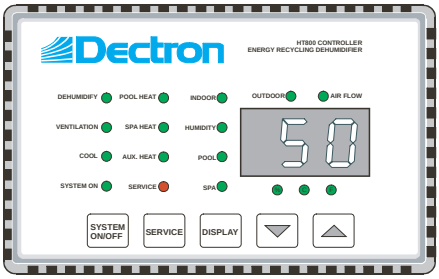
DRY-O-TRON®

Owner's Manual

FOR MODELS

DS	DSV	RS
010	010	010
015	015	015
020	020	020
030	030	030
040	040	040
050	050	050
060	060	060
070	070	070
080	080	080

With HT 800 CONTROLLER



For future reference, write your model number* here _____

write your serial number* here _____

write your ref number* here _____

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

Data subject to change without notice.

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.

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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 natatorium to be comfortable and condensation free the following areas must be addressed by you and your contractor, engineer and architect design team:

- **Δ Humidity Control**
- **Δ Air distribution**
- **Δ Duct design**
- **Δ Ventilation requirements**
- **Δ Moisture Migration**
- **Δ Pool Water chemistry**

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

Dectron provides guidelines (included in this manual) for each of these critical areas. **These guidelines have been developed from years of field experience and should be strictly adhered to or there is a good chance that your system will not work as expected.** It is the responsibility of the owner and his design team (contractor, engineer and architect) to ensure that careful consideration has been given to all of the aspects of natatorium environment control.

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

The DS Series

- Δ Recycles energy
- Δ Saves up to 80% of the energy costs associated with indoor pools and spas
- Δ Helps protect against building damage resulting from uncontrolled humidity
- Δ 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.

Product Description

How the DRY-O-TRON® Works

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

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

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

The DRY-O-TRON® dehumidifiers have been specifically designed to offer a complete solution for natatorium environment control. In DRY-O-TRON® units, cooling is used to produce from moist air:

- Comfortable, dry supply air
- Total heating requirement for pool water
- 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:

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

A built-in automatic compensation system permits unit startup regardless of water temperatures. During initial start-up with low pool water temperature, all available heat is directed to the pool water. Once the desired temperature is reached, the water heating system adjusts its output automatically.

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

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.

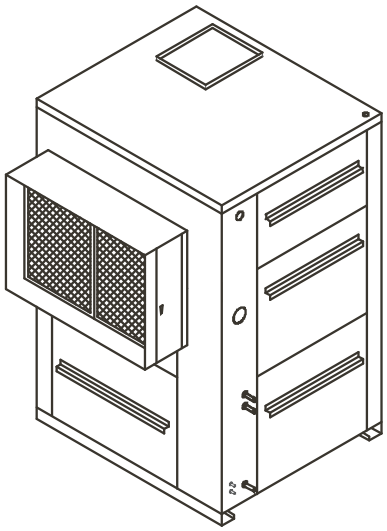
Δ An optional outdoor air intake system includes an automatic damper to stop the outdoor air flow during unoccupied periods.

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. Where available, automatic refrigeration staging matches the system capacity to the load. Energy consumption is always minimized.

Horizontal Configuration



Vertical Configuration

Unit Nameplate

CSA and ETL Label

Model Nomenclature:

iXX-SSS-V

D = indoor cabinet
R = outdoor cabinet

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

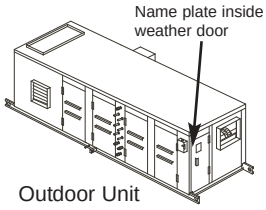
nominal moisture removal capacity in lbs./hr.

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

Name plate on corner

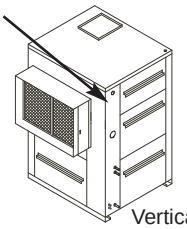
Horizontal Indoor Unit

Name plate inside weather door



Outdoor Unit

Name plate on corner



Vertical Indoor Unit

Dectron DRY-O-TRON ®

MODEL #:
SERIAL #:
I.D. D

ELECTRICAL RATING	460 V ac, 3 ph, 60 Hz	
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
COMPRESSOR	LRA	RLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
BLOWER MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
COND. FAN MOTOR	HP	FLA
PUMP MOTOR	HP	FLA
ENTHALPY MOTOR	HP	FLA
ELECTRIC HEATER	kW	A
	Max. L.A.T. (°F)	

SERVICE POWER
SPACE HEATING COIL
PSIG Max.

MCA A MAX. FUSE/CKT. BKR.* 15 A
*(HACR type per NEC)

R-22 FACTORY CHARGE lbs
AIR VOLUME CFM
BELT SIZE
WIRING DIAGRAM

REFRIGERANT DESIGN PRESSURES: HIGH/LOW 300/150 PSIG

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

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

Component specifications.

Important branch circuit information

Adjust supply-air flow to this value ±10%.

Replace with belt of same type and size when necessary.

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
OIL TO BE ADDED AT START-UP: oz
OIL TYPE:
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

Ref number

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.

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

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

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

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

Natatorium

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

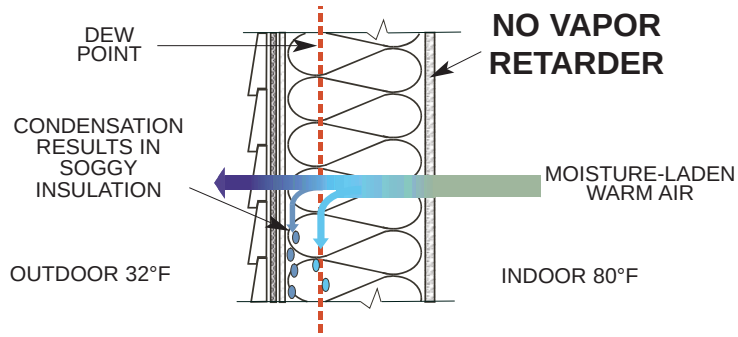
Before the design of the roof and walls is finalized the enclosure temperature and relative humidity must be known, thus determining the dew point (the temperature at which condensation will occur). Any building surface below this dew point temperature will condense water from the air.

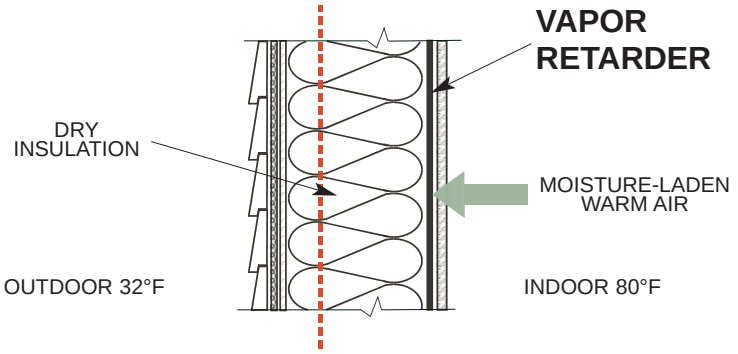
IMPORTANT!

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.



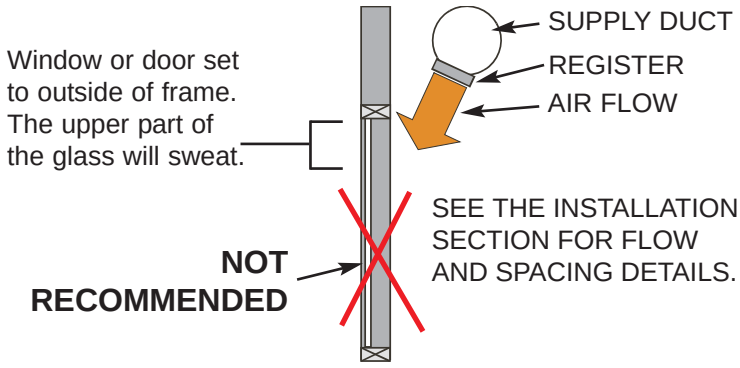


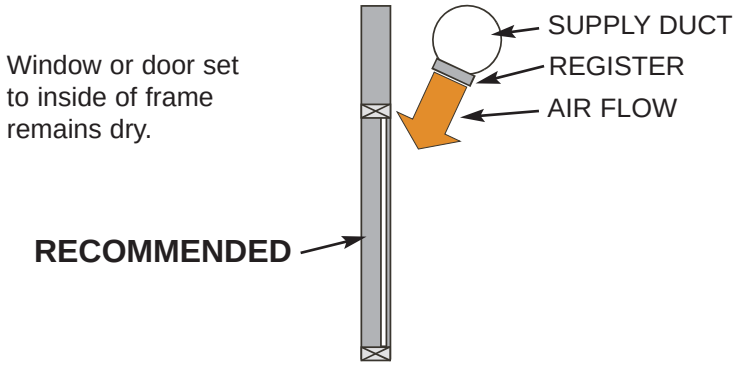
Δ Window Design

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.





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 under-chlorination which can result in high levels of bacteria, fungi, viruses etc.

Maintaining proper chlorine levels and constant pH levels will eliminate the foul odors. Airborne chloramines also have a strong affinity to pure water such as condensate. Stagnant condensate in walls and on windows can accumulate considerable amounts of chloramines which make the condensate acidic and corrosive. The prevention of 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	0.2 PPM	0 PPM	0.2 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.

Installation — 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, and where the remote-condenser tubes (if any) will be no longer than specified on the unit nameplate.

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 DA5 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 conditioned space! Check your local codes.**

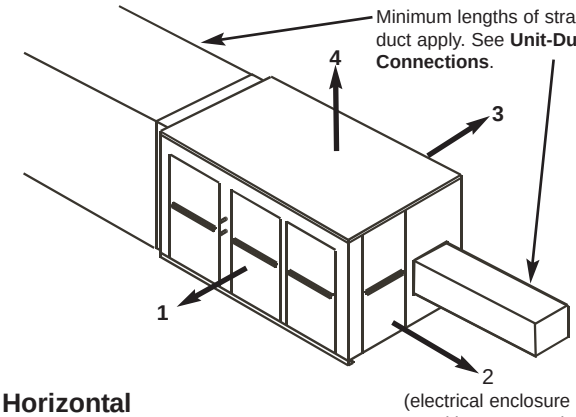
Δ Completing

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.

Minimum Service Access[a] ft (m)

	1	2	3	4
DS/RS-010 - DS/RS-030	2 (0.6)	3[b] (1)	2 (0.6)	3 (1)
DS/RS-040 - DS/RS-060	3 (1)	3[b] (1)	3 (1)	3 (1)
DS/RS-080	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.

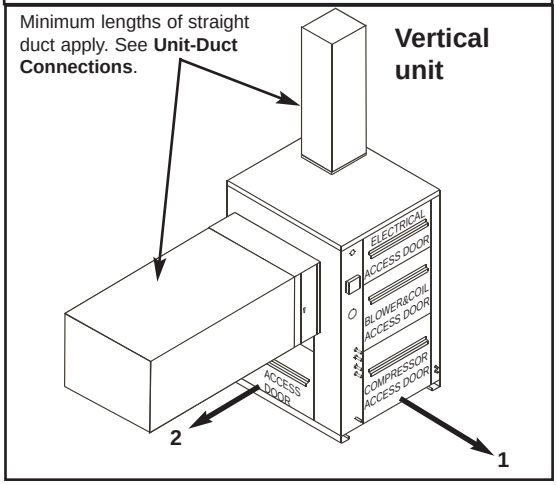


Horizontal unit

Minimum Service Access[a] ft (m)

	1	2
DSV-010 - DSV-080	3[b] (1)	2 (.6)

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.

Isolators and Drain Installation

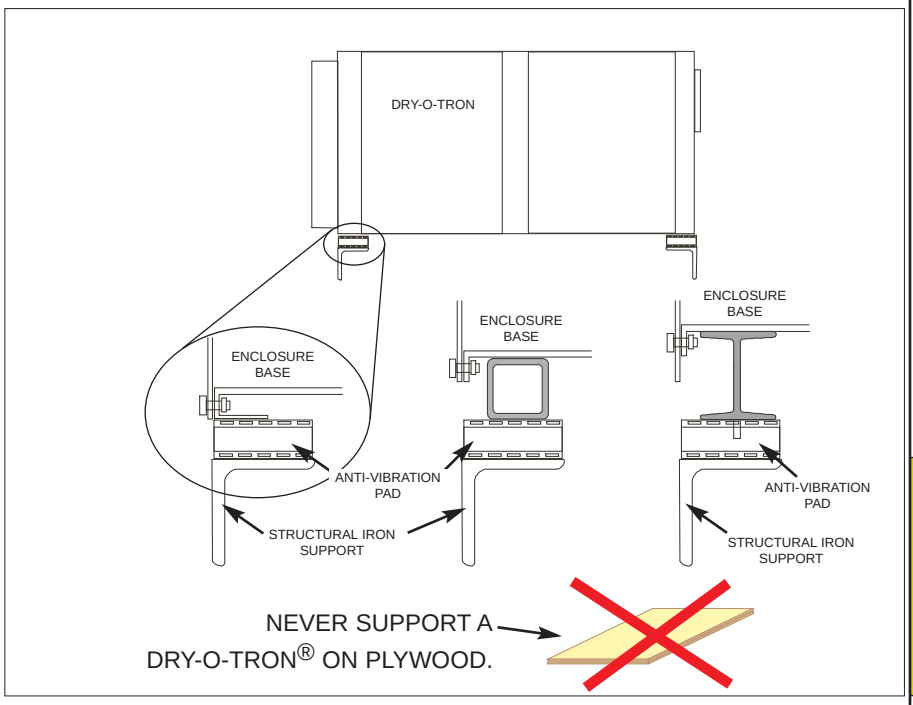
Sound and Vibration Elimination

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.

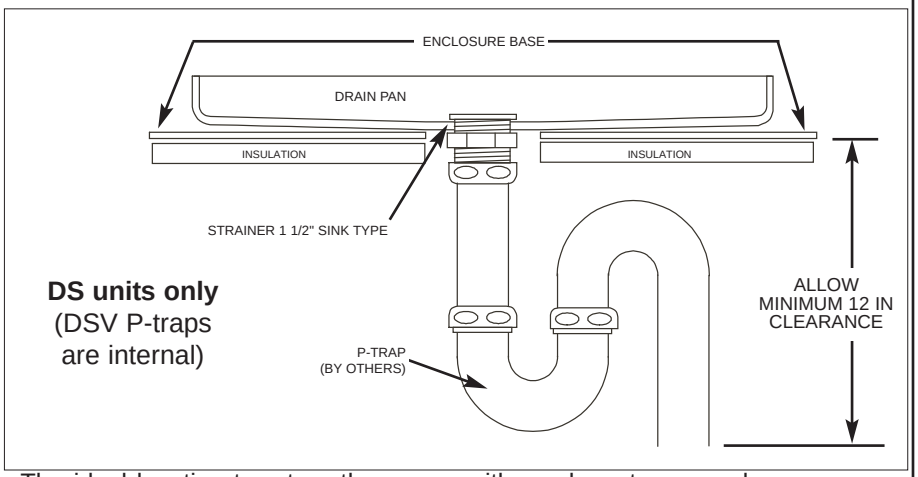
Install flexible duct to all duct connections of the DRY-O-TRON® to prevent sound and vibration transmission. Use aerofoil type turning vanes on all elbows. Elbows and acoustic insulation can be used to further reduce noise where necessary. See **Installation - Unit-Duct Connections**.



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 DSV units, the internal P-trap is factory-installed.

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



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

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!

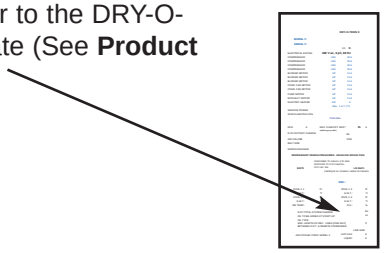
The ideal location to return the condensate to the pool water system is gravity drainage to the nearest skimmer or surge tank (if so equipped). If the DRY-O-TRON® is located below the pool water surface a condensate pump is required (available from Dectron with rated maximum pump head of 9 feet and shut-off pressure of 13 feet - if a 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.

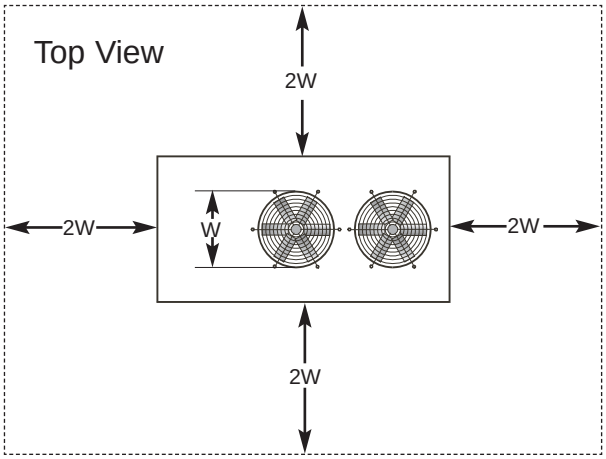
Installation Locate Remote Condenser

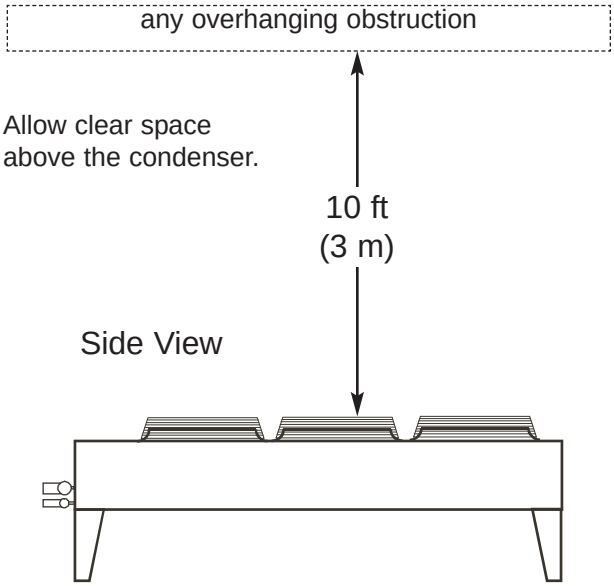
For units with air-cooled air conditioning, select a suitable location for the remote condenser, where it will not be subject to damage. Allow at least twice the width of the condenser fan of clear space around the condenser for smooth intake air flow and service accessibility. Spacing requirements are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

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

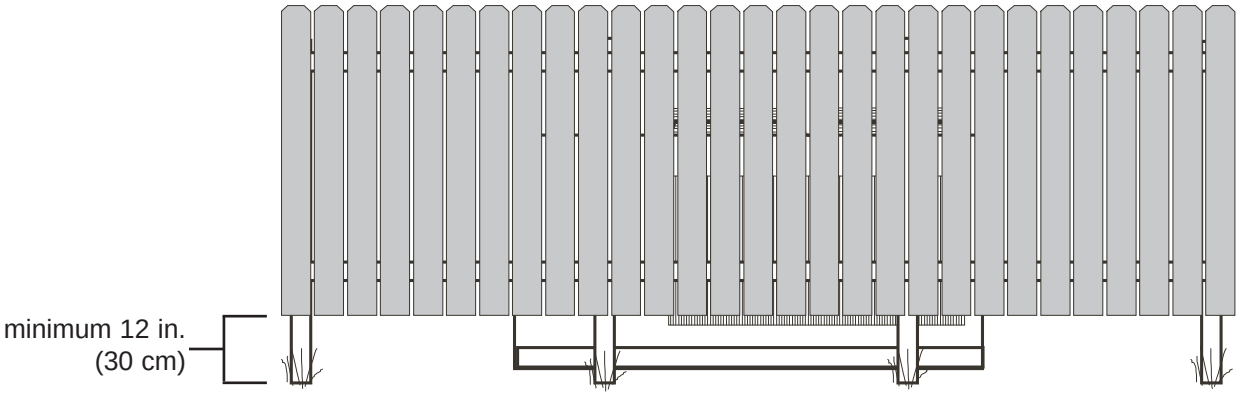


Allow clear space around the condenser equal to at least at least twice the width of the condenser fan.





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



Power

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

Important!

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

Important!

Ground the unit using the grounding lug provided. 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.

Wiring

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. Do not change internal wiring.
Be sure the branch circuit phase rotation is correct before completing the installation.

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

Installation

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

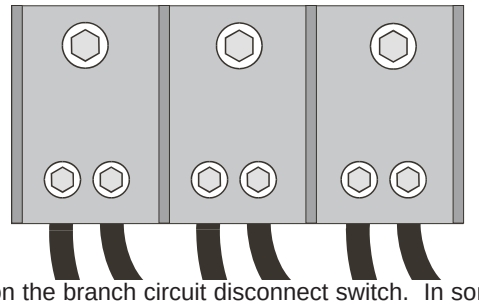
A 230V DRY-O-TRON® is designed to run on 208V also. In this case it is necessary to select the 208V primary tap on the control transformers. See the unit wiring diagram.

Δ Service power

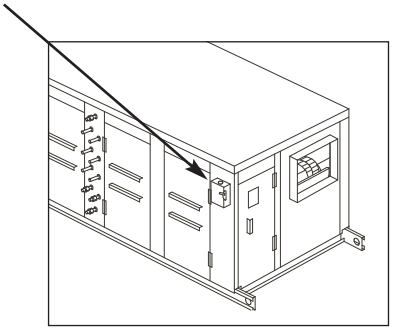
The DRY-O-TRON® may be provided with service lights which require a separate 115VAC 15A 60Hz branch circuit. Wire this branch circuit to the service branch circuit input lugs. Use only copper wire.

INSTALLATION

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



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



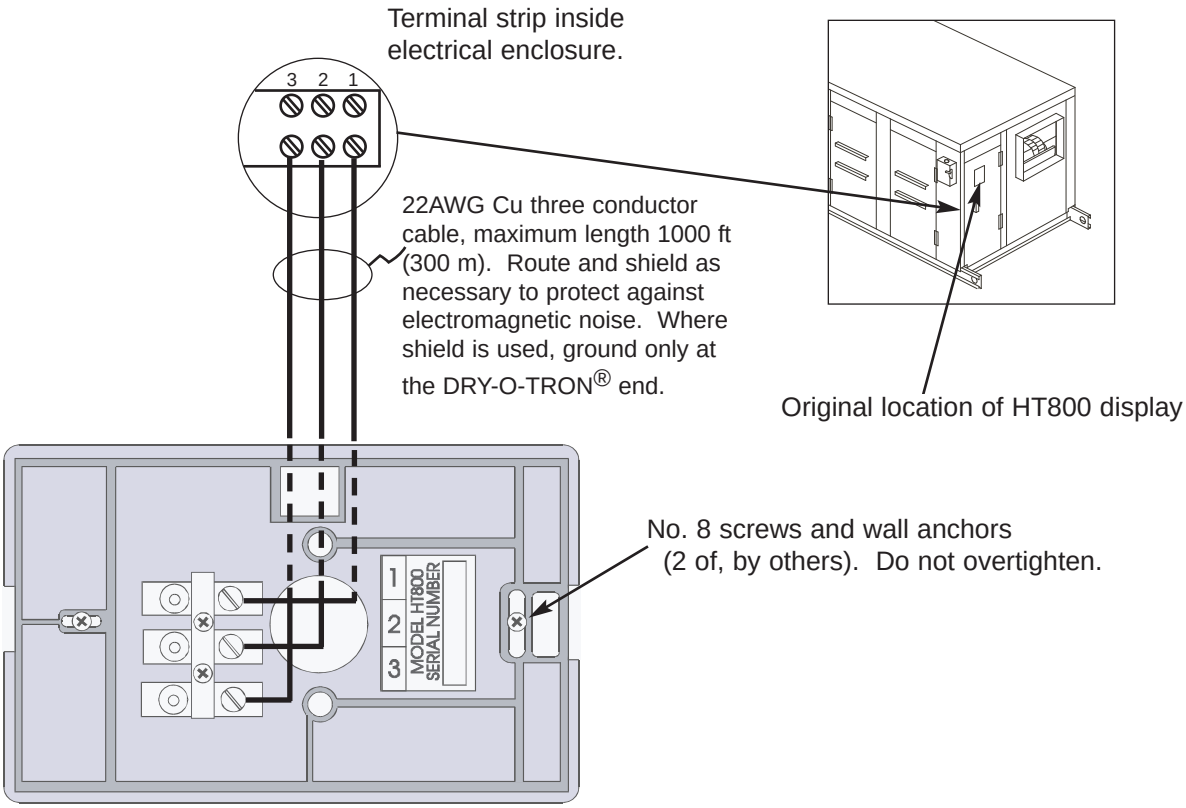
Turn on the branch circuit disconnect switch. In some cases the blower may start. Some DRY-O-TRON® units may have voltage monitors that prevent operation in the event the branch circuit has voltage that is too high, too low, has lost a phase, or has reversed phase rotation. If the green LED is not lit, 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.

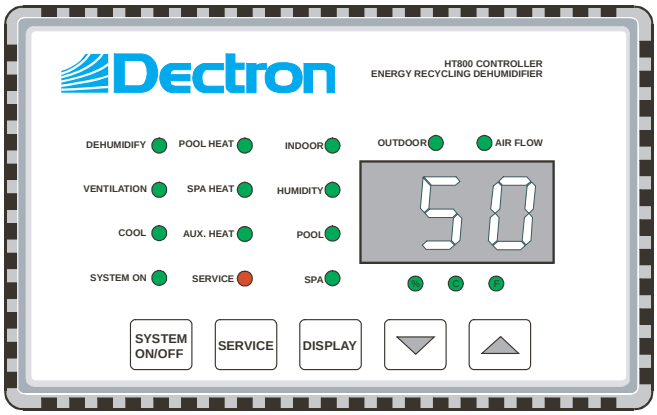
Data subject to change without notice.

Installation Wiring Control Signals

The HT800 controller display ships on the unit as shown. It can be relocated to a more convenient spot within 1000 feet (300 m) of the DRY-O-TRON®.

Δ The HT800 sub-base, blank cover, and outdoor sensor (if any) ship separately.
Δ Install the HT800 sub-base on an interior wall of the natatorium.
Δ Install the display out of direct sunlight.
Δ Install the display away from heating or cooling sources.
Δ The wall should be flat, clean, and free of vibration.
Δ The display should be protected against air drafts that are not representative of room conditions.





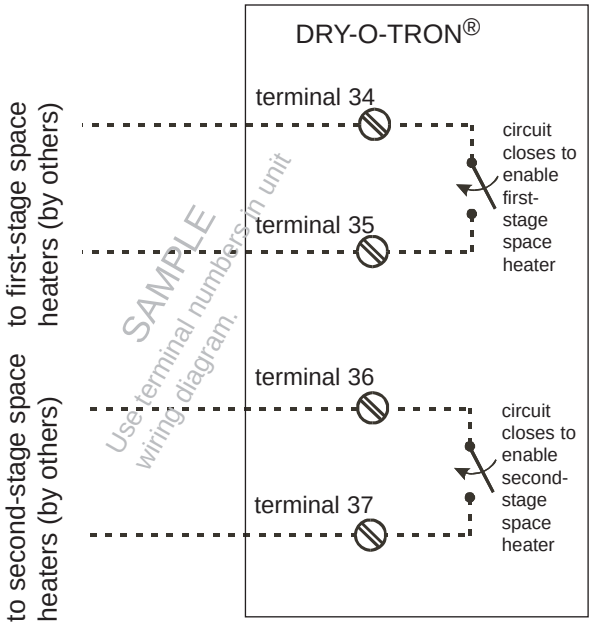
Loosen the locking screw on the left of the display, and gently pull the display from its unit-mounted sub-base. Cover the sub-base with the blank cover provided.

Align the three pins of the display with the sockets on the wall-mounted sub-base and gently push the display onto the sub-base. Tighten the locking screw.

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 circuit closure in the DRY-O-TRON® will enable the space heater. When the circuit is open, the space heater should be disabled.

The DRY-O-TRON® outputs are rated 2A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage to external heaters. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



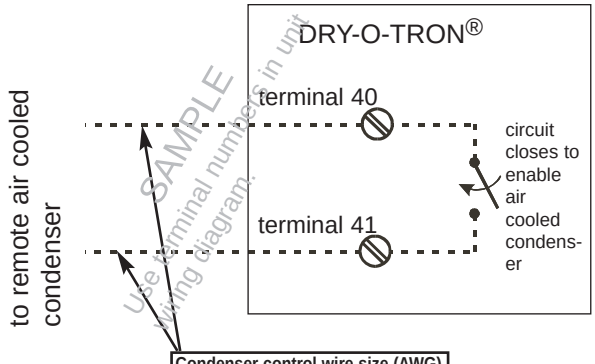
REMOTE CONDENSER (DRY-O-TRON® units with air-cooled air-conditioning option only)

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® outputs are rated 2A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage to external condensers. 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 **Setup - Adjustments**.



Condenser control wire size (AWG)				
wire length (ft)	Number of fans 1	2	3	4
10	20	20	20	20
20	20	20	20	20
30	20	20	20	20
40	20	20	20	16
50	20	20	18	16
60	20	20	18	14
70	20	20	18	14
80	20	18	16	12
90	20	18	16	12
100	20	18	16	12
110	18	18	16	12

INSTALLATION

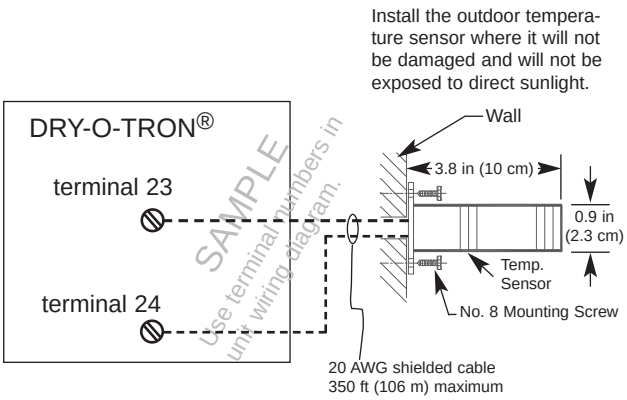
OPTIONAL REMOTE OUTDOOR AIR TEMPERATURE SENSOR

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 **Startup - Outdoor Temperature Sensor**.

