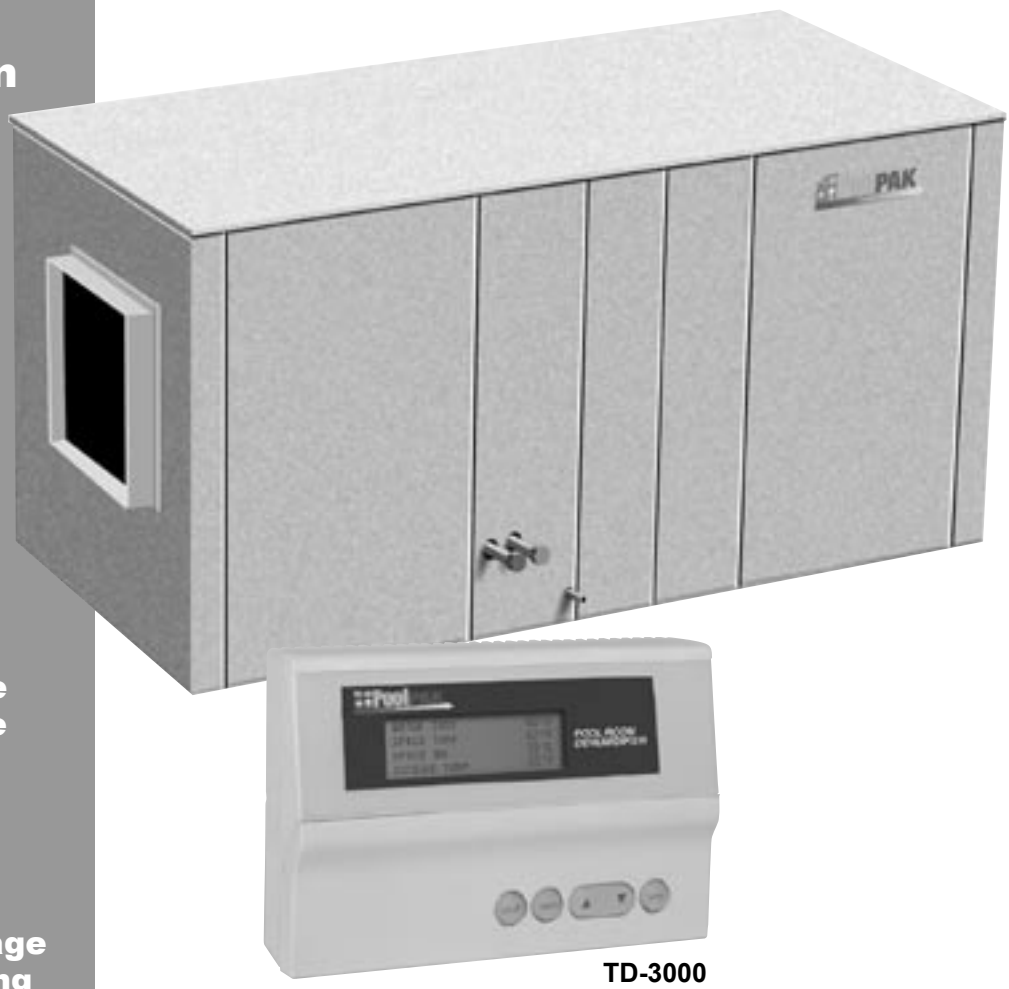
PoolPAK International

POOL COM PAK
HORIZONTAL

Application/Specification/Installation & Operation Manual

Dehumidification Systems for Swimming Pool Enclosures

- Models AWH550 - AWH3500 (HCDH 550 - 3500)
- Pool water heating via heat recovery (AWH models)
- TD-3000 interface device
- Controls humidity levels to prevent condensate damage using a cold surface sensor controller
- Controls space temperature for comfort
- Controls energy usage for reduced operating cost
- 7 to 60 #/hr. moisture recovery capacity
- 800 to 5300 CFM plus code Required Ventilation Air



TD-3000
Interface Device

J99006475

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The POOLCOMPAK Dehumidification System

The PoolComPak is a complete dehumidification system designed expressly for indoor swimming pool enclosures such as commercial and residential pools, therapy pools, saunas and whirlpools. The PoolComPak dehumidification system takes into account two important factors: the swimming pool occupant (personal comfort) and the swimming pool environment (the physical structure and surrounding furnishings).

The swimming pool enclosure can be a hostile environment for equipment, decor and building structures. The PoolComPak's major function is to dehumidify the pool enclosure air through a vapor compression cycle. During this cycle the PoolComPak recycles the sensible and latent heat and places it back into the pool water and air as needed. This recycling process saves money and keeps your pool environment efficient and safe.

Solid state microprocessor technology in conjunction with sensors that continually monitor water and air conditions provide superior occupant comfort. Unlike typical outside air ventilation systems, the PoolComPak system re-uses energy and blankets the walls and windows with warm, dry air.

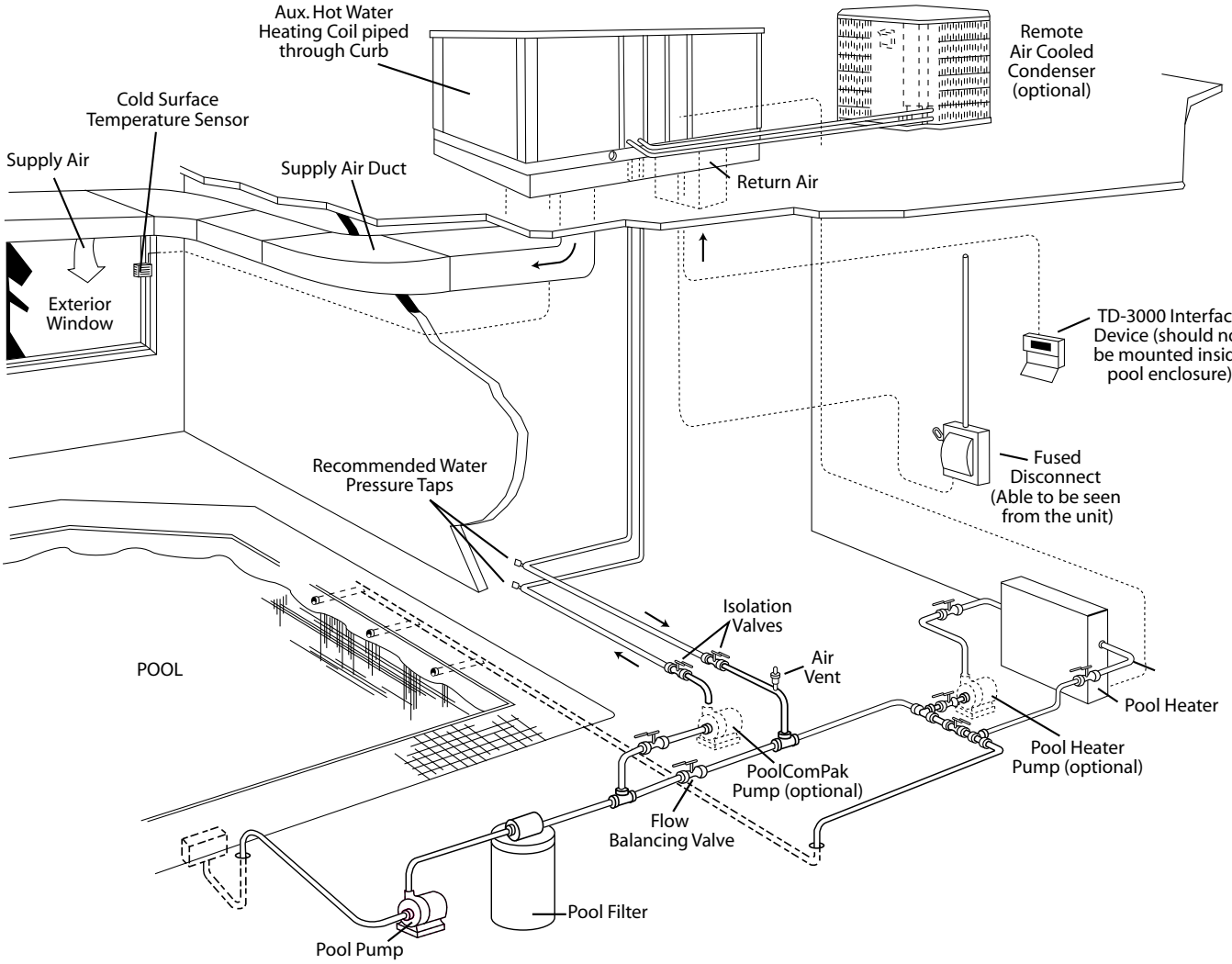
Environmental Issues:

- Prevents condensation that damages both the structural steel and concrete
- Eliminates rust and paint blisters in steel roofing
- Eliminates percolation of concrete that destroys structural members
- Protects the surrounding interior furnishings
- No unsightly rust stains
- Dry to the touch furnishings

Flexible Design:

- It can be located inside or outside the enclosure
- Horizontal Orientation
- Curb Mountable
- Optional Air Conditioning Mode
- Optional Outside Air
- Economizer Operation
- Top and/or Bottom Supply Duct Orientation
- Easily fits into a Standard Utility Room
- Internal Hot Water Coil or Duct-Mounted Electric Heater

TYPICAL POOLCOMPAK HORIZONTAL SYSTEM LAYOUT



TYPICAL POOL WATER & AIR TEMPERATURE SET-POINTS

	WATER TEMP. °F	Air Temp. °F	Room RH%
Recreational Pools	80 – 85	Water Temp. + 2	55 – 60
Therapy Pools	86 – 92	86	55 – 60
Whirlpools	99 – 104	86	55 – 60

COMPLETE ENVIRONMENTAL CONTROL FOR RESIDENTIAL AND SMALL COMMERCIAL POOLS

TD-3000 - CONTROL SYSTEM

The TD-3000 is a micro-processor based system that maintains pool enclosure humidity and air and water temperatures at optimum levels, automatically. It is also possible to monitor this critical data via the Internet using the optional Remote Access Package. This also allows the controller to be accessed from the factory via the internet or a telephone line.

The TD-3000 is designed to work with the PoolComPak dehumidification system to provide an environment that is both comfortable and cost effective. It controls unwanted humidity in the pool enclosure and helps to prevent unsightly condensation from forming on surfaces.

The TD-3000 provides accurate control and allows the user to read system parameters and change setpoints easily. For this purpose, a remote mountable control panel with a text display and keypad is provided. The panel can be mounted in an office or in the equipment room. (The TD-3000 control panel contains no sensors.)

All setpoints are saved in the memory of the TD-3000 and are not erased in the event of a power failure. Critical operating data can be easily accessed by a service technician for the purpose of system operation and evaluation.

The TD-3000 has an optional Remote Access Package.

HUMIDITY CONTROL

As the humidity within the pool enclosure rises above the desired setpoint, the TD-3000 activates the compressor within the PoolComPak to begin the dehumidification process. If the water temperature is below the desired setpoint, a portion of the heat recovered during dehumidification is directed to the pool water condenser for water heating. If the water temperature is at or above the setpoint, all of the recovered heat is directed to the air reheat condenser for space heating. If neither air heating nor water heating are required, all the recovered heat can be directed to an auxiliary remote air-cooled condenser if the system is so equipped. If the system does not include an auxiliary air-cooled condenser, the TD-3000 will direct the recovered heat to the air reheat condenser until the need for dehumidification is satisfied.

COLD SURFACE TEMPERATURE HUMIDITY RESET

The TD-3000 control system includes a sensor that measures the temperature of the coldest surface in the pool enclosure, usually a exterior exposure window or door frame. When the temperature of this surface approaches the dewpoint temperature of the space, the controller lowers the humidity setpoint to activate dehumidification. This function helps to prevent condensation on the cold surface.

POOL WATER HEATING (AWH Model)

Water heating with recovered heat will happen whenever the compressor is running and the water temperature is below the setpoint. The TD-3000 will activate the auxiliary pool water heating system if the water temperature cannot be satisfied with recovered heat. An auxiliary pool water heater must be supplied as part of the pool water pump and filter system.

SPACE HEATING

When the water temperature has been satisfied and the compressor is running, the TD-3000 directs all the recovered heat to the reheat hot gas coil. Space heating will continue until the space temperature reaches the setpoint The TD-3000 will activate the auxiliary (electric, steam, gas or hot water) space heating system if the unit is unable to satisfy the heating need with heat recovered during dehumidification.

SPACE COOLING (OPTIONAL)

If space cooling is required and the unit is equipped with an auxiliary condenser (remote air-cooled or water-cooled), the TD-3000 will activate the space cooling mode of operation. In this mode, the heat removed from the space air will be directed to the auxiliary condenser if the pool water temperature is satisfied. The air cooling mode of operation is independent of the need for dehumidification.

ECONOMIZER (OPTIONAL)

When the unit is equipped with a field supplied economizer, the TD-3000 will automatically select the most economical method for space cooling. An economizer utilizes outside air rather than the compressor to achieve space cooling. A sensor connected to the TD-3000 monitors the outside air temperature. When appropriate, the controller will disable the compressor and bring in cool outside air for economical operation. Proper exhaust fan system must be designed to ensure negative room pressure in the economizer mode.

NETWORKING - MULTIPLE UNITS

TD-3000 networking allows up to four PoolComPak units to be connected together. The units will work with each other to control water temperature, air temperature, and relative humidity. Networked PoolComPak units have all the features of standard PoolComPaks plus the ability to control water temperature in multiple pools. They also allow system dehumidification capacity to be staged. All units on the network are accessible from a single remote control panel for convenience.

AREAS OF APPLICATION

PoolComPak units have been designed to control humidity for a wide range of applications, specifically small and medium size indoor pools. Some of these applications include:

- Hot Tubs, Spas, and Whirlpools
- Residential Pools
- Hotel and Motel Pools
- School Natatoriums
- YMCA and Club Pools

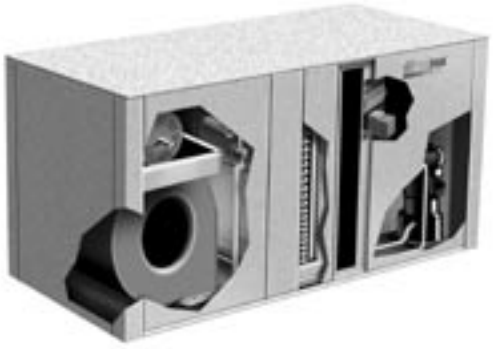
For humidity control in pool rooms where pool water heating via heat recovery is not feasible or in commercial or industrial applications, e.g., ice skating rinks, hockey and curling arenas, hospitals, printing areas, confectioneries, therapy pools, community and recreation centers, process control areas, greenhouses, farms, restaurants, warehouses, aquariums, beverage bottling plants, dairy production facilities, breweries, fire stations, basements, locker rooms, museums, libraries, photo labs, fish hatcheries, plastics industries, archives, theaters, laboratories and computer rooms, use High Capacity Dehumidifiers (HCD) by PoolPak International. .

EFFECTS OF MOISTURE

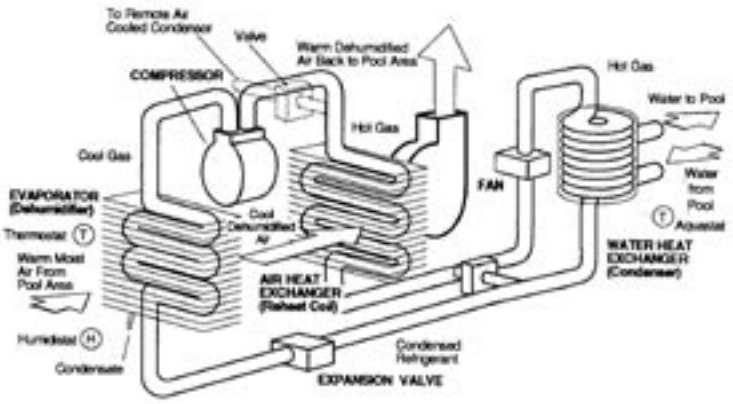
Excess humidity in natatorium structures may be readily apparent as condensation on cool surfaces such as windows and outside doors, the growth of mildew or mold, and, when coupled with poor pool water chemistry, accelerates corrosion of metals. In its less obvious forms, moisture may penetrate walls and ceilings and cause rot that becomes noticeable only when large scale structural failure occurs. Humidity levels are also a major factor in the comfort of pool users.

MOISTURE LOADS

An indoor swimming pool produces large quantities of water vapor through evaporation, which accounts for roughly 95% of the pool water heat loss, making the water colder. This excessive humidity will form damaging condensation unless removed from the building. In the past, the method of removing this water vapor was by ventilating an otherwise energy efficient building, exhausting the humid air and all the energy it contained.



PoolComPak Horizontal Cutaway



PoolComPak Schematic

Then, additional energy was used to bring in and heat up the necessary makeup air and heat up the pool water. The ideal solution to removing the water vapor from the pool area is to convert the latent (wet) heat contained in the moist air back into sensible (dry) heat, and put that heat back into the pool water and air. This is the principle of the PoolComPak units.

PoolComPak Dehumidification Systems reduce the energy input required to maintain pool water and air temperatures. By dehumidifying the air and recycling the latent energy back into the pool air and water, the unit will reduce operating costs when compared to conventional heating and ventilating systems. Pool water and enclosure heating are still required but with greatly reduced requirements. PoolPak International recommends that backup heating equipment for both pool water and pool enclosure air be capable of carrying the full system heating requirements. This makes for a well-designed system that will provide the least amount of pool down time if unforeseen system problems occur. Building conductive loads and other losses must be taken into consideration.

A PoolComPak unit, when matched correctly to the evaporation rate of the pool water and overall dehumidification requirements, will efficiently maintain the pool air at relative humidity levels between 50 and 60%. It should be noted that a lower evaporation rate occurs when the pool enclosure's air temperature is maintained above the pool water temperature. Evaporation losses, and the energy required to maintain desired room conditions, will dramatically increase if the air temperature is allowed to fall below the pool water temperature. It is recommended that the continuous dry bulb temperature entering the evaporator of the PoolComPak units not fall below 75°F.

POOLCOMPAK PRINCIPLES OF OPERATION

ROOM DEW POINT CONTROL

PoolComPak units with the TD-3000 controller operate using a new, advanced type of control called dew point temperature control. This method of control is more accurate than conventional relative humidity control. The main purpose of a dehumidification system is to maintain the amount of moisture in the pool area below a level that would cause damage to the building. Relative humidity is a measurement of the percentage of moisture which is in the air at a given dry bulb temperature in proportion to the maximum amount of moisture that could be contained at this particular dry bulb temperature. Warmer air can hold more moisture than colder air and therefore, changes in dry bulb temperature will change the relative humidity reading without any change in the actual amount of moisture in the air. The amount of moisture in the air is expressed as "grains of moisture per pound of dry air" and is directly related to the dew point temperature.

The TD-3000 uses dew point control to operate the PoolComPak unit and maintain the moisture level below the set point. The space dry bulb temperature and relative humidity determine the dew point temperature. By varying the space temperature and space relative humidity set points, the dew point set point is changed. When the space dew point temperature rises more than 1/2 degree Fahrenheit above the space dew point temperature set point, the TD-3000 controller energizes the compressor for dehumidification. As the temperature drops more than 1/2 degree Fahrenheit below the dew point temperature set point the controller de-energizes the compressor.

The chart below shows how the relative humidity can vary with the same amount of moisture in the air as the dry bulb temperature varies.

Dry Bulb Temp.	RH	Dew Point	Grains of Moisture /Pound of Dry Air
75˚F	86%	70˚F	110
85˚F	61%	70˚F	110

The PoolComPak unit is shown in the cutaway illustration and schematically on page 10. The unit's fan draws in warm, moist air from the pool enclosure. This air passes through the evaporator (dehumidifier) coil and gives up heat energy to the refrigerant which is in a cool, liquid state. This exchange of energy causes the air temperature to fall below its dew point, resulting in moisture condensation on the evaporator coil. The moisture formed falls into the unit's condensate drain pan. After passing through the evaporator, the refrigerant becomes a cool gas.

The refrigerant then enters the unit's compressor, where it is compressed into a hot gas. While in the compressor, the refrigerant absorbs the energy used to operate the compressor. This hot gas refrigerant then travels either through an air reheat coil (condenser), the pool water condenser or to an optional auxiliary A/C condenser, which may be either air or water cooled. If air heating is called for, the reheat coil is used. The hot refrigerant exchanges energy with the cooler, dehumidified air coming from the evaporator. This causes the temperature of the air to rise for heating. If pool water heating is required, the hot gas flows into a pool water condenser*, where it adds energy to the incoming pool water. This heats the pool water while the refrigerant is condensed into a warm liquid. If air cooling is called for, the refrigerant flows to the auxiliary A/C condenser bypassing the reheat coil and pool water condenser and allowing cool air from the evaporator to provide space cooling to the natatorium.

ROOM AIR DISTRIBUTION

All PoolComPak models provide continuous air recirculation, and with a good air distribution system, will promote uniform pool conditions. To remove the required moisture and maintain controlled conditions, it is essential that there be adequate air movement and distribution in the natatorium. The unit must remove the humid air from the pool area and discharge the dehumidified air back into it. The supply air should be distributed over areas subject to condensation (windows, outside walls, support trusses, skylight, etc.).

AIRSIDE DESIGN

The supply air volume and external static pressure (ESP) capability of the fan to overcome static losses within the duct work is given for each model in the Specification Section. It is recommended that an experienced engineering or mechanical contracting firm do the design, sizing and layout of the duct system.

SUPPLY DUCT

After dehumidification, dry air is supplied back to the room. Supply air may be distributed from a duct around the perimeter at floor level or from above, directing the air over outside walls, windows and other surfaces

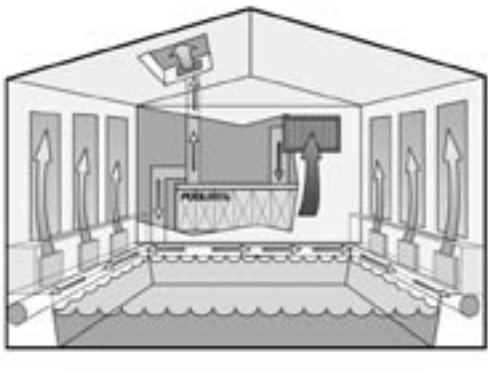
* HCDH models do not have pool water heating capabilities.

susceptible to condensation or down the center of the room blowing air toward the surfaces prone to have condensation. See figures below for illustration. Recommended volume of supply air should provide three to six air changes an hour. Caution should be taken not to short circuit air between the return and supply as this will cause air stratification and pockets of high humidity.

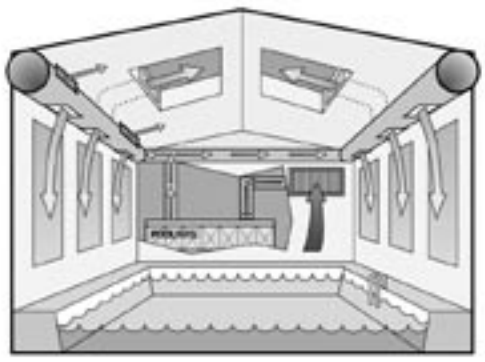
- Supply ducts should be as short and with as few turns as possible. Use turning vanes to minimize air noise and static pressure drop.
- Do not direct the supply air at or across the pool surface as this increases the evaporation rate.
- Recommended maximum supply duct air velocity is 1000 FPM. The recommended velocity from diffusers is 300 to 500 FPM.
- In multiple unit installations, supply air from each unit may go into a common supply duct or into a plenum.
- A supply air duct collar is provided at the fan outlet. The duct should be attached to this with a flexible rubber or canvas connection to minimize vibration transmission.

RETURN DUCT

The unit will operate most efficiently in a natatorium where the supply and return openings are placed diagonally opposite each other. All ducting should be done in accordance with acceptable practices. Short flexible connections of rubber or canvas can be made between the return duct and the unit to eliminate vibration transmission through the duct.



Below Grade Air Distribution System



Overhead Duct Air Distribution System

PoolPak International does not recommend the use of equipment rooms as return air plenum(s) due to the potential of corrosion for components installed inside the mechanical room. The return air duct should always connect the pool enclosure to the return air plenum collar of the PoolComPak unit(s). See the above figures for illustration.

- PoolComPak models include a factory mounted and wired space temperature and humidity sensor at the return air opening of the unit.
- When installing a unit with the economizer option, the space temperature and humidity sensor is shipped loose for field mounting. Refer to the installation section for mounting location. Caution should be exercised.
- When the ventilation air option is selected, adequate exhaust capacity via separate fan must be specified to ensure the natatorium remains slightly negative. Failure to specify adequately sized exhaust system may result in damage to structure and pool odors may be forced into other areas of the building.

Connection of fresh air intake ducts to the return duct ahead of the evaporator coil is not recommended. The following conditions may occur as a result:

- Loss of control of the space temperature and humidity due to the space temperature and humidity sensor indicating the mixed air temperature of the space is higher or lower than actual space conditions.
- The compressor may cycle on low pressure or defrost fault conditions dependant upon the mixed air temperature.
- Potential moisture damage in the return duct due to condensation from the mixed air temperature.

OTHER AIR SIDE CONSIDERATIONS

- An auxiliary hot water, electric or gas duct heater must be installed in the supply duct to provide space heating. Be sure that the additional air pressure drop across the heater is accounted for in the unit selection. These components must be designed for use in swimming pool environments.
- Outside fresh air may be introduced through the unit by using its fan and a small duct attached to the top or side of the unit. When outside air is ducted into the unit, an exhaust fan must be installed to remove a slightly greater amount of air from the space.
- Maintain the enclosure at a slightly negative pressure. This will help eliminate moisture and chemical odor migration to other spaces. The exhaust fan should be sized about 10% greater than the amount of outside air being introduced into the space. Ducts are the only practical solution to proper air distribution in large facilities. Ducts can be fabric, aluminum, PVC or galvanized steel. Even though "dry air" is being supplied back to the pool, do not use duct board or similar materials. If the unit is installed in an area that is below the natatorium's dew point temperature, the ducts and the unit may require insulation, pitching and drainage.

UNIT/FACILITY INTERFACE

A Typical PoolComPak System Layout and its connection to the natatorium and pool water piping systems is shown in the figure on page 7.

Installation requires the unit to be placed on a roof mounted curb, the mechanical room floor, an appropriate location in the pool room, or outside on an equipment housekeeping pad. Isolation pads should be placed under the unit to minimize transmission of noise due to unit operation. Then pool water is piped to the unit. Electrical power from a properly sized and fused disconnect is connected to the unit. The supply and return air ducts are connected to their respective locations on the unit. The condensate is piped back to the pool or to the sewer. If an optional remote air-cooled condenser is used, place the condenser in a proper outdoor location. Refrigerant piping connects the remote condenser to the unit. Refrigerant lines must be leak checked and evacuated through installer provided access valves. Control and power wiring are run to complete the installation, including the mounting of cold wall surface sensor.

If a field-furnished auxiliary space heating coil is installed, the control for this heater must be field wired to the PoolComPak controls shown in the field wiring diagram on page 56.

Outside air can be ducted into the unit through the optional outside air duct on the top or end of the unit. The unit can draw up to 30% of its supply air from the outside. The air volume supplied to the space is then up to 130% of the PoolComPak's return air. When ventilating the natatorium in this way, an auxiliary exhaust fan must be furnished in the natatorium to exhaust to the outside an air volume slightly greater than the air volume introduced into the natatorium from the outside. This will maintain a negative pressure in the space, preventing odor and moisture migration.

POWER SUPPLY

A separate fused disconnect switch must be provided as per local codes and easy accessibility of the PoolComPak unit. Use the minimum circuit ampacity listed on the unit's data plate to determine the minimum

wire size for incoming electrical power. The ground connection for the unit is located in the unit's control panel. The power supply to the unit must be adequate for the compressor starting amperage (LRA). If it is not, a compressor rotor stall will occur during start-up due to an excessive voltage drop. All field wiring must be done according to the wiring diagram provided with the unit and in conformance to the National Electrical Code (NEC) and any other applicable local electrical code(s).

CONTROL WIRING

All control wiring field connections are described in the wiring diagram furnished with the unit as well as in the Installation section of this manual. All control wiring is low voltage. Use the cable provided for wiring between unit controller and TD-3000 interface device.

CONDENSATE PIPING

The condensate may be piped to a drain or returned to the pool. If returned to the pool, the condensate should be piped to the skimmer. PoolPak International recommends neither for, nor against, the practice of returning condensate to the pool. The overflow drain should be piped in a similar fashion. The installer should review the local codes prior to making the decision of where to dispose of the condensate. The amount of condensate recovered in a year is about equal to the volume of the pool.

STANDARD ITEMS FACTORY MOUNTED

- Dehumidification coil
- Air side reheat coil (hot gas reheat coil)
- Pool water condenser to add recovered heat to pool water (AWH model*)
- Down, top (for indoor installations) or horizontal supply air configuration
- Filters and filter rack
- Air temperature and relative humidity sensor

STANDARD ITEMS FACTORY SUPPLIED FOR FIELD INSTALLATION

- TD-3000 Control Interface Device
- Pool water temperature sensor (AWH model*)
- Cold surface temperature sensor
- Outside air sensor (with economizer option only)

SYSTEM OPTIONS

- Remote air-cooled condenser for space air conditioning
- A factory-mounted water-cooled condenser with a refrigerant head-pressure controlled water regulating valve for space air conditioning. City water and closed loop cooling tower water may be used for the water cooled condenser loop. Never use ground water for the water cooled condenser. Consult the factory for cooling tower applications.
- Capability of introducing up to 30% outside air
- Spa water heater/dehumidification unit desuperheater
- Heat tape and weather proofing for outdoor installation
- Up to 1.5" ESP
- Economizer
- Network multiple units
- Remote monitoring via Internet

* HCDH models do not have pool water heating capabilities.

EQUIPMENT SELECTION

PoolPak International offers engineers, architects, contractors and customers a computer generated equipment selection and operating cost analysis. It is of extreme importance that all moisture loads be accounted for. Examples of this would include waterfalls or whirlpools. These require special considerations in determining an accurate evaporation load and dehumidification duty. An input data form is shown on following page.

CURB MOUNTING

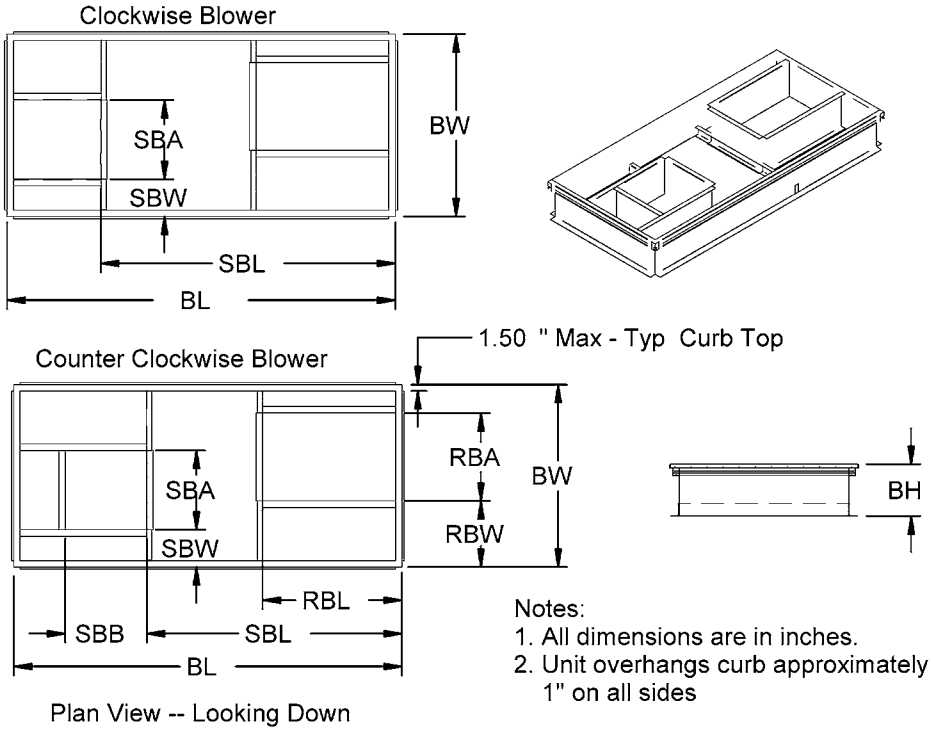
Illustrated in the figure is a curb that has been designed specifically for the PoolComPak product line. The outside dimensions of the curb are such that the base of PoolComPak extends over the edge of the curb all the way around. This aids in preventing rainwater, running down the side of the unit, from getting between the base of the PoolComPak and the curb.

