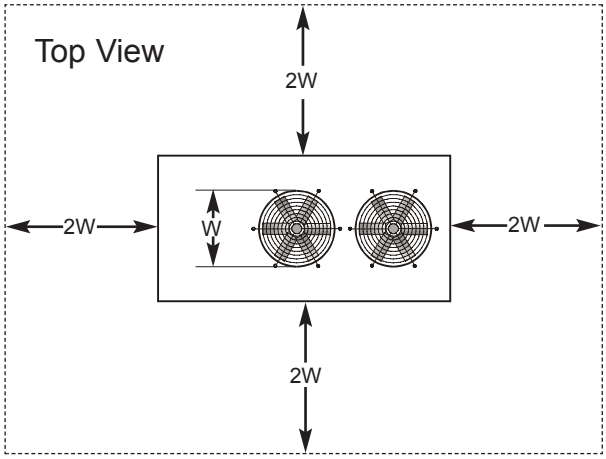
The ideal location to return the condensate to the pool water system is gravity drainage to the nearest skimmer or surge tank (if so equipped). If the DRY-O-TRON® is located below the pool water surface a condensate pump is required (available from Dectron with rated maximum pump head of 9 feet and shut-off 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.

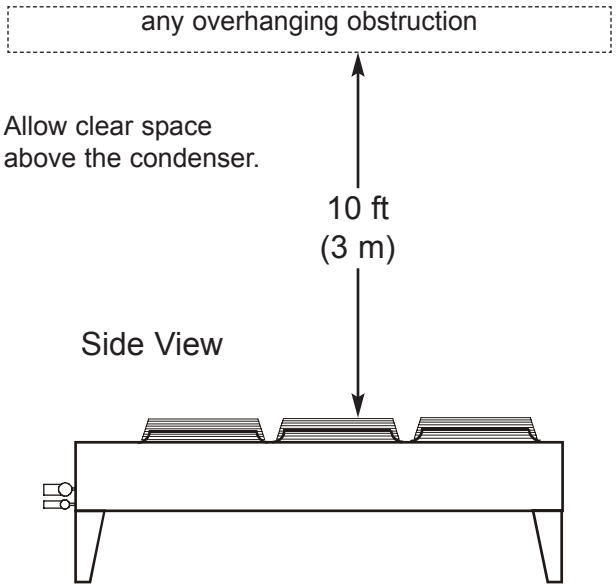
If a condensate pump is used it must have sufficient pump head to overcome vertical lift and water pressure if pumped into a pressurized pipeline. When connecting to a pressurized pipeline a check valve and normally closed solenoid valve should be utilized in the condensate pump discharge line, with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

Locate Remote Condenser Installation

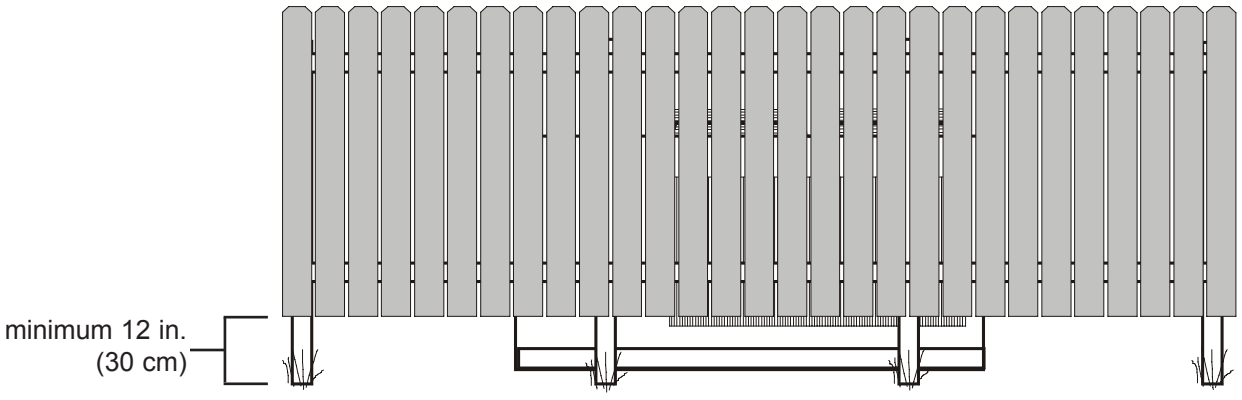
For units with air cooled air conditioning, select a suitable location for the remote condenser, where it will not be subject to damage. Allow at least twice the width of the condenser fan of clear space around the condenser for smooth intake air flow and service accessibility. Spacing requirements are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

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





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



INSTALLATION

Installation Wiring Power

INSTALLATION

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

Important!

For models beginning in "DB" or "RB", install a conduit seal(s) in the conduit(s) connected to the DRY-O-TRON®.

Important!

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

Important!

Ground the unit using the grounding lug provided. Ground to the same grounding system used for other electrical devices associated with the circulation of pool water.

Important!

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

Important!

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

Important!

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

Δ Use properly sized wire

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

Δ Insure phase rotation

All the motors in the unit are connected for the same phase rotation.
Be sure the phase rotation is correct before completing the installation.

NOTE: The blower running direction can be used to test phase rotation.

Δ Insure phase voltage

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

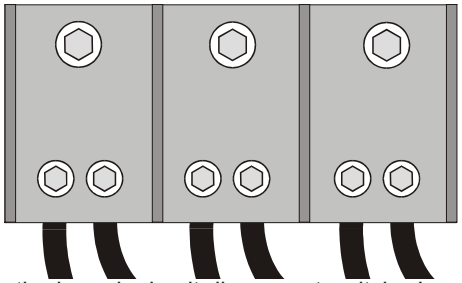
Δ 208V units

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

Δ Service power

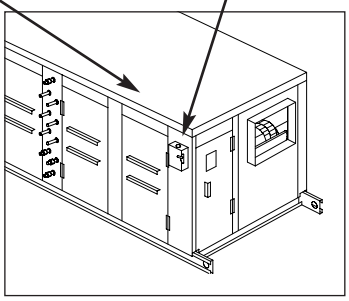
The DRY-O-TRON® may be provided with service lights which require a separate 115VAC 15A 60Hz branch circuit. Wire this branch circuit to the service branch circuit input lugs. Use only copper wire.

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



For models beginning in "DB" or "RB", install a conduit seal(s) in the conduit(s) connected to the DRY-O-TRON®.

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



Turn on the branch circuit disconnect switch. In some cases the blower may start. Some DRY-O-TRON® units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase rotation. 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 rotation is correct.

Δ Locate remote display

If the installation includes a remote display locate the display where it is convenient to use, but not in a location which could expose the display to damage.

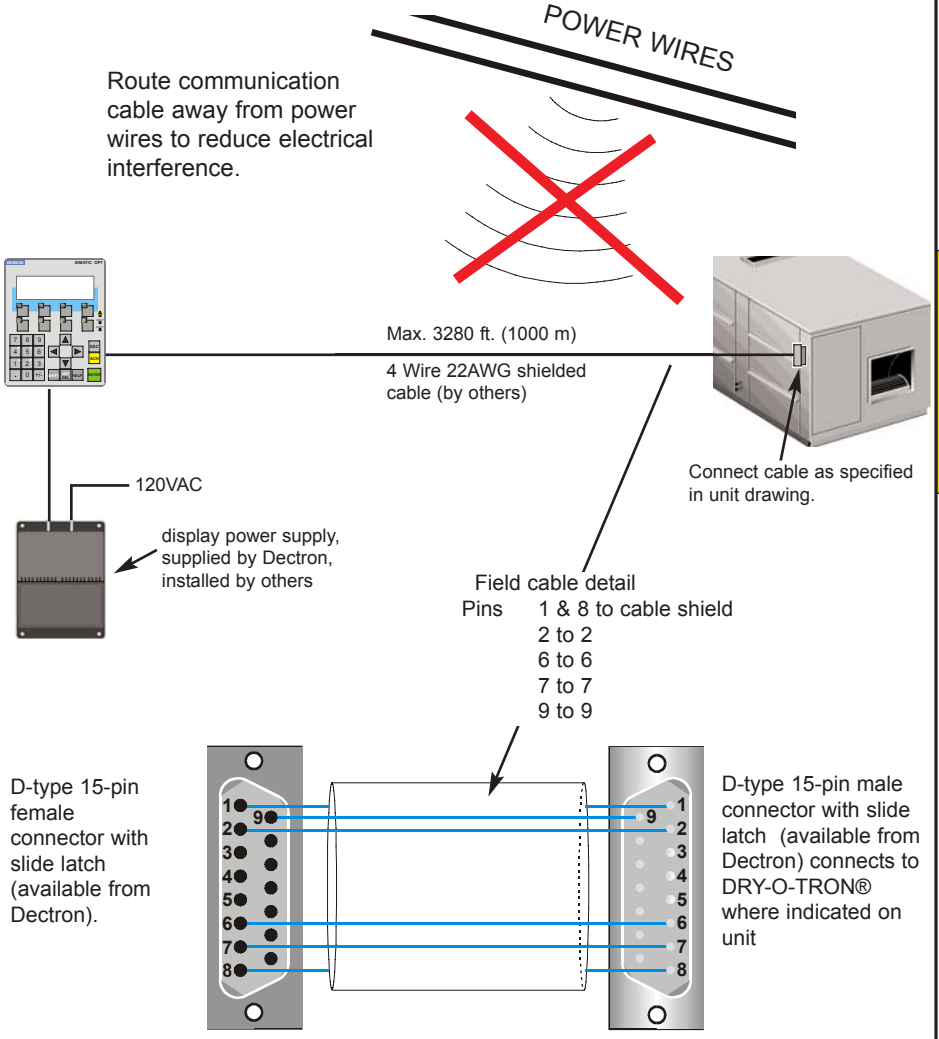
The display cable length is limited to 3280 feet (1000 meters).

Important!

To avoid electrical noise problems, control wiring should not be run near to or parallel to power wiring.

Δ Electrical noise

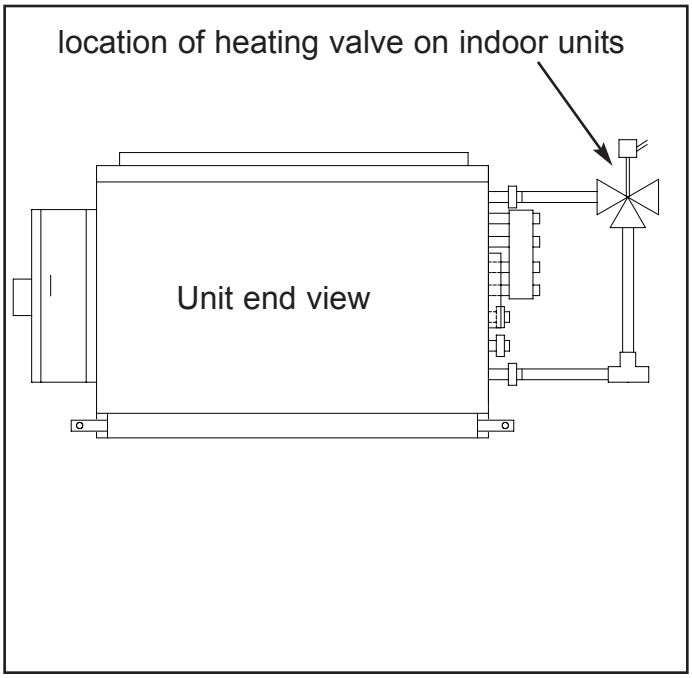
For units with remote display panels, communications between the DRY-O-TRON® and the remote display can be interrupted by external electrical noise. Such noise can be produced by variable speed motor drives, light dimmers, electric discharge lighting, and other non-linear electrical loads.



INSTALLATION

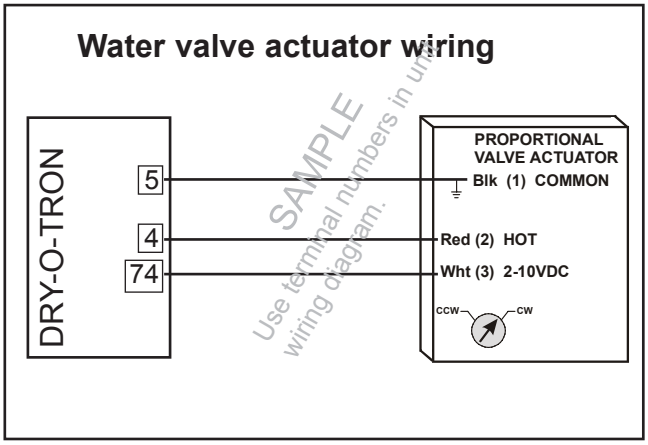
HOT WATER OR STEAM HEAT UNITS ONLY

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



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

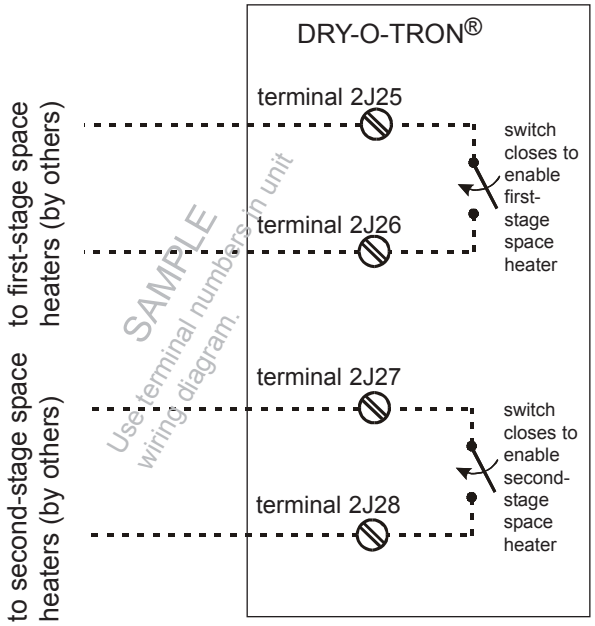
Actuator wiring must follow the wiring diagram for your unit. Take care to prevent the application of other voltages to these wires.



EXTERNAL SPACE HEATERS (by others)

Some installations may use space heaters provided by others. In this case the space heater controls must be wired to the DRY-O-TRON® controls (see unit field 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 space heater. When the dry contacts are open, the space heater should be disabled.

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.



Similar circuits are used for any other space heaters. See the unit field wiring diagram in the unit information package.

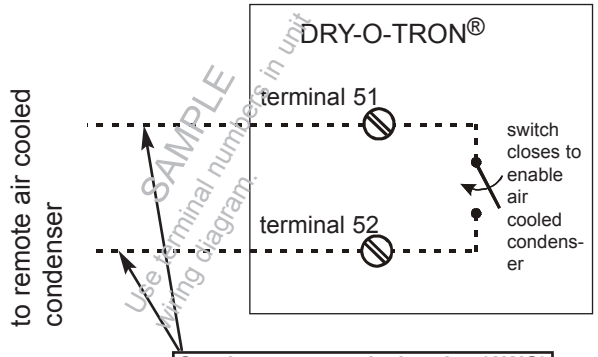
REMOTE CONDENSER (DRY-O-TRON® units with air cooled air conditioning option only)

Some DRY-O-TRON® units may be provided with air cooled air conditioning. In this case the remote air cooled condenser controls must be wired to the DRY-O-TRON® controls (see unit wiring diagram). The remote condenser has its own power supply so there is a dry contact switch closure to enable the remote condenser.

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.

In some cases temperature switches inside the remote condenser may have to be adjusted. See section Setup - Adjustments.



Condenser control wire size (AWG)

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

INSTALLATION

OPTIONAL REMOTE OUTDOOR AIR TEMPERATURE SENSOR

Some installations may have the (optional) remote outdoor air temperature sensor. For these installations, the sensor may ship uninstalled, and thus have to be installed in the field.

Select a location for the sensor that will be out of direct sunlight or other abnormal temperature conditions.

Wire the sensor as shown on the unit field wiring diagram in the unit information package. Route the wire to avoid sources of electrical noise.

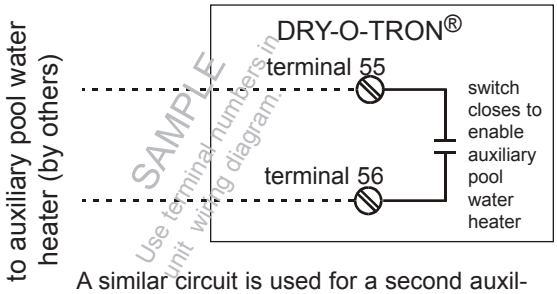
If an outdoor temperature sensor is used, the controller must be told that it is connected, see section Startup - Outdoor Temperature Sensor.

OPTIONAL AUXILIARY POOL WATER HEATER

Some DRY-O-TRON® units may come equipped with an 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 (by others). For changes to the use of an auxiliary pool water heater (by others) consult Dectron or a Dectron certified technician.

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.

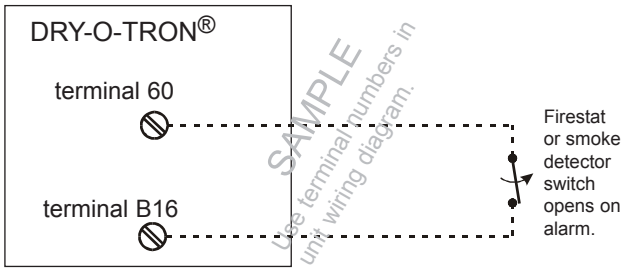


A similar circuit is used for a second auxiliary pool water heater. See the unit field wiring diagram in the unit information package.

FIRESTAT CONNECTION

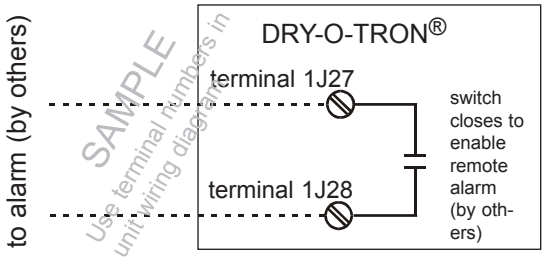
For units requiring a firestat interlock, remove the jumper between terminals 60 and B16, or as shown on the unit wiring diagram. In the jumper's place substitute an isolated normally closed switch closure from the fire alarm (by others).

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.



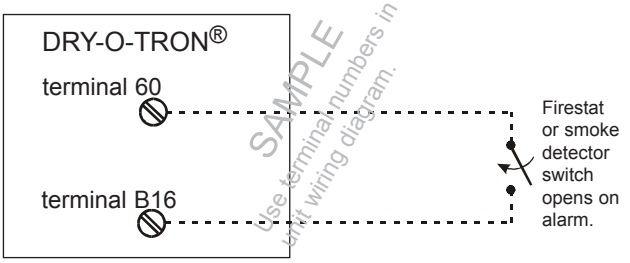
GENERAL ALARM

All 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 attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.

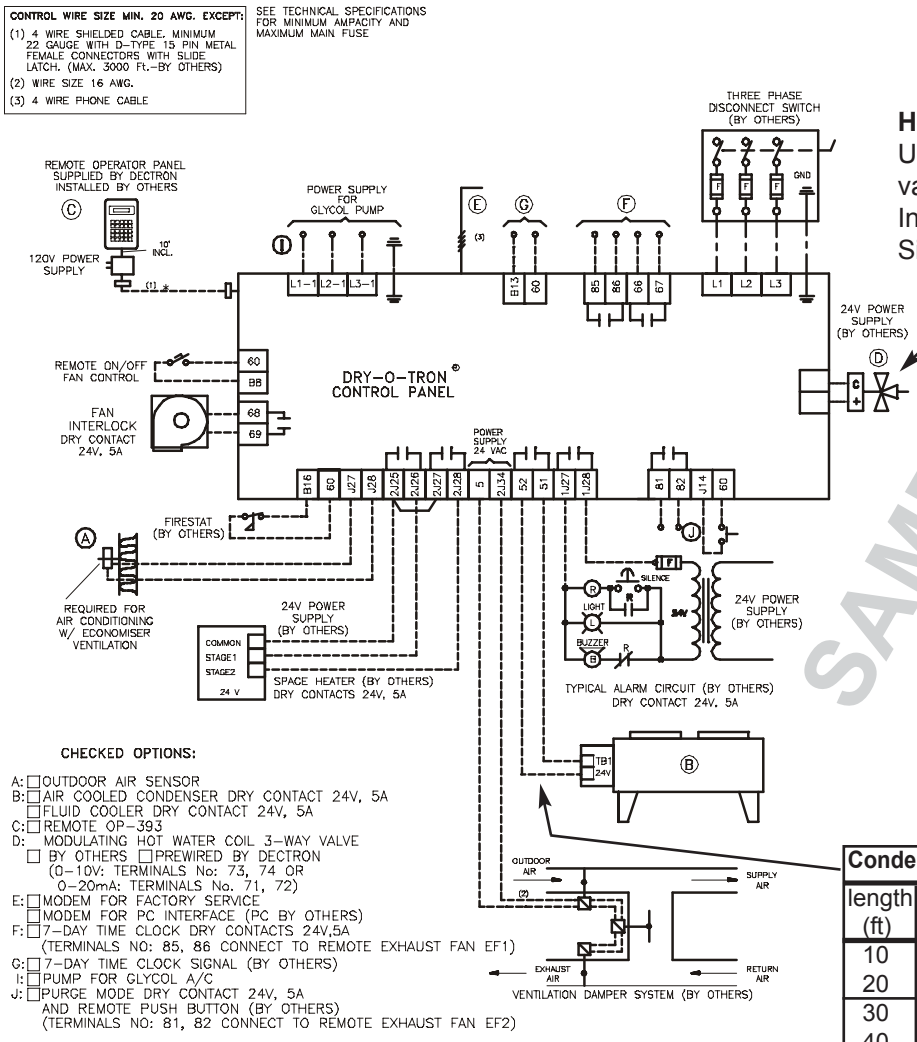


PURGE INITIATION SWITCH

Some DRY-O-TRON® units may be provided with the optional Purge mode (see section Product Description). In this case the installer must connect a normally open momentary push button switch at a convenient location. Purge mode begins when the switch is pressed.



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



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

CHECKED OPTIONS:

A: ☐ OUTDOOR AIR SENSOR
B: ☐ AIR COOLED CONDENSER DRY CONTACT 24V, 5A
☐ FLUID COOLER DRY CONTACT 24V, 5A
C: ☐ REMOTE OP-393
D: MODULATING HOT WATER COIL 3-WAY VALVE
☐ BY OTHERS ☐ PREWIRED BY DECTRON
(0-10V: TERMINALS No: 73, 74 OR
0-20mA: TERMINALS No. 71, 72)
E: ☐ MODEM FOR FACTORY SERVICE
☐ MODEM FOR PC INTERFACE (PC BY OTHERS)
F: ☐ 7-DAY TIME CLOCK DRY CONTACTS 24V,5A
(TERMINALS NO: 85, 86 CONNECT TO REMOTE EXHAUST FAN EF1)
G: ☐ 7-DAY TIME CLOCK SIGNAL (BY OTHERS)
I: ☐ PUMP FOR GLYCOL A/C
J: ☐ PURGE MODE DRY CONTACT 24V, 5A
AND REMOTE PUSH BUTTON (BY OTHERS)
(TERMINALS NO: 81, 82 CONNECT TO REMOTE EXHAUST FAN EF2)

Condenser control wire size (AWG)

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

Installation Unit - Duct Connections

Important!

Poor duct design can reduce the amount of air delivered.

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

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

Select grilles, registers, and diffusers for low static pressure loss, required throw, and specified air flow. Choose hardware resistant to deterioration due to chemicals in the pool enclosure.

Δ Duct material

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

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

Where located in areas below room temperature, ductwork must be insulated on the outside with 2 inch fiberglass wrap with FSK facing. All ducts must be designed to be dry. All seams must be sealed.

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.

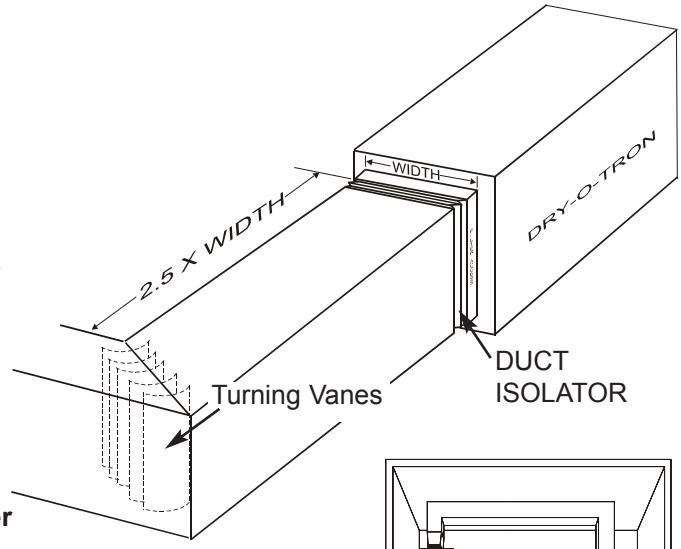
Return Duct

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

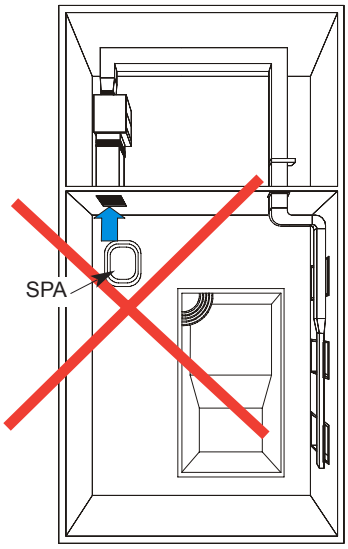
It is very important to allow straight length in the return duct as shown. There should be no elbows, transitions, offsets, or other flow interruptions closer than 2.5 X WIDTH of the return duct opening.

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

The straight length is not required for units with top or bottom return air connections.



Never install a DRY-O-TRON® natatorium dehumidifier in a return-air plenum room. Corrosive chemicals in the air will shorten the life of the electrical components.



Never install the return duct grille near 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.

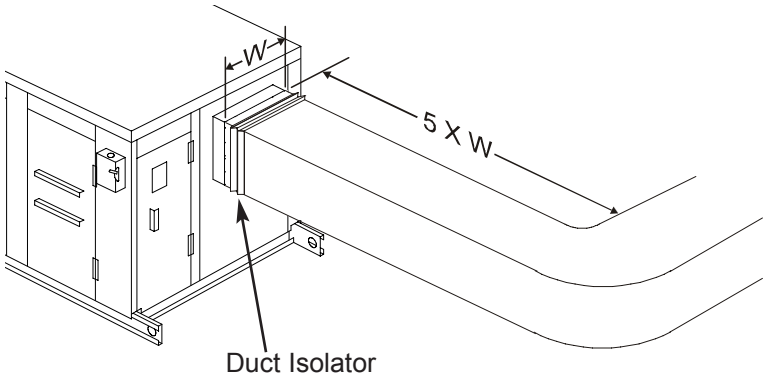
A better solution is to exhaust the air over the spa or hot tub.

Supply Duct

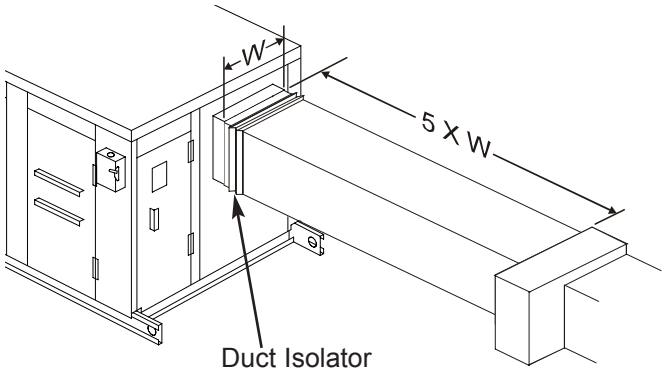
Refer to AMCA[1] guidelines for system effect considerations.

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

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

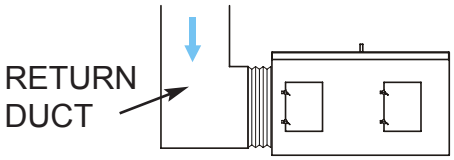


Some units may have external duct heaters (by others). To prevent heater failures and hot spots, locate the heater at least 5 X the duct width away from the blower, or any air flow interruptions such as elbows and transitions.



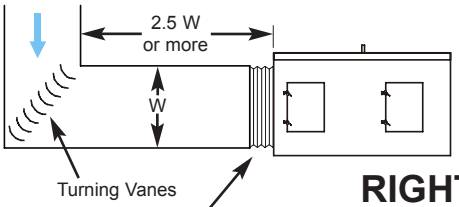
1. Air Movement and Control Association International, Inc.
   30 West University Drive
   Arlington Heights, Illinois 60004-1893

Installation Standard Practice for Ducts



WRONG

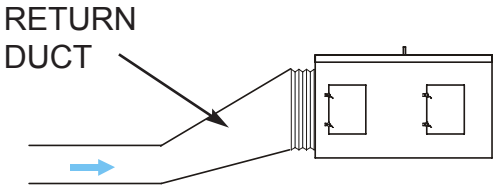
The air will not be evenly distributed over the evaporator.



Always install vibration isolator.

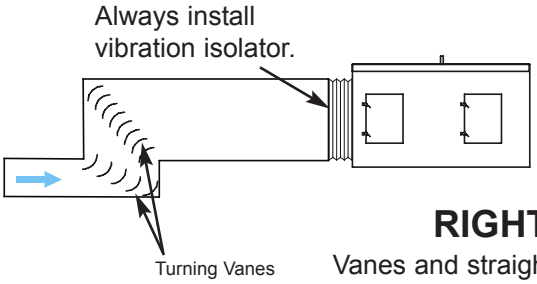
RIGHT

Vanes and straight length allow air to flow evenly.