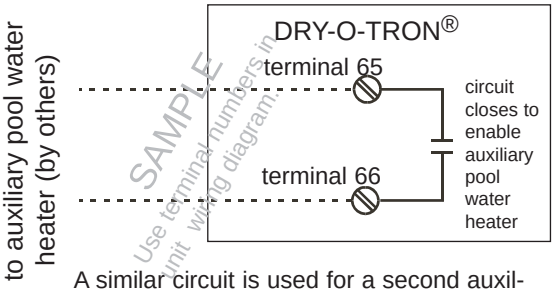


OPTIONAL AUXILIARY POOL WATER HEATER

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 circuit 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® outputs are rated 2A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage to auxiliary water heaters. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.

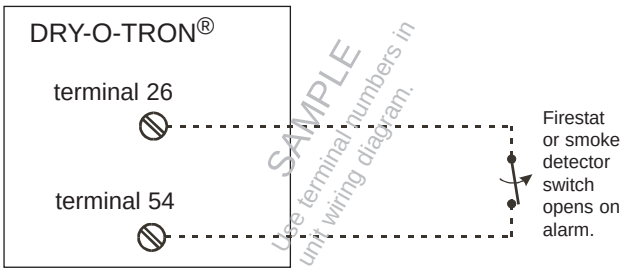


A similar circuit is used for a second auxiliary pool water heater. See the unit field wiring diagram in the unit information package.

FIRESTAT CONNECTION

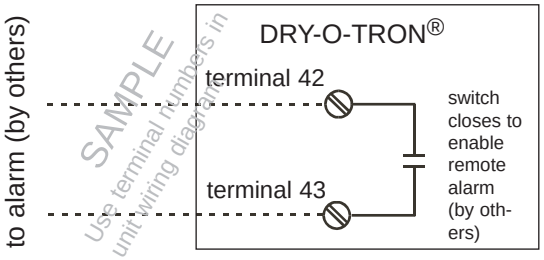
For units requiring a firestat interlock, remove the jumper between terminals 25 and 54, or as shown on the unit wiring diagram. In the jumper's place substitute an isolated normally closed switch closure from the fire alarm (by others).

If the fire alarm is triggered, the resulting open circuit between these terminals will cause the DRY-O-TRON® to shutdown.



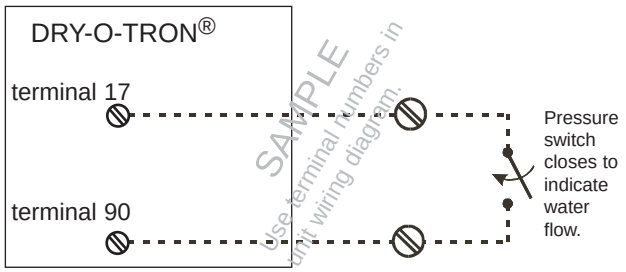
GENERAL ALARM

All DRY-O-TRON® units are provided with an output for a general alarm. A circuit 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 2A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage to alarms. Do not attempt to use an internal DRY-O-TRON® power source unless so directed by Dectron.



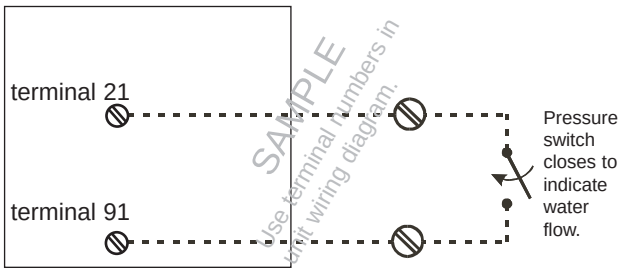
POOL WATER PRESSURE SWITCH

The presence of pool water flow is detected by a pressure switch. For some units, this switch may ship separately. Install the switch as shown under **Installation - Piping**. Wire the switch as shown here.



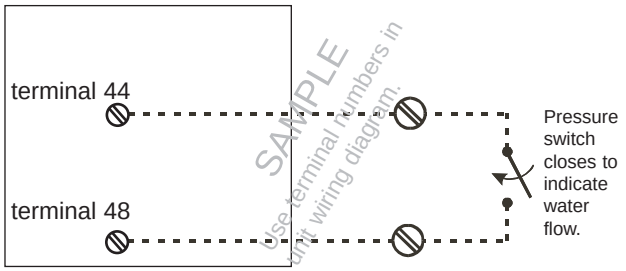
SPA WATER PRESSURE SWITCH

Some units may be equipped with provisions to heat a second pool or spa. The presence of spa water flow is detected by a pressure switch. For some units, this switch may ship separately. Install the switch as shown under **Installation - Piping**. Wire the switch as shown here.



AIR CONDITIONING WATER PRESSURE SWITCH (units with water-cooled air conditioning only)

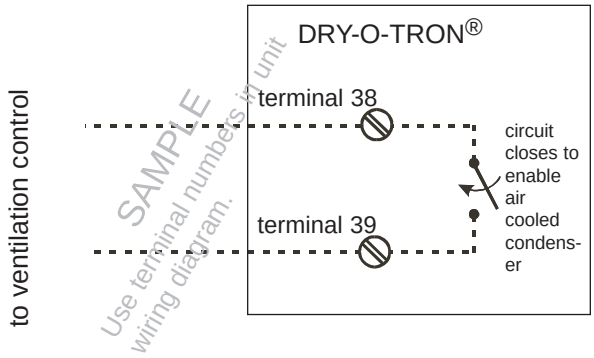
Some units may be equipped for water-cooled air conditioning. The presence of cooling water flow is detected by a pressure switch. For some units, this switch may ship separately. Install the switch as shown under Installation - Piping. Remove the jumper between terminals 44 and 48, then wire the switch as shown here.



VENTILATION

Some units may be equipped for the control of a ventilation system. Unless the optional ventilation power supply was ordered, the ventilation system must have its own power supply so that a circuit closure will enable ventilation.

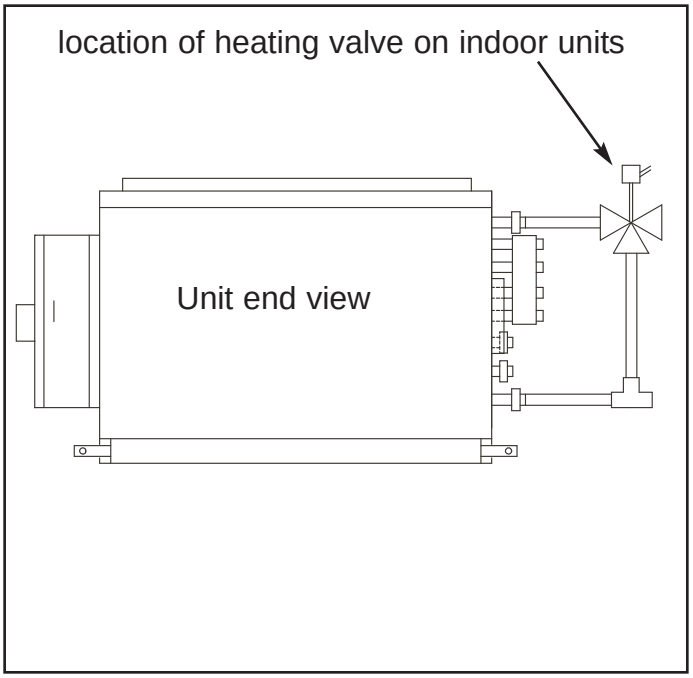
The DRY-O-TRON® dry contacts are rated 2A at 24VAC 60Hz. Do not overload these outputs. The DRY-O-TRON® does not provide output voltage for ventilation, except with the option "Power Supply for Ventilation". Do not attempt to use an internal DRY-O-TRON® power source unless the option "Power Supply for Ventilation" was ordered.



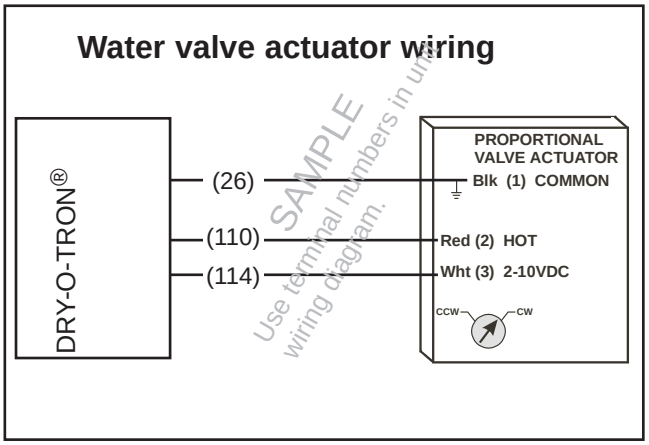
INSTALLATION

HOT WATER OR STEAM HEAT UNITS ONLY

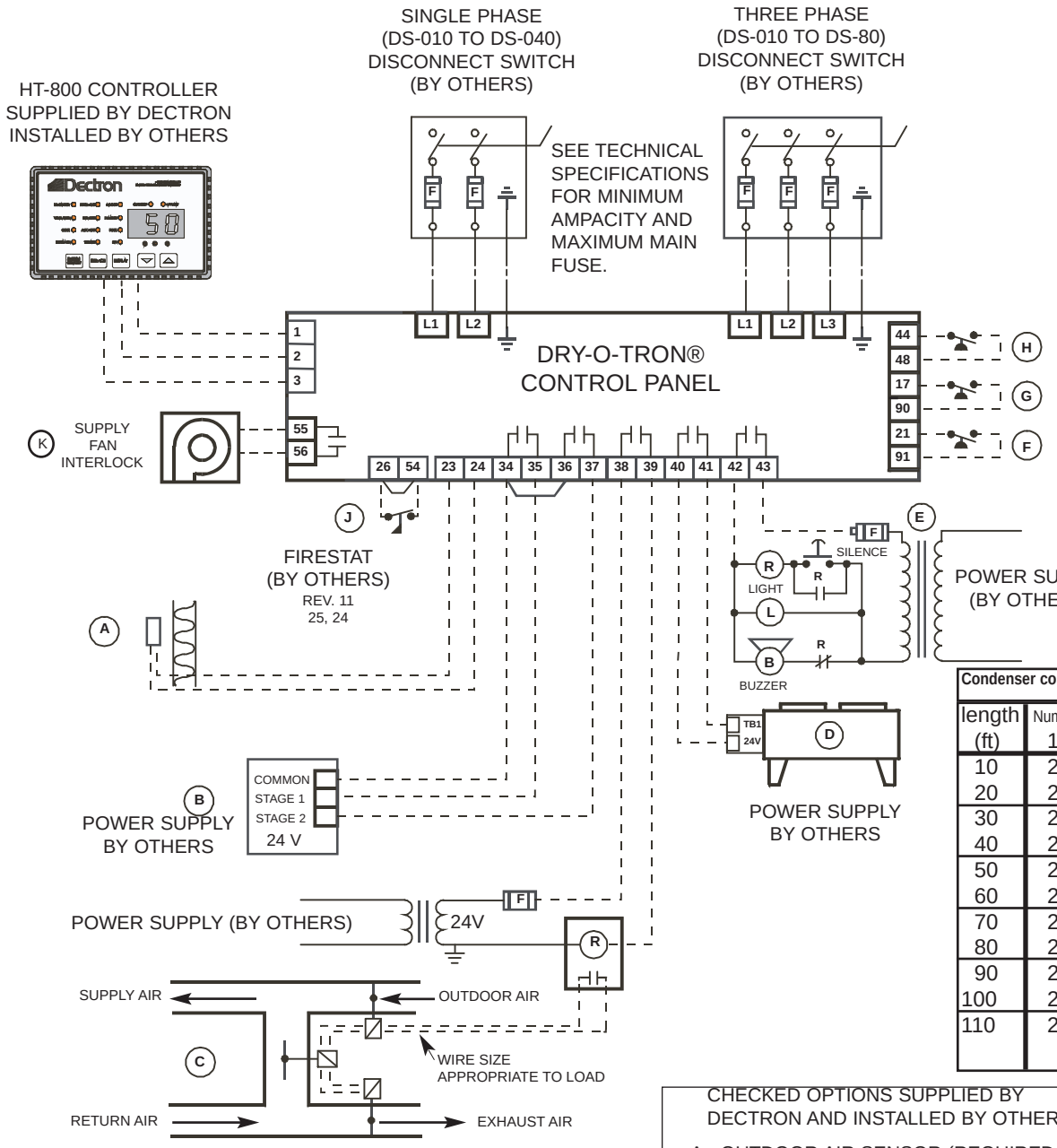
Some installations may have hot water or steam heating systems. In these cases there may be an electrically actuated valve to control the flow of the hot fluid. On D series (indoor) units, this valve is located outside the unit cabinet.



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.



Wiring Installation



Condenser control wire size (AWG)				
length (ft)	Number of condenser fans 1	2	3	4
10	20	20	20	20
20	20	20	20	20
30	20	20	20	20
40	20	20	20	18
50	20	20	20	18
60	20	20	20	16
70	20	20	18	16
80	20	20	18	16
90	20	20	18	16
100	20	20	18	14
110	20	20	16	14

POWER WIRE

CONTROL WIRE 20 AWG EXCEPT AS NOTED

"R" = RELAY (BY OTHERS)

"REV. 11" = REVISION 11 AND EARLIER HT-800 CONTROLLERS

CHECKED OPTIONS SUPPLIED BY DECTRON AND INSTALLED BY OTHERS

- ☐ A OUTDOOR AIR SENSOR (REQUIRED FOR AIR CONDITIONING WITH ECONOMIZER VENTILATION)
- ☐ B SPACE HEATER
- ☐ C VENTILATION AND DAMPER SYSTEM (BY OTHERS)
- ☐ D AIR COOLED CONDENSER
- ☐ E ALARM CIRCUIT (BY OTHERS)
- ☐ F SPA WATER PRESSURE SWITCH
- ☐ G POOL WATER PRESSURE SWITCH
- ☐ H WATER COOLED A/C WATER PRESSURE SWITCH
- ☐ J FIRESTAT
- ☐ K SUPPLY FAN INTERLOCK

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 by 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.

Elbows near the DRY-O-TRON® must be equipped with aerofoil turning vanes and acoustic insulation.

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

If a below-grade duct system is used, transite or PVC-coated round metal ductwork should be used.

Δ Flexible duct connectors

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

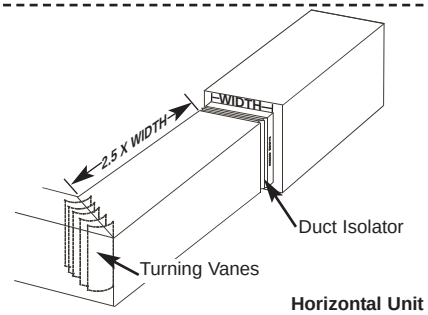
Return Duct

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.

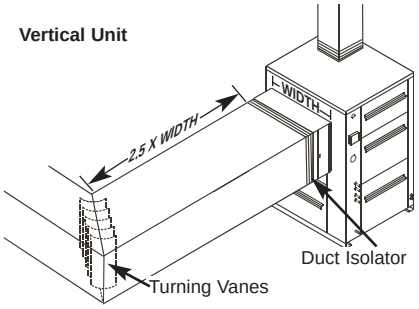
If turning vanes are not used in elbows, allow a length of straight duct equal to at least 5 X WIDTH.

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



Horizontal Unit

Vertical Unit



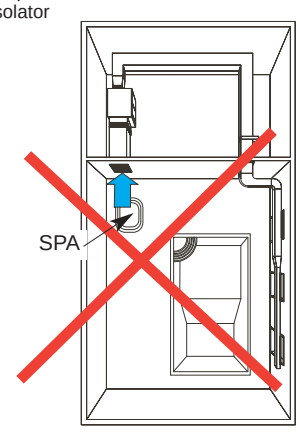
Never install a DRY-O-TRON® natatorium dehumidifier in a return-air plenum room. Corrosive chemicals in the air will shorten the life of the electrical components.

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.

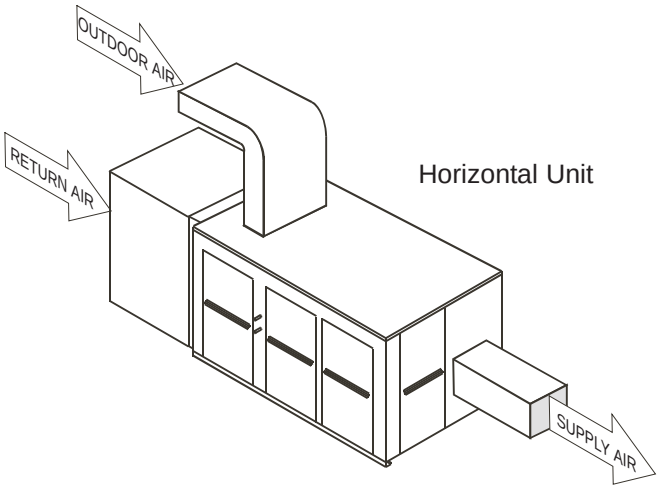
A better solution is to exhaust the air over the spa or hot tub.



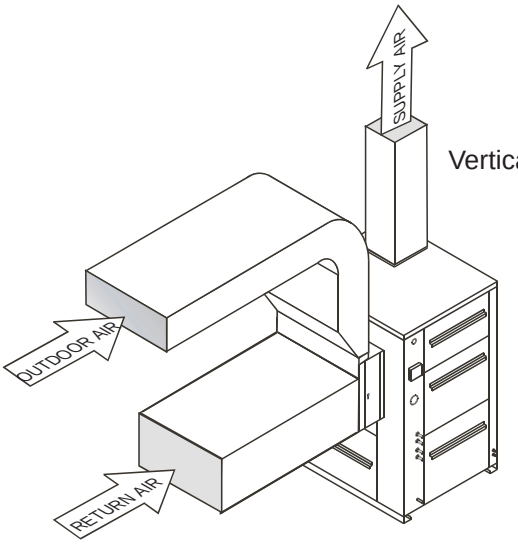
Outdoor-Air Intake Duct

Indoor units may be supplied with outdoor air via a duct. Where this is the case, use only the outdoor-air connection provided.

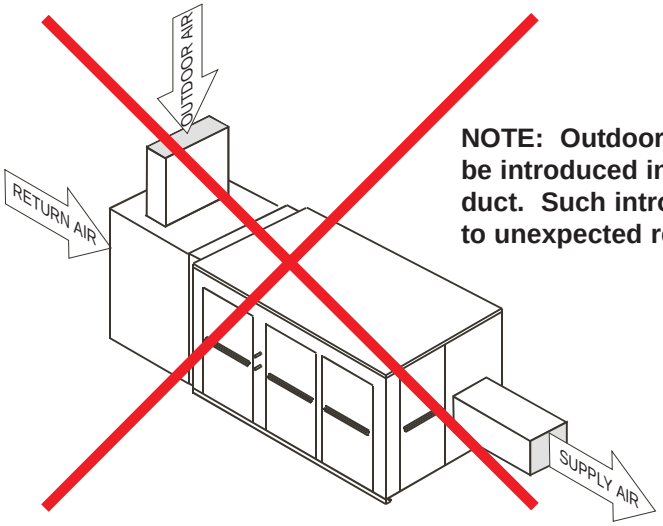
Outdoor air must be filtered and balanced.



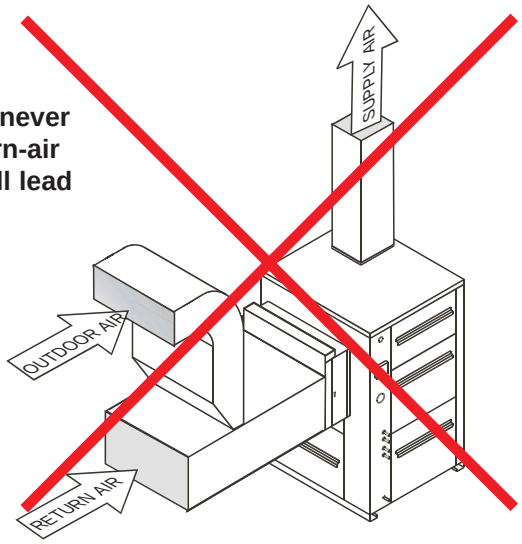
Horizontal Unit



Vertical Unit



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



Installation Unit - Duct Connections

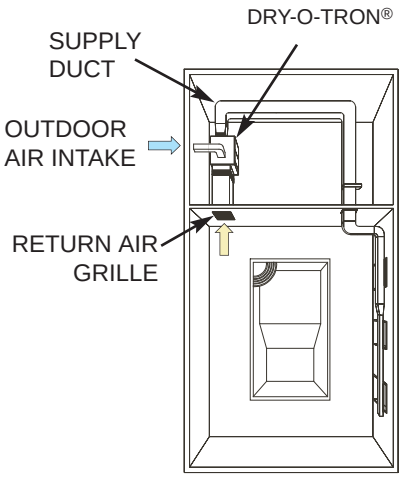
Ventilation, Method 1

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.

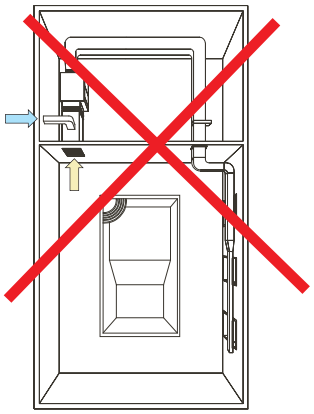
Note: In cold climates, outdoor air should be heated (by others) to room temperature before entering a DRY-O-TRON® that does not have the air-conditioning option.

Outdoor air must be filtered before entering the DRY-O-TRON®.

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

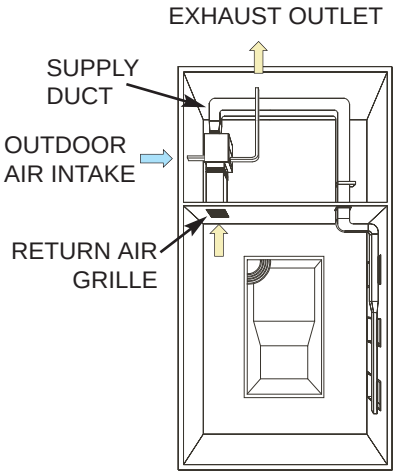


NEVER BRING OUTDOOR AIR INTO THE RETURN DUCT.



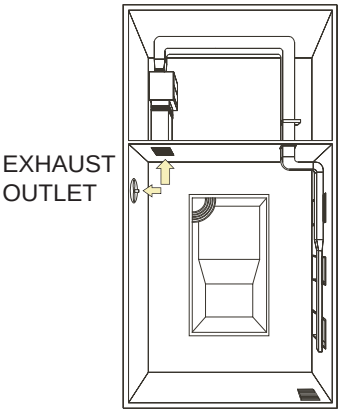
When makeup air is brought into a space, it is also necessary to exhaust 110% of the amount being brought in. This maintains a slight negative pressure on the space and reduces moisture movement into the rest of the building.

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.**



Data subject to change without notice.

Unit - Duct Connections Installation

Ventilation, Method 2

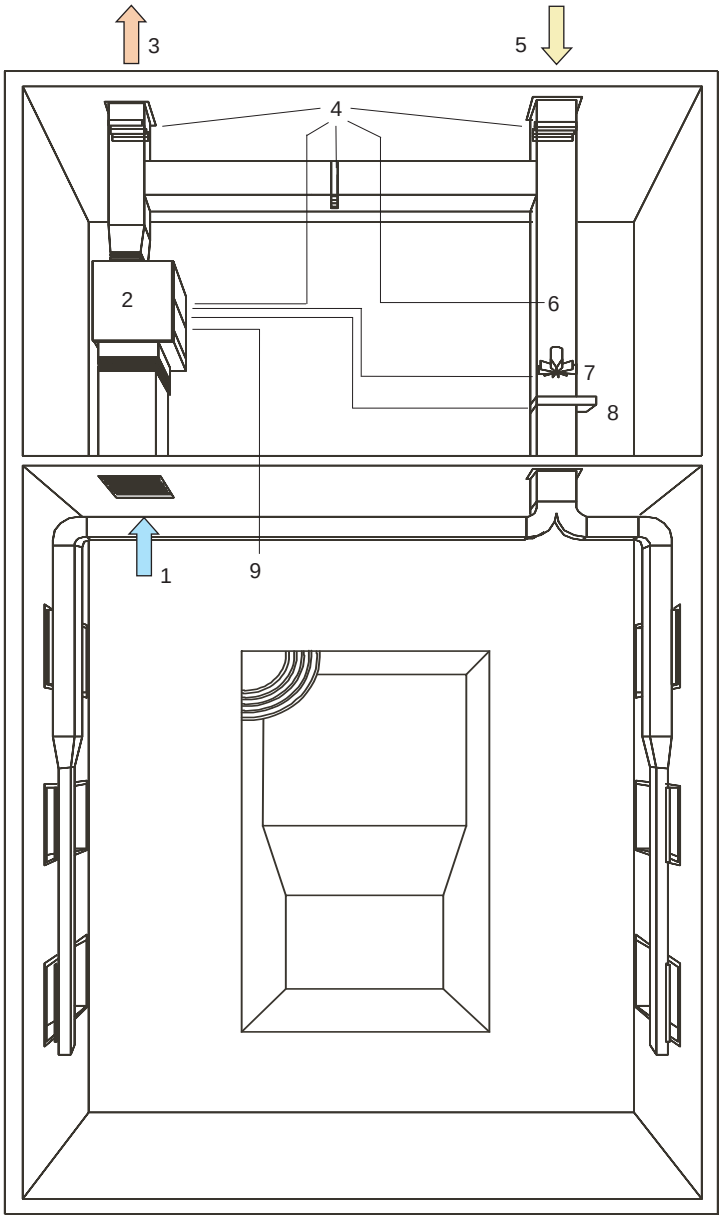
The mechanical system must ensure that adequate ventilation, including the introduction of outdoor air, is provided according to the applicable building codes. The quality of the indoor air is extremely important to ensure user comfort.

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-040 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 DS-080 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 room will vary according to the outdoor air conditions.



IMPORTANT!

All outdoor air inlets must have a separate air filter.

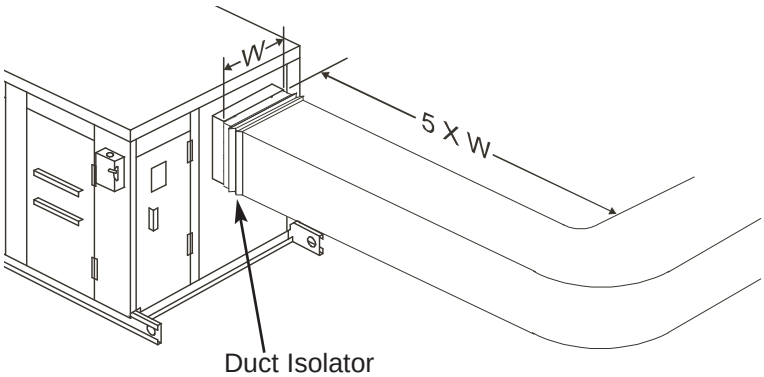
1. Return air
2. DRY-O-TRON® as return air blower
3. Exhaust air
4. Modulating damper control, (DA5-080 and larger) Power supply for ventilation
5. Make-up air (provide air filters)
6. Modulating thermostat (by others)
7. Supply blower (by others)
8. Auxiliary space heater (by others) controlled by DRY-O-TRON®
9. Space temperature and humidity sensed and controlled by DRY-O-TRON®

Supply Duct

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

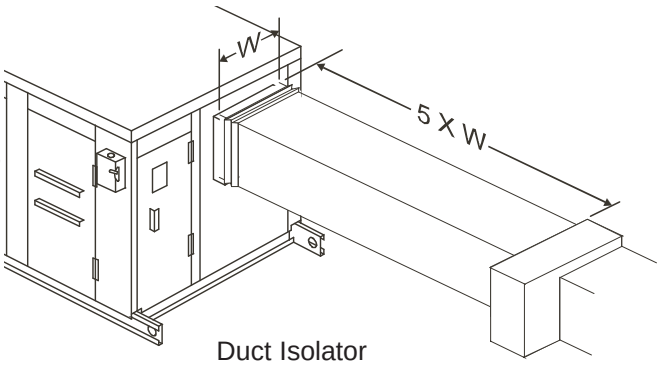
To prevent unexpected external energy loss, allow a section of straight duct with a length five times the blower width leaving the DRY-O-TRON®. There should be no elbows, transitions, offsets, duct heaters, or other flow interruptions closer that 5 X the width of the blower.

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



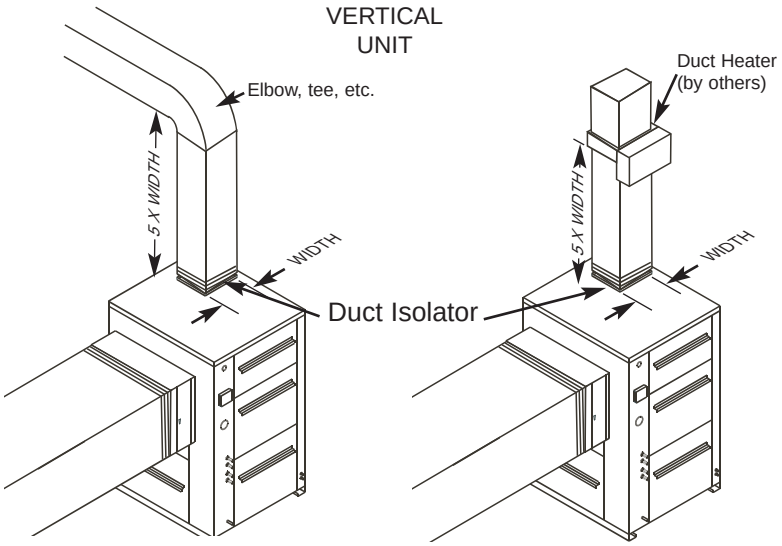
HORIZONTAL UNIT

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.