It is the installing contractor's responsibility to complete the following:

- Flash the curb into the roof
- Insulate the curb
- Connect the supply and return duct to the curb's duct support rails.
- Connect condensate drain line with appropriate trap
- Seal the curb to the bottom of the PoolComPak using the gasket supplied with the curb
- Seal the pool water pipes where they go through the curb

If specified when ordering, all water piping connections can be made through the curb. These water connections include: pool water, condensate, auxiliary hot water coil (optional).

If the PoolComPak is to be mounted on a curb, the unit must be ordered with the "outdoor" option. PoolComPaks produced for curb mounting receive special weatherizing and insulating that non-curb mounted PoolComPaks do not receive.



PoolComPak Curb Assembly

Note: If the factory is not notified that a PoolComPak is to be mounted outdoors, the PoolComPak will not be weather tight, it will leak, and will not be properly insulated.

PoolComPak Curb Dimensions

Model		550/800	1200	1400/1800	2600S*	2600L**	3500
		Overall Dimension					
	BL	58.5	58.5	70.5	90.5	90.5	90.5
	BW	32.3	32.3	42.5	42.5	42.5	42.5
	BH	12	12	12	12	12	12
		Return Duct Chase					
	RBW	14.6	14.6	19.5	15.4	15.4	15.4
	RBL	22.2	22.2	25.5	32.5	32.5	32.5
	RBA	12.0	12.0	15.0	20.5	20.5	20.5
		Supply Duct Chase					
	SBW	16.2	16.2	19.0	8.7	8.7	8.7
	SBA	9.4	9.4	12.3	12.5	18.5	18.5
	SBB	10.4	10.4	13.5	13.5	19.0	19.0
CW -Rotation	SBL	44.8	44.8	54.4	74.0	68.6	68.6
CCW - Rotation	SBL	43.0	43.0	49.6	59.5	59.5	59.5

* S is 4000 CFM Max, L is 4000 to 6500 CFM

PoolComPak Selection – Input Data Form

Project Data

Name: _____ Location: _____

Prepared By: _____ Creation Date: _____

Engineer Data

Name: _____ Location: _____

Phone: _____ Fax: _____

Owner Data

Name: _____ Location: _____

Contractor Data

Name: _____ Location: _____

Phone: _____ Fax: _____

Weather-City Data

Base City: _____

Equipment – Dehumidifier Type

- ❑ AWH Air & Water Heating
- ❑ HCDH Air Heating Only

Room Design

Length	_____ ft	Design Winter Outside DB	_____	°F
Width	_____ ft	Design Winter Building Loss	_____	MBH
Height	_____ ft	Design Summer Outside DB	_____	°F
Indoor DB Temperature	_____ °F	Design Summer Outside WB	_____	°F
Indoor Relative Humidity	_____ %	Design Summer Solar/Trans/Lights & Sensible Heat Gain	_____	MBH

Pool Data

	USAGE	AREA	TEMP
Pool 1	_____	_____	_____
Pool 2	_____	_____	_____
Pool 3	_____	_____	_____
Pool 4	_____	_____	_____
Pool 5	_____	_____	_____

POOL USE SCHEDULE

Occupied hours per day _____

Uncovered hours per day _____

Occupied days per week _____

Months per year _____

**Light, Medium, Heavy, Diving, Whirlpool, Wave pool slide, Waterfall*

Existing/Backup Mechanical System *(only complete if applicable)*

Existing/Backup System Type _____

Is Existing/Backup System electrical resistance? YES_____ NO _____

Existing/Backup Efficiency

Energy Costs

Electricity Cost $_____ /kWh Thermal Fuel Cost $ _____ /Therm

Conventional Heat & Vent System Outside Air Flow Data

Calculated annual average outside air flow based on weather data, pool evaporation and people_____ cfm

SECTION 15755

Part 1- GENERAL - AWH (with pool water heating) MODELS

1.1 Description

1.1.1 Furnish and install, as shown in plans and schedule and as specified herein, an indoor swimming - pool heat pump dehumidification system with air-to-water and air-to-air heat recovery. The unit shall be completely factory-assembled, including all internal piping and control wiring. The system shall include a compressor, a water condenser, an evaporator coil, an air side condenser coil, a circulating fan, and a micro-processor based control system.

1.1.2 Units shall be manufactured and tested in the U.S.A. and listed by and carry the label of ETL.

1.2 Intent

1.2.1 It is the intent of this Section of the specifications to provide a complete and operable Natatorium dehumidification system as shown and specified on the plans and Schedule.

1.3 Basis of Design: (Select one of the following:)

1.3.1 No Equal Units shall be PoolPak International - PoolComPak AWH _____ , no equal.

1.3.2 Base Bid/Alternate Unit shall be base bid with specified PoolPak International - PoolComPak AWH _____.

An Add or Deduct Alternate may be provided as indicated on the Bid form subject to the following conditions:

1.3.2.1 Alternate Bid shall include revised layout including details on supply / return air connections, piping connections, ventilation / exhaust connections, power / control wiring connections.

1.3.2.2 Alternate Bid shall include Full Disclosure (by paragraph and schedule) to be submitted to the engineer ten days prior to the bid and approved by the engineer in writing prior to the Bid. Full Disclosure shall clearly list and define any exceptions or deviations to the specified equipment and specified performance and any items which exceed the specifications. Manufacturer shall include a full disclosure of the unit's energy recovery features including unit's reheat capabilities, pool water heating capabilities and recovery of pool water evaporation energy.

1.3.2.3 Where the intent of the specification is met but with different construction materials or methods the difference shall be completely defined by paragraph in the Full Disclosure. The Full Disclosure shall include complete documented data.

Part 2 – PRODUCT

2.1 Principle of Operation

2.1.1 The unit shall control space temperature and relative humidity, pool water temperature and shall provide controlled ventilation. Warm moist air from the natatorium is drawn over an evaporator; and the latent and sensible heat is removed from the air. The heat captured by this process and the heat generated from the compressor power consumption are absorbed by a mechanical refrigeration system. The resulting dryer, cooler air is drawn over a reheat condenser coil and auxiliary heating coil (if provided) by a supply fan. The code required amount of ventilation air is introduced into the dehumidified air after the evaporator and reheat condenser.

2.1.2 The refrigeration system is activated if any of the following occur:

a. Relative humidity rises above set point

b. Space temperature rises above the set point.

2.1.3 The unit shall monitor space temperature and relative humidity, pool water temperature and building surface temperature.

2.1.4 The thermal energy absorbed by the refrigeration system is distributed as follows:

a. To maintaining the natatorium space temperature.

b. To maintaining pool water temperature.

c. Heat is also transferred to condenser as described in paragraph 2.14.7.

2.2 Construction

2.2.1 Indoor Unit:

2.2.1.1 The cabinet shall be fabricated out of a minimum of 20 gauge G90 galvanized steel, painted after fabrication. The paint shall be an electrostatically applied polyamide epoxy powder coating, with a thickness of 2-3 mils, baked and bonded at 420°F until it forms a hard, textured surface.

2.2.1.2 Construction shall be modular, consisting of removable panels with permanently affixed fasteners. Base pans shall be formed out of a minimum of 16 gauge G90 galvanized steel with floor mounting support channels. The condensate drain pan under the evaporator shall be stainless steel. The compressor and controls shall be located in a compartment out of the air stream. Surfaces adjacent to the coil compartment shall be insulated with insulation to prevent condensation.

2.2.1.3 The unit shall be of horizontal design . The supply air discharge shall be vertical, from the top of the unit cabinet for indoor installations or the supply air discharge shall be of horizontal or down design.

2.2.2 Outdoor Unit:

2.2.2.1 The unit shall be able to be mounted in an outdoor location. The unit shall be weather proofed. The unit's condensate drain line, pool water condenser and optional water-cooled condenser shall be insulated and wrapped with electrical heat tape and connected to an automatic thermostat. The thermostat shall activate the heat tape when the ambient temperature falls below 40°F, preventing the condensate, pool water, and water cooled condenser water from freezing inside the condenser(s) in the event of pump shutdown.

2.2.2.2 An outdoor air rainhood and bird screen shall be provided by the unit manufacturer. (Outside air option)

2.2.2.3 Hinged Access Doors shall be provided at the openings for Compressor, Electrical Panel, Blowers, Motors and Drives. Doors shall be double-wall, insulated, mounted on continuous piano hinge, secured with latches and sealed against a rigid steeel frame with hollow-bulb rubber gasket material.

2.3 Compressor

2.3.1 The compressor shall be high-efficiency scroll type or heavy-duty, heat pump rated reciprocating compressor operating at scheduled voltage, phase, and frequency.

2.3.2 The suction gas cooled compressor shall be equipped with thermal overload protection and a crankcase heater to prevent refrigerant migration to the compressor oil during shutdown.

2.4 Filter Rack and Filters

2.4.1 The dehumidification unit shall include a weather tight air filter section with a duct flange and access door for side loading of filters. The filters shall be Class II, one inch (standard) or two inch (optional), throw away.

2.5 Refrigerant

2.5.1 The refrigerant shall be R-22.

2.6 Fan

2.6.1 The fan shall be a forward-curved, centrifugal blower. The wheel shall be dynamically balanced and installed on a steel shaft. The blower scroll and housing shall be constructed of cold-rolled steel, coated with an electrostatically applied acrylic enamel paint or G90 galvanized steel.

2.6.2 The fan shall operate at the scheduled supply air CFM, outside air CFM (if equipped with this option) and W.C. external static pressure (ESP).

2.7 Fan Motor

2.7.1 The class B winding fan motor shall be belt drive. The motor shall comply with the efficiency requirements of EPACT-92. The belt drive assembly shall include a single “A” or “B” section belt and an adjustable motor sheave or double “B” section belt and non-adjustable motor sheave depending upon motor horsepower for establishing the specified CFM. Single phase motors shall be capacitor start. The fan motor horsepower, voltage and frequency shall be as scheduled.

2.8 Evaporator (dehumidification) Coil

2.8.1 The coil shall be of adequate face area and rows to remove the specified amount of moisture from the air stream at specified conditions.

2.8.2 The evaporator coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be polyester-coated for added corrosion protection. (Standard)

2.8.3 The evaporator coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.9 Air Condenser (air reheat) Coil

2.9.1 The coil shall be of sufficient size to reject the required amount of total heat.

2.9.2 The condenser coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be acrylic-coated for added corrosion protection. (Standard)

2.9.3 The condenser coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.10 Auxiliary Air Hot Water Coil (Optional)

2.10.1 The hot water coil shall be factory mounted after the air reheat condenser coil. The installing contractor shall install the control valve (by others) and pipe the hot water to the connections on the outside of the unit. The control device for the valve must be interlocked with the terminal strips in the unit.

2.10.2 Coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be acrylic-coated for added corrosion protection. (Standard)

2.10.3 Coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.11 Water Condenser (pool heating)

2.11.1 For recovering heat to pool water, the unit shall be equipped with a refrigerant-to-water, helically

wound coaxial condenser sized to reject the required amount of heat. The water side tubing shall be constructed of cupronickel for corrosion protection. The maximum water pressure drop shall be as scheduled.

2.12 TD-3000 Control Panel

2.12.1 The control panel shall have a 4 line, 20 character LCD display, LED annunciators, and a 15 button key pad. The controller main board shall have all set points and program information stored in nonvolatile memory for protection from power failure.

2.12.2 The control panel shall be wall or unit mounted. It shall be capable of being mounted up to 1000 feet from the unit. All internal circuit boards shall be conformal coated. The control panel shall be connected to the unit by standard six wire RJ25 phone cord. The control panel shall be capable of being directly connected to the unit for service convenience.

2.12.3 REMOTE ACCESS PACKAGE (RAP) (Optional) The dehumidifier shall be remotely monitored and controlled. All setpoints and monitoring functions listed in the CONTROL PANEL paragraph shall be remotely accessible. Remote monitoring and control shall be accomplished with a web server (by unit manufacturer) located in the dehumidifier's control panel. Web server shall contain a built in modem suitable for connection to a data quality telephone line. Web server shall also contain a built in 10/100BaseT ethernet interface for direct connection to the facility's existing ethernet network. Unit shall be monitored and controlled using standard web browser software.

2.12.4 The controller shall be micro-processor based. The following set points shall be programmable at the panel:

- 2.12.4.1 Space Air Temperature
- 2.12.4.2 Space Relative Humidity
- 2.12.4.3 Pool Water Temperature

2.12.5 The following LCD readouts or annunciators shall be provided:

- 2.12.5.1 Power On
- 2.12.5.2 Space Air Temperature
- 2.12.5.3 Space Relative Humidity
- 2.12.5.4 Pool Water Temperature
- 2.12.5.5 Cold Surface Condensation Prevention Temperature
- 2.12.5.6 Outside Air Temperature (Optional)
- 2.12.5.7 Economizer Mode On/Off (Optional)
- 2.12.5.8 Compressor Circuit Fault
- 2.12.5.9 Unit in Air Heating Mode
- 2.12.5.10 Unit in Dehumidifying Mode
- 2.12.5.11 Unit in Air Conditioning Mode
- 2.12.5.12 Dehumidifying Mode Based on Cold Surface Temperature Status
- 2.12.5.13 Auxiliary Air Heating Coil On/Off
- 2.12.5.14 Pool Water Heating On/Off
- 2.12.5.15 Service - Diagnostic Codes

2.13 Control Sensors

2.13.1 The unit shall be provided with the following factory mounted and wired control devices:

- 2.13.1.1 Space Dry Bulb Temperature Sensor (field wired with economizer option)

2.13.1.2 Space Relative Humidity Sensor (field wired with economizer option)

2.13.1.5 Defrost Controller

2.13.1.6 The unit shall be delivered with the following factory supplied sensors to be installed in the field: Pool Water Temperature Sensor, Cold Surface Condensation Prevention Temperature Sensor

2.13.1.7 Outside Air Dry Bulb Temperature (with economizer option)

2.13.2 An anti-cycle timer shall be provided in the unit control system to prevent short-cycling of the compressor.

2.13.3 Under normal conditions, the unit fan shall operate continuously, to provide air circulation within the pool enclosure.

2.13.4 The compressor shall not operate if the defrost thermostat set point has been reached. Evaporator coil defrost shall be accomplished by the flow of air drawn across the coil by the unit fan.

2.14 Sequence of Operation

2.14.1 Description

All operating and logic controls shall be factory mounted and wired in the unit. Control sequences shall be designed specifically to control swimming pool environmental conditions.

2.14.2. Humidity Control

When the humidity is above the set point the controller energizes the compressor and directs hot gas to air reheat condenser. If the pool water temperature is below the set point, the recovered heat is directed to the pool water condenser and the air reheat condenser or the auxiliary air cooling condenser, if so equipped. If the pool water temperature is at or above the set point, the recovered heat is directed to the air reheat condenser or the auxiliary air cooling condenser, if so equipped.

2.14.3. Pool Water Heating

When the dehumidifier is in either the dehumidifying and/or air conditioning mode and the pool water temperature is below the set point, a portion of the recovered heat is directed to the pool water condenser. At other times when the pool water requires heat, the PoolComPak activates the main pool water heater.

2.14.4. Spa Water Heating (optional)

The dehumidification unit shall include a factory mounted and refrigerant piped desuperheater properly sized to provide supplementary heat to spa water when the compressor is operating and the spa water is flowing through the desuperheater. The installing contractor shall pipe the spa water to the connections on the outside of the unit.

2.14.5. Space Heating

When the compressor is running in the dehumidification mode and the pool water temperature is at or above the set point and the space temperature is below the set point, the recovered heat is directed to the air reheat condenser. If the space temperature drops more than 2°F below the set point, the auxiliary space heating system (by others) shall be activated by a dry contact closure from the controller. A further drop in space temperature will activate the second stage of auxiliary heat (if available).

2.14.6. Space Humidity Reset Control based on Cold Surface Temperature

When the temperature of the interior surface at the cold surface sensor drops to within 5ºF of the absolute humidity set point (dew point), the absolute humidity set point is offset downward. This condition causes the dehumidifier system to activate humidity control, lowering the space dew point and hindering the formation of condensate on the cold surfaces.

2.14.7 Air Conditioning (Optional [Select 2.14.7.1 or 2.14.7.2])

2.14.7.1. Air Cooled Condenser

2.14.7.1.1 In order to achieve space cooling of the natatorium by the rejection of reclaimed heat, the dehumidifier shall be equipped with a properly sized remote air cooled condenser and shall automatically change over from heating to air conditioning as a function of dry bulb cooling demand in the natatorium. The sensible and latent heat recovered in air conditioning mode is rejected via an air cooled condenser if it is not needed for pool water heating.

2.14.7.1.2 The dehumidification unit shall include external hot gas and liquid connections to permit piping by the installing contractor to a remote air-cooled condenser provided by the unit manufacturer. The dehumidification unit's electrical panel shall have connections for the control of the condenser. The control voltage shall be 24 VAC.

2.14.7.1.3 The condenser shall have one or two head pressure controlled variable speed horsepower fan motor(s). The fan motor(s) shall be specifically designed for variable speed operation and have permanently lubricated ball bearings and an internal thermal overload. Fan blades shall be of the aluminum propeller blade type. Multiple fan units will be mounted on a common weatherized steel channel base and have common refrigerant and electrical connections. The fans shall be mounted on a close-mesh steel grill that has been vinyl coated for weather resistance. The condenser shall be of the vertical airflow type. The condenser fan and control wiring shall terminate in an electrical box integral with the cabinet. The condenser cabinet shall be zinc-coated steel covered with a high adhesive, baked on finish. The condenser coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The condenser shall be shipped with a dry nitrogen holding charge.

2.14.7.2 Water Cooled Condenser

2.14.7.2.1. In order to achieve space cooling of the natatorium by the rejection of reclaimed heat, the dehumidifier shall be equipped with an auxiliary water cooled condenser and shall automatically change over from heating to air conditioning as a function of dry bulb cooling demand in the natatorium. The sensible and latent heat recovered in air conditioning mode is rejected to the auxiliary water cooled condenser if pool water temperature is satisfied. This condenser shall be factory-mounted and refrigerant-piped, non-cleanable, with a head pressure controlled water regulating valve.

2.14.7.2.2 The condensing water shall be noncorrosive and non-fouling with a temperature range of 45°F to 85°F. The condenser shall be a counterflow, helically wound, coaxial, tube-in-tube heat exchanger for maximum heat transfer from the refrigerant to the condensing water. The water tube shall be constructed of corrosion-resistant cupronickel. The water circuit connections shall be MPT. The heat exchanger shall be UL Listed or CSA Certified.

2.14.8 Outside Air (Optional)

2.14.8.1 The dehumidification unit casing shall include a manual locking damper with duct collar, to permit the introduction of up to 30% outside air to the inlet of the fan, downstream of the evaporator and reheat coil. Damper assembly shall be of heavy-duty construction, designed for industrial applications. The frame and opposing blades shall be fabricated of formed 16 gauge galvanized steel. The shaft shall be 1/2" plated steel hex.

2.14.8.2 The opening shall be on the unit's top.

2.14.8.3 The opening shall be on the unit's end (indoor units only).

2.14.8.4 Preheating of outside air may be required for freeze protection and occupant comfort. An exhaust fan, with a capacity equal to or greater than the amount of outside air brought into the unit shall be furnished and installed by the installing contractor.

2.14.8.5 A duct mounted filter and filter rack shall be provided by the unit manufacturer (Indoor unit only).

2.14.9 Economizer (Optional)

2.14.9.1 The economizer shall operate in the space cooling mode when there is no dehumidification requirement. When the outside air temperature is greater than 50°F and more than 5°F below the space temperature set point and the space temperature rises above the set point, the compressor shall be de-energized and a dry contact closure shall be made. Upon closure, outside and exhaust air dampers (by others) shall open and return air dampers (by others) shall close and the exhaust fan (by others) shall be energized. The outside air shall be ducted into the return air plenum (by others).

2.14.9.2 If the space temperature continues to rise and exceeds the space temperature set point by more than two degrees, the dry contact closure shall be opened, reversing the field installed damper positions and de-energizing the exhaust fan and the compressor shall be energized in the air conditioning mode (if so equipped). The compressor shall continue to run until the call for air conditioning is satisfied.

2.14.9.3 The economizer shall also be activated in the air conditioning mode if the auxiliary air conditioning condenser option is not installed or if the compressor is locked out by a fault condition.

2.14.10 Fire Trip

2.15.10.1 Upon receipt of a contact closure from a fire control system (by others) a fire trip cycle shall be initiated. Compressor and fan motor shall be de-energized. For units equipped with the optional economizer, the dry contact shall open causing the outside and exhaust air dampers to close and the return air damper to open.

2.15 Roof Curb

2.15.1 The roof curb shall be "island" design enclosing the entire bottom surface of the pool dehumidifier unit. It shall be minimum 18 gauge galvanized steel construction. 12 inches high, including a wood nailer, a counter flashing lip and one-quarter inch sponge rubber gasketing for all mating surfaces.

Part 3 – EXECUTION

3.1 Factory Test

3.1.1 Refrigeration and electrical system operation and specification conformance shall be verified by factory test prior to shipment.

3.2 Warranty

3.2.1 The unit shall be protected by a one year limited warranty covering parts and a limited 30 day warranty covering labor. The compressor shall be protected by an additional four year warranty covering parts only.

Refer to Warranty policy guidelines for details.

3.3 Start-up

3.3.1 All units shall be thoroughly cleaned by the installing contractor in accordance with the manufacturer's instructions prior to being placed into service.

3.3.2 Start-up service shall be provided in accordance with the equipment manufacturer's instructions and must include complete testing of all controls and unit operation. The agency responsible for start-up shall record the refrigeration pressures and electrical operating data. Copies of this data are to be supplied to the owner and manufacturer.

End of SECTION 15755

SECTION 15755

Part 1- GENERAL – HCDH (NON POOL WATER HEATING) MODELS

1.1 Description

1.1.1 Furnish and install, as shown in plans and schedule and as specified herein, an indoor swimming -pool heat pump dehumidification system with air-to-air heat recovery. The unit shall be completely factory-assembled, including all internal piping and control wiring. The system shall include a compressor, an evaporator coil, an air side condenser coil, a circulating fan, and a micro-processor based control system.

1.1.2 Units shall be manufactured and tested in U.S.A. and listed by and carry the label of ETL.

1.2 Intent

1.2.1 It is the intent of this Section of the specifications to provide a complete and operable dehumidification system as shown and specified on the plans and Schedule.

1.3 Basis of Design: (Select one of the following:)

1.3.1 No Equal

Units shall be PoolPak International - HCDH _____ , no equal.

1.3.2 Base Bid/Alternate

Unit shall be base bid with specified PoolPak International - HCDH _____.

An Add or Deduct Alternate may be provided as indicated on the Bid form subject to the following conditions:

1.3.2.1 Alternate Bid shall include revised layout including details on supply / return air connections, piping connections, ventilation / exhaust connections, power / control wiring connections.

1.3.2.2 Alternate Bid shall include Full Disclosure (by paragraph and schedule) to be submitted to the engineer ten days prior to the bid and approved by the engineer in writing prior to the Bid. Full Disclosure shall clearly list and define any exceptions or deviations to the specified equipment and specified performance and any items which exceed the specifications. Manufacturer shall include a full disclosure of the unit's energy recovery features including unit's reheat capabilities.

1.3.2.3 Where the intent of the specification is met but with different construction materials or methods the difference shall be completely defined by paragraph in the Full Disclosure. The Full Disclosure shall include complete documented data.

Part 2 – PRODUCT

2.1 Principle of Operation

2.1.1 The unit shall control space temperature and relative humidity and shall provide controlled ventilation. Warm moist air is drawn over an evaporator; and the latent and sensible heat is removed from the air. The heat captured by this process and the heat generated from the compressor power consumption are absorbed by a mechanical refrigeration system. The resulting dryer, cooler air is drawn over a reheat condenser coil and auxiliary heating coil (if provided) by a supply fan. The code required amount of ventilation air is introduced into the dehumidified air after the evaporator and reheat condenser.

2.1.2 The refrigeration system is activated if any of the following occur:

a. Relative humidity rises above set point

b. Space temperature rises above the set point.

2.1.3 The unit shall monitor space temperature and relative humidity and building surface temperature.

2.1.4 The thermal energy absorbed by the refrigeration system is distributed as follows:

a. Maintaining the natatorium space temperature.

b. All remaining heat is then transferred to condenser as described in paragraph 2.14.5.

2.2 Construction

2.2.1 The cabinet shall be fabricated out of a minimum of 20 gauge G90 galvanized steel, painted after fabrication. The paint shall be an electrostatically applied polyamide epoxy powder coating, with a thickness of 2-3 mils, baked and bonded at 420°F until it forms a hard, textured surface.

2.2.2 Construction shall be modular, consisting of removable panels with permanently affixed fasteners. Base pans shall be formed out of a minimum of 16 gauge G90 galvanized steel with floor mounting support channels. The condensate drain pan under the evaporator shall be stainless steel. The compressor and controls shall be located in a compartment out of the air stream. Surfaces adjacent to the coil compartment shall be insulated with insulation to prevent condensation.

2.2.3 The unit shall be of horitonzal design. The supply air discharge shall be vertical, from the top of the unit cabinet for indoor installations, or the supply air discharge shall be of horizontal design or down design.

2.3 Outdoor Unit

2.3.1 The unit shall be able to be mounted in an outdoor location. The unit shall be weather proofed. The unit's condensate drain line and optional water-cooled condenser shall be insulated and wrapped with electrical heat tape and connected to an automatic thermostat. The thermostat shall activate the heat tape when the ambient temperature falls below 40°F, preventing the condensate, and water cooled condenser water from freezing inside the condenser(s) in the event of pump shutdown.

2.3.2 An outdoor air rainhood and bird screen shall be provided by the unit manufacturer. (Outside air option)

2.3.3 Hinged Access Doors shall be provided at the openings for Compressor, Electrical Panel, Blowers, Motors and Drives. Doors shall be double-wall, insulated, mounted on continous piano hinge, secured with latches and sealed against a rigid steel fram with hollow-bulb rubber gasket material.

2.4 Compressor

2.4.1 The compressor shall be a heavy-duty, fully hermetic, reciprocating or compliant scroll compressor operating at scheduled voltage, phase, and frequency.

2.4.2 The suction gas cooled compressor shall be equipped with thermal overload protection and a crankcase heater to prevent refrigerant migration to the compressor oil during shutdown.

2.5 Filter Rack and Filters

2.5.1 The dehumidification unit shall include a weather tight air filter section with a duct flange and access door for side loading of filters. The filters shall be Class II, one inch (standard) or two inch (optional), throw away.

2.6 Refrigerant

2.6.1 The refrigerant shall be R-22.

2.7 Fan

2.7.1 The fan shall be a forward-curved, centrifugal blower. The wheel shall be dynamically balanced and

installed on a steel shaft. The blower scroll and housing shall be constructed of cold-rolled steel, coated with an electrostatically applied acrylic enamel paint or G90 galvanized steel.

2.7.2 The fan shall operate at the scheduled supply air CFM, outside air CFM (if equipped with this option) and W.C. external static pressure (ESP).

2.8 Fan Motor

2.8.1 The class B winding fan motor shall be belt drive. The motor shall comply with the efficiency requirements of EPACT-92. The belt drive assembly shall include a single "A" or "B" section belt and an adjustable motor sheave or double "B" section belt and non-adjustable motor sheave depending upon motor horsepower for establishing the specified CFM. Single phase motors shall be capacitor start. The fan motor horsepower, voltage and frequency shall be as scheduled.

2.9 Evaporator (dehumidification) Coil

2.9.1 The coil shall be of adequate face area and rows to remove the specified amount of moisture from the air stream at specified conditions.

2.9.2 The evaporator coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be acrylic-coated for added corrosion protection. (Standard)

2.9.3 The evaporator coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.10 Air Condenser (air reheat) Coil

2.10.1 The coil shall be of sufficient size to reject the required amount of total heat.

2.10.2 The condenser coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be acrylic-coated for added corrosion protection. (Standard)

2.10.3 The condenser coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.11 Auxiliary Air Hot Water Coil (Optional)

2.11.1 The hot water coil shall be factory mounted after the air reheat condenser coil. The installing contractor shall install the control valve (by others) and pipe the hot water to the connections on the outside of the unit. The control device for the valve must be interlocked with the terminal strips in the unit.

2.11.2 Coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The fins shall be polyester-coated for added corrosion protection. (Standard)

2.11.3 Coil shall be constructed of copper fins mechanically bonded to copper tubes. (Optional)

2.12 TD-3000 Control Panel

2.12.1 The control panel shall have a 4 line, 20 character LCD display, LED annunciators, and a 15 button key pad. The controller main board shall have all set points and program information stored in nonvolatile memory for protection from power failure.

2.12.2 The control panel shall be wall or unit mounted. It shall be capable of being mounted up to 1000 feet from the unit. All internal circuit boards shall be conformal coated. The control panel shall be connected to the unit by standard six wire RJ25 phone cord. The control panel shall be capable of being directly connected to the unit for service convenience.

2.13.3 REMOTE ACCESS PACKAGE (RAP) (Optional) The dehumidifier shall be remotely monitored and controlled. All setpoints and monitoring functions listed in the CONTROL PANEL paragraph shall be remotely accessible. Remote monitoring and control shall be accomplished with a web server (by unit manufacturer) located in the dehumidifier's control panel. Web server shall contain a built in modem suitable for connection to a data quality telephone line. Web server shall also contain a built in 10/

100BaseT ethernet interface for direct connection to the facility's existing ethernet network. Unit shall be monitored and controlled using standard web browser software.

2.12.4 The controller shall be micro-processor based. The following set points shall be programmable at the panel:

2.12.3.1 Space Air Temperature

2.12.3.2 Space Relative Humidity

2.12.5 The following LCD readouts or annunciators shall be provided:

2.12.5.1 Power On

2.12.5.2 Space Air Temperature

2.12.5.3 Space Relative Humidity

2.12.5.4 Cold Surface Condensation Prevention Temperature

2.12.5.5 Outside Air Temperature (Optional)

2.12.5.6 Economizer Mode On/Off (Optional)

2.12.5.7 Compressor Circuit Fault

2.12.5.8 Unit in Air Heating Mode

2.12.5.9 Unit in Dehumidifying Mode

2.12.5.10 Unit in Air Conditioning Mode

2.12.5.11 Dehumidifying Mode Based on Cold Surface Temperature Status

2.12.5.12 Auxiliary Air Heating Coil On/Off

2.12.5.13 Service - Diagnostic Codes

2.13 Control Sensors

2.13.1 The unit shall be provided with the following factory mounted and wired control devices:

2.13.1.1 Space Dry Bulb Temperature Sensor (field wired with economizer option)

2.13.1.2 Space Relative Humidity Sensor (field wired with economizer option)

2.13.1.3 Defrost Controller

2.13.1.4 The unit shall be delivered with the following factory supplied sensors to be installed in the field: Cold Surface Condensation Prevention Temperature Sensor

2.13.1.5 Outside Air Dry Bulb Temperature (with economizer option)

2.13.2 An anti-cycle timer shall be provided in the unit control system to prevent short-cycling of the compressor.

2.13.3 Under normal conditions, the unit fan shall operate continuously, to provide air circulation within the pool enclosure.

2.13.4 The compressor shall not operate if the defrost thermostat set point has been reached. Evaporator coil defrost shall be accomplished by the flow of air drawn across the coil by the unit fan.

2.14 Sequence of Operation

2.14.1. Description

All operating and logic controls shall be factory mounted and wired in the unit. Control sequences shall be designed specifically to control swimming pool environmental conditions.

2.14.2. Humidity Control

When the humidity is above the set point the controller energizes the compressor and directs hot gas to the air reheat condenser or the auxiliary air cooling condenser, if so equipped.

2.14.3. Space Heating

When the compressor is running in the dehumidification mode the space temperature is below the set point, the recovered heat is directed to the air reheat condenser. If the space temperature drops more than 2°F below the set point, the auxiliary space heating system (by others) shall be activated by a dry contact closure from the controller. A further drop in space temperature will activate the second stage of auxiliary heat (if available).

2.14.4 Space Humidity Reset Control based on Cold Surface Temperature

When the temperature of the interior surface at the cold surface sensor drops to within 5ºF of the absolute humidity set point (dew point), the absolute humidity set point is offset downward. This condition causes the dehumidifier system to activate humidity control, lowering the space dew point and hindering the formation of condensate on the cold surfaces.