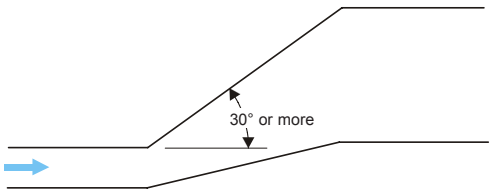
WRONG

The air will not be evenly distributed over the evaporator.



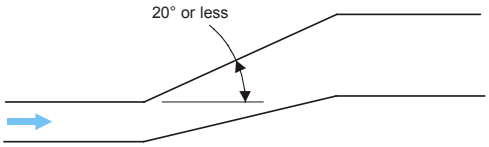
RIGHT

Vanes and straight length allow air to flow evenly.



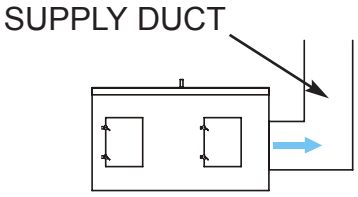
WRONG

Air cannot follow this steep angle.



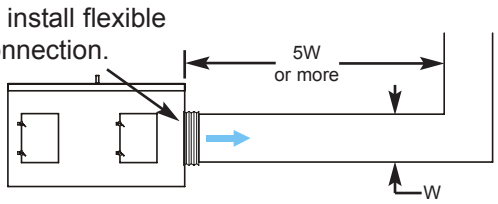
RIGHT

Air can follow this transition.



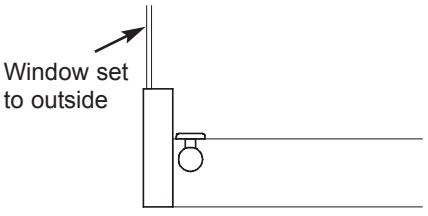
WRONG

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



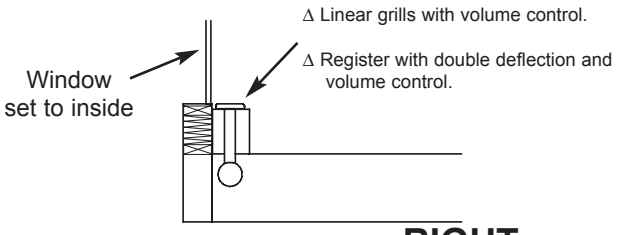
RIGHT

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



WRONG

Air cannot reach the lower part of the window.

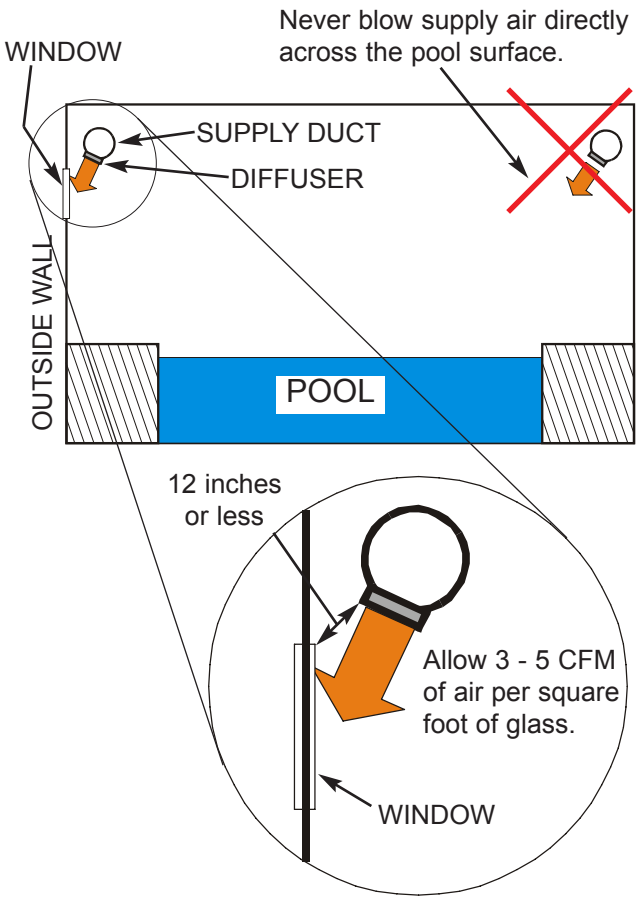


RIGHT

Dry air reaches all the window.

Air Distribution

Do not blow supply air directly across the pool surface or wet deck.



Δ Reduce evaporation

The air velocity directly above and close to the pool water surface should be in the 10 to 30 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, especially for swimmers just leaving the pool water.

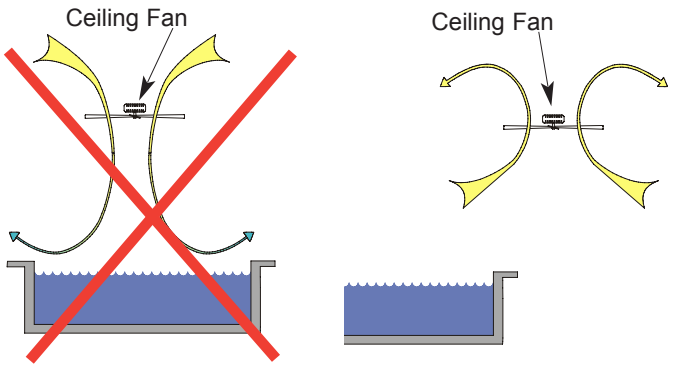
Δ Prevent Condensation

The quantity of supply air and the air velocity from the air distribution system must be sufficient to blanket the areas with 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 natatorium dew point temperature. (See table below.) Supply air must be blown directly onto the entire surface of the glass using linear diffusers in order to prevent condensation.

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.

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

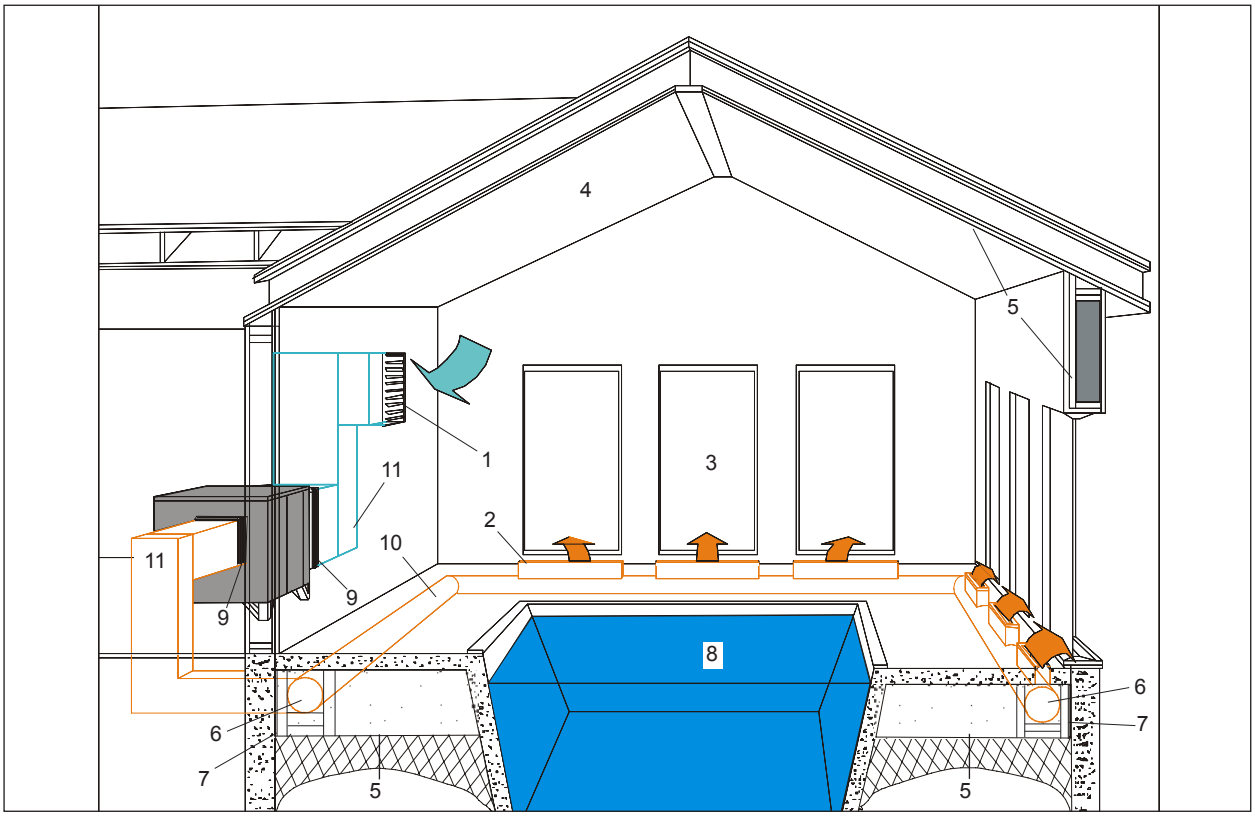


Recommended Minimum Temperatures for Interior Surfaces

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

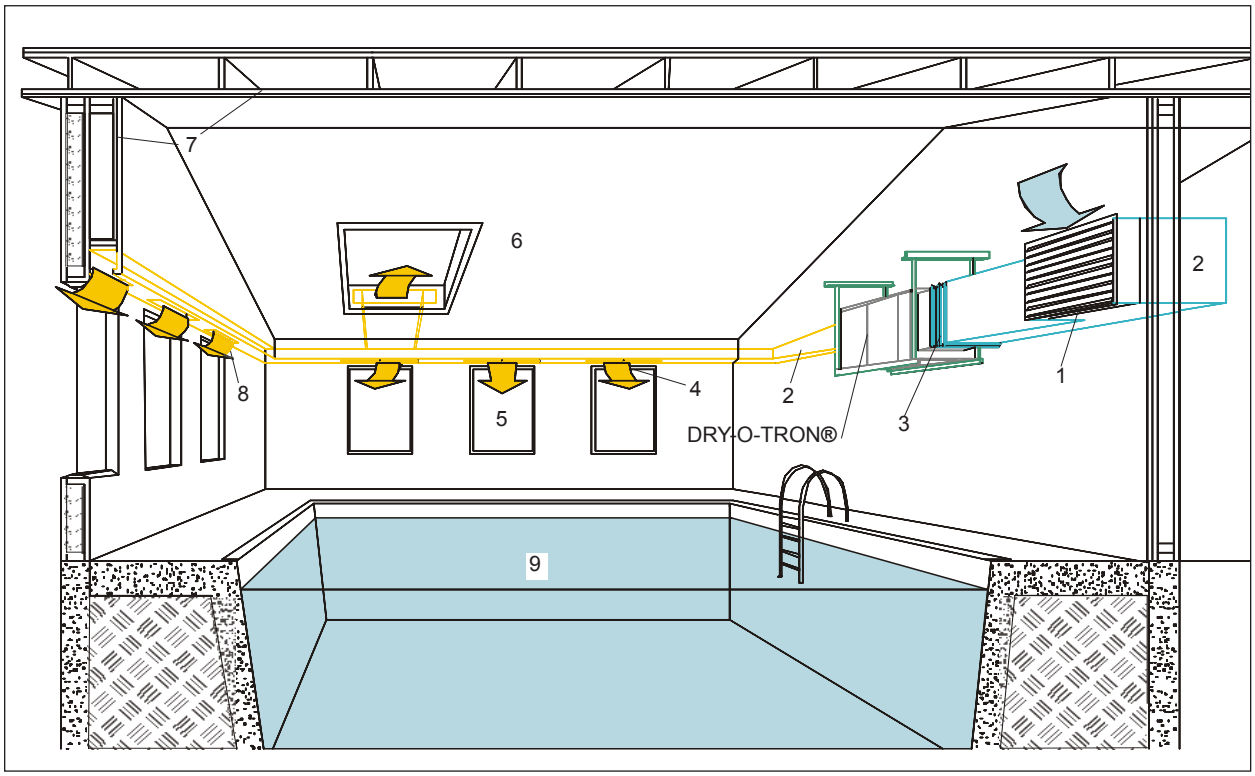
INSTALLATION

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 10 to 15 ft above floor 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 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. 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.
5. A vapor barrier in all walls and ceilings is necessary. Dehumidification will not prevent the condensation of liquid water inside cold walls.
6. Where duct is installed below the floor, use PVC coated round metal duct.
7. Duct installed beneath the floor should be insulated with styrofoam insulation.
8. Do not direct air over the pool water surface.
9. Always install flexible duct connections.
10. Under-floor perimeter air distribution for low windows
11. Install 90° elbow and use acoustic insulation up to elbow only to eliminate air movement noise (see also Duct Design guidelines)

Overhead Supply Duct Air Distribution Installation



1. Locate the return air inlet 10 to 15 ft above floor for proper air circulation and to prevent blocking of the grille.
2. Where an elbow is required, use acoustic insulation up to the elbow to eliminate air movement noise. (See also Duct Design guidelines.)
3. Always install flexible duct connections.
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.

Installation Air Distribution Ventilation

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 must conform with ASHRAE Standards 62-1989 or its latest revision.

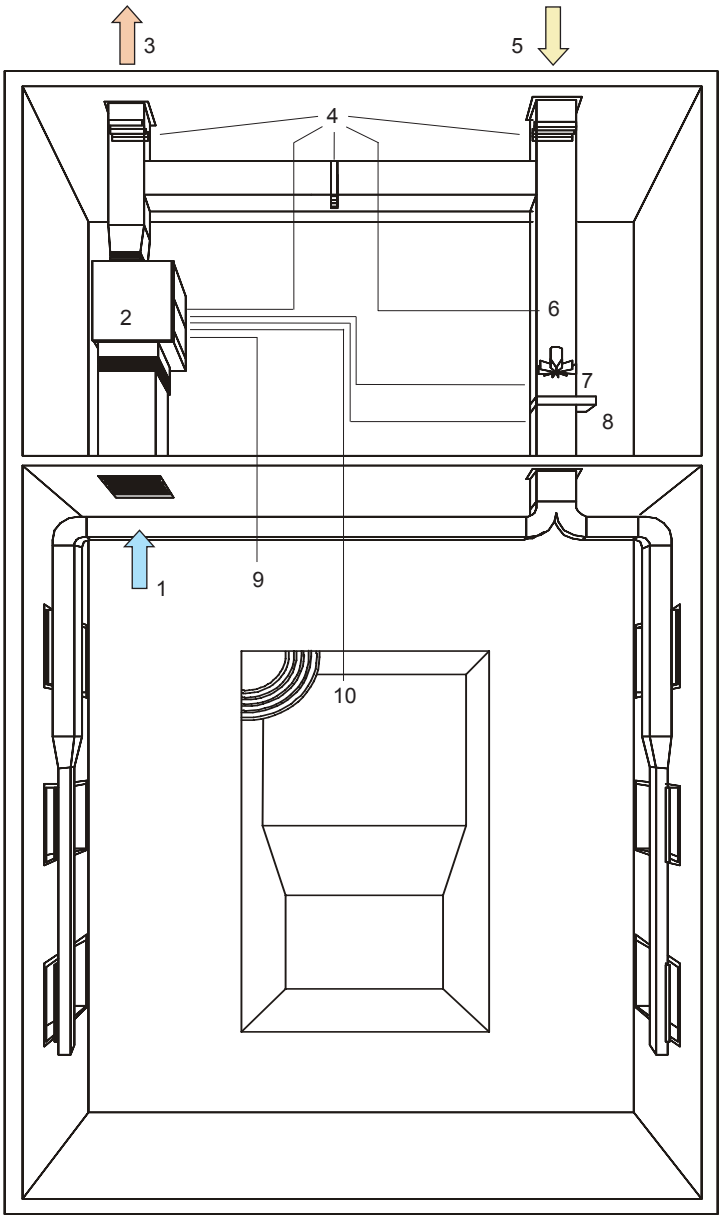
DRY-O-TRON® units are available in a number of configurations which will easily accept the introduction of controlled quantities of outdoor air. DRY-O-TRON® models DS 40 and larger are equipped with a standard make-up air intake which will allow up to 15% (30% with air conditioning option) outdoor air. DRY-O-TRON® DB and RB units (with economizer section) come with a built-in mixing box for the introduction of up to 100% make-up air during cooling mode.

Standard DS units can also be used with external mixing boxes and damper arrangements. The DRY-O-TRON® system comes complete with control contacts and models DS80 and larger include a 24VAC/120VA power supply for ventilation (optional on smaller models) to operate the damper motors.

During outdoor air ventilation the moisture load in the pool enclosure will vary according to the outdoor air conditions.

IMPORTANT!

All outdoor air inlets must have a separate air filter.

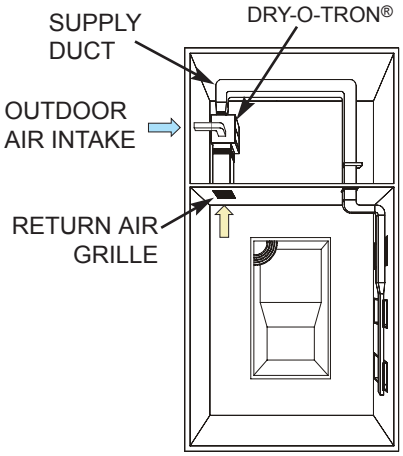


1. Return air
2. DRY-O-TRON® as return air blower
3. Exhaust air
4. Modulating damper control, DS-080 and larger Power supply for ventilation
5. Make-up air (provide air filters)
6. Modulating thermostat (by others)
7. Supply blower (by others)
8. Auxiliary space heater (by others) controlled by DRY-O-TRON®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

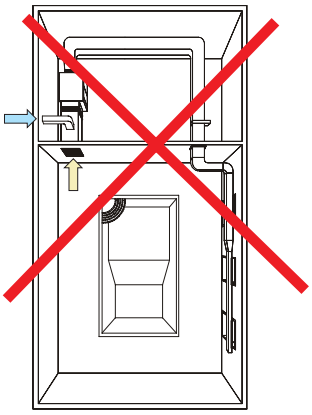
Ventilation Air Distribution Installation

Some DRY-O-TRON® units may be factory equipped for the direct intake of makeup air. The makeup air flow rate with this method is limited to no more than 15% (30% with air conditioning option) of the total air flow rate.

Be sure to connect the makeup air to the identified port only. **Never connect an outdoor air intake to the return duct.**

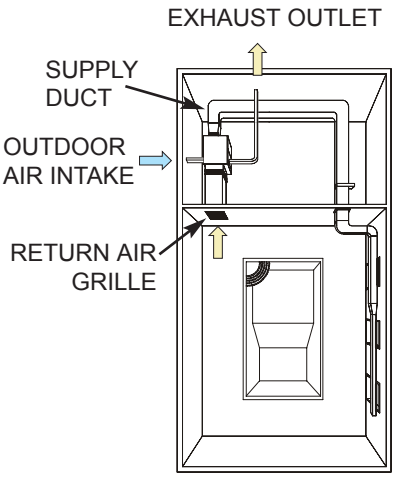


NEVER BRING OUTDOOR AIR INTO THE RETURN DUCT.



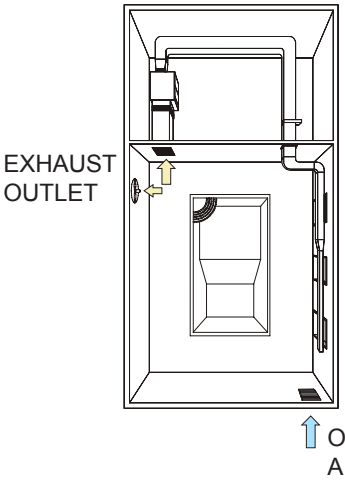
When makeup air is brought into a natatorium, it is also necessary to exhaust 110% of the amount being brought in. This maintains a slight negative pressure on the natatorium and reduces moisture and odor movement into the rest of the building.

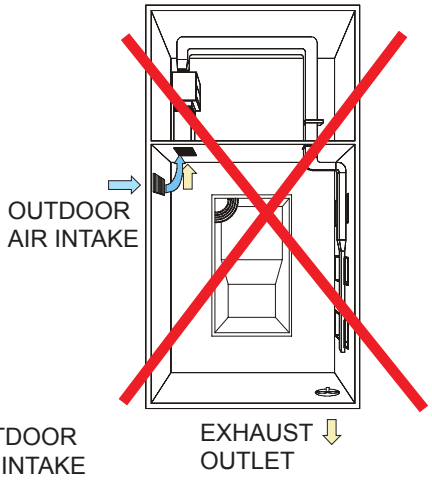
Some DRY-O-TRON® units may be equipped with both makeup air intake and exhaust air outlets. In this case connect the outdoor air and exhaust air ducts to the identified ports only. **Never connect an outdoor air intake to the return duct.** Locate the exhaust far from the intake.



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

Arrange makeup air to enter the room far away from the DRY-O-TRON® return duct grille. **Never allow outdoor air to enter the return grille.**





Important!

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

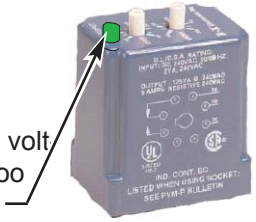
Important!

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

Adjust airflow

Before the DRY-O-TRON® is operated, the supply duct air flow must be measured and set by a qualified air balancing technician. Air flow must be measured with all air side access doors closed.

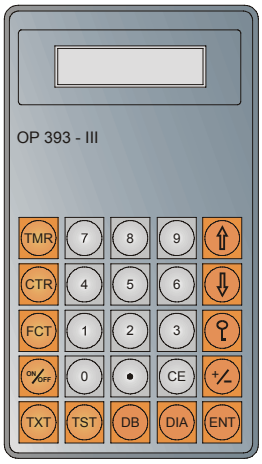
Air flow is adjusted by changing the variable sheave on the blower motor shaft. Do not use other sheaves or change the airflow outside the range given on the unit nameplate, without the express approval of Dectron.



To run the blower only,

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

2. In the DRY-O-TRON electrical enclosure, press START on the blower motor overload (if any).



3. On the controller display, press (DB) then (1) then (ENT) then (1) then (ENT) .

The blower will start after a short delay.

If the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the DRY-O-TRON® input lugs. **Do <u>not</u> move any factory installed wires.** Torque the connectors as discussed earlier.

When the air flow has been properly adjusted, the blower can be stopped by

1. On the controller display, press (DB) then (1) then (ENT) then (0) then (ENT) .

If possible and safe, leave the electrical power connected to the DRY-O-TRON 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 10 hours before the compressors are started.

INSTALLATION

Important!

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

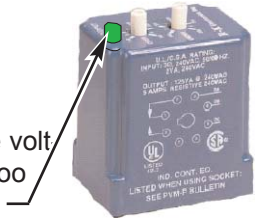
Important!

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

Adjust airflow

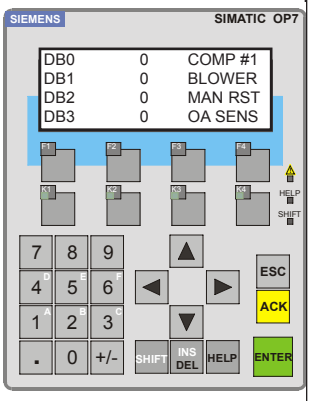
Before the DRY-O-TRON® is operated, the supply duct air flow must be measured and set by a qualified air balancing technician. Air flow must be measured with all air side access doors closed.

Air flow is adjusted by changing the variable sheave on the blower motor shaft. Do not use other sheaves or change the airflow outside the range given on the unit nameplate, without the express approval of Dectron.



To run the blower only,

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



2. In the DRY-O-TRON electrical enclosure, press START on the blower motor overload (if any).

3. On the controller display, press F4 then press ▲ or ▼ as necessary to move the cursor to the DB1 value.

4. Press 1 then ENTER.

The blower will start after a short delay.

If the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the DRY-O-TRON® input lugs. **Do <u>not</u> move any factory installed wires.** Torque the connectors as discussed earlier.

When the air flow has been properly adjusted, the blower can be stopped by

1. Press F4 then press ▲ or ▼ as necessary to move the cursor to the DB1 value.
2. Press 0 then ENTER.

If possible and safe, leave the electrical power connected to the DRY-O-TRON 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 10 hours before the compressors are started.

INSTALLATION

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY

ASSEMBLING AND BRAZING CONDENSER TUBES

IMPORTANT:

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

IMPORTANT:

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

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

IMPORTANT:

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

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

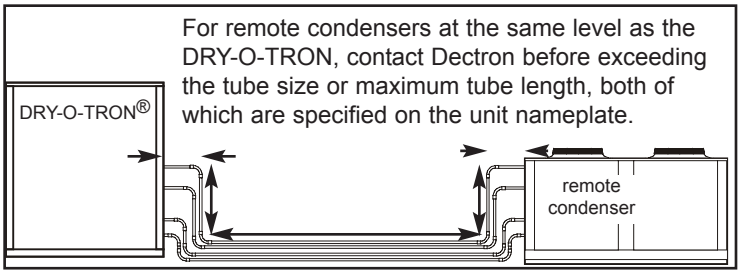
Note: Some DRY-O-TRON® units may have two pairs of tubes to the remote condenser.

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

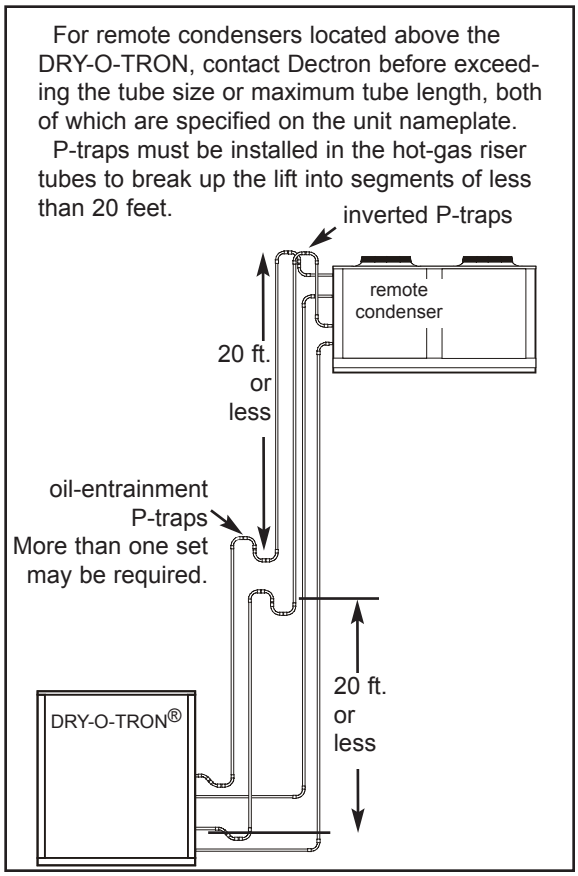
During silver soldering the inside of the tube must be protected from oxidation by flooding the tube with an inert gas such as nitrogen, argon, or carbon dioxide. Silver soldering copper tubes with air inside will produce a flaky copper oxide scale that can contaminate the refrigeration system and damage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

IMPORTANT:

Check carefully for leaks.



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



Refrigerant Piping Installation

UNITS WITH AIR-COOLED AIR CONDITIONING ONLY

EVACUATION, REFRIGERANT AND OIL CHARGING

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

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

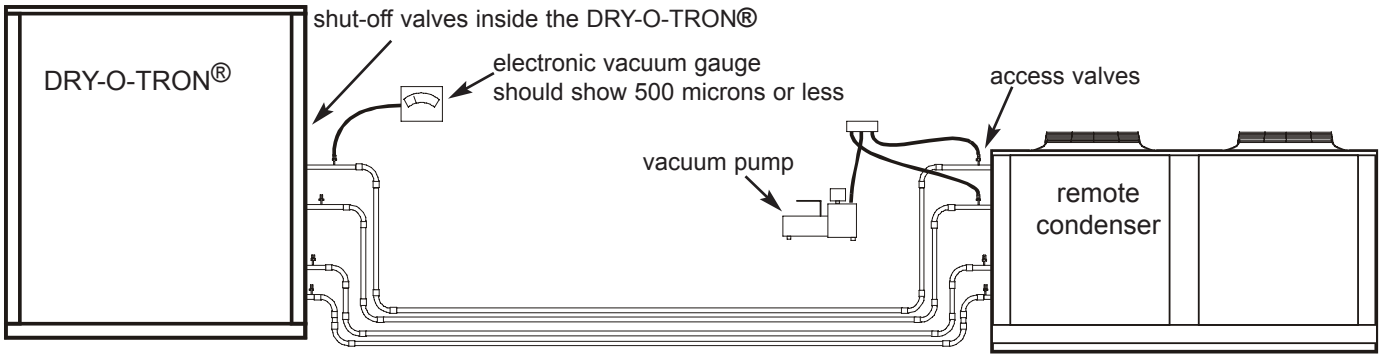
IMPORTANT:
The remote condenser and the tubes connecting it to the DRY-O-TRON® must be evacuated to a pressure below 500 microns of mercury as measured by an electronic vacuum gauge. Compound gauges as found on refrigeration manifolds are inadequate.

To insure a correct reading, install the electronic vacuum gauge far away from the vacuum pump.

After proper evacuation, pump in the weight and type of refrigerant (by others) specified on the unit nameplate (see Product Description - Unit Nameplate) through the remote condenser access valves.

Pump in the amount of oil (by others) shown below.