VERTICAL UNIT

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



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

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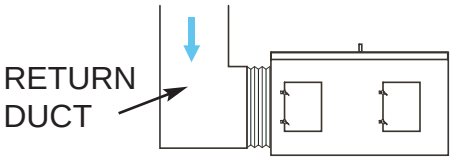
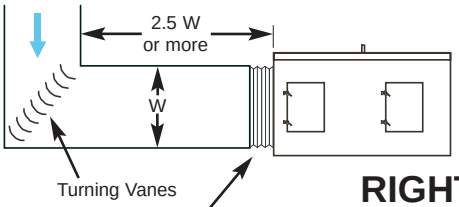
Installation — Standard Practice for Ducts



WRONG

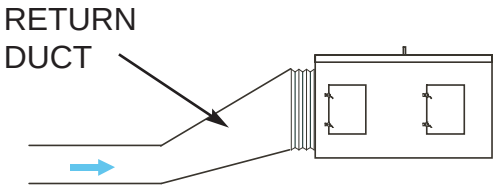
The air will not be evenly distributed over the evaporator.



Always install vibration isolator.

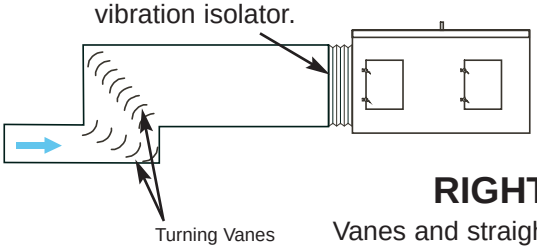
RIGHT

Vanes and straight length allow air to flow evenly.



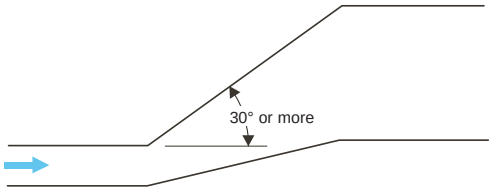
WRONG

The air will not be evenly distributed over the evaporator.



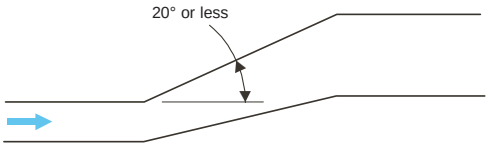
RIGHT

Vanes and straight length allow air to flow evenly.



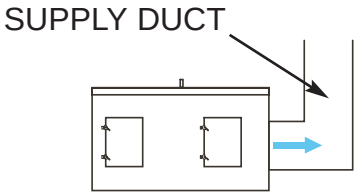
WRONG

Air cannot follow this steep angle.



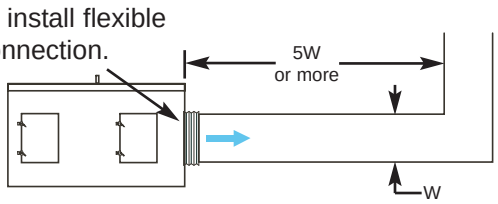
RIGHT

Air can follow this transition.



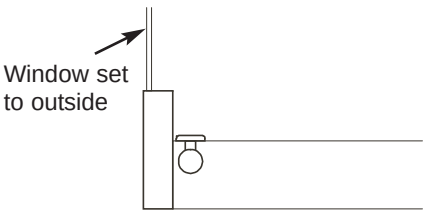
WRONG

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



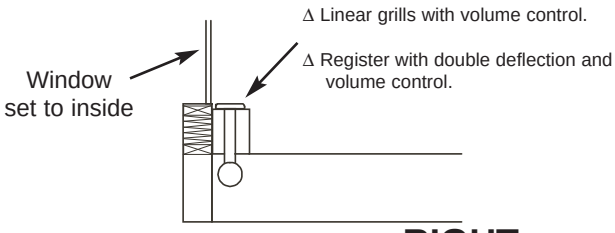
RIGHT

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



WRONG

Air cannot reach the lower part of the window.



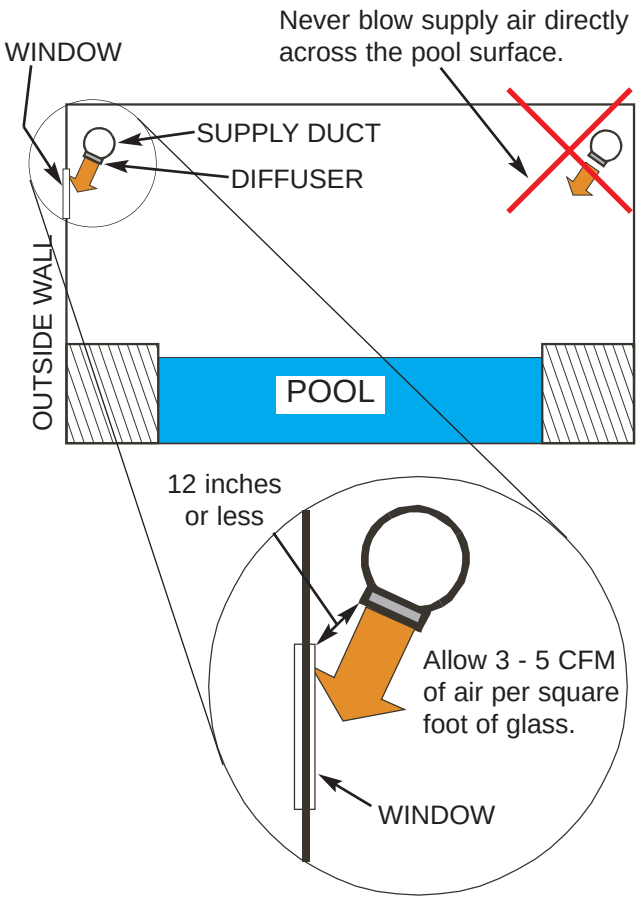
RIGHT

Dry air reaches all the window.

Data subject to change without notice.

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.

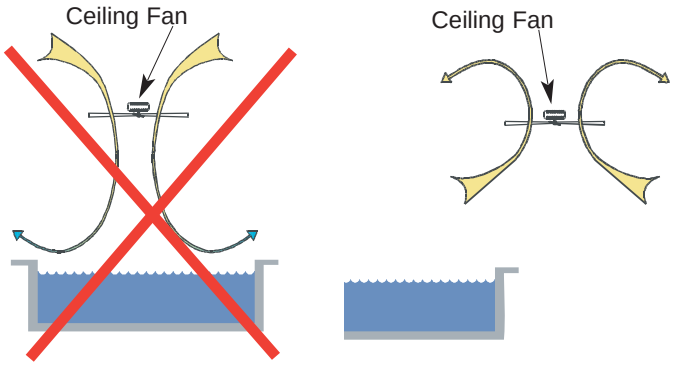
Δ Prevent Condensation

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 , 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.



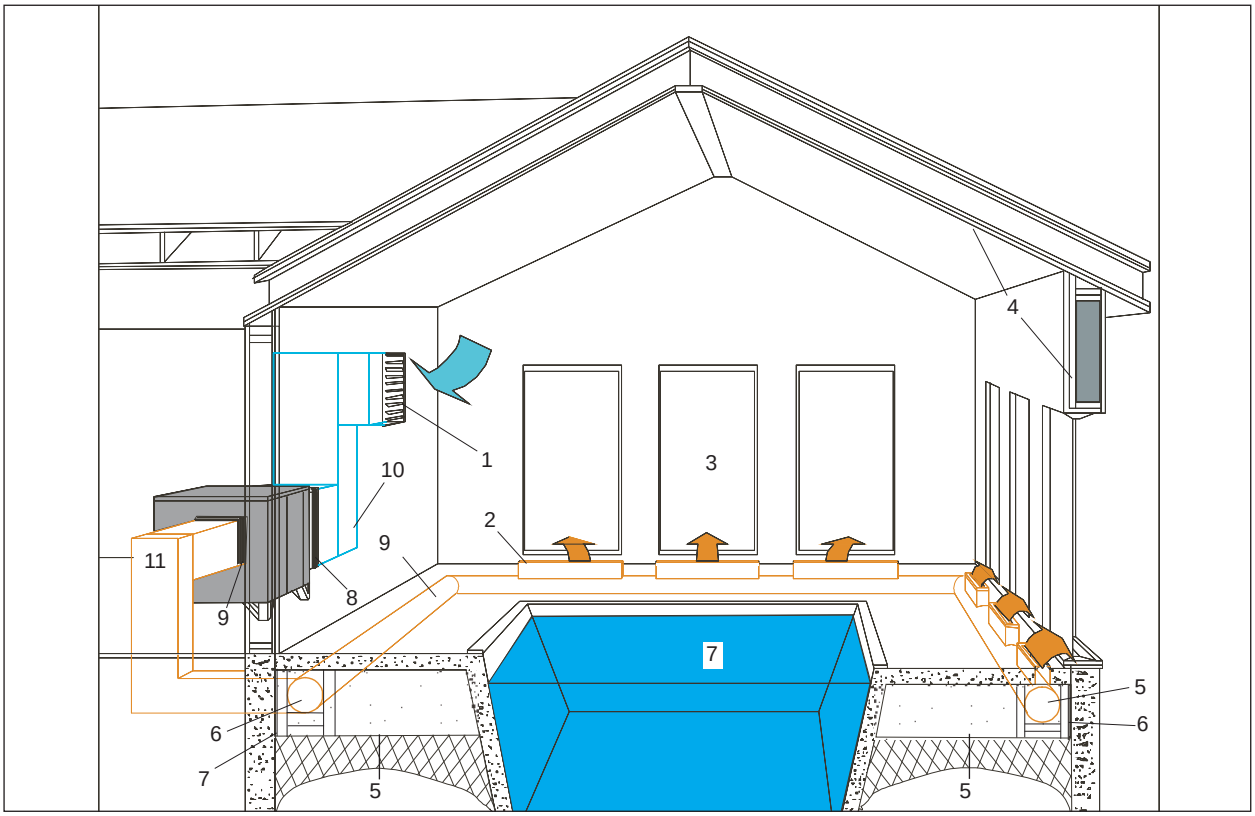
Recommended Minimum Temperatures for Interior Surfaces

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

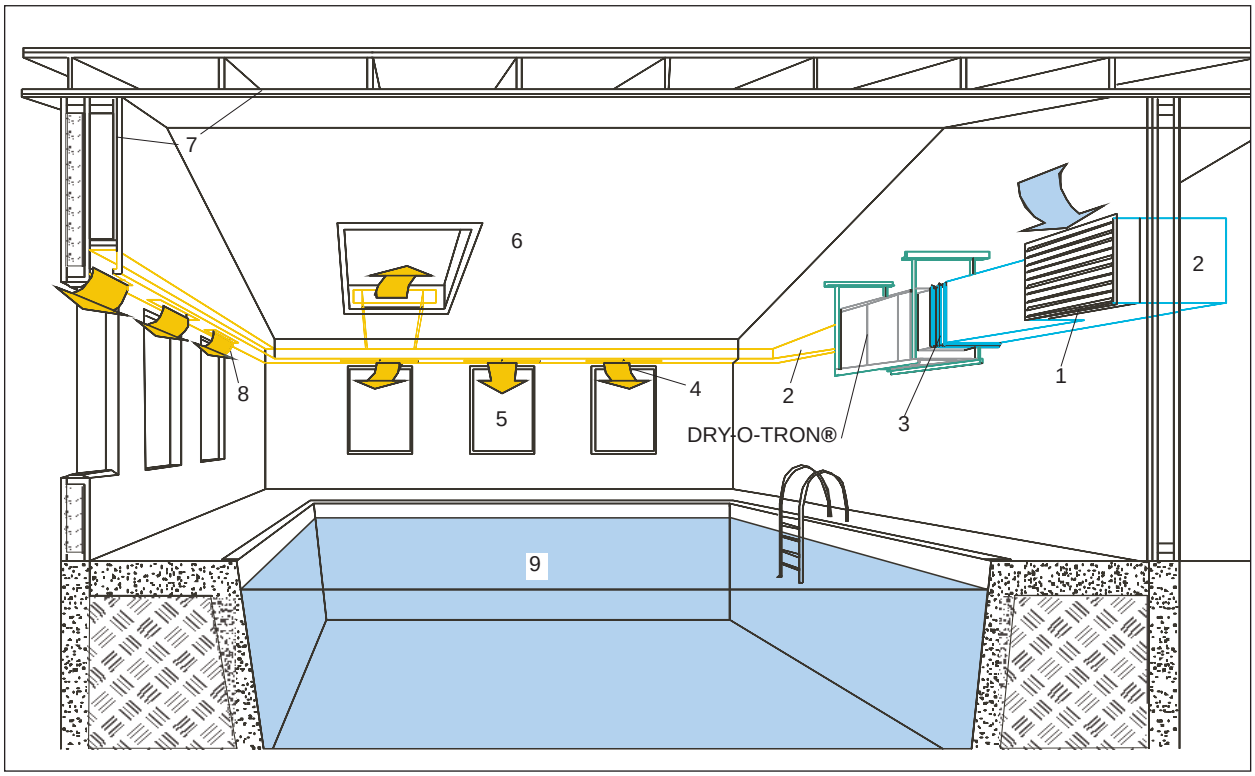
Installation Air Distribution Under-floor Supply Duct

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. A vapor retarder in all walls and ceilings is necessary. Dehumidification will not prevent the condensation of liquid water inside cold walls.
5. Where duct is installed below the floor, use PVC coated round metal duct.
6. Duct installed beneath the floor should be insulated with styrofoam insulation.
7. Do not direct air over the pool water surface.
8. Always install flexible duct connections.
9. Under-floor perimeter air distribution for low windows
10. 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 retarder 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.

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.

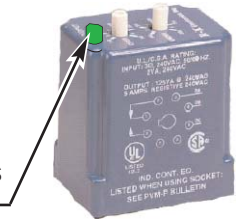
Important!

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.

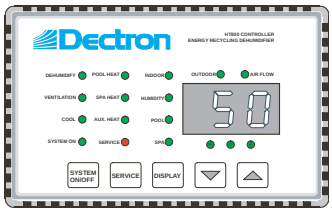
Air flow is adjusted by changing the variable sheave on the blower motor shaft. Do not use other sheaves or change the air flow outside the range given on the unit nameplate, without the expressed approval of Dectron.



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 sequence. If the green LED is not lit, confirm that the applied voltage is within ±10% of the nameplate voltage (NEMA MG-1), that all three phases are present, and that the phase rotation is correct.

2. In the DRY-O-TRON electrical enclosure, press **START** on the blower motor overload (if any). Do not turn press start on the compressor overload (if any). Turn OFF the compressor emergency switch (if any). Turn ON the blower emergency switch (if any).



3. On the HT800 display, press SYSTEM ON/OFF until SYSTEM ON illuminates.

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

When the air flow has been properly adjusted, the blower can be stopped by pressing SYSTEM ON/OFF until SYSTEM ON goes off.

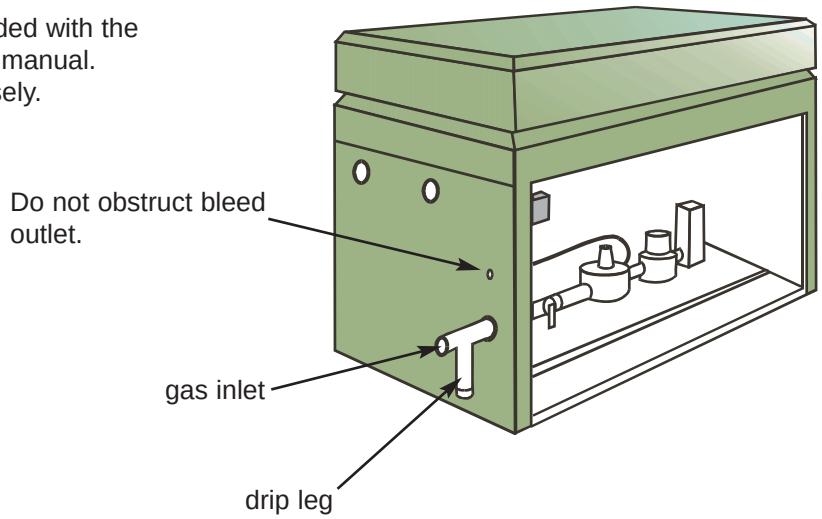
If possible and safe, leave the electrical power connected to the DRY-O-TRON and leave the blower overload ON. This will allow the compressor crankcase heater to function. The crankcase heaters must be on continuously for at least 10 hours before the compressor is started.

INSTALLATION

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

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

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.

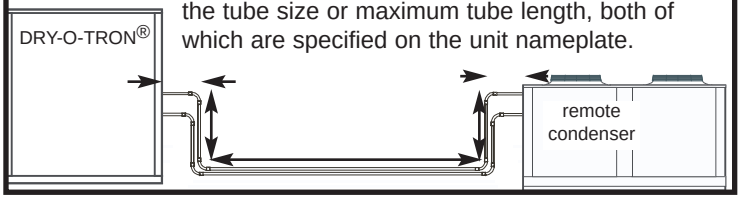
Connect the refrigerant tubes between the DRY-O-TRON® and the remote condenser. Use only clean Type ACR copper tube. Silver braze the copper tube joints using BCuP filler. Soft solder is subject to long-term failure. If flux must be used, use only enough flux to solder. Excess flux can contaminate the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

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

IMPORTANT:

Check carefully for leaks.

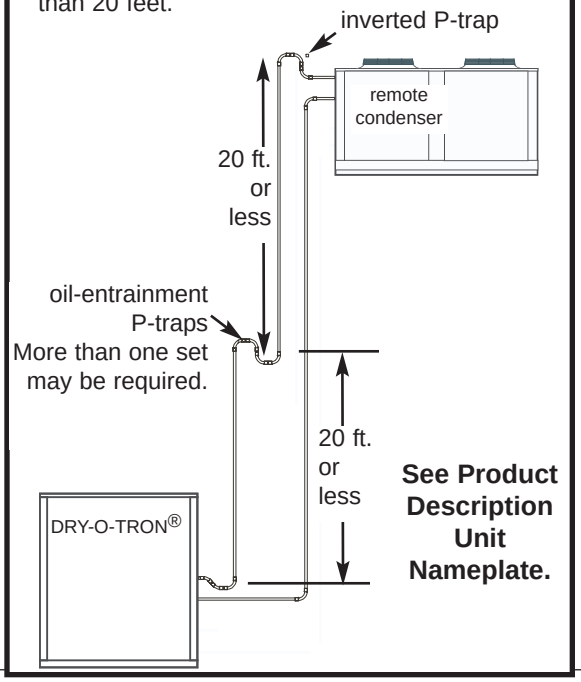
For remote condensers at the same level as the DRY-O-TRON, contact Dectron before exceeding the tube size or maximum tube length, both of which are specified on the unit nameplate.



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

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

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



See Product Description Unit Nameplate.

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:
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.

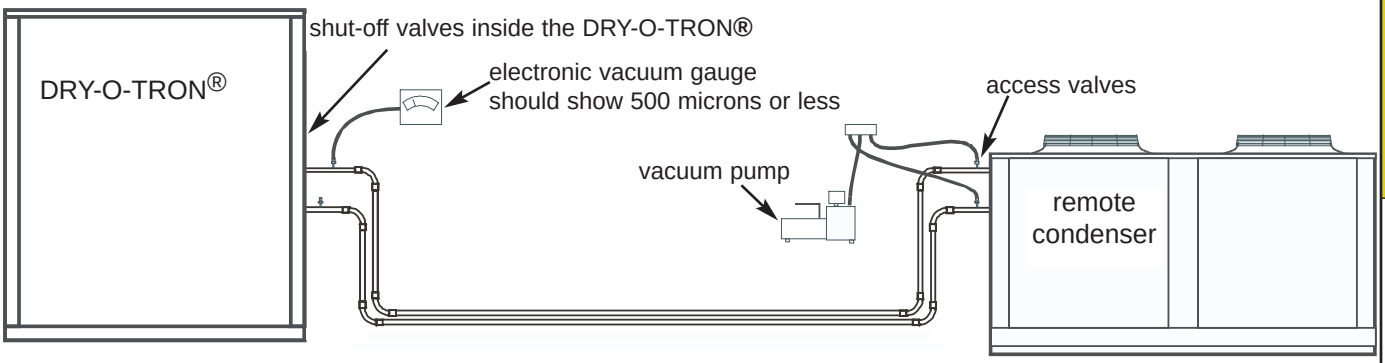
To insure a correct reading, install the electronic vacuum gauge far away from the vacuum pump.

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 two condenser isolation valves located inside the DRY-O-TRON®.

Locate and open the two refrigerant receiver isolation valves.



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.
010	6	0.40	0.19	9	0.55	0.26	11	0.71	0.34
015	7	0.46	0.22	10	0.62	0.29	12	0.77	0.37
020	13	0.78	0.37	17	1.07	0.51	22	1.36	0.64
030	17	1.06	0.50	21	1.34	0.63	26	1.63	0.77
040	27	1.69	0.80	33	2.06	0.98	39	2.44	1.15
050	35	2.20	1.04	44	2.73	1.29	52	3.24	1.53
060	35	2.20	1.04	44	2.73	1.29	52	3.24	1.53
080	42	2.63	1.25	55	3.44	1.63	68	4.26	2.01

Installation Piping Condenser Water

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

IMPORTANT:

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

IMPORTANT:

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

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

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

Where 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:

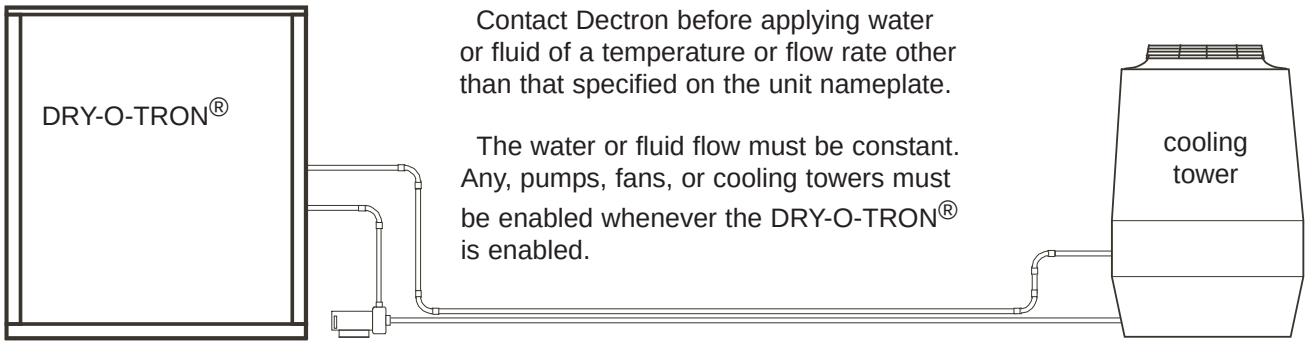
Cooling water must be protected from freezing if the water flow could be interrupted during low ambient temperatures.

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.

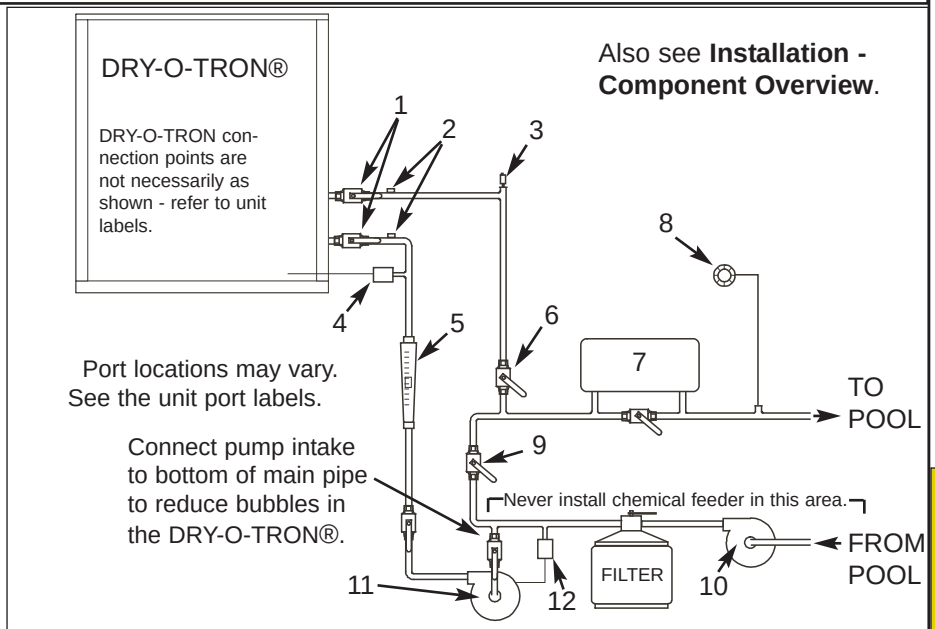
Pool Water Piping Installation

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.



Maximum Pool Water Flow Rates and Pressure Drops

Model DS	010	015	020	030	040	050	060	080
Maximum GPM	6	6	6	8.5	8.5	15	20	20
Max. Press. Drop(PSI)	6	6	6	6	6	6	6	6

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
      1. the elevation of the DRY-O-TRON® above the pool surface,
      2. 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.

INSTALLATION

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

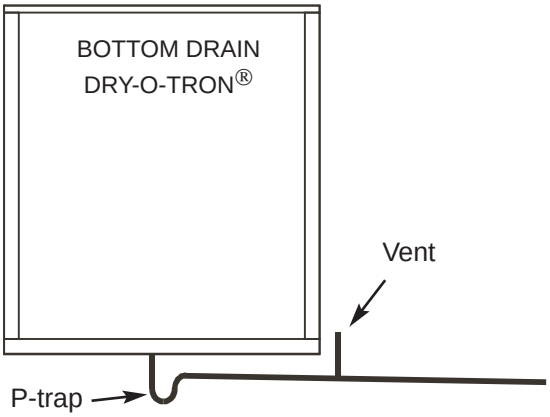
To prevent air from being drawn through the condensate drain pipe, the P-trap must be filled with water before starting the unit blowers. Failure to do this will cause the drain pan to overflow during operation.

Δ Condensate pump

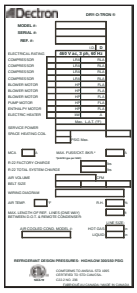
If a condensate pump must be used, be sure it has enough pressure and volume capability. If the condensate is to be delivered to a pipe that might be pressurized above atmospheric pressure, install a check valve to prevent backflow.

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.

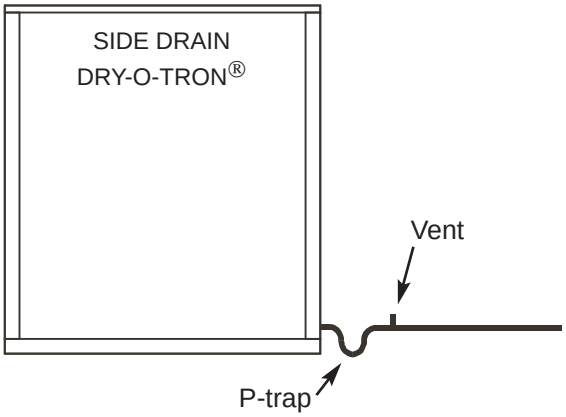
Depending on conditions, bottom drains may have to be protected against freezing.



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.**



See Product Description Unit Nameplate



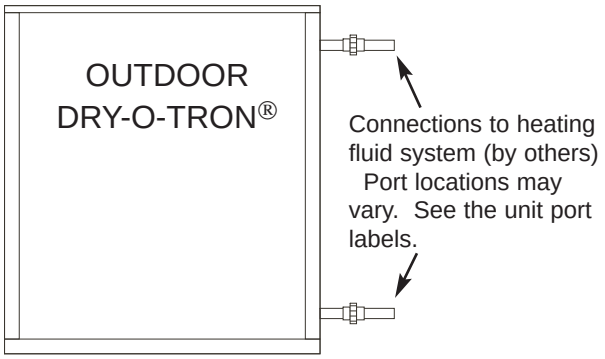
WATER-HEATED, GLYCOL-HEATED, OR STEAM-HEATED UNITS ONLY

Connect the heating fluid tubes between the DRY-O-TRON® and the hot fluid source. Where connection must be made to metal tube other than copper 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.

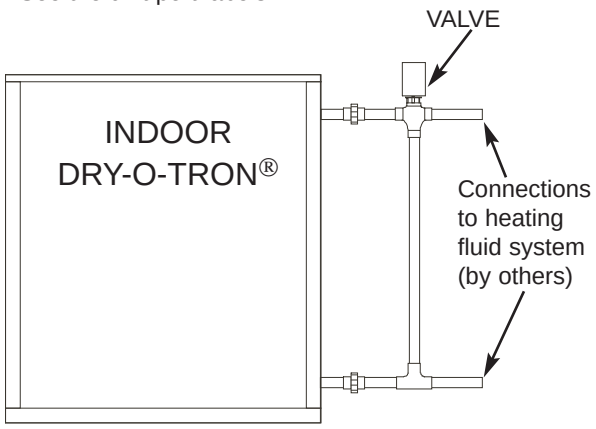


Port locations may vary.
See the unit port labels.

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.