2.14.5 Air Conditioning (Optional [Select 2.14.5.1 or 2.14.5.2])

2.14.5.1 . Air Cooled Condenser

2.14.5.1.1 In order to achieve space cooling of the natatorium by the rejection of reclaimed heat, the dehumidifier shall be equipped with a properly sized remote air cooled condenser and shall automatically change over from heating to air conditioning as a function of dry bulb cooling demand in the natatorium. The sensible and latent heat recovered in air conditioning mode is rejected via an air cooled condenser if it is not needed for pool water heating.

2.14.5.1.2 The dehumidification unit shall include external gas and liquid connections to permit piping by the installing contractor to a remote air-cooled condenser provided by the unit manufacturer. The dehumidification unit's electrical panel shall have connections for the control of the condenser. The control voltage shall be 24 VAC.

2.14.5.1.3 The condenser shall have one or two head pressure controlled variable speed horsepower fan motor(s). The fan motor(s) shall be specifically designed for variable speed operation and have permanently lubricated ball bearings and an internal thermal overload. Fan blades shall be of the aluminum propeller blade type. Multiple fan units will be mounted on a common weatherized steel channel base and have common refrigerant and electrical connections. The fans shall be mounted on a close-mesh steel grill that has been vinyl coated for weather resistance. The condenser shall be of the vertical airflow type. The condenser fan and control wiring shall terminate in an electrical box integral with the cabinet. The condenser cabinet shall be zinc-coated steel covered with a high adhesive, baked on finish. The condenser coil shall be constructed of aluminum fins mechanically bonded to copper tubes. The condenser shall be shipped with a dry nitrogen holding charge.

2.14.5.2 Water Cooled Condenser

2.14.5.2.1 In order to achieve space cooling of the natatorium by the rejection of reclaimed heat, the dehumidifier shall be equipped with an auxiliary water cooled condenser and shall automatically change over from heating to air conditioning as a function of dry bulb cooling demand in the natatorium. The sensible and latent heat recovered in air conditioning mode is rejected to the auxiliary water cooled condenser if pool water temperature is satisfied. This condenser shall be factory-mounted and refrigerant-piped, non-cleanable, with a head pressure controlled water regulating valve.

2.14.5.2.2 The condensing water shall be noncorrosive and non-fouling with a temperature range of 45°F to 85°F. The condenser shall be a counterflow, helically wound, coaxial, tube-in-tube heat exchanger for maximum heat transfer from the refrigerant to the condensing water. The water tube shall be constructed of corrosion-resistant cupronickel. The water circuit connections shall be MPT. The heat exchanger shall be UL Listed or CSA Certified.

2.14.6 Outside Air (Optional)

2.14.6.1 The dehumidification unit casing shall include a manual locking damper with duct collar, to permit the introduction of up to 30% outside air to the inlet of the fan, downstream of the evaporator and reheat coil. Damper assembly shall be of heavy-duty construction, designed for industrial applications. The frame and opposing blades shall be fabricated of formed 16 gauge galvanized steel. The shaft shall be 1/2" plated steel hex.

2.14.6.2 The opening shall be on the unit's top.

2.14.6.3 The opening shall be on the unit's end (Indoor Installations only.

2.14.6.4 Preheating of outside air may be required for freeze protection and occupant comfort. An exhaust fan, with a capacity equal to or greater than the amount of outside air brought into the unit shall be furnished and installed by the installing contractor.

2.14.6.5 A duct mounted filter and filter rack shall be provided by the unit manufacturer (Indoor unit option only).

2.14.7 Economizer (Optional)

2.14.7.1 The economizer shall operate in the space cooling mode when there is no dehumidification requirement. When the outside air temperature is greater than 50°F and more than 5°F below the space temperature set point and the space temperature rises above the set point, the compressor shall be de-energized and a dry contact closure shall be made. Upon closure, outside and exhaust air dampers (by others) shall open and return air dampers (by others) shall close and the exhaust fan (by others) shall be energized. The outside air shall be ducted into the return air plenum (by others).

2.14.7.2 If the space temperature continues to rise and exceeds the space temperature set point by more than two degrees, the dry contact closure shall be opened, reversing the field installed damper positions and de-energizing the exhaust fan and the compressor shall be energized in the air conditioning mode (if so equipped). The compressor shall continue to run until the call for air conditioning is satisfied.

2.14.7.3 The economizer shall also be activated in the air conditioning mode if the auxiliary air conditioning condenser option is not installed or if the compressor is locked out by a fault condition.

2.14.8 Fire Trip

2.14.8.1 Upon receipt of a contact closure from a fire control system (by others) a fire trip cycle shall be initiated. Compressor and fan motor shall be de-energized. For units equipped with the optional economizer, the dry contact shall open causing the outside and exhaust air dampers to close and the return air damper to open.

2.15 Roof Curb

2.15.1 The roof curb shall be "island" design enclosing the entire bottom surface of the pool dehumidifier unit. It shall be minimum 18 gauge galvanized steel construction. 12 inches high, including a wood nailer, a counter flashing lip and one-quarter inch sponge rubber gasketing for all mating surfaces.

Part 3 – EXECUTION

3.1 Factory Test

3.1.1 Refrigeration and electrical system operation and specification conformance shall be verified by factory test prior to shipment.

3.2 Warranty

3.2.1 The unit shall be protected by a one year limited warranty covering parts and a limited 30 day warranty covering labor. The compressor shall be protected by an additional four year warranty covering parts only.

Refer to Warranty policy guidelines for details.

3.3 Start-up

3.3.1 All units shall be thoroughly cleaned by the installing contractor in accordance with the manufacturer's instructions prior to being placed into service.

3.3.2 Start-up service shall be provided in accordance with the equipment manufacturer's instructions and must include complete testing of all controls and unit operation. The agency responsible for start-up shall record the refrigeration pressures and electrical operating data. Copies of this data are to be supplied to the owner and manufacturer.

End of SECTION 15755

PERFORMANCE & ELECTRICAL DATA

AWH & HCDH 550

STANDARD OPERATING CONDITIONS

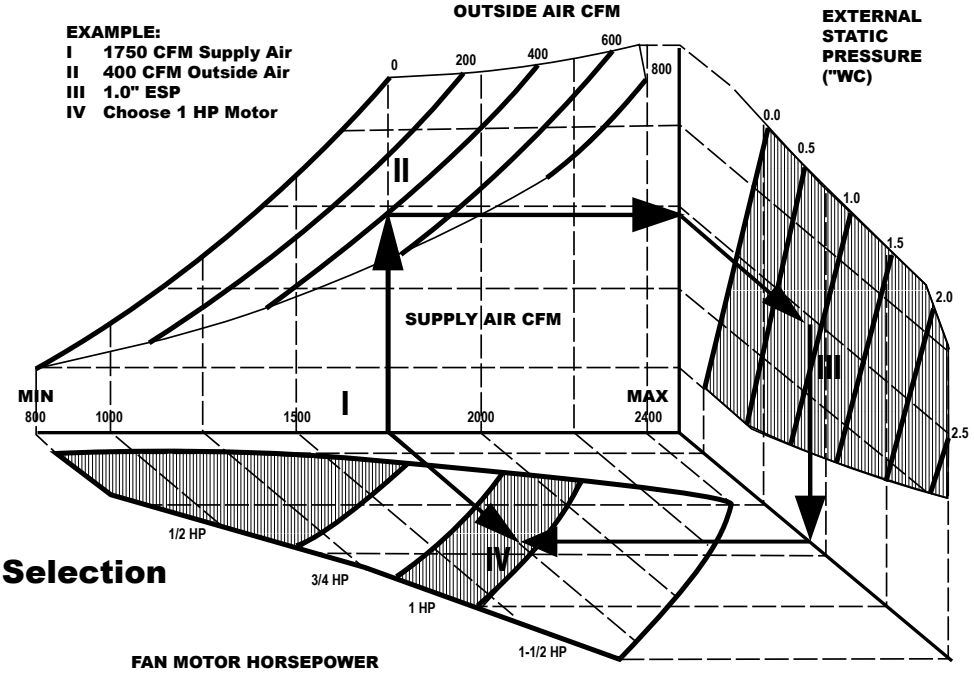
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	1,000	80°F	9.8	24772	14227	5938	29689
82°F	50%	1,000	80°F	7.6	23612	15434	5672	28360

208-230/1/60				
Fan Motor HP	½	¾	1	1.5
Fan Motor FLA	5.1	6.2	7.3	9.7
Compressor LRA	49			
Compressor RLA	10.4			
Minimum Circuit Ampacity	18	19	20	23
Maximum Circuit Protection	25			30
75°C Field Wire Size (AWG)	10			
Service Ground Size (AWG)	10			

Water Pressure Drop		Non-Vented	Vented
Pool Water Condenser*	GPM	4	4
	PD-ft.	5	6
Optional Water Condenser	GPM	4	-
	PD-ft.	10	-

Factory Refrigerant Charge		
W/Optional Air Cooled Condenser	10 lbs	15 oz
W/Optional Water Cooled Condenser	8 lbs	7 oz
Unit Weight		
Shipping – 510 lbs.	**Operating** – 470 lbs.	

Fan Motor Selection



* HCDH models do not have pool water heating capabilities.

AWH & HCDH 800

STANDARD OPERATING CONDITIONS

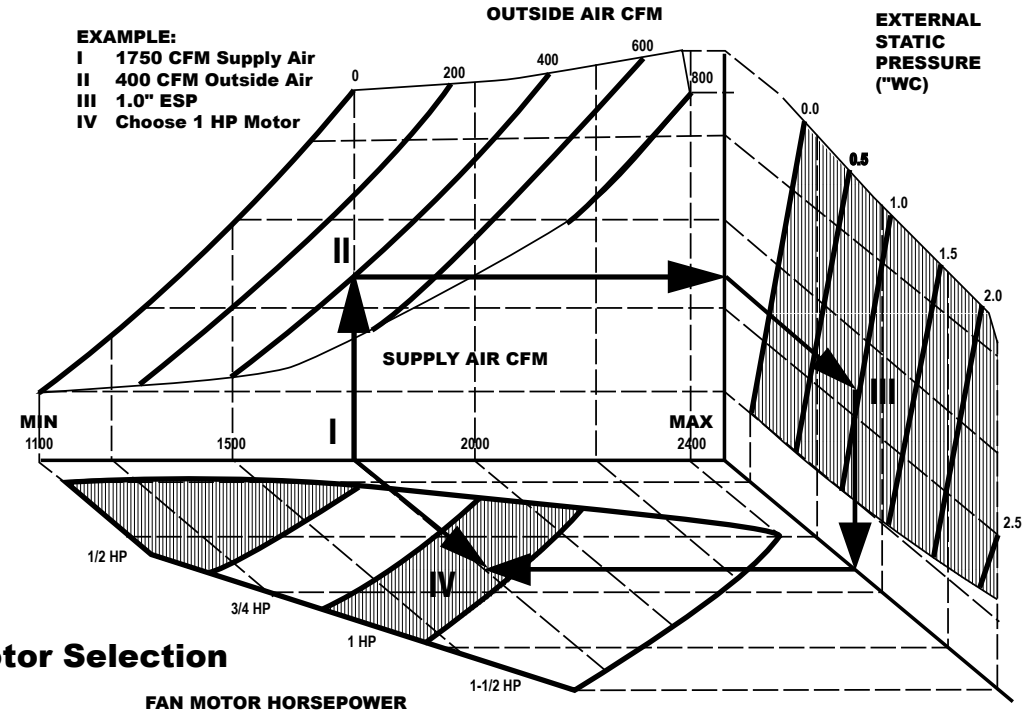
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	1,500	80°F	15.5	37607	20929	9201	46007
82°F	50%	1,500	80°F	12.3	35874	22639	8792	43961

	208-230/1/60				208-230/3/60				460/3/60				575/3/60			
Fan Motor HP	½	¾	1	1.5	½	¾	1	1.5	½	¾	1	1.5	½	¾	1	1.5
Fan Motor FLA	5.1	6.2	7.3	9.7	2.4	3.3	4.6	6.4	1.1	1.6	2.1	3	0.9	1.3	1.6	2.4
Compressor LRA	95				75				38				32			
Compressor RLA	16.7				10.6				5.3				3.9			
Minimum Circuit Ampacity	26	27	28	31	16	17	18	20	8	8	9	10	6			7
Maximum Circuit Protection	35			40	20		25		15				15			
75°C Field Wire Size (AWG)	8				12		10		14				14			
Service Ground Size (AWG)	10				12		10		14				14			

Water Pressure Drop		Non-Vented	Vented
Pool Water Condenser*	GPM	5	6
	PD-ft.	6	10
Optional Water Condenser	GPM	5	-
	PD-ft.	12	-

Factory Refrigerant Charge		
W/Optional Air Cooled Condenser	12 lbs	4 oz
W/Optional Water Cooled Condenser	9 lbs	6 oz
Unit Weight		
Shipping – 530 lbs.	**Operating** – 490 lbs.	

Fan Motor Selection



Contact factory if the desired condition is outside of any border.

* HCDH models do not have pool water heating capabilities.

AWH & HCDH 1200

STANDARD OPERATING CONDITIONS

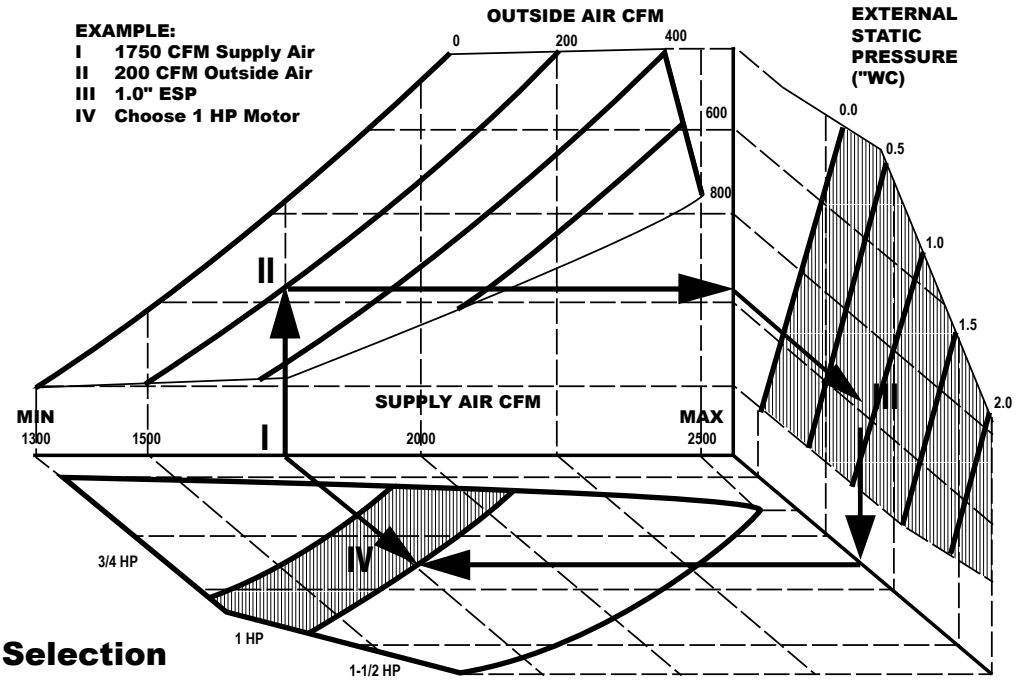
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	1,800	80°F	21.1	50066	27362	11949	59745
82°F	50%	1,800	80°F	16.7	47885	29916	11431	57157

	208-230/1/60			208-230/3/60			460/3/60			575/3/60		
Fan Motor HP	¾	1	1.5	¾	1	1.5	¾	1	1.5	¾	1	1.5
Fan Motor FLA	6.2	7.3	9.7	3.3	6.4	6.6	1.6	2.1	3.0	1.3	1.6	2.4
Compressor LRA	115			90			45			36		
Compressor RLA	20.5			13.1			6.7			5.7		
Minimum Circuit Ampacity	32	33	35	20	21	23	10		11	8	9	10
Maximum Circuit Protection	40	45		25	30		15			15		
75°C Field Wire Size (AWG)	8			10			14			14		
Service Ground Size (AWG)	10			10			14			14		

WATER PRESSURE DROP		NON-VENTED	VENTED
Pool Water Condenser*	**GPM**	8	10
	PD-ft.	14	24
Optional Water Condenser	**GPM**	8	-
	PD-ft.	25	-

FACTORY REFRIGERANT CHARGE		
W/Optional Air Cooled Condenser	15 lbs	2 oz
W/Optional Water Cooled Condenser	12 lbs	8 oz
UNIT WEIGHT		
Shipping – 570 lbs.	**Operating** – 530 lbs.	

Fan Motor Selection



Contact factory if the desired condition is outside of any border.

AWH & HCDH 1400

STANDARD OPERATING CONDITIONS

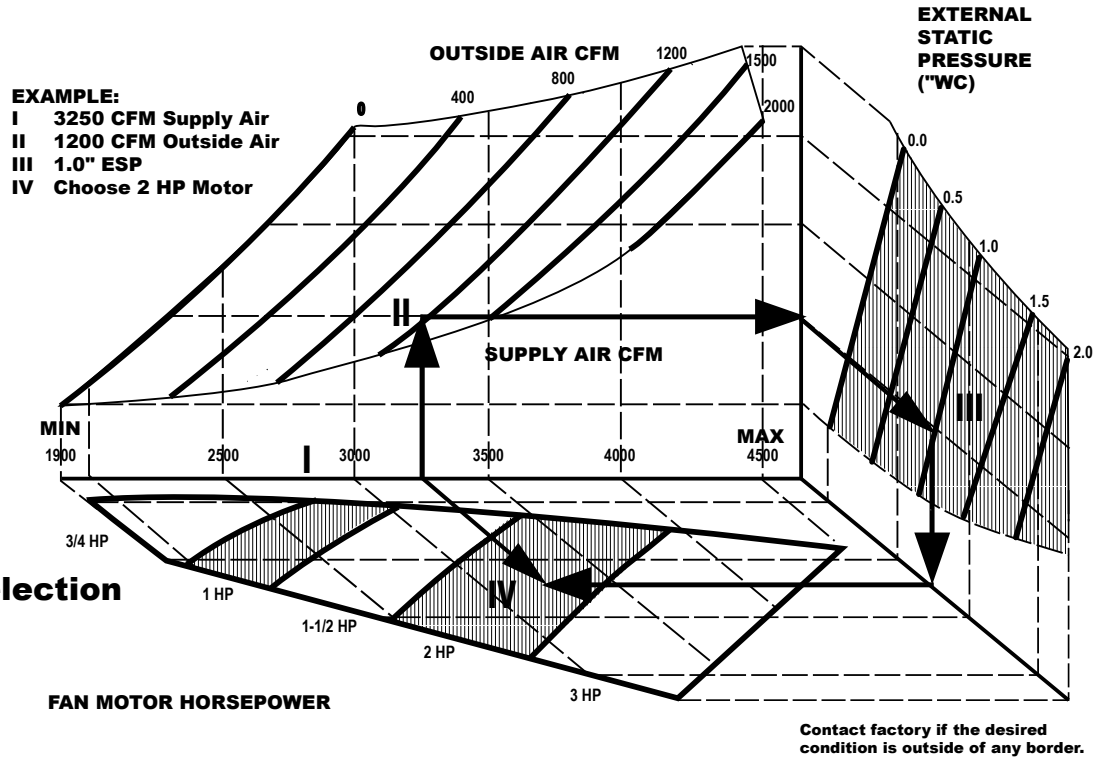
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	2,100	80°F	26.7	65187	36458	15668	78342
82°F	50%	2,100	80°F	20.1	62746	41118	15091	75454

	208-230/1/60					208-230/3/60					460/3/60					575/3/60				
Fan Motor HP	¾	1	1.5	2	3	¾	1	1.5	2	3	¾	1	1.5	2	3	¾	1	1.5	2	3
Fan Motor FLA	6.2	7.3	9.7	11.8	18.7	3.3	4.6	6.4	7.0	9.5	1.6	2.1	3	3.3	4.3	1.3	1.6	2.4	2.7	3.6
Compressor LRA	165					125					67					50				
Compressor RLA	28.9					16.0					8.2					5.8				
Minimum Circuit Ampacity	42	43	46	48	55	23	25	26	27	30	12	13	14	15		9	9	10	11	
Maximum Circuit Protection	60				70	30		35		40	15		20			15				
75°C Field Wire Size (AWG)	8				6	10		8			14		12			14				
Service Ground Size (AWG)	10				8	10					14		12			14				

Water Pressure Drop		Non-Vented	Vented
Pool Water Condenser*	GPM	8	10
	PD-ft.	5	8
Optional Water Condenser	GPM	8	-
	PD-ft.	10	-

Factory Refrigerant Charge		
W/Optional Air Cooled Condenser	27 lbs	0 oz
W/Optional Water Cooled Condenser	20 lbs	2 oz
Unit Weight		
Shipping – 710 lbs.	**Operating** – 650 lbs.	

Fan Motor Selection



Contact factory if the desired condition is outside of any border.

AWH & HCDH 1800

STANDARD OPERATING CONDITIONS

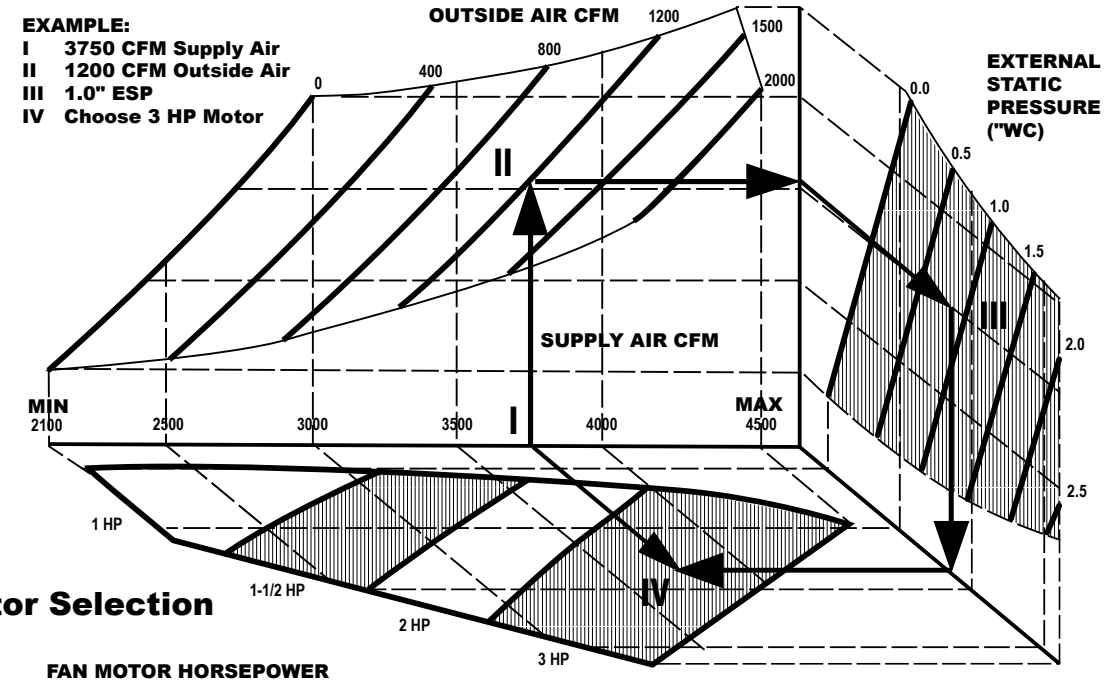
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	2,400	80°F	31.4	75071	41285	18061	90305
82°F	50%	2,400	80°F	25.0	72323	45423	17388	86938

	208-230/1/60				208-230/3/60				460/3/60				575/3/60			
Fan Motor HP	1	1.5	2	3	1	1.5	2	3	1	1.5	2	3	1	1.5	2	3
Fan Motor FLA	7.3	9.7	11.8	18.7	4.6	6.4	7.0	9.5	2.1	3	3.3	4.3	1.6	2.4	2.7	3.6
Compressor LRA	165				146				73				60			
Compressor RLA	34.3				21.4				9.6				7.9			
Minimum Circuit Ampacity	50	53	55	62	31	33	34	36	14	15		16	11	12	13	
Maximum Circuit Protection	60	70		80	40	45			20				15			20
75°C Field Wire Size (AWG)	8	6			8				12				14			12
Service Ground Size (AWG)	10	8			10				12				14			12

WATER PRESSURE DROP		NON-VENTED	VENTED
Pool Water Condenser*	GPM	10	12
	PD-ft.	8	12
Optional Water Condenser	GPM	10	-
	PD-ft.	15	-

FACTORY REFRIGERANT CHARGE		
W/Optional Air Cooled Condenser	28 lbs	4 oz
W/Optional Water Cooled Condenser	21 lbs	15 oz
UNIT WEIGHT		
Shipping – 720 lbs.	**Operating** – 660 lbs.	

Fan Motor Selection



Contact factory if the desired condition is outside of any border.

* HCDH models do not have pool water heating capabilities.

AWH & HCDH 2600L & 2600S

STANDARD OPERATING CONDITIONS

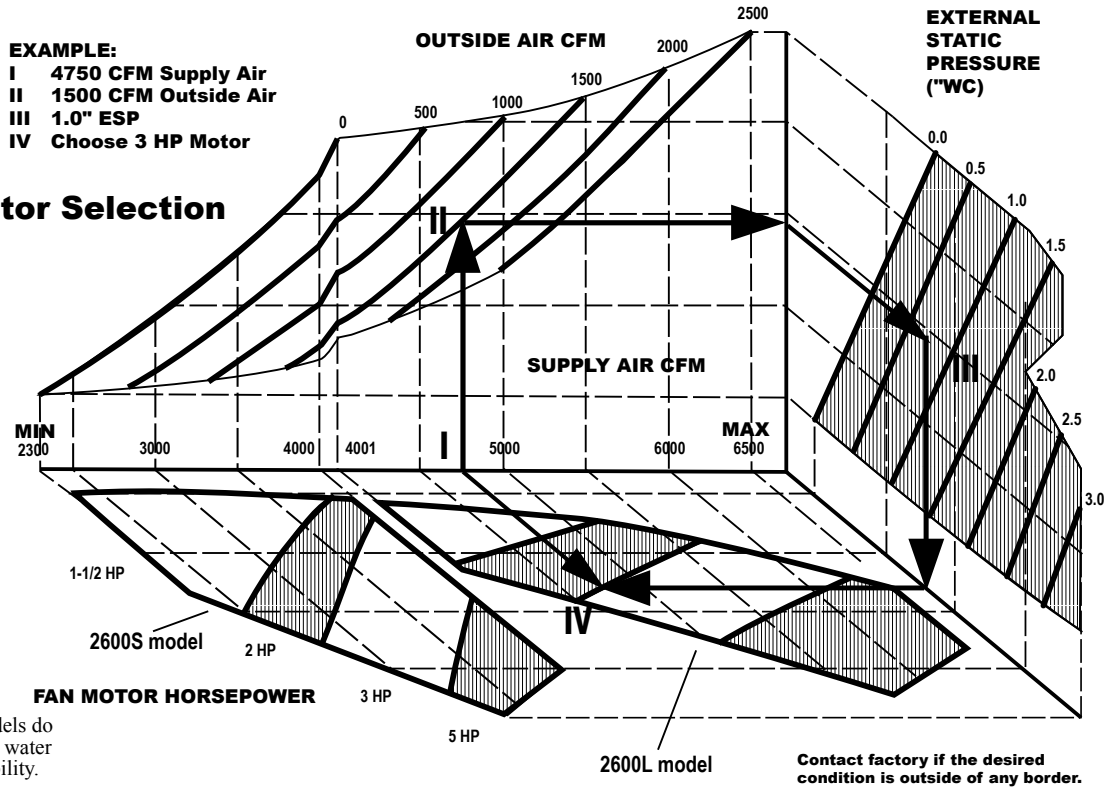
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	3,400	80°F	45.2	108085	59450	25915	129577
82°F	50%	3,400	80°F	35.9	103253	64625	24770	123848

	208-230/3/60				460/3/60				575/3/60			
Fan Motor HP	1.5	2	3	5	1.5	2	3	5	1.5	2	3	5
Fan Motor FLA	6.4	7.0	9.5	14.8	3	3.3	4.3	6.7	2.4	2.7	3.6	5.2
Compressor LRA	195				95				80			
Compressor RLA	32.1				16.4				12			
Minimum Circuit Ampacity	47		50	55	24		25	27	17	18	19	21
Maximum Circuit Protection	60			70	30			35	25			
75°C Field Wire Size (AWG)	8			6	10			8	10			
Service Ground Size (AWG)	10			8	10				10			

WATER PRESSURE DROP		NON-VENTED	VENTED
Pool Water Condenser*	GPM	13	16
	PD-ft.	6	8
Optional Water Condenser	GPM	13	-
	PD-ft.	12	-

FACTORY REFRIGERANT CHARGE		
W/Optional Air Cooled Condenser	24 lbs	0 oz
W/Optional Water Cooled Condenser	23 lbs	5 oz
UNIT WEIGHT		
Shipping – 1590 lbs.	**Operating** – 1460 lbs.	

Fan Motor Selection



* HCDH models do not have pool water heating capability.

AWH & HCDH 3500

STANDARD OPERATING CONDITIONS

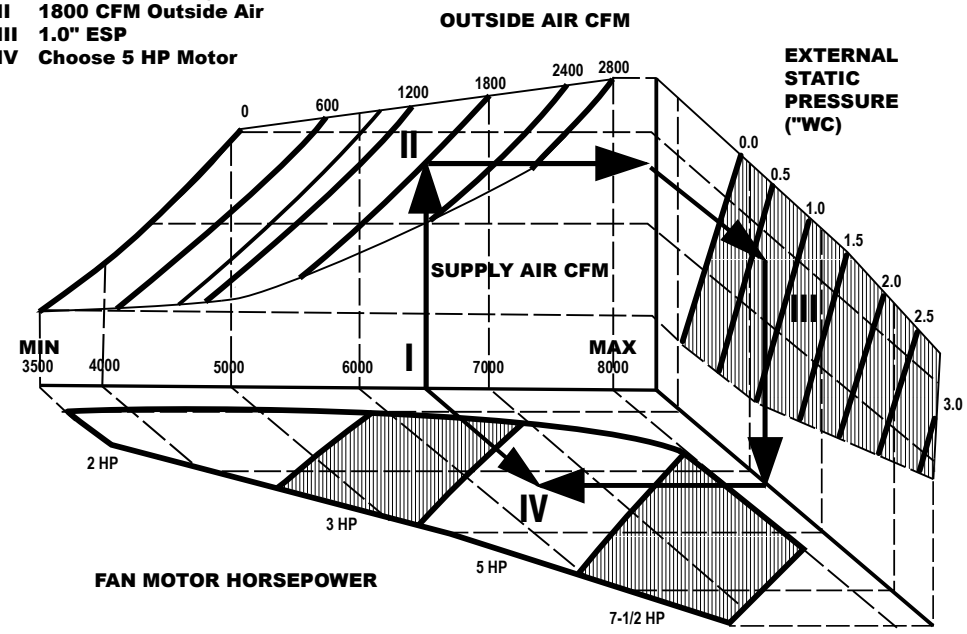
Return Air			Return Pool Water Temp.	Moisture Removal (lbs/hr)	Total Cooling Capacity (BTUH)	Sensible Cooling Capacity (BTUH)	Water Heating Capacity (BTUH)*	Optional AC Condenser Max Heat Rejection (BTUH)
Temp.	RH	CFM						
82°F	60%	4,400	80°F	59.9	136965	72513	32806	164031
82°F	50%	4,400	80°F	46.9	131158	80694	31410	157051

	208-230/3/60				460/3/60				575/3/60			
Fan Motor HP	2	3	5	7.5	2	3	5	7.5	2	3	5	7.5
Fan Motor FLA	7	9.5	14.8	22	3.3	4.3	6.7	10	2.7	3.6	5.7	8.0
Compressor LRA	264				130				103			
Compressor RLA	42				19.2				14.1			
Minimum Circuit Ampacity	60	62	67	75	27	28	31	34	20	21	23	26
Maximum Circuit Protection	80		90	100	35	40		45	25	30		
75°C Field Wire Size (AWG)	6		4		8				10			
Service Ground Size (AWG)	8				10				10			

Water Pressure Drop		Non-Vented	Vented
Pool Water Condenser*	GPM	22	24
	PD-ft.	12	17
Optional Water Condenser	GPM	22	-
	PD-ft.	26	-

Factory Refrigerant Charge		
W/Optional Air Cooled Condenser	38 lbs	14 oz
W/Optional Water Cooled Condenser	39 lbs	11 oz
Unit Weight		
Shipping – 1660 lbs.	**Operating** – 1530 lbs.	