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



INSTALLATION

Add this much oil to each refrigeration circuit. Use oil type specified on compressor.

Model	50 feet maximum condenser tube length, per unit nameplate			75 feet maximum condenser tube length, per unit nameplate			100 feet maximum condenser tube length, per unit nameplate		
	ounce	pint	liter	oz.	pt.	l.	oz.	pt.	l.
042 Circuits 1 & 2	12	0.8	0.4	17	1.0	0.5	21	1.3	0.6
062 Circuits 1 & 2	13	0.8	0.4	18	1.1	0.5	31	2.0	0.9
082 Circuits 1 & 2	27	1.7	0.8	33	2.1	1.0	39	2.4	1.2
100 Circuits 1 & 2	50	3.1	1.5	65	4.1	1.9	95	5.9	2.8
102 Circuits 1 & 2	22	1.3	0.6	30	1.9	0.9	38	2.4	1.1
120 Circuits 1 & 2	59	3.7	1.7	75	4.7	2.2	104	6.5	3.1
122 Circuits 1 & 2	23	1.5	0.7	32	2.0	0.9	51	3.2	1.5
150 Circuits 1 & 2	69	4.3	2.1	88	5.5	2.6	142	8.9	4.2
152 Circuits 1 & 2	30	1.9	0.9	43	2.7	1.3	56	3.5	1.7
162 Circuits 1 & 2	40	2.5	1.2	53	3.3	1.6	66	4.1	1.9
182 Circuits 1 & 2	49	3.1	1.5	65	4.1	1.9	94	5.9	2.8
202 Circuits 1 & 2	59	3.7	1.7	78	4.9	2.3	97	6.0	2.9
242 Circuit 1	89	5.6	2.6	112	7.0	3.3	176	11.0	5.2
Circuit 2	55	3.5	1.6	70	4.4	2.1	113	7.1	3.4
282 Circuits 1 & 2	72	45	2.1	91	5.7	2.7	144	9.0	4.3
362 Circuits 1 & 2	94	5.9	2.8	124	7.8	3.7	155	9.7	4.6
482 Circuits 1 & 2	130	8.1	3.8	168	10.5	5.0	206	12.9	6.1
562 Circuits 1 & 2	133	8.3	3.9	171	10.7	5.1	209	13.1	6.2

Data subject to change without notice.

Installation Piping Condenser Water

UNITS WITH WATER OR FLUID COOLED AIR CONDITIONING ONLY

IMPORTANT:

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

IMPORTANT:

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

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

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

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

IMPORTANT:

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

IMPORTANT:

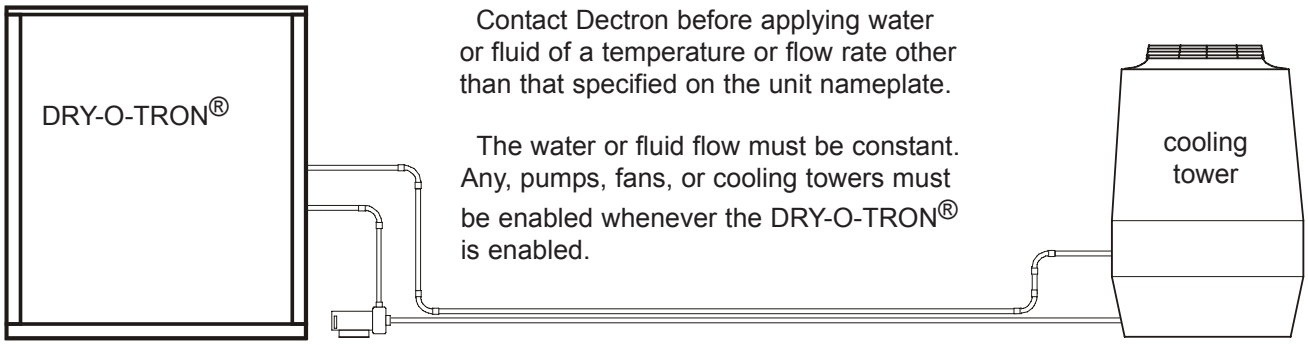
Cooling water must be protected from freezing if the water flow could be interrupted during low ambient temperatures.

IMPORTANT:

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

Water or Fluid Pressure Switch

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



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

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

Port locations may vary.
See the unit port labels.

Pool Water Piping Installation

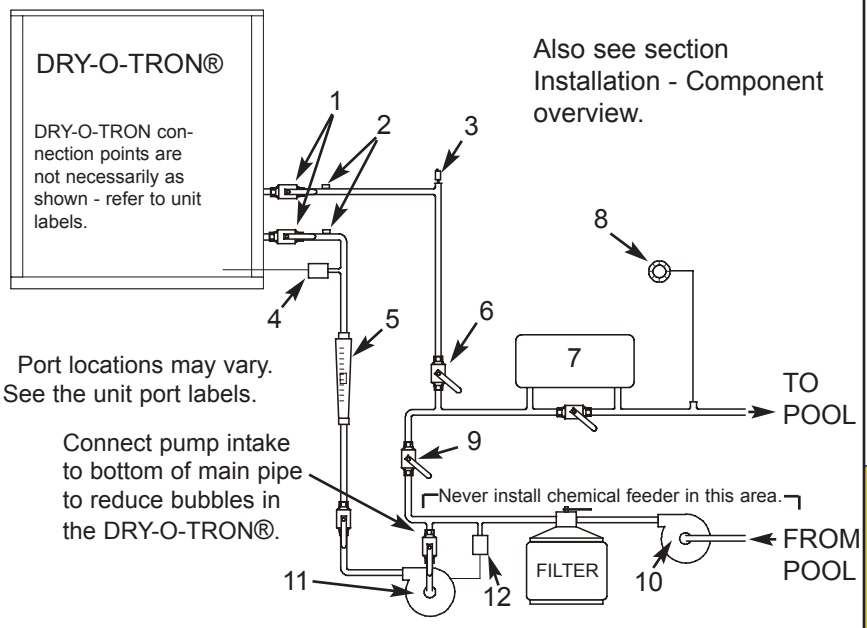
IMPORTANT!

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®. DO NOT use smaller pipe sizes! If the pipe connections between the DRY-O-TRON® and the main by-pass valve are longer than 10 feet, then increase the pipe size.

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.

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.



All models have 6 PSI water pressure drop.
For flow rates see **Startup - Pre-startup Adjustments**.

1. **Pool water isolation valves**
2. **Pressure / temperature ports (by others)** are ideal for measuring the pressure drop across the DRY-O-TRON®.
3. **Automatic air vent (by others)** must be installed on high points of the piping to remove air bubbles.
4. **Pool water pressure switch** (may be factory installed) detects the presence of pool water flow.
5. **Pool water flow meter (by others)** is ideal for setting the pool water flow rate. This flow rate is important for long life and proper operation.
6. **Throttling ball valve (circuit setter, by others)**
   - assures proper operation of the air vent
   - should be installed in the lowest point of the water return line
   - is used to adjust the water flow to produce an outlet water temperature 12°F to 20°F above the inlet water temperature during pool water heating mode.
7. **Auxiliary pool water heater (optional or by others), controlled by the DRY-O-TRON®**
   This must be installed downstream of the DRY-O-TRON®.
8. **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®.**
9. **Bypass valve (by others)**
   It is strongly suggested that the secondary circulating pump (11) be installed. If it is not installed, it may be possible to throttle the bypass valve to force water through the DRY-O-TRON®.
10. **MAIN FILTER PUMP (by others)**
    This pump may be sized for filtration and sanitation only. Caution: The secondary circulation pump (11) 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.
11. **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.
12. **Pressure switch** (by others) stops secondary pump during filter backwashing.

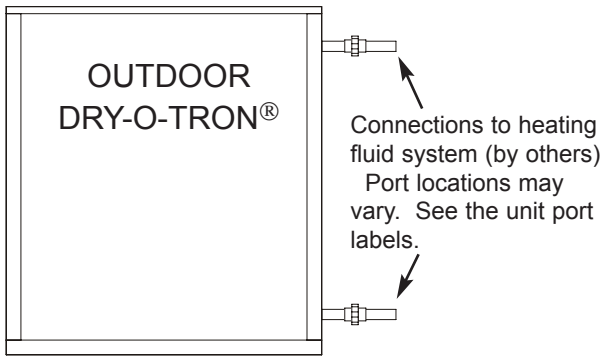
WATER, GLYCOL, OR STEAM HEATED UNITS ONLY

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

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

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

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

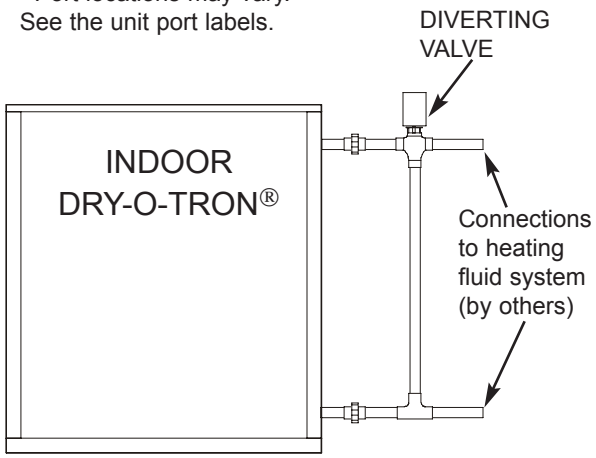


Port locations may vary.
See the unit port labels.

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!

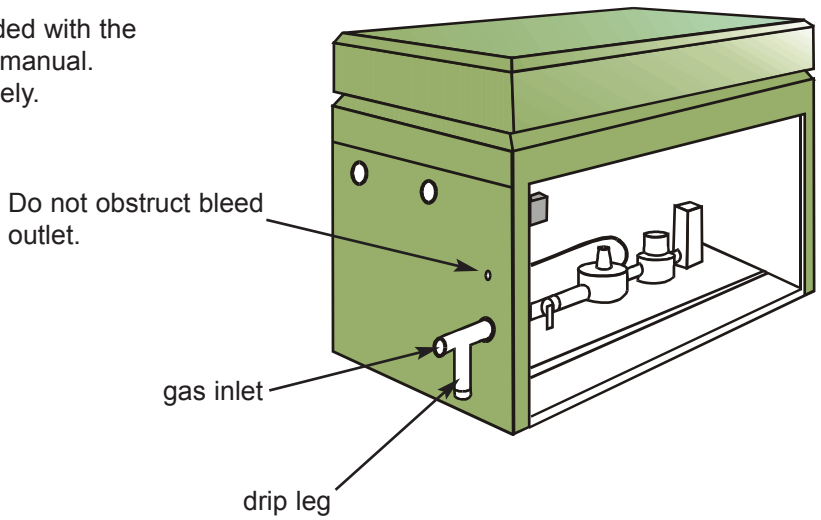
See Installation - Wiring - Heating Valve for proper methods of wiring this valve.



Boiler Piping Installation

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

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



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

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

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

Installation Piping Condensate Drains

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

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 a negative 1.5 inch water column pressure in the DRY-O-TRON® cabinet.

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

Δ Route drain pipe

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

Deliver the condensate to a suitable point. 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.

Δ Fill P-trap

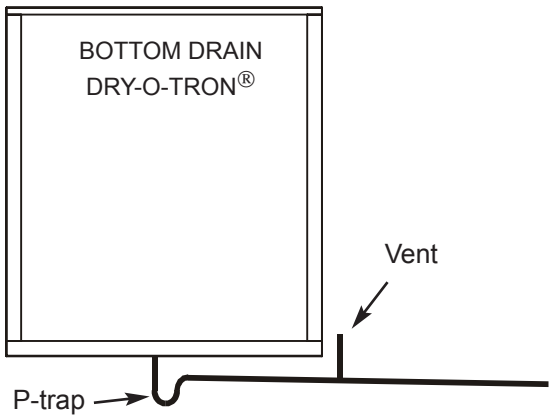
To prevent air from being drawn through the condensate drain pipe, the P-trap must be filled with water before starting the unit blowers. Failure to do this will cause the drain pan to overflow during operation.

Δ Condensate pump

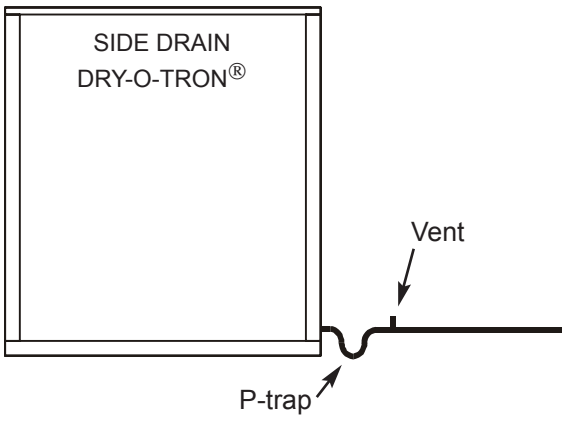
If a condensate pump must be used, be sure it has enough pressure and volume capability. If the condensate is to be delivered to a pipe that might be pressurized above atmospheric pressure, install a check valve to prevent backflow.

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

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



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



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Installation Component Overview

1. Outdoor air filter & manual damper
- Optional motorized damper actuator
- Optional 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 the mechanical room
- Optional side connection available

4. Water flow meter (by others)

5. Pool Water Connection (by others)
- Components in water circuit 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.
- Schedule 40 CPVC piping is recommended.

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.

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 coils
- Controlled by the DRY-O-TRON®'s microprocessor

10. Operator Panel

Mounted on the electrical panel door
- Optional remote mounting

11. Refrigerant Access Valves
- Service gauge connection
- Refrigerant charging access
- Top Valve is head pressure
- Bottom valve is suction pressure

12. Air Vent (by others)
- Must be installed on all high points of the pool water plumbing system.

13. Automatic Chemical Feeder (by others)
- Must be located in the main pool return line downstream of all auxiliary equipment to prevent corrosion and equipment deterioration

14. 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

15. Throttling Ball Valve (circuit setter, by others)
- Assures proper operation of the air vent
- 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.

16. Water Pressure Switch (unit mounted in Models 80 and larger)

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

17. By-Pass Valve (by others)
- Throttle to force water through the DRY-O-TRON® when the recommended secondary circulating pump is not used

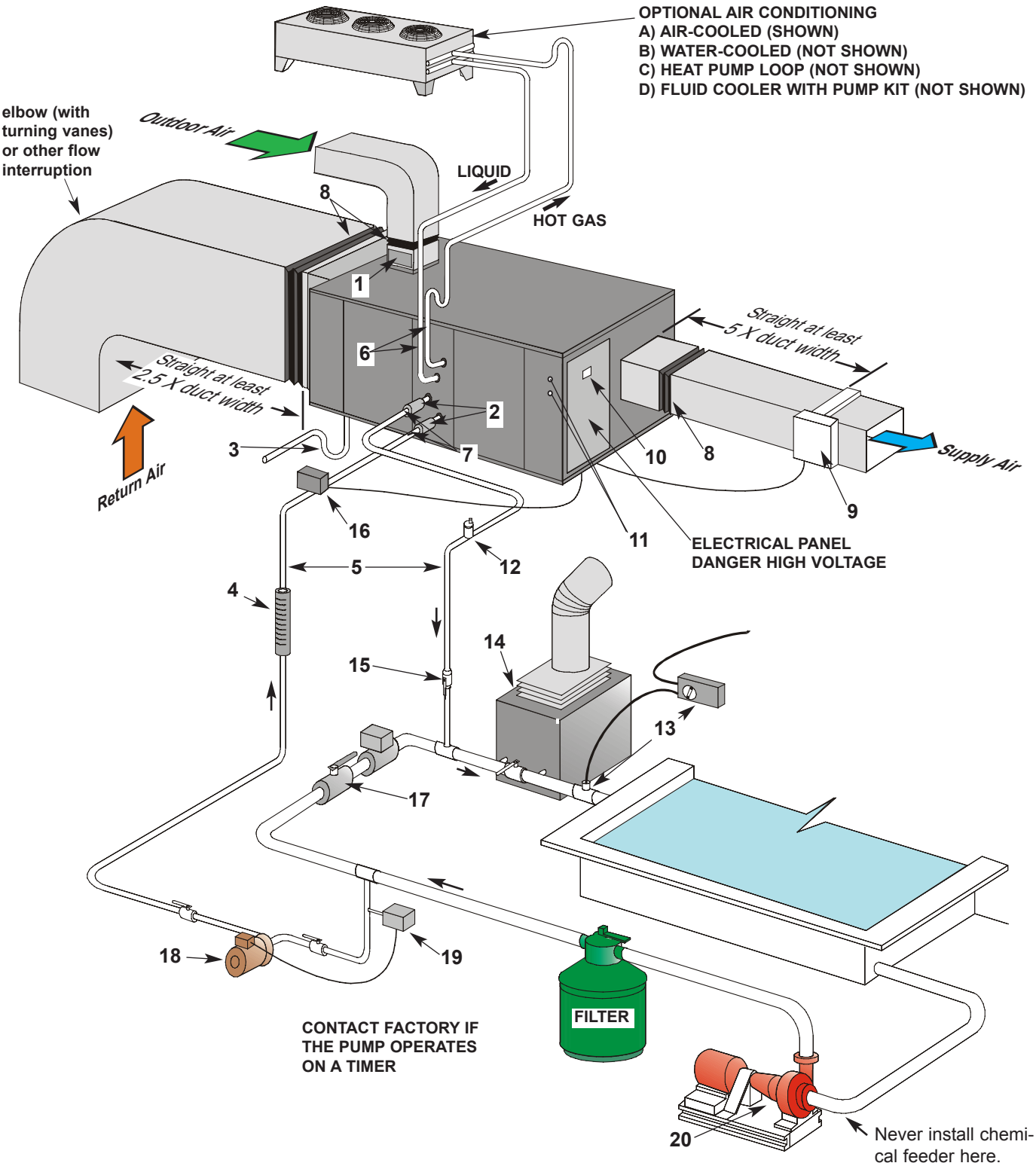
18. Secondary Circulating Pump (by others)
- Must be suitable for pool water
- Secondary circulating pump selection for an OPEN system and :
  - Δ DRY-O-TRON® flow rate
  - Δ Total pressure drop including: DRY-O-TRON®, external piping, valve pressure drop and elevation difference between the pool water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

19. 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

20. 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

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



Data subject to change without notice.

Installation

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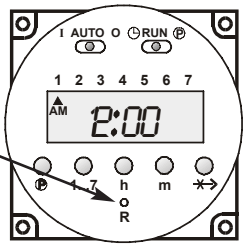
Contents

Startup

Pre-Startup Adjustments

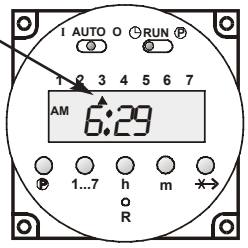
Some units may be equipped with a seven-day time clock to increase outdoor air intake during Occupied periods. In this case the clock must be set for local time and for Occupied periods.

If mistakes are made while programming, all settings can be erased by pressing **R**. If the display shows EEE, press R and start over.



A. Set present day and time-of-day

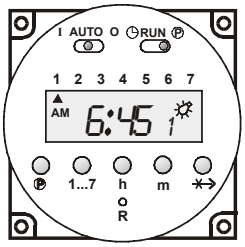
1. Move **RUN** switch to ◷ (RUN P).
2. Press **1...7** to move the indicator under the day of the week. ex. **3** for Wednesday
3. Press **h** to set the hour of the day. ex: 6 AM
4. Press m to set the minutes past the hour. ex: 6:29 AM



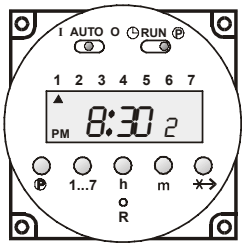
5. Move **RUN** switch to RUN (RUN P).
6. Colon will blink. Clock is now set to day and time.

B. Set Occupied period for Mondays.

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

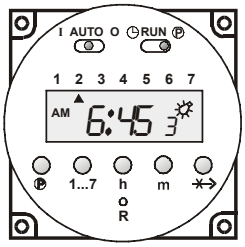


5. Press Ⓟ to set the end of the Monday Occupied period. The 2 indicates the second timer action. The ☼ disappears to indicate Unoccupied.
6. Press **h** to set the hour of the end of the Monday Occupied period. ex: 8 PM
7. Press **m** to set the minute of the end of the Monday Occupied period. ex: 8:30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



C. Set Occupied period for other days.

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



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

Manual operation

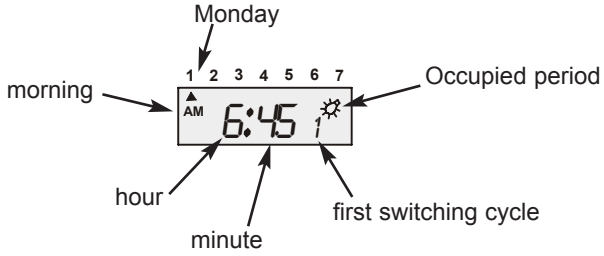
To force an Occupied period, move the **AUTO** switch to "I" (I AUTO O). Leave the **RUN** switch on RUN (RUN P).

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

To skip the next Occupied period, press ⇤↦.

Indication of Occupied period

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

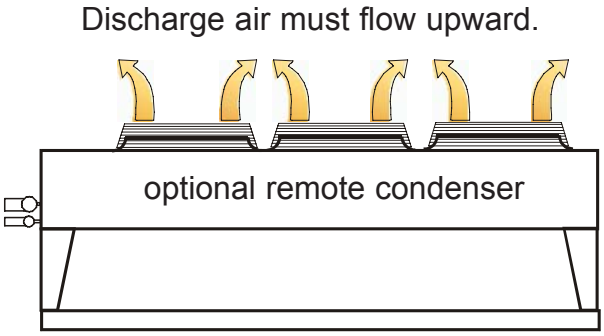


STARTUP

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

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

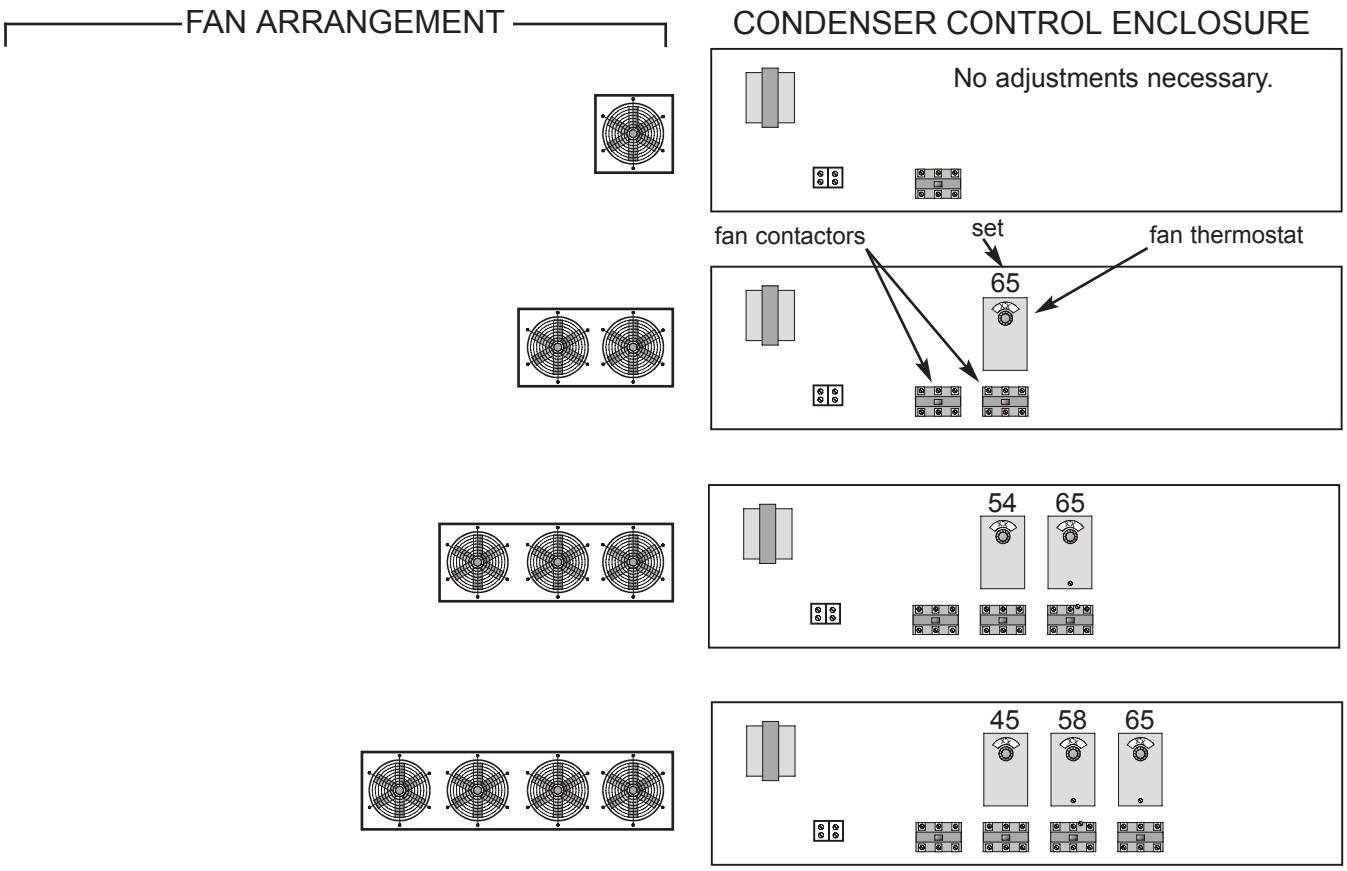
Single phase fans will inherently turn the proper direction. If three phase fans turn the wrong way, a qualified person should disconnect the branch circuit and interchange any two wires on the power inlet lugs in the condenser control enclosure. Do not move any factory installed wires.



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

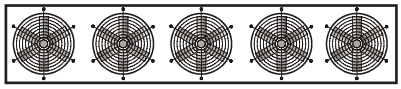
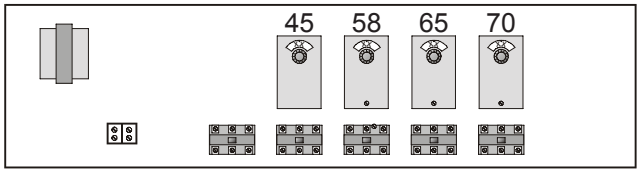
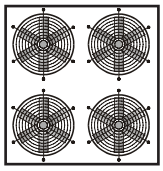
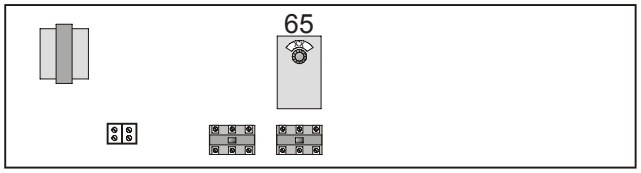
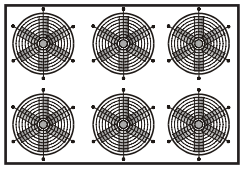
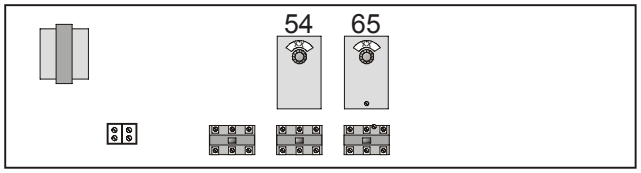
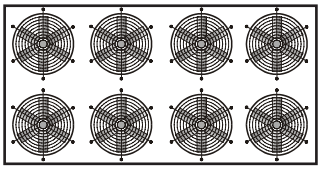
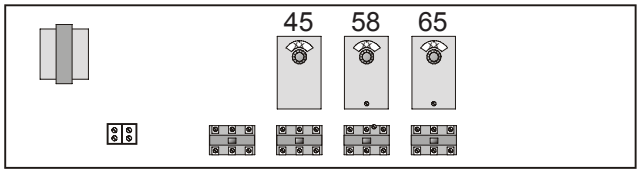
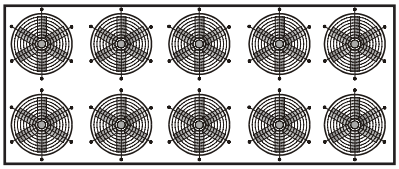
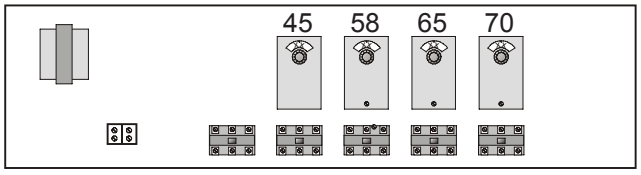
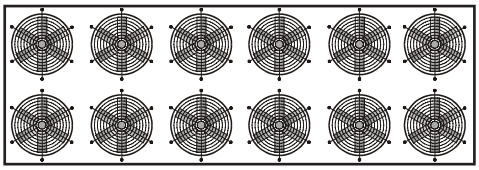
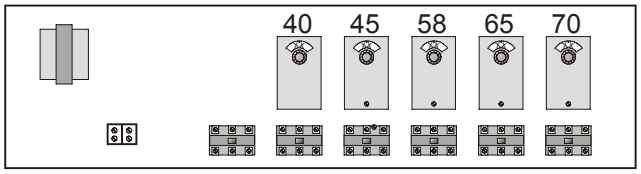
Units with optional air cooled air conditioning will have a remote condenser. Some remote condensers may have more than one fan. Condensers with multiple fans have a minimum number of fans that run continuously whenever the DRY-O-TRON® is in cooling mode. Any other fans will be controlled by thermostats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

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



STARTUP

FAN THERMOSTATS, continued

FAN ARRANGEMENT	CONDENSER CONTROL ENCLOSURE
	
	
	
	
	
	

STARTUP

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

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

Unit Size	Flow (GPM) Water @ 90°F
042	17
062	30
082	40
100	40
102	40
120	60
122	60
150	60
152	80
162	80
182	80
202	100
242	120
282	140
362	140
482	240
562	280

Dry-Cooler® FLUID FLOW (units with Dry-Cooler® cooled air-conditioning option only)

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

Unit Size	Flow (GPM) 50% Eth.. Glycol Solution @ 110°F
042	28
062	40
082	56
100	73
102	73
120	94
122	94
150	107
152	107
162	127
182	145
202	160
242	178
282	210
362	276
482	375
562	437

POOL WATER FLOW

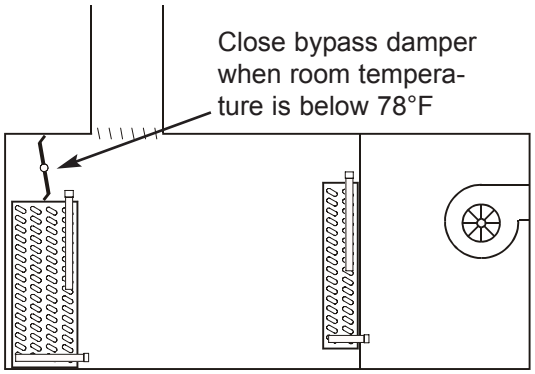
Units must have a constant pool water flow rate. If a flowmeter is not available, see **Adjustments** later in this section.