INSTALLATION

Installation

Installation 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 (See **Installation-Piping-Refrigerant** and **Startup-Add Refrigerant**.)
- Upper access valve is head pressure
- Lower access 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

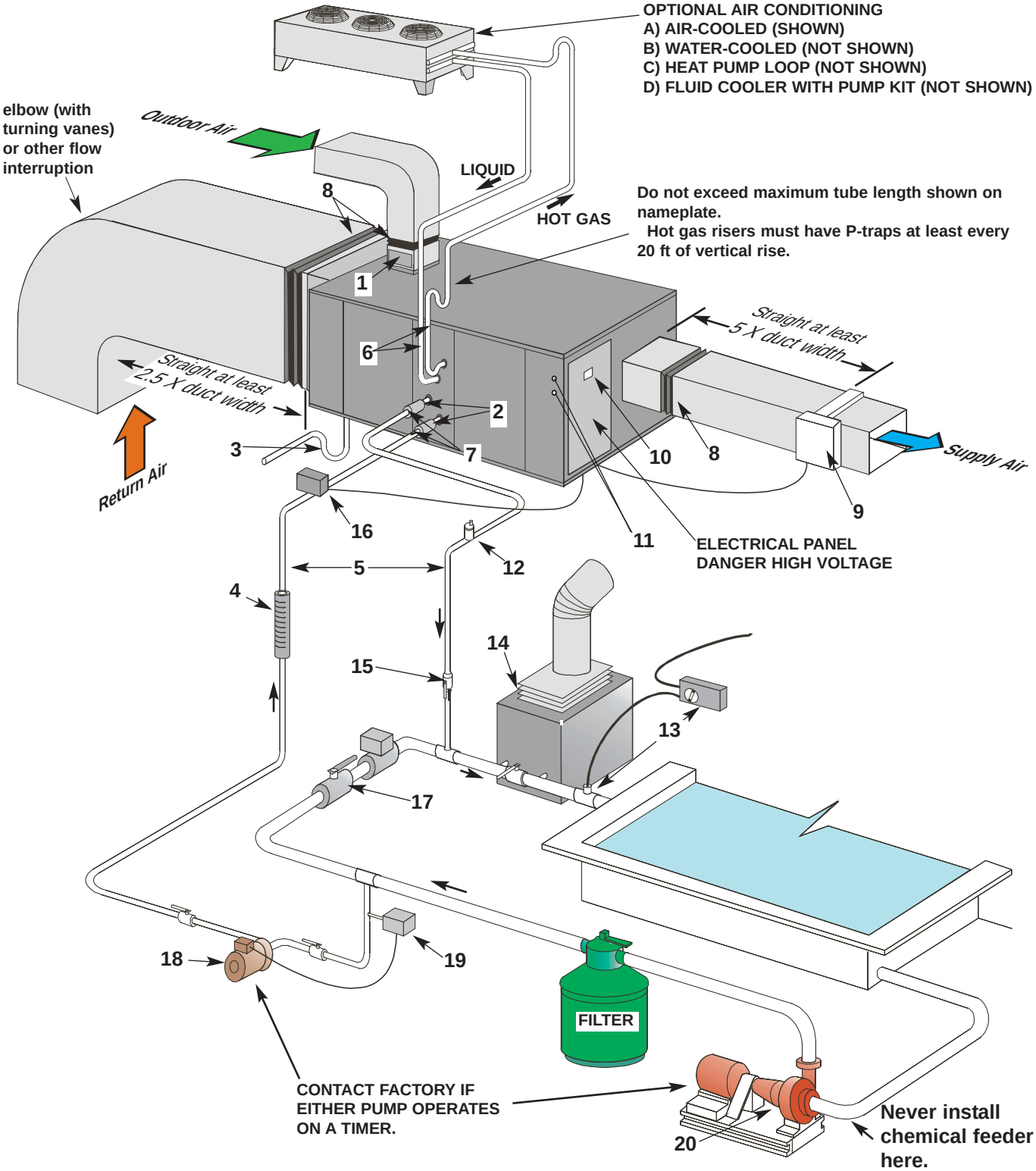
17. By-Pass Valve (by others)
- Throttle to force water through the DRY-O-TRON® when the recommended secondary circulating pump is not used

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.

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



INSTALLATION

Data subject to change without notice.

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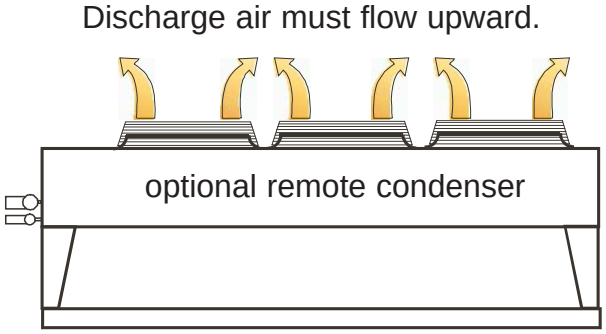
CONDENSER FAN ROTATION (units with air-cooled air conditioning option only)

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.

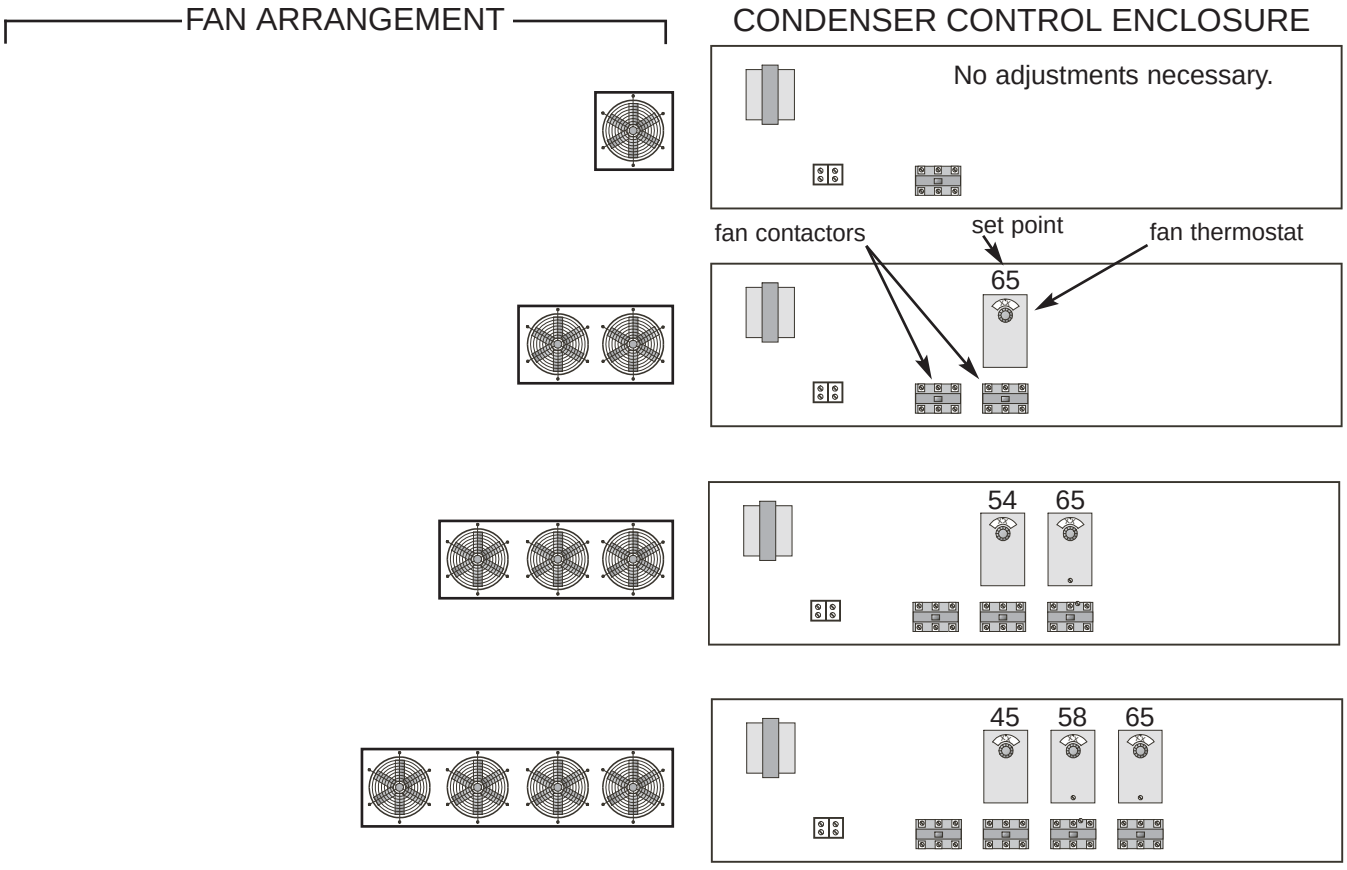
Single phase fans will inherently turn the proper direction. If three phase fans turn the wrong way, a qualified person should disconnect the branch circuit and interchange any two wires on the power inlet lugs in the condenser control enclosure. Do not move any factory installed wires.



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.

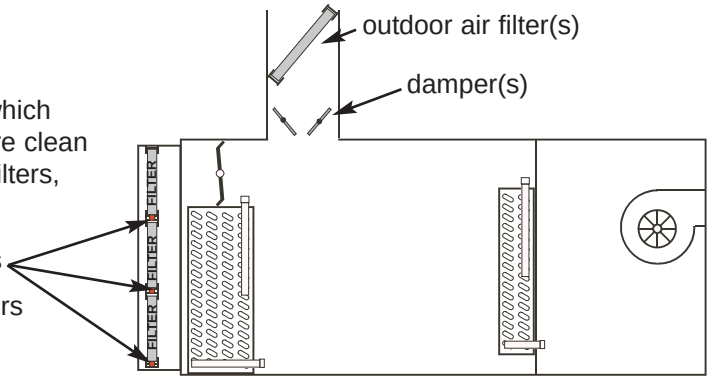


STARTUP

Pre-Startup Adjustments

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 .

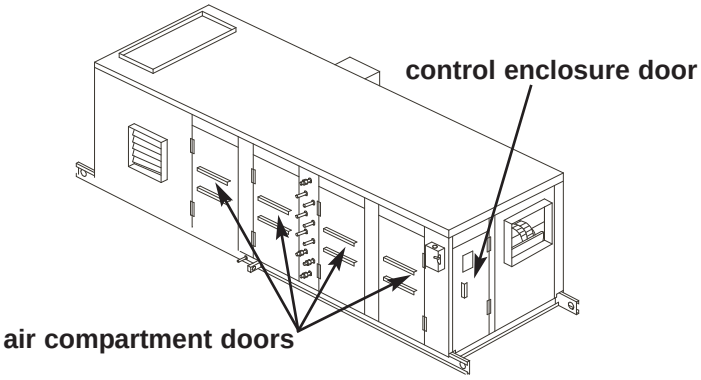


The size and number of filters and draw tabs may vary.

CLOSE ALL AIR COMPARTMENT DOORS AND ACCESS PANELS

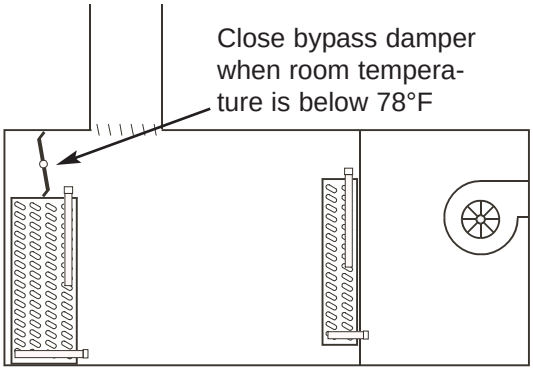
The control enclosure door is not an air compartment door.

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.



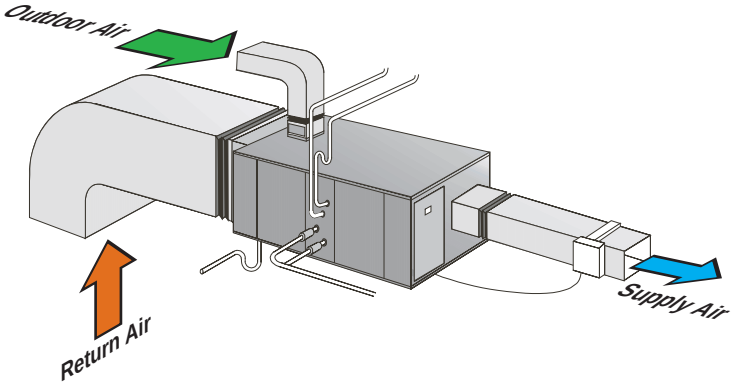
units with MANUAL EVAPORATOR BYPASS DAMPER only

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.



AIRFLOW

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



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

Units with optional fluid cooled air conditioning must have a constant flow of fluid of the correct temperature (Standard inlet temperature has a maximum of 90°F (32°C)).

Unit Size→	010	015	020	030	040	050	060	080
GPM→ @85°F	6	6	8.5	15	20	20	30	40

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

Units with Dry-Cooler® cooled air conditioning must have a constant flow of fluid of the correct temperature (Standard inlet temperature has a maximum of 110°F (43°C)).

Unit Size→	010	015	020	030	040	050	060	080
GPM→ @110°F	8	10	14	20	28	36	45	54

POOL AND/OR SPA WATER FLOW

Units must have a constant pool water flow rate. If a flowmeter is not available, see Operation-Adjustments in this manual. The proper inlet water temperature after completion of startup is stated on the unit nameplate. See Product Description - Unit Nameplate.

Unit Size→	010	015	020	030	040	050	060	080
GPM→ @85°F	6	6	6	8.5	8.5	15	20	20

STARTUP

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-cooled or fluid-cooled condensers

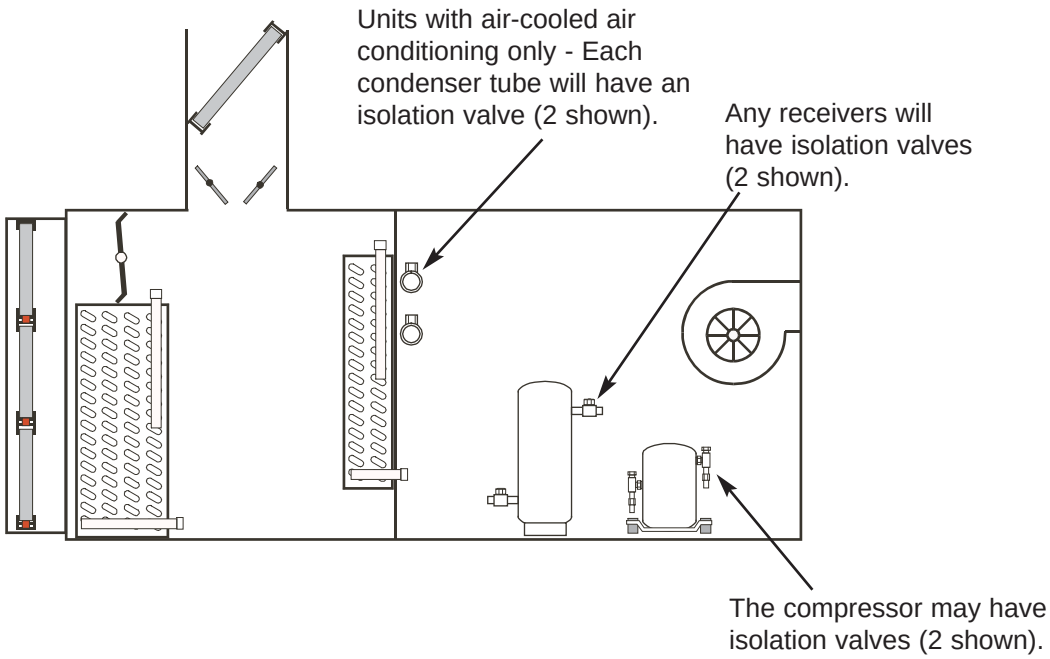
Repeat the above steps for the condenser water flow rate and fluid flow switches. See the recommended flow rates in **Startup - Pre-Startup Adjustments**.

Be sure that the following manual valves have been opened:

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

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

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



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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 any heating fluid system is installed, free of leaks, and has the proper flow and temperature. See **Installation - Isolators and Drain.** 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 is properly connected with a filled P-trap, is free of leaks, and works. your initials

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

For units with boilers, confirm that the fuel gas is supplied between 7" W.C. and 14" W.C., or at a special pressure specified at time of order. (See **Installation - Piping - Boiler**.) your initials

For units with boilers, confirm that the fuel gas piping is correctly sized. (See **Installation - Piping - Boiler**.) 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 **Setup - Airflow**. your initials

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

Model _____

S/N _____

Ref _____

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

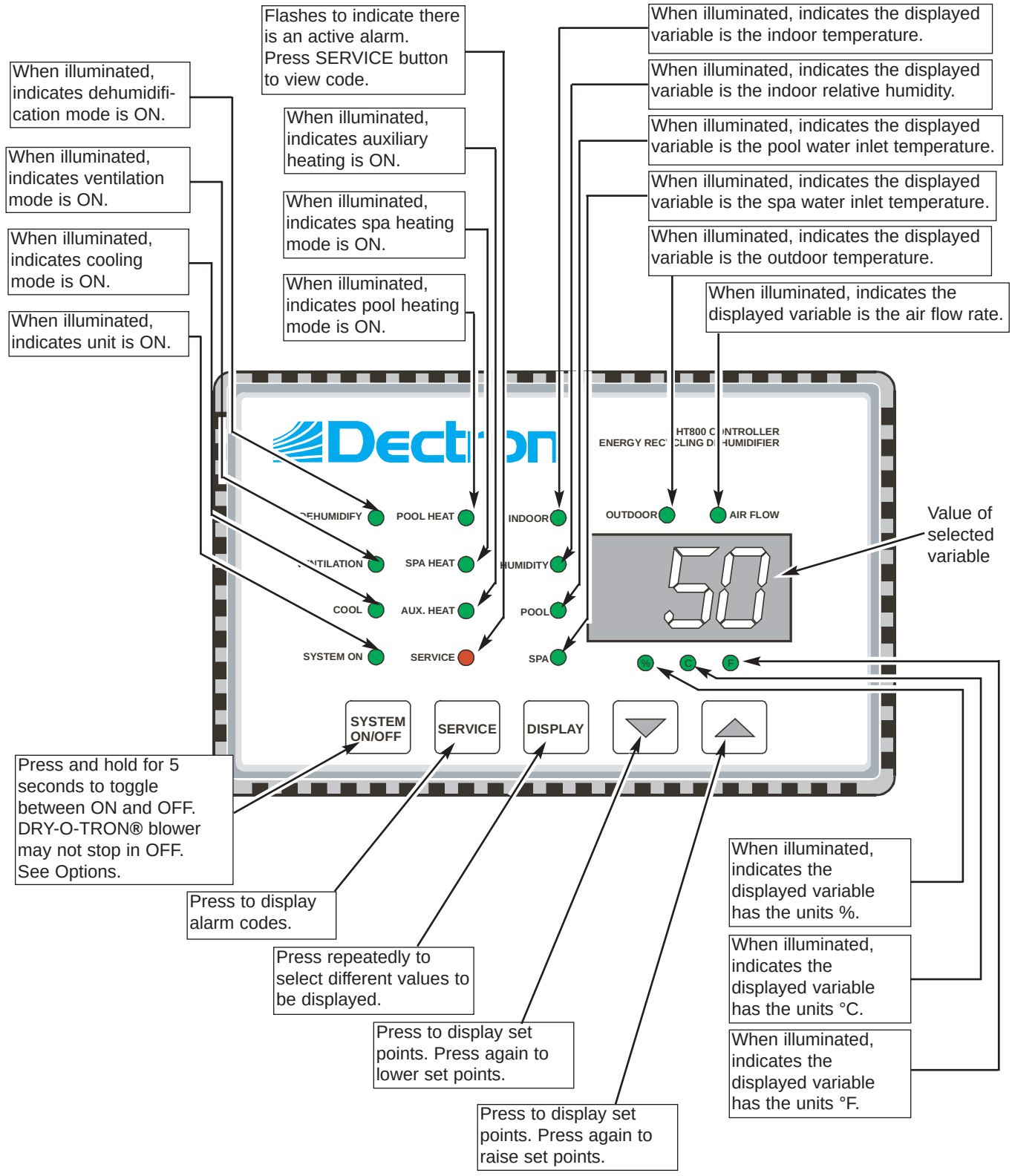
Confirm that any shipping blocks, spacers, or retainers have been removed. your initials

Model _____ S/N _____ Ref _____

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

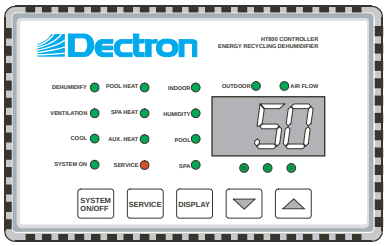
STARTUP

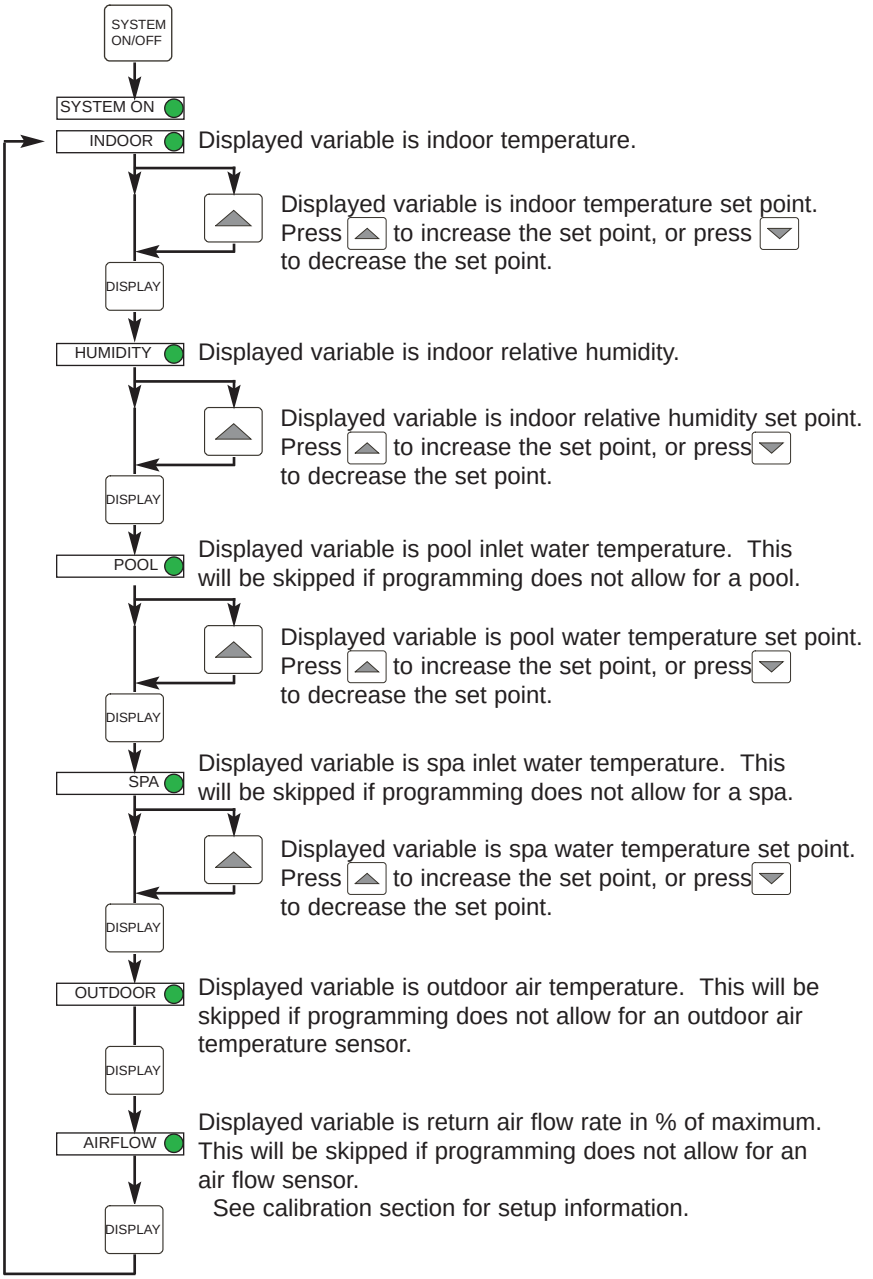
Data subject to change without notice.


Flashes to indicate there is an active alarm. Press SERVICE button to view code.
When illuminated, indicates the displayed variable is the indoor temperature.
When illuminated, indicates dehumidification mode is ON.
When illuminated, indicates the displayed variable is the indoor relative humidity.
When illuminated, indicates auxiliary heating is ON.
When illuminated, indicates the displayed variable is the pool water inlet temperature.
When illuminated, indicates ventilation mode is ON.
When illuminated, indicates spa heating mode is ON.
When illuminated, indicates the displayed variable is the spa water inlet temperature.
When illuminated, indicates cooling mode is ON.
When illuminated, indicates pool heating mode is ON.
When illuminated, indicates the displayed variable is the outdoor temperature.
When illuminated, indicates unit is ON.
When illuminated, indicates the displayed variable is the air flow rate.
ENERGY REC
HT800 C NTROLLER
CLING D HUMIDIFIER
DEHUMIDIFY
POOL HEAT
INDOOR
OUTDOOR
AIR FLOW
VENTILATION
SPA HEAT
HUMIDITY
Value of selected variable
COOL
AUX. HEAT
POOL
50
SYSTEM ON
SERVICE
SPA
%
C
F
SYSTEM ON/OFF
SERVICE
DISPLAY
Press and hold for 5 seconds to toggle between ON and OFF. DRY-O-TRON® blower may not stop in OFF. See Options.
When illuminated, indicates the displayed variable has the units %.
Press to display alarm codes.
When illuminated, indicates the displayed variable has the units °C.
Press repeatedly to select different values to be displayed.
When illuminated, indicates the displayed variable has the units °F.
Press to display set points. Press again to lower set points.
Press to display set points. Press again to raise set points.

STARTUP

Startup Interface Map





Displayed variable is indoor temperature.

Displayed variable is indoor temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

Displayed variable is indoor relative humidity.

Displayed variable is indoor relative humidity set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

Displayed variable is pool inlet water temperature. This will be skipped if programming does not allow for a pool.

Displayed variable is pool water temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

Displayed variable is spa inlet water temperature. This will be skipped if programming does not allow for a spa.

Displayed variable is spa water temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

Displayed variable is outdoor air temperature. This will be skipped if programming does not allow for an outdoor air temperature sensor.

Displayed variable is return air flow rate in % of maximum. This will be skipped if programming does not allow for an air flow sensor.

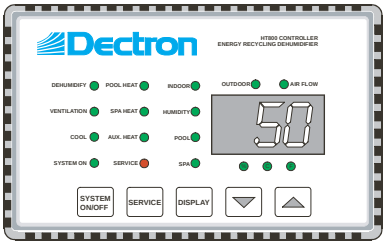
See calibration section for setup information.

In the event of a failure, SERVICE will flash. Press SERVICE to view the alarm code.

After the cause of the alarm has been corrected, press and hold SERVICE to clear the alarm code.

STARTUP

Change Temperature Display Mode



Your HT800 controller comes pre-programmed from the factory for the conditions determined at time of sale. If it is desired to change the temperature display mode, e.g. from °F to °C, follow the steps below. Choose one of the display codes according to the chart.
NOTE: "**+**" indicates pressing two buttons at the same time.

	Press	Screen	temperature units	default display	room temperature measured by
1.	DISPLAY + ▼ hold 3 seconds	Lo			
2.	▲ X approx. 9 times	08			
3.	DISPLAY	CF			
4.	▲	existing display code			
5.	▼ OR ▲ **Recommended-- Factory default**	07	°F	room temperature	return air sensor
	Recommended for a remote location	05	°F	room temperature	thermostat sensor
		03	°F	set point	return air sensor
		01	°F	set point	thermostat sensor
	Recommended-- Factory default	06	°C	room temperature	return air sensor
	Recommended for a remote location	04	°C	room temperature	thermostat sensor
		02	°C	set point	return air sensor
		00	°C	set point	thermostat sensor

The temperature display mode is now set. The display will return to normal approximately 35 seconds after the last button is pressed.

Startup

Set Pools

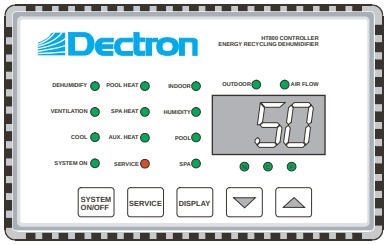
Set Pool Priority

Set Starting Delays

Your HT800 controller comes pre-programmed from the factory for the conditions determined at time of sale. If it is desired to change

a. the number of pools with water flow thorugh the DRY-O-TRON®, or
b. the heating priority of the pools, or
c. the starting delays, then

choose one of the display codes according to the chart below. For other conditions, consult Dectron or a Dectron-certified service technician.



NOTE: "**+**" indicates pressing two buttons at the same time.

NOTE: Pool water should be connected to DRY-O-TRON DS/RS units in order to re-cycle the lost pool heat. Lack of such connection and the necessary adjustments below should be temporary.

	Press	Screen	If the relative humidity is above 60% on compressor start, ignore evaporator temperature sensor and force pool heating mode for 20 minutes.	Pool water is connected to the DRY-O-TRON®.	Spa water is connected to the DRY-O-TRON®.	Give the spa heating priority.
1.	DISPLAY + ▼ for 3 seconds	Lo				
2.	▲ X approx. 9 times	08				
3.	DISPLAY	P1				
4.	▲	existing display code				
5.	▼ OR ▲ **Contact Dectron or a Dectron-certified technician before using other values.**	03	NO	NO	NO	
		02	NO	YES	NO	
		01	NO	NO	YES	
		00	NO	YES	YES	NO
		04	NO	YES	YES	YES
		11	YES	NO	NO	
		10	YES	YES	NO	
		09	YES	NO	YES	
		08	YES	YES	YES	NO
		12	YES	YES	YES	YES

The controller will return to normal approximately 35 seconds after the last button is pushed.

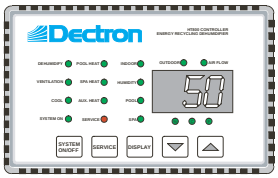
Set Auxiliary Pool Water Heater

Set Outdoor Temperature Sensor

Set Air Flow Sensor

Your HT800 controller comes pre-programmed from the factory for the conditions determined at time of sale. If conditions have changed so that it is necessary to change whether or not the unit will have an auxiliary pool water heater connected (see **Installation - Wiring - Control Signals**), or whether or not the unit will have an outdoor air temperature sensor connected (see **Installation - Wiring - Control Signals**), or whether or not the unit has an airflow sensor, follow these steps. Choose one of the display codes according to the chart.

NOTE: "**+**" indicates pressing two buttons at the same time.