EXAMPLE:
I 6500 CFM Supply Air
II 1800 CFM Outside Air
III 1.0" ESP
IV Choose 5 HP Motor

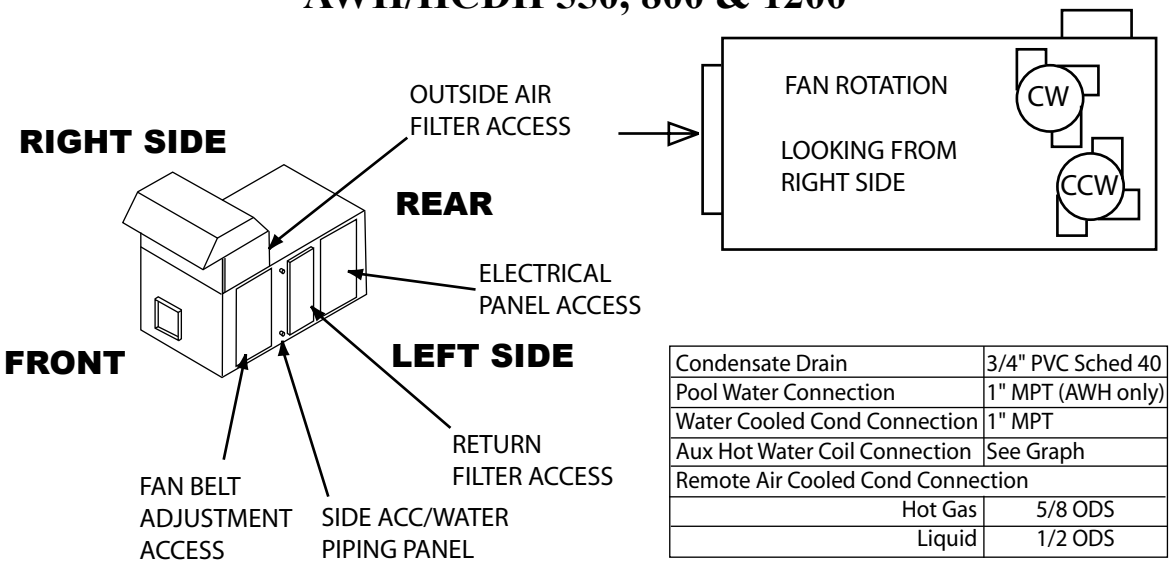


Fan Motor Selection

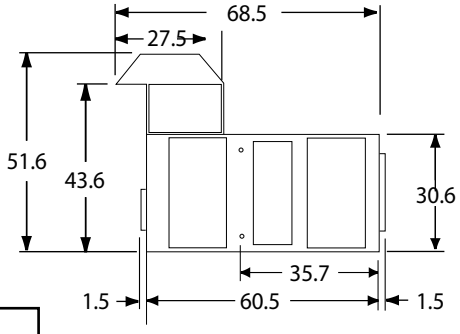
Contact factory if the desired condition is outside of any border.

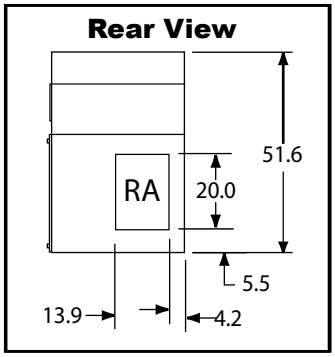
UNIT DIMENSIONS

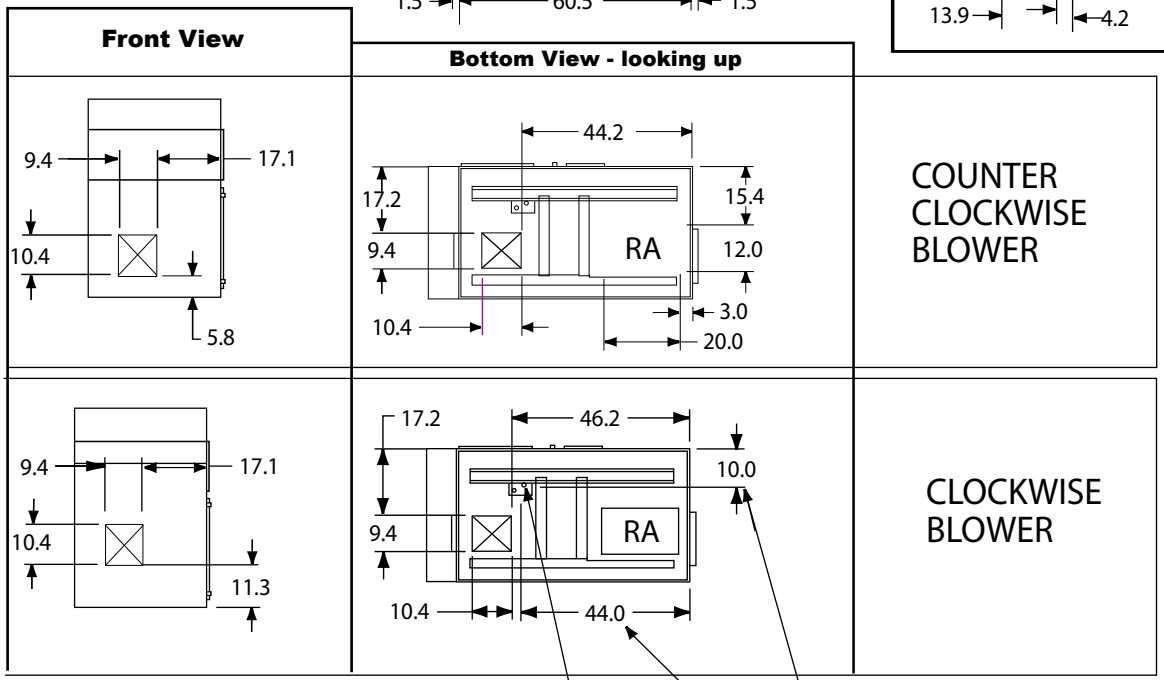
OUTDOOR UNIT
AWH/HCDH 550, 800 & 1200



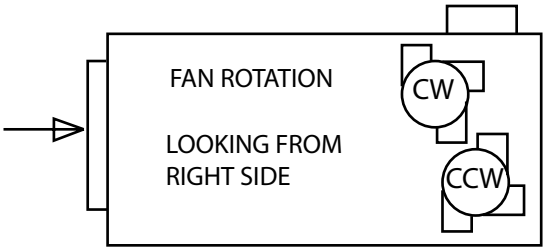
Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	5/8 ODS
Liquid	1/2 ODS





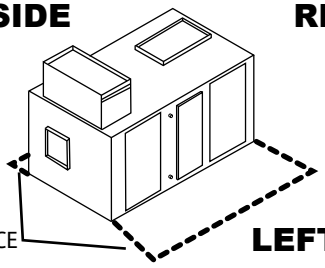


INDOOR UNIT
AWH/HCDH 550, 800 & 1200



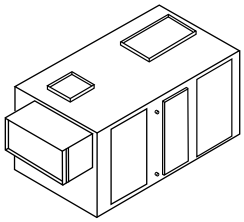
Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	5/8 ODS
Liquid	1/8 ODS

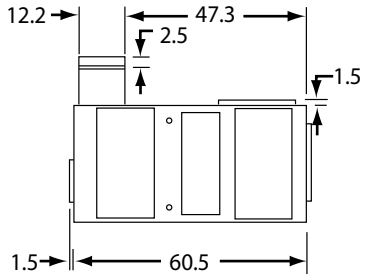
RIGHT SIDE **REAR**



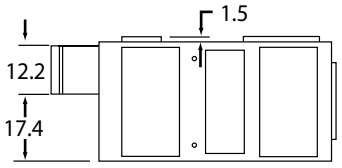
FRONT
MIN CLEARANCE
3 FT LEFT SIDE
1 FT RIGHT SIDE

LEFT SIDE

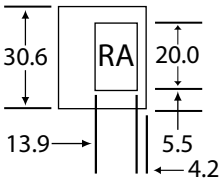


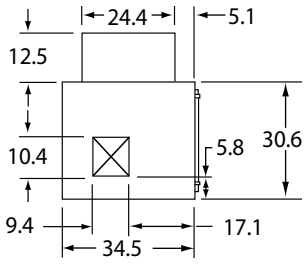
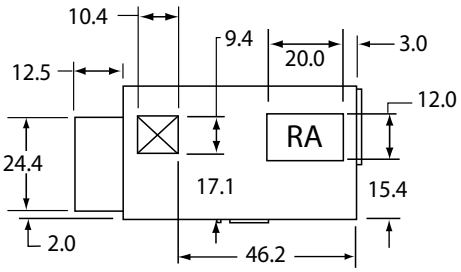
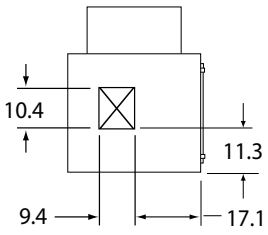
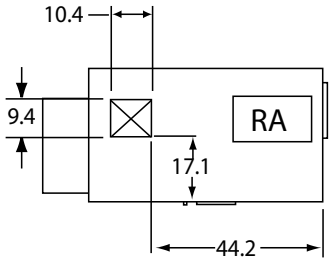


Left Side View

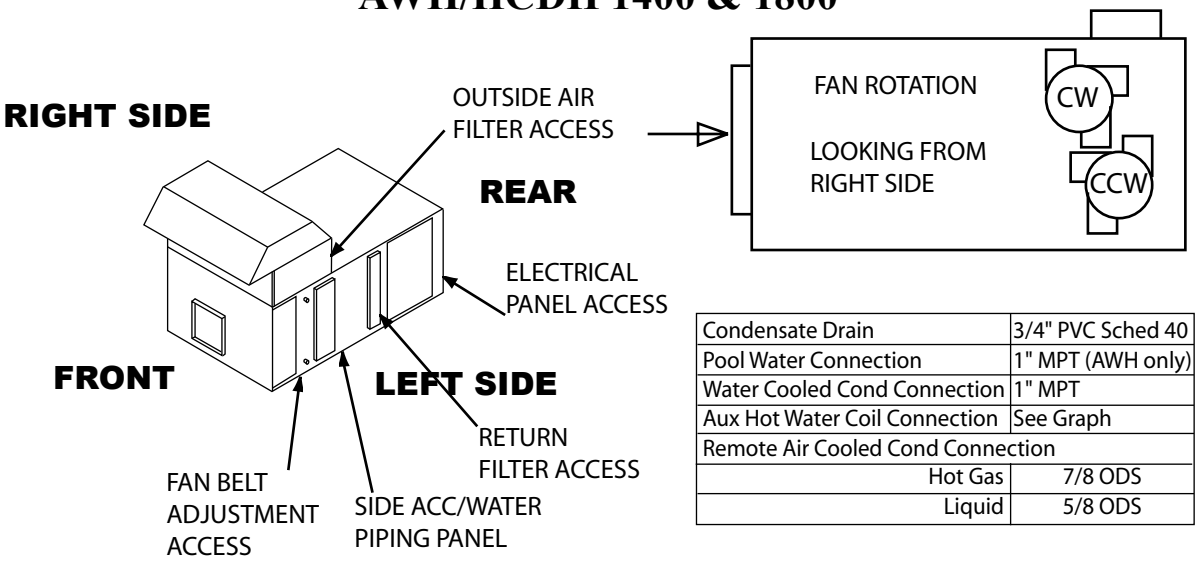


Rear View

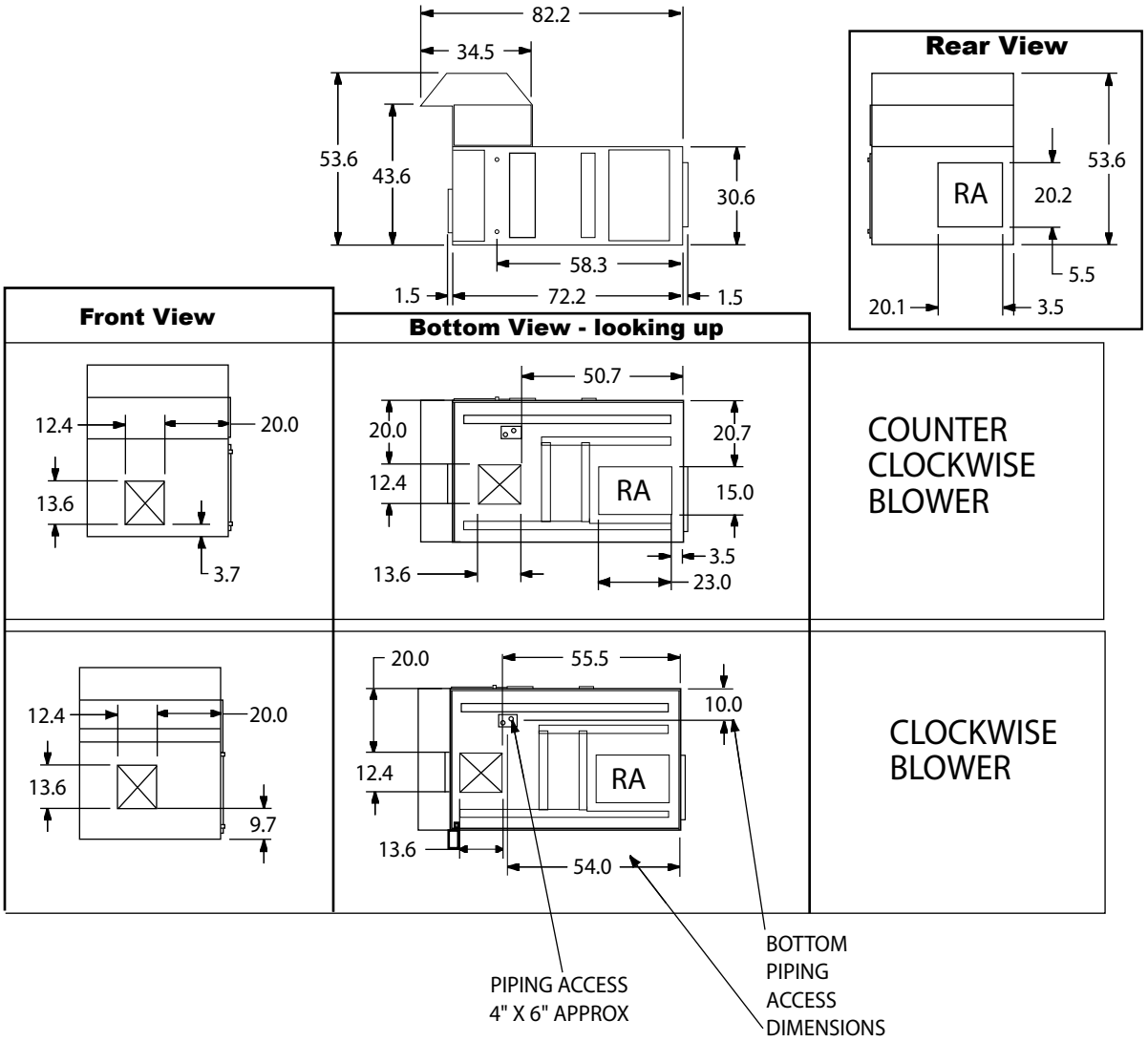


Front View	Top View	
		**COUNTER CLOCKWISE BLOWER**
		**CLOCKWISE BLOWER**

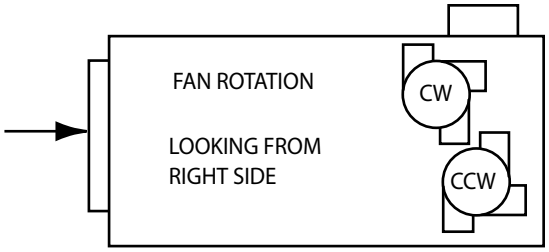
OUTDOOR UNIT
AWH/HCDH 1400 & 1800



Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	7/8 ODS
Liquid	5/8 ODS



INDOOR UNIT
AWH/HCDH 1400 & 1800



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Remote Air Cooled Cond Connection	
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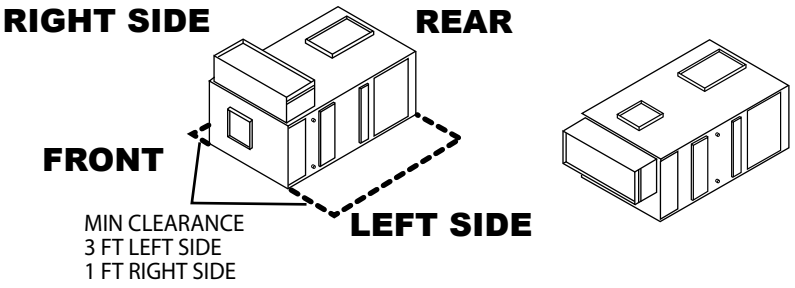
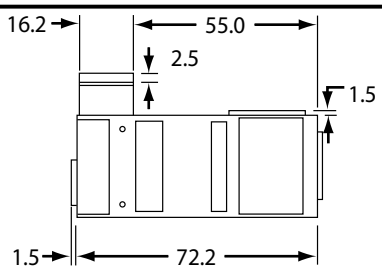
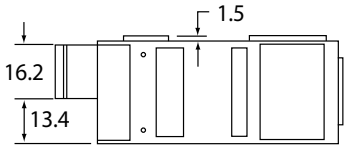
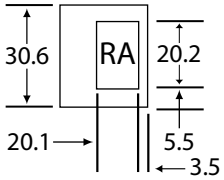




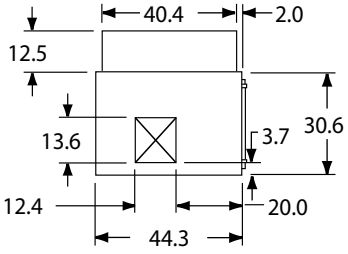
Left Side View



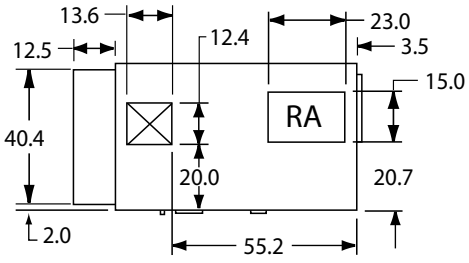
Rear View



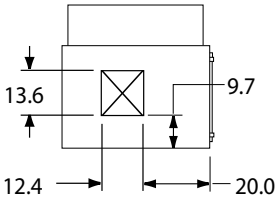
Front View

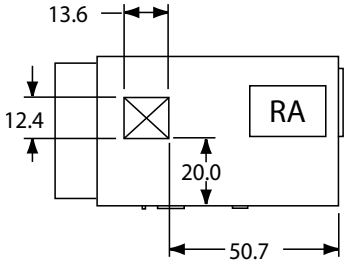


Top View



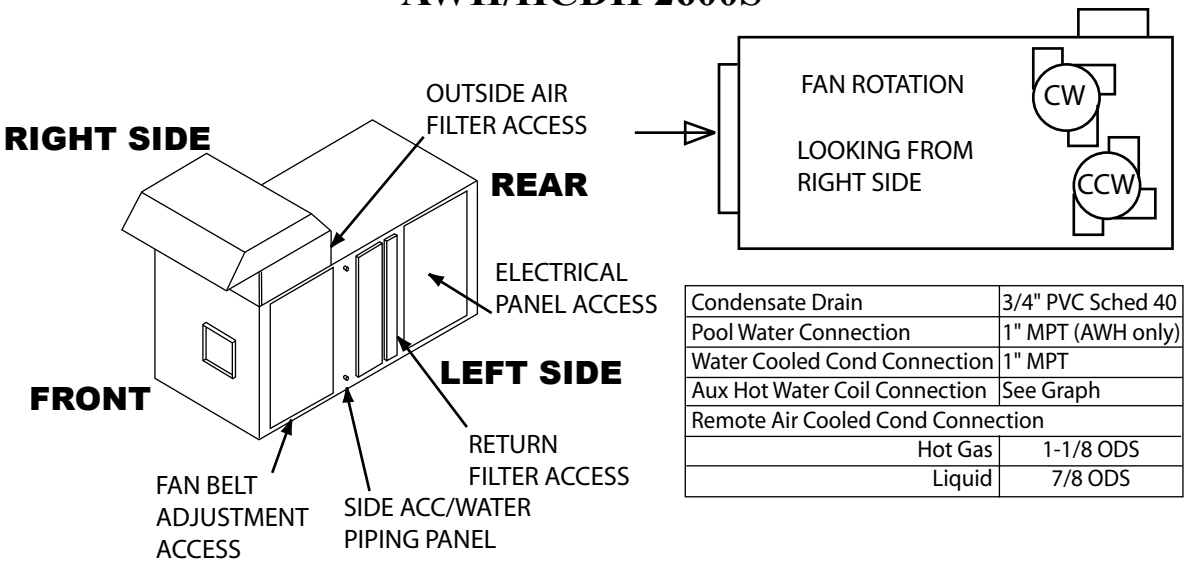
COUNTER CLOCKWISE BLOWER



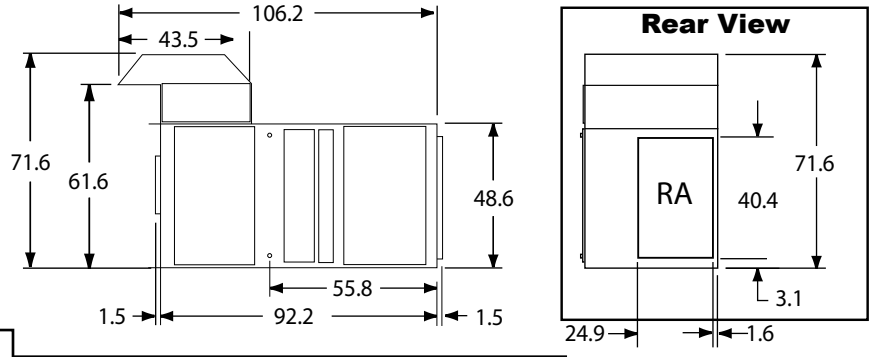


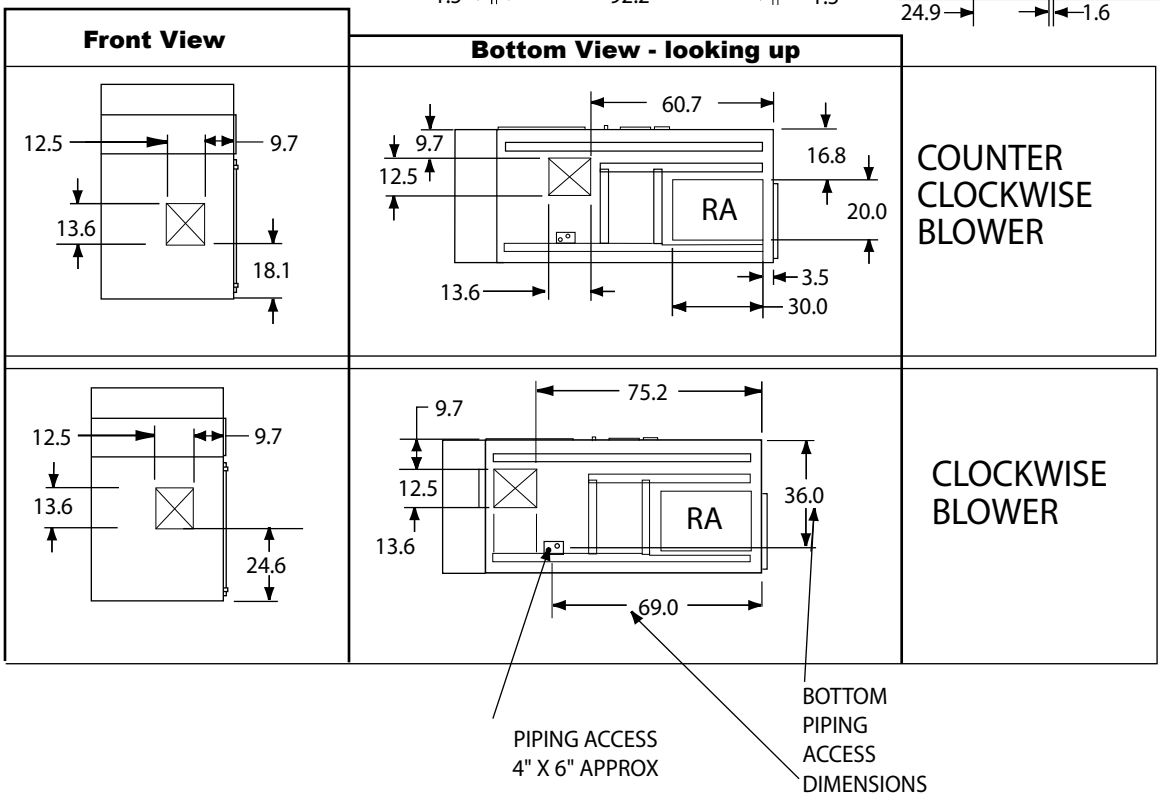
CLOCKWISE BLOWER

OUTDOOR UNIT
AWH/HCDH 2600S

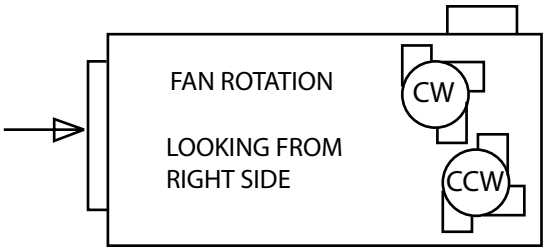


Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	1-1/8 ODS
Liquid	7/8 ODS





INDOOR UNIT
AWH/HCDH 2600S



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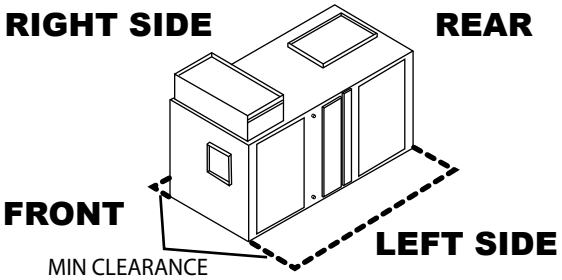
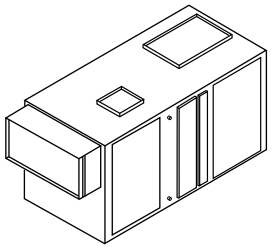
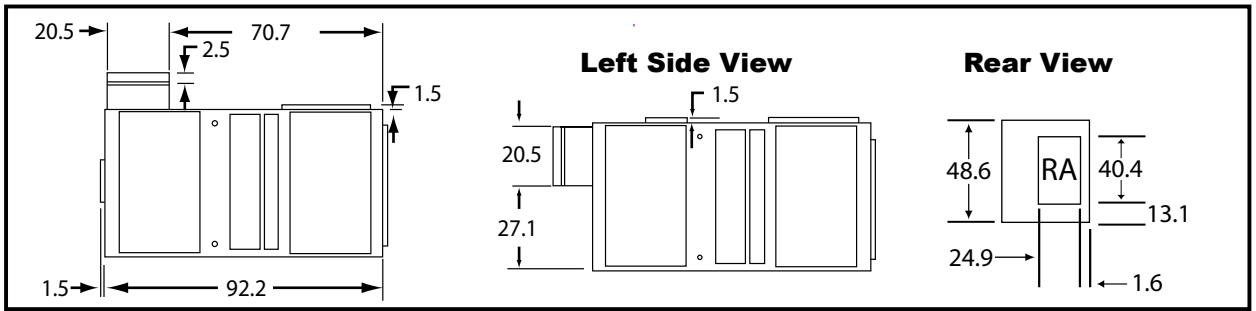
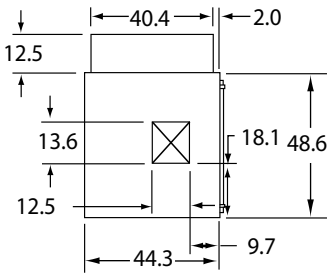
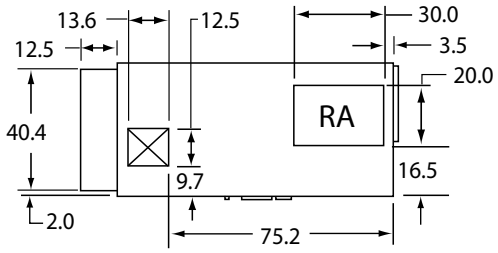
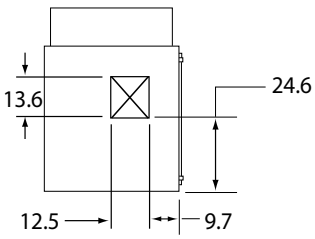
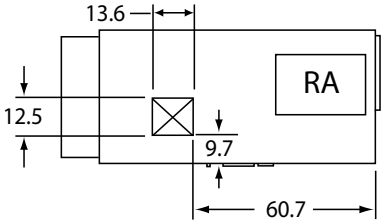
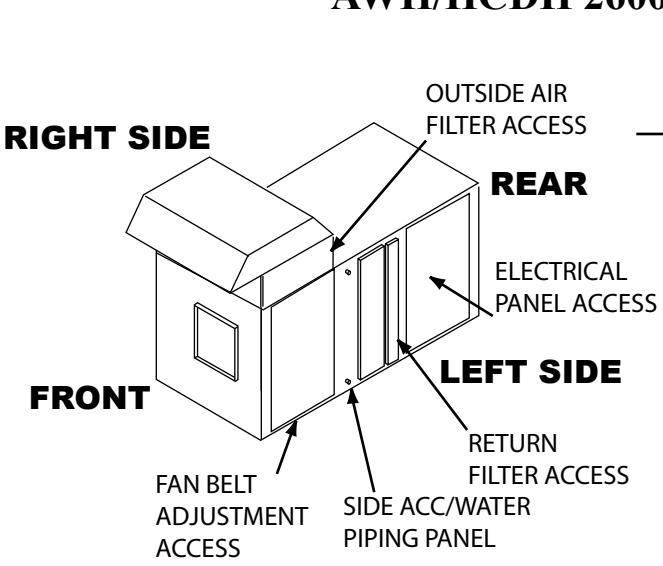


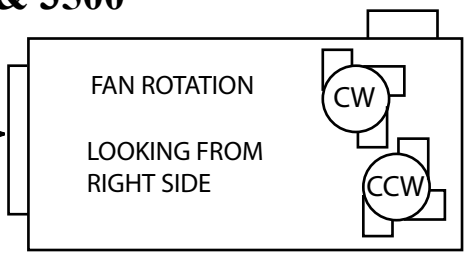




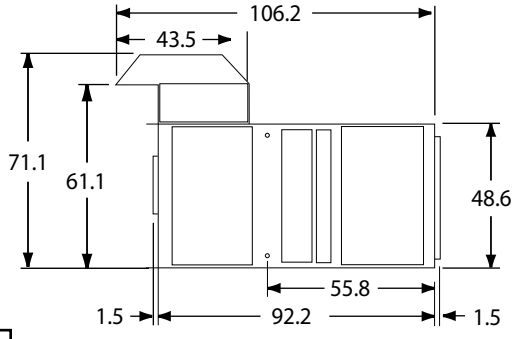
Front View	Top View	
		**COUNTER CLOCKWISE BLOWER**
		**CLOCKWISE BLOWER**