Unit Size	Flow (GPM) Water @ 85°F
042	12
062	17
082	17
100	20
102	26
120	20
122	30
150	40
152	40
162	40
182	40
202	40
242	60
282	80
362	80
482	120
562	160

STARTUP

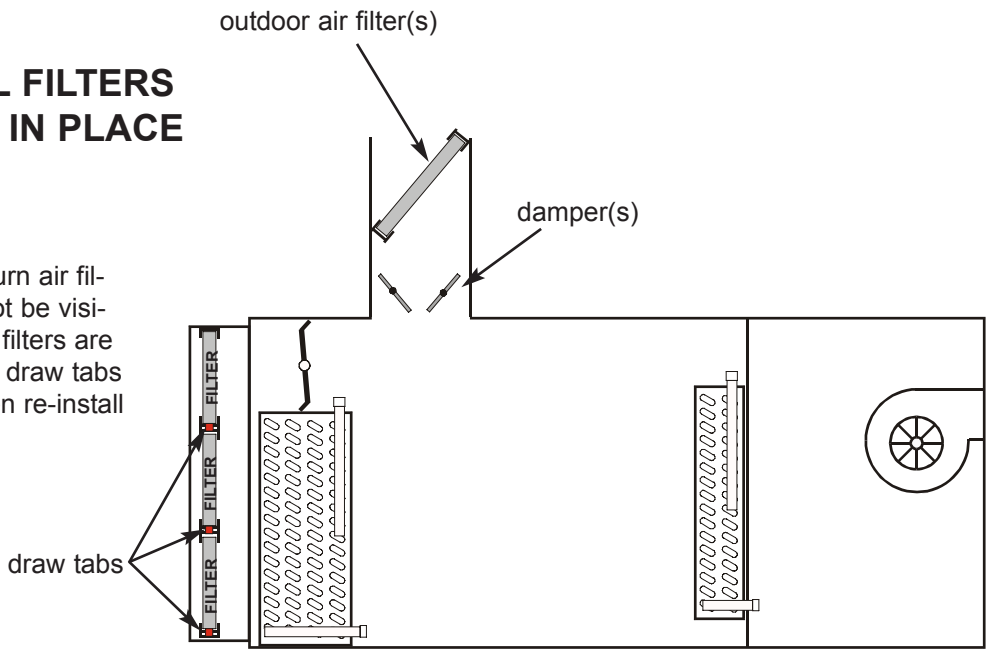
units with MANUAL EVAPORATOR BYPASS DAMPER only

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. If the room temperature at startup is above 78°F, a manual evaporator bypass damper should be fully open.



CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE

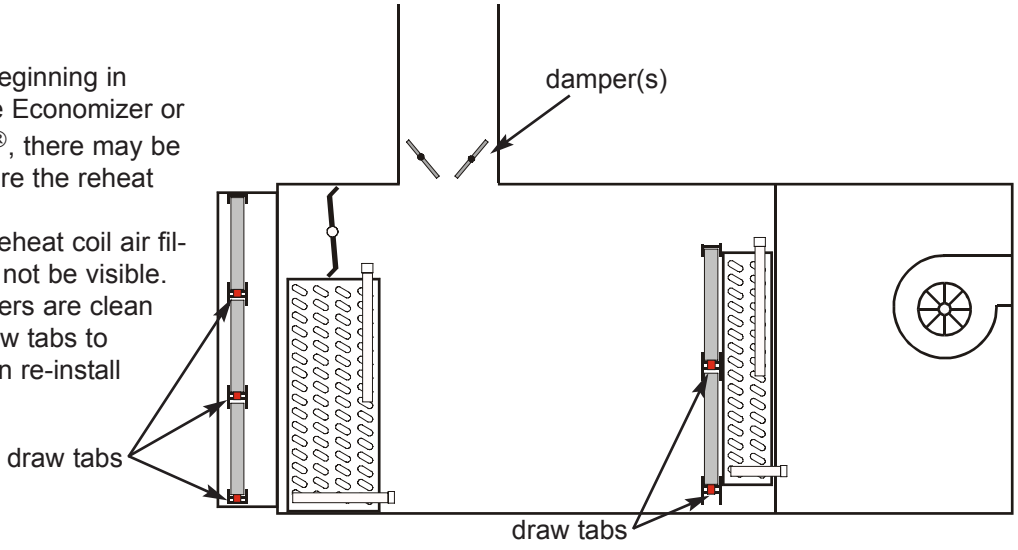
There may be several return air filters, some of which may not be visible. To be sure that all the filters are clean and in place, use the draw tabs to remove all the filters, then re-install them .



The size and number of filters and draw tabs may vary.

For units with models beginning in "DB" or "RB", which have Economizer or Intelligent Energy Saver®, there may be another set of filters before the reheat coil.

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



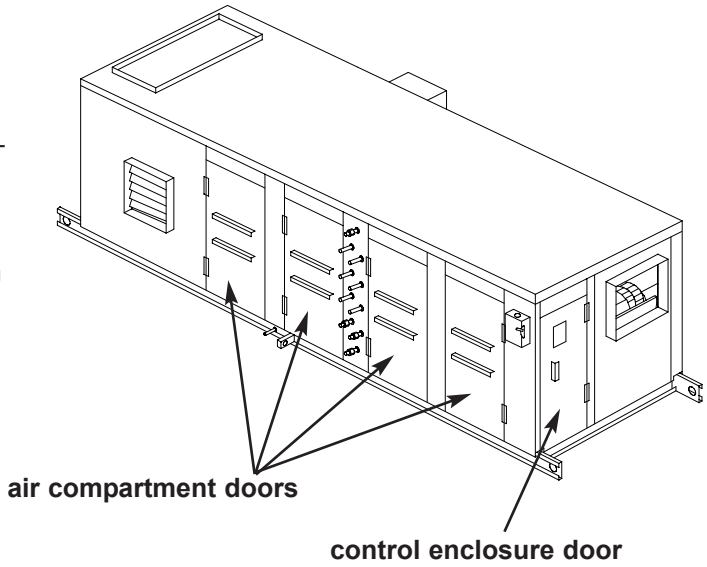
The size and number of filters and draw tabs may vary.

STARTUP

CLOSE ALL AIR COMPARTMENT DOORS AND ACCESS PANELS

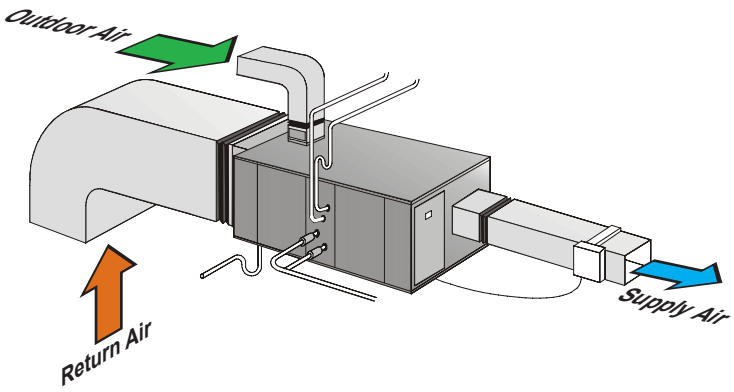
The control enclosure door is not an air compartment door.

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



Airflow

The return air flow rate in CFM should be within ±10% of the amount specified on the unit nameplate. See section Installation - Air Distribution - Adjust airflow.



Units with Economizer or Intelligent Energy Saver -

The outdoor conditions, called "changeover point", which trigger Economizer operation are preset at the factory based on data supplied with the order. If the changeover point must be changed, consult Dectron or a Dectron certified service technician.

The minimum outdoor air intake flow rate during Occupied periods must be set at installation - see section Installation - Air Distribution - Adjust airflow. To adjust this value consult Dectron or a Dectron certified technician.

The indoor air exhaust flow rate must be set at installation, see section Installation - Air Distribution - Adjust airflow. To adjust this value, consult Dectron or a Dectron certified service technician.

Units with SmartSaver -

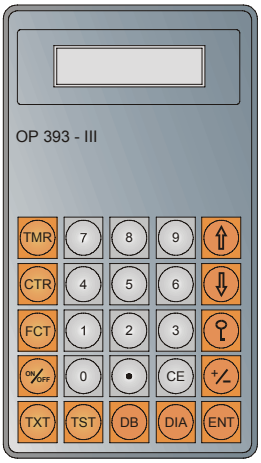
The Outdoor air intake flow rate must be set at installation, see section Installation - Air Distribution - Adjust airflow. This flow rate is determined by ventilation requirements and may be found in the unit submittal information. This flow rate should not exceed 15% (or 30% with optional air conditioning) of the return air flow rate. To adjust this value, consult Dectron or a Dectron certified service technician.

The room exhaust air flow rate must be set at installation, see section Installation - Air Distribution - Adjust airflow. This flow rate should be 110% of the outdoor air intake flow rate above. To adjust this value, consult Dectron or a Dectron certified service technician.

Units with Purge Mode

The time delay for purge mode is preset at the factory to exhaust one complete room volume in 15 minutes. If this delay must be adjusted, consult Dectron or a Dectron certified technician.

STARTUP



Some installations may have the optional remote outdoor air temperature sensor. For these installations, the sensor may ship uninstalled, and may have to be installed in the field.

Select a location for the sensor that will be out of direct sunlight or other abnormal temperature conditions.

Wire the sensor as shown in the unit field wiring diagram in the unit information package.

If an outdoor temperature sensor is used, the controller must be told that it is connected.

1. Turn on the branch circuit disconnect switch.

2. On the controller display, press DB then 3 then ENT then 1 then ENT .

If the controller must be told that the remote outdoor air temperature sensor is not connected, then

1. Turn on the branch circuit disconnect switch.

2. On the controller display, press DB then 3 then ENT then 0 then ENT .

STARTUP

OP-7 Outdoor temperature sensor Startup

Some installations may have the optional remote outdoor air temperature sensor. For these installations, the sensor may ship uninstalled, and may have to be installed in the field.

Select a location for the sensor that will be out of direct sunlight or other abnormal temperature conditions.

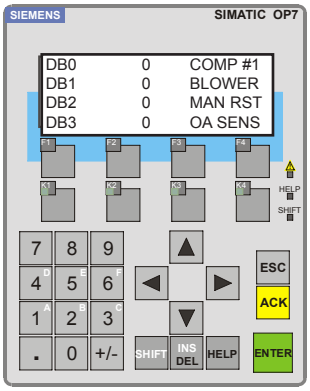
Wire the sensor as shown in the unit field wiring diagram in the unit information package.

If an outdoor temperature sensor is used, the controller must be told that it is connected.

1. Turn on the branch circuit disconnect switch.

2. On the controller display, press F4 then press ▼ as necessary to move the cursor over the DB3 value.

3. Press 1 then ENTER.



If the controller must be told that the remote outdoor air temperature sensor is not connected, then

1. Turn on the branch circuit disconnect switch.

2. On the controller display, press F4 then press ▼ as necessary to move the cursor over the DB3 value.

3. Press 0 then ENTER.

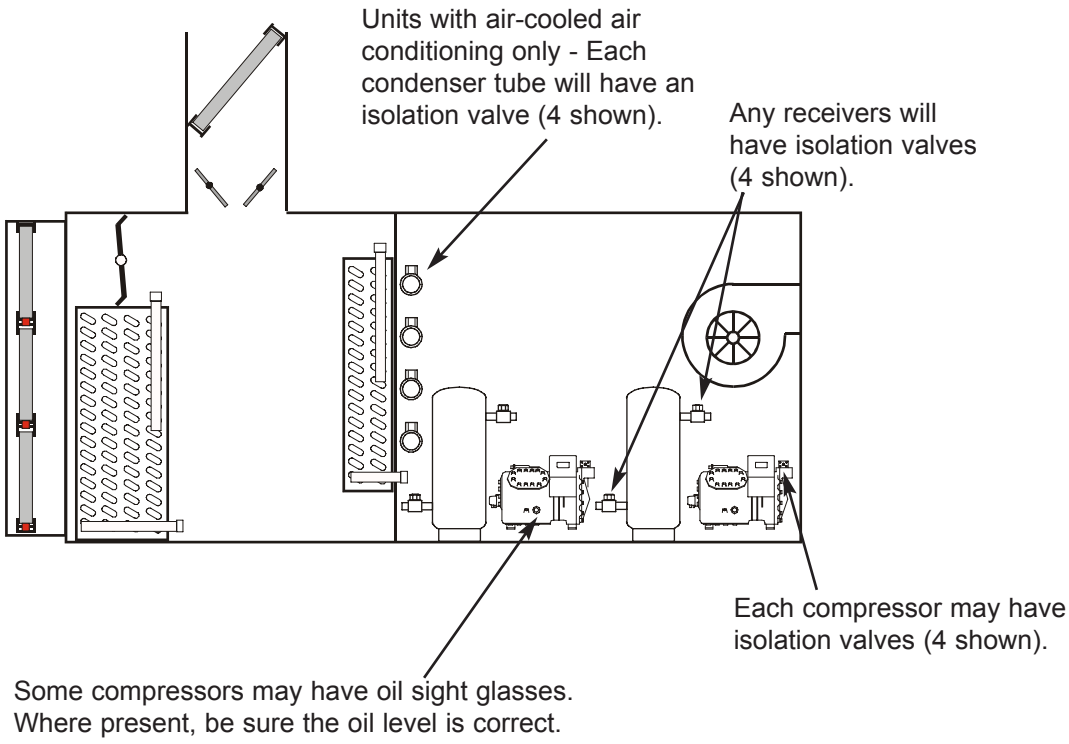
STARTUP

Be sure that the following manual valves have been opened:

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

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

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



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.

Natatorium

Confirm that the natatorium walls and ceiling have been adequately insulated and have a proper vapor barrier (see Natatorium - Moisture migration) your initials

Confirm that any windows are installed and so constructed as to allow proper air flow over the glass (see Natatorium - Moisture migration). your initials

Confirm that the pool has been filled and that the pool water chemistry is as specified by the National Pool & Spa Institute (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

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 chemicals are not stored in the same room with the DRY-O-TRON®. your initials

Confirm that no construction dust or other debris is in the return duct. your initials

Confirm that no construction dust or other debris will be drawn into the return duct or the outdoor air duct (if any). your initials

Piping

Confirm that all specified air vents are installed and operating. your initials

For units with air cooled air conditioning, confirm that refrigerant piping is installed and free of leaks. your initials

For units with air cooled air conditioning, confirm that the condenser and tubes have been evacuated to 500 microns of mercury or less. your initials

For units with water or fluid cooled air conditioning, confirm that the water or fluid flow is within tolerance according to the unit specifications. your initials

Confirm that the heating fluid system (if any) is installed and free of leaks. See Installation - Isolators and Drain. your initials

Confirm that the heating fluid system has proper flow and temperature. your initials

Confirm that the pool water piping to the DRY-O-TRON® is installed and free of leaks. your initials

Confirm that the pool water is flowing at the proper rate (see Installation - Piping - Pool Water). your initials

Confirm that the condensate drain pipe is properly connected with a P-trap, and is free of leaks. your initials

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

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

Wiring

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

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 applied 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 section "Setup - Airflow" of this manual. your initials

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

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

Startup Pre-Startup Checklist

Unit preparation

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

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

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

For units with an outdoor air intake, confirm that the intake hood is unobstructed. your initials

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

Confirm that all return air duct filters are clean and in place. your initials

Confirm that all outdoor air duct filters are clean and in place. your initials

Confirm that the air heat exchangers are clean. 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 10 hours. your initials

Air distribution

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 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

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

Confirm that all grilles and diffusers are unobstructed. your initials

Confirm that all construction dust and debris has been removed from the ducts. your initials

For units with outdoor air intakes, confirm that the intake duct is properly connected (see Installation - Air Distribution - Ventilation). your initials

Confirm that the DRY-O-TRON return grille is not near or above a spa, whirlpool, or hot tub (if any) your initials

Confirm that air does not blow directly on the pool surface. your initials

Remote Condenser or Dry-Cooler®

Confirm that the condenser or Dry-Cooler® is located properly for good airflow (see Installation- Locate Condenser). your initials

Confirm that the voltage to be applied to the condenser corresponds to that specified on the condenser nameplate, NEMA MG-1 and ANSI C84.1. your initials

Confirm that the condenser tubes have been tested for refrigerant leaks. your initials

Confirm that the top and side clearances are at least as large as specified in Installation - Locate Condenser. your initials

Confirm that no construction dust, leaves, or other debris will be drawn into the heat exchangers. your initials

Confirm that any shipping blocks, spacers, or retainers have been removed. your initials

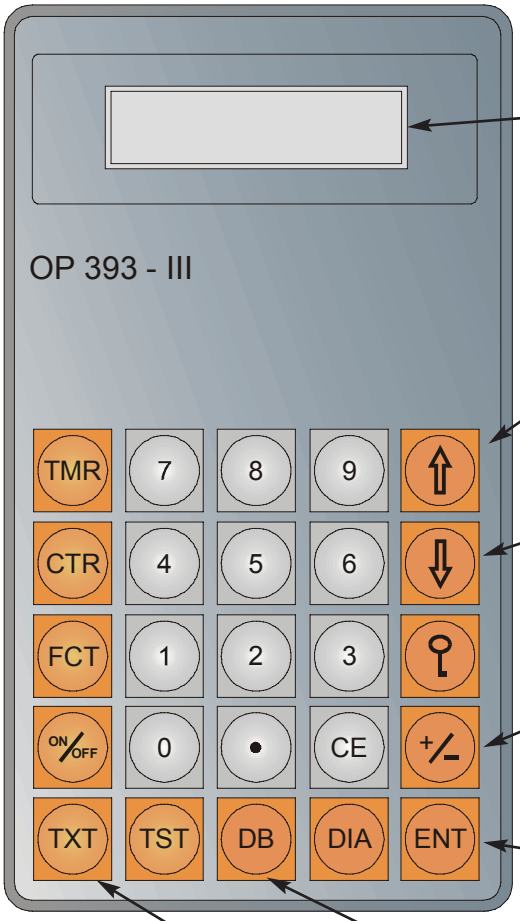
Completed by _____ Ph. ( ) _ _ _ - _ _ _ _

OP-393 Controller Interface Startup

The DOTICS-9 controller display may be mounted on the unit, in a remote location (optional), or two displays (optional) may be used.

Status messages are accessible in the default TEXT mode, which is started by pressing (TXT). Text mode will be automatically started after a time delay.

Status and control values are stored in registers, which are addressable memory locations. These registers are accessible in REGISTER ACCESS mode, which is begun by pressing (DB) shown below.



Two-line LCD display

(⇧) scrolls upward through status messages in TXT mode, and upward through register addresses in REGISTER ACCESS mode.

(⇩) scrolls downward through status messages in TXT mode, and downward through register addresses in REGISTER ACCESS mode.

(+/-) changes the sign of number constants in control registers. This is usually for indicating to the controller that a number is negative.

(ENT) is used in REGISTER ACCESS mode. It indicates the end of a register address or the end of a number entered into a register.

(DB) starts the REGISTER ACCESS mode, in which the display shows the contents of status and control registers.

(TXT) starts the TEXT mode, in which the display shows status messages.

STARTUP

Startup Enable Operation OP-393

IMPORTANT!

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

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

Important!

Starting a DRY-O-TRON® when the pool water is cold is always a two-stage procedure. Be prepared to return to the site to do the final adjustments when the pool water and pool enclosure are at design conditions.

Important!

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

1. Apply electric power

If the disconnect switch for the remote condenser is not already ON, turn it ON now.

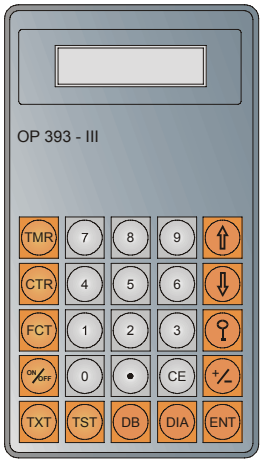
The DRY-O-TRON® branch circuit disconnect should already be ON. If it is not ON, turn it ON now. For units with manual reset overload(s) for the blower motors, press the START button(s) on the overload(s). This starts the compressor crankcase heaters. Allow no less than 10 hours of crankcase heater operation before enabling a compressor.

For units with service lights and/or receptacles, turn ON the disconnect switch for the DRY-O-TRON® service circuit.

2. Start blower

On the controller display, press (DB) then (1) then (ENT) then (1) then (ENT).

The blower will start after a short delay. If the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the DRY-O-TRON® input lugs. **Do <u>not</u> move any factory installed wires.**



3. Check Air Distribution

Be sure the air flow rate is correct before proceeding. Be sure that the air flow at each diffuser is correct. See Installation - Air Distribution - Adjust Airflow. Be <u>certain</u> that there is no construction dust in the space or in the return duct.

STOP **DO NOT PROCEED UNLESS THE ELECTRIC POWER HAS BEEN APPLIED TO THE UNIT AND THE BLOWER OVERLOAD HAS BEEN ON FOR AT LEAST 10 HOURS.**

This is necessary for the compressor crankcase heater function.

4. Enable compressor 1

On the controller display, press (DB) then (0) then (ENT) then (1) then (ENT) .

Compressor number 1 will start if there is a suitable demand.

STOP **Do not start the compressor on a second refrigeration system until the startup procedures for the first refrigeration system have been completed. You will be instructed to return to this point.**

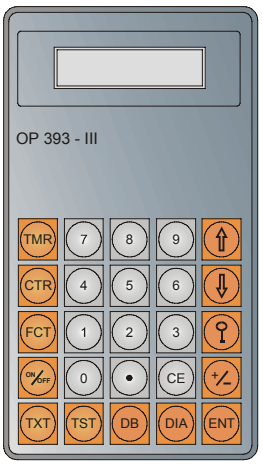
5. Enable compressor 2 (if any)

On the controller display, press (DB) then (4) then (ENT) then (1) then (ENT) .

Compressor number 2 will start if there is a suitable demand.

OP-393 Set point Adjustment Startup

The design set points (as shown on the unit nameplate) are factory set. However, it may be necessary to temporarily change set points in order to operate the modes required by the startup procedure. Follow the procedure illustrated by the examples below to change set points.



If the message "*50" appears, it indicates that a dis-allowed input has been entered. Try again, pressing the buttons carefully.

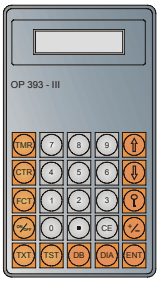
The set points are protected by a Set point Password, which is available from Dectron. This password must be entered in register 7 before set points can be changed.

	Start register access mode	Address	End Address	Value	End Value
	DB	then 7	then ENT	then 1 then 7 then 9 then 3	then ENT
Example: To change the relative humidity set point to 57%	DB	then 4 then 0	then ENT	then 5 then 7	then ENT
Example: To change the room air temperature set point to 86°F	DB	then 4 then 1	then ENT	then 8 then 6	then ENT
Example: To change the pool water temperature set point to 84°F	DB	then 4 then 2	then ENT	then 8 then 4	then ENT
Example: To change the whirlpool water temperature set point to 102°F	DB	then 4 then 3	then ENT	then 1 then 0 then 2	then ENT
Example: To change the outdoor air ventilation changeover temperature set point to 64°F	DB	then 4 then 4	then ENT	then 6 then 4	then ENT
Example: To change the supply air temperature set point to 125°F	DB	then 4 then 5	then ENT	then 1 then 2 then 5	then ENT
Clear the set point password.	DB	7 then	ENT	then 0	then ENT

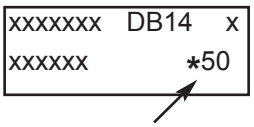
STARTUP

Startup Read Sensors OP-393

Present sensor readings are read by accessing the proper registers. After entering the register address and concluding it with (ENT), the present reading is immediately displayed.



If the message "*50" appears, it indicates that a dis-allowed input has been entered. Try again, pressing the buttons carefully.



Present reading

	Start register access mode	Address	End Address	Display
Ex: To read the present relative humidity (assume 50%)	DB	then 1 then 0 then ENT		+00050 DB14 10 +00050
Ex: To read the return air temperature (assume 82°F)	DB	then 1 then 1 then ENT		+00082 DB14 11 +00082
Ex: To read the supply air temperature (assume 65°F)	DB	then 1 then 2 then ENT		+00065 DB14 12 +00065
Ex: To read cooling coil #1 leaving air temperature (assume 52°F)	DB	then 1 then 3 then ENT		+00052 DB14 13 +00052
Ex: To read cooling coil #2 leaving air temperature (assume 51°F)	DB	then 2 then 0 then ENT		+00051 DB14 20 +00051
Ex: To read the entering pool #1 water temperature (assume 81°F)	DB	then 1 then 4 then ENT		+00081 DB14 14 +00081
Ex: To read the leaving pool #1 water temperature (assume 93°F)	DB	then 1 then 5 then ENT		+00093 DB14 15 +00093
Ex: To read the entering pool #2 water temp. (if any) (assume 98°F)	DB	then 1 then 8 then ENT		+00098 DB14 18 +00098
Ex: To read the leaving pool #2 water temp. (if any) (assume 108°F)	DB	then 1 then 9 then ENT		+00108 DB14 19 +00108
Ex: To read the outdoor air temperature (optional) (assume 75°F)	DB	then 1 then 7 then ENT		+00075 DB14 17 +00075
Ex: To read the compressor #1 discharge temperature (assume 185°F)	DB	then 1 then 6 then ENT		+00185 DB14 16 +00075
Ex: To read the compressor #2 discharge temperature (assume 190°F)	DB	then 2 then 1 then ENT		+00190 DB14 21 +00075

STARTUP

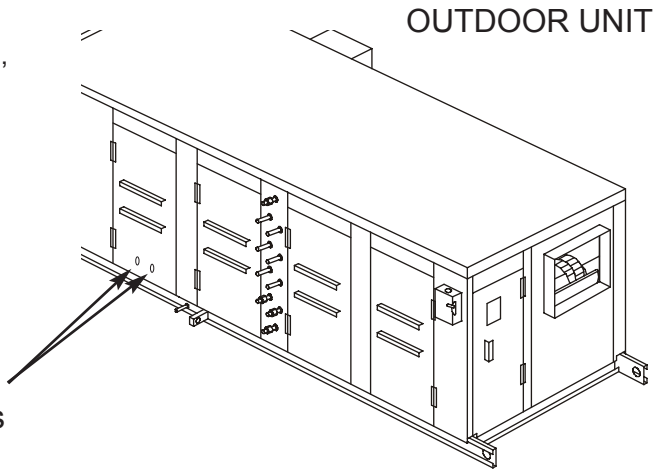
COMPLETE REFRIGERANT FILL

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

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

After the unit has been running in Dehumidification mode for 30 minutes, the refrigerant sight glass(es) should be full (no bubbles).

If this is not the case, first be sure that the liquid solenoid valve is not cycling. (See unit wiring diagram.) If the liquid line solenoid valve is cycling, reduce the adjustment of the associated refrigerant expansion valve(s). If the liquid line solenoid valve is not cycling but there are bubbles in the sight glass after 30 minutes of operation, contact Dectron.



Outdoor units (RS, RB) have sight glasses located behind transparent windows in access panels.