	Press	Screen	latent-sensible heating mode	latent-sensible heating mode & auxiliary pool water heater	auxiliary pool water heater	auxiliary pool water heater also works as 2nd stage	A/C option installed	airflow sensor option installed	outdoor temperature sensor option installed
1.	DISPLAY + ▼ for 3 seconds	Lo							
2.	▲ X approx. 9 times	08							
3.	DISPLAY	01							
4.	▲	existing display code							
5.	▼ OR ▲	00	NO	NO	NO	NO	NO	NO	NO
		01	NO	NO	NO	NO	NO	NO	YES
		02	NO	NO	NO	NO	NO	YES	NO
		03	NO	NO	NO	NO	NO	YES	YES
		04	NO	NO	NO	NO	YES	NO	NO
		05	NO	NO	NO	NO	YES	NO	YES
		06	NO	NO	NO	NO	YES	YES	NO
		07	NO	NO	NO	NO	YES	YES	YES
		16	NO	NO	YES	NO	NO	NO	NO
		17	NO	NO	YES	NO	NO	NO	YES
		18	NO	NO	YES	NO	NO	YES	NO
		19	NO	NO	YES	NO	NO	YES	YES
		20	NO	NO	YES	NO	YES	NO	NO
		21	NO	NO	YES	NO	YES	NO	YES
		22	NO	NO	YES	NO	YES	YES	NO
		23	NO	NO	YES	NO	YES	YES	YES
		48	NO	NO	YES	YES	NO	NO	NO
		49	NO	NO	YES	YES	NO	NO	YES
		50	NO	NO	YES	YES	NO	YES	NO
		51	NO	NO	YES	YES	NO	YES	YES
		52	NO	NO	YES	YES	YES	NO	NO
		53	NO	NO	YES	YES	YES	NO	YES
		54	NO	NO	YES	YES	YES	YES	NO
		55	NO	NO	YES	YES	YES	YES	YES

Contact Dectron or a Dectron-certified technician before using other values.

The display will return to normal approximately 35 seconds after the last button is pressed.

Setup

This page is intentionally left blank.

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.

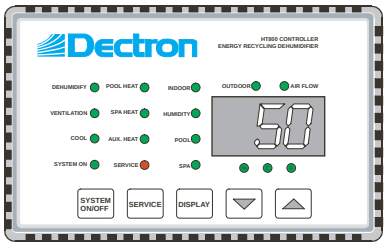
Do NOT turn on the electric power unless the power supply voltage matches that specified on the unit nameplate.

Be <u>certain</u> that there is no construction dust in the space or in the return duct.

1. Apply electric power

If the disconnect switch for the remote condenser is not already ON, turn it ON now. For units with a manual reset overload for the blower motor, press the **START** button on the overload. 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 some units, the blower runs whenever electric power is applied to the unit. On other units, it will be necessary to press SYSTEM ON/OFF on the controller display until SYSTEM ON illuminates. 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**.

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.

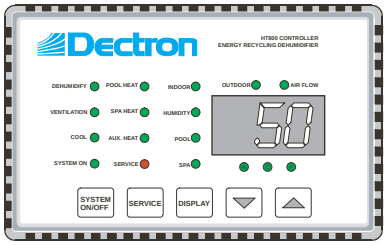
4. Enable compressor 1

For units with external overloads for the compressor, press **START** on the overload. For other units, turn ON the compressor emergency switch.

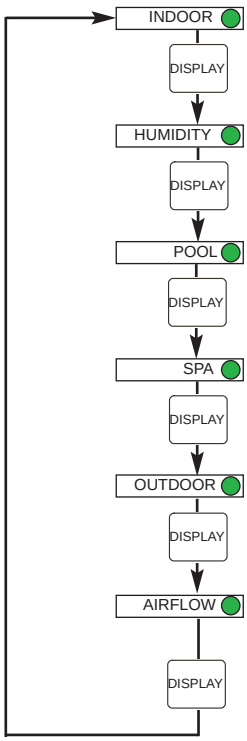
Startup

Read Primary Sensors

Indoor temperature is displayed by default. Other sensors may be read by following the instructions below:



To read sensors other than INDOOR temperature, press DISPLAY as necessary to cause the LED next to the name of the desired quantity to illuminate. The numerical value in the screen is then the value of the indicated sensor. The display will return to INDOOR if DISPLAY is pressed again after the last available sensor has been shown. The display will return to INDOOR if no buttons are pushed for a preset time.



Displayed variable is present indoor temperature.

Displayed variable is present indoor relative humidity.

Displayed variable is present pool inlet water temperature. This will be skipped if programming does not allow for a pool.

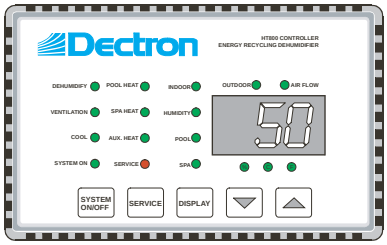
Displayed variable is present spa inlet water temperature. This will be skipped if programming does not allow for a spa.

Displayed variable is present outdoor air temperature. This will be skipped if programming does not allow for an outdoor air temperature sensor.

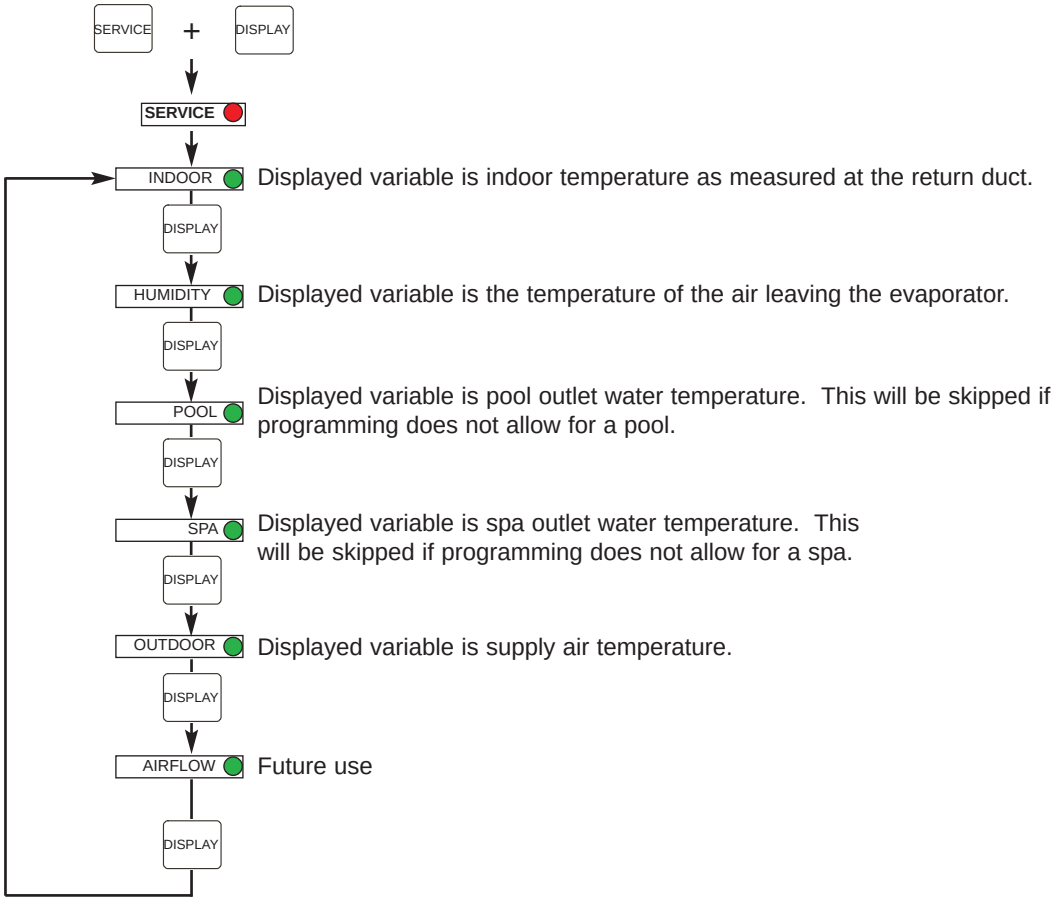
Displayed variable is return air flow rate in % of maximum. This will be skipped if programming does not allow for an air flow sensor.

STARTUP

Read Secondary Sensors



To access the secondary sensors, press SERVICE and DISPLAY at the same time, and hold them until SERVICE illuminates. Use the table below to interpret the display.



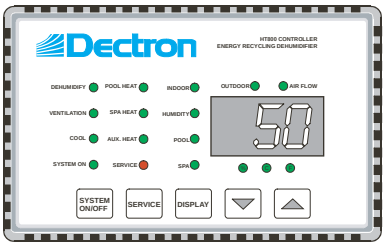
If no buttons are pressed for a pre-set time, the display will automatically return to the primary sensors.

STARTUP

Startup View and Change Set Points

Some primary sensors have set points associated with them. To view and/or change these set points, follow the chart below:

At any time, you may cease pressing buttons, and the display will return to normal after a delay.



INDOOR — Displayed variable is indoor temperature.

Displayed variable is indoor temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

DISPLAY

HUMIDITY — Displayed variable is indoor relative humidity.

Displayed variable is indoor relative humidity set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

DISPLAY

POOL — Displayed variable is pool inlet water temperature. This will be skipped if programming does not allow for a pool.

Displayed variable is pool water temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

DISPLAY

SPA — Displayed variable is spa inlet water temperature. This will be skipped if programming does not allow for a spa.

Displayed variable is spa water temperature set point. Press ▲ to increase the set point, or press ▼ to decrease the set point.

DISPLAY

OUTDOOR — Displayed variable is outdoor air temperature. This will be skipped if programming does not allow for an outdoor air temperature sensor.

DISPLAY

AIRFLOW — Displayed variable is return air flow rate in % of maximum. This will be skipped if programming does not allow for an air flow sensor.

See calibration section for setup information.

DISPLAY

STARTUP

Add Refrigerant

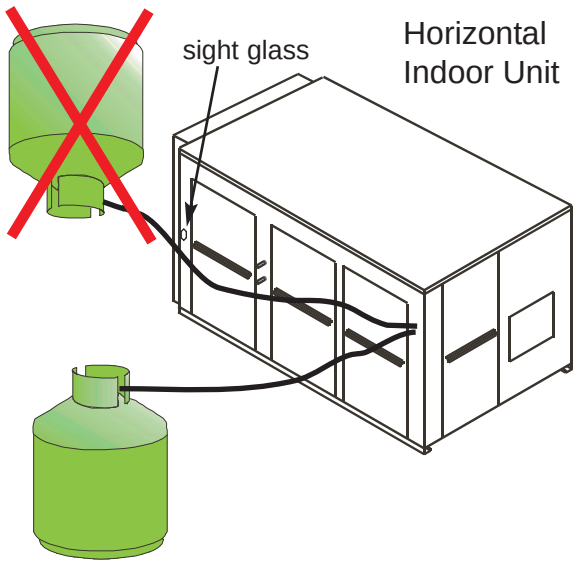
COMPLETE REFRIGERANT FILL

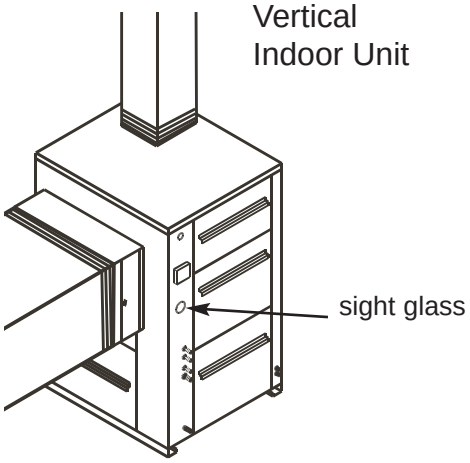
For units with air-cooled air conditioning, the required additional weight of refrigerant (see **Description - Unit Nameplate**) should have been added when the remote condenser was installed in **Installation - Piping - Refrigerant**. If not all the refrigerant was added, it must be added now.

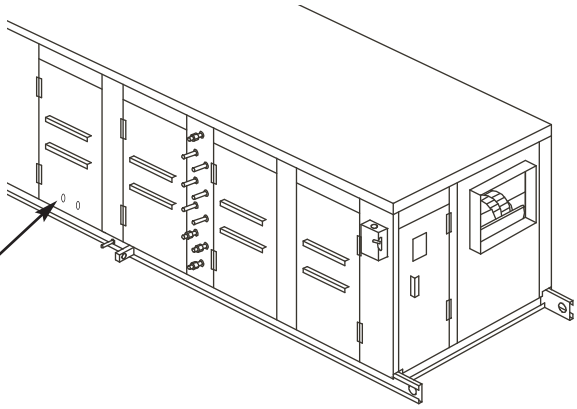
If the additional refrigerant cannot be pumped into the remote condenser access valves while the compressor is OFF, then refrigerant vapor only can be added to the unit through the suction access valve while the compressor is running. **NEVER ADD LIQUID REFRIGERANT TO THE SUCTION ACCESS VALVE.**

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 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.

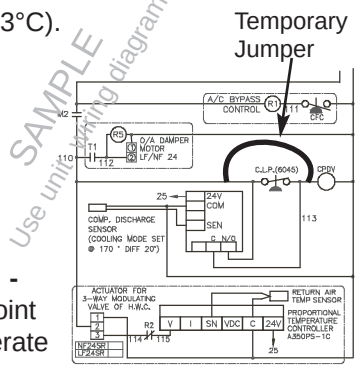
STARTUP

Adjust Refrigerant Expansion Valve(s)

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

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

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. Install the remote sensor of a known-accurate electronic thermometer (by others) by clamping it tightly to the compressor discharge tube, about six inches from the compressor shell.
6. Insulate the sensor with at least 1/2" (1 cm) of an insulation suitable for 200°F (93°C).
7. Tape the insulation to prevent air leakage onto the sensor when the blower runs.
8. Route the sensor cable out the access panel or access door of the unit.
9. Connect the cable to the thermometer.
10. Close the access panels or doors.
11. In the unit control enclosure, place a temporary jumper between wire 110 and wire 113 (across the pressure switch labeled "CLP", see unit wiring diagram.)
12. Start the unit per the instructions given in **Startup - Enable Operation**.
13. If the unit does not operate in pool heating mode (POOL HEAT ON, see **Startup - Controller Interface**), then temporarily adjust the pool water temperature set point (see **Startup - Adjust Set points**) up at least 5°F (3°C) to cause the unit to operate for in full pool heating mode. The compressor should run.
14. Be sure that the refrigerant sight glass is completely full of liquid, with no bubbles. If not, return to step 1.
15. After the compressor has been running in pool heating mode for at least 20 minutes, the compressor discharge temperature as measured by the thermometer should be between 180°F (82°C) and 200°F (93°C).
16. (a) If the compressor discharge temperature is below 180°F ((82°C), close the expansion valve(s) half a turn at the time, allowing at least 15 minutes between adjustments, until the compressor discharge temperature is between 180°F (82°C) and 200°F (93°C).
    (b) If the compressor discharge temperature is above 200°F ((93°C), open the expansion valve(s) half a turn at the time, allowing at least 15 minutes between adjustments, until the compressor discharge temperature is between 180°F (82°C) and 200°F (93°C).
17. Allow the DRY-O-TRON® to operate continuously for at least 1 hour after the last adjustment before checking to be sure the temperatures remain in the proper range.
18. Return the set points to normal, as noted on the unit nameplate (see **Product Description - Unit Nameplate**).
19. Remove the tape, insulation, and thermometer sensor.
20. Remove the temporary jumper between wire 110 and wire 113 (across the pressure switch labeled "C.L.P.)
21. Close the access panels or doors.



Adjust Water Flow Rate

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

Units with optional fluid cooled air conditioning must have a constant flow of fluid of the correct temperature (Standard inlet temperature has a maximum of 90°F (32°C)).

	010	015	020	030	040	050	060	080
	6	6	8.5	15	20	20	30	40

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

Units with Dry-Cooler® cooled air conditioning must have a constant flow of fluid of the correct temperature (Standard inlet temperature has a maximum of 110°F (43°C)).

Unit Size→	010	015	020	030	040	050	060	080
GPM→ @85°F	8	10	14	20	28	36	45	54

POOL AND/OR SPA WATER FLOW

Units must have a constant pool water flow rate. If a flowmeter is not available, see Operation-Adjustments in this manual. The proper inlet water temperature after completion of startup is stated on the unit nameplate. See Product Description - Unit Nameplate.

Unit Size→	010	015	020	030	040	050	060	080
GPM→ @85°F	6	6	6	8.5	8.5	15	20	20

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

Adjust the pool water pressure switches:

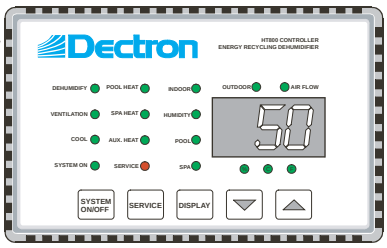
The pool water pressure switch informs the unit controller that pool water flow is present. To adjust this pressure switch, first adjust the water flow as shown above, then

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-cooled 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 — Calibrate Airflow Sensor



Some units may have the optional air flow sensor to indicate when filters must be changed and to protect the unit against loss of air flow. In this case the air flow sensor must be calibrated during startup.

1. Confirm that all air filters are clean and in place.

2. Allow the unit to run for at least several minutes to insure that the evaporator is condensing water from the air.

NOTE: "**+**" indicates pressing two buttons at the same time.

	Press	Screen
3.	DISPLAY + ▼ hold 3 seconds	Lo
4.	▲ X approx. 9 times	08
5.	DISPLAY X approx. 4 times	Fc
6.	▲	any number
7.	▼ + ▲ hold 3 seconds	100

The sensor is now calibrated for the installation. The display will return to normal approximately 35 seconds after the last button is pressed.

STARTUP

Internal temperatures

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).

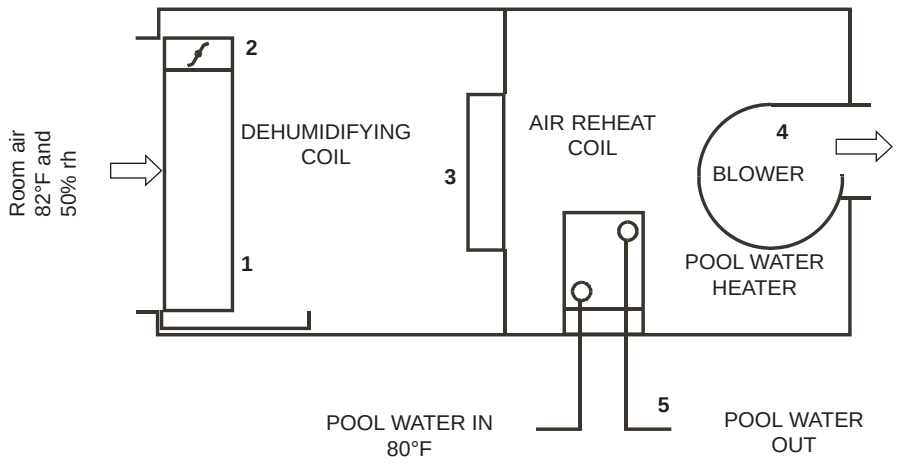
IMPORTANT!
After final adjustments are made, ensure that the Start-up Report and Warranty Registration form is completely filled in and a copy returned to the Dectron representative or the Dectron factory to register the warranty.

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	72	96

DRY-O-TRON® SIDE VIEW SECTION



STARTUP

Startup Factory Assistance, Training

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

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

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

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

Warranty Registration Startup

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

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

Installation Name.....

Installation Address .....

Dectron Representative.....

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

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? (See **Installation - Air Distribution**.) your initials

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Refrigerant charge OK? (See chiller manual.) 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.

STARTUP

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

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

Operational Data

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

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						

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

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

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

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

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

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

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

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

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

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

Warranty

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

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

[1]Does not cover labor costs.

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

[2]Does not cover labor costs.

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

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

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

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

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1-800-667-6338 or
1-888-DECTRON
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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.
- 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 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 Twenty-Four Months

Check compressor discharge temperature.

- See **Startup - Adjust Refrigerant Expansion Valve(s)**.

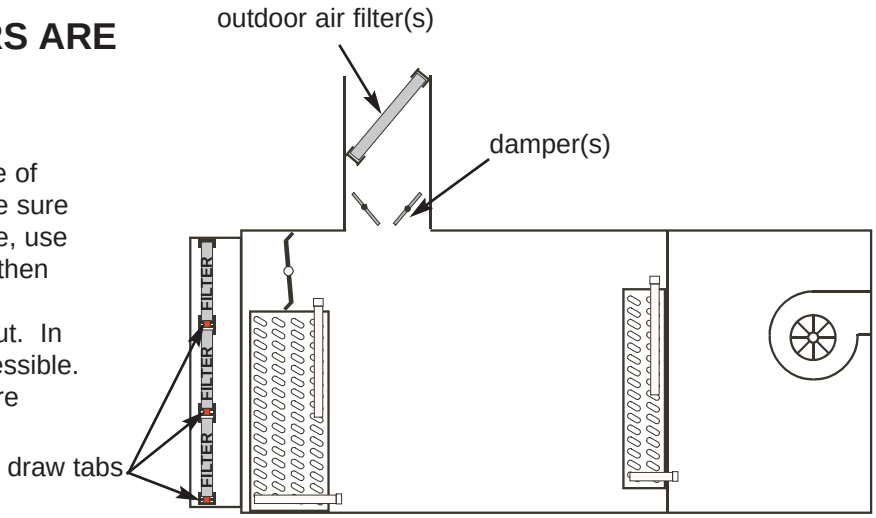
CHECK THAT ALL FILTERS ARE CLEAN AND IN PLACE

Check Air Filters

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

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

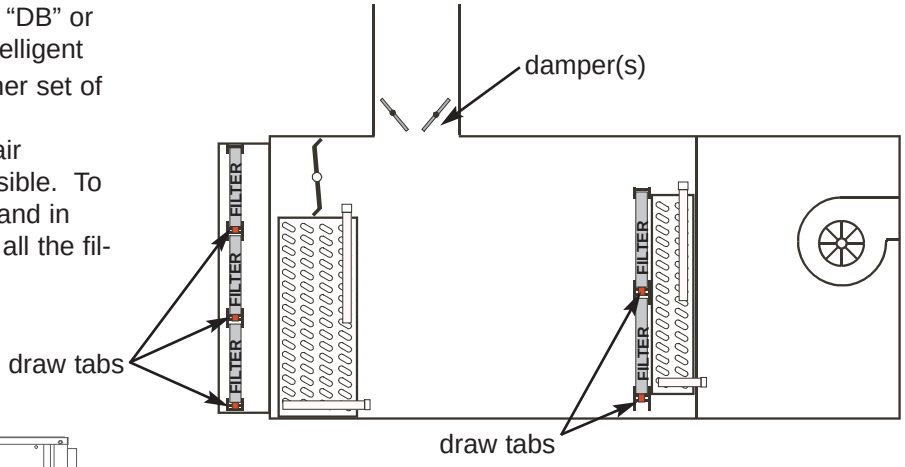
Filters for outdoor air must be moisture resistant.

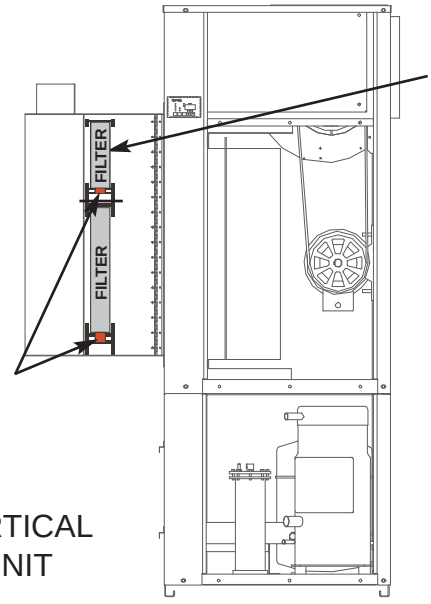


The size and number of filters and draw tabs may vary.

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 .





VERTICAL UNIT

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

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

OPERATION

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

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

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

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

ex: For S=32 inches,

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

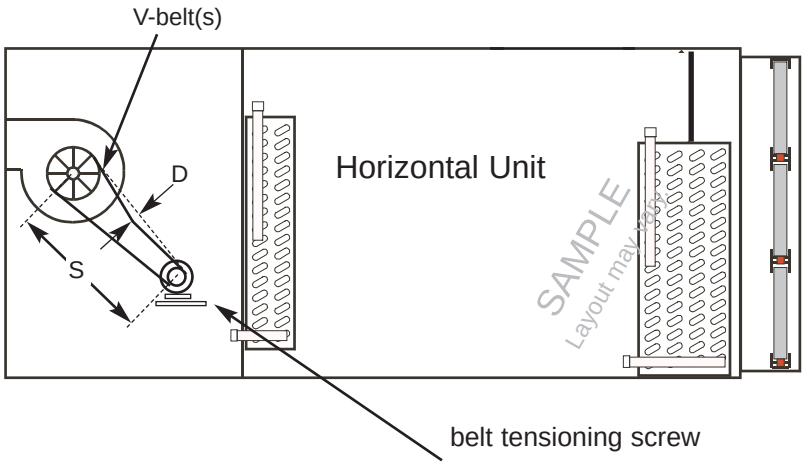
Measure the diameter of the smaller sheave.

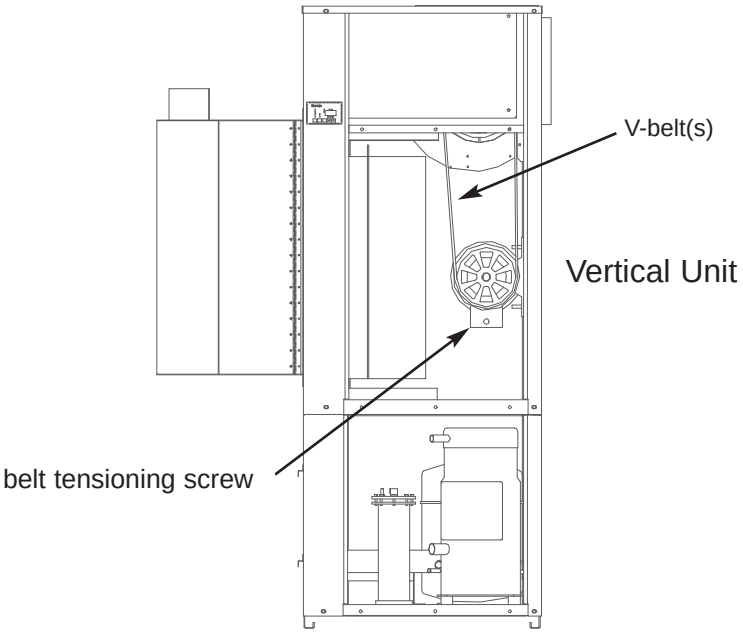
Read the V-belt cross-section size from the belt label or from the unit nameplate.

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

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

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





OPERATION

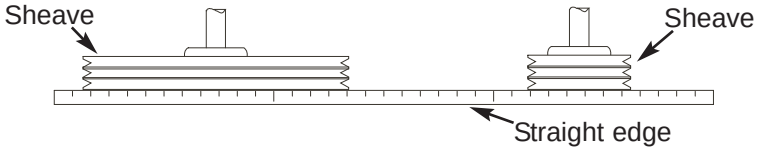
V-Belt Tensioning

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

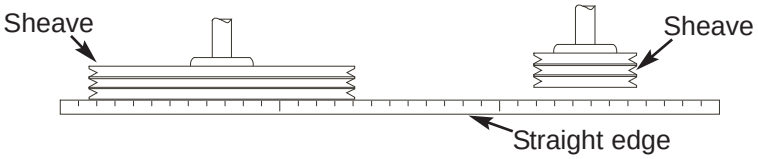
Where sheaves carry more than one belt, never replace only one belt. If any belt must be replaced, replace all the belts with new ones. When replacing multiple belts use only new belts from the same manufacturer and the same lot number, or use matched belts. Failure to do this will result in severe belt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

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

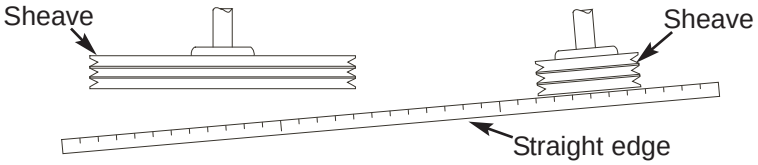
Belt sheaves must be properly aligned, as shown below.



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



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

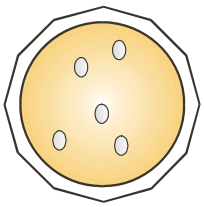


OPERATION

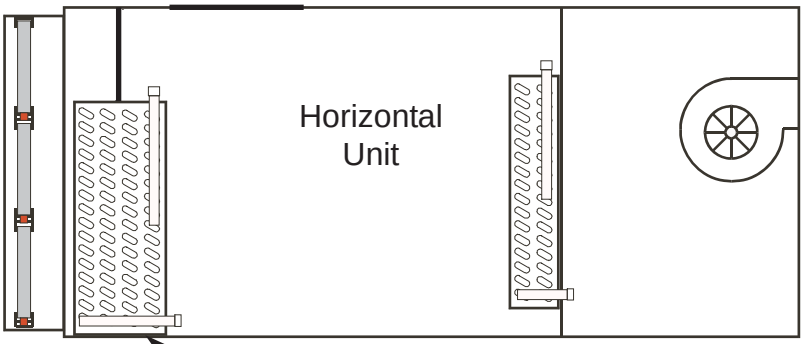
Be sure there are no bubbles or droplets in the refrigerant sight glasses after five minutes of compressor operation.

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

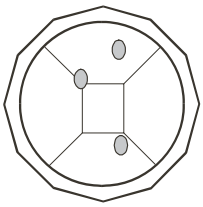
If bubbles or droplets are noted, contact Dectron or a Dectron-certified technician.



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

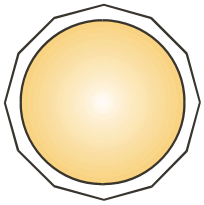


The drain pan is located under the evaporator.