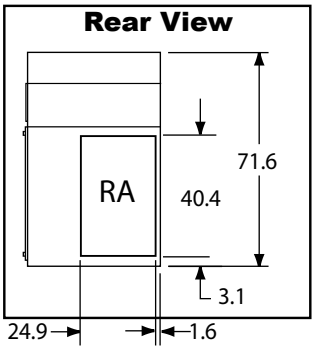
OUTDOOR UNIT
AWH/HCDH 2600L & 3500

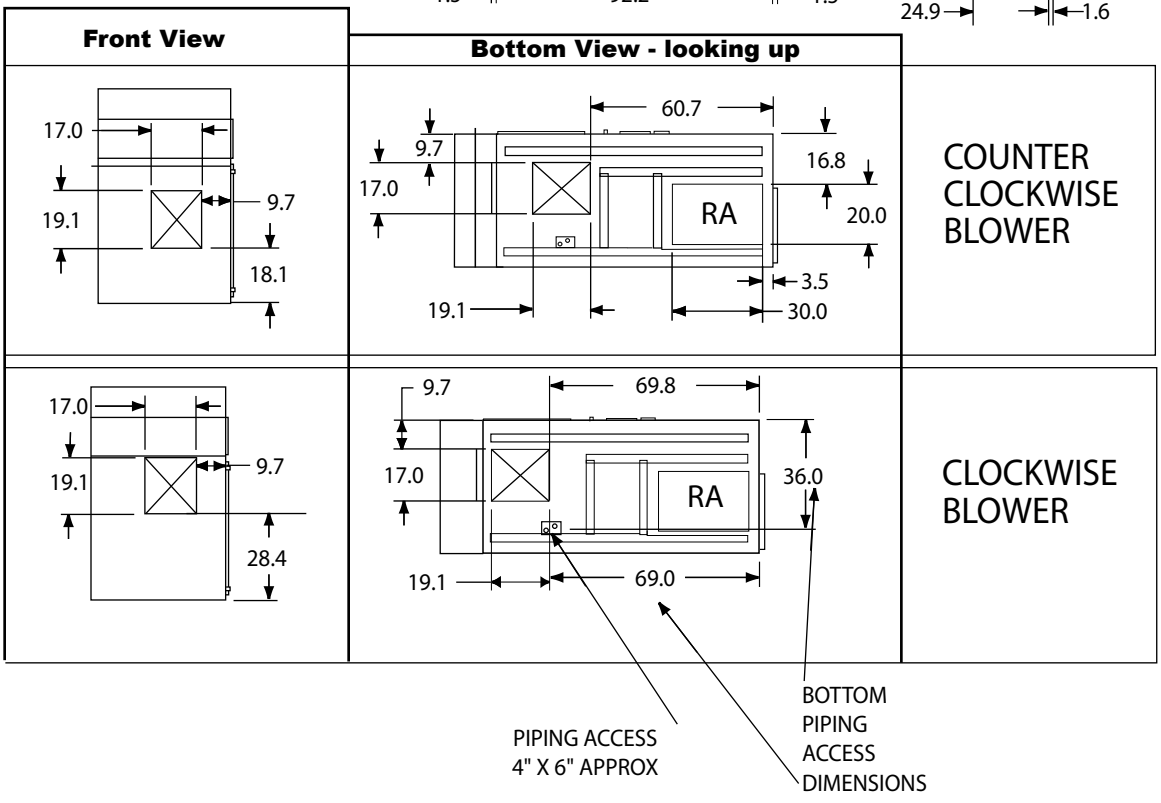




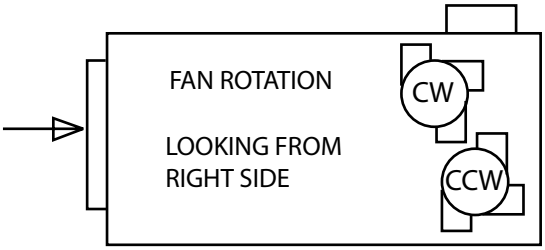
Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	1-1/8 ODS
Liquid	7/8 ODS



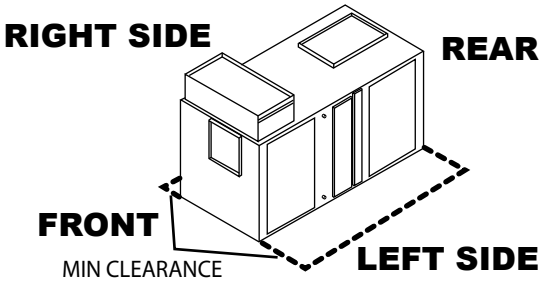




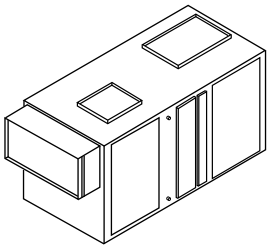
INDOOR UNIT
AWH/HCDH 2600L & 3500

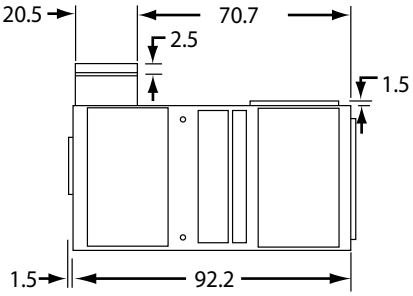


Condensate Drain	3/4" PVC Sched 40
Pool Water Connection	1" MPT (AWH only)
Water Cooled Cond Connection	1" MPT
Aux Hot Water Coil Connection	See Graph
Remote Air Cooled Cond Connection	
Hot Gas	1-1/8 ODS
Liquid	7/8 ODS

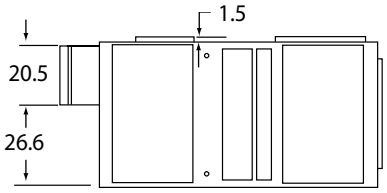


MIN CLEARANCE
3 FT LEFT SIDE
1 FT RIGHT SIDE

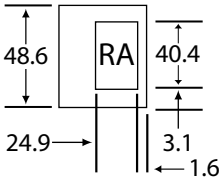


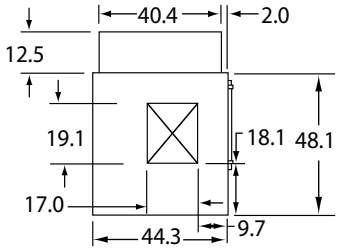
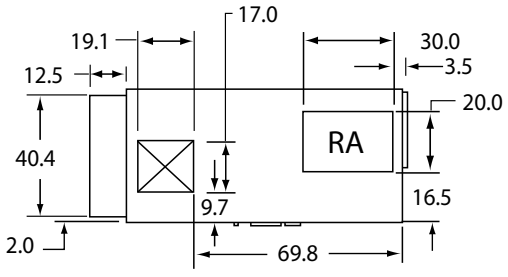
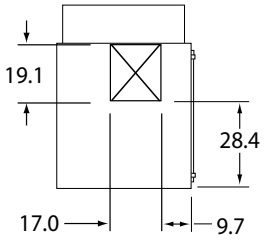
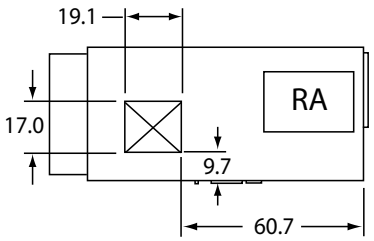


Left Side View

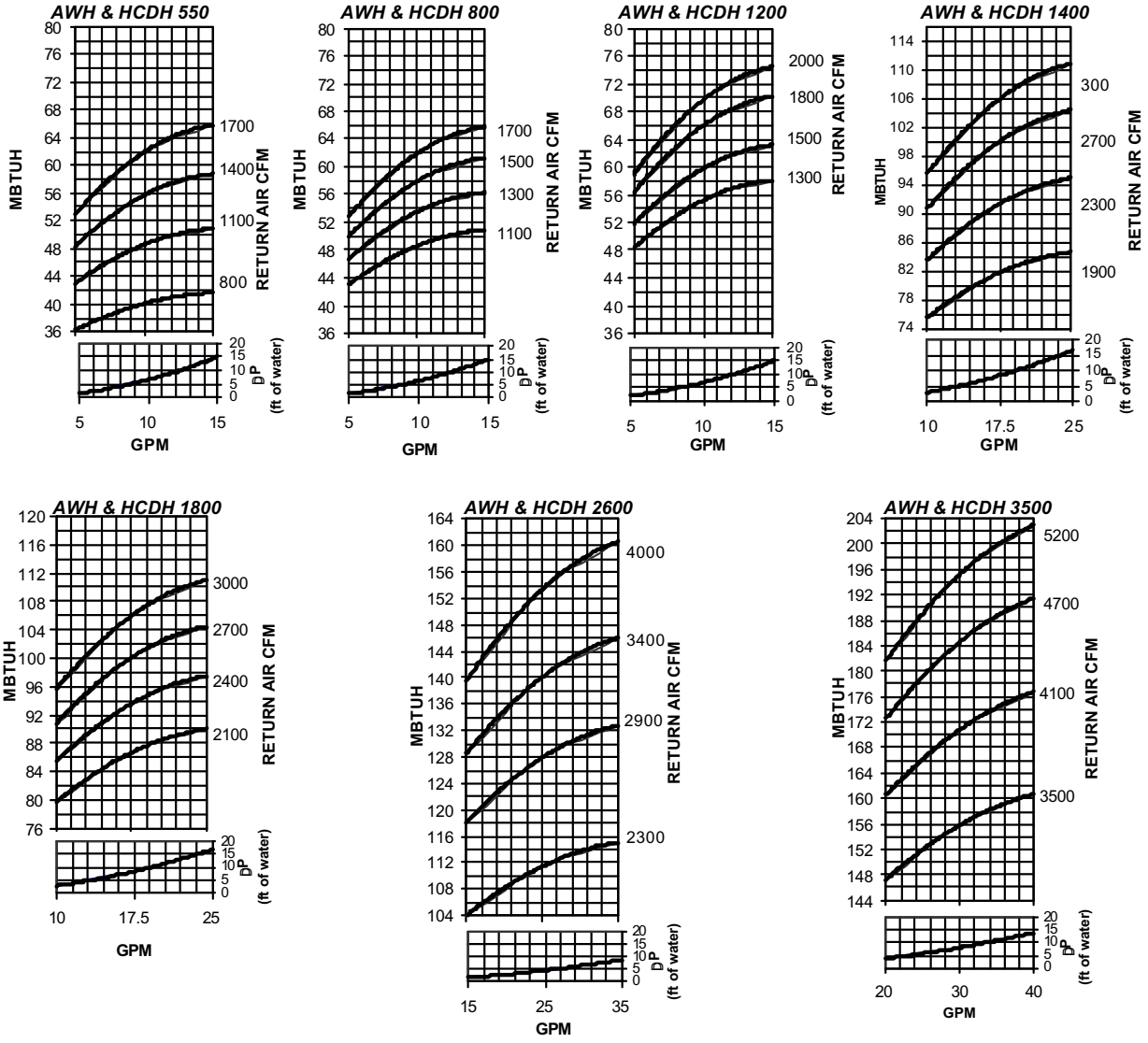


Rear View



Front View	Top View	
		**COUNTER CLOCKWISE BLOWER**
		**CLOCKWISE BLOWER**

ONE ROW HOT WATER COIL CAPACITIES



NOTE:

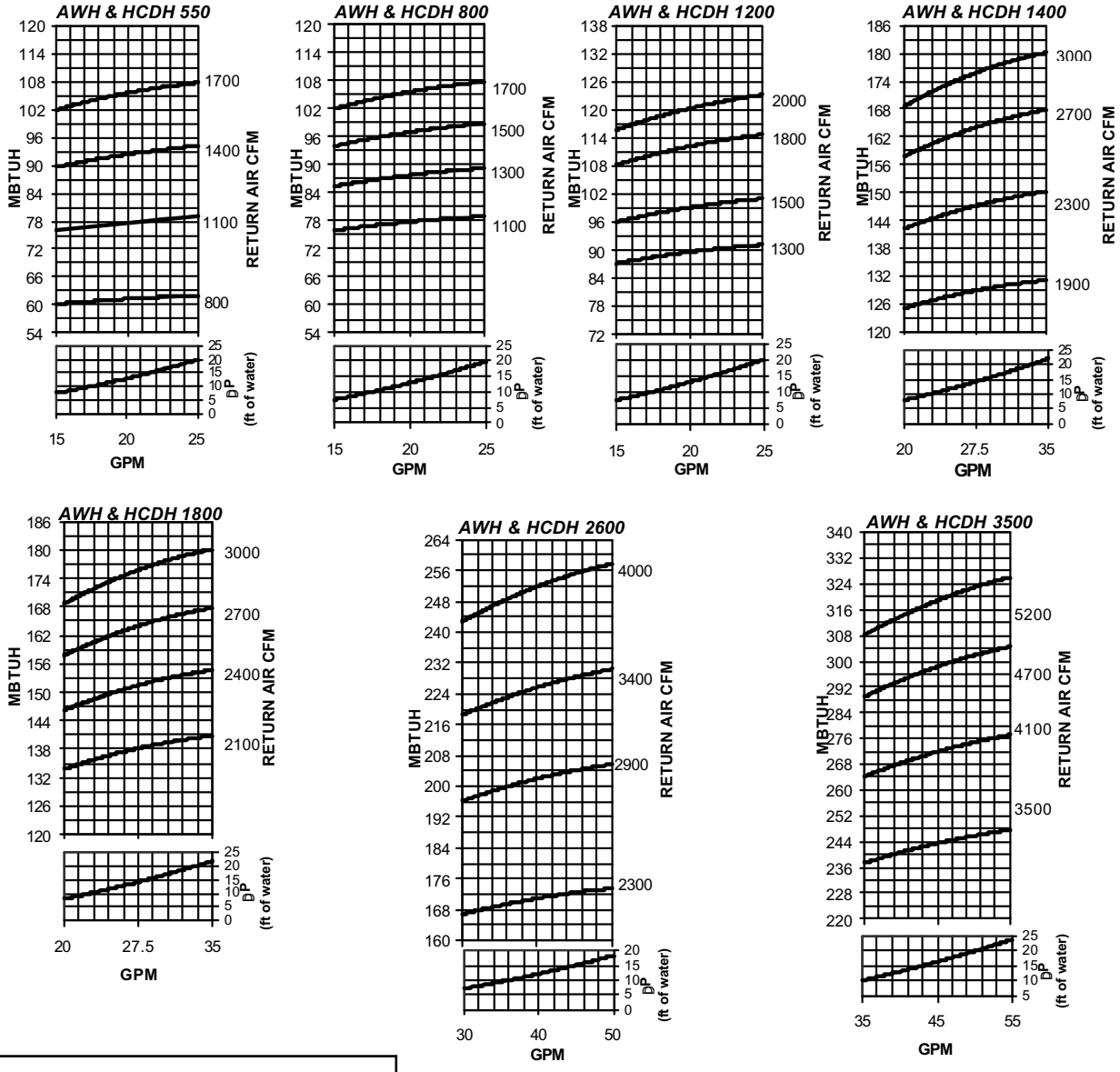
Coils add 0.1”WC to ESP

Entering Air Temperature - 80°F

Entering Water Temperature - 180°F

Max. Working Pressure - 125 psi

TWO ROW HOT WATER COIL CAPACITIES



NOTE:

Coils add 0.2”WC to ESP

Entering Air Temperature - 80°F

Entering Water Temperature - 180°F

Max. Working Pressure - 125 psi

ELECTRICAL DUCT HEATER

- TUBULAR, SHEATHED ELEMENTS.
- GALVANIZED STEEL CABINET.
- DUCT-MOUNTED, FLANGED TYPE.
- AIRFLOW IN EITHER DIRECTION.
- UL AND CSA APPROVED HEATER.
- AIRFLOW PROVING SWITCH.
- AUTO AND MANUAL RESET, HIGH TEMPERTURE LIMITS.
- MAGNETIC CONTACTORS.
- 24 VOLT CONTROL CIRCUIT AND TRANSFORMER.
- STANDARD HEATER FOR INDOOR INSTALLATION IN UNINSULATED DUCT
- OPTIONAL-OUTDOOR INSTALLATION

VOLTS/FREQ/HZ	DUCT SIZE 12" x 12"	DUCT SIZE 15" x 15"	DUCT SIZE 20" x 20"	DUCT SIZE 28" x 28"
208/60/1 OR 230/60/1	5KW-1STG	10KW-2STG	20KW-1STG	- - -
	10KW-2STG	15KW-2STG	30KW-1STG	- - -
	- - -	15KW-2STG	30KW-2STG	- - -
	- - -	20KW-2STG	40KW-2STG	- - -
208/60/3 OR 230/60/3	5KW-1STG	10KW-1STG	20KW-1STG	30KW-1STG
	10KW-2STG	15KW-1STG	30KW-1STG	45KW-1STG
	- - -	15KW-2STG	30KW-2STG	45KW-2STG
	- - -	20KW-2STG	40KW-2STG	60KW-2STG
460/60/3 OR 575/60/3	5KW-1STG	10KW-1STG	20KW-1STG	30KW-1STG
	10KW-2STG	15KW-1STG	30KW-1STG	45KW-1STG
	- - -	15KW-2STG	30KW-2STG	45KW-2STG
	- - -	20KW-2STG	40KW-2STG	60KW-2STG

DUCT HEATER INSTALLATION

1. Flange both ends of the ducts outwards on three sides to match heater flanges as shown.
2. Fasten heater to duct using sheet metal screws for smaller heaters or bolts for larger ones.
3. Seal opening with suitable sealing compound.
4. If needed use additional hangers to support heater.
5. Electrical power connections must be made within NEC standards and local electrical codes.
6. Refer to the Field Wiring Diagram on page 56 for control connections.

Reference Dimensions: Fan Outlet

AWH/HCDH 550/800/1200 - 9-1/4 x 10-3/8 inches

AWH/HCDH 1400/1800/2600- 12-1/2 x 12-7/8 inches

AWH/HCDH 2600/3500 - 17-1/2 x 18-7/8 inches

Duct heater width = 8 inches; Flange width = 1 inch

GENERAL DUCT HEATER INFORMATION

Power wiring should incorporate properly sized fuses or motor rated circuit breakers. A disconnect must be fitted within easy access and sight of the unit.

Supply voltage must be maintained within +/- 10% of design voltage on both single and three phase units. Cycles must be within +/- 5% of design. Failure to operate within these ranges can adversely affect performance, cause failure of the equipment, and may void warranty terms.

Multipliers to calculate Line Currents: (Line current in amperes = Multiplier x KW capacity)

VOLTS / PH	208V / 1	230V / 1	208V / 3	460V / 3	575V / 3
MULTIPLIER (amp. per KW)	4.81	4.17	2.78	1.20	0.96

GENERAL UNIT INSTALLATION INFORMATION

HANDLING

All standard PoolComPak units are shipped as completely assembled units and care should be taken to avoid damage due to rough handling. If the unit is not to be immediately installed, it must be protected from weather and site hazards.

CLEARANCE

For proper operation and service, all PoolComPak units require a minimum of 36 inches clearance on left side and 12 inches on the right side with service panels. Sides without service access panels may be mounted against walls. Refer to DIMENSIONAL DATA for unit sizes in the Specification section of this manual.

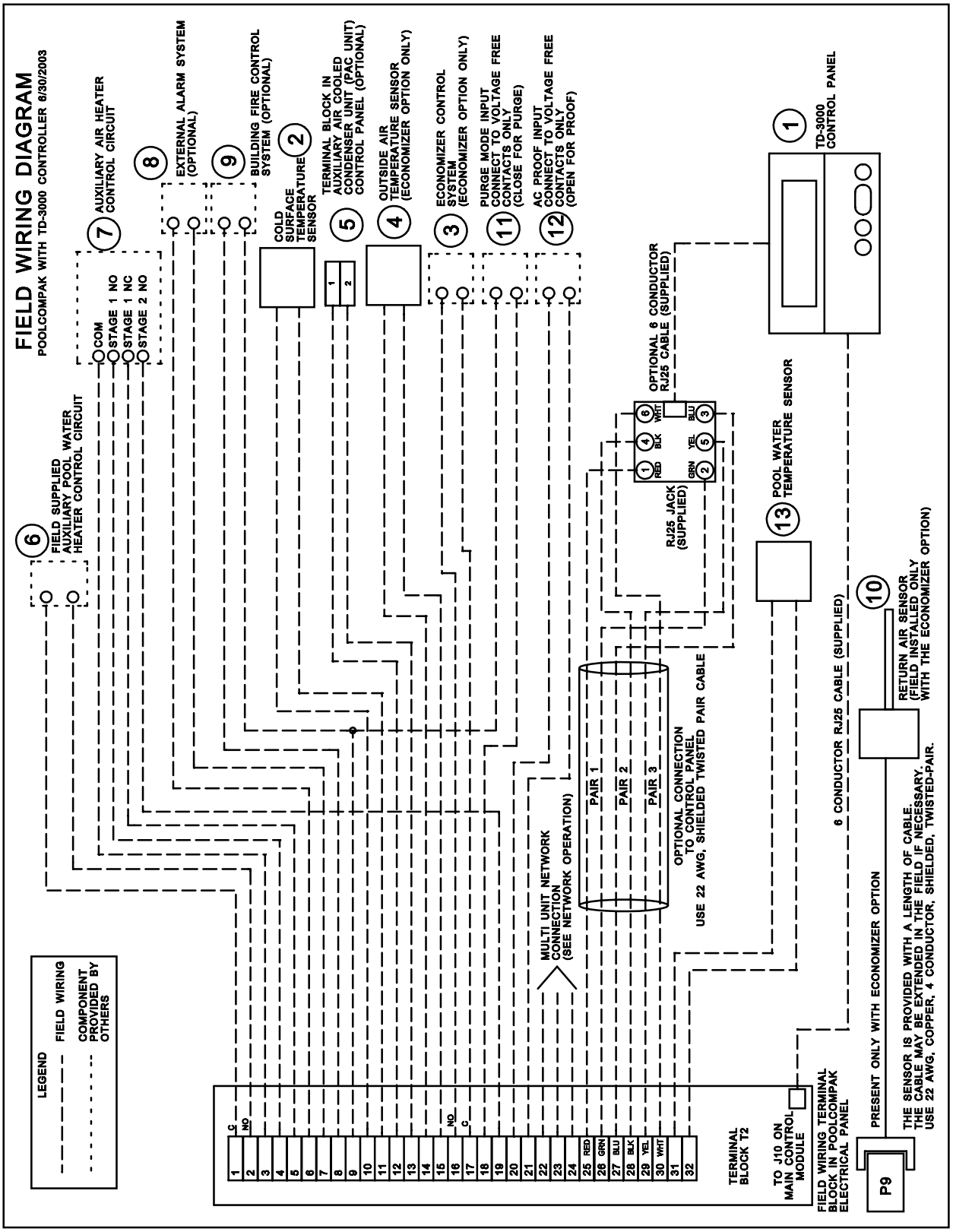
MOUNTING OF POOLCOMPAK UNITS

Locate the PoolComPak unit on a firm level base. If floor mounting, ensure that the floor is capable of supporting the operating weight. If wall mounting or hanging a unit, provide a support structure that is capable of supporting the unit while protecting pool patrons and employees from injury. Ensure that the support structure will not interfere with the operation of the unit. Provision must be made for servicing units suspended above floor level. Install isolation pads under the unit to minimize unit transmitted vibration noise.

INSPECTION

Upon receipt of the PoolComPak unit(s). Immediately inspect for damage. In particular, inspect the housing and the evaporator coil face. Minor indentations of the fins will not affect performance. However, if there is substantial damage, immediately notify shipping company of unseen damage at delivery with a detailed letter outlining the damage. Retain copies of all shipping damage claim documentation as well as photographs of the observed damage.

PoolPak International does not ship damaged units from its facility nor is it responsible for damage incurred during transit.

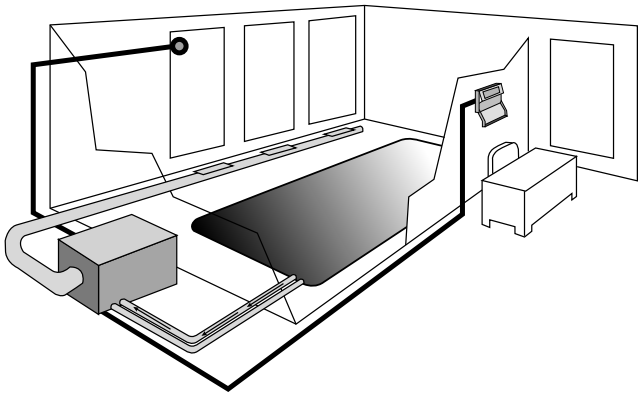


TD-3000 Field Wiring Diagram

TD-3000 CONTROLS

INSTALLATION

The following represents a typical PoolComPak unit installation. The field wiring diagram on page 52 shows the sensors and other devices necessary for operation of the TD-3000 equipped dehumidification system. The diagram also shows how each device is connected to the PoolComPak unit electrical panel. Following the field wiring diagram is a description of each part of the system, including how to install it. The numbers beside each part on the wiring diagram correspond to the numbers in the text that follows.



TD-3000 Installation

1. Control Panel

The control panel shown on page 63 allows the user to view space temperature, pool water temperature, and relative humidity, change set points, and receive fault notifications. It should be mounted in a convenient location that is outside the pool area. The ambient temperature of the mounting location must always be above 32°F. The maximum distance from the PoolComPak unit is 1000 feet. For distances greater than 1000 feet, contact the factory.

The control panel does not contain any sensors and should be mounted outside the pool enclosure. A factory supplied RJ25 (6 conductor) cable must be installed between the PoolComPak unit and the control panel.

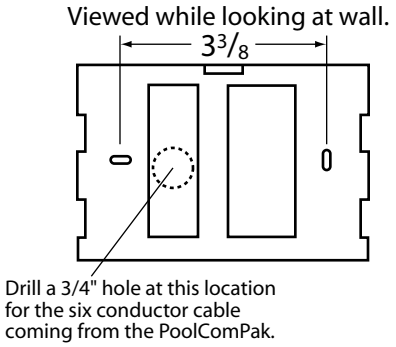
This cable, as supplied by the factory, is 25 feet long. For distances greater than 25 feet, use 6 conductor, 22 AWG, shielded, twisted-pair cable along with the supplied RJ25 jack and 7 foot cable.

Secure the mounting bracket in the desired location using hardware appropriate for the mounting surface. A 3/4" hole must be drilled for the 6-conductor cable which connects the control panel to the PoolComPak unit. For convenience, the control panel may be connected directly to the jack, J10, located in the PoolComPak's electrical panel during service or start-up. Refer to the figure on page 54 for control panel mounting dimensions.

2. Cold Surface Temperature Sensor

This sensor is used to measure the temperature of the coldest surface in the pool enclosure. When the temperature of the surface drops to within 5°F of the dew point of the space air, the humidity set point will be automatically reset downward to help prevent condensation on the cold surface. It should be noted that resetting the humidity set point downward will not be able to compensate for lower quality building materials such as single pane glass or non-thermally broken frames.

The sensor should be mounted on an exterior window or door frame. In cases where there are no exterior windows or doors, the sensor should be mounted on the inside surface of an exterior wall. The sensor may be mounted either horizontally or vertically with the back of the sensor in contact with the cold surface. Electrical connection should be made with 22 AWG, copper, 2 conductor, shielded, twisted-pair cable. Connect the shield drain wire to ground at the PoolComPak unit end only.



Control Panel Mounting Plate

3. Economizer System (Optional)

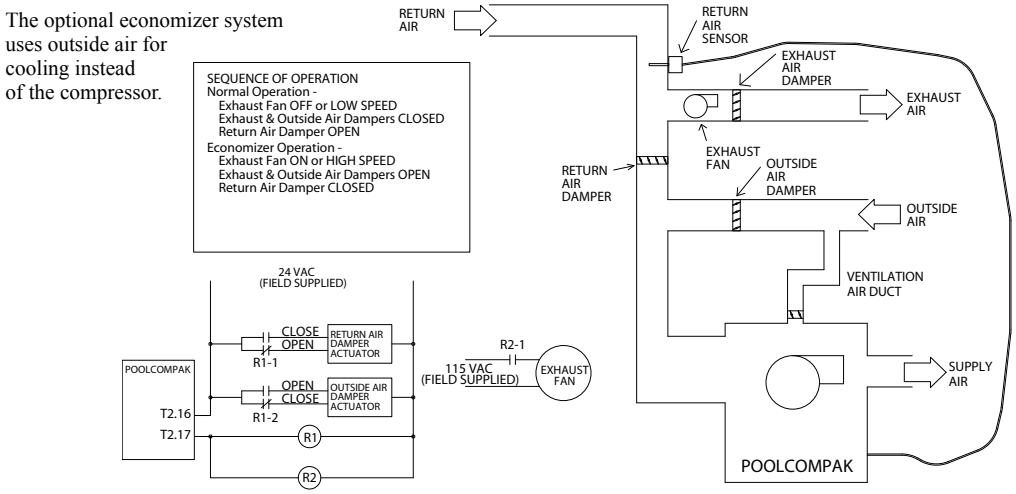
WARNING: When economizer option is selected, adequate exhaust capacity via separate fan must be specified to ensure the natatorium remains slightly negative. Failure to specify adequately sized exhaust system may result in damage to structure and pool odors may be forced into other areas of the building.

An economizer system cools the space with outside air instead of the compressor. See figure below for an illustration of a typical economizer system.

The TD-3000 provides a dry contact closure to activate the economizer. The contacts of the TD-3000 may be connected directly to the economizer control circuit provided the circuit is 24 VAC maximum and the current does not exceed 1 amp inductive. The other components of the system must be provided by others.

The economizer will operate only when space cooling is required and there is no dehumidification requirement. When the outside air temperature is greater than 50°F and more than 5°F below the space temperature set point and the space temperature rises above the set point, the compressor is disabled and a dry contact closure between T2.16 and T2.17 is made to activate the economizer. When the TD-3000 contacts close, relay R1 is energized causing the outside and exhaust air dampers (by others) to open and the return air damper (by others) to close. At the same time relay R2 is energized causing the exhaust fan to run.

The optional economizer system uses outside air for cooling instead of the compressor.



Typical Economizer System w/Control

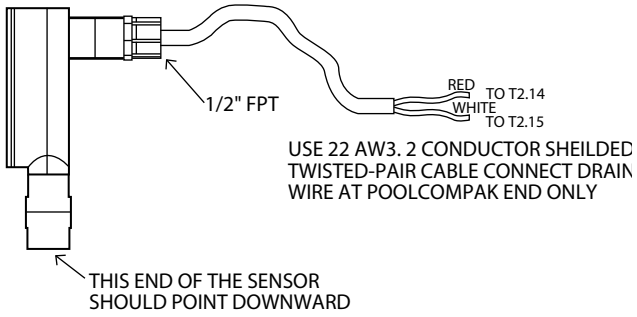
The optional economizer system uses outside air for cooling instead of the compressor.

If the space temperature continues to rise and exceeds the space temperature set point by more than two degrees, the economizer contact is opened, reversing the field installed damper positions. The compressor is energized in the air cooling mode (if so equipped). The compressor will then continue to run until the call for air cooling is satisfied.

The economizer will also be activated in the air cooling mode if the auxiliary condenser option is not installed or if the compressor is locked out by a fault condition.

4. Outside Air Temperature Sensor (Economizer Option Only)

The outside air temperature sensor is installed only when the outside air economizer option is included. The sensor is mounted inside a 1/2" PVC conduit pull elbow. It can be mounted to the outside of the building using standard PVC conduit fittings. The sensor should be mounted near the outside air intake vent for the economizer system. It is very important to mount the sensor so that it does not receive direct sunlight. The exposure to sunlight will cause the sensor housing to warm, resulting in temperature readings that are higher than the actual air temperature. This condition may prevent the TD-3000 from selecting the economizer mode of operation. If possible, mount the sensor under an overhang or on a surface with a northern exposure. Electrical connection should be made with 22 AWG, copper, 2 conductor, shielded, twisted-pair cable. Connect the shield drain wire to ground at the PoolComPak end only. See figure below for an illustration of the outside air temperature sensor. Seal the conduit leading to the sensor with silicon caulk to prevent moisture from migrating out to the sensor and condensing inside the sensor.

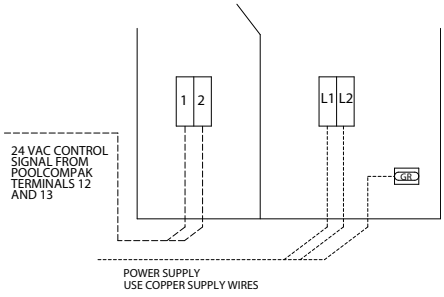


Outside Air Sensor

5. Air Cooled Condenser (Optional)

The air cooled condenser is used to reject heat recovered from the space during the air cooling mode of operation. Only PoolComPak brand air cooled condensers (PAC Units) may be used with a PoolComPak Unit. The TD-3000 provides 24 VAC control signal to the speed control located in the PAC unit control panel.

The speed control then runs the condenser fan motor at the appropriate speed. See figure below for an illustration of a PAC unit field wiring.