STARTUP

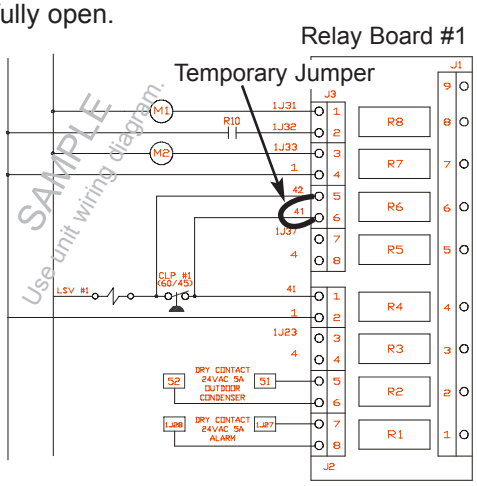
Startup TXV Adjustment OP-393

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

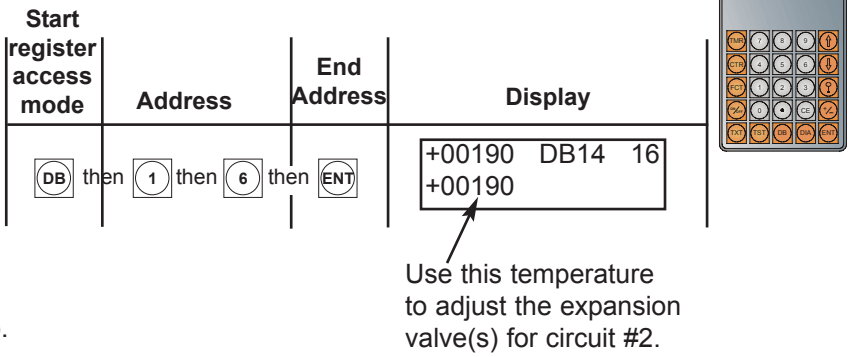
➡ Do not attempt to adjust the expansion valve based on evaporator superheat. ⬅

Adjust circuit #1 expansion valve(s)-

1. 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 air flow has been adjusted to the value shown on the unit nameplate. (See **Product Description - Unit Nameplate**.
3. Be sure that the room temperature and relative humidity are at 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.
5. Close the access panels or doors.
6. In the unit control enclosure, place a temporary jumper between wire 41 and wire 42 (across the pressure switch labeled "CLP") (See unit wiring diagram.)



7. If the unit model number ends in "2", e.g. DS042, RB282, there will be two refrigeration circuits. Identify the expansion valve(s) associated with the first circuit.
8. Start the unit per the instructions given in **Startup - Enable Operation**.
9. If the unit does not operate in pool heating mode (status message POOL 1 HEAT ON, see **Operation - Controller Messages.**), then temporarily increase the pool water temperature set point by at least 5°F (3°C) to cause the unit to operate in full pool heating mode. (See **Startup - Adjust Set Points.**) The compressor should run.
10. 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.
11. Allow the unit to run in pool heating mode for at least 20 minutes, then read compressor #1 discharge temperature at controller register 16 as shown. This temperature should be between 180°F (82°C) and 200°F (93°C).
12. (a) If register 16 is below 180°F (82°C), close the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 16 is between 180°F (82°C) and 200°F (93°C).
    (b) If register 16 is above 200°F (93°C), open the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 16 is between 180°F (82°C) and 200°F (93°C).
    (c) For multiple expansion valves, try to keep the average valve-bulb temperatures as near the same as possible, while meeting the requirements of (a) and (b) above.



13. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment, then check to be sure DISCHARGE 1 TEMP is between 180°F (82°C) and 200°F (93°C).
14. Replace the expansion valve caps.
15. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
16. Remove the temporary jumper between wire 41 and wire 42.
17. Close the access panels or doors.
18. If the model number ends in "2", e.g. DS042, RB282, then go to the next page.

STARTUP

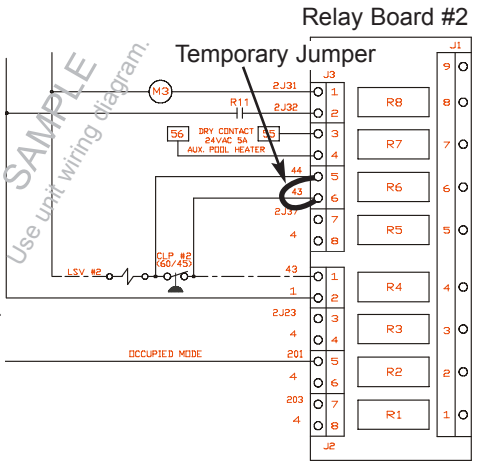
OP-393 TXV Adjustment Startup

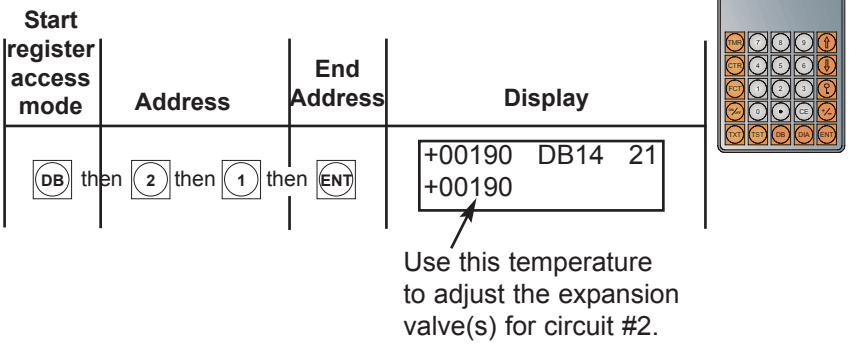
If the DRY-O-TRON® model number ends in 2, e.g. DS042, DS242, there will be two refrigeration systems. In this case return to **Startup - Enable Operation** and repeat the steps in the intervening pages for the second refrigeration system. The expansion valve(s) must be adjusted at startup, since airflow affects the evaporator loading. To obtain proper operation and long life, it is important to adjust the expansion valve(s) as described below.

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

Adjust circuit #2 expansion valve(s)-

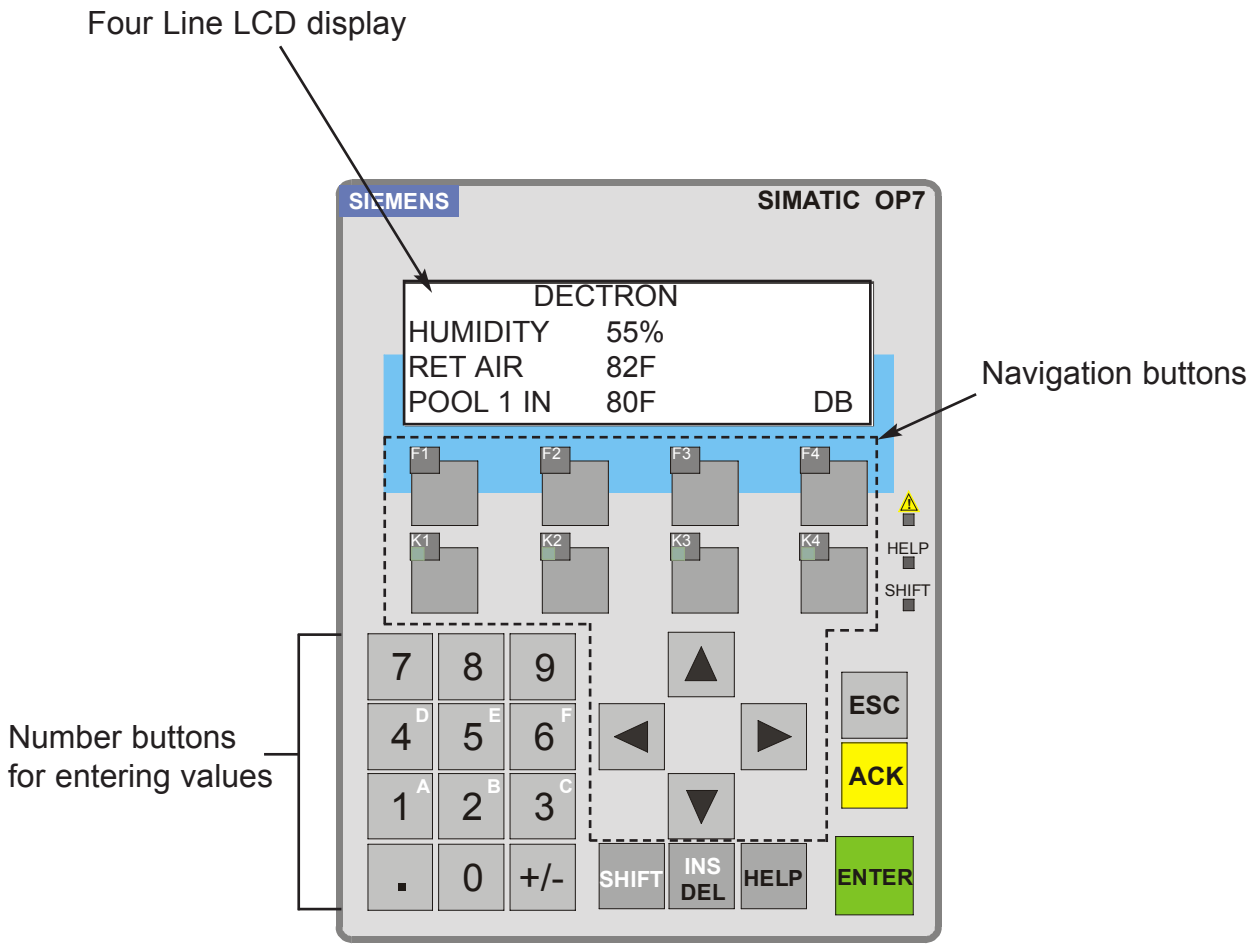
1. For units with air-cooled air conditioning, be sure that the specified additional refrigerant has been added. (See **Product Description - Unit Nameplate**, **Installation - Piping - Refrigerant**, and **Startup - Add Refrigerant**.)
2. Be sure that the air flow has been adjusted to the value shown on the unit nameplate. (See **Product Description - Unit Nameplate**.
3. Be sure that the room temperature and relative humidity are at 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.
5. Close the access panels or doors.
6. In the unit control enclosure, place a temporary jumper between wire 43 and wire 44 (across the pressure switch labeled "CLP #2") (See unit wiring diagram.)
7. Identify the expansion valve(s) associated with the second circuit.
8. Start the unit per the instructions given in **Startup - Enable Operation**.
9. If the unit does not operate in pool heating mode (status message POOL x HEAT ON, see **Operation - Controller Messages.**), then temporarily increase the pool water temperature set point by at least 5°F (3°C) to cause the unit to operate in full pool heating mode. (See **Startup - Adjust Set points**) The compressor should run.
10. 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.
11. Allow the unit to run in pool heating mode for at least 20 minutes, then read compressor #2 discharge temperature at controller register 21 as shown. This temperature should be between 180°F (82°C) and 200°F (93°C).
12. (a) If register 21 is below 180°F (82°C), close the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 21 is between 180°F (82°C) and 200°F (93°C).
    (b) If register 21 is above 200°F ((93°C), open the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 21 is between 180°F (82°C) and 200°F (93°C).
    (c) For multiple expansion valves, try to keep the average valve-bulb temperatures as near the same as possible, while meeting the requirements of (a) and (b) above.
13. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment, then check to be sure register 21 is between 180°F (82°C) and 200°F (93°C).
14. Replace the expansion valve caps.
15. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
16. Remove the temporary jumper between wire 43 and wire 44.
17. Close the access panels or doors.





The Dotics-9 controller communicates via an interface as shown below. Text messages for status and any possible alarms, as well as configuration settings, set points, temperatures, etc., are all accessed through the interface.

Set points and temperatures are contained in memory registers labeled "DBxxx", where "xxx" is a numerical register address. Navigation through these registers is detailed in the next pages.



OP-7 Enable Operation Startup

IMPORTANT!

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

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

Important!

Starting a DRY-O-TRON® when the pool water is cold is always a two-stage procedure. Be prepared to return to the site to do the final adjustments when the pool water and pool enclosure are at design conditions.

Important!

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

1. Apply electric power

If the disconnect switch for the remote condenser is not already ON, turn it ON now.

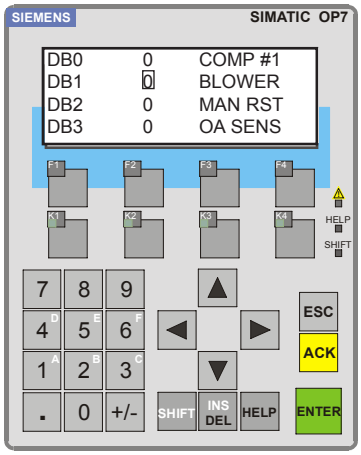
The DRY-O-TRON® branch circuit disconnect should already be ON. If it is not ON, turn it ON now. For units with manual reset overload(s) for the blower motors, press the START button(s) on the overload(s). This starts the compressor crankcase heaters. Allow no less than 10 hours of crankcase heater operation before enabling a compressor.

For units with service lights and/or receptacles, turn ON the disconnect switch for the DRY-O-TRON® service circuit.

2. Start blower

On the controller display, press F4 then ▲ or ▼ to move the cursor to the DB1 Blower value.

Press 1 to change the DB1 Blower value to "1", then press ENTER. The blower will start after a short delay. If the blower does not turn the proper direction, a qualified person should disconnect electric power and interchange any two of the branch circuit wires at the DRY-O-TRON® input lugs. **Do <u>not</u> move any factory installed wires.**



3. Check Air Distribution

Be sure the air flow rate is correct before proceeding. Be sure that the air flow at each diffuser is correct. See Installation - Air Distribution - Adjust Airflow. Be certain that there is no construction dust in the space or in the return duct.

STOP **DO NOT PROCEED UNLESS THE ELECTRIC POWER HAS BEEN APPLIED TO THE UNIT AND THE BLOWER OVERLOAD HAS BEEN ON FOR AT LEAST 10 HOURS.**

This is necessary for the compressor crankcase heater(s) function.

4. Enable compressor 1

On the controller display, press F4 then ▲ or ▼ to move the cursor to the DB0 COMP #1 value.

Press 1 to change the DB0 COMP #1 value to "1", then press ENTER. Compressor number 1 will start if there is a suitable demand.

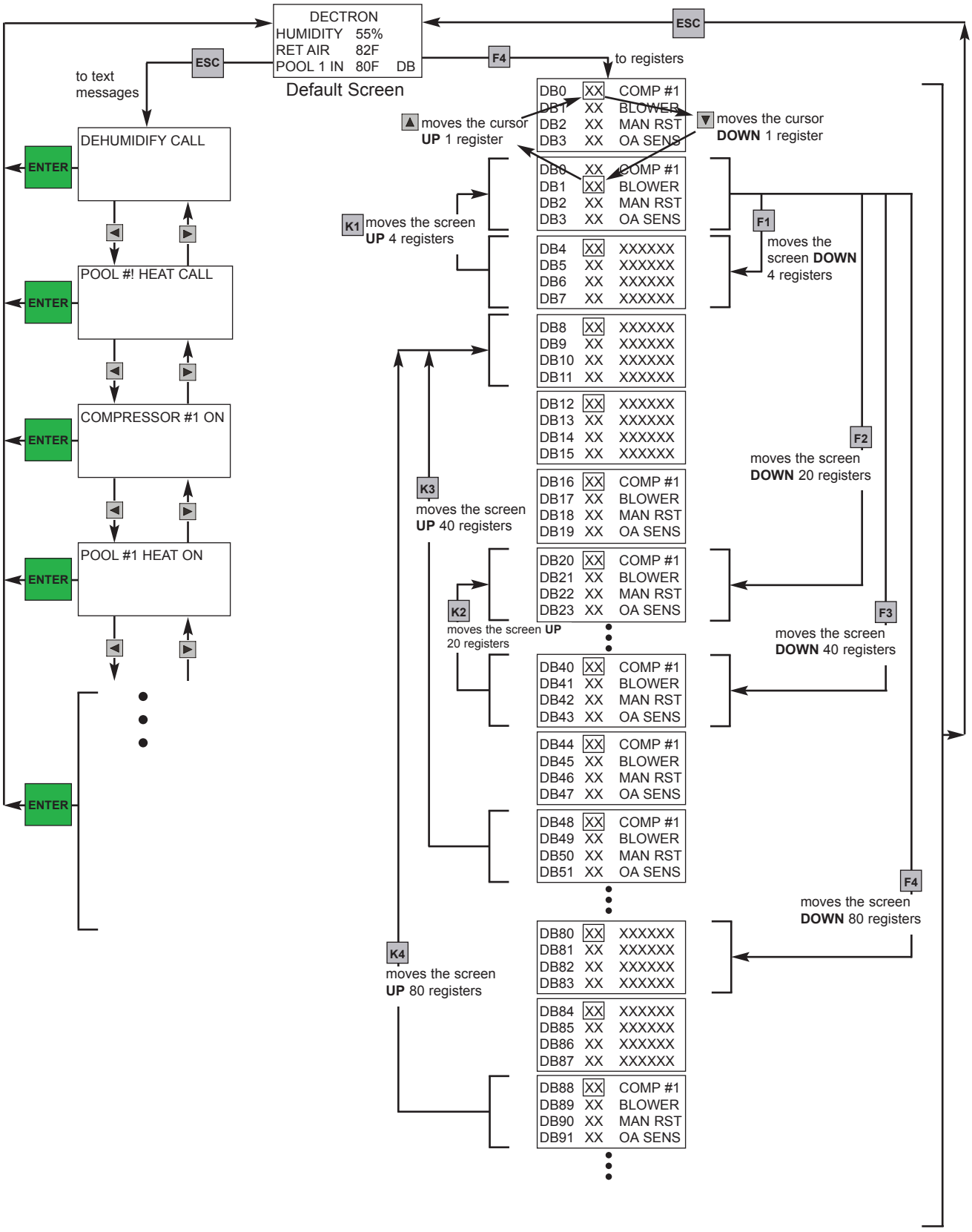
STOP **Do not start the compressor on a second refrigeration system until the startup procedures for the first refrigeration system have been completed. You will be instructed to return to this point.**

5. Enable compressor 2 (if any)

On the controller display, press F4 then ▲ or ▼ to move the cursor to the DB4 COMP #2 value.

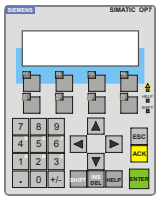
Press 1 to change the DB0 COMP #1 value to "1", then press ENTER. Compressor number 2 will start if there is a suitable demand.

STARTUP


DECTRON
HUMIDITY 55%
RET AIR 82F
POOL 1 IN 80F DB
Default Screen
ESC
F4
to registers
to text messages
DEHUMIDIFY CALL
POOL #! HEAT CALL
COMPRESSOR #1 ON
POOL #1 HEAT ON
ENTER
▲ moves the cursor UP 1 register
▼ moves the cursor DOWN 1 register
K1 moves the screen UP 4 registers
F1 moves the screen DOWN 4 registers
F2 moves the screen DOWN 20 registers
K3 moves the screen UP 40 registers
K2 moves the screen UP 20 registers
F3 moves the screen DOWN 40 registers
F4 moves the screen DOWN 80 registers
K4 moves the screen UP 80 registers
DB0 XX COMP #1
DB1 XX BLOWER
DB2 XX MAN RST
DB3 XX OA SENS
DB4 XX XXXXXX
DB5 XX XXXXXX
DB6 XX XXXXXX
DB7 XX XXXXXX
DB8 XX XXXXXX
DB9 XX XXXXXX
DB10 XX XXXXXX
DB11 XX XXXXXX
DB12 XX XXXXXX
DB13 XX XXXXXX
DB14 XX XXXXXX
DB15 XX XXXXXX
DB16 XX COMP #1
DB17 XX BLOWER
DB18 XX MAN RST
DB19 XX OA SENS
DB20 XX COMP #1
DB21 XX BLOWER
DB22 XX MAN RST
DB23 XX OA SENS
DB40 XX COMP #1
DB41 XX BLOWER
DB42 XX MAN RST
DB43 XX OA SENS
DB44 XX COMP #1
DB45 XX BLOWER
DB46 XX MAN RST
DB47 XX OA SENS
DB48 XX COMP #1
DB49 XX BLOWER
DB50 XX MAN RST
DB51 XX OA SENS
DB80 XX XXXXXX
DB81 XX XXXXXX
DB82 XX XXXXXX
DB83 XX XXXXXX
DB84 XX XXXXXX
DB85 XX XXXXXX
DB86 XX XXXXXX
DB87 XX XXXXXX
DB88 XX COMP #1
DB89 XX BLOWER
DB90 XX MAN RST
DB91 XX OA SENS

STARTUP

Present sensor readings are read by accessing the proper registers.



DECTRON
HUMIDITY 55%
RET AIR 82F
POOL 1 IN 80F DB

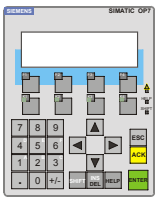
controller default screen

	Press	Display
Ex: To read the present **relative humidity** (assume 50%)	F4 then [F1 X 2]	DB8 XX OCCUP DB9 XX DB10 50 INT %RH DB11 82 RTRN AIR
Ex: To read the **return air temperature** (assume 82°F)	F4 then [F1 X 2]	
Ex: To read the **supply air temperature** (assume 65°F)	F4 then [F1 X 3]	DB12 65 SPLY AIR DB13 52 EVAP #1 DB14 81 EWT #1 DB15 93 LWT #1
Ex: To read **cooling coil #1 leaving air temperature** (assume 52°F)	F4 then [F1 X 3]	
Ex: To read the **entering pool #1 water temperature** (assume 81°F)	F4 then [F1 X 3]	
Ex: To read the **leaving pool #1 water temperature** (assume 93°F)	F4 then [F1 X 3]	
Ex: To read **compressor #1 discharge temperature** (assume 190°F)	F4 then [F1 X 4]	DB16 190 DISCH DB17 75 OUTDOOR DB18 98 EWT #2 DB19 108 LWT #2
Ex: To read the **outdoor air temperature** (optional) (assume 75°F)	F4 then [F1 X 4]	
Ex: To read the **entering pool #2 water temp.** (if any) (assume 98°F)	F4 then [F1 X 4]	
Ex: To read the **leaving pool #2 water temp.** (if any) (assume 108°F)	F4 then [F1 X 4]	
Ex: To read **cooling coil #2 leaving air temperature** (assume 51°F)	F4 then [F1 X 5]	DB20 51 EVAP #2 DB21 187 DISCH #2 DB22 XX XXXXX DB23 XX XXXXX
Ex: To read **compressor #2 discharge temperature** (assume 187°F)	F4 then [F1 X 5]	

K1 F1 ESC

STARTUP

Data subject to change without notice.



The design set points (as shown on the unit nameplate) are factory set. However, it may be necessary to temporarily change set points in order to operate the modes required by the startup procedure. Follow the procedure illustrated by the examples below to change set points.

The examples below are based on starting from the default screen in each case.

DECTRON		
HUMIDITY	55%	
RET AIR	82F	
POOL 1 IN	80F	DB

controller default screen

The set points are protected by a Set point Password, which is "1793". This password must be entered in register 7 before set points can be changed.

	PRESS	VALUE	DISPLAY	Enter Value
	F4 then F1 then [▼ X 3]	1 7 9 3	DB4 1 COMP #2 DB5 XX XXXXXXX DB6 XX XXXXXXX DB7 **1793** Password	ENTER
Example: To change the relative humidity set point to 57%	F4 then F3	5 7	DB40 **57** % RH SET DB41 XX RA SET DB42 XX PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the room air temperature set point to 86°F	F4 then F3 then ▼	8 6	DB40 57 % RH SET DB41 **86** RA SET DB42 XX PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the pool water temperature set point to 84°F	F4 then F3 then [▼ X 2]	8 4	DB40 57 % RH SET DB41 86 RA SET DB42 **84** PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the whirlpool water temperature set point to 102°F	F4 then F3 then [▼ X 3]	1 0 2	DB40 57 % RH SET DB41 86 RA SET DB42 84 PL1 SET DB43 **102** PL2 SET	ENTER
Example: To change the outdoor air ventilation changeover temperature set point to 64°F	F4 then F3 then F1	6 4	DB44 **64** OA SET DB45 XX SA SET DB46 XX XXXXXXX DB47 XX XXXXXXX	ENTER
Example: To change the supply air temperature set point to 125°F	F4 then F3 then F1 then ▼	1 2 5	DB44 64 OA SET DB45 **125** SA SET DB46 XX XXXXXXX DB47 XX XXXXXXX	ENTER
Clear the set point password.	F4 then F1 then [▼ X 3]	0	DB4 1 COMP #2 DB5 XX XXXXXXX DB6 XX XXXXXXX DB7 **0** Password	ENTER ESC

STARTUP

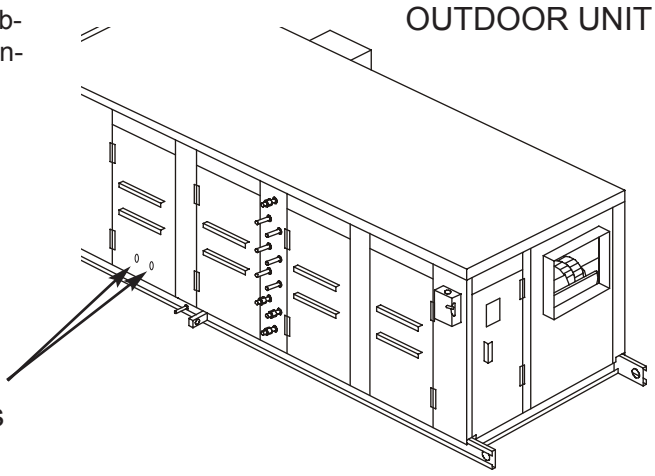
COMPLETE REFRIGERANT FILL

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

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

After the unit has been running in Dehumidification mode for 30 minutes, the refrigerant sight glass(es) should be full (no bubbles).

If this is not the case, first be sure that the liquid solenoid valve is not cycling. (See unit wiring diagram.) If the liquid line solenoid valve is cycling, reduce the adjustment of the associated refrigerant expansion valve(s). If the liquid line solenoid valve is not cycling but there are bubbles in the sight glass after 30 minutes of operation, contact Dectron.



Outdoor units (RS, RB) have sight glasses located behind transparent windows in access panels.

STARTUP

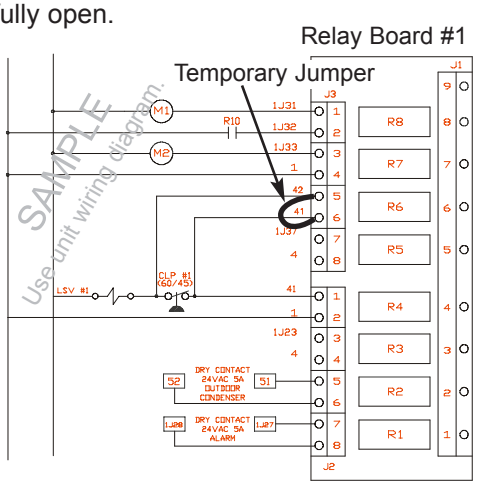
Startup TXV Adjustment OP-7

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

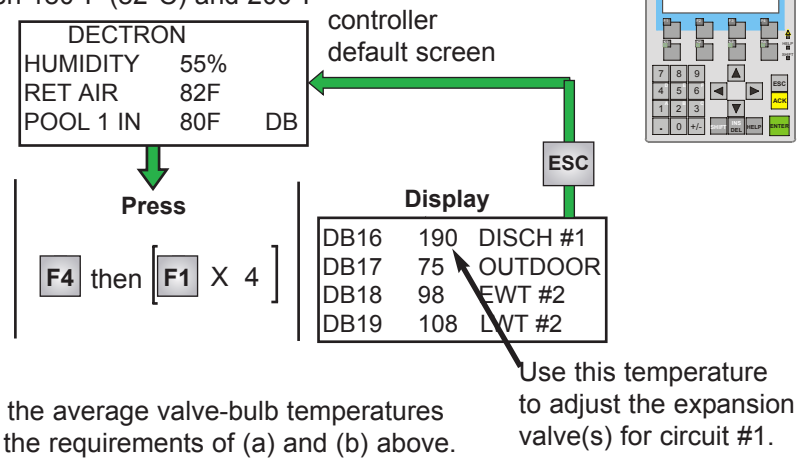
Do not attempt to adjust the expansion valve based on evaporator superheat.

Adjust circuit #1 expansion valve(s)-

1. 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 air flow has been adjusted to the value shown on the unit nameplate. (See **Product Description - Unit Nameplate**.
3. Be sure that the room temperature and relative humidity are at 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.
5. Close the access panels or doors.
6. In the unit control enclosure, place a temporary jumper between wire 41 and wire 42 (across the pressure switch labeled "CLP") (See unit wiring diagram.)



7. If the unit model number ends in "2", e.g. DS042, RB282, there will be two refrigeration circuits. Identify the expansion valve(s) associated with the first circuit.
8. Start the unit per the instructions given in **Startup - Enable Operation**.
9. If the unit does not operate in pool heating mode (status message POOL 1 HEAT ON, see **Operation - Controller Messages.**), then temporarily increase the pool water temperature set point by at least 5°F (3°C) to cause the unit to operate in full pool heating mode. (See **Startup - Adjust Set points**) The compressor should run.
10. 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.
11. Allow the unit to run in pool heating mode for at least 20 minutes, then read compressor #1 discharge temperature at controller register 16 as shown. This temperature should be between 180°F (82°C) and 200°F (93°C).
12. (a) If register 16 is below 180°F (82°C), close the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 16 is between 180°F (82°C) and 200°F (93°C).
    (b) If register 16 is above 200°F (93°C), open the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 16 is between 180°F (82°C) and 200°F (93°C).
    (c) For multiple expansion valves, try to keep the average valve-bulb temperatures as near the same as possible, while meeting the requirements of (a) and (b) above.



13. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment, then check to be sure DISCHARGE 1 TEMP is between 180°F (82°C) and 200°F (93°C).
14. Replace the expansion valve caps.
15. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
16. Remove the temporary jumper between wire 41 and wire 42.
17. Close the access panels or doors.
18. If the model number ends in "2", e.g. DS042, RB282, then go to the next page.