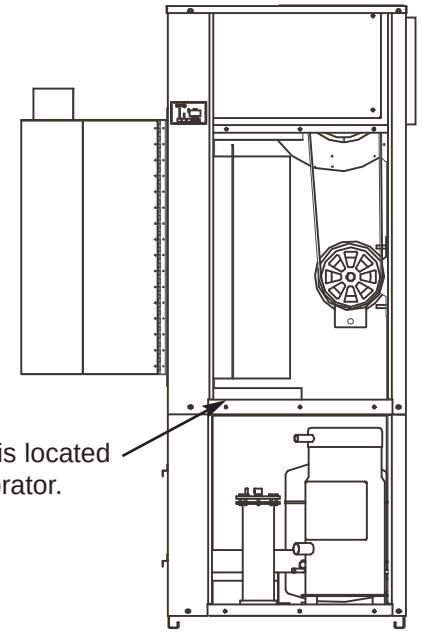


Oil droplets in the sight glass may indicate severe problems such as loss of refrigerant.

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



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



The drain pan is located under the evaporator.

OPERATION

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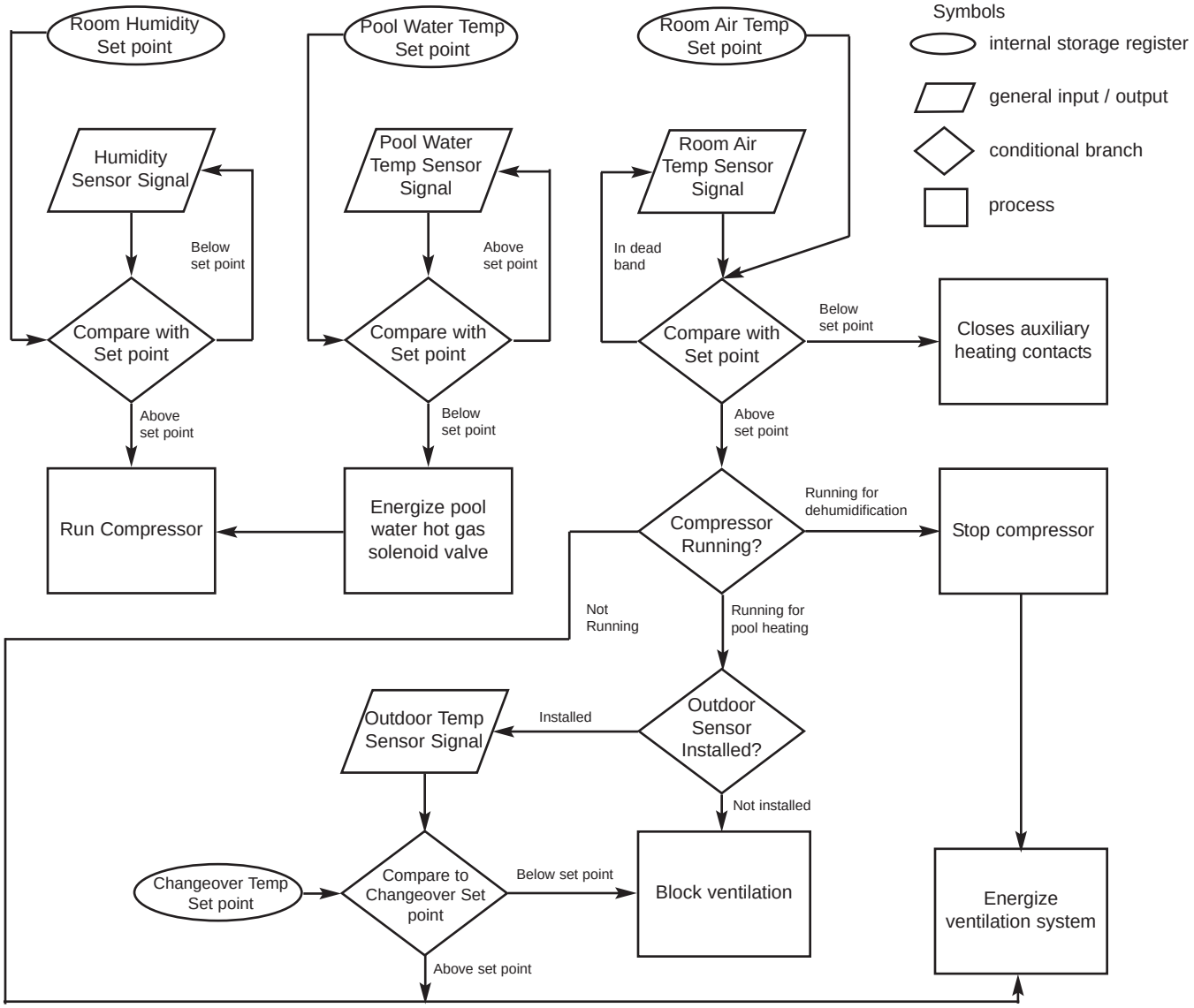
Operation Logical Flowchart W/O Air Conditioning

- 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.



Data subject to change without notice.

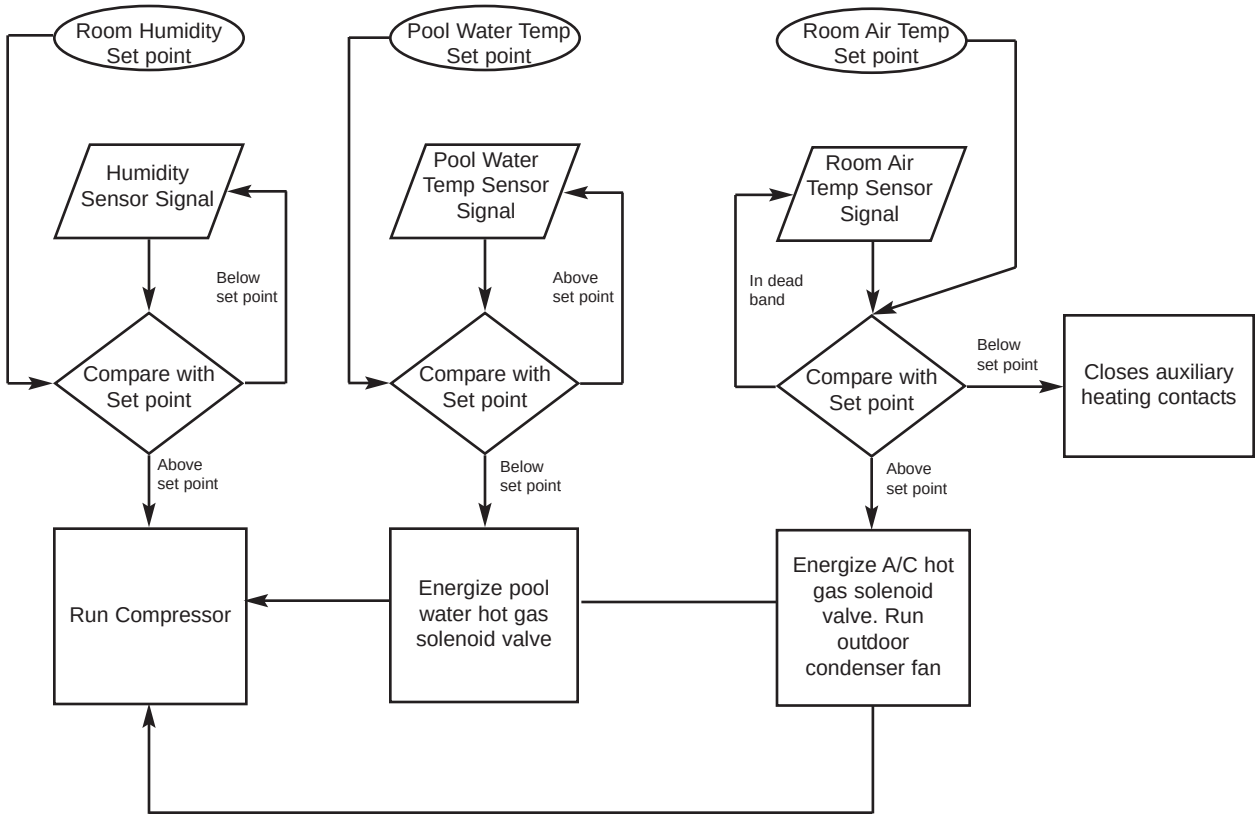
Δ Dehumidification
On a call for dehumidification only, DRY-O-TRON® operates in dehumidification with minimum water heating mode.

Δ Space cooling
The A/C hot gas solenoid valve is energized and the outdoor condenser fan is operating. The DRY-O-TRON® runs in air conditioning mode.

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

Δ Space Heating
On a call for space heating, the DRY-O-TRON® operates as above for dehumidification and pool water heating. In addition, the auxiliary space heating system is activated by contacts provided.

Symbols
- internal storage register
- general input / output
- conditional branch
- process



OPERATION

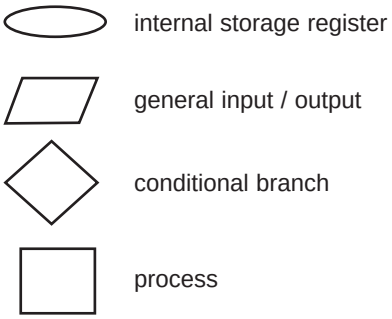
Δ Dehumidification
On a call for dehumidification only, the DRY-O-TRON® operates in minimum water heating mode.

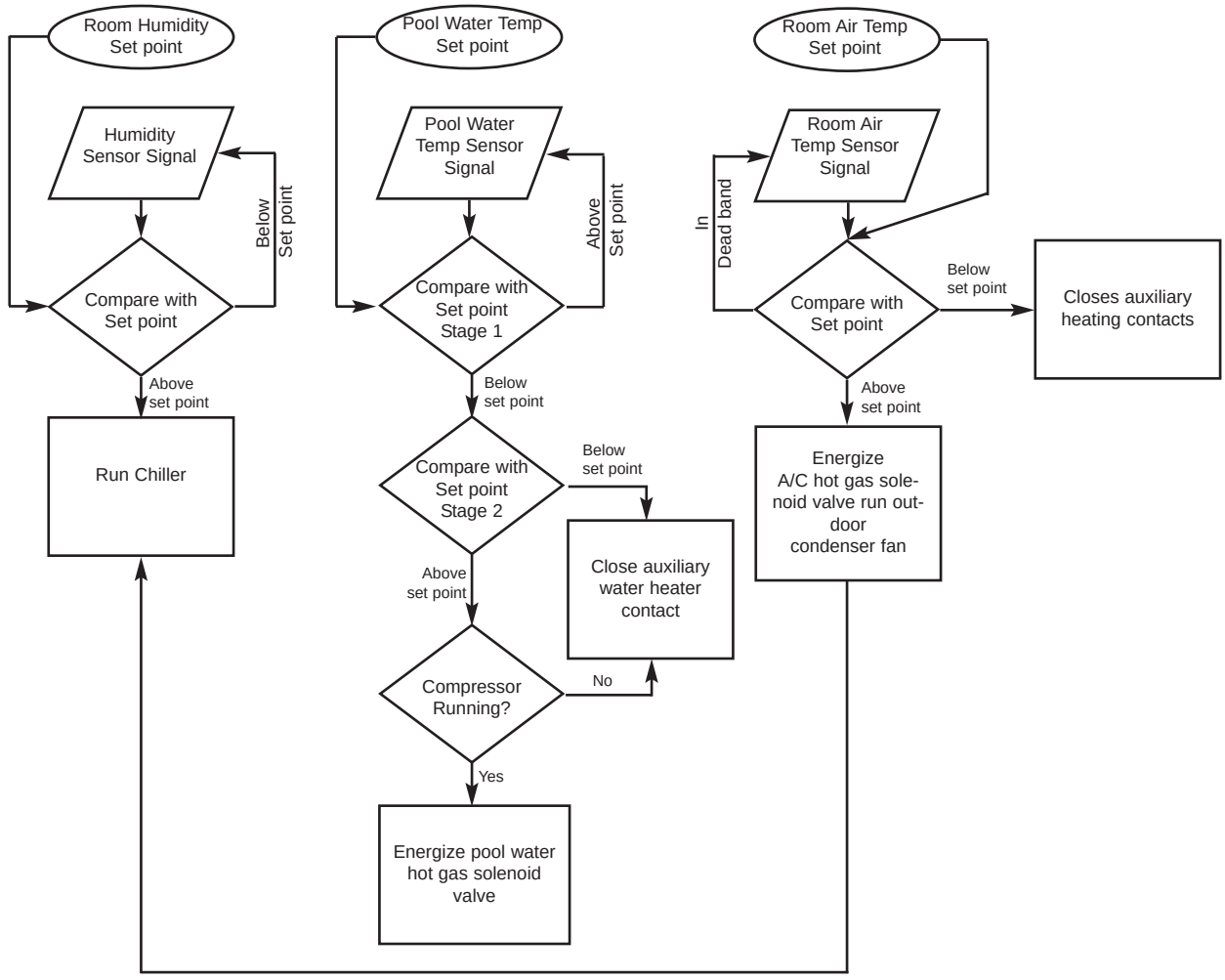
Δ Pool Water Heating
On a call for pool water heating, the auxiliary pool water heater operates to provide maximum pool water heating. The DRY-O-TRON® will only heat pool water during a concurrent dehumidification demand mode and/or cooling demand mode.

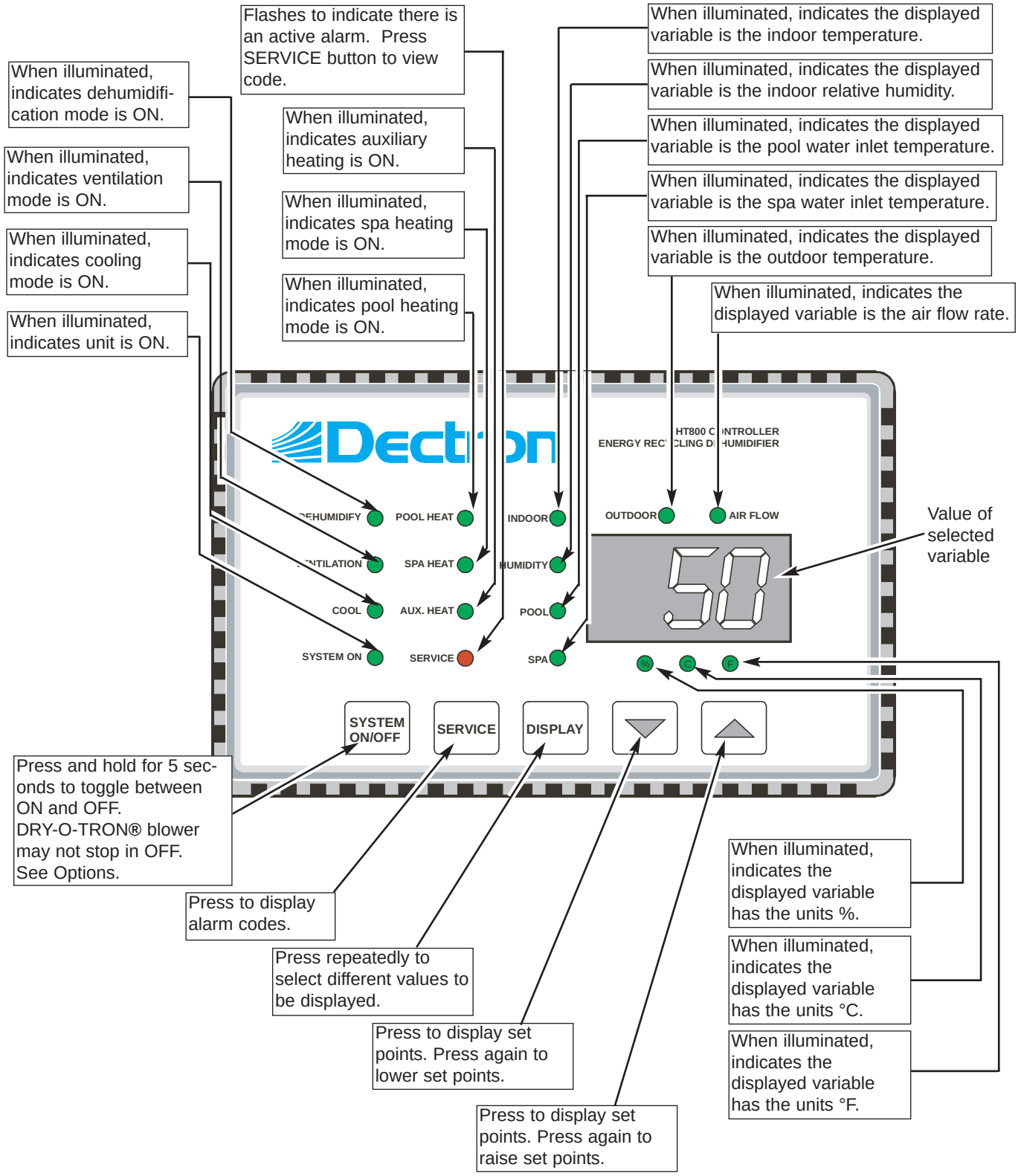
Δ Space Cooling
On a call for cooling, the air conditioning hot gas solenoid valve is energized and the outdoor condenser fan is operating. The DRY-O-TRON® runs in air conditioning mode.

Δ Space Heating
On a call for space heating, the DRY-O-TRON® operates as above for dehumidification and pool water heating. The auxiliary space heating system is activated by contacts provided.

Symbols



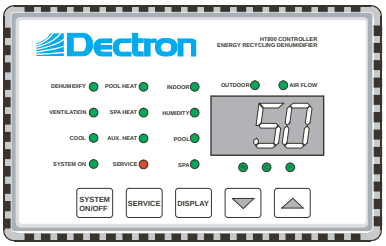


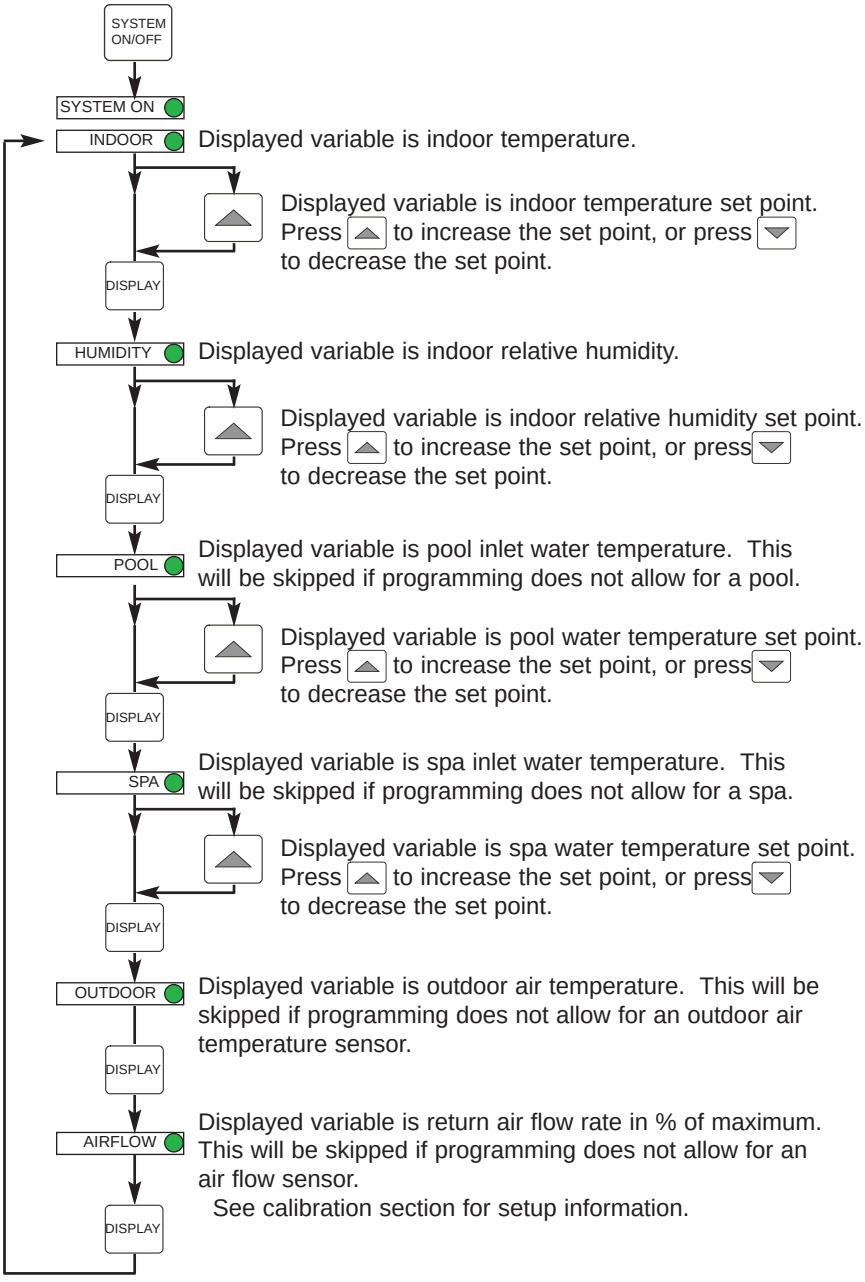

When illuminated, indicates dehumidification mode is ON.
When illuminated, indicates ventilation mode is ON.
When illuminated, indicates cooling mode is ON.
When illuminated, indicates unit is ON.
Flashes to indicate there is an active alarm. Press SERVICE button to view code.
When illuminated, indicates auxiliary heating is ON.
When illuminated, indicates spa heating mode is ON.
When illuminated, indicates pool heating mode is ON.
When illuminated, indicates the displayed variable is the indoor temperature.
When illuminated, indicates the displayed variable is the indoor relative humidity.
When illuminated, indicates the displayed variable is the pool water inlet temperature.
When illuminated, indicates the displayed variable is the spa water inlet temperature.
When illuminated, indicates the displayed variable is the outdoor temperature.
When illuminated, indicates the displayed variable is the air flow rate.
Value of selected variable
POOL HEAT
SPA HEAT
AUX. HEAT
SERVICE
INDOOR
HUMIDITY
POOL
SPA
OUTDOOR
AIR FLOW
SYSTEM ON/OFF
SERVICE
DISPLAY
Press and hold for 5 seconds to toggle between ON and OFF. DRY-O-TRON® blower may not stop in OFF. See Options.
Press to display alarm codes.
Press repeatedly to select different values to be displayed.
Press to display set points. Press again to lower set points.
Press to display set points. Press again to raise set points.
When illuminated, indicates the displayed variable has the units %.
When illuminated, indicates the displayed variable has the units °C.
When illuminated, indicates the displayed variable has the units °F.

OPERATION

Operation

Interface Map



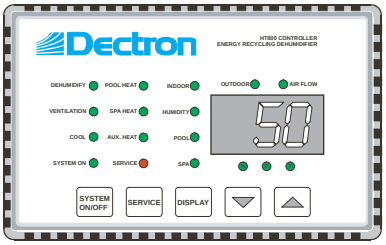


In the event of a failure, SERVICE will flash. Press SERVICE to view the alarm code.

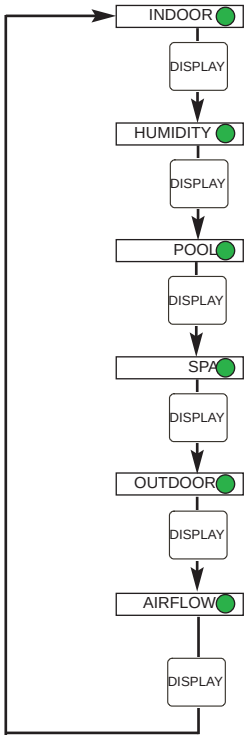
After the cause of the alarm has been corrected, press and hold SERVICE to clear the alarm code.

OPERATION

Read Primary Sensors



Indoor temperature is displayed by default. To read sensors other than INDOOR temperature, press DISPLAY as necessary to cause the LED next to the name of the desired quantity to illuminate. The numerical value in the screen is then the value of the indicated sensor. The display will return to INDOOR temperature if DISPLAY is pressed again after the last available sensor has been shown. The display will return to INDOOR temperature if no buttons are pushed for a preset time.



Displayed variable is present indoor temperature.

Displayed variable is present indoor relative humidity.

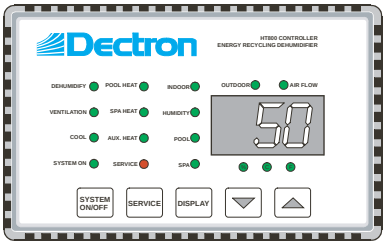
Displayed variable is present pool inlet water temperature. This will be skipped if programming does not allow for a pool.

Displayed variable is present spa inlet water temperature. This will be skipped if programming does not allow for a spa.

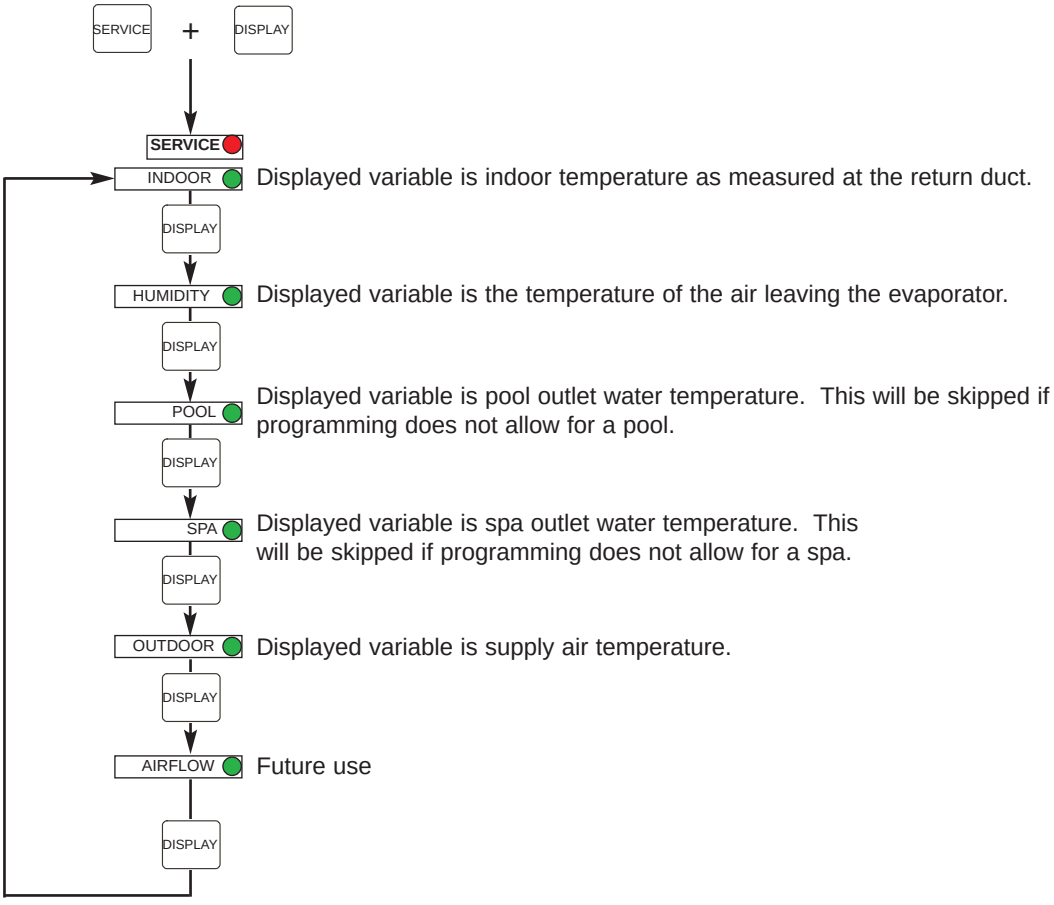
Displayed variable is present outdoor air temperature. This will be skipped if programming does not allow for an outdoor air temperature sensor.

Displayed variable is return air flow rate in % of maximum. This will be skipped if programming does not allow for an air flow sensor.

OPERATION



To access the secondary sensors, press SERVICE and DISPLAY at the same time, and hold them until the SERVICE light illuminates. Use the table below to interpret the display.



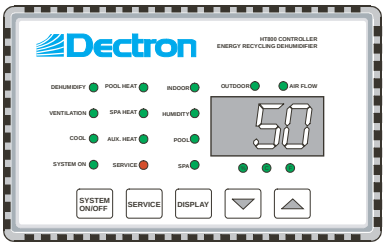
If no buttons are pressed for a time, the display will automatically return to the primary sensors.

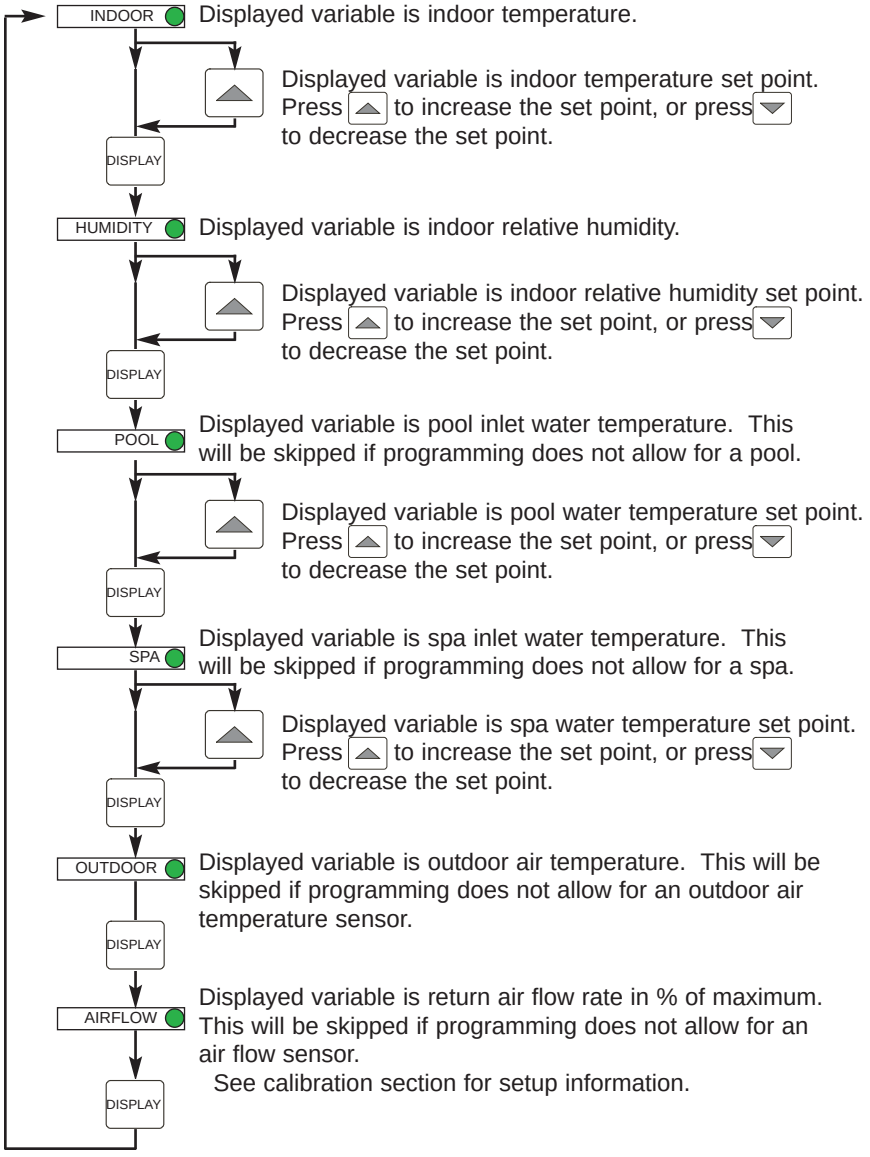
OPERATION

View and Change Set Points

Some primary sensors have set points associated with them. To view and/or change these set points, follow the chart below:

At any time, you may cease pressing buttons, and the display will return to normal after a delay.