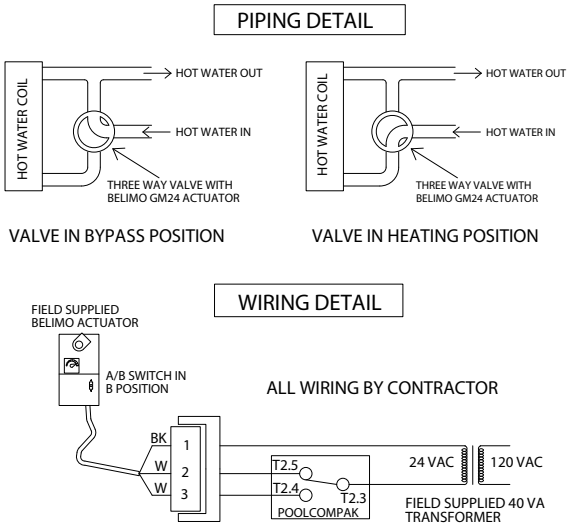
PAC Unit Field Wiring

6. Auxiliary Pool Water Heating System (AWH Model only*)

The auxiliary pool water heating system is provided by others. Typically a gas fired or electric pool water heater is used. The TD-3000 provides a dry contact closure that signals a need for auxiliary water heating. The contacts of the TD-3000 may be connected directly to the heater's control circuit provided the circuit is 24 VAC maximum and the current does not exceed 1 amp inductive. Any other applications will require an additional relay (by others) to be installed between the TD-3000 and the pool water heating system.

7. Auxiliary Air Heating System

Typically a duct mounted electric heater, hot water coil or a factory installed unit mounted hot water coil is used to provide air heating. The TD-3000 provides a form "C" (NO and NC) dry contact closure that signals a need for auxiliary air heating. The TD-3000 contacts may be directly connected to an electric duct heater control circuit, provided the circuit is 24 VAC maximum and the current through the contacts does not exceed 1 amp inductive. The figure below shows a typical installation that utilizes a 3 way hot water control valve and a unit or duct mounted hot water coil.



Installation of a Hot Water Coil 3 Way Valve

8. External Alarm System

The TD-3000 provides a normally open contact closure for connection to a building management system. If a fault occurs, the controller will energize this output to indicate that there is a problem with the dehumidification system. The control panel will display the cause of the fault and provide a suggested course of action. This output may also be used to energize an external alarm light or buzzer. It may also be directly connected to an external circuit as long as the circuit is 24 VAC maximum and the current through the contacts does not exceed 1 amp inductive.

9. Building Fire Control System

The TD-3000 can receive a contact closure signal from a building fire control system. This input of the controller must be connected to dry (voltage free) contacts only. When this input receives a contact closure, the PoolComPak unit compressor and fan will be shut down and the control panel will show an alarm condition. When the contact closure opens, The PoolComPak unit will resume normal operations. It is possible to change the operation of the fire trip input to be active on open instead of close. See the Service section of this manual on page 66 for further explanation.

* HCDH models do not have pool water heating capabilities.

10. Return Air Sensor

The return air sensor measures air temperature and relative humidity. The sensor is normally factory mounted in the PoolComPak unit filter rack. However, with the optional economizer it is necessary to field mount this sensor in the duct work. The sensor must be located in the return duct upstream of the exhaust duct connection. See the figure on page 54 for a typical location of the sensor with the economizer system. When field mounting is necessary, the sensor will be provided from the factory with a length of cable. The end of the cable will be terminated with a receptacle to be connected to the plug P9 inside the PoolComPak unit electrical box. This cable may be field-extended if necessary. Use 22 AWG, copper 4 conductor, shielded, twisted-pair cable.

11. Purge Mode Input

The TD-3000 can receive a contact closure signal from an external source to activate purge mode operation. During purge mode, the compressor is disabled and the economizer output is activated to bring in 100% outside air.

12. AC Proof Input

Optional interlock for use with certain types of heat rejection condensers. Dry contact closure indicates a problem and prevents compressor operation in air cooling mode.

13. Pool Water Temperature Sensor

Units equipped with a pool water heating condenser require installation of factory supplied pool water temperature sensor. It must be mounted upstream of the PoolComPak and the auxiliary water heater. The sensor can be threaded directly into a ¼" FPT fitting. Electrical connection should be made with 22 AWG, copper, 2 conductor, shielded, twisted-pair cable. Connect the shield drain wire to ground at the PoolComPak end only.

POOL WATER PIPING

Do not run piping across service panels, evaporator coil face or air discharge outlet.

POOL WATER PIPING INSTALLATION (AWH Models only*)

If a new or existing pool heater is piped within the same circuit, the PoolComPak unit should be connected in a parallel loop between the filter and the other heater. This allows the PoolComPak unit to act as the primary water heating source and the other heater as a backup or supplemental water heater. All pool purification and chemical feed systems MUST be installed down line from the unit. This includes the practice of adding chemicals directly to the skimmer which results in highly concentrated, corrosive chemicals passing over and through the PoolComPak water condenser.

Water chemistry must be maintained at a pH level between 7.2 and 7.6, with a free chlorine level not exceeding 3.0 PPM and a combined chlorine level maintaining at less than 0.3 PPM.

If possible, install the PoolComPak unit above the pool water level. If it is installed below the pool level, isolation valves must be added. Breakable couplings should be located near the unit on both the water inlet and outlet lines. When installing piping, connect the piping to these couplings last so as not to place stress on the other connection in the plumbing system.

A constant flow of water is required through the PoolComPak units' condenser. The circuit to and from the unit must be capable of maintaining the flow rate as specified for the installed unit (refer to SPECIFICATIONS: Performance Data). To ensure correct water flow, the filter pump usually operates at the same time as the PoolComPak unit. However, to reduce energy consumption during filter off cycle times, a two speed or small auxiliary water pump which bypasses the filter may be used.

PoolPak International recommends installing water pressure tap ports to check influent and effluent water

* HCDH models do not have pool water heating capability.

pressure. Refer to the Specifications section for the particular unit model in question for the proper flow rate and pressure drop across the water condenser.

The pressure tap ports should be installed in a straight length of the water piping, exterior to, the PoolComPak. Install the port before any 90-degree turns and approximately 6 inches from the corner-post of the unit.

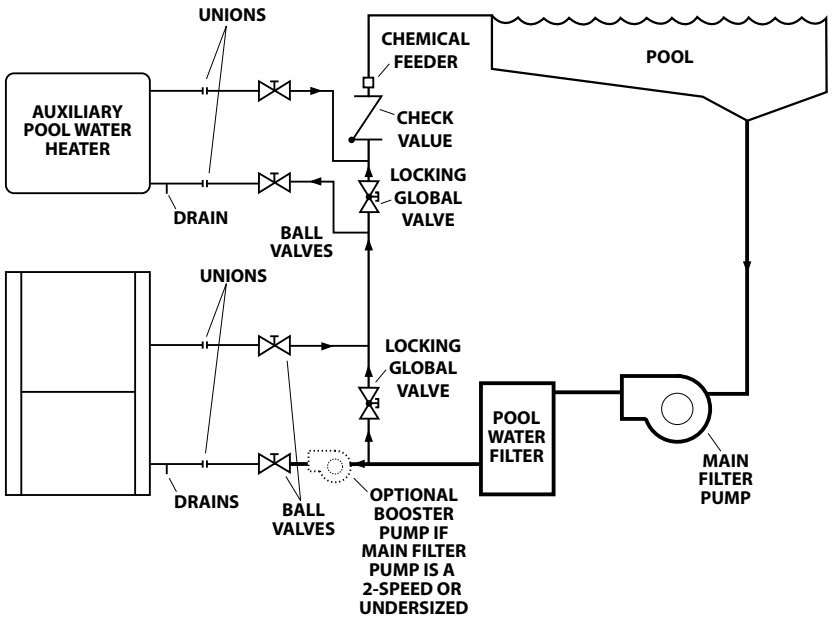
Excessive water flow can cause premature erosion and pitting of the pool water condenser. Adjust value so that the water flow does not exceed the GPM or pressure drop listed in the table.

In some instances, piping from the PoolComPak unit to the filter return line may not be feasible or economical. The unit may be installed on its own supply and return line using a properly sized water pump and appropriate strainer. Ensure that auxiliary water heating systems are staged to supplement the PoolComPak unit water heating.

If the PoolComPak unit is installed above the pool surface and the main circulating pump cannot provide the proper water flow to it at the specified pressure, an auxiliary booster pump is required. Refer to illustration below.

Any condensate may be returned to the pool, but PoolPak International neither recommends nor disapproves of this practice. The installer should check local codes prior to making this decision. Condensate must be filtered prior to being returned to the pool.

If multiple PoolComPak units are installed on the water piping circuit, pipe them (and any auxiliary water heater) in parallel. Piping PoolComPak units in series may result in the unit(s) down stream sensing the pool water temperature as satisfied and not reject heat to the water to its full capacity by control call. The actual pool water temperature should be sensed by each PoolComPak unit and auxiliary water heater.



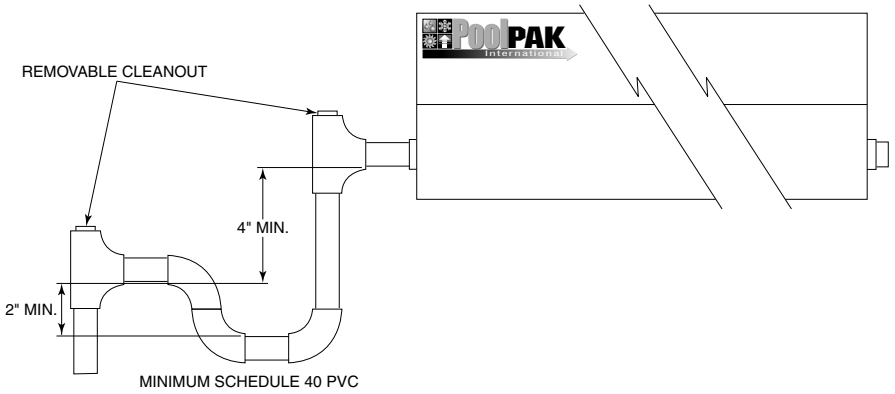
Typical Pool Water Piping Diagram (AW Model only*)

CONDENSATE PIPING INSTALLATION

The drain pans are connected to a common drain system which is brought underneath the unit and out the control/compressor side of the base frame. The condensate drain trap and piping can be installed at either location. The trap and piping must be supplied and installed by the customer. The untrapped drain connection must be permanently sealed with a suitable PVC plug. Provisions MUST be made for disposal of condensate.

Condensate from the dehumidifier coil will have nearly the same properties as the pool water itself. It is recommended that building materials subjected to the condensate and systems used for its disposal are checked for compatibility. For drain piping use PVC plastic pipe minimum of Schedule 40. The drain line must be trapped and sloped to provide proper drainage. The trap depth must be a minimum of 6 inches (See figure below).

Drain line exposed to outdoor ambient temperatures must be protected against freezing. Wrap lines with electric heat tape (follow manufacturer's instructions) controlled by an automatic thermostat set at a minimum of 35°F to protect against freezing. Insulate all piping. Insulation must be sealed at all seams. Power for heat tape must be supplied external to the PoolComPak.



Condensate Trap

AIR-COOLED CONDENSER INSTALLATION

Installation of the outdoor air-cooled condenser should only be done by a qualified refrigeration mechanic familiar with this type of work. Many service problems can be avoided by taking adequate precautions to provide an internally clean and dry system and by using procedures and materials that conform with established procedural standards. The following piping recommendations are intended for use as a general guide. For more complete information, refer to the latest ASHRAE Handbook.

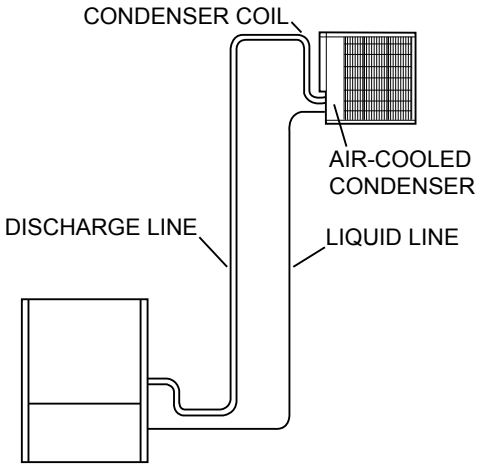
PoolComPak Model PAC Air-cooled Condenser

The following guidelines apply to field fabricated piping:

- Use clean, dehydrated, refrigeration-grade copper tubing for all refrigerant lines. Hard drawn tubing should be used where no appreciable amount of bending around pipes or obstructions is necessary. If soft copper tubing must be used, care should be taken to avoid sharp bends which may cause restrictions and excessive

refrigerant pressure drops.

- Use long radius elbows wherever possible with one exception - short radius elbows should be used for any traps in the hot gas riser.
- Braze all copper to copper joints with a phosphorus-copper alloy material such as Silfos 5 or equivalent. Do not use soft solder.
- During brazing operations flow an inert gas, such as nitrogen, through the lines to prevent internal oxidation scaling and contamination.
- Support refrigeration lines at intervals with suitable hangers, brackets or clamps.
- Pack glass fiber insulation and a sealing material such as Permagum around refrigerant lines, where they penetrate a wall, to reduce vibration and to retain some flexibility.
- The lines must be sized and routed so that oil is carried through the system. With PAC units at the same level and less than 25 feet use the line size chart listed below. This will give satisfactory system performance for these applications. Using smaller lines than recommended will give excessive pressure drops, resulting in reduced capacity and increased power consumption. Oversized lines could result in an oil flow problem within the system and possible compressor damage.
- For PAC units at a higher elevation between the PAC and the PoolComPak unit, refer to figure.
- For PAC units at the same elevation, and lines less than 25 feet, 550 – 1800 units are charged with the additional refrigerant charge (ACC unit and piping less than 25 feet) at 95°F - 105°F ambient air temperatures. 2600 and 3500 units require additional refrigerant.
- For all PAC units at a higher or lower elevation or more than 25 feet of distance between the PAC and the PoolComPak unit, refer to the figure on page 62 and the example for the required amount of refrigerant charge (piping only) at 95°F - 105°F ambient air temperatures.
- Discharge lines should be designed to prevent condensed refrigerant and oil from draining back to the compressor during OFF cycles. Use the following guidelines.
- The highest point in the discharge line should be above the highest point in the condenser coil.



Hot Gas Riser

- The hot gas line should loop toward the floor if the condenser is located above the PoolComPak unit, especially if the hot gas riser is long.
- PoolComPak units do not utilize compressors with unloading stages. Consequently, double hot gas risers are not needed for reduced load conditions as refrigerant flow rates will not fall below minimum velocities necessary to carry oil up through the discharge line.

  Excessive pressure drops in the liquid line may cause flashing of the refrigerant and a loss of a liquid seal at the expansion valve inlet. A reduction in capacity may then occur because the presence of gaseous refrigerant will partially block the expansion valve. Using liquid line sizes as recommended on the following page for these units and the proper system refrigerant charges will prevent this problem.

  A filter-drier is not needed in the liquid line as one is factory installed in the PoolComPak unit.

The liquid line and discharge line should not be in contact with one another. If the installing contractor must tie these lines together because of an installation requirement, the contractor must insulate them from each other to prevent heat transfer. Also, because the discharge line is hot during system operation, the contractor must take precautions to avoid skin contact.

NOTE: Do not add oil to system. Compressor oil charge is sufficient for proper system operation with interconnecting refrigerant lines of up to 100 feet in length.

See page 62 for the required additional oil and refrigerant charge (ACC unit and piping) at 95°F - 105°F ambient air temperatures. Use the calculation method shown on the figure to calculate the additional refrigerant and oil.

Air-cooled condensers for PCP unit's have been factory designed to accommodate the special capacity and pressure drop requirements of each PCP model. These air-cooled condensers must be properly matched to the PCP model so that the pool water heating and cooling modes work properly over the entire operating range.

PAC AIR COOLED CONDENSER

PoolComPak Unit	ACC Model No.	Ambient Temp.	Diagram No.	Unit Height	Vapor O.D.***	Liquid O.D.***	Unit Weight	Motor HP	Motor FLA		Min. Circuit Ampacity**	
				A	B	C			208/230V	460V	208/230V	460V
AWH & HCDH 550	PAC-42	95° F thru 105° F	1	37-1/6"	5/8"	1/2"	120	0.5	1Ø	1Ø	1Ø	1Ø
AWH & HCDH 800									3.0	1.5	3.8	1.9
AWH & HCDH 1200	PAC-53				3/4"							
AWH & HCDH 1400	PAC-85				7/8"	5/8"	210					
AWH & HCDH 1800												
AWH & HCDH 2600	PAC-126		2	39"	1-1/8"		470	2 x 0.5	2 x 3.0	2 x 1.5	7.5	3.8
AWH & HCDH 3500	PAC-169					3/4"						

Notes: *Contact factory for selection if ambient temperature is greater than 105°F.
**Maximum overload protection 15 amps. Units come in single phase only.
*** For up to 25 ft. in length.

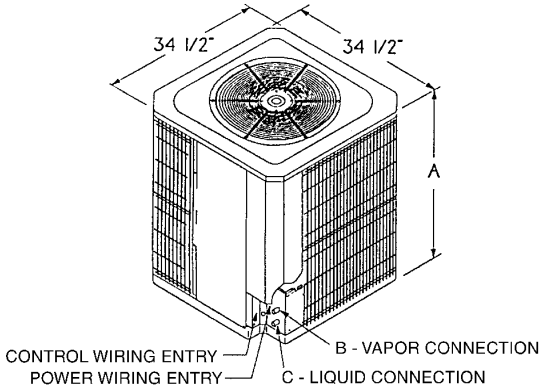


Diagram 1

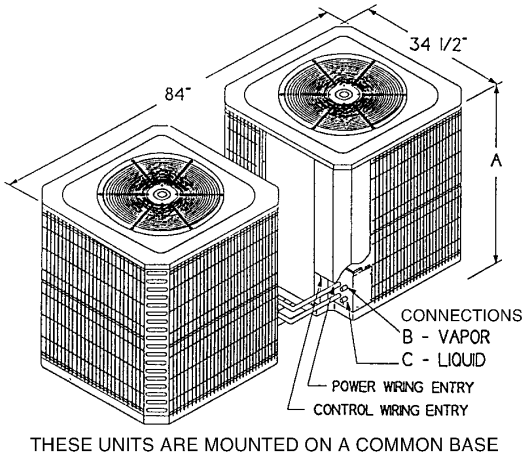
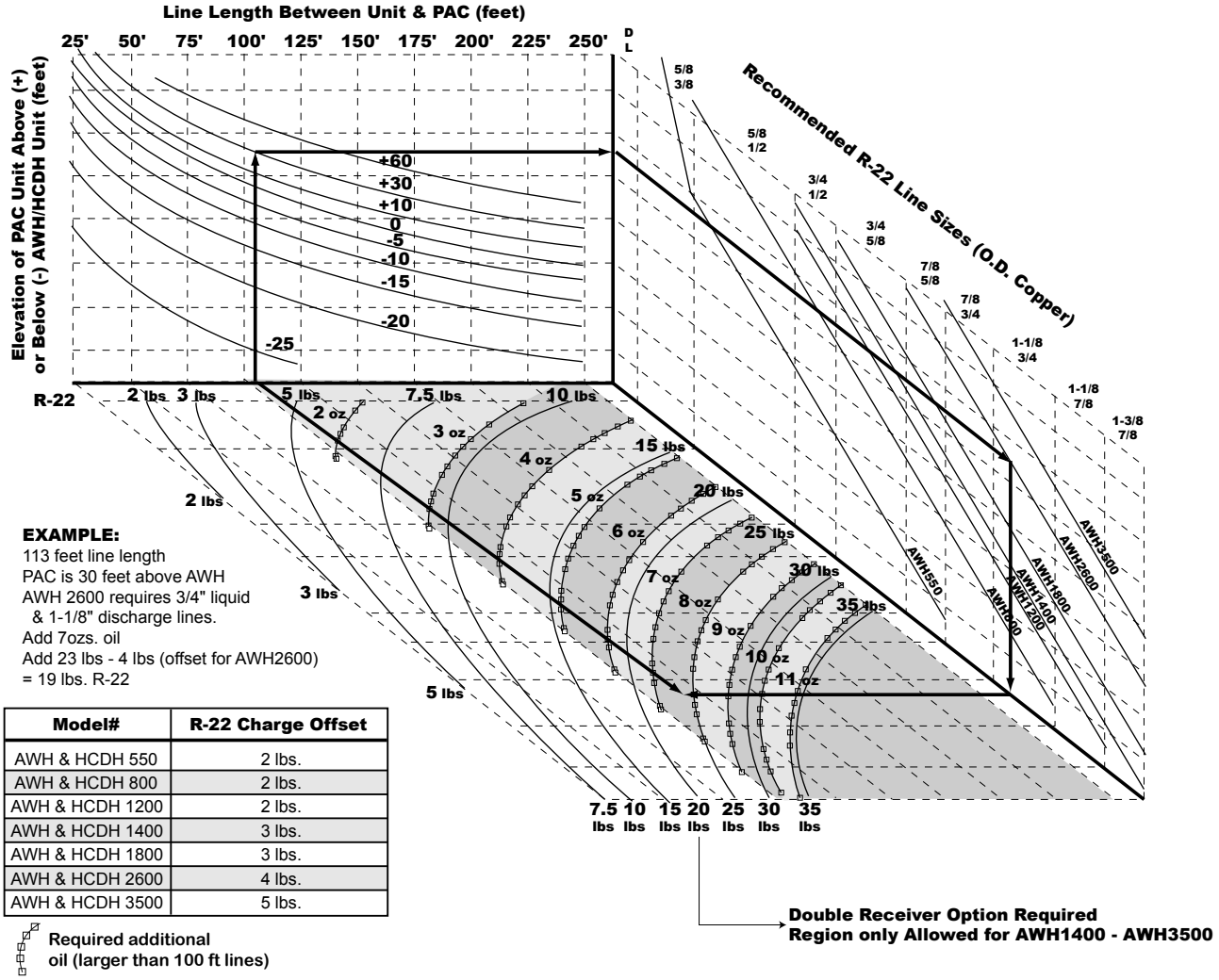


Diagram 2



EXAMPLE:
113 feet line length
PAC is 30 feet above AWH
AWH 2600 requires 3/4" liquid & 1-1/8" discharge lines.
Add 7ozs. oil
Add 23 lbs - 4 lbs (offset for AWH2600)
= 19 lbs. R-22

Model#	R-22 Charge Offset
AWH & HCDH 550	2 lbs.
AWH & HCDH 800	2 lbs.
AWH & HCDH 1200	2 lbs.
AWH & HCDH 1400	3 lbs.
AWH & HCDH 1800	3 lbs.
AWH & HCDH 2600	4 lbs.
AWH & HCDH 3500	5 lbs.

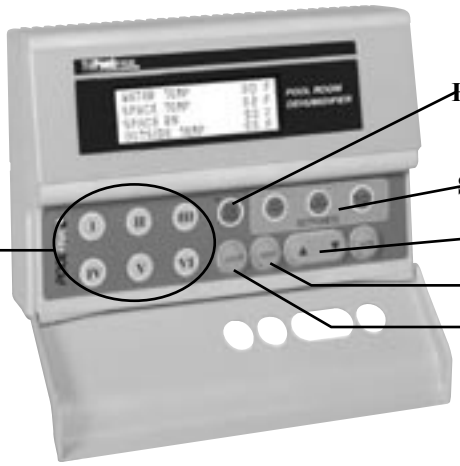
Additional R22 requirements for lines longer than 25 ft must be calculated according to the ASIO.

AWH & HCDH 2600 and 3500 units require an additional 10½ lbs R22 for the first 25 ft line length.

Compressor	Refrigerant	Oil type		Supplier
Copeland	R-22	Suniso_3GS	Mineral Oil (3GS)	WITCO
Bristol				
H2*B	R-22	Suniso_3GS	Mineral Oil (3GS)	WITCO
H2*C, H2*R	Zerol 150 w/3% Syn-O-Ad	Alkylbenzene (150T)	Shrieve (w/1.5% Syn-O-Ad 8478)	
H2*G	Zerol 150 w/1.5% Syn-O-Ad	Alkylbenzene (150T)	Shrieve (w/1.5% Syn-O-Ad 8478)	
Trane	R-22	TRANE OIL 00042	Mineral Oil	

Required Additional Refrigerant Charge, and Line Sizing for PAC Unit at 95˚F - 105˚F Ambient Temperature

TD 3000 SET UP/CONFIGURATION



TD-3000 Control Panel

STATUS SCREENS

Normally the control panel will automatically rotate between three different screens to display the status of the system. Pressing the Hold/Rotate key will stop the automatic screen rotation and hold the presently displayed screen. After a one minute delay the screens will start rotating again. The user may also turn off the screen hold function before the one minute time-out by pressing the Hold/Rotate key a second time. While under a different service screen these screens may be easily accessed by pressing service key **VI**.

Screen 1: Conditions

SPACE TEMP	82ºF
SPACE RH	59 %
OUTSIDE TEMP	65ºF
SPACE DEWPOINT	66ºF

Screen 1 displays:

- Space Temperature
- Space Relative Humidity
- Outside Air Temperature (Economizer Option Only)
- Space Dew point

Screen 2: Water Status

WATER HEATING	YES
AUX WATER HEAT	YES
WATER TEMP	80ºF

Screen 2 displays:

WATER HEATING YES or NO

Yes indicates that the unit is returning a majority of the recovered heat back to the pool water.

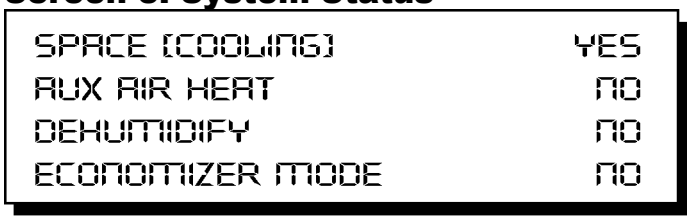
AUX WATER HEAT YES or NO

Yes indicates that the controller has closed the relay contact requesting the auxiliary pool water heater to run.

WATER TEMPERATURE 80°F

Displays the temperature of the water.

Screen 3: System Status



Screen 3 displays:

SPACE

[HEATING] YES indicates that the space requires heating.

[COOLING] YES indicates that the space requires cooling.

[TEMPERATURE] OK indicates that the space temperature is at the set point.

AUX AIR HEAT YES or NO

Yes indicates that the unit requires assistance with space heating and has closed the relay contact which controls the auxiliary air heat source.

DEHUMIDIFY YES or NO

Yes indicates that the humidity of the space is above the humidity set point.

ECONOMIZER MODE (OPTIONAL) YES or NO

Yes indicates that the unit is using the outdoor air in an economizer function to maintain the desired space conditions. Economizer Mode is displayed only if the unit has the Economizer Mode option and the Economizer Mode enabled under the service setup screen.

CHANGING SET POINTS

Three set points, air temperature, relative humidity, and water temperature, can be accessed through the control panel. To change a set point, press the corresponding set point key. See figure on previous page. The associated set point screen will appear. Use the up (▲)or down (▼) arrow key to select the new set point value. Press the **enter** key to save the change.

AIR TEMP (Range 75°F to 95°F)

The air temperature should normally be set about 2°F above the pool water temperature to minimize the pool water evaporation rate. After the air temperature set point is changed, the dew point set point will automatically adjust, and automatically return to the status screen.

HUMIDITY (Range 45% to 65%)

The range for the humidity set point is normally 50% to 60%. Lower set points will require more electricity to satisfy the dehumidification requirement. Again, the dew point set point will automatically adjust.

WATER TEMP (Range 70˚F to 104˚F)

The water temperature set point is normally set between 80°F and 88°F for a swimming pool and higher for a spa depending upon user preference.

ON-OFF BUTTON

All PoolComPak units are programmed to enable the customer to turn off the unit while allowing the compressor crankcase heater to remain energized. Keeping the crankcase heater energized will prevent excessive refrigerant accumulation in the compressor oil.

CAUTION: MAIN POWER IS NOT DISCONNECTED FROM THE UNIT.

Do not attempt to perform preventive maintenance on or around moving parts inside the unit or around the PAC air-cooled condenser. Open the service-disconnect or breaker whenever performing preventive maintenance, as this will disconnect main power from the PoolComPak. Keep personnel clear of the fan motor, blower, compressor, and electrical components when turning off the unit with the On-Off button.

Pressing the on-off button one time will de-energize the components and turn off the green indicator light inside the on-off button. The controller will go into normal default mode, which allows the air heating and bypass solenoid valves to remain energized.

Components that will de-energize

- Compressor
- Fan motor
- Air cooled condenser fan motor
- Auxiliary air heat

Pressing the button a second time will energize the components and turn on the green indicator light. The fan motor will start immediately upon pressing the button. The compressor will energize when the five minute anti-cycle timer, times out only if there is a call for the compressor to run. This timer starts after the green indicator light illuminates.

TD 3000 SERVICE PARAMETERS

The following instructions detail the service functions of the TD-3000 controller. These instructions are meant for use by a qualified HVAC service technician. Improper settings may cause poor operation.

SERVICE PARAMETERS - Key I

Pressing the **I** key prompts the user for the service password **0005**. Press the up arrow or down arrow until the service password is displayed, then press the **enter** key to accept the password. The user may then set the TD-3000 control parameters for the specific application and user preferences.

Pressing the up arrow or down arrow keys will cycle through the available parameters. When the parameter to

be changed is shown on the screen, press the **II** key to move the cursor to the desired parameter. Once the cursor is highlighting the parameter use the up arrow or down arrow to change the value. Press enter to accept the new value. The cursor will then move back to the top left screen position.

NOTE: Depending on the type of PoolComPak (PCP) and installed options, some of the following parameters may not be available. Default values for the parameters are shown in bold type.

Available parameters include the following:

- Units for displayed temperatures and set points - **FAHRENHEIT** or **CELSIUS**
- Min. Outside Air Temp For Economizer **- 50.0°F** (Range 40°F to 60°F) The economizer function will not be allowed if the outside air temperature is less than this parameter.
- Economizer Option Installed - Yes or **No** When set to YES, this parameter tells the TD-3000 that an economizer system is installed. The controller will then select economizer operation when possible instead of mechanical air cooling.
- Economizer Offset Value **- 5.0** (Range 2.0 to 9.9) This parameter specifies how far below the space temperature set point the outside air temperature must be before the controller will select economizer operation.
- Dead band Value for Dew point Control **- 1.0** (Range 1.0 to 2.0) This parameter specifies the dead band for controlling space humidity.
- Dead band Value for Air Heating Control **- 1.0** (Range 1.0 to 2.0) This parameter specifies the dead band for controlling space temperature.
- Dead band Value for Water Heating Control **- 0.5** (Range .5 to 1.5) This parameter specifies the dead band for controlling water temperature.
- Dead band Value for Aux Water Heating Control **- 0.5** (Range .5 to 1.5) This parameter specifies the dead band for controlling water temperature with the auxiliary water heating system (by others).
- Anti-cycle Timer Duration **- 5** minutes (Range 1 to 9) This parameter specifies the minimum time the compressor must remain off after running. This time delay starts when the compressor is shut off.
- Number of Degrees Below Set point to Activate the Aux Water Heater **- 1.0** (Range 0.0 to 9.9) This parameter specifies the offset between the pool water heating set point of the PoolComPak and the auxiliary water heating system (by others).
- Enter the offset between aux. heat stage 1 and stage 2. Normally set for 1°F . The amount of temperature offset between the energized first stage of auxiliary air heat and when the controller energizes the second stage of auxiliary air heating. Range 1.0°F to 2.0°F
- Set Fire Trip to be Active with an Open or Closed Contact **Closed** This parameter determines whether the TD-3000 will sense a fire alarm when the fire trip input is in an open or closed state.
- Manual Mode **OFF** This parameter can be used to put the TD-3000 into a manual mode. In this mode, the compressor and fan are shut off and the individual parts of the TD-3000 system can be energized for testing and troubleshooting. For more information on manual mode operation, see the section titled Manual Mode below.
- Manual Control **0** The parameters on this screen are used to activate individual outputs of the TD-3000 in manual mode operation. This parameter screen will not be shown unless the Manual Mode parameter on the previous screen has been set to ON.
- Sensor Offsets **- 00** (Range -10 to 10 for temperatures and -20 to 20 for relative humidity) These parameters can be used to calibrate the sensors after the PoolComPak (PCP) has been installed. All offsets must be entered in degrees Fahrenheit (°F) (except humidity). The offset number will be added to the value read from the sensor.