STARTUP

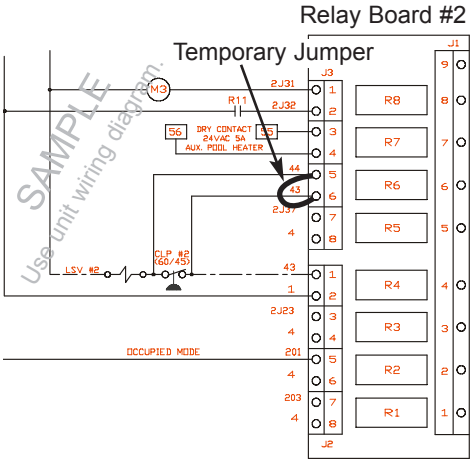
OP-7 TXV Adjustment Startup

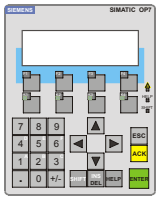
If the DRY-O-TRON® model number ends in 2, e.g. DS042, DS242, there will be two refrigeration systems. In this case return to **Startup - Enable Operation** and repeat the steps in the intervening pages for the second refrigeration system. The expansion valve(s) must be adjusted at startup, since airflow affects the evaporator loading. To obtain proper operation and long life, it is important to adjust the expansion valve(s) as described below.

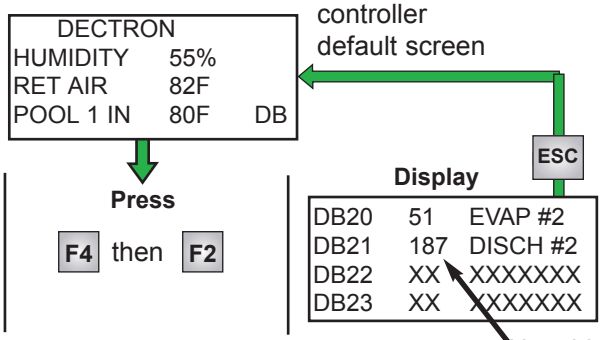
→ Do not attempt to adjust the expansion valve based on evaporator superheat. ←

Adjust circuit #2 expansion valve(s)-

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 air flow has been adjusted to the value shown on the unit nameplate. (See **Product Description - Unit Nameplate**.
3. Be sure that the room temperature and relative humidity are at 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.
5. Close the access panels or doors.
6. In the unit control enclosure, place a temporary jumper between wire 43 and wire 44 (across the pressure switch labeled "CLP #2") (See unit wiring diagram.)
7. Identify the expansion valve(s) associated with the second circuit.
8. Start the unit per the instructions given in **Startup - Enable Operation**.
9. If the unit does not operate in pool heating mode (status message POOL x HEAT ON, see **Operation - Controller Messages.**), then temporarily increase the pool water temperature set point by at least 5°F (3°C) to cause the unit to operate in full pool heating mode. (See **Startup - Adjust Set points**) The compressor should run.
10. 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.
11. Allow the unit to run in pool heating mode for at least 20 minutes, then read compressor #2 discharge tempera ture at controller register 21 as shown. This temperature should be between 180°F (82°C) and 200°F (93°C).
12. (a) If register 21 is below 180°F (82°C), close the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 21 is between 180°F (82°C) and 200°F (93°C).
    (b) If register 21 is above 200°F ((93°C), open the expansion valve(s) 1/2 turn at the time, allowing at least 15 minutes between adjustments, until register 21 is between 180°F (82°C) and 200°F (93°C).
    (c) For multiple expansion valves, try to keep the average valve-bulb temperatures as near the same as possible, while meeting the requirements of (a) and (b) above.
13. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment, then check to be sure register 21 is between 180°F (82°C) and 200°F (93°C).
14. Replace the expansion valve caps.
15. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
16. Remove the temporary jumper between wire 43 and wire 44.
17. Close the access panels or doors.







STARTUP

Startup — Adjust Flow Switches

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

Adjust the pool water pressure switches:

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

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

Units with water or fluid cooled condensers

Repeat the above steps for the condenser water flow rate and fluid flow switches. See the recommended flow rates in **Startup - Pre-Startup Adjustments.**

STARTUP

Flow rates are most easily set with the recommended flow meter (see **Installation - Piping**). If this is not possible, the flow rate can be set by waiting until the space and pool water are at design temperatures, then

1. Reduce the relative humidity set point to operate the unit in Dehumidification.
2. Increase the pool water temperature set point to operate the unit in Pool #1 Heating.
3. Wait at least 20 minutes.
4. Read the entering pool #1 water temperature (see **Startup - Read Sensors**).
5. Read the leaving pool #1 water temperature (see **Startup - Read Sensors**).
6. Subtract the entering pool #1 water temperature from the leaving pool #2 water temperature. The difference should be 12°F to 20°F. Adjust the water flow until this condition is reached.
7. Check the temperature difference again twenty minutes after the last adjustment to be sure it is stable.

Repeat steps 1 - 7 for a second pool (if any).

Adjustments

Startup

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).

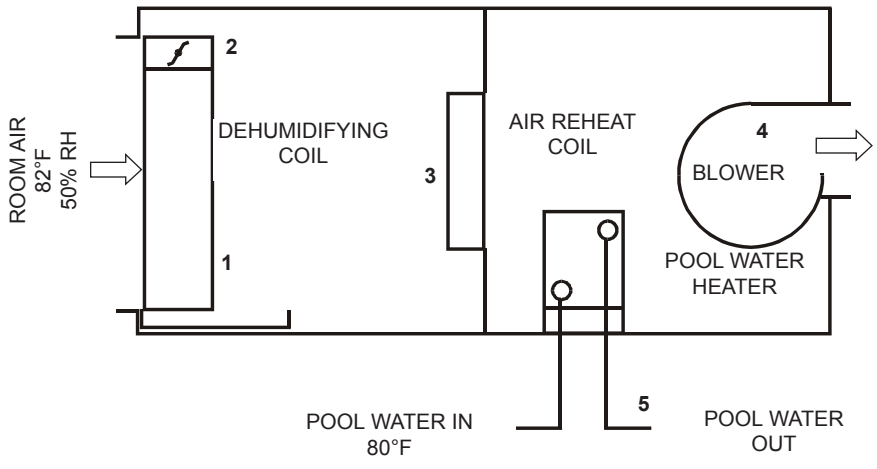
IMPORTANT!
After final adjustments are made, ensure that the Start-up Report and Warranty Registration form is completely filled in and a copy returned to the Dectron representative or the Dectron factory to register the warranty.

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	70	96

DRY-O-TRON® SIDE VIEW SECTION



STARTUP

Startup

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

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

In some cases Dectron may be able to provide Dectron personnel to supervise the startup procedure for a fee. In this case, the Dectron employee will travel to the site and supervise, guide, and assist the contractor in the start-up. The Dectron employee does not do the 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 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.

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, etc.

DRY-O-TRON® DS Series
Start-up Report & Warranty Registration

Warranty void unless completed and a copy returned to Dectron immediately after start-up!

Installation Name.....

Installation Address .....

Dectron Representative.....

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

Compressor Serial #.....Blower Belt Size.....

Electrical power	L1 - L2	L2 - L3	L1 - L3	Nameplate
Blower amperage				
Blower voltage				
Compressor amperage				
Compressor voltage				

Proper air distribution provided? (Section Installation - Air Distribution) your initials

Proper duct design provided? (Sec. Installation - Duct) your initials

Proper ventilation provided? (Sec. Installation - Ventilation) your initials

Vapor retardant installed properly? (Sec. Natatorium - Moisture Migration) your initials

NO chemicals in mechanical room? (Sec. Installation - Unpacking & Locating) your initials

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

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

Flexible duct installed at inlet and outlet of DRY-O-TRON®? (Sec. Installation - Duct) your initials

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

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

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

Pool water piping installed properly? (Sec. Installation - Piping - Pool Water) your initials

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

Remote condenser installed properly? (See condenser manual) your initials

Operator panel installed properly? (Sec. Installation - Wiring - Control Signals - Remote Display) your initials

Outdoor temperature sensor (if any) installed properly? (Installation - Field Wiring Diagram) your initials

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

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

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

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

Refrigerant charge OK? your initials

No fault codes are displayed on operator panel? your initials

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

Bypass damper open if room temp > 78°F? your initials

Air flow.....cfm

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

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

Data subject to change without notice.

DRY-O-TRON® DS Series
Start-up Report & Warranty Registration

Warranty void unless completed and a copy returned to Dectron immediately after start-up!

Operational Data

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

For 2 compressor units		Pool Heating	Dehumidification	Whirlpool Heating	A/C Only	A/C & Pool Heating	A/C & Whirlpool Heating
Entering Air Temperature	°F						
Leaving Air Temperature	°F						
Entering Water Temperature	°F						
Leaving Water Temperature	°F						
Pool Heater Water Flow	GPM						
Whirlpool Heater Water Flow	GPM						
Room Relative Humidity	%						
Condenser Pressure	PSIG						
Suction Pressure	PSIG						
Oil Pressure	PSIG						
Sight Glass Clear?	Y/N						
TX Valve Bulb Temperature	°F						
Compressor Discharge Temp.	°F						
Air Leaving Cooling Coil Temp.	°F						

STARTUP

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

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

Company Name .....

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

Data subject to change without notice.

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:

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

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

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

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

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

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

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

Warranty

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

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

[1]Does not cover labor costs.

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

[2]Does not cover labor costs.

Optional Delayed Start-Up Warranty
Under this warranty upon expiry of the initial 30-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. This extended warranty must be purchased before shipment of the unit.

U.S.A
DECTRON INC.
10935 Crabapple Road
Suite 202A
Roswell, GA 30075-5827
Tel.: 770-649-0102 or
1-800-676-2566
Fax: 770-649-0243

CANADA
DECTRON INC.
4300 Poirier Boulevard
Montreal, QC.
H4R 2C5
Tel.: 514-334-9609 or
1-800-667-6338 or
1-888-DECTRON
Fax: 514-334-9184

Contents

Operation

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

Every Month

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 the letter "B" in the model number 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.
- **Do not operate the unit for any amount of time without all filters in place.**

Check the blower belt

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

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

For units with air cooled air conditioning, check that the remote condenser is clean.

- Clean any trash or leaves that might interfere with proper air flow.

For indoor units-

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

Every Six Months

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

Check the compressor discharge temperature. See Startup - Adjustments - Adjust Refrigerant Expansion Valve(s).

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

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

Every Twelve Months

Check for blower bearing wear.

Grease the blower bearings.

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

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

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

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

Every Three Years

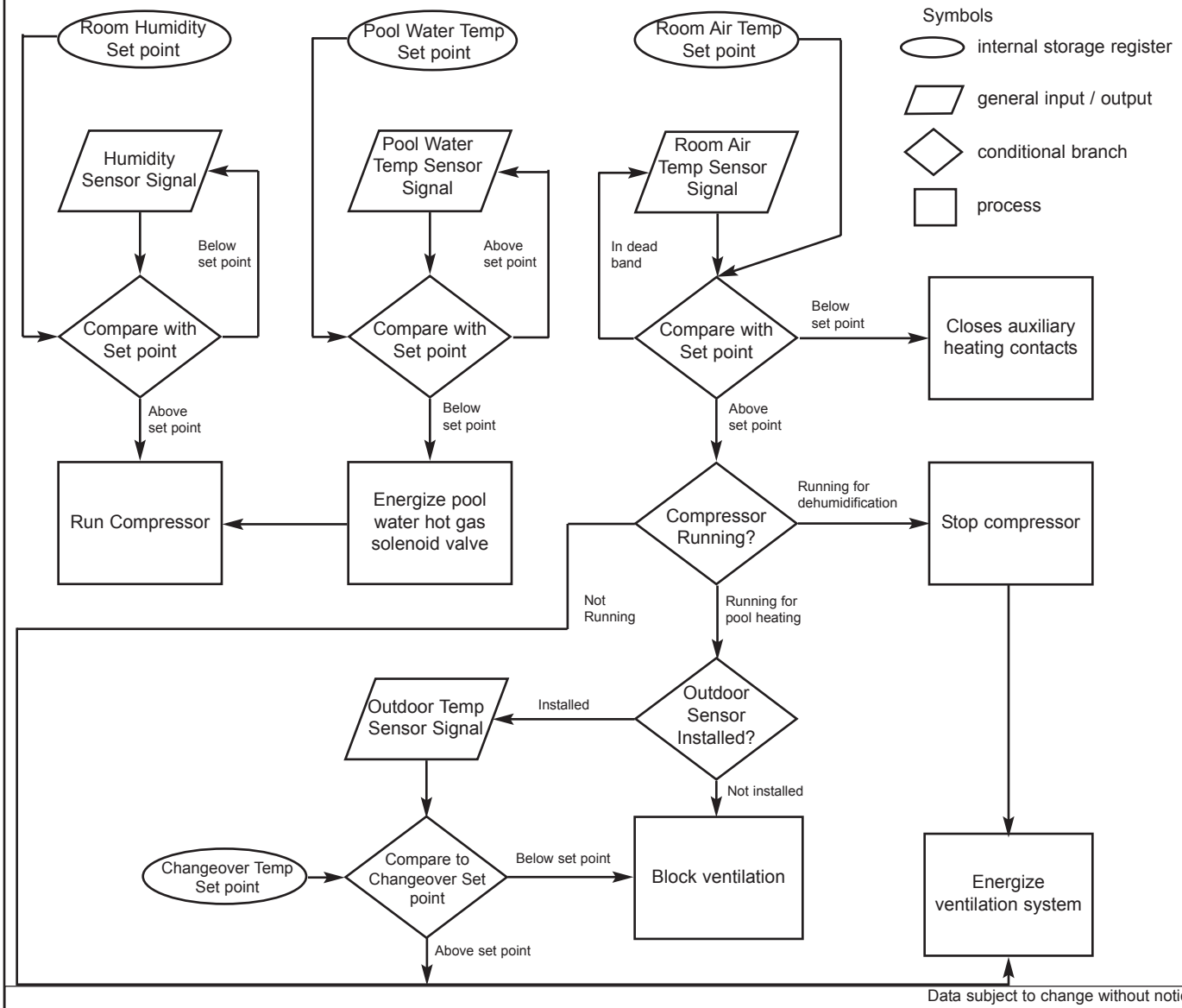
Replace controller battery. See section "Operation - Dotics-9 Controller".

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

OPERATION

W/O Air Conditioning Logical Flowchart 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.



OPERATION

Data subject to change without notice.

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.

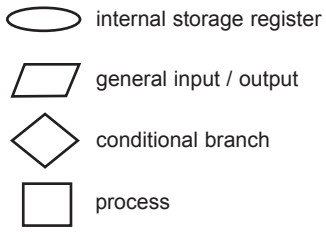
Δ Pool Water Heating

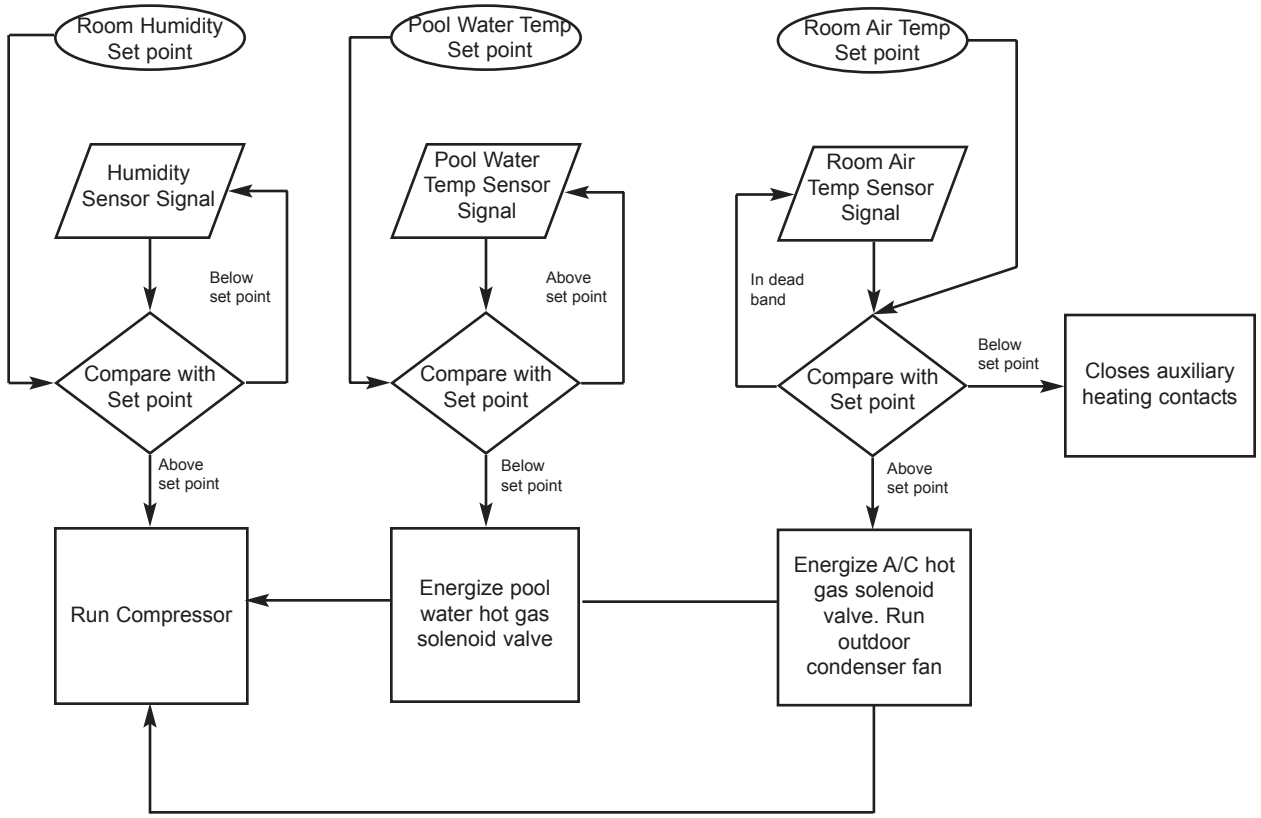
Pool water temperature is maintained by minimum and maximum water heating modes. On a call for pool water heating, the pool water hot gas solenoid valve is energized. The DRY-O-TRON® operates in maximum water heating mode.

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





OPERATION

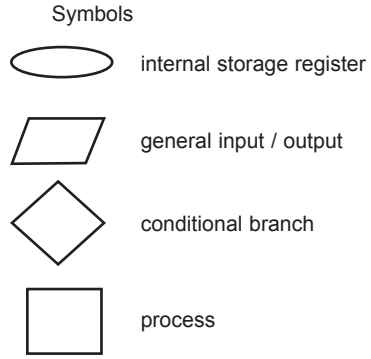
A/C and Aux. Pool Heater Logical Flow Chart Operation

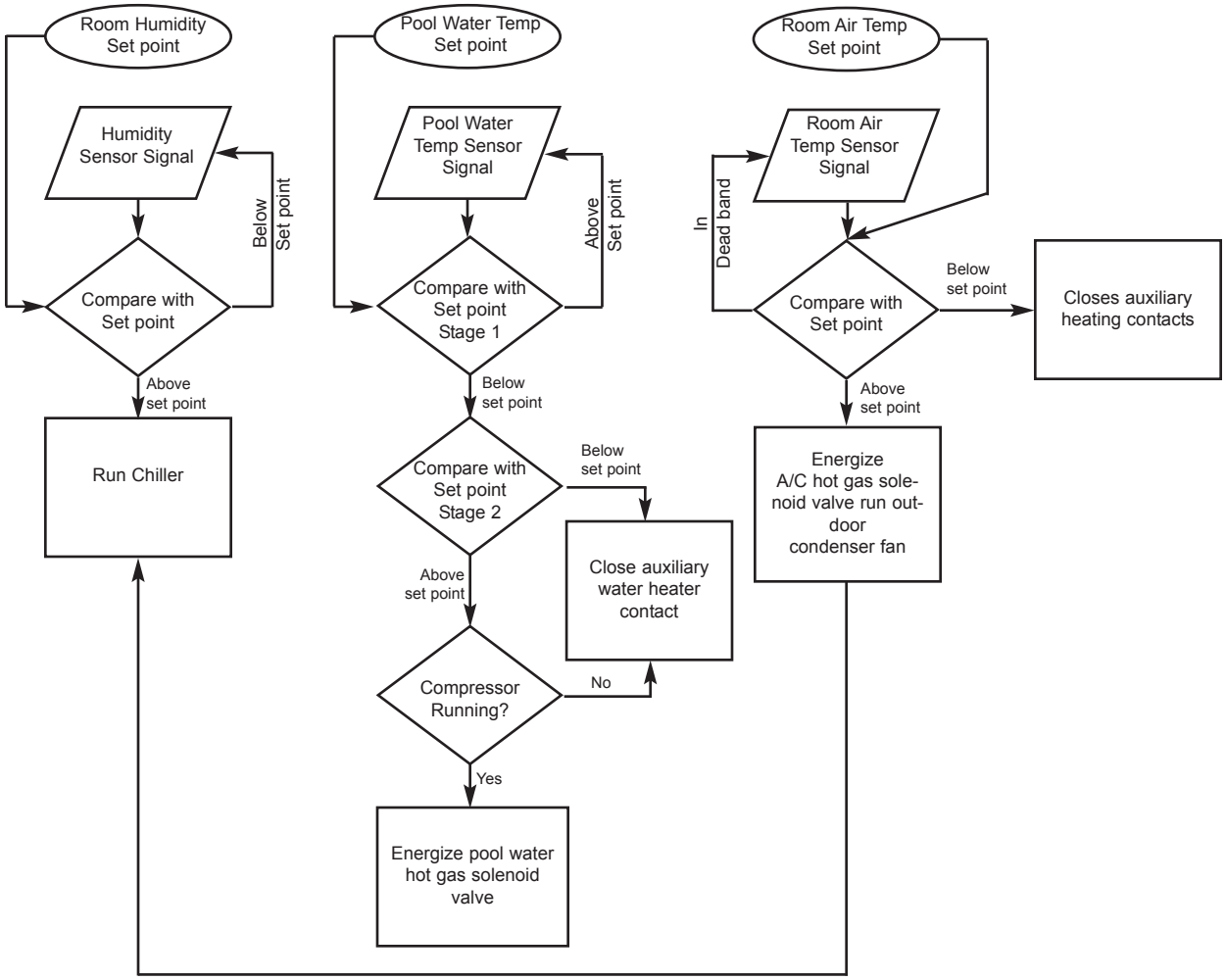
Δ Dehumidification
On a call for dehumidification only, the DRY-O-TRON® operates in minimum water heating mode.

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.

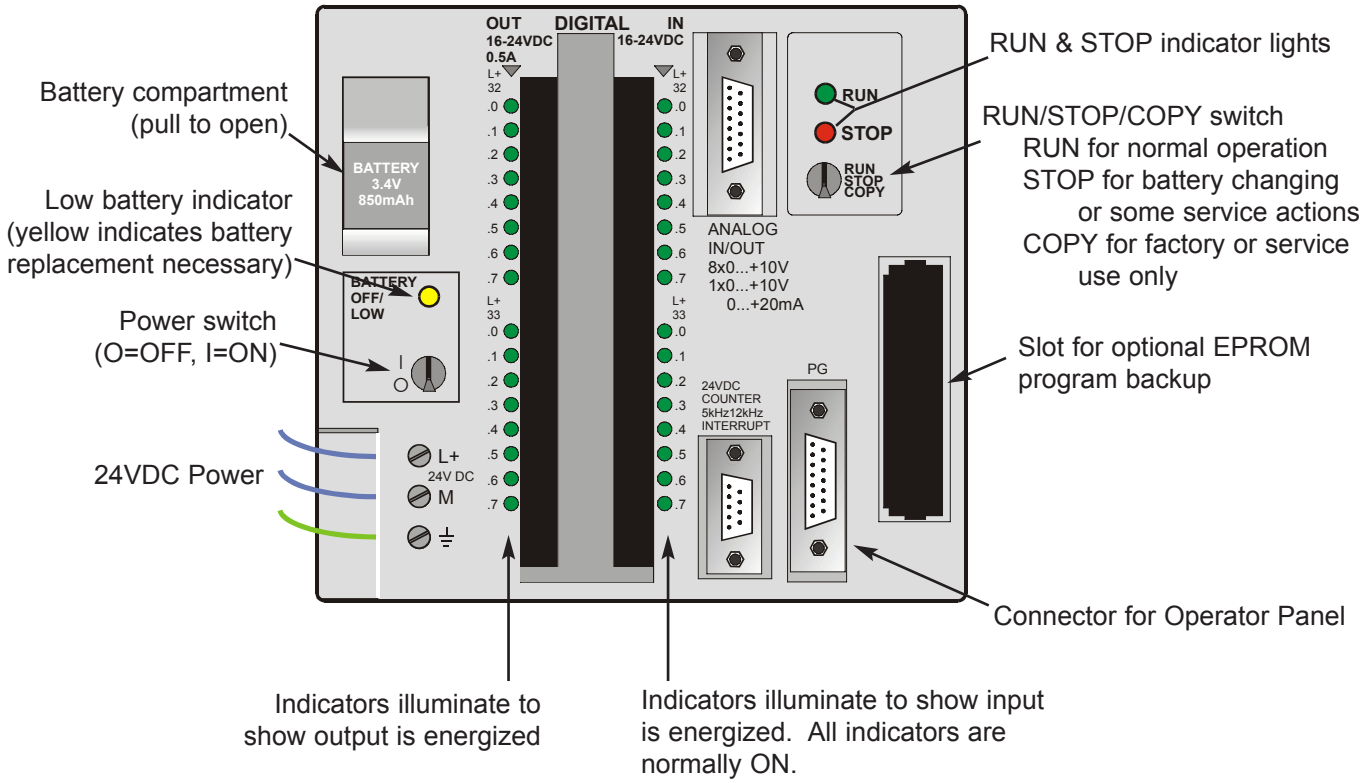




OPERATION

DOTICS - 9 controller

located in electrical enclosure



OPERATION

IMPORTANT!

DO NOT remove the battery from the controller when the power is turned off or the program will be erased.

Δ Changing the Battery

If the power fails or the controller is switched off, the program is maintained by battery power. Replace the battery every three years or whenever the message "REPLACE BATTERY!" appears on the display and the yellow low battery warning light is illuminated on the controller in the electrical cabinet.

IMPORTANT!

Remove and replace the battery while the power is turned on!

After replacing the battery, move the "RUN/STOP" switch to the "STOP" position briefly, then back to the "RUN" position. This will clear the "REPLACE BATTERY" message.

Replacement battery should be SAFT Lithium 3.5V LS-3 or equivalent.

WARNING!

Do not charge lithium batteries. They could explode. Dispose of used batteries properly.

Δ On/Off and Run/Stop Switches

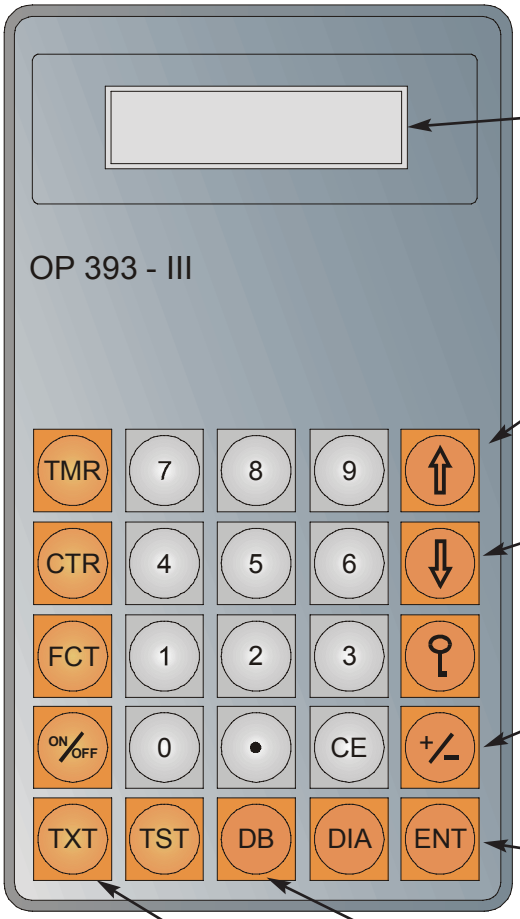
The on/off switch controls power to the microprocessor and should be left in the "ON" position for normal operation.

The run/stop switch can be used to halt operation for service purposes. It should be left in the "RUN" position for normal operation.

The DOTICS-9 controller display may be mounted on the unit, in a remote location (optional), or two displays (optional) may be used.

Status messages are accessible in the default TEXT mode, which is started by pressing TXT. Text mode will be automatically started after a time delay.

Status and control values are stored in registers, which are addressable memory locations. These registers are accessible in REGISTER ACCESS mode, which is begun by pressing DB as shown below.



Two-line LCD display

scrolls upward through status messages in TXT mode, and upward through register addresses in REGISTER ACCESS mode.

scrolls downward through status messages in TXT mode, and downward through register addresses in REGISTER ACCESS mode.

changes the sign of number constants in control registers. This is usually for indicating to the controller that a number is negative.

is used in REGISTER ACCESS mode. It indicates the end of a register address or the end of a number entered into a register.

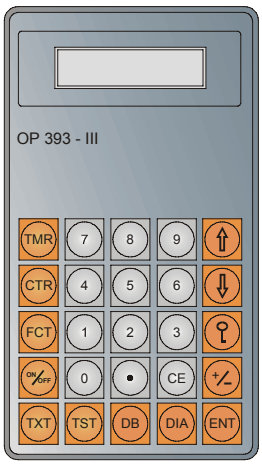
starts the REGISTER ACCESS mode, in which the display shows the contents of status and control registers.

starts the TEXT mode, in which the display shows status messages.