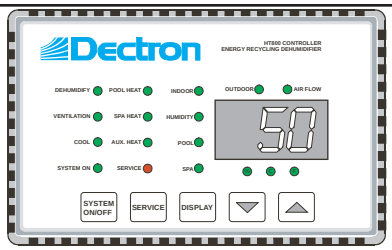




Operation

Service Codes

In the event of a failure, SERVICE will flash. Press SERVICE to view the alarm code. After the cause of the alarm has been corrected, press and hold SERVICE for 5 seconds to clear the alarm code. If the cause of the alarm disappears, SERVICE will go OFF, but the alarm code remains in memory, and may be viewed by pressing SERVICE.



Service Codes, HT800

1 = Communication fault
2* = Filter blocked
3* = High pressure fault (3rd time in succession)
4* = Low pressure fault (3rd time in succession)
5* = High pressure fault (Switch open)
6* = Low pressure fault (Switch open)
7* = Pool water temperature over 120°F
8* = Spa water temperature over 120°F
9* = Chilled air temperature over 60°F for more than 5 minutes
10*= Chilled air temperature below 35°F for more than 3 minutes
11 = Pool water pressure fault
12 = Spa water pressure fault
13 = A/C water pressure fault
14 = Outdoor air temperature sensor fault
15 = Inlet spa water temperature sensor fault
16 = Outlet spa water temperature sensor fault
17 = Inlet pool water temperature sensor fault
18 = Outlet pool water temperature sensor fault
19 = Supply air temperature sensor fault
20 = Evaporator air temperature sensor fault
21 = Return air temperature sensor fault
22 = Humidity sensor fault
23 = HT800 temperature sensor fault
24 = System OFF more than 10 minutes
25 (Rev 12) = Pool Water Heating is disabled on loss of pool water flow. Unit operates on all other modes.
26 (Rev. 12) = Whirlpool Water Heating is disabled on loss of whirlpool water flow. Unit operates on all other modes.

27 (Rev.12) = Defective HT800 Controller- Emergency Sequence: When the Emergency Jumper between terminals 44 & 45 of the I/O board is disconnected, a 48-hour emergency cycle begins. After 30 seconds the HT800 relinquishes control to the I/O board and can be removed. The fan is ON, the unit runs in dehumidification for 52 minutes, followed by 20 minutes OFF. High pressure, low pressure, and outlet water temperature limits remain in effect. The green I/O board LED blinks to show:
- 1 blink - high pressure failure
- 2 blinks - low pressure failure
- 4 blinks - pool water too hot or bad sensor
- 8 blinks - spa water too hot or bad sensor

28 (Rev. 12) = Defective Humidity Sensor, Emergency Sequence: Unit runs in 48 hour emergency dehumidification mode. ON for 52 minutes, followed by 20 minutes OFF. Other modes are normal. Automatic reset.

30 Check sum error
40 Room temperature set point out of range
41 Humidity set point out of range
42 Pool water temperature set point out of range
43 Spa water temperature set point out of range
44 Ventilation chageover temperature set point out of range
45 System mode out of range

81 = Compressor operates in space heating mode
82 = If the RH is above 60%, override operating mode
- After a power failure
- After a system shutdown and power up
- After an alarm has been cleared
- Pool heating mode is forced for a preset time (refer to "Pi" table)

83 (Rev. 12) = Minimum Compressor Run Time: Compressor has 20 minute minimum run time. This can be bypassed by pressing the SERVICE and the UP key at the same time.

90 = High pressure (momentary) 1st or 2nd trip
91 = Low pressure (momentary) 1st or 2nd trip
92 = 15 minutes delay (Switch remade) after a momentary high pressure
93 = 15 minutes (Switch remade) delay after a momentary low pressure
94 = 3 minutes compressor anti-cycling delay
95 = System "OFF" less than 10 minutes.
96 = No demand (will show demand if auxiliary pool heater is on)**
97 = Ventilation (low outdoor temperature)
00 = Compressor will start

*Compressor stops with these faults. Must be reset after fault is repaired. Press and hold "SYSTEM ON/OFF" key for 5 seconds to switch "OFF", then press and hold same key for 5 seconds to switch back "ON". Press and hold "SERVICE" key for 5 seconds after repair to erase last fault code.

** Display will show pool heating (LED) is on even though compressor is not on; during periods of low relative humidity and pool heat demand.

Revision 12 HT-800 Controllers

The WaterSmart feature, which allows operation in modes other than water heating when water flow has been lost has been added

An emergency mode which does not require the HT800 thermostat has been added.

An emergency mode which does not require a humidity sensor has been added.

Addition of a minimum compressor run time of 20 minutes has been added.

OPERATION

Data subject to change without notice.

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #1 **Communication fault**	1. Broken or loose wire between HT-800 controller and I/O board	• If HT-800 is remote mounted: Remove controller and mount it on unit. Remove remote wires on terminals 1, 2 & 3. • **Repair any damaged or loose wires.**
	2. Corrosion at the HT-800 connector pins or I/O board screw terminals (#1, 2, 3)	• **Clean pins , terminals and wires.**
	3. Defective I/O board	• LED on I/O board is not flashing • Remove HT-800 controller and check the following voltages: 5VDC b/n terminals 1 & 3; 0VDC b/n terminals 1 & 2. • **Replace I/O board.**
	4. Defective HT-800 controller	If voltages on I/O board are O.K., then • LED on I/O board is on 20 seconds and off 30 seconds. • **Replace HT-800 controller.**
Code #2 **Filter blocked**	1. Blocked air filter	• **Replace filter with same type and size. If code 2 persists see Code 6 (sensor out of calibration)**
	2. Broken fan belt	• **Replace belt with same type and size.**
	3. Improper fan belt tension	• **Adjust tension and align pulleys.**
	4. Reverse fan rotation (3 phase units only)	• **Reverse two power wires on fan contactor.**
	5. Severe restriction in duct work	• **Check ductwork for location of restriction and remove.**
	6. Sensor out of calibration	• **See configuration and calibration page of owners manual for airflow sensor calibration (Fc)**
Code #3 **High pressure (3rd time in 15 minutes)**	1. High return air temperature	• Check CSA/ETL label for unit design temperatures. • **Adjust set points accordingly.**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #3 **High pressure (3rd time in 15 minutes)** **... continuation**	1. High return air temperature ...continuation	• **This is indicative of a triac failure in the ON position on the HT-800 I/O board. Press the system on/off key until "system on" LED is out. Check the air temperature differential to make sure heating has shut off. Wait 1 minute. Turn system back on, making sure there is no heating demand. If the heating comes back on, the the triac in the board is defective and the board must be replaced. If the heat stays off, then the current draw of the heating relay coil is greater than 1 amp and is overloading the triac. An isolating relay must then be installed to operate the heating relay indirectly.**
	2. Dirty reheat coil	• Check for proper air filters on return air and on outdoor air intake. • **Clean coil and replace any missing filters.**
	3. Corroded fins on reheat coil	• High concentration of chemicals, chemicals stored in mechanical room, large fluctuations in pool water chemistry • **Insure proper precautions are taken to protect unit from corrosion due to pool chemicals.** • Return air grille too close to whirlpool • **Due to the nature of whirlpools, (i.e., hot and very active), it is virtually impossible to maintain a proper water balance. These types of pools do not maintain an effective e chlorine level for very long. As a result the formation of chloramines (a corrosive gas given off when chlorine levels are too low) occurs rapidly and frequently. The concentrated chloramines above the whirlpool are then drawn directly into the DRY-O-TRON® where they attack the aluminum fins of the coil. Evaporated body oils are also present in the hot air above a whirlpool. These oils will collect on the inside of the return duct as well as on filters and coils, resulting in a sticky coating. It is for these reasons that the return air grill should be located as far as possible from the whirlpool.**
	4. Low air flow	• ΔT across evaporator coil must be between 30°F and 35°F. • **Adjust variable pulley accordingly.**

OPERATION

Diagnostics - Controller — Operation

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #3 **High pressure (3rd time in 15 minutes)** **... continuation**	5. Low water flow	• Check water-pressure switch adjustment. • **Adjust water-pressure switch. See Startup-Pre-Startup Adjustments - Adjust Water Flow Rate.** • Check circulating pump for DRY-O-TRON®. • **The main filter pump is usually sized for pool water filtration and sanitation. If there is any doubt that the main filter pump cannot develop the total head to assure the flow requirement or if the DRY-O-TRON® is installed more than 8 feet high with respect to the pool water surface, a separate circulating pump for the DRY-O-TRON® is required. Refer to the Owner's Manual for flow requirement.**
	6. Refrigerant overcharge	• Check CSA/ETL label for proper charge. • **Verify the charge of units with air-cooled air conditioning. This check is best performed in cold weather.** **1. Jumper the contact for the outdoor air-cooled condenser fans. (Make sure all fans are running.)** **2. Force the compressor to run in either pool heating or dehumidification modes. (A/C must not be allowed to operate.** **3. Allow the unit to run in this fashion for approximately 2 hours. (This will force the outdoor condenser to flood with liquid refrigerant.)** **4. Remove gas until bubbles appear in the sightglass.** **5. Recharge unit until sightglass is clear.** • **All other units, remove R-22 until bubbles appear in sight glass, then recharge to clear sight glass in all modes of operation.**

OPERATION

Data subject to change without notice.

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #3 **High pressure (3rd time in 15 minutes)** **... continuation**	7. Jammed 3-way valve	• 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 with 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.**
	8. ORI-6 valve (water heating intensity) setting too high	• Unit cools air while in pool heating. • **Turn valve adjustment counter clockwise until spindle is flush with housing. Turn valve clockwise approximately 7.5 turns. While in pool heating, supply-air temperature should be the same as return air temperature ± 2°F. (Fine tune valve accordingly).**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #3 **High pressure (3rd time in 15 minutes)** **... continuation**	9. Undersized receiver (Unit trips in summer only)	• Check outdoor condenser line length one way, as well as line sizes and check to make sure they do not exceed the indicated maxima on the CSA/ETL label. • **Contact the factory if the line length or size is greater than that specified.**
	10. Closed ball valve(s)	• Verify all ball valves are open. • **Open all valves.**
	11. Outdoor condenser dirty (Unit trips in A/C only)	• Inspect outdoor coil. • **Clean coil as necessary.**
	12. Outdoor condenser fans not running (Unit trips in A/C only)	• Check that condenser has power. • **Apply power to outdoor condenser, provided it has not been disconnected for service.** • Check dry contact on HT-800 I/O board (terminal 40-41) while in Cooling mode. • **If contact is open, replace I/O board.** • 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**.
	13. Triac for A/C three-way valve has failed ON.	• Check if 3-way valve remains energized when A/C call is satisfied. • **Replace HT-800 I/O board if necessary.**
	14. Defective high-pressure switch	• Switch opens at less than rated pressure. • **Replace any defective switches.**
Code #4 **Low pressure** **(3rd time in 15 minutes)**	1. Low return-air temperature	• Check CSA/ETL label for design temperatures. • **Adjust set points accordingly. For air temperatures below 76°F the bypass damper should be closed (if so equipped).** • Check auxiliary air-heating system for proper operation. • **Repair air-heating system if necessary.** • In heating mode, check auxiliary air heat output on HT-800 I/O board with incandescent test light. (Do not use ohm meter). • **If output is OPEN replace I/O board.**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #4 **Low pressure (3rd time in 15 minutes) ...continuation**	2. Return air too dry (Below 40%R.H.)	• Check CSA/ETL label for design humidity. • **Adjust set point accordingly.** • Check volume of any unit mounted outdoor air intake. (Max. allowable is 15% of total flow unless unit is specifically designed for a greater amount.) • **Adjust outdoor-air intake volume accordingly.**
	3. Low refrigerant charge (low pressure failure may only occur in winter)	• Check system for leaks. • **Repair any leaks**. • Check sight glass for bubbles. • **Charge to clear sight glass in all modes. Note: For units with A/C, charge will have to be verified during winter when outdoor condenser is flooded.**
	4. Low air flow	• Check for blocked air filters. • **Replace with same type and size.** • Check for slipping or broken fan belt. • **Adjust tension or replace with same size and type.** • Check for duct restriction. • **Remove restriction.**
	5. Blocked liquid line filter/drier	• If bubbles are visible in sight glass, measure liquid temperature on either side of filter/drier. A drop of more than 2° is unacceptable. • **Replace liquid line filter/drier.**
	6. Closed liquid-line ball valve (If so equipped)	• Check that all ball valves are fully open. • **Open any closed or partially closed valves.**
	7. Closed suction-line rotolock valve (If so equipped)	• Check on suction side of compressor. • **Open valve fully.**
	8. ORI-6 valve (water heating intensity) setting too high	• Unit appears to be fully charged but continues to cut out on low pressure. • **Turn valve adjustment counter- clockwise until spindle is flush with housing. Turn valve clockwise approximately 7 1/2 turns. While in pool heating mode, supply-air temperature should be the same as return-air temperature ±2°F. (Fine tune valve accordingly)**

OPERATION

Diagnostics - Controller Operation

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #4 **Low pressure (3rd time in 15 minutes) ...continuation**	9. Defective low-pressure switch	• Switch opens at higher than rated pressure (25 psi). • **Replace defective switch.**
	10. Defective power head on thermal-expansion valve	• Place sensing bulb in cold water, and then warm it up in your hands. A rapid suction-line temperature change should occur. If not, valve is defective. • **Replace valve.**
Code #5 **High pressure**	1. Defective high-pressure switch	• Switch is open, unit does not start. • **Replace defective high-pressure switch.**
	2. Broken or loose wire from high-pressure switch **Also see Code #3.**	• Check switch wiring. • **Replace any damaged wires with the same gauge and color.**
Code #6 **Low pressure**	1. Low or no refrigerant in unit	• Check system pressure at low-pressure access valve port. Pressure must be greater than 80 psi. in order for the switch to reset once a low pressure has occurred. • **If pressure is less than 80psi, and switch is still open, unit has a leak which must be located and repaired.**
	2. Defective low-pressure switch (remains open at all times)	• Switch is open even though system pressure is above 80 psi. • **Replace defective switch.**
	3. Broken or loose wire from low-pressure switch **Also see Code #4.**	• Check switch wiring. • **Replace any broken wires with the same gauge and color.**
Code #7 **Pool water exit temperature over 120°F**	1. Low water flow	• Verify that all pumps are running and balancing valves are set correctly. • **Make any necessary adjustments.**

OPERATION

Data subject to change without notice.

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #7 **Pool-water exit temperature over 120°F ...continuation**	2. Sensor out of calibration	• Verify that water temperature leaving DRY-O-TRON® is really over 120°F. • **If water is not over 120°, compare actual temp. with that displayed on HT-800. If the difference is less than 10°F re-calibrate sensor. See configuration and calibration page of owners manual for leaving pool water sensor calibration. (Cc register)**
	3. Sensor located too close to refrigerant hot-gas line	• **Move sensor further away from refrigerant line. (Move sensor outside unit enclosure if necessary).**
	4. Defective sensor	• Verify that water temperature leaving DRY-O-TRON® is really over 120°F. • **If water is not over 120°, compare actual temp. with that displayed on HT-800. If the difference is greater than 10°F replace sensor.** • **See Code #7.**
Code #8 **Spa water over 120°F**	1. See Code #7.	• **See configuration and calibration page of owners manual for leaving spa water sensor calibration.**
Code #9 **High limit evaporator. (Over 80°F for 5 minutes)**	1. Evaporator bypass damper is closed with return-air temperature over 76°F.	• **Open damper.**
	2. Low refrigerant charge	• Check sight glass for bubbles. • **Repair any leaks, then charge unit to clear sight glass in all modes. Verify the charge of units with air-cooled air conditioning. This check is best performed in cold weather.** **1. Jumper the contact for the outdoor air-cooled condenser fans. (Make sure all fans are running.)** **2. Force the compressor to run in either pool heating or dehumidification modes. (A/C must not be allowed to operate.** **3. Allow the unit to run in this fashion for approximately 2 hours. (This will force the outdoor condenser to flood with liquid refrigerant.)** **4. Remove gas until bubbles appear in the sightglass.** **5. Recharge unit until sightglass is clear.**

OPERATION

Data subject to change without notice.

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #9 **High limit evaporator.** **(Over 80°F for 5 minutes)**	3. Improperly adjusted or defective hot-gas bypass valve (units with A/C only)	• Check to see if line from hot gas bypass valve to distributor is hot. • 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 with 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 dehumidifica tion, 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.**
	4. Excessive air flow	• Check temperature differential across evaporator. It should be 30° - 35°F @ 80° - 85°F, 50% R/H. • **Adjust motor pulley accordingly.**
	5 Excessive load	• Room temperature is over 90°F / 80% R/H. • **To keep the unit running, temporarily remove wires 11 & 12 from the I/O board terminals 11 & 12. Connect a 10kΩ–12kΩ ¼W resistor between terminals 11 & 12. Return wiring to normal as soon as conditions return to normal**
	6. Improper return-air duct connection at unit (e.g., 90° elbow very close to the unit) Uneven air distribution across the evaporator and bypass damper prevents normal air cooling.	• **Correct improper duct. See Installation section of this manual for proper duct design.**

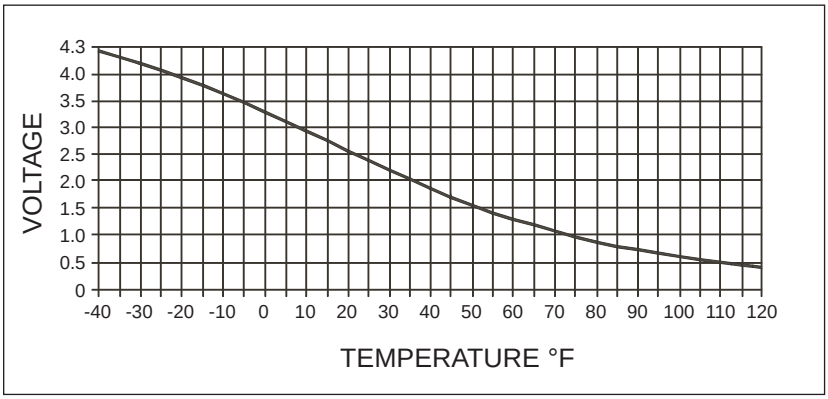
OPERATION

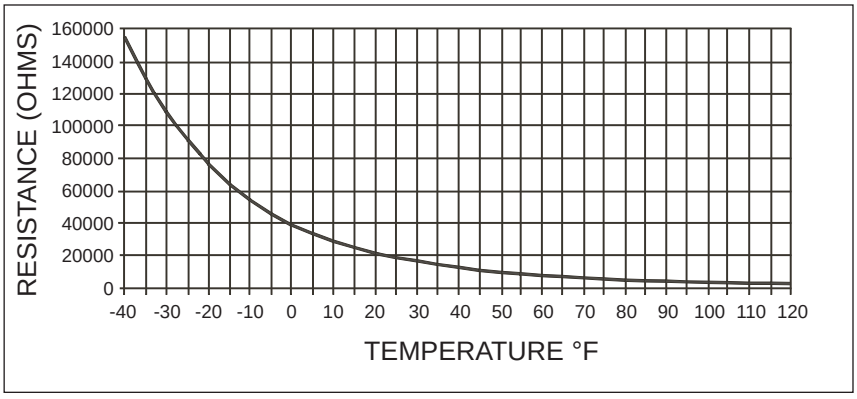
SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #9 **High-limit evaporator. (Over 80°F for 5 minutes) ...continuation**	7. Defective power head on thermal expansion valve	• Place sensing bulb in cold water, and then warm it up in your hands. A rapid suction line pressure change should occur. If not, power head is defective. • **Replace power head if possible. If not, replace valve. Contact Dectron or a Dectron-certified technician.**
	8. Sensor out of calibration	• See **Sensor Calibration. Contact Dectron or a Dectron-certified technician.**
	9. Defective chilled-air temperature sensor	• Order a new sensor. To keep the unit running, temporarily remove wires 11 & 12 from the I/O board terminals 11 & 12. Connect a 10kΩ–12kΩ ¼W resistor between terminals 11 & 12. Replace the sensor as soon as possible.
Code #10 **Low limit evaporator. (Below 20°F for 3 minutes)**	1. Insufficient air flow	• Check temperature differential across evaporator. It should be 30° - 35°F @ 80° - 85°F, 50% R/H. • **Adjust motor pulley accordingly.**
	2. Insufficient load	• Room temperature below 75°F and/or below 40% R/H. • **Adjust room set points per the CSA/ETL label.**
	3. Improper return-air duct connection at unit, e.g., 90° elbow very close to the unit. Uneven air distribution across the evaporator and bypass damper prevents normal air cooling.	• **Correct improper duct. See Installation section of this manual for proper duct design.**
	4. Chilled-air sensor out of calibration	• See **Operation - Sensor Calibration**.
	5. Chilled-air sensor defective	• Order a new sensor. To keep the unit running, temporarily remove wires 11 & 12 from the I/O board terminals 11 & 12. Connect a 10kΩ–12kΩ ¼W resistor between terminals 11 & 12. Replace the sensor as soon as possible.

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #11 **Pool water-pressure fault (transient on Revision 12 HT800)**	1. Low pool water flow	• Check pool pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	2. Defective or wrongly adjusted water-pressure switch	• Make sure switch closes when adequate water flow is present. • **See Startup - Adjust Water Flow Rate.**
Code #12 **Spa low water-pressure fault (transient on Revision 12 HT800)**	1. Low spa water flow	• Check spa pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	2. Defective or wrongly adjusted water pressure switch	• Make sure switch closes when adequate water flow is present. • **See Startup - Adjust Water Flow Rate.**
Code #13 **A/C water-pressure fault (Units with water cooled A/C only)**	1. Low A/C water flow	• Check pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	2. Defective or wrongly adjusted water pressure switch	• Make sure switch closes when adequate water flow is present. • **See Startup - Adjust Water Flow Rate.**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Codes #14 outdoor temperature sensor fault	1. Sensor wires broken or shorted to ground 2. Defective sensor 3. Defective I/O board	• **Measure the true temperature at the suspected sensor with a known accurate thermometer.** • **Measure DC voltage between sensor terminals on I/O board (Note A, this page).** • **Compare the voltage and the true temperature using the upper chart at left. If the voltage agrees with the true temperature, replace I/O board. If the voltage and true temperature do not agree, proceed to next step.** • **Disconnect electrical power from the unit.** • **Remove the wires for the suspected sensor from the I/O board terminals (see unit wiring diagram).** • **Measure the resistance of the sensor circuit (Note B, this page).** • **Compare the resistance and the true temperature using the lower chart at left. If the resistance agrees with the true temperature, consult Dectron. If the resistance and true temperature do not agree, proceed to next step.** • **Disconnect the sensor from the extension wires.** • **Measure the resistance of the sensor.** • **Compare the resistance and the true temperature using the lower chart at left. If the resistance agrees with the true temperature, repair or replace the wires connecting the sensor to the I/O board. If the resistance and true temperature do not agree, replace the sensor.** • See **Sensor Calibration.**





Change-over set point: Above 70°F the optional air conditioning is on.
Below 70°F the ventilation is on.

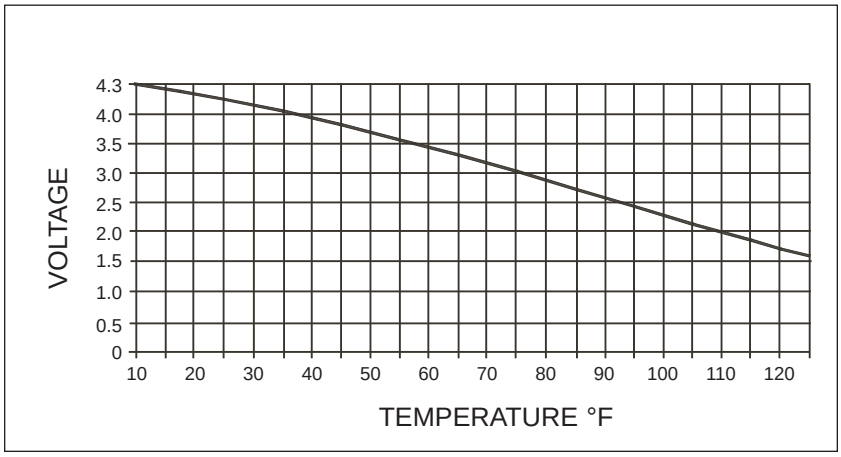
Notes:

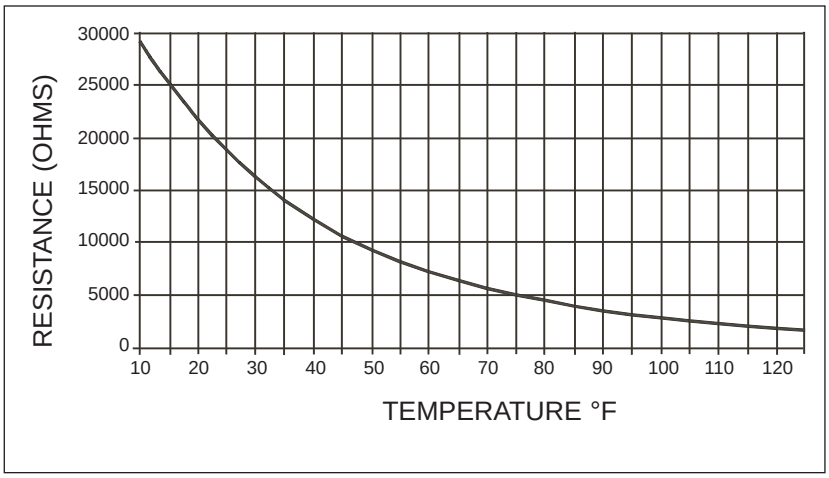
A. When measuring the sensor voltage, put the negative (black) voltmeter probe on terminal 26 of the I/O board. Refer to the unit wiring diagram for appropriate terminal numbers.

B. Disconnect sensor from I/O board before measuring sensor resistance.

Diagnostics - Controller

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Codes #15 through 21 faults of temperature sensors 15. spa water inlet 16. spa water outlet 17. pool water inlet 18. pool water outlet 19. supply air 20. evaporator leaving air 21. return air	1. Sensor wires broken or shorted to ground 2. Defective sensor 3. Defective I/O board	• **Measure the true temperature at the suspected sensor with a known accurate thermometer.** • **Measure DC voltage between sensor terminals on I/O board (Note A).** • **Compare the voltage and the true temperature using the upper chart at left. If the voltage agrees with the true temperature, replace I/O board. If the voltage and true temperature do not agree, proceed to next step.** • **Disconnect electrical power from the unit.** • **Remove the wires for the suspected sensor from the I/O board terminals (see unit wiring diagram).** • **Measure the resistance of the sensor circuit (Note B).** • **Compare the resistance and the true temperature using the lower chart at left. If the resistance agrees with the true temperature, consult Dectron. If the resistance and true temperature do not agree, proceed to next step.** • **Disconnect the sensor from the extension wires.** • **Measure the resistance of the sensor.** • **Compare the resistance and the true temperature using the lower chart at left. If the resistance agrees with the true temperature, repair or replace the wires connecting the sensor to the I/O board. If the resistance and true temperature do not agree, replace the sensor.** • See **Sensor Calibration.**





Notes:

A. When measuring the sensor voltage, put the negative (black) volt meter probe on terminal 26 of the I/O board. Refer to the unit wiring diagram for appropriate terminal numbers.