  Example:

  The TD-3000 displays an air temperature of 84°F. The temperature of the air, measured with a thermometer, is 82°F.

The offset value equals the actual temperature (82°F) minus the indicated temperature (84°F)

82°F - 84°F = -2°F

The offset to be entered for "AIR TEMP" is -02. To change the offset, press the II key until the cursor is located under the "AIR TEMP" offset number. Using the up arrow or down arrow adjust this number until it reads -02. When finished, press enter. This procedure can be used to change all offsets.

The following offsets may be adjusted on this screen:

Air Temp - Return air temperature sensor

Water - Pool water temperature sensor

Surface - Cold surface temperature sensor

RH - Relative humidity sensor

Outs - Outside air temperature sensor

(Economizer option only)

MANUAL MODE

Using the TD-3000's manual mode, it is possible to control each of the controller's outputs individually. During this mode of operation, the compressor and fan motor will remain off.

To put the TD-3000 in manual mode, press the service button labeled **I**. Enter the password 0005. Using the up or down arrows, locate the parameter screen for manual mode. On this screen, press **II** to move the cursor to the ON/OFF parameter. When the flashing cursor is located under OFF, press the up or down arrow key to change the value to ON. At this point the compressor and fan motor will shut off and all other outputs will go to the values set on the next parameter screen. Press the enter key to move to the manual mode control screen.

MANUAL MODE CONTROL SCREEN

There will be as many as five outputs listed on this screen. The screen may show fewer than five outputs depending on the configuration of the PoolComPak system. The following values may be listed on the screen:

- Reheat — Air Reheat coil solenoid valve output
- Rm Cnd — 24 VAC control signal to PAC unit (remote air cooled condenser)
- Sol — Auxiliary condenser solenoid valve output
- Ecn — Economizer system contact closure output
- Aux Air — Auxiliary air heating system contact closure output
- Aux Wtr — Auxiliary water heating system contact closure output

Following each output is either a 0 or a 1. The number 0 indicates that the output relay is off. The 1 indicates that the relay is on. Use the **II** key to move to the output value to be changed. When the cursor is flashing under the correct value, press the up or down arrow key to change the value. When this value is set from a 0 to a 1, the corresponding output will be energized immediately. When the value is set from 1 to 0, the output will be de-energized. There will be a five second delay before the air reheat solenoid or auxiliary condenser solenoid valves de-energize. More than one output may be turned on at one time. When finished with manual mode operation, move the cursor back to the top left corner of the screen with the **II** key and press the up arrow. The screen will now be displaying the manual mode ON/OFF screen. Before setting this parameter to OFF, make sure that everything is clear of the blower motor and belts. As soon as this parameter is set to OFF, the blower motor will be energized and the unit will resume normal operation.

SERVICE INFORMATION SCREENS- Key III

There are three screens of information accessible by pressing the **III** key. Use the up and down arrows to rotate through screens.

The first screen shows the following values:

- Surface Temperature: The temperature measured by the cold surface temperature sensor.
- Dew Point Temperature: The dew point temperature is automatically calculated by the air temperature and relative humidity.
- Enable Network Control? YES or NO Enables networking of multiple units controlling one space, and the units were ordered for network control, enable network control by setting to YES. Refer to the Network Multiple Units Installation section for complete set-up and operation after enabling.

Service Info Screen 1

The second screen displays the number of hours the following components have been active since the unit was last powered up. These values are reset to 0000 when the unit is powered on.

- CMPR: The number of hours the compressor has been on since power up.
- FAN: The number of hours the fan has been running since power up.
- A/C: The number of hours the system has been in mechanical air cooling mode since power up. This number does not include time spent in economizer air cooling mode.
- AIR: The number of hours the auxiliary air heating system has been energized.
- WTR: The number of hours the auxiliary water heating system has been energized.

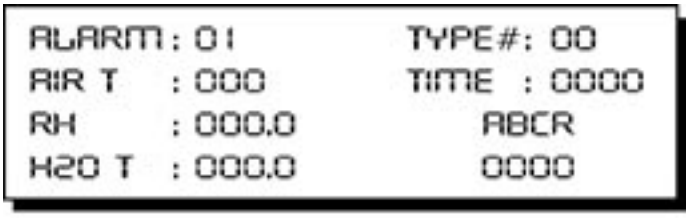
Service Info Screen 2

The third screen shows the number of faults that have occurred since the unit was powered up. Faults included in this count are high pressure, low pressure and high compressor motor temperature. If the number of faults reaches ten, the TD-3000 will lockout the compressor to protect it from damage and display an alarm screen instructing the user to contact a service technician. It is important to determine the cause of the fault and correct it before resetting the unit. The number of faults can be reset to zero only by shutting off the power disconnect to the PCP for at least ten seconds and then reapplying power.

Service Info Screen 3

The fourth screen shows Enhanced Alarm History. For information on how to read the enhanced alarm history, refer to the Enhanced Alarm History on page 80.

Service info Screen 4



The fifth screen shows AC Proof Status (if equipped). Units with water cooled condensers will have an AC proof status. The status screen will read Proven or Not Proven. Units with PAC air cooled condensers will automatically see the open circuit and read Proven.

Service Info Screen 5

The sixth screen, Purge Mode allows the user to force the fresh air intake damper and exhaust dampers fully open to introduce a high volume of fresh air into the natatorium when shocking the pool. This feature will only work when the optional Economizer dampers are installed in the system. To activate this feature, press the **II** key to move the cursor under the OFF setting then press the Up Arrow key to change to ON then, press the Enter key to accept. The warning “CAUTION!!! NO FREEZE PROTECTION” will flash on the screen while Purge Mode is active. It is the user’s responsibility to use this feature with common sense and not bring in 100% outside air for extended periods of time when it is below freezing outside. To turn the feature off, use **II** key to locate the cursor under the ON text then, use the Up Arrow key to change to OFF. Then, press the **ENTER** key to accept.

Service Info Screen 6

TD-3000 - ADDITIONAL KEY LISTINGS

Key IV - Operating Parameters

Arrow up to the password **0775** and press the **ENTER** key.

- Is the optional air conditioning installed?
  YES or NO
  Allow operations of an optional remote air cooled condenser unit for air cooling option.
- Enable the water heating first option?
  YES or NO
  Allows for operation of compressor to heat the water without a need for dehumidification.
- Select the type of unit, AWH or HCDH.
  AWH or HCDH
  Determined by the model of the unit. Unit model # verifies if the unit is AW or HCDH.
  HCDH units do not have pool water condensers.
- Does this unit have a hot gas bypass valve?
  Yes or NO
- Read the analog inputs every_____seconds.
  Range 005 or 030
  Time period that the controller reads the analog inputs. Normally set to 10.
- Does this unit have a compressor module?
  YES or NO
  Some units with a scroll compressor have high motor temperature modules and must be set for YES.
- Enable the fan Overload?
  YES or NO
  Allows operator to set-up and test fan motor overload circuit. The controller must be set to YES to pick up the Alarm condition. NO is used for turning off the fan for Factory testing of the Defrost circuit.
- Test modes:
  Allows operator to test each circuit of PoolComPak operation.

Note: If the outputs do not energize, manipulate set points to energize the desired outputs. The compressor anti cycle timer must time out.

- Dehumidification
  ON or OFF
  Allows compressor to energize in dehumidification rejecting the heat into the air re-heat condenser and water re-heat condenser; providing that none of the other test modes are energized.

Note: The bypass solenoid may or may not be energized depending on the water temperature and water temperature set point.

- Air Cooling
  ON or OFF
  When the Air Cooling Test Mode is set to ON, the air cooling solenoid is energized. If the Dehumidification test mode is ON, the remote air cooled condenser and compressor energize.
- Water Heating
  ON or OFF
  ON De-energizes the bypass solenoid. OFF Energizes the bypass solenoid.
- Aux. Water Heating
  ON or OFF
  ON Energizes the auxiliary water heating relay. OFF de-energizes it.
- Aux. Air Heating
  ON or OFF
  ON Energizes the auxiliary air heating relay. OFF de-energizes it.

COOL

- Top Dead band - The Top Dead band is the point above the air cooling dead band that the controller will energize the cooling cycle.
- Bottom Dead band - The Bottom Dead band is the point below the air cooling dead band that the controller de-energizes the air cooling cycle.
- Min Value - A read only screen for the lowest space temperature recorded after the cooling cycle de-energizes. This is the low point that the space temperature has drifted to after shutting down the cooling cycle. This value is then used to adjust the Bottom Dead band value.
- Max Value - A read only screen for the highest space temperature recorded after the cooling cycle de-energizes. This is the high point that the space temperature has drifted to after shutting down the cooling cycle. This value is then used to adjust the Top Dead band value.

HEAT

- Top Dead band - The Top Dead band is the point above the air heating dead band that the controller will de-energize the air heating cycle.
- Bottom Dead band - The Bottom Dead band is the point below the air heating dead band that the controller energizes the air heating cycle.
- Min Value - A read only screen for the lowest space temperature recorded during the heating cycle. If the value remains higher than the lowest value recorded, the lowest value will remain as the recorded Min Value. If the value drops lower than the Min Value recorded it will reset the Min Value and set that value to the new lowest Min Value.
- Max Value - A read only screen for the highest space temperature recorded. This is the value that the temperature reaches after the heating cycle de-energizes. If the value remains lower than the highest Max Value recorded, the highest Max Value remains the same Max Value. If the value rises above the Max Value recorded it will reset the Max Value to the new highest Max Value.

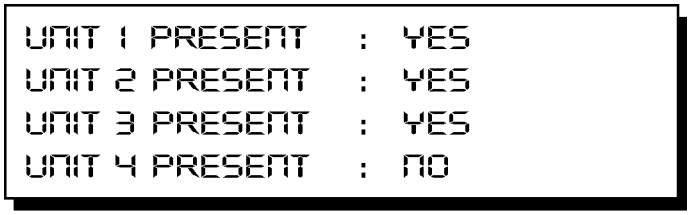
TD-3000 NETWORK OPERATION

Networked TD-3000 units operate in a MASTER/SLAVE environment. This means that one unit (master) determines heating, cooling, and dehumidification requirements and broadcasts them on the network to the other units (slaves). This ensures that all units work together instead of against each other. Each networked unit contains all sensor and controls necessary for independent operation and is capable of acting in the master role. Units on the network are identified by a number between one and four. The unit with the lowest identification number having no uncleared alarms will be the master unit.

If an alarm condition occurs in the master unit, it will give up the role of master. The unit with the next lowest identification number and no unclear alarms will take over the master role. The unit that experienced the alarm condition will operate in the slave role until the alarm is cleared at the control panel.

A single control panel is used to monitor all units on the network. ***Indicator lights beside Roman numeral buttons I through IV indicate which unit is currently being displayed. The next unit in line can be selected by pressing button V.*** If an alarm condition occurs in a unit, the corresponding light will flash and the control panel will automatically switch to the unit with the alarm. The light will continue to flash even if the control panel is displaying another unit. For the standard configuration, all set points can be changed while the control panel is displaying any unit. The set point is automatically updated in every unit on the network. Other configurations may require the control panel to be displaying a particular unit to change the set point.

Network Status Screen 1



The control panel provides two network status screens. They can be accessed through the service menus under button **I**. The figure above shows the first screen that displays the status of units one through four as present or not. Use this screen to verify that all units on the network are connected and communicating with each other. The figure below shows the second screen that displays network information for the unit that is being displayed by the control panel, including network role, connection status and network identification number.

Network Status Screen 2

CONFIGURATION

Using the following four parameters, it is possible to configure the TD-3000 network to accommodate a wide variety of installation options. Press button **I** at the control panel to access these parameters on the service menu. These parameters must be set in each unit individually. Default values are shown in bold type.

Pool Water Temperature Control - LOCAL or NETWORK.

Determines whether the unit will control water temperature based on the master's command (NETWORK) or its own temperature sensor and set point (LOCAL). If a unit set to LOCAL becomes the master, other units in the network will not use the master's command for water heating. They will look to the next line that is not set to LOCAL. This parameter is only set to LOCAL if the unit is connected to a different pool than the rest of the units on the network. Because the unit is controlling water temperature on its own, it is necessary to select the correct unit with the control panel before changing the water temperature set point.

Staged Dehumidification Control - YES or NO

Determines whether the unit will run in dehumidification when there is a need for 1 stage or 2 stages of dehumidification. The master unit will start on any need for dehumidification independent of this parameter.

Slave units with this parameter set to YES will dehumidify only if the master is asking for 2 stages of dehumidification. Setting this parameter to NO will cause the unit to dehumidify when the master calls for at least 1 stage of dehumidification. Using this parameter, it is possible to configure the number of units in each dehumidification stage.

Dehumidification Stage 2 Offset (in degrees of dew point) - 0 to 9.9°F (4.0°F).

Determines how far humidity of the space has to rise above the set points before the unit will request 2 stages of dehumidification on the network. This parameter is normally the same in all units on the network. Making this parameter smaller will bring on the second stage of dehumidification sooner.

Enable Network Control - YES or NO

Determines whether the unit will participate in the master/slave environment. Setting this parameter to NO will cause the unit to act like a standard TD-3000 single unit The unit will never become the master on the network and will not listen to the demands broadcast by the master on the network. Although units with this parameter set to NO do not participate in the master/slave environment, they are still accessible through the network control panel. Like the LOCAL pool water temperature setting, this parameter, when set to NO, requires this unit to be displayed on the control panel before changing any of the set points. The other screens for Pool Water Temperature Control, Staged Dehumidification, and Stage 2 Offset are not available when this parameter is set to NO.

CHANGING SET POINTS

Each unit on the network maintains two groups of set points, network and local. If a unit has the Enable Network Control parameter set to YES and the Water Temperature Control parameter set to NETWORK, it will control to the network set points. Set points changed when the control panel is displaying this unit will be changed in every unit on the network with the same NETWORK and Water Temperature Control parameters. Units that are configured for Network Control and LOCAL water temperature control will control using local water temperature set point, the network air temperature and relative humidity set points. When the air temperature and relative humidity set points are changed when the control panel is displaying the unit, they will be changed in all units configured for Network control. The water temperature set point will only be changed in the unit currently being displayed by the control panel. Units that are not configured for Network Control will use all local set points. Therefore any set points changed while the control panel is displaying this unit will only be changed in this unit.

WARNING

HIGH VOLTAGE
is used in the operation of this equipment.
DEATH OR SERIOUS INJURY
may result if personnel fail to observe precautions.

Work on electronic equipment should not be undertaken unless the individual(s) has (have) been trained in the proper maintenance of the equipment and is (are) familiar with its potential hazards.

Shut off power supply to equipment before beginning work and follow lockout procedures. When working inside equipment with power off, take special care to discharge every capacitor likely to hold dangerous potential.

Be careful to not contact high voltage connections when installing or operating this equipment.

LOW VOLTAGE

DO NOT be misled by the term "low voltage." Voltages as low as 50 volts may cause death.

UNIT START-UP

To ensure that the system will perform at optimum levels, follow these outlined instructions.

PRE-START CHECKLIST

Before starting the unit, be sure that the following items have been completed.

- ❑ Check that the unit physical installation (ducting, piping, etc.) is in accordance with the recommendations of the Installation section.
- ❑ Verify electrical power and control connections are in accordance with local and NEC codes. Check for proper power supply and a properly sized and installed fused disconnect switch located within sight of the PoolComPak unit.
- ❑ Ensure that proper pool water flow and pressure are available. Check the water flow direction into and out of the unit. Make sure that the PoolComPak unit is down line from the filter and up line from the chemical feed system.
- ❑ Check that the condensate drain is connected. If returning condensate to the pool, ensure that this practice is in compliance with local codes. Make sure that the condensate is filtered prior to returning to the pool.
- ❑ Check that the overflow drain is connected independent of the condensate drain. If returning the overflow to the pool, ensure that this practice is in compliance with local codes. Make sure that the overflow is filtered prior to returning to the pool.
- ❑ Ensure that the space air temperature of the pool enclosure is not lower than 72°F, and the temperature of the pool water is at least 70°F.
- ❑ If the PoolComPak unit is equipped with the auxiliary air cooled condenser option, ensure that it has been correctly wired and piped and that the control wiring has been connected between the PoolComPak and the PAC

unit. See PAC Installation, "PAC Air Cooled Condenser" for installation recommendations.

- ❑ If the PoolComPak unit is equipped with the auxiliary water cooled condenser A/C option, ensure that proper water flow and temperature are available. Check the water flow direction into and out of the unit.
- ❑ Verify all electrical connections with the field wiring diagram shown in the figure on page 52. Check all connections to be sure they are tight.
- ❑ Check to be sure that all packaging materials have been removed from the unit.
- ❑ Make sure that the fan belt(s) are tight and the fan scroll turns freely in the blower housing.
- ❑ Complete Section 1 on the PoolComPak Warranty Registration and Start-up Log sheet found on page 80.

START-UP

1. After making sure that all personnel are clear of the unit and the water flow to the unit is OFF, turn on the electrical power supply. The control panel will briefly sound a buzzer and the display will come on. On three phase units with power protection modules, if the control panel does not come on, check to see if the red trip light on the protection module is lit. If it is, turn off the power to the unit, reverse any two of the power leads, and reapply power. The blower motor will start approximately one minute after power is applied. For three phase units without power protection modules, when the blower motor starts, verify that it is rotating in the proper direction. If it is backwards, turn off power to the unit, reverse any two of the power leads, and reapply power.
2. After the blower is running in the correct direction, replace the access panel on the blower compartment and measure the current draw of the motor. Make sure that it does not exceed the FLA value listed on the motor's nameplate. Record the current value(s) on the start-up log sheet. If the value is too high, the static pressure in the supply duct may be too low and the motor pulley will need to be adjusted. If the value is too low, the pulley will also need to be adjusted.
3. The display on the control panel will be rotating through the three main screens. Check the displayed values for the space temperature and relative humidity against values measured with an accurate thermometer and hygrometer. If they differ, use the sensor offset procedure described on page XX to correct the readings on the TD-3000. If the PoolComPak unit includes the economizer option, also calibrate the outside air temperature sensor reading at this time.
4. Press the **III** button on the control panel. Compare the surface temperature reading to the temperature of the surface, measured with an accurate thermometer. If necessary, adjust the offset value in the TD-3000.
5. Press the **I** button. Enter the password 0005. Use the down arrow key to change to the manual mode screen. When the screen is displayed, press the II button to move the cursor to the "OFF" field. Press the down arrow key and then press enter. The blower motor will now shut off and the screen will display output values that can be controlled individually. To energize a specific output, follow the directions in the section titled Manual Mode on page 67. Use this method to verify operation of the auxiliary air and water heating systems and the remote auxiliary air cooled condenser if so equipped. Also verify operation of the economizer system, if present.
6. Verify operation of the compressor's crankcase heater by measuring the current draw. The AC amperage should be greater than 0.1 Amp.

NOTE: The crankcase heater must be in continuous operationfor at least 24 hours before continuing with step 7.

7. Disconnect power from the PoolComPak unit. Re-tension the blower belt. Turn on the pool water supply to the unit. Use valves in the water line to set the flow rate to the range called out on the PoolComPak unit's data plate. After correct water flow has been established, reapply power to the unit.

NOTE: Excessive flow rate can erode the pool water condenser.

8. Set the humidity set point to 45% and the air temperature set point to 2°F above the current temperature in the

space. Set the pool water temperature set point to 104°F. This should cause the unit to run in water heating mode. The compressor will start approximately six minutes after power is applied to the unit. Measure the current draw of the compressor. It should be less than the RLA value listed on the PCP unit data plate. Record the current value(s) in Section 2 of the start-up log sheet. Also measure the voltage at the unit's power connections and record on the start-up log sheet. Allow the compressor to run for ten minutes. Record the performance data in Section 3 of the start-up log sheet under the column labeled Water Heating. The sight glass is located above the electrical box inside the PCP unit.

9. Change the water temperature set point to 70°F. This should cause the unit to change to air heating mode. The supply air temperature should increase several degrees after a minute or two. Allow the compressor to run another ten minutes. Record the performance data in Section 3 of the start-up log sheet under the column labeled Air Heating.
10. If the unit is equipped with an auxiliary air-cooled condenser, change the air temperature set point to 75°F. The unit should change from air heating mode to air cooling mode. Check to be sure that the remote air cooled condenser fan is running or that water is flowing through the auxiliary water cooled condenser. The temperature of the supply air from the PCP unit should drop after a minute or two. Allow the unit to run for at least ten minutes in this mode. Record the performance data in Section 3 of the start-up log sheet under the column labeled Air Cooling.
11. If the unit is equipped with an auxiliary A/C condenser, change the water temperature set point to 104°F. This should cause the unit to change to air cooling and water heating mode. Allow the unit to run in this mode for at least ten minutes. Record the performance data on the start-up log sheet in Section 3 under the column labeled Air Cooling and Water Heating. Complete Section 4 of the start-up log sheet noting any unusual occurrences in the comments section and return it to PoolPak International.
12. Place the control panel back on the wall if it was removed during start-up. It is not necessary to disconnect power from the unit before unplugging the control panel.
13. Adjust the air temperature, relative humidity, and water temperature set points to the design values.
14. The start-up procedure is now complete and the unit is fully operational.
15. Return Warranty Registration & Start-Up Report to:

    PoolPak International
    Attn: Service Department
    P.O. Box 3331
    York PA 17402.
    Or fax to (717) 757-5085.

All warranty rights are jeopardized if the Warranty Registration & Start-Up Report is not received within 10 days of start-up date.

NETWORKED UNIT - START-UP

1. Ensure that all units are powered off. Complete the Unit Start-Up-Pre-Start-Up Checklist for each unit first.
2. Check the network cable connections and ensure that they are made in accordance with the figure found on page 92 in this manual.
3. Perform the Start-up procedure in the Unit-Start-Up Section for unit 1. Connect the control panel directly to the unit being started. Ensure that power to the other units is off during this procedure.
4. Repeat step 3 for all units in the network, one at a time.
5. Apply power to all units in the network. Check the network status screens to make sure that all units are properly connected to the network and communicating with each other. It may take up to 30 seconds for the units to locate each other on the network.
6. Use button **V** on the control panel to select unit 1. It should be acting in the master role. The light next to the

set point buttons indicate this.

7. Check the system set points and adjust to design conditions as necessary.
8. Adjust the network configuration parameter as necessary. See the CONFIGURATION section on page 60 of this manual for more information.
9. Check to see that all units are operating in the same mode. The compressors will remain off for the first six minutes after power is applied. Because dehumidification can be broken into two stages, it is possible that not all compressors will run simultaneously.
10. Return the control panel to the permanent mounting location.
11. The PoolComPak TD-3000 network is now fully operational.

MAINTENANCE

Periodic routine maintenance will promote extended equipment life. While PoolComPak units use components that are usually maintenance free and do not require service, a simple check could result in noticing possible problems before they develop into major problems.

Daily Maintenance

- Pool water chemistry is a part of daily maintenance and it is recommended to follow National Spa and Pool Institute standards. PoolPak International strongly recommends following the enclosed table on page 75 per National Spa and Pool Institute values.
- PoolPak International recommends daily logging of your pool water chemistry. MAINTENANCE AND YOUR POOL WATER CHEMISTRY IS IMPORTANT TO PROTECT YOUR WARRANTY RIGHTS.

Monthly Maintenance

- Air Filters, inspect and replace or clean as applicable. Dirty filters restrict air flow and can cause improper unit operation.
- Ensure that the condensate collection pan is draining properly and the condensate is not overflowing or being drawn into the supply air stream. Check the condensate and overflow lines to ensure that neither are clogged.
- Check the operation of the blower motor and scroll. Ensure that the scroll does not rub the housing. Check for proper belt tension. Worn or cracked belts should be replaced. Check fan and mounting brackets for tightness.
- Ensure that the ALARM light is not illuminated.

Annual Maintenance

- Inspect the refrigeration and water circuits for leaks, wear or corrosion. Corrosion on the water piping or condenser may indicate poor pool chemical maintenance and improper chlorine and pH levels.
- Check operation of TD-3000 semi-annually.
- Check electrical components for loose wiring.
- Although the exterior of the PoolComPak units are powder coated, wipe down unit periodically, particularly if installed in an area subject to dirt or chemical concentration.
- Wash, brush, or vacuum the evaporator and air condenser coils. This will ensure proper heat transfer and reduce static pressure losses. Caution should be taken not to wet electrical components inside the unit.

If service and inspections are not performed by a competent and experienced service firm, the manufacturer warranty may be voided.

	POOL			SPA		
	IDEAL	MIN.	MAX.	IDEAL	MIN.	MAX.
Total Chlorine	1.0 – 3.0	1.0	3.0	3.0 – 5.0	1.0	10.0
Free Chlorine (ppm)	1.0 – 3.0	1.0	3.0	3.0 – 5.0	1.0	10.0
Combined Chlorine (ppm)	0.0	0.0	0.2	0.0	0.0	0.2
Bromine (ppm) *if applicable*	2.0 – 4.0	2.0	4.0	3.0 – 5.0	2.0	10.0
PH	7.4 – 7.6	7.2	7.8	7.4 – 7.6	7.2	7.8
Total Alkalinity	80 – 100	60	180	80 – 100	60	180
TDS	1000 - 2000	300	3000	1000 - 2000	300	3000
Calcium Hardness (ppm)	200 - 400	150	1000	200 – 400	150	1000
Calcium Acid (ppm)	30 –50	10	100	30 – 50	10	100

Recommended values per National Spa & Pool Institute

TROUBLESHOOTING

When properly installed according to the instructions in this manual, the PoolComPak unit with a TD-3000 controller will perform as designed and provide a pool environment that is both comfortable and cost effective. However, in the unlikely event that the system does not function properly, the TD-3000 has many features that will help a service technician resolve the issue.

The PCP unit has numerous safety devices designed to protect the system from failures. The compressor will shut down whenever a high refrigerant pressure, low refrigerant pressure, high motor temperature (scroll compressor models), or evaporator coil freeze-up occurs. Additionally, the compressor and fan will be shut down whenever a fire detection system alerts the PCP unit that a fire trip mode of operation is required or if a fan motor overload condition is present.

If the PoolComPak's compressor will not operate upon start-up or troubleshooting and there are no alarm conditions, check to see that the actual dew point temperature is not below the dew point temperature set point. The dew point temperature and dew point temperature set point is displayed under service key III. The compressor will only run after the dew point temperature rises above the dew point temperature set point. This is usually achieved by a rise in the air temperature. The compressor will not operate unless these dew point conditions are satisfied. Normally a rise in the air temperature will bring the dew point above the dew point set point. The rise in air temperature is achieved by energizing the auxiliary air heat circuit.

Whenever a fault condition occurs, the alarm button will glow red and the control panel will display the fault condition and a recommended course of action. If the fault is a high pressure, low pressure, or defrost, the TD-3000 will display a three digit number representing the status of the A/C solenoid, reheat solenoid and bypass solenoid at the time of the fault. In the table below, a 1 indicates ON and a 0 indicates OFF.

A/C SOLENOID	REHEAT SOLENOID	BYPASS SOLENOID
1	0	0
1	0	1
0	1	0
0	1	1

After 10 faults occur, the controller will lockout the compressor to prevent it from being damaged. Repeated high pressure, low pressure, high motor temperature, or defrost trips can cause the compressor motor to fail. When any of these conditions are present, the problem must be diagnosed and corrected immediately. Faults caused by fire trips are not counted in the 10 fault lockout protection. If the space relative humidity is greater than the humidity set point but the compressor is not operating, and the TD-3000 control panel reads that the unit is calling for dehumidification, make sure the PoolComPak has sufficient water flow. The TD-3000 will lock out the compressor if the unit does not have sufficient water flow.

After a fault condition has been eliminated, the control panel alarm light will remain lit. However, the alarm will no longer be shown during normal screen rotation. Pressing the **alarm** key will show any faults that have occurred since the alarm light was reset. To reset the alarm light, press and hold the **VI** key and then press the alarm key. If there are currently no fault conditions, the alarm light will go off. The alarm contact closure output of the controller operates in conjunction with the alarm light on the control panel.

Fault conditions detected by the TD-3000 are displayed as the following:

- COMPRESS HI PRESSURE - indicates that the compressor was shut down due to high refrigerant pressure when the pressure rises above 395 PSIG. See the Troubleshooting Guide on pages 78-79 for possible causes and solutions. The TD-3000 will restart the compressor five minutes after the fault occurred.
- COMPRESS LO PRESSURE - indicates that the compressor was shut down due to low refrigerant pressure when the pressure falls below 10 PSIG. See the Troubleshooting Guide on page 78 for possible causes and solutions. The TD-3000 will restart the compressor five minutes after the fault occurred.
- EEPROM FAILURE - indicates that a problem with the TD-3000 has been detected through self diagnostics. The PCP unit will be shut down if this fault occurs. Contact a qualified service provider to correct the problem.
- FIRE TRIP - indicates that the TD-3000 has received an alarm signal from the building fire control system. The PCP unit will be shut down as long as the alarm signal is present. When the signal is cleared, the unit will resume normal operation.
- SENSOR FAILURE - indicates that a sensor attached to the TD-3000 has failed. Depending on which sensor has failed, some functions of the PCP unit may be disabled until the sensor is repaired. This alarm screen will show the status of several sensors. An example is illustrated below.

```
      ^ SENSOR FAILURE ^
SPACE TEMP              > OK
POOL WTR TEMP           > FAIL
OUTSIDE AIR             > OK
```

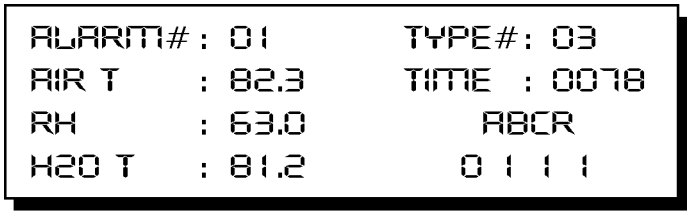
- COMPRESSOR MOTOR THERMAL OVERLOAD - indicates that the compressor protection module has detected a high motor winding temperature in the compressor. The TD-3000 will shut down the compressor until the protection module resets. See the Troubleshooting Guide on pages 78-79 for causes and solutions. (Scroll compressors only).
- 10 FAULT LOCKOUT - indicates that 10 faults have occurred since the unit was powered up. Faults included in this count are high pressure, low pressure, thermal overload, and defrost. The TD-3000 will lock out the compressor to protect it from damage caused by a recurring fault condition. Contact a qualified service provider to correct the problem.
- FAN OVERLOAD - indicates that the fan starter overload has tripped. The TD-3000 will shut down the PCP unit when this fault occurs. The fan starter must be reset manually, after which the unit will resume normal operation. See the Troubleshooting Guide on pages 78-79 for causes and solutions.
- DEFROST TRIP ACTIVE - indicates that the defrost thermostat is open (opens at 30° F). The TD-3000 will shut down the compressor when this fault occurs. The unit will resume normal operation after the thermostat closes (closes at 40° F). See the Troubleshooting Guide on pages 78-79 for causes and solutions.

ENHANCED ALARM HISTORY

The TD-3000 includes an alarm history log. This allows a service technician to better assess any problem with the system. The history function takes a snapshot of space conditions and unit status when an alarm occurs. The controller will store this information for the 10 most recent alarms. Information stored includes the following:

- Type of alarm
- Time of occurrence on unit clock
- AC solenoid status
- Bypass solenoid status
- Compressor status
- Reheat solenoid status
- Space temperature
- Space relative humidity
- Water temperature

To access the alarm history log, press button **III** on the control panel. Use the up or down key to select the history screen. An illustration of the screen is shown below.



The last ten alarms are stored as alarm numbers one through ten. Alarm one is the most recent and ten is the oldest. To select an alarm number press the **II** button to move the cursor to the alarm number field. Use the up or down keys to change the number and then press enter. The screen displays the alarm **TYPE** as a number. This number can be decoded as follows:

1. Low Water Flow
2. Defrost
3. High Pressure
4. Low Pressure
5. Fire Alarm Active
6. Fan Motor Overload
7. Compressor Motor Thermal Protector
8. Return Air Temperature Sensor Failure
9. Return Air Relative Humidity Sensor Failure
10. Water Temperature Sensor Failure
11. Outside Air Temperature Sensor Failure
12. Surface Temperature Sensor Failure
13. 10 Fault Lockout Activated
14. Problem with TD-3000 detected by internal diagnostics

The time of the alarm is displayed under the alarm type. This is the value of the controller's clock when the alarm occurs. It is expressed in hours since power was last applied to the unit. The air temperature, relative humidity, and water temperature are displayed in Fahrenheit. The status of the AC solenoid, Bypass solenoid,

Compressor, and Reheat Solenoid are displayed as a zero or one beneath letter in the lower right corner of the screen.