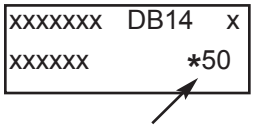
OPERATION

Startup Set point Adjustment OP-393

The design set points (as shown on the unit nameplate) are factory set. However, it may be necessary to temporarily change set points in order to operate the modes required by the startup procedure. Follow the procedure illustrated by the examples below to change set points.



If the message "*50" appears, it indicates that a dis-allowed input has been entered. Try again, pressing the buttons carefully.

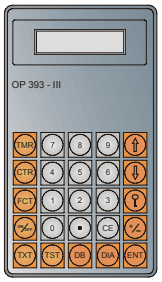


The set points are protected by a Set point Password, which is available from Dectron. This password must be entered in register 7 before set points can be changed.

	Start register access mode	Address	End Address	Value	End Value
	DB	then 7	then ENT	then 1 then 7 then 9 then 3	then ENT
Example: To change the relative humidity set point to 57%	DB	then 4 then 0	then ENT	then 5 then 7	then ENT
Example: To change the room air temperature set point to 86°F	DB	then 4 then 1	then ENT	then 8 then 6	then ENT
Example: To change the pool water temperature set point to 84°F	DB	then 4 then 2	then ENT	then 8 then 4	then ENT
Example: To change the whirlpool water temperature set point to 102°F	DB	then 4 then 3	then ENT	then 1 then 0 then 2	then ENT
Example: To change the outdoor air ventilation changeover temperature set point to 64°F	DB	then 4 then 4	then ENT	then 6 then 4	then ENT
Example: To change the supply air temperature set point to 125°F	DB	then 4 then 5	then ENT	then 1 then 2 then 5	then ENT
Clear the set point password.	DB	7 then	ENT	then 0	then ENT

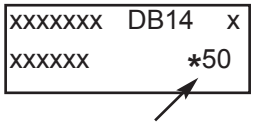
OPERATION

OP-393 Read Sensors Startup



Present sensor readings are read by accessing the proper registers. After entering the register address and concluding it with (ENT), the present reading is immediately displayed.

If the message "*50" appears, it indicates that a dis-allowed input has been entered. Try again, pressing the buttons carefully.



Present reading

	Start register access mode	Address	End Address	Display
Ex: To read the present relative humidity (assume 50%)	DB	then 1 then 0 then ENT		+00050 DB14 10 +00050
Ex: To read the return air temperature (assume 82°F)	DB	then 1 then 1 then ENT		+00082 DB14 11 +00082
Ex: To read the supply air temperature (assume 65°F)	DB	then 1 then 2 then ENT		+00065 DB14 12 +00065
Ex: To read cooling coil #1 leaving air temperature (assume 52°F)	DB	then 1 then 3 then ENT		+00052 DB14 13 +00052
Ex: To read cooling coil #2 leaving air temperature (assume 51°F)	DB	then 2 then 0 then ENT		+00051 DB14 20 +00051
Ex: To read the entering pool #1 water temperature (assume 81°F)	DB	then 1 then 4 then ENT		+00081 DB14 14 +00081
Ex: To read the leaving pool #1 water temperature (assume 93°F)	DB	then 1 then 5 then ENT		+00093 DB14 15 +00093
Ex: To read the entering pool #2 water temp. (if any) (assume 98°F)	DB	then 1 then 8 then ENT		+00098 DB14 18 +00098
Ex: To read the leaving pool #2 water temp. (if any) (assume 108°F)	DB	then 1 then 9 then ENT		+00108 DB14 19 +00108
Ex: To read the outdoor air temperature (optional) (assume 75°F)	DB	then 1 then 7 then ENT		+00075 DB14 17 +00075
Ex: To read the compressor #1 discharge temperature (assume 185°F)	DB	then 1 then 6 then ENT		+00185 DB14 16 +00075
Ex: To read the compressor #2 discharge temperature (assume 190°F)	DB	then 2 then 1 then ENT		+00190 DB14 21 +00075

OPERATION

When equipped with an OP-393 interface, the DOTICS controller defaults to the display of status messages. If desired, messages can be displayed at any time by pressing TXT.

The screen can only display one message at a time. To view any other messages, scroll through the messages by pressing ⇩ or ⇧ .

DEMAND MESSAGES

DEHUMIDIFY CALL	The relative humidity is above set point.
POOL #1 HEAT CALL	The temperature of pool #1 is above set point.
POOL #2 HEAT CALL	The temperature of pool #2 is above set point.
COOLING CALL	The space temperature is above set point.
AIR HEATING CALL	The space temperature is below set point.

OPERATING MODE MESSAGES

DEHUMIDIFY ON	The refrigeration system is ON to dehumidify the air.
POOL #1 HEAT ON	Heat is being added to the water of pool #1.
POOL #2 HEAT ON	Heat is being added to the water of pool #2.
A/C ON	The cooling system is ON. Heat is not being returned to the room air.
AIR HEATING ON	Heat is being returned to the room air.
VENTILATION ON	The ventilation system is enabled.
AUX AIR HEAT ST1	The first stage space heater is enabled.
AUX AIR HEAT ST2	The second stage space heater is enabled.
AUX AIR HEAT ST3	The third stage space heater is enabled.
AUX AIR HEAT ST4	The fourth stage space heater is enabled.

OTHER STATUS MESSAGES

BLOWER OFF	The blower has been turned OFF by manual input.
UNIT REMOTE OFF	The unit has been turned OFF by the remote input (if any).
SERVICE MODE ON	The service password is still in the password register. Enter "0" before leaving.
OCCUPIED PERIOD	The clock input indicates the present time period is for human occupation of the space.
PLEASE WAIT	The controller is analyzing a problem. This may require up to 45 minutes. If the problem disappears, normal operation will resume. See **Operation - Diagnostics**. If the problem persists, an ALARM MESSAGE will be displayed. Consult a Dectron certified technician.

OPERATION

When equipped with an OP-393 interface, the DOTICS controller defaults to the display of status messages. If desired, messages can be displayed at any time by pressing (TXT).

The screen can only display one message at a time. To view any other messages, scroll through the messages by pressing (⇩) or (⇧) .

SENSOR PROBLEMS (An open circuit displays "-50°F. A short circuit displays "250°F.

OUTDR AIR SENSOR	There is a problem with the circuit of the outdoor air sensor.
LWT #1 SENSOR	There is a problem with the circuit of the pool #1 leaving water temperature sensor.
EWT #1 SENSOR	There is a problem with the circuit of the pool #1 entering water temperature sensor.
SPLY AIR SENSOR	There is a problem with the circuit of the supply air temperature sensor.
RTRN AIR SENSOR	There is a problem with the circuit of the return air temperature sensor.
HUMIDITY SENSOR	There is a problem with the circuit of the humidity sensor.
EVAP #2 SENSOR	There is a problem with the circuit of cooling coil #2 temperature sensor.
LWT #2 SENSOR	There is a problem with the circuit of the pool #2 leaving water temperature sensor.
EWT #2 SENSOR	There is a problem with the circuit of the pool #1 entering water temperature sensor.
DISCHG #1 SENSOR	There is a problem with the circuit of the compressor #1 discharge temperature sensor.
DISCHG #2 SENSOR	There is a problem with the circuit of the compressor #2 discharge temperature sensor.

ALARM MESSAGES

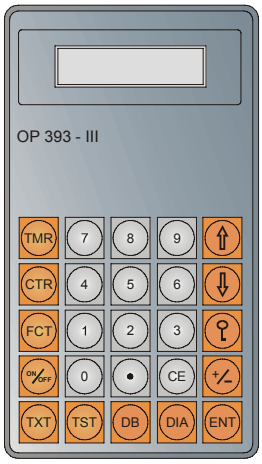
LOW WATER FLOW #1	The water flow rate from pool #1 is below set point.
LOW WATER FLOW #2	The water flow rate from pool #2 is below set point.
BLOWER OVERLOAD	The blower motor overload relay has tripped.
EVAP #1 TOO COLD	The temperature of the air leaving cooling coil #1 is too low.
EVAP #2 TOO COLD	The temperature of the air leaving cooling coil #2 is too low.
EVAP #1 TOO HOT	The temperature of the air leaving cooling coil #1 is too high.
EVAP #2 TOO HOT	The temperature of the air leaving cooling coil #2 is too high.
LWT #1 TOO HOT	The temperature of the water returning to pool #1 has exceeded 120°F.
LWT #2 TOO HOT	The temperature of the water returning to pool #2 has exceeded 120°F.
FIRESTAT ON	There is an alarm signal from the fire/smoke alarm (if any, by others).
FREEZESTAT ON	The heating coil temperature is much too low.
POWER FAILURE	The branch circuit voltage monitor has detected voltage that is too high, too low, missing a phase, or has reversed phase sequence.
MANUAL RST REQ'D	The controller has stopped for a reason that requires human intervention. see Operation - Start, Stop, Reset.
REPLACE BATTERY	The memory backup battery voltage is too low.
A/C LOW WATER	The air conditioning condenser cooling water flow rate is below set point.
LOW AIR FLOW	The return air flow rate is too low. Replace filters or correct any other flow problems.

OPERATION

Operation Start, Stop, Reset OP-393

Major components of the DRY-O-TRON® can be started and stopped by entering the correct values in the blower control register. See the chart below.

Some alarms require human intervention. In these cases, the controller will display the text message "MANUAL RST REQ'D". The controller must be told when the fault has been corrected by forcing a manual reset. See the chart below.



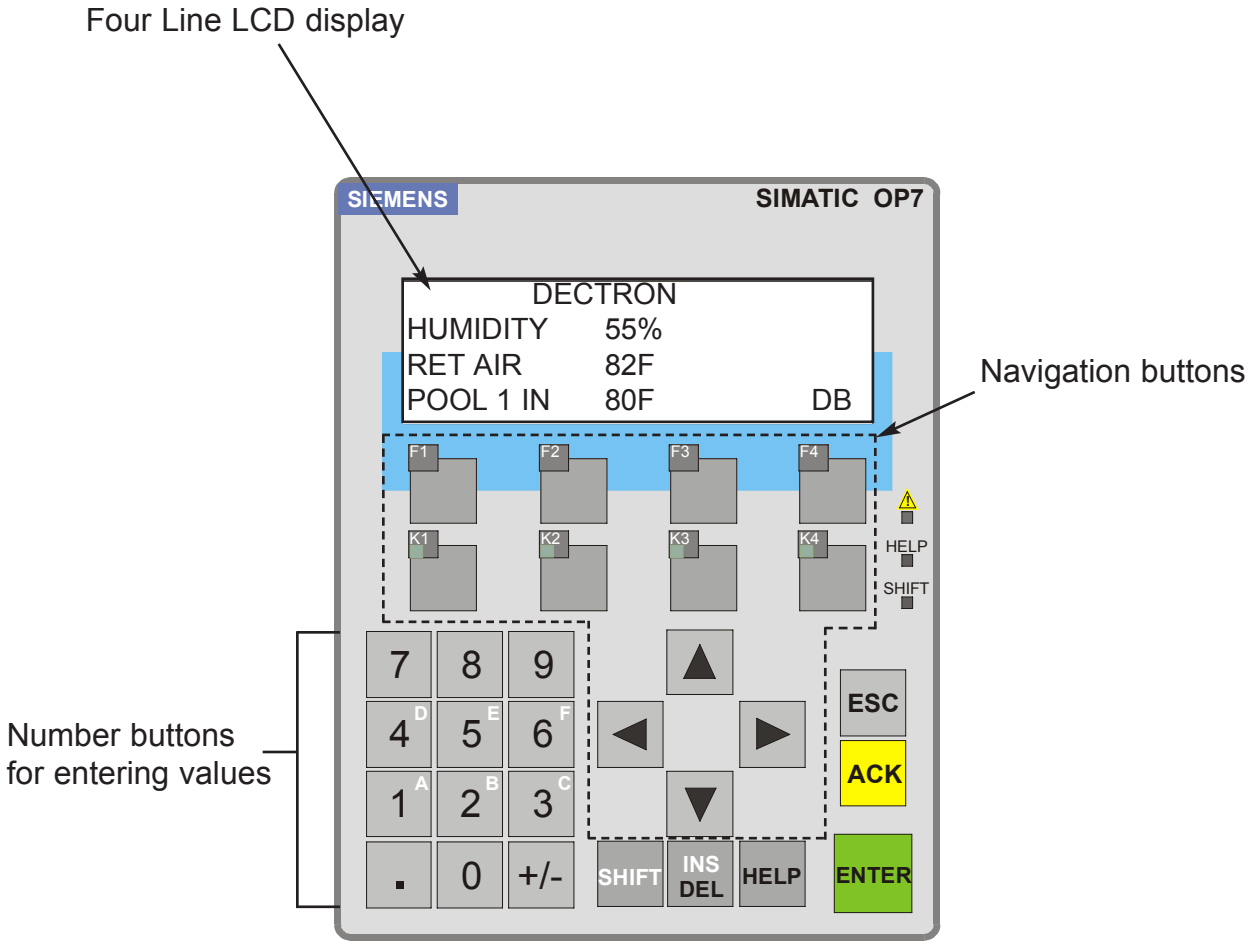
	Start register access mode	Address	End Address	Value	End Value
To **enable the blower**, press	DB	then 1 then	ENT	then 1 then	ENT
To **disable the blower**, press	DB	then 1 then	ENT	then 0 then	ENT
To **enable compressor #1**, press	DB	then 0 then	ENT	then 1 then	ENT
To **disable compressor #1**, press	DB	then 0 then	ENT	then 0 then	ENT
To **enable compressor #2 (if any)**, press	DB	then 4 then	ENT	then 1 then	ENT
To **disable compressor #2 (if any),** press	DB	then 4 then	ENT	then 0 then	ENT
To force a **manual reset**, press	DB	then 2 then	ENT	then 1 then	ENT

NOTE: Even though the number 1 is entered into the reset control register, the register value will immediately revert to 0. This is normal.

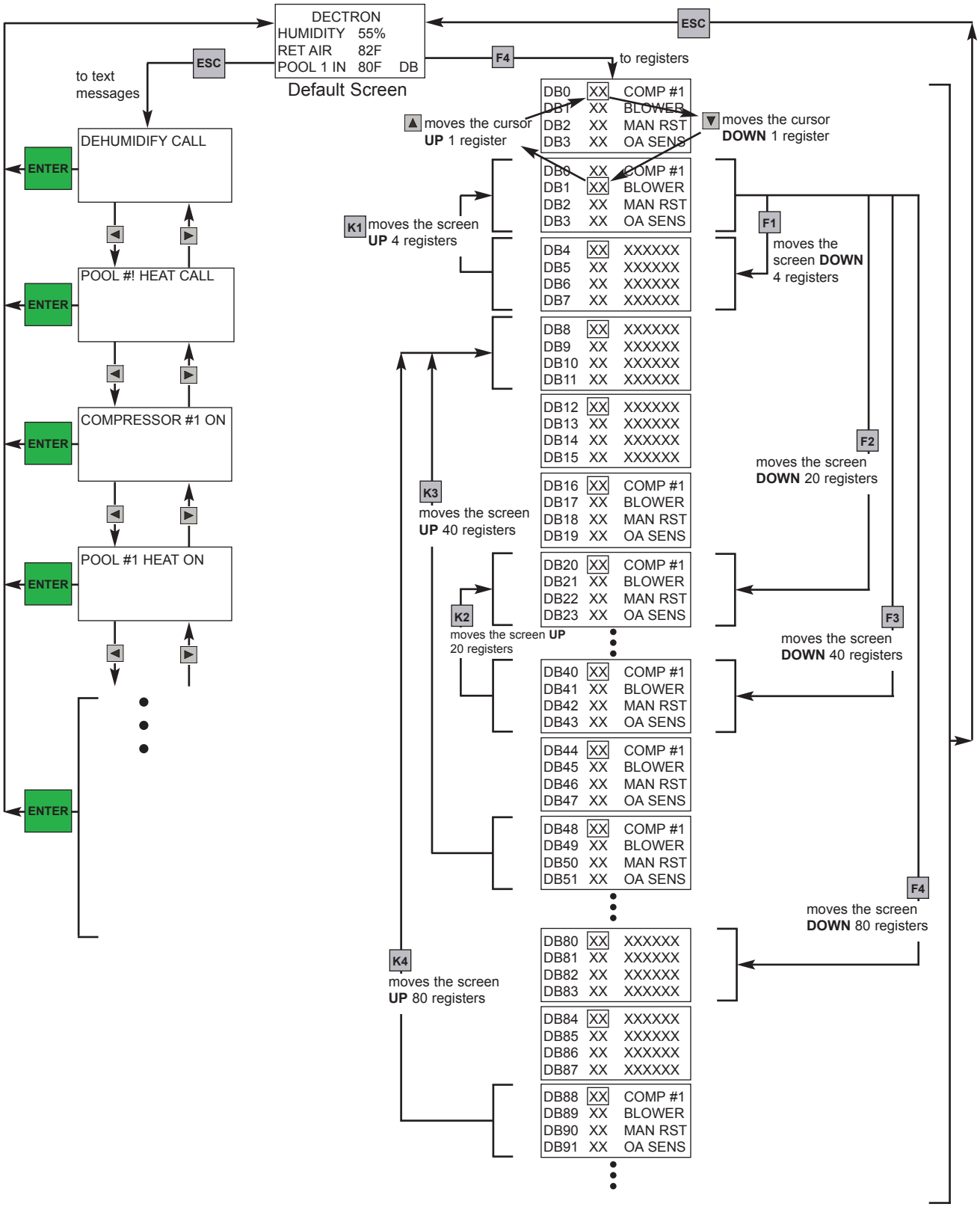
OPERATION

The Dotics-9 controller communicates via an interface as shown below. Text messages for status and any possible alarms, as well as configuration settings, set points, temperatures, etc., are all accessed through the interface.

Set points and temperatures are contained in memory registers labeled "DBxxx", where "xxx" is a numerical register address. Navigation through these registers is detailed in the next pages.



OPERATION


DECTRON
HUMIDITY 55%
RET AIR 82F
POOL 1 IN 80F DB
Default Screen
ESC
F4
to registers
to text messages
DEHUMIDIFY CALL
POOL #! HEAT CALL
COMPRESSOR #1 ON
POOL #1 HEAT ON
ENTER
▲ moves the cursor UP 1 register
▼ moves the cursor DOWN 1 register
K1 moves the screen UP 4 registers
F1 moves the screen DOWN 4 registers
F2 moves the screen DOWN 20 registers
K3 moves the screen UP 40 registers
K2 moves the screen UP 20 registers
F3 moves the screen DOWN 40 registers
F4 moves the screen DOWN 80 registers
K4 moves the screen UP 80 registers
DB0 XX COMP #1
DB1 XX BLOWER
DB2 XX MAN RST
DB3 XX OA SENS
DB4 XX XXXXXX
DB5 XX XXXXXX
DB6 XX XXXXXX
DB7 XX XXXXXX
DB8 XX XXXXXX
DB9 XX XXXXXX
DB10 XX XXXXXX
DB11 XX XXXXXX
DB12 XX XXXXXX
DB13 XX XXXXXX
DB14 XX XXXXXX
DB15 XX XXXXXX
DB16 XX COMP #1
DB17 XX BLOWER
DB18 XX MAN RST
DB19 XX OA SENS
DB20 XX COMP #1
DB21 XX BLOWER
DB22 XX MAN RST
DB23 XX OA SENS
DB40 XX COMP #1
DB41 XX BLOWER
DB42 XX MAN RST
DB43 XX OA SENS
DB44 XX COMP #1
DB45 XX BLOWER
DB46 XX MAN RST
DB47 XX OA SENS
DB48 XX COMP #1
DB49 XX BLOWER
DB50 XX MAN RST
DB51 XX OA SENS
DB80 XX XXXXXX
DB81 XX XXXXXX
DB82 XX XXXXXX
DB83 XX XXXXXX
DB84 XX XXXXXX
DB85 XX XXXXXX
DB86 XX XXXXXX
DB87 XX XXXXXX
DB88 XX COMP #1
DB89 XX BLOWER
DB90 XX MAN RST
DB91 XX OA SENS

OPERATION

The Dotics controller has text mode to display status messages. To display status messages, press ESC. There may be several status messages. To view all the messages one message at a time, press ◀ or ▶. To return to the default screen press ENTER.

DEMAND MESSAGES

DEHUMIDIFY CALL	The relative humidity is above set point.
POOL #1 HEAT CALL	The temperature of pool #1 is above set point.
POOL #2 HEAT CALL	The temperature of pool #2 is above set point.
COOLING CALL	The space temperature is above set point.
AIR HEATING CALL	The space temperature is below set point.

OPERATING MODE MESSAGES

DEHUMIDIFY ON	The refrigeration system is ON to dehumidify the air.
POOL #1 HEAT ON	Heat is being added to the water of pool #1.
POOL #2 HEAT ON	Heat is being added to the water of pool #2.
A/C ON	The cooling system is ON. Heat is not being returned to the room air.
AIR HEATING ON	Heat is being returned to the room air.
VENTILATION ON	The ventilation system is enabled.
AUX AIR HEAT ST1	The first stage space heater is enabled.
AUX AIR HEAT ST2	The second stage space heater is enabled.
AUX AIR HEAT ST3	The third stage space heater is enabled.
AUX AIR HEAT ST4	The fourth stage space heater is enabled.

OTHER STATUS MESSAGES

BLOWER OFF	The blower has been turned OFF by manual input.
UNIT REMOTE OFF	The unit has been turned OFF by the remote input (if any).
SERVICE MODE ON	The service password is still in the password register. Enter "0" before leaving.
OCCUPIED PERIOD	The clock input indicates the present time period is for human occupation of the space.
PLEASE WAIT	The controller is analyzing a problem. This may require up to 45 minutes. If the problem disappears, normal operation will resume. See **Operation - Diagnostics**. If the problem persists, an ALARM MESSAGE will be displayed. Consult a Dectron certified technician.

OPERATION

The Dotics controller has text mode to display status messages. To display status messages, press ESC. There may be several status messages. To view all the messages one message at a time, press ◀ or ▶. To return to the default screen press ENTER.

SENSOR PROBLEMS (An open circuit displays "-50°F". A short circuit displays "250°F".

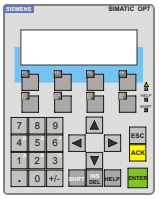
DISCHG #1 SENSOR	There is a problem with the circuit of the compressor #1 discharge temperature sensor.
DISCHG #2 SENSOR	There is a problem with the circuit of the compressor #2 discharge temperature sensor.
EVAP #2 SENSOR	There is a problem with the circuit of cooling coil #2 temperature sensor.
EWT #1 SENSOR	There is a problem with the circuit of the pool #1 entering water temperature sensor.
EWT #2 SENSOR	There is a problem with the circuit of the pool #1 entering water temperature sensor.
HUMIDITY SENSOR	There is a problem with the circuit of the humidity sensor.
LWT #1 SENSOR	There is a problem with the circuit of the pool #1 leaving water temperature sensor.
LWT #2 SENSOR	There is a problem with the circuit of the pool #2 leaving water temperature sensor.
OUTDR AIR SENSOR	There is a problem with the circuit of the outdoor air sensor.
SPLY AIR SENSOR	There is a problem with the circuit of the supply air temperature sensor.
RTRN AIR SENSOR	There is a problem with the circuit of the return air temperature sensor.

ALARM MESSAGES

A/C LOW WATER	The air conditioning condenser cooling water flow rate is below set point.
BLOWER OVERLOAD	The blower motor overload relay has tripped.
EVAP #1 TOO COLD	The temperature of the air leaving cooling coil #1 is too low.
EVAP #2 TOO COLD	The temperature of the air leaving cooling coil #2 is too low.
EVAP #1 TOO HOT	The temperature of the air leaving cooling coil #1 is too high.
EVAP #2 TOO HOT	The temperature of the air leaving cooling coil #2 is too high.
FIRESTAT ON	There is an alarm signal from the fire/smoke alarm (if any, by others).
FREEZESTAT ON	The heating coil temperature is much too low.
LOW AIR FLOW	The return air flow rate is too low. Replace filters or correct any other flow problems.
LOW WATER FLOW #1	The water flow rate from pool #1 is below set point.
LOW WATER FLOW #2	The water flow rate from pool #2 is below set point.
LWT #1 TOO HOT	The temperature of the water returning to pool #1 has exceeded 120°F.
LWT #2 TOO HOT	The temperature of the water returning to pool #2 has exceeded 120°F.
MANUAL RST REQ'D	The controller has stopped for a reason that requires human intervention. see Operation - Start, Stop, Reset.
PLEASE WAIT	There is a high pressure failure, a low pressure failure, or a compressor overheat. See **Controller Diagnostics.**
POWER FAILURE	The branch circuit voltage monitor has detected voltage that is too high, too low, missing a phase, or has reversed phase sequence.
REPLACE BATTERY	The memory backup battery voltage is too low.

OPERATION

Major components of the DRY-O-TRON® can be started and stopped by entering the correct values in the blower control register. See the chart below.



Some alarms require human intervention. In these cases, the controller will display the text message "MANUAL RST REQ'D". The controller must be told when the fault has been corrected by forcing a manual reset. See the chart below.

DECTRON		
HUMIDITY	55%	
RET AIR	82F	
POOL 1 IN	80F	DB

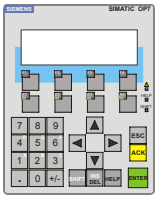
controller default screen

	PRESS	DISPLAY	value	Enter value	
To **enable the blower**, press	F4 then ▼	DB0 0 COMP #1 DB1 [1] BLOWER DB2 0 MAN RST DB3 0 OA SENS	1	ENTER	ESC
To **disable the blower**, press	F4 then ▼	DB0 0 COMP #1 DB1 [1] BLOWER DB2 0 MAN RST DB3 0 OA SENS	0	ENTER	ESC
To **enable compressor #1**, press	F4	DB0 [1] COMP #1 DB1 1 BLOWER DB2 0 MAN RST DB3 0 OA SENS	1	ENTER	ESC
To **disable compressor #1**, press	F4	DB0 [0] COMP #1 DB1 1 BLOWER DB2 0 MAN RST DB3 0 OA SENS	0	ENTER	ESC
To **enable compressor #2**, (if any) press	F4 then [F1 X 2]	DB4 [1] COMP #2 DB5 X XXXXXXXX DB6 X XXXXXXXX DB7 0 PASSWORD	1	ENTER	ESC
To **disable compressor #2**, (if any) press	F4 then [F1 X 2]	DB4 [0] COMP #2 DB5 X XXXXXXXX DB6 X XXXXXXXX DB7 0 PASSWORD	0	ENTER	ESC
To force a **manual reset**, press NOTE: Even though the number 1 is entered into the reset control register, the register value will immediately revert to 0. This is normal.	F4 then ▼	DB0 1 COMP #1 DB1 1 BLOWER DB2 [1] MAN RST DB3 0 OA SENS	1	ENTER	ESC

OPERATION

Operation — Read Sensors

Present sensor readings are read by accessing the proper registers.



DECTRON
HUMIDITY 55%
RET AIR 82F
POOL 1 IN 80F DB

controller default screen

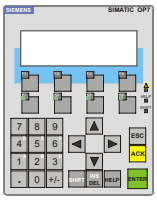
	Press	Display
Ex: To read the present **relative humidity** (assume 50%)	F4 then [F1 X 2]	DB8 XX OCCUP DB9 XX DB10 50 INT %RH DB11 82 RTRN AIR
Ex: To read the **return air temperature** (assume 82°F)	F4 then [F1 X 2]	
Ex: To read the **supply air temperature** (assume 65°F)	F4 then [F1 X 3]	DB12 65 SPLY AIR DB13 52 EVAP #1 DB14 81 EWT #1 DB15 93 LWT #1
Ex: To read **cooling coil #1 leaving air temperature** (assume 52°F)	F4 then [F1 X 3]	
Ex: To read the **entering pool #1 water temperature** (assume 81°F)	F4 then [F1 X 3]	
Ex: To read the **leaving pool #1 water temperature** (assume 93°F)	F4 then [F1 X 3]	
Ex: To read **compressor #1 discharge temperature** (assume 190°F)	F4 then [F1 X 4]	DB16 190 DISCH DB17 75 OUTDOOR DB18 98 EWT #2 DB19 108 LWT #2
Ex: To read the **outdoor air temperature** (optional) (assume 75°F)	F4 then [F1 X 4]	
Ex: To read the **entering pool #2 water temp.** (if any) (assume 98°F)	F4 then [F1 X 4]	
Ex: To read the **leaving pool #2 water temp.** (if any) (assume 108°F)	F4 then [F1 X 4]	
Ex: To read **cooling coil #2 leaving air temperature** (assume 51°F)	F4 then [F1 X 5]	DB20 51 EVAP #2 DB21 187 DISCH #2 DB22 XX XXXXX DB23 XX XXXXX
Ex: To read **compressor #2 discharge temperature** (assume 187°F)	F4 then [F1 X 5]	

K1 F1 ESC

OPERATION

Data subject to change without notice.

Set Point Adjustment



The design set points (as shown on the unit nameplate) are factory set. However, it may be necessary to temporarily change set points in order to operate the modes required by the startup procedure. Follow the procedure illustrated by the examples below to change set points.

The examples below are based on starting from the default screen in each case.