B. Disconnect sensor from I/O board before measuring sensor resistance.

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #22 **Humidity sensor fault**	1. Sensor is reading outside its design parameters.	• **Disconnect wires #4, #5 & #6 on the I/O board. Look for 5 Vdc ± 0.25 between #4 & #5. If voltage is not OK replace I/O board. If voltage is OK and Code 22 persists, replace sensor.**
	2. High load.	• Room RH over 90% may cause an erroneous sensor fault due to sensor calibration variations at the extreme of the scale. • **Temporarily re-calibrate sensor to read less than 100%. This will allow unit to run until load is reduced. See configuration and calibration page of owners manual for humidity sensor calibration. (Hc register)**
	3. Defective air-flow sensor	• **Disconnect the air-flow sensor.** • **Remove the wire from the No. 3 terminal of the airflow sensor, and connect it to the No. 1 terminal of the humidity sensor.** • **Reduce the "oi" code in the HT800 configuration register by 2. See Startup - Set Airflow Sensor.** • **If the service light stops flashing, replace the air-flow sensor, replace the wire from No.1 terminal on humidity sensor to No. 3 terminal on airflow sensor, set "oi" configuration register to its original value.** • See **Sensor Calibration.**
Code #23 **HT-800 temperature sensor fault**	1. Sensor located inside the HT-800 controller is reading outside its design parameters.	• **Change CF code to read return-air sensor.** • **Replace HT-800 controller.**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #24 **System OFF more than 10 minutes**		• **If system is not shut down for service, turn system back on using the system on/off button.**
Code #25 **Rev. 12 Pool Water Heating Disabled, other modes operate**	1. Low pool water flow	• Check pool pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	2. Defective or misadjusted water pressure switch	• Make sure switch closes when adequate water flow is present. • **Adjust water-pressure switch. See Startup- Pre-Startup Adjustments - Adjust Water Flow Rate.**
Code #26 **Rev. 12 Spa Water Heating disabled, other modes operate**	1. Low spa water flow	• Check spa pumps and balancing valves for proper adjustment. • **Re-establish proper water flow as soon as possible.**
	2. Defective or misadjusted water pressure switch.	• Make sure switch closes when adequate water flow is present. • **Adjust water-pressure switch. See Startup- Pre-Startup Adjustments - Adjust Water Flow Rate.**
Code #27 **Rev. 12 Defective HT800 Controller - Emergency Sequence**	Manually selected by removing the Emergency Jumper	• **Unit will operate in emergency mode. Replace HT800 controller as soon as possible.** **Emergency Sequence:** **When the Emergency Jumper is disconnected, an Emergency Cycle is enabled. All the control functions are now transferred to the I/O board. The HT800 controller will no longer have authority over the system. If desired, the HT800 controller can be removed and the emergency cycle will continue.** **After the emergency jumper is removed, there will be a 30-second delay before anything happens. The blower will run continuously even if it was originally OFF. After a 5-minute delay the compressor will begin a cycle of 52 minutes ON and 20 minutes OFF. This cycle will continue for 48 hours, allowing time for the replacement of the HT800.** **During this cycle the blower motor will be protected by the overload. The compressor will be protected by the overload and by pressure and temperature limits as**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #27 **Rev. 12 Defective HT800 Controller - Emergency Sequence (continued)**		**shown below. The green LED on the I/O board will flash as shown below to indicate the type of failure.** **High pressure • • • • • • •** **Low pressure •• •• •• •• ••** **Pool water outlet temperature over 120°F. or sensor defect •••• •••• ••••** **Whirlpool water outlet temperature over 120°F. or sensor defect •••••••• •••••••• ••••••••**
Code #28 **Rev. 12 Defective Humidity Sensor - Emergency Sequence**		• **Unit runs in 48-hour emergency dehumidification mode. ON for 52 minutes, followed by 20 minutes OFF. Other modes are normal. Automatic reset.**

OPERATION

Diagnostics - Controller

When one of these codes flashes:

- **Δ Remove the controller from the base.**
- **Δ Hold down the DISPLAY and the DOWN keys and plug the controller onto the base.**
- **Δ Hold both buttons until "LC" is displayed, then proceed as below:**

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #30 **Check sum error**	1. Set point parameters are outside the acceptable limits.	• **Re-enter all configuration register values** • **If this does not correct the problem, re-enter all configuration values to original factory settings.** • **If problem persists, contact factory.**
Code #40 **Room-temperature set point out of range**	1. Set point parameters are outside the acceptable limits.	• **Re-enter room temperature set point.** • **If problem persists, replace HT-800.**
Code #41 **Humidity set point out of range**	1. Set point parameters are outside the acceptable limits.	• **Re-enter humidity set point.** • **If problem persists, replace HT-800.**
Code #42 **Pool-water temperature set point out of range**	1. Set point parameters are outside the acceptable limits.	• **Re-enter pool temperature set point.** • **If problem persists, replace HT-800.**
Code #43 **Spa-water temperature set point out of range**	1. Set point parameters are outside the acceptable limits.	• **Re-enter spa temperature set point.** • **If problem persists, replace HT-800.**
Code #44 **Ventilation changeover temperature set point out of range**	1. Set point parameters are outside the acceptable limits.	• **Re-enter ventilation set point.** • **If problem persists replace HT-800.**
Code #45 **System mode out of range**		• **Self re-adjusting after the set point settings are re-entered. No value for this parameter.**

OPERATION

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Code #81 **Compressor operates in space heating mode**	Demand for space heating.	• **No action required.**
Code #82 **Override operating mode**	Unit will run in pool heating for a pre-programmed time if the RH is over 60% following a system shut down, power failure or alarm reset.	
Code #83 **Minimum compressor run time (Revision 12 only)**		• **Minimum compressor run time is 20 minutes. This can be bypassed by pressing the SERVICE and the UP key together.**
Code #90 **High pressure (momentary)**	This code will be displayed three times prior to a Code 3.	• **See Code 3.**
Code #91 **Low pressure (momentary)**	This code will be displayed three times prior to a code 4.	• **See Code 4.**
Code #92 **15 minute delay following high pressure trip**	Auto reset is delayed. (max. 15 minutes)	• **No action required.**
Code #93 **15 minute delay following low pressure trip**	Auto reset is delayed. (max. 15 minutes)	• **No action required.**
Code #94 **3 minute compressor anti-cycling delay**	Compressor has cycled off and timer is running.	• **No action required.**
Code #95 **System off less than 10 minutes.**		• **If system is not shut down for service, turn system back on using the system on/off button.**
Code #96 **No demand.**	No reason for compressor to operate.	• **No action required.**
Code #97 **Ventilation (low outdoor temperature)**	Unit is in ventilation mode.	• **No action required.**
Code #00 **Compressor will start**	All parameters are fine. Compressor is ready to start.	• **No action required.**

OPERATION

Data subject to change without notice.

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Unit not heating pool or not heating spa	1. Pool or spa solenoid valve is stuck in other position.	• 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 with 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 defective valve**.
	2. Pool or spa water temperature sensor is out of calibration.	• Verify actual water temperature and compare with what is displayed on HT-800.
		• **If the difference is less than 10°F re-calibrate sensor. See configuration and calibration page of owners manual for pool and spa water sensor calibration. If more than 10°F replace sensor.**
	3. Reversed water flow Incorrect connection will cause water heating modes to cycle ON and OFF quickly.	• Verify water connections at DRY-O-TRON®.
		• **Switch water connections to establish proper flow.**
	4. Inadequate water flow	• **Establish correct water-flow rate. Check performance of pump or be sure water bypass valve is not wide open.**
		• **Set water-pressure switch correctly.**
	5. Spa heat priority, and unit cannot keep up with spa demand.	• Excessive spa-heat loss.
		• **Correct source of excessive losses.**
		• **Measure pool or spa surface area and compare with size specified on the CSA/ETL label.**
	6. Pool or spa is larger or warmer than specified.	• **If pools are larger than specified, contact Dectron.**
		• Check pool/spa set points and compare with CSA/ETL label.
		• **Adjust set points accordingly.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Unit not heating pool or not heating spa ... continued	7. Triac on I/O board for pool or spa heating is not working.	• Verify if appropriate 3-way valve is energized when there is a demand. • **Replace I/O board as necessary.**
	8. "Pi" code of HT-800 has been changed.	• Check "Pi" code using the configuration instructions in the Owner's Manual. • **Change code back to the appropriate value.**
	9. Low condenser pressure	• **Adjust ORI valve (water heating intensity) if so equipped. See HT800 Diagnostics Code 3 for adjusting method.**
	10. Fouled heat exchanger	• **Check water heat exchanger for plugging or scaling. Correct as necessary.**
	11. Air in water circuit can cause reduction of water flow and/or reduction of heat transfer.	• **Remove air. Eliminate source of air accumulation.**
	12. Compressor not responding to demand.	• **Check OI register to be sure unit was not ordered for use with external pool heater.**
Pool or Spa water is too warm	1. Pool or spa temperature set point is too high.	• **Return set point(s) to range shown on unit nameplate.**
	2. Incorrect ORI valve (water heating intensity) setting	• 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 with 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 defective valve. See HT800 Diagnostics Code 3 for setting method.**
	3. Room temperature too high	• **Return set point(s) to range shown on unit nameplate.**
	4. Room relative humidity too high	• **Return set point(s) to range shown on unit nameplate.**
	5. Water heating solenoid valve stuck in heating position.	• Check operation by changing water temperature set point.

OPERATION

Data subject to change without notice.

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Pool or Spa water is too warm	6. Defective triac on HT-800 I/O board	• **Adjust water temperature set point to eliminate water heating demand. An open circuit should appear between** **terminals 29 & 26 (pool)** **terminals 31 & 26 (spa).** **If not, replace I/O board.**
Unit not cooling	1. A/C solenoid valve is stuck in dehumidification position	• 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 with 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 defective valve.**
	2. Return air sensor is out of calibration (This sensor is a combination return air and relative humidity sensor.)	• Verify actual air temperature and compare with what is displayed on HT-800. • **If the difference is less than 10°F re-calibrate sensor. See configuration and calibration page of service manual for return air sensor calibration. If more than 10°F replace sensor.**
	3. Wrongly adjusted head pressure bypass valve (ORI-6 5/8)	• Check if hot gas is going to both the outdoor condenser and the reheat coil at the same time. • **DS 060 and larger units have a head-pressure valve that allows the hot gas to circulate through the reheat coil during air conditioning should the head pressure exceed 295 psig. This could occur on abnormally hot days, and prevents the unit from tripping on high pressure. This valve is an ORI-6 (5/8inch) valve, located in the compressor section of the unit. To check the valve adjustment.** **1. Close the isolation valves for the outdoor condenser.** **2. Run the unit in A/C.** **3. The head pressure should rise to the setting of the bypass valve.** **4. Adjust the valve if necessary (clockwise to increase pressure, counter-clockwise to decrease pressure.** • **Replace defective valve.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Unit not cooling... continued	4. Closed isolation valves for outdoor condenser	• Check position of ball valves. • **Open valves.**
	5. Defective triac on HT-800 I/O board	• Check if A/C 3-way valve is energized. • **Replace I/O board.**
	6. "Oi" code of HT-800 has been changed	• Check "Oi" code using the configuration instructions in the Owner's Manual. • **Change code back to the appropriate value.**
	7. Room load exceeds the cooling capacity of the unit.	• Check air temperature differential through the DRY-O-TRON®. • **If differential is 10°F - 12°F the unit is cooling properly.**
Compressor will not start	1. No demand	• Adjust set points to values on unit name-plate.
	2. Anti-short-cycle timer prevents start-up for 3 minutes.	• Wait.
	3. Compressor overload is turned off or has tripped (three phase units only).	• **Turn overload on (where so equipped).**
	4. Compressor thermal protector is open.	• **Allow one hour for compressor to cool.**
	5. Open water-pressure switch circuit	• Check circuit continuity. Check for water flow. Check pressure switch adjustment.
	6. Loose control or power wiring	• Check for electrical continuity under load.
	7. Water exit temperature above 120°F	• Check water flow rate. • **Clear fault code.**
	8. Compressor crankcase full of liquid refrigerant	• **Be sure crankcase heater has been warm for at least 10 hours prior to starting the compressor.**
	9. Low voltage may cause failure to start (Long inadequately sized branch circuit conductors may cause low voltage at inrush.)	• Use adequate branch circuit conductors. Consult Dectron for use of hard-start kit (single phase units only). • **Consult Dectron for recommendations.**
	10. Defective start capacitor (single phase units only)	• **Replace capacitor.**
	11. Defective capacitor relay (single phase units only)	• **Replace relay.**
	12. Defective contactor	• Check that contactor is getting power. • **Replace contactor.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Compressor will not start	13. Defective HT-800 I/O board	• Check for power on terminals #25 and #26. Check for closed circuit between terminals 26 & 27. • **Replace I/O board as necessary**
	14. Defective compressor	• Check compressor for shorts, open windings, and locked rotor. • **Replace compressor.**
High humidity in space	1. Incorrect duct design can produce stratification of room air.	• See Installation section of this manual for proper duct design. • **Correct duct design as necessary.**
	2. Incorrect duct design can cause improper evaporator air velocity.	• See Installation section of this manual for proper duct design. • **Correct duct design as necessary.**
	3. Incorrect duct design can reduce air flow below operating range.	• See Installation section of this manual for proper duct design. • **Correct duct design as necessary.**
	4. Incorrect blower speed can cause improper total air flow.	• Assure proper total air flow by testing. • **Adjust blower speed as appropriate.**
	5. Dirty air filters can seriously reduce the total air flow.	• **Be sure the unit is always operated with clean air filters.**
	6. Room air temperature being too high can reduce the dehumidification effect.	• **Adjust set point to range stated on unit nameplate.**
	7. Reduced pool water flow rate can cause excessive condenser pressure.	• **Adjust water flow rate by flow meter or ΔT. See Startup-Pre-Startup-Adjustments-Adjust water flow rate.**
	8. Insufficient refrigerant can reduce the refrigeration effect.	• **Be sure there are no bubbles in the sight glass under any conditions.**
	Excessive length of tube connecting to remote condenser (if so equipped) can cause refrigerant undercharge.	• **Be sure the total length of tube (one way) is no greater than that specified on the unit nameplate.**
	9. Excessive amounts of refrigerant can reduce the refrigeration effect.	• **Be sure the right amount of refrigerant is present.**
	10. Air-side clogging of the air reheat heat exchanger can reduce total air flow and heat transfer.	• **Be sure the unit is only operated with clean filters in place. Always filter any outdoor air brought into the unit. Do not locate the return grille near a spa or hot tub.**
	11. Reduced heat transfer of a remote air-cooled condenser (if so equipped) can cause excessive condenser pressure.	• **Be sure the remote condenser is clean and the fans are operating properly in cooling mode.**
	12. Non-condensable gases in the refrigeration system can reduce the refrigeration effect.	• **Always evacuate to 500 microns of mercury or better.**
	13. Closed manual shut-off valves can reduce the refrigeration effect.	• **Be sure all manual valves that should be open are open.**
	14. Clogged filter-driers can reduce the refrigeration effect.	• **See HT800 Diagnostics, Code #4 & #5 for methods.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Room temperature too low	1. Set point too low	• **Adjust set points to values shown on unit nameplate.**
	2. Excessive outdoor-air intake	• **Adjust outdoor intake rate to no more than 15% of total air flow.**
	3. Failure of auxiliary duct heater (by others)	• **Verify proper heater operation. Correct as necessary.**
Room temperature too high	1. Set point too high	• **Adjust set points to values shown on unit nameplate.**
	2. Excessive outdoor-air intake	• **Adjust outdoor intake rate to no more than 15% of total air flow.**
	3. Outdoor condenser dirty or fan(s) not operating	• **Be sure heat exchangers are clean. Assure fan operation.**
	4. Auxiliary duct heater ON with no heating demand	• **Verify proper heater operation. Correct as necessary.**
	5. Air-conditioning diverting valve stuck	• 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 with 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.**
Supply air temperature too low	1. Unit is in air-conditioning mode	• **Check set points. Verify operation of air-conditioning diverting valve (see verification instructions for the 3-way valve above.)**
	2. Excessive outdoor-air intake	• **Adjust outdoor intake rate to no more than 15% of total air flow.**
	3. Excessive pool-water flow rate	• **Adjust water flow. See Startup-Pre-Startup-Adjustments-Adjust water flow rate.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Low compressor oil pressure	1. Compressor crankcase full of liquid refrigerant	• **Be sure compressor crankcase heater is warm. Allow at least 10 hours for it to heat up before initial start-up.**
	2. Expansion valve incorrectly adjusted.	• **Compressor discharge temperature must be above 160°F. Liquid flooding at the compressor is a very serious problem that will quickly lead to a compressor failure. There are only a limited number of ways in which liquid refrigerant can return to the compressor.** **1. The return air is too cold and/or dry and is not forcing the refrigerant in the evaporator to vaporize.** **2. The thermal expansion valve is misadjusted or defective and is not metering the refrigerant properly.** **3. The pumpdown valve (on units so equipped) is leaking during the off cycle allowing the evaporator to accumulate liquid. Oil failures caused by this problem will only occur inthe first 5 minutes after the compressor starts.**
	3. Low oil level in crankcase	• **Check for and correct any refrigerant leaks. Assure that proper steps have been taken to assure oil return. See installation diagram.**
Low condenser pressure	1. Room air temperature too low	• **Adjust set point per nameplate.**
	2. Room humidity too low	• **Adjust set point per nameplate.** • **Assure that outdoor air intake is not excessive.**
	3. Pool temperature too low	• **Reduce water flow rate slightly until a reasonable temperature is achieved.**
	4. ORI valve (water heating intensity) incorrectly set	• **See HT800 Diagnostics Code 4 for method.**
	5. Insufficient refrigerant in system	• **Add refrigerant to eliminate bubbles in the sight glass in all modes.**
High suction pressure	1. Room air temperature above normal can cause increased load on the evaporator.	• **Adjust set point per the nameplate.**
	2. Room relative humidity above normal can cause increased load on the evaporator.	• **Adjust set point per the nameplate.**
	3. A closed evaporator-bypass damper can cause high air velocities in the evaporator.	• **Open the bypass damper whenever the room air temperature is above 78°F.**
	4. Improper duct design can cause high air velocities in the evaporator.	• **See installation section of this manual. Correct duct design as necessary.**

OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
High suction pressure continued	5. Excessive total air flow can cause high air velocities in the evaporator.	• **Set total air flow by test to the nameplate value.**
	6. A worn or damaged compressor may produce less refrigerant pumping.	• **Compare compressor current to value shown on nameplate.**
Evaporator icing	1. Dirty air filters reduce air flow.	• **Replace dirty filters.**
	2. Low room temperature	• **Adjust set points per nameplate.** • **Close evaporator-bypass damper when air is below 76°F.**
	3. Low air flow	• **Assure blower turns proper direction (3-phase units only)** • **Assure blower belt tension is right.**
	4. Low refrigerant charge	• **Add refrigerant to eliminate bubbles in the sight glass in all modes.**
	5. Improper duct design	• **See Installation section of this manual for proper design.**
Excessive noise	1. Lack of unit support isolators allows vibration to be transmitted to floors, etc.	• **See Installation section of this manual for proper unit support methods.**
	2. Lack of duct isolators allows vibration to be transmitted to the ducts.	• **See Installation section of this manual for proper duct isolation methods.**
	3. Loose blower belts and/or pulleys can produce unexpected noise.	• **Check blower belts and pulleys for proper tension and alignment.**
	4. Improperly closed access panels can produce a whistling noise as air leaks into the cabinet.	• **Assure all panels are closed tightly and that all gaskets are in place.**
	5. An incorrectly set expansion valve can cause liquid refrigerant flood back to the compressor, with accompanying noise.	• **Adjust expansion valve to produce at least 160°F compressor discharge gas temperature.**
	6. Liquid refrigerant in crankcase can cause excessive noise on startup	• **Assure that the compressor crankcase heater is functioning. Allow at least 10 hours for the crankcase heater to warm up before initial startup.**
	7. Failure of a blower bearing can produce a rumbling noise.	• **Examine blower bearing for play or looseness. Replace as necessary.**
Unit runs continuously (no damage will result)	1. Set points out of range	• **Adjust set points per nameplate.**
	2. Heavy pool use can cause the water evaporation rate to increase dramatically.	• **Conditions will return to normal after peak use subsides.** • **Be sure original design activity factor has not been exceeded.**
	3. A defective liquid line solenoid valve can prevent pump down mode (if so equipped) from terminating.	• **Assure unit is not remaining in pump down mode.**

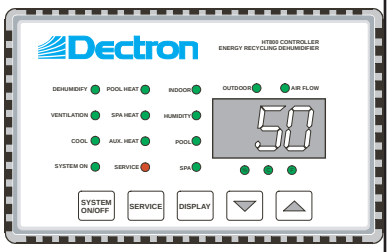
OPERATION

PROBLEMS NOT INDICATED BY HT-800 SERVICE CODES

SYMPTOM	POSSIBLE CAUSE	CHECKS & ACTION
Auxiliary air heating system stays on	Triac failure	• **This is indicative of a triac failure in the ON position on the HT-800 I/O board. Press the system on/off key until "system on" LED is out. Check the air temperature differential to make sure heating has shut off. Wait 1 minute. Turn system back on, making sure there is no heating demand. If the heating comes back on, the the triac in the board is defective and the board must be replaced. If the heat stays off, then the current draw of the heating relay coil is greater than 1 amp and is overloading the triac. An isolating relay must then be installed to operate the heating relay indirectly.**
Corrosion or clogging of heat exchangers	Missing or dirty filters	• **Due to the nature of whirlpools, (i.e. hot and very active), it is virtually impossible to maintain a proper water balance. These types of pools do not maintain an effective chlorine level for very long. As a result the formation of chloramines (a corrosive gas give off when chlorine levels are too low) occurs rapidly and frequently. The concentrated chloramines above the whirlpool are then drawn directly into the DRY-O-TRON® where they attack the aluminum fins of the coil. Evaporated body oils are also present in the hot air above a whirlpool. These oils will collect on the inside of the return duct as well as on filters and coils, resulting in a sticky coating. It is for these reasons that the return air grill should be located as far as possible from the whirlpool.** • **Contact Dectron or a Dectron-certified technician.**
Inadequate pool water flow	Lack of a booster pump	• **The main filter pump is usually sized for pool water filtration and sanitation. If there is any doubt that the main filter pump cannot develop the total head to assure the flow requirement or if the DRY-O-TRON® is installed more than 8 feed higher than the pool water surface, a separate circulating pump for the DRY-O-TRON® is required. Refer to the Owner's Manual for the flow requirement.** • **See Startup - Pre-Startup Adjustments- Adjust water flow rate and Installation Overview.**

Operation — Sensor Calibration

NOTE: For calibration of the air flow sensor option, see **Startup - Set Air Flow Sensor**.



Sensors are subject to drift over time, and a replacement sensor is never exactly the same as the original sensor. Should a sensor be replaced or need re-calibration follow these steps:

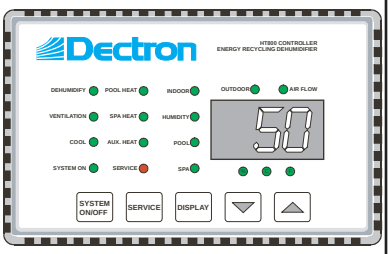
1. Locate the sensor.
2. Attach the sensor of a known-accurate instrument to the DRY-O-TRON® sensor.
3. After allowing the instrument enough time to settle, note the instrument reading.
4. Note the DRY-O-TRON sensor reading as shown in **Operation - Read Primary Sensors** and **Operation - Read Secondary Sensors**.
5. Using the chart below, navigate to the calibration register for the sensor in question. **Be very careful not to change any other registers.**

NOTE: "**+**" indicates pressing two buttons at the same time.

	Press	Screen
1.	DISPLAY + ▼ for 3 seconds	Lo
2.	▲ X approx. 18 times	17
3.	DISPLAY As necessary to reach the desired calibration register.	
	Select one. — Thermostat temp. sensor	tc
	Humidity sensor	Hc
	Pool inlet water temp. sensor	Pc
	Spa inlet water temp. sensor	Sc
	Outdoor temp. sensor	oc
	Return air temp. sensor	rc
	Chilled air temp. sensor	Ec
	Pool outlet water temp. sensor	Lc
	Spa outlet water temp. sensor	cc
	Supply air temp. sensor	Ac
4.	▲	present sensor reading
5.	▼ OR ▲ As necessary to cause the present sensor reading to match that of the known instrument.	
6.	The controller will return to normal approximately 35 seconds after the last button is pushed.	

OPERATION

Replace Thermostat Repair Operation



Should a HT800 thermostat be replaced, those ordered by unit serial number will be programmed appropriately. Stock thermostats must be programmed in the field.

HT800 controllers are divided into Revision 12 and pre-Revision 12. DRY-O-TRON units shipped before summer of 1999 may be pre-Revision 12. Later units may be Revision 12. All replacement thermostats are Revision 12. The replacement thermostat must be told whether it is installed on a Revision 12 controller or a pre-Revision 12 controller.

Be very careful not to change any other registers.

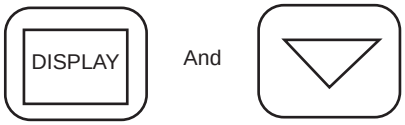
NOTE: "**+**" indicates pressing two buttons at the same time.

	Press	Screen
1.	DISPLAY + ▼ for 3 seconds	Lo
2.	▲ X approx. 18 times	17
3.	DISPLAY X approx. 4 times	no
4.	▲	present sensor reading
5.	▼ OR ▲ Revision 12 controller pre-Revision 12 controller	31 26
6.	The controller will return to normal approximately 35 seconds after the last button is pushed.	

OPERATION

Appendix 1 Controller Configuration Register

Keys



Step 1 Press (DISPLAY) and (DOWN) keys for 3 seconds to enter configuration mode.
Step 2 When "LO" message appear, adjust display to 17 with (UP) key (configuration password).
Step 3 Press (DISPLAY) to see first configuration code.
Step 4 Press (UP) once to display current setting, then press (UP) repeatedly to change the setting.
Step 5 Press (DISPLAY) to see next configuration message.
Step 6 Repeat steps 4 and 5 until configuration is complete.
Step 7 Display returns to normal mode 25 seconds after last key press.

( ) = range of setting
{ } = recommended setting

Code	Meaning	Description
CF	scale and sensor	Select °F or °C, select sensor**(**0-7**)**. See "CF" table on next page.
P,	pools installed	Select pool and spa installed. See "Pi" table on next page.
o,	options installed	Select which options are installed. See "oi" table on next page.
no	new options (Rev. 12)	Set to **31** for units with WaterSmart feature. For all others set to **26**.
Fd	filter dirty	Percent of airflow at which filter is considered dirty **(**0 -100%**) {**80**}** Airflow below this blinks AIRFLOW.
FJ	filter blocked	Percent of airflow at which filter is considered dirty **(**0 -100%**) {**40**}** Airflow below this produces alarm 2.
Ft	filter time	Stabilization time for airflow sensor **(**0.1 - 9.9 minutes**) {**5 minutes**}**
cd	dead band	Dead band between cooling set point and heating set point **(**1.8 - 18.0 °F**)** or **(**0.5 -10.0 °C**) {**2F**} {**1C**}**
hd	heating differential	Differential between auxiliary heat stage #1 and stage #2 **(**0.4 - 9.0 °F**)** or **(**0.2 - 5.0 °C**) {**1 °F**}**
Ab	operating differential	Operating differential for air temperature control **(**0.4 - 4.0 °F**)** or **(**0.2 - 2.2 °C**) {**2 °F**}**
Pb	pools differential	Operating differential for pool and spa temperature control **(**0.4 - 4.0 °F**)** or **(**0.2 - 2.2 °C**) {**2 °F**}**
Hb	humidity differential	Operating differential for humidity control **(**1.0 - 9.9%**) {**5%**}**
dP	dew point control	Evap. temp. lower than this value will close the bypass damper to prevent coil freezing **(**37 - 55°F**)** or **(**2 -13 °C**). {**37 °F**}**
tc	thermostat calibration	Thermostat temp. sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)** (Not available when CF = 2,3,6, or 7).
Hc	humidity calibration	Calibration of relative humidity sensor **(**± 10%**)**
Pc	pool inlet calibration	Entering pool water temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
Sc	spa inlet calibration	Entering Spa water temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
oc	outdoor calibration	Outdoor air temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
Fc	flow calibration	See Owners Manual, section Startup - Adjust Airflow Sensor.
rc	return calibration	Return air temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
Ec	evaporator calibration	Chilled air temperature sensor calibration **(**± 9°F**)** or **(**± 5 °C**)**
Cc	pool outlet calibration	Leaving pool water temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
cc	spa outlet calibration	Leaving spa water temperature sensor calibration **(**± 9 °F**)** or **(**± 5 °C**)**
Ac	supply air calibration	Supply air temperature calibration **(**± 9 °F**)** or **(**± 5 °F**)**
,t	integral time	ON/OFF = 0 (heating), proportional = 60 (heating)
LC	lock code	Permits change of the security code **(**0 to 99**)**

Data subject to change without notice.

Configuration Tables

"CF" Table (Display Type)

Display	Active Sensor	Display	"CF"
°C	Thermostat sensor	Set point	0
°F	Thermostat sensor	Set point	1
°C	Return air sensor	Set point	2
°F	Return air sensor	Set point	3
°C	Thermostat sensor	Thermostat temperature	4
°F	Thermostat sensor	Thermostat temperature	5
°C	Return air sensor	Return air temperature	6
°F	Return air sensor	Return air temperature	7

"Pi" Table (Pools installed)

Spa have heating priority?	Spa installed?	Pool installed?	"Pi"
-	yes	yes	0
-	yes	-	1
-	-	yes	2
-	-	-	3
yes	yes	yes	4

Override Operating Mode

Δ Normal mode	+0
Δ Ignore evaporator and force pool heating for 20 minutes, if ambient above 60% r.h	+8
Δ Ignore evaporator and force pool heating for 30 minutes, if ambient above 60% r.h	+16
Δ Ignore evaporator and force pool heating for 45 minutes, if ambient above 60% r.h	+24

"oi" Table (Options installed)

A/C Option installed?	Air flow sensor installed?	Outdoor sensor installed	"oi"
-	-	-	0
-	-	yes	1
-	yes	-	2
-	yes	yes	3
yes	-	-	4
yes	-	yes	5
yes	yes	-	6
yes	yes	yes	7

Δ Air Heating Mode	+8
Δ Auxiliary Pool Water Heater	+16
Δ Air Heating Mode & Auxiliary Pool Water Heater	+72
Δ Auxiliary Pool Water Heater Second Stage	+32

Note: The Δ options in "oi" table are available on HT 800 thermostat identified as Rev. 7 and up.
The Δ options in "Pi" table are available on HT 800 thermostat identified as Rev. 10 and up.

Configuration Tables, continued

"no" Table (new options)

Option	Description	"no"
HSD	Humidity Sensor Alarm	+16
NHD	New Heating Differential	+8
WPS	Water pressure switch location	+4
MCRT	Minimum compressor run time	+2
BPSV	Bypass solenoid valve #5 &#6 (WaterSmart)	+1

Total value for "no", Rev. 12: 31
Total value for "no", pre-Rev. 12: 26