DECTRON		
HUMIDITY	55%	
RET AIR	82F	
POOL 1 IN	80F	DB

	PRESS	VALUE	DISPLAY	Enter Value
The set points are protected by a Set point Password, which is "1793". This password must be entered in register 7 before set points can be changed.	F4 then F1 then [▼ X 3]	1 7 9 3	DB4 1 COMP #2 DB5 XX XXXXXXX DB6 XX XXXXXXX DB7 **1793** Password	ENTER
Example: To change the relative humidity set point to 57%	F4 then F3	5 7	DB40 **57** % RH SET DB41 XX RA SET DB42 XX PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the room air temperature set point to 86°F	F4 then F3 then ▼	8 6	DB40 57 % RH SET DB41 **86** RA SET DB42 XX PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the pool water temperature set point to 84°F	F4 then F3 then [▼ X 2]	8 4	DB40 57 % RH SET DB41 86 RA SET DB42 **84** PL1 SET DB43 XX PL2 SET	ENTER
Example: To change the whirlpool water temperature set point to 102°F	F4 then F3 then [▼ X 3]	1 0 2	DB40 57 % RH SET DB41 86 RA SET DB42 84 PL1 SET DB43 **102** PL2 SET	ENTER
Example: To change the outdoor air ventilation changeover temperature set point to 64°F	F4 then F3 then F1	6 4	DB44 **64** OA SET DB45 XX SA SET DB46 XX XXXXXXX DB47 XX XXXXXXX	ENTER
Example: To change the supply air temperature set point to 125°F	F4 then F3 then F1 then ▼	1 2 5	DB44 64 OA SET DB45 **125** SA SET DB46 XX XXXXXXX DB47 XX XXXXXXX	ENTER
Clear the set point password.	F4 then F1 then [▼ X 3]	0	DB4 1 COMP #2 DB5 XX XXXXXXX DB6 XX XXXXXXX DB7 **0** Password	ENTER ESC

OPERATION

Diagnostic tips

The DOTICS-9 PLC is located inside of the electrical panel. There are two columns of green LEDs on the front of the PLC: one for inputs (labeled IN) located on the right and one for outputs (labeled OUT) located on the left.

When used in conjunction with the unit electrical drawing, the LEDs are very helpful in troubleshooting. The PLC is capable of handling 16 inputs and 16 outputs. Each column of LEDs is numbered (addresses) from 32.0 to 32.7 and 33.0 to 33.7. These addresses are shown in brackets on the unit electrical drawing. The actual number of inputs and outputs used may vary from unit to unit depending on options, etc.

For the unit to operate ALL input LEDs must be illuminated. As the electrical drawing shows, even if an input has no safety switch it will still be connected directly to the positive side of the 24 VDC power supply (wire #60). This means that if an input LED is not illuminated, then the cause of interruption can be determined by referring to the corresponding address on the electrical diagram.

Similar troubleshooting logic can be applied to the output LEDs. By comparing the address of an illuminated output LED to the electrical diagram, it can be determined which relays should be energized and consequently which machine components should be active.

These troubleshooting tips are intended to be used with the diagnostic messages that will be shown on the keypad display.

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
A/C LOW WATER	Low A/C water flow	• Check pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	Defective or misadjusted water pressure switch	• Make sure switch closes when adequate water flow is present. • **Refer to Startup - Adjust Flow switches.**
BLOWER OVERLOAD	Defective motor	• **Replace motor.**
	Low main voltage	• Measure line voltage. Must be the same as indicated on CSA/ETL label ± 10%. • **Shut down unit until proper power is restored.**
	Defective overload	• Check blower motor and draw and compare with the setting on the overload. (Temporarily raise over load setting if necessary to measure amp draw.) • **Replace overload.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
BLOWER OVERLOAD **(continued)**	Loose low voltage lead on overload auxiliary contact	• Check 24v wiring on auxiliary contact. • **Tighten any loose connections.**
	Defective overload auxiliary contact	• Check continuity of the auxiliary contact. • **Replace contact.**
	Overload has been turned off for service reasons	• Make sure motor and drive are intact and that no one is servicing the motor. • **Turn the overload back on.**
COMPRESSOR DISCHARGE TEMPERATURE #1 OR #2 TOO HOT	High superheat	• Check thermal expansion valve for proper adjustment. • **Adjust expansion valve to achieve 180°F - 200°F compressor discharge temperature. (DB16 for compressor #1, DB21 for compressor #2.) This is measured on the discharge line with an insulated probe.**
	Low refrigerant charge	• Check the refrigerant sight glass for bubbles. • **Charge unit until sight glass is clear in all modes. Charge should be checked again when weather gets cold.**
	Defective sensor	• Measure actual discharge temperature using a thermocouple and compare with reading on DOTICS-9 (DB16 or DB21). • **If reading is off by more than 10°F, replace sensor. If less than 10°F, recalibrate. (Re-calibrate at DB 116 for compressor #1 and DB121 for compressor #2) when compressor is running and hot. Service password is required.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COMPRESSOR DISCHARGE TEMPERATURE #1 OR #2 TOO HOT **(continued)**	Defective thermal expansion valve	• Place sensing bulb in cold water, and then warm it up in your hands. A rapid suction line pressure change should occur. If not, the valve is defective. • **Replace valve.**
COMPRESSOR DISCHARGE TEMPERATURE #1 OR #2 TOO COLD	Low superheat	• Check terminal expansion valve for proper adjustment. • **Adjust expansion valve to achieve 180°F-- 200°F compressor discharge temperature (DB16 for compressor #1 and DB21 for compressor #2). This is measured on the discharge line with an insulated probe.**
	Return air too cold and/or too dry	• Check CSA/ETL label for proper design temperature and humidity. • **Adjust controls accordingly.**
	Defective sensor	• Measure actual discharge temperature using a thermocouple and compare with reading on DOTICS-9 (DB16 for compressor #1 and DB21 for compressor #2). • **If reading is off by more than 10°F, replace sensor. If less than 10°F, re-calibrate. Re-calibrate at DB116 for compressor #1 and DB121 for compressor #2 when compressor is running and hot. Service password is required.**
	Defective thermal expansion valve	• Place sensing bulb in cold water, and then warm it up in your hands. A rapid suction line pressure change should occur. If not, the valve is defective. • **Replace valve.**

Controller Diagnostics Operation

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
COMPRESSOR #1 OR #2 OVERLOAD	Defective compressor	• Check for open or shorted winding. • **Replace compressor.**
	Low main voltage	• Measure line voltage. It must be the same as indicated on CSA/ETL label ± 10%. • **Shut down unit until proper power is restored.**
	Defective overload	• Check compressor amp draw and compare with the setting on the overload. (Temporarily raise overload setting if necessary to measure amp draw.) • **Replace overload.**
	Loss of one leg of main power (three-phase units only)	• Check voltage on each leg. Unbalanced phase voltage must not exceed 2% between phases. • **Shut down unit until proper power is resorted.**
	Defective overload auxiliary contact	• Check continuity of the auxiliary contact. • **Replace contact.**
	Overload has been turned off for service reasons.	• Make sure compressor is intact and that no one is doing service. • **Turn overload back on.**
COMPRESSOR #1 OR #2 OVERHEAT	Defective compressor	• Compressor will draw LRA. • **Replace compressor.**
	Defective solid state module	• **Replace module.** • **Tighten all connections on module.**
	Loose lead on solid state module	• **Verify net oil pressure. The minimum allowable is 25 psi.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
EVAPORATOR #1 OR #2 TOO COLD	Insufficient air flow	• Check temperature differential across the evaporator. It should be between 30°F and 35°F at design conditions. • **Adjust blower motor pulley accordingly.**
	Insufficient load	• Room temperature below 75°F and/or below 40% relative humidity. • **Adjust room set points per the CSA/ETL label.**
	Defective sensor	• Check actual temperature off of evaporator at same location as sensor. If sensor reading is off more than 10°F it is defective. • **Replace sensor.**
	Improper return air duct connection at unit (i.e., 90° elbow very close to the unit)	• This will cause the evaporator to be unevenly charged with air. It is therefore impossible to get the proper evaporator air leaving temperature at the correct air volume. • **Correct improper duct. See Installation - Unit/Duct Connections for proper duct design.**
	Too much outdoor air being introduced between evaporator and condenser. This will severely drop the velocity over the evaporator coil.	• Check for balancing damper in outdoor air duct. • **Throttle down outdoor air until suction pressure and evaporator leaving air temperature are acceptable. The ΔT across the evaporator coil should be between 30°F and 35°F at design conditions.**

Controller Diagnostics Operation

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
EVAPORATOR #1 OR #2 TOO HOT	Evaporator bypass damper is closed. (Return air is over 76°F.)	• **Open damper.**
	Low refrigerant charge	• Check refrigerant sight glass for bubbles. • **Repair any leaks, then charge unit until sight glass is clear in all modes.**
	Improperly adjusted or defective hot gas bypass valve	• Check to see if the line from the hot gas bypass valve to the distributor is hot. • **Contact Dectron or a Dectron-certified technician.**
	Excessive air flow	• Check temperature differential across evaporator. It should be between 30°F and 35°F at design conditions. • **Adjust the blower motor pulley accordingly.**
	Excessive load	• The room temperature is over 90°F and 80% R/H. • **Temporarily change the sensor calibration at DB113 (sensor #1) and DB120 (sensor #2). This change should be removed when the room conditions are more favorable. A service password is required.**
	Defective sensor	• Check the actual temperature off of the evaporator at the same location as the sensor. If the sensor reading is off more than 10°F it is defective. • **Replace the sensor.**
	Improper return air duct connection at the unit (i.e. 90° elbow very close to the unit)	• This will cause the evaporator to be unevenly charged with air. It is therefore impossible to get the proper evaporator air leaving temperature at the correct air volume. • **Correct the improper duct. See Installation - Unit/Duct Connections for proper duct design.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
FIRESTAT ON	Fire alarm has tripped	• **Manual reset.**
	Loose wire from the fire alarm	• Check all related wiring. • **Repair any loose or broken wires.**
FREEZESTAT ON	Freezestat has tripped	• Excessive cold outdoor air. • **Reduce outdoor air volume. Manual reset.**
	Defective freezestat	• Measure air temperature at freezestat capillary. • **Replace freezestat.**
	Loose or broken wire	• Check all related wiring. • **Repair any loose or broken wires.**
HIGH PRESSURE #1 OR #2	High return air temperature	• Check CSA/ETL label for unit design temperature. • **Adjust set points accordingly.** • Relay for space heat on relay board is sticking, causing auxiliary heat to remain on when there is no demand. • **Check for a closed contact at terminals 2J25 and 2J26 (1st stage) and 2J27 and 2J28 (2nd stage). If contact is closed, contact Dectron.**
	Dirty reheat coil	• Check for proper air filters on return and outdoor air intake. • **Clean coil and replace any missing filters.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
HIGH PRESSURE #1 OR #2 **(continued)**	Corroded fins on reheat coil	• High concentration of chemicals. • Chemicals stored in mechanical room. • High fluctuation in pool chemistry. • **Insure that the proper precautions are taken to protect the unit from corrosive air. See Installation -- Location and Installation -- Unit/Duct Connections.**
	Low air flow	• Check ΔT across evaporator coil. It should be between 30°F and 35°F at design conditions. • **Adjust variable pulley accordingly.**
	Low water flow	• Check water pressure switch adjustment. • **Adjust water pressure switch. See Pre-Startup Adjustments.** • Check circulating pump that supplies water to the DRY-O-TRON®. • **See Installation -- Piping.**
	Refrigerant overcharge	• Check CSA/ETL label for proper refrigerant charge amount. • **For units with A/C, contact Dectron or a Dectron-certified technician. All other units, remove R-22 until bubbles appear in the sight glass, then recharge to clear sight glass in all modes of operation.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
HIGH PRESSURE #1 OR #2 **(continued)**	Jammed 3-way valve	• **Contact Dectron or a Dectron-certified technician.**
	ORD valve stuck open	• Unit will trip on high pressure in dehumidification only.
	ORI-6 valve (water heating intensity) setting is too high	• Unit cools air while in pool heating. • **Turn the valve adjustment counter-clockwise until the spindle is flush with the housing. Turn the valve clockwise approximately 7-1/2 turns. The supply air temperature, during the pool heating operation, should be the same as the return air temperature ± 2°F. (Fine tune the valve accordingly.)**
	Undersized receiver (unit trips in summer only)	• Check the outdoor condenser line length one way, as well as the line sizes and check to make sure they do not exceed what is indicated on the CSA/ETL label. • **If line length or size is greater than that indicated on the label contract Dectron.**
	Closed ball valve	• Verify that all ball valves are open. • **Open any closed valves.**
	Outdoor condenser dirty (Unit trips in A/C only.)	• Inspect the outdoor coil. • **Clean the coil.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
HIGH PRESSURE #1 OR #2 **(continued)**	Outdoor condenser fans not running (Unit trips in A/C only)	• Check that condenser has power. • **Re-power outdoor condenser, provided it has not been disabled for maintenance.** • Check for closed contact on DOTICS-9 relay board (terminals 1J25 and 1J26 on units shipped prior to December, 1994, and terminals 51 and 52 on later units. • **If contact is open, contact Dectron.** • Check control wiring for outdoor condenser. • **Repair any missing or damaged wiring.** • Check outdoor condenser fan contactor. • **Replace any defective or worn parts.** • Check outdoor condenser fan motors. • **Replace any defective motors.**
	Relay for A/C 3-way valve is sticking	• Check to see if 3-way valve remains energized when A/C call is satisfied. • **Replace any defective relay.**
	Defective high pressure switch	• Switch opens at less than the rated pressure. • **Replace any defective switches.**
	Broken or loose wire from high pressure switch	• Verify that all switch wires are intact. • **Repair any damaged or loose wires with the same gauge and color.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
LEAVING WATER TEMPERATURE #1 OR #2 IS TOO HOT	Low water flow	• Verify that all pumps are running and that the balancing valves are set correctly. • **Make any necessary adjustments.**
	Defective sensor	• Verify that the water temperature leaving the DRY-O-TRON® is really over 120°F. • **If the water temperature is not over 120°F, compare the actual temperature with that displayed on the DOTICS-9. If the difference is greater than 10°F, replace that sensor.**
	Sensor is out of calibration	• Verify that the water temperature leaving the DRY-O-TRON® is really over 120°F. • **If water is not over 120°F, compare the actual temperature with that displayed on the DOTICS-9. If the difference is less than 10°F, recalibrate the sensor at DB115 (pool #1) and DB119 (pool #2). The service password is required.**
	Sensor is located too close to the refrigerant hot gas line	• **Move the sensor further away from the refrigerant line. It is possible to move the sensor to a pipe outside of the unit enclosure if necessary.**
LOW PRESSURE #1 OR #2	Low return air temperature	• Check the CSA/ETL label for design temperatures. • **Adjust set points accordingly.** • Check the auxiliary air heating for proper operation. • **Repair the air-heating system if necessary.** • Check the auxiliary air heat output on the DOTICS-9 relay board. • **If no output is present contact Dectron.**

Controller Diagnostics Operation

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
LOW PRESSURE #1 OR #2 **continued**	Return air is too dry (below 40% R/H)	• Check CSA/ETL label for design temperatures. • **Adjust set point accordingly.** • Check outdoor air volume. The maximum allowable is 15% unless unit is specially designed for a greater amount. • **Adjust outdoor air volume accordingly.**
	Low refrigerant charge	• Check the system for leaks. • **Repair any leaks.** • Check the sight glass for bubbles. • **Charge to clear the sight glass in all modes. (For units with A/C, the charge will have to be verified during the winter when the outdoor condenser is flooded.**
	Low air flow	• Check for a slipping or broken fan belt. • **Adjust the tension or replace with the same size and type.** • Check for blocked air filters. • **Replace with the same type and size.** • Check the fan motor for correct rotation (3-phase units only). • **Reverse any two wires on the fan motor contactor.** • Check for duct restriction. • **Remove the restriction.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
LOW PRESSURE #1 OR #2 **continued**	Blocked liquid line filter/drier	• 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.**
	Closed liquid line ball valve	• Check that all the ball valves are fully open. • **Open any closed or partially-closed valves.**
	Closed suction line rotolock valve (if so equipped)	• Check on the suction side of the compressor. • **Open the valve fully and then close 1/2 turn to open the accessory port.**
	Undersized receiver (unit trips in winter only)	• Check the outdoor condenser line length one way, as well as line sizes. Check to make sure they do not exceed what is indicated on the CSA/ETL label. • **If the line length or size is greater than that indicated on the label, contact Dectron.**
	ORI-6 valve (water heating intensity) setting is too high	• The unit appears to be fully charged but continues to cut out on low pressure. • **Turn the valve adjustment counter-clockwise until the spindle is flush with the housing. Turn the valve clockwise approximately 7-1/2 turns. The supply air temperature during pool heating operation should be the same as the return air temperature ± 2°F. Fine tune the vale accordingly.**
	Defective low pressure switch.	• The switch opens at high than rated pressure (25 psi). • **Replace the defective switch.**

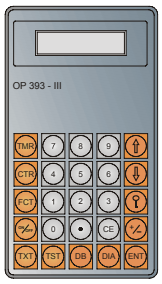
Controller Diagnostics Operation

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
LOW PRESSURE #1 OR #2 **continued**	Broken or loose wire on low pressure switch	• Check the switch wiring. • **Replace any damaged wires with the same gauge and color.**
	There is too much outdoor air being introduced between the evaporator and the condenser. This will severely drop the velocity over the evaporator coil.	• Check for balancing damper in outdoor air duct. • **Throttle down outdoor air until suction pressure and evaporator leaving air temperature are acceptable. The ΔT across the evaporator coil should be between 30°F and 35°F at design conditions.**
	Defective power head on the thermal expansion valve	• Place the sensing bulb in cold water and then warm it up in your hands. A rapid suction-line temperature change should occur. If not, the valve is defective. • **Replace the valve.**
	Defective liquid pump-down solenoid valve	• Check the temperature on each side of the valve. A differential of more than 2°F is unacceptable. • **Replace the solenoid valve.**
LOW WATER FLOW #1 OR #2	Low pool water flow	• Check pool pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	Defective or wrongly adjusted water pressure switch.	• Make sure switch closes when adequate water flow is present. • **See Startup -- Pre-Startup Adjustments.**

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
OIL FAILURE #1 OR #2	Defective oil pressure switch	• **Replace the oil pressure switch.**
	Low oil level	• Check the oil level through the sight glass on the compressor crankcase. Oil should be 1/4 - 1/2 the sight glass with the compressor off; 1/4 - 3/4 with the compressor running.
		• **Add oil as required.**
	Liquid flooding	• The liquid refrigerant is returning to the compressor. Oil will foam excessively, the compressor end bell will be cold and sweat; and the compressor discharge temperature will stay very low.
		• **See Startup - OP-7 Controller Interface - TXV Valve Adjustment.**

PLEASE WAIT for OP-393 Display

Some alarms are automatically reset on the first two occurrences after 15 minute delays. A third occurrence will display a named alarm that requires manual reset. The first two occurrences display "Please Wait".
In the event "Please Wait" is displayed, the cause can be determined as below.



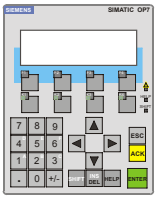
	Start register access mode	Address	End Address	Display	
To investigate refrigeration circuit #1	DB	then 3 then 4 then ENT		+0000x DB14 34 +0000x	x=1 circuit #1 high refrigerant pressure alarm x=2 circuit #1 low refrigerant pressure alarm x=3 circuit #1 compressor overheat alarm x=0 circuit #1 not involved, go to
To investigate refrigeration circuit #2	DB	then 3 then 6 then ENT		+0000x DB14 36 +0000x	x=1 circuit #2 (if any) high refrigerant pressure alarm x=2 circuit #2 (if any) low refrigerant pressure alarm x=3 circuit #2 (if any) compressor overheat alarm x=0 circuit #2 not involved

Controller Diagnostics Operation

ALARM	POSSIBLE CAUSES	CHECKS & CORRECTIONS

PLEASE WAIT for OP-7 Display

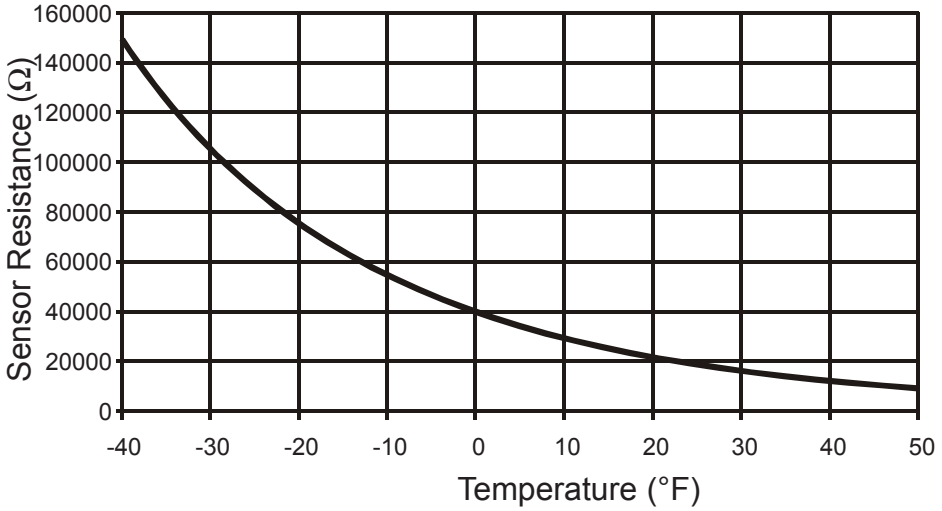
Some alarms are automatically reset on the first two occurrences after 15 minute delays. A third occurrence will display a named alarm that requires manual reset. The first two occurrences display "Please Wait".
In the event "Please Wait" is displayed, the cause can be determined as below.



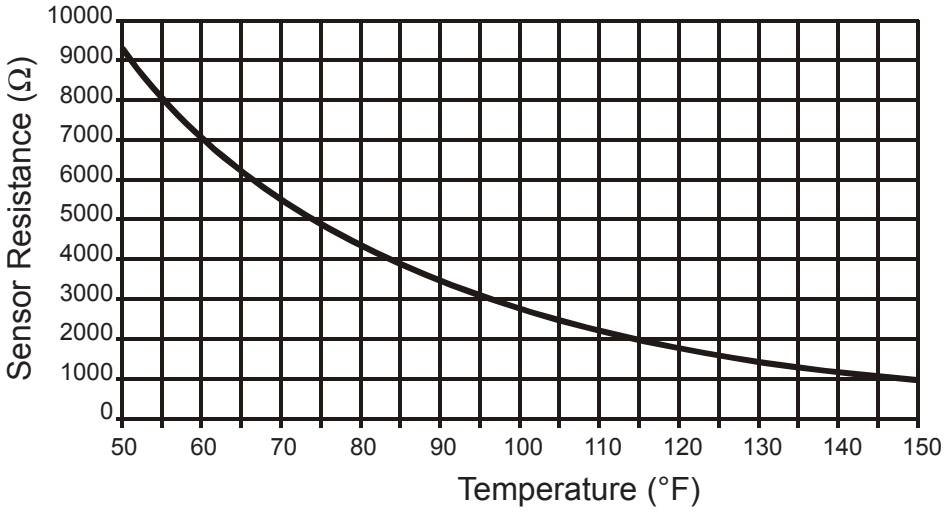
	PRESS	DISPLAY
To investigate refrigeration circuit #1	F4 then [F1 X 3]	DB32 ?? ????????? DB33 ?? ????????? DB34 XX ← LST ALRM DB35 ?? ????????? xx=1 circuit #1 high refrigerant pressure alarm xx=2 circuit #1 low refrigerant pressure alarm xx=3 circuit #1 compressor overheat alarm xx=0 circuit #1 not involved, go to
To investigate refrigeration circuit #2	F1	DB36 XX ← LST ALRM DB37 ?? ????????? DB38 ?? ????????? DB39 ?? ????????? xx=1 circuit #2 high refrigerant pressure alarm xx=2 circuit #2 low refrigerant pressure alarm xx=3 circuit #2 compressor overheat alarm

POWER FAILURE	Line voltage is too low or too high Phase imbalance	• Measure line voltage and compare to that indicated on CSA/ETL label. The voltage must be within ± 10%. • **Shut the unit down until proper power is restored.**
	Phase Loss	• Check the voltage on all three legs; one or more legs may not have power. • **Shut the unit down until proper power is restored.**
	Phases reversed	• **Switch any two of the power wires on the main terminal block.**
	Defective voltage monitor	• Measure the voltage on all three legs; if all are acceptable, then monitor is defective. • **Replace the voltage monitor.**

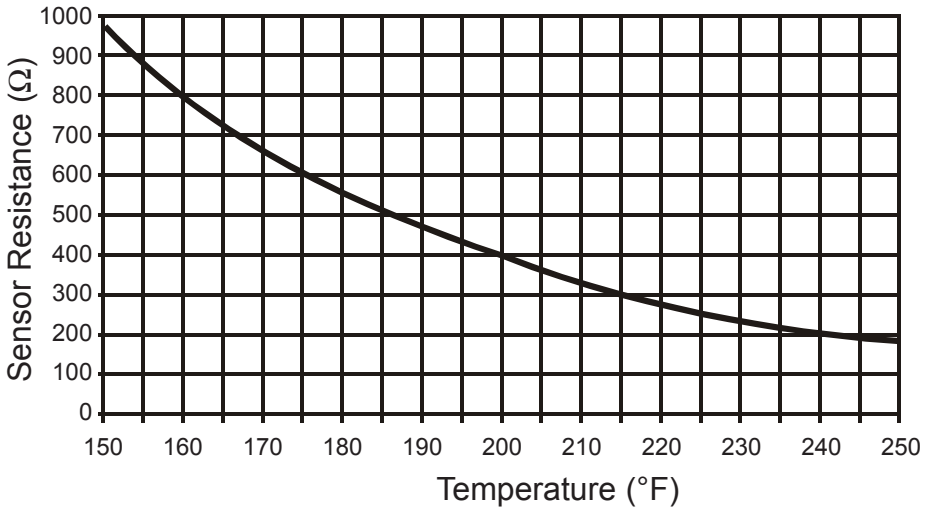
Use this chart for the temperature range -40°F to 50°F.



Use this chart for the temperature range 50°F to 150°F.



Use this chart for the temperature range 150°F to 250°F.



PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
PROBLEMS NOT INDICATED BY DOTICS-9		
UNIT IS NOT HEATING THE POOL OR SPA	Pool or spa solenoid valve is stuck in dehumidification	• Verify that the three-way valve may be jammed: 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 pool heating and/or A/C, trips on high pressure in dehumidification mode, and also runs wi5th higher than normal pressures in A/C alone, then the pool heating three-way valve is not shifting completely out of pool heat. (This is assuming that no other cause for a high pressure trip can be found. 3. If the unit runs well in pool heating and A/C, trips on high pressure in dehumidification, and runs higher than normal pressures in pool heat alone, then the A/C three-way valve is not shifting completely out of air conditioning. • **Replace the defective valve.**
	Pool or spa water temperature sensor is out of calibration	• Measure actual water temperature and compare with what is displayed on DOTICS-9. • **If the difference is less than 10°F, recalibrate the sensor. (Recalibrate at DB114 for pool and DB118 for spa. Service password is required.) If the difference is more than 10°F, replace the sensor.**

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
PROBLEMS NOT INDICATED BY DOTICS-9		
UNIT IS NOT HEATING THE POOL OR SPA **continued**	Reversed water flow	• Check the water connections at the DRY-O-TRON®. The unit will cycle rapidly in and out of pool heating. • **Switch the water connections to establish proper flow.**
	Spa heat has priority, and the unit cannot keep up with spa demand	• Possibly the spa three-way valve is sticking. See previous instructions for verifying a jammed three-way valve on page 109. • **Replace the defective valve.** • Excessive spa heat loss. • **Correct the source of excessive heat losses.**
	The pool or spa is larger or warmer than specified or the temperature set point is higher than specified.	• Measure the pool or spa surface area and compare with the size indicated on the CSA/ETL label. • **If pools are larger than indicated, contact factory.** • Check pool/spa set points and compare with those specified on the CSA/ETL label. • **Adjust set points accordingly.**
	The relay for the pool or spa heating is not working	• Check to see if the appropriate three-way valve is energized when there is a demand. • **Replace the appropriate relay on the S5 relay board.**

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
PROBLEMS NOT INDICATED BY DOTICS-9		
THE UNIT IS NOT COOLING	A/C solenoid valve is stuck in dehumidification	• See previous instructions for verifying a jammed three-way valve on page 109. • **Replace the defective valve.**
	Return air sensor is out of calibration	• Measure the actual air temperature and compare it with what is displayed on the DOTICS-9. • **If the difference is less than 10°F, recalibrate the sensor (at DB113). The service password is required. If the difference is more than 10°F, replace the sensor.**
	The heat pressure bypass valve (ORI-6 5/8) is misadjusted	• Check that the hot gas is going to both the outdoor condenser and the reheat coil at the same time. • **Contact Dectron or a Dectron-certified technician.**
	The isolation valves for the outdoor condenser are closed	• Check the position of the ball valves. • **Open the valves.**
	The room load exceeds the cooling capacity of the unit	• Check the air temperature differential through the DRY-O-TRON®. • **If the differential is 10°F -- 12°F, the unit is cooling properly.**

PROBLEM	POSSIBLE CAUSES	CHECKS & CORRECTIONS
PROBLEMS NOT INDICATED BY DOTICS-9		
COMPRESSOR WILL NOT START	The compressor overload is turned off or has tripped (three-phase units only)	• **Turn the overload on.**
	Defective contactor	• Check that the contactor is getting power. • **Replace the contactor.**
	Defective compressor	• Check the compressor for shorts, open windings, and a locked rotor. • **Replace the compressor.**