A " AC solenoid
B " Bypass solenoid
C " Compressor
R " Reheat solenoid.

A/C Solenoid	ReHeat Solenoid	ByPass Solenoid
1	0	0
1	0	1
0	1	0
0	1	1

Troubleshooting Guide - Networked Units

SYMPTOM	CAUSE	SOLUTION
Not all units shown as present on network status screen.	1. Unit is not properly connected to network. 2. Unit is not powered on.	1. Correct the network connection. 2. Apply power to all units.
Unit not available at the control panel.	1. Unit is not properly connected to network. 2. Unit is not powered on.	1. Correct the network connection. 2. Apply power to all units.
Units working against each other (#1-heat, #2-cool, etc.)	1. Network Control parameter set to **NO** on some units. 2. Unit is not properly connected to the network.	1. Set Network Control to **YES** for units that are to operate together. 2. Correct the network connection.
All compressors are off and the space conditions are not close to the setpoints.	1. All units are powered off. 2. All units have uncleared alarm conditions.	1. Apply power to all units. 2. Determine and correct the cause of the alarm and then clear alarms in the units.

Troubleshooting Guide

SYMPTOM		CAUSE	SOLUTION
Fan Off Compressor Off	No Display On Terminal Unit	1. Main power disconnect open. 2. Blown main power fuse. 3. Tripped circuit breaker. 4. No 24 VAC output from transformer T2.	1. Turn disconnect **ON**. 2. Replace blown fuse. 3. Reset circuit breaker. 4. Isolate and correct problem.
Fan On Compressor On or Off	No Display On Terminal Unit	1. Cable between PoolComPak and terminal unit is disconnected or damaged.	1. Check cable connection.
Fan Off Compressor Off	Display shows: Fan Overload	1. Adjustable fan pulley incorrectly adjusted. 2. Very low static pressure on supply duct. 3. Fuse FU3 blown. 4. Fuse FU1 & FU2 blown.	1. Adjust pulley to lower current. 2. Connect duct if not connected; correct low static pressure. 3. Replace fuse. 4. Replace fuses.
Fan Off Compressor Off	Display shows: Fire Trip	1. Fire/Smoke detection system indicates an alarm condition.	1. System will automatically reset when alarm condition clears.
Fan On Compressor Off	Display shows: Compress Hi Pressure Trip code 010 or 011	1. Fan belt off or loose. 2. Obstruction in supply duct. 3. Excessive refrigerant in system. 4. Non-condensibles in system. 5. Reheat solenoid not opening.	1. Replace or tighten fan belt. 2. Remove duct obstruction. 3. Remove charge to proper amount. 4. Recover, evacuate and charge system. 5. Repair reheat solenoid.
Fan On Compressor Off	Display shows: Compress Hi Pressure Trip code 100 or 101	1. A/C condenser power off. 2. A/C condenser fan blocked. 3. Excessive refrigerant charge. 4. Non-condensibles in system. 5. A/C solenoid not opening.	1. Restore power to A/C condenser 2. Remove blockage. 3. Remove charge to proper amount. 4. Recover, evacuate and charge system. 5. Repair A/C solenoid.
Fan On Compressor Off	Display shows: Compress Lo Pressure Trip code 100 or 101	1. Fan belt off or loose. 2. Dirty air filter. 3. Obstruction in return duct. 4. Plugged filter drier. 5. TXV valve malfunctioning.	1. Replace or tighten fan belt. 2. Replace air filter. 3. Remove duct obstruction. 4. Replace filter drier. 5. Replace TXV valve.
Fan On Compressor Off	Key VI displays: Water Flow Low	1. Pool water circulation pump off 2. Pool water filter dirty 3. Valve in wrong position	1. Turn on pump 2. Backwash filter 3. Restore valve to proper position
Fan On Compressor Off	Display shows: Defrost Trip Active	1. Dirty air filter 2. Ambient air temp below 75°F 3. Low refrigerant charge 4. Not enough return air	1. Replace air filter 2. Heat space with auxiliary heat 3. Properly charge system 4. Adjust air flow to unit
Fan On Compressor Off (Scroll Compressor Only)	Display shows: Compressor Motor Thermal Overload	1. Low refrigerant charge 2. Plugged filter drier 3. Defective thermal overload 4. Defective compressor	1. Properly charge system 2. Replace filter drier 3. Replace thermal overload module 4. Replace compressor

WARRANTY REGISTRATION AND START-UP LOG SHEET

PoolComPak AWH/HCDH Series with the TD-3000 Controller

NOTE: Warranty void if not completed and returned to PoolPak International immediately following start-up.

Section 1: Site Information

Job Name: _____

Address: _____ City: _____ State: _____ Zip: _____

Model #: _____ Serial #: _____

Compressor Serial #: _____ A/C Condenser Model #: _____ Serial #: _____

Fresh Air Intake Percent Open: _____ % Are Pool Chemicals stored near unit? Yes No

Pipe Length from Unit to Condenser: _____ ft. Line Size: Vapor: _____ Liquid: _____

Auxiliary Air Cooled Condenser Location: Above PCP Unit Below PCP Unit Same Height

Return to: Service Department
PoolPak International
P.O. Box 3452
York, PA 17402 Or **Fax to: ATTN: Service Department** (717) 757-5085

Section 2: Power

	L1 – L2	L2 – L3	L1 – L3	Nameplate
Unit Voltage:	_____ V	_____ V	_____ V	_____ V
Compr Current:	_____ A	_____ A	_____ A	_____ A
Blower Current:	_____ A	_____ A	_____ A	_____ A

Section 3: Performance Data

Note: To obtain accurate readings, a delay of ten minutes is required between every mode of operation or adjustment.

		Water Heating	Air Heating	Air Cooling	Air Cooling & Pool Heating	Comments
Return Air Temperature	°F					
Supply Air Temperature	°F					
Space Relative Humidity	%					
Pool Water Temperature	°F					
Bulb Temperature TX Value	°F					
Compressor Discharge Temp.	°F					
Compressor Suction Temp.	°F					
Discharge Pressure	PSIG					
Suction Pressure	PSIG					
Sight Glass Clear	(Y/N)					

Comments: _____

_____

_____

_____

Company Name: _____

Telephone: (_____) _____ Ext: _____

Fax: (_____) _____

Technician: _____ Date: _____

PoolComPak TD-3000 Operating Logsheet

For increased troubleshooting support, fill out this logsheet and fax to PoolPak International Service Department. Fax: (717) 757-5085 with the following information:

Name: _____ Ph: _____

Job Name: _____ Fax: _____

Model #: _____ SN: _____

ALARM STATUS: Press the alarm key to view the alarm status.

Write down all alarm codes and corresponding three 0 or 1 digit codes in the space provided.

_____

_____

_____

_____

_____

_____

_____

SETPOINTS:

Air Temperature: _____ Water Temperature: _____

Air Relative Humidity: _____

SERVICE KEY I: Arrow Up to Password 0005 and Press Enter. Arrow Down through and record the following:

Select units for displayed temp. and set points	_____ Fahrenheit	_____ Centigrade
Enter the minimum outside air temp. for economizer		_____
Is the economizer option installed?	Yes	No
Enter economizer offset value		_____
Enter the deadband value for dewpoint control in degrees		_____
Enter the deadband value for air heating in degrees		_____
Enter the deadband value for water heating in degrees		_____
Enter the deadband value for auxiliary water heating in degrees		_____
Compressor anti-cycle timer		_____ Min.
Enter the number of degrees below setpoint to activate the aux. water heater		_____
Enter the offset between aux heat stage 1 and stage 2		_____
Set the fire trip to be active on open or close	Open	Close
Manual Mode	On	Off

MANUAL CONTROL:

Reheat _____ Bypass _____

Rm Cnd _____ AC Sol _____ Vnt _____

Aux Air _____ Aux Wtr _____

Offsets:

Air Temperature _____ Space RH _____

Water Temperature _____ Outside Temperature _____

Surface Temperature _____

Enable Network Control Yes No

SERVICE KEY III: Arrow Down

Temperatures:

Surface _____ °F Dewpoint _____ °F Dewpoint Setpoint _____ °F

Run Hours:

Compressor _____

Fan _____

Air Conditioning _____

Auxiliary Air Heating _____

Auxiliary Water Heating _____

Faults Since Power up:

Alarm #:	**1**	Type #: _____	Alarm #:	**2**	Type #: _____
Air T:	_____	Time: _____	Air T:	_____	Time: _____
RH:	_____	A B C R _____	RH:	_____	A B C R _____
H2O T:	_____		H2O T:	_____	

Press the "ENTER" key once. The cursor will flash below the alarm#. Press the up arrow once to raise the number. Press the "ENTER" key again and record the information. (Repeat this process for each fault.)

Alarm #:	**3**	Type #: _____	Alarm #:	**4**	Type #: _____
Air T:	_____	Time: _____	Air T:	_____	Time: _____
RH:	_____	A B C R _____	RH:	_____	A B C R _____
H2O T:	_____		H2O T:	_____	

Alarm #:	**5**	Type #: _____	Alarm #:	**6**	Type #: _____
Air T:	_____	Time: _____	Air T:	_____	Time: _____
RH:	_____	A B C R _____	RH:	_____	A B C R _____
H2O T:	_____		H2O T:	_____	

AC Proof Status: Proven Not Proven

Purge Mode Status: On Off

SERVICE KEY VI: Arrow Down

Space Temperature: _____ °F

Space Relative Humidity _____ %

Space Dewpoint _____ °F

Outside Temperature _____ °F

Water Heating Yes No

Auxiliary Water Heating	Yes	No
Water Flow	Yes	No
Water Temp	_____ °F	
Space Heating	Yes	No
Auxiliary Air Heating	Yes	No
Dehumidify	Yes	No
Economizer Mode	Yes	No

SERVICE KEY IV: Arrow Up and Enter Password 0775. Arrow Down through and record the following:

Is the optional air conditioning installed?	Yes	No
Enable the water heating first options?	Yes	No
Select the type of unit, AWH or HCDH.	AWH	HCDH
Does this unit have a hot gas bypass valve?	Yes	No
Read the analog inouts every _____ seconds.		
Does the unit have a compressor module?	Yes	No
Enable the Fan Overload?	Yes	No

Test Modes:

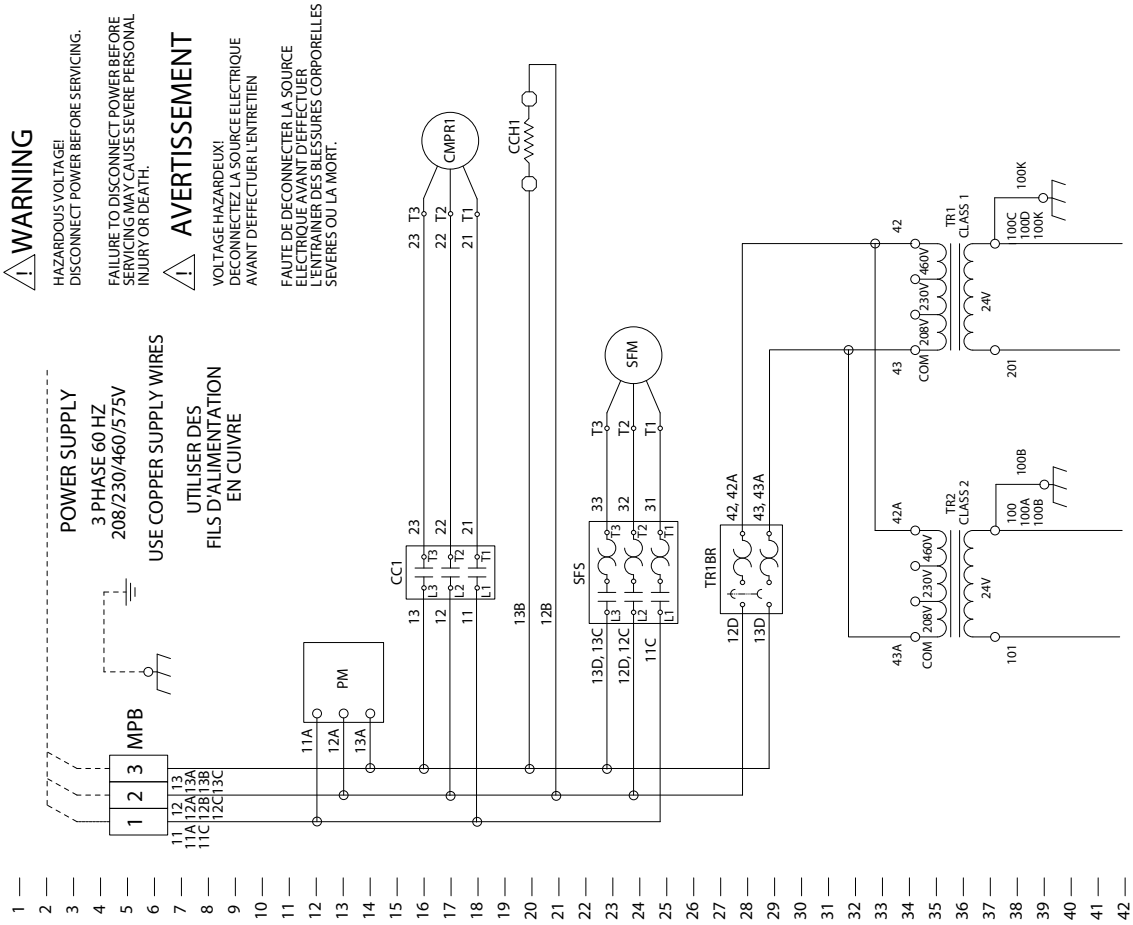
Dehumidification:	On	Off
Air Cooling:	On	Off
Water Heating:	On	Off
Aux. Water Heating:	On	Off
Aux. Air Heating:	On	Off

Cool:

Top Deadband	:_____
Bottom Deadband:	_____
Min. Value:	_____
Max. Value:	_____

Heat:

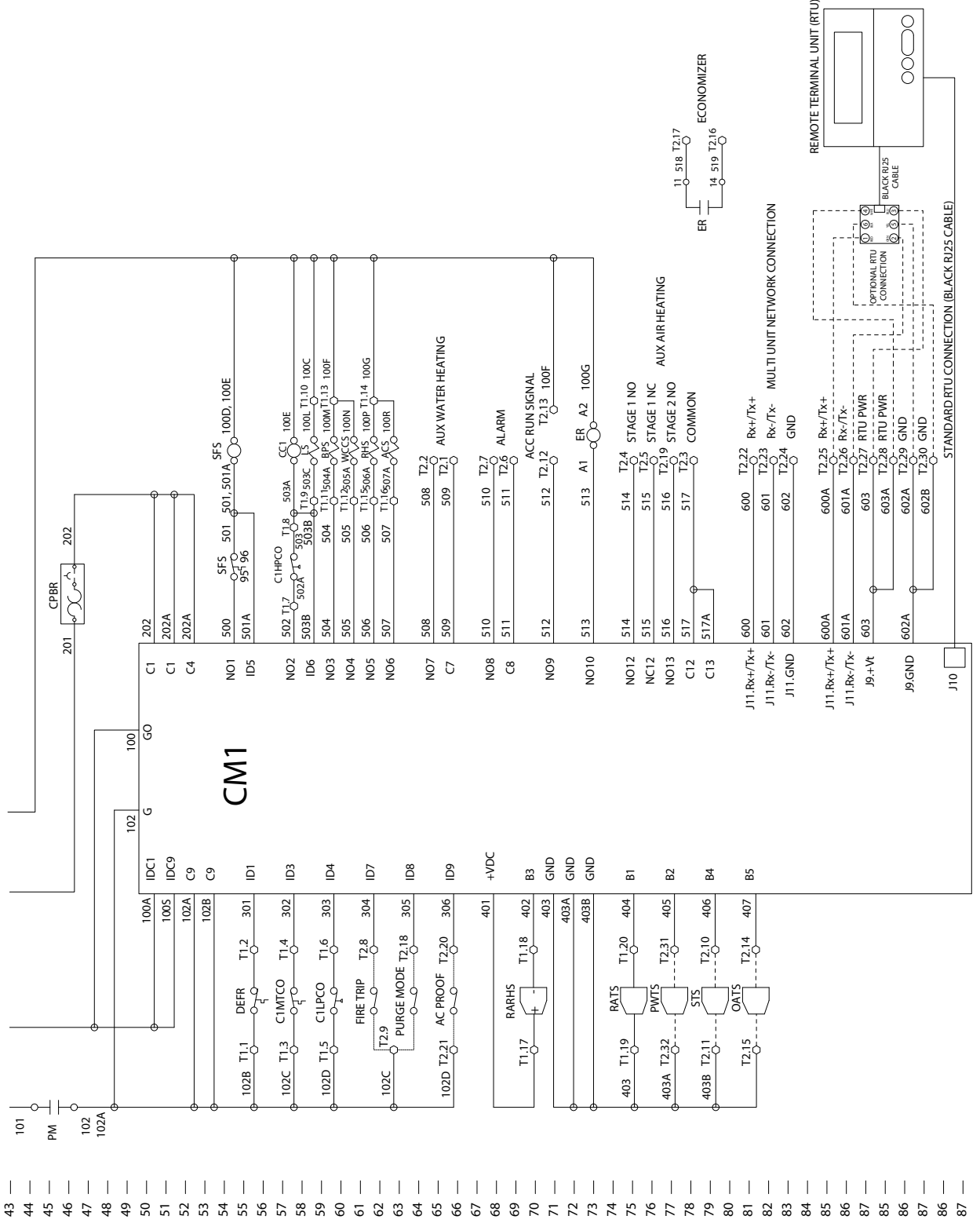
Top Deadband:	_____
Bottom Deadband:	_____
Min. Value:	_____
Max. Value:	_____



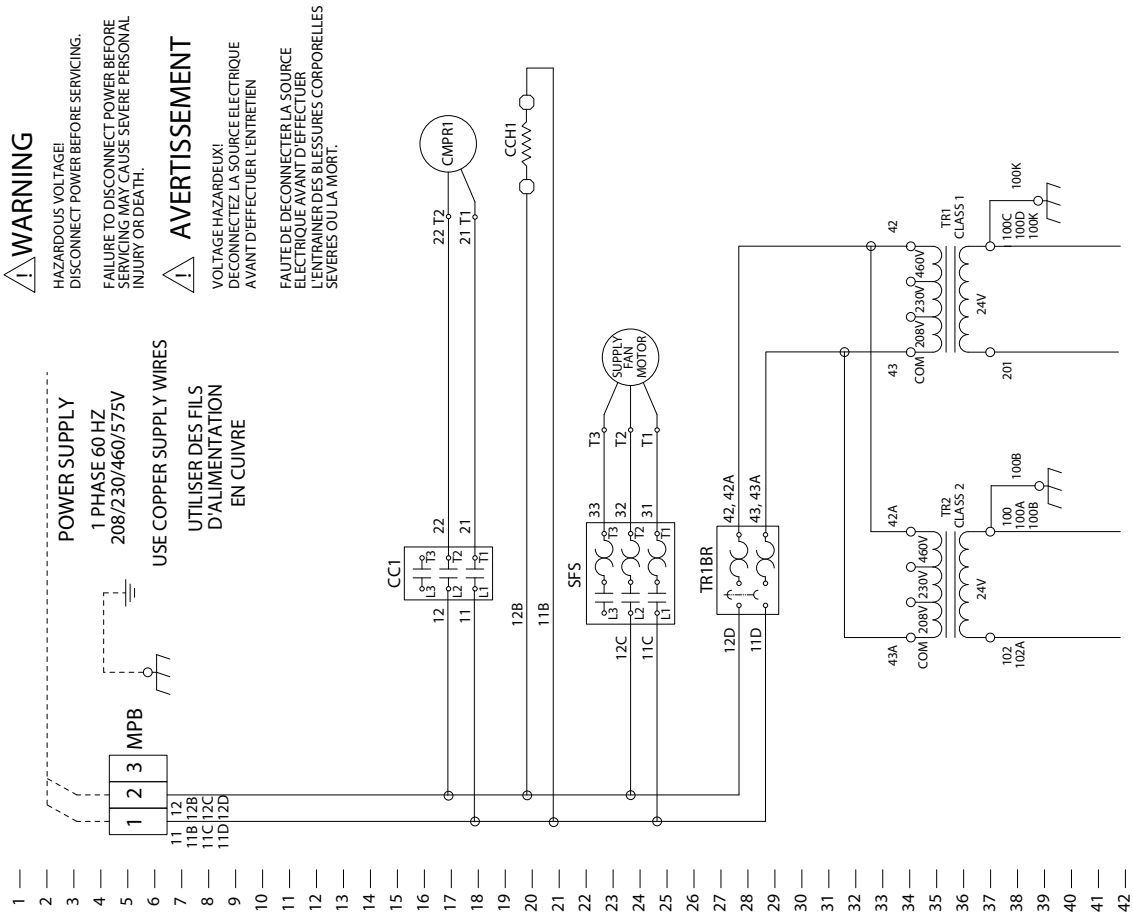
LEGEND		
DEVICE DESIGNATION	DESCRIPTION	LINE NUMBER
ACS	AIR COOLING SOLENOID	62
BPS	BYPASS SOLENOID	59
C1HPCO	CMPR1 HIGH PRESSURE CUTOUT	57
C1LPCO	CMPR1 LOW PRESSURE CUTOUT	59
C1MTCO	CMPR1 MOTOR TEMP CUTOUT	57
CC1	CMPR1 CONTACTOR	16, 57
CCH1	CMPR1 CRANKCASE HEATER	20
CM1	CONTROL MODULE 1	50
CMPR1	COMPRESSOR 1	16
CPBR	CONTROL POWER BREAKER	46
DEFR	DEFROST SWITCH	55
ER	ECONOMIZER RELAY	72, 77
LS	LIQUID SOLENOID	58
MPB	MAIN POWER BLOCK	2
OATS	OUTSIDE AIR TEMP SENSOR	80
PM	PHASE MONITOR	12, 45
PWTS	POOL WATER TEMP SENSOR	76
RARHS	RETURN AIR RH SENSOR	69
RATS	RETURN AIR TEMP SENSOR	74
RHS	REHEAT SOLENOID	61
RTU	REMOTE TERMINAL UNIT	84
SFM	SUPPLY FAN MOTOR	24
SFS	SUPPLY FAN STARTER	23, 54
STS	COLD SURFACE TEMP SENSOR	78
TR1	MAIN CTL TRANSFORMER	35
TR1BR	TR1 PRIMARY CIRCUIT BREAKER	28
TR2	CONTROL MODULE TRANSFORMER	35
WHS	WATER HEATING SOLENOID	60

NOTES:
1. TRANSFORMER PRIMARY CONNECTIONS ARE SHOWN FOR FOR 460V. REFER TO DIAGRAM ON TRANSFORMER FOR PROPER CONNECTION OF OTHER VOLTAGES.

Wiring—Three Phase PoolComPak with TD-3000 Control



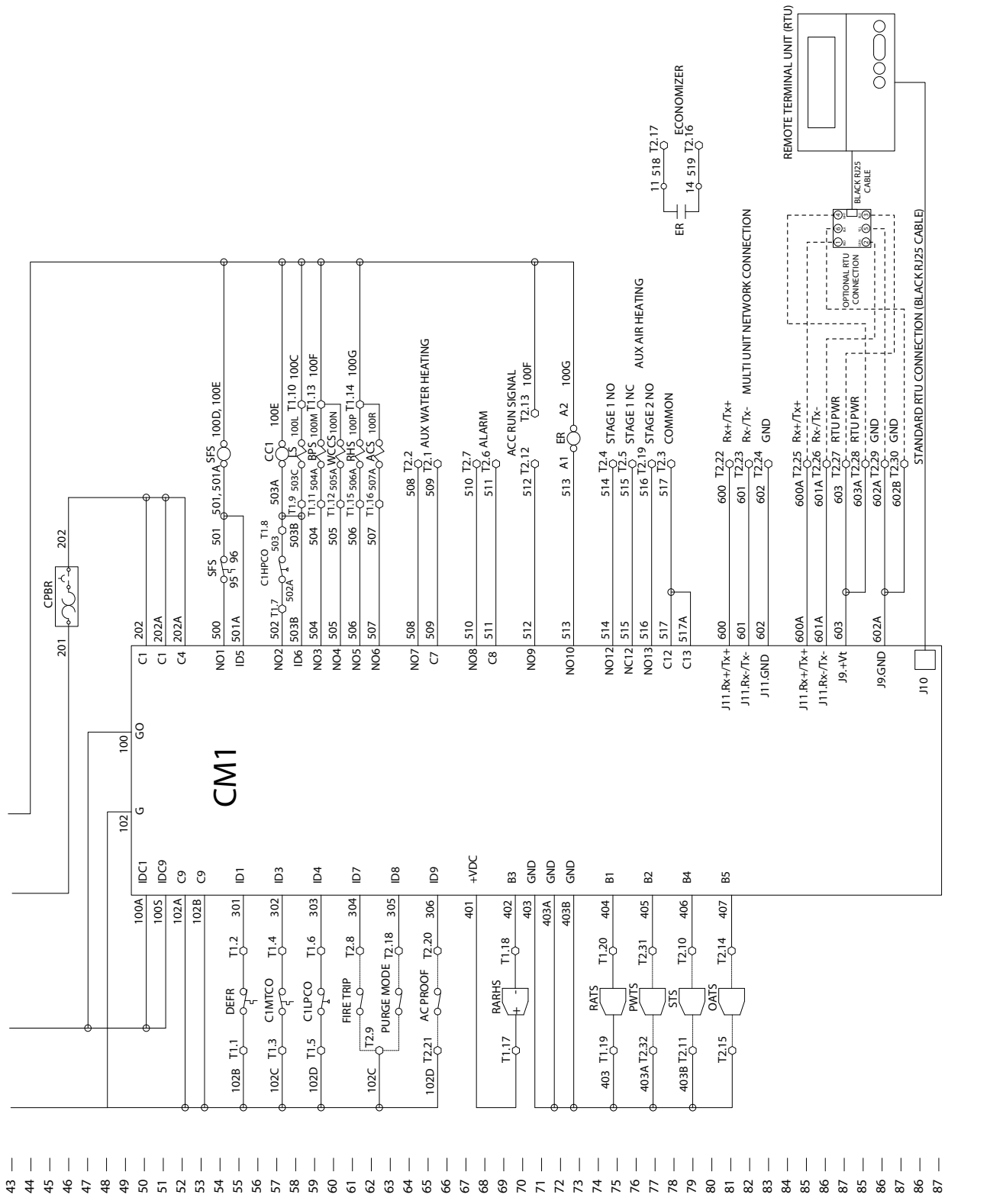
Wiring—Three Phase PoolComPak with TD-3000 Control



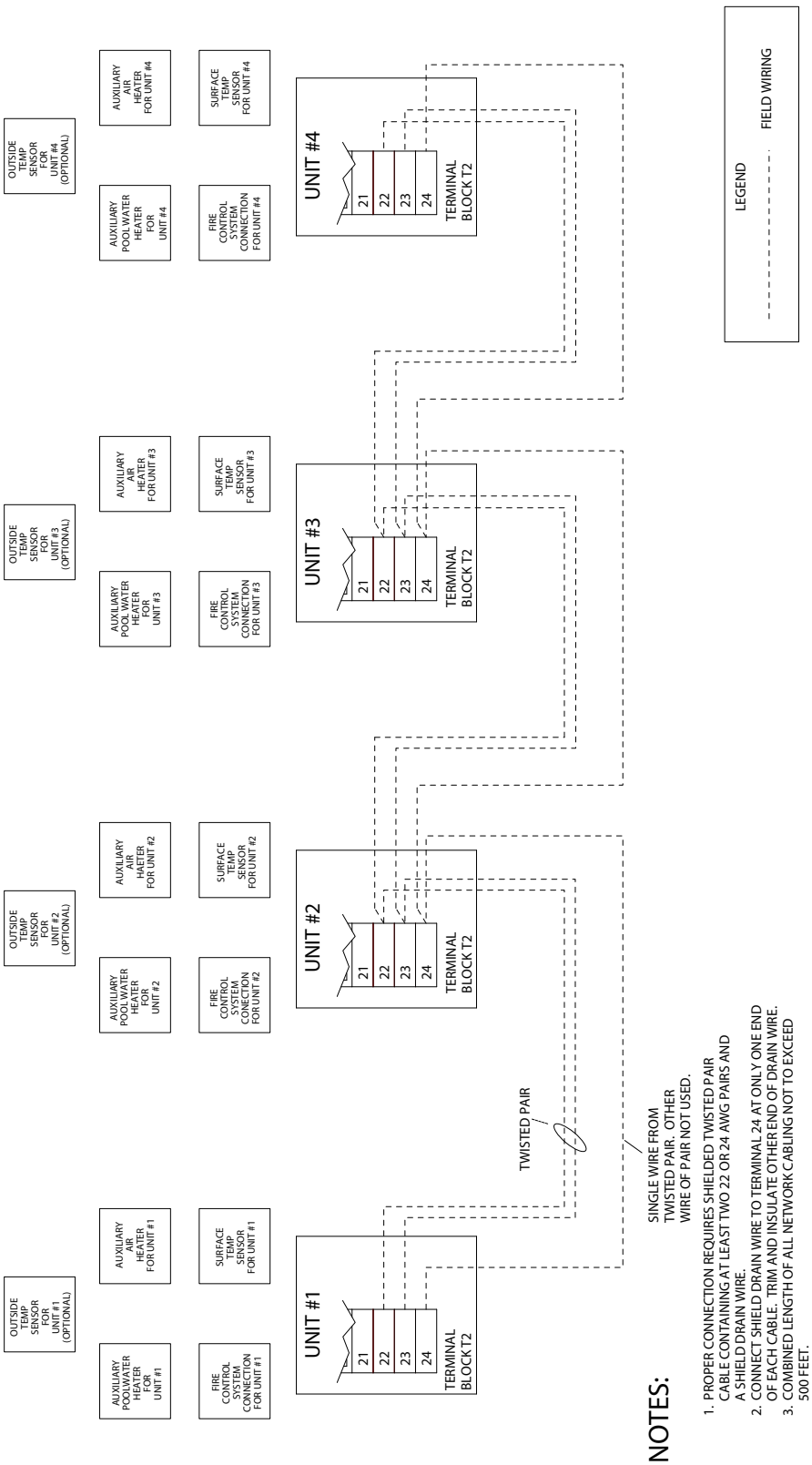
LEGEND		
DEVICE DESIGNATION	DESCRIPTION	LINE NUMBER
ACS	AIR COOLING SOLENOID	62
BPS	BYPASS SOLENOID	59
C1HPCO	CMPR1 HIGH PRESSURE CUTOUT	57
C1LPCO	CMPR1 LOW PRESSURE CUTOUT	59
C1MTCO	CMPR1 MOTOR TEMP CUTOUT	57
CC1	CMPR1 CONTACTOR	16, 57
CCH1	CMPR1 CRANKCASE HEATER	20
CM1	CONTROL MODULE 1	50
CMPR1	COMPRESSOR 1	16
CPBR	CONTROL POWER BREAKER	46
DEFR	DEFROST SWITCH	55
ER	ECONOMIZER RELAY	72, 77
LS	LIQUID SOLENOID	58
MPB	MAIN POWER BLOCK	2
OATS	OUTSIDE AIR TEMP SENSOR	80
PWTS	POOL WATER TEMP SENSOR	76
RARHS	RETURN AIR RH SENSOR	69
RATS	RETURN AIR TEMP SENSOR	74
RHS	REHEAT SOLENOID	61
RTU	REMOTE TERMINAL UNIT	84
SFM	SUPPLY FAN MOTOR	24
SFS	SUPPLY FAN STARTER	23, 54
STS	COLD SURFACE TEMP SENSOR	78
TR1	MAIN CTL TRANSFORMER	35
TR1BR	TR1 PRIMARY CIRCUIT BREAKER	28
TR2	CONTROL MODULE TRANSFORMER	35
WHS	WATER HEATING SOLENOID	60

NOTES:
1. TRANSFORMER PRIMARY CONNECTIONS ARE SHOWN FOR FOR 460V. REFER TO DIAGRAM ON TRANSFORMER FOR PROPER CONNECTION OF OTHER VOLTAGES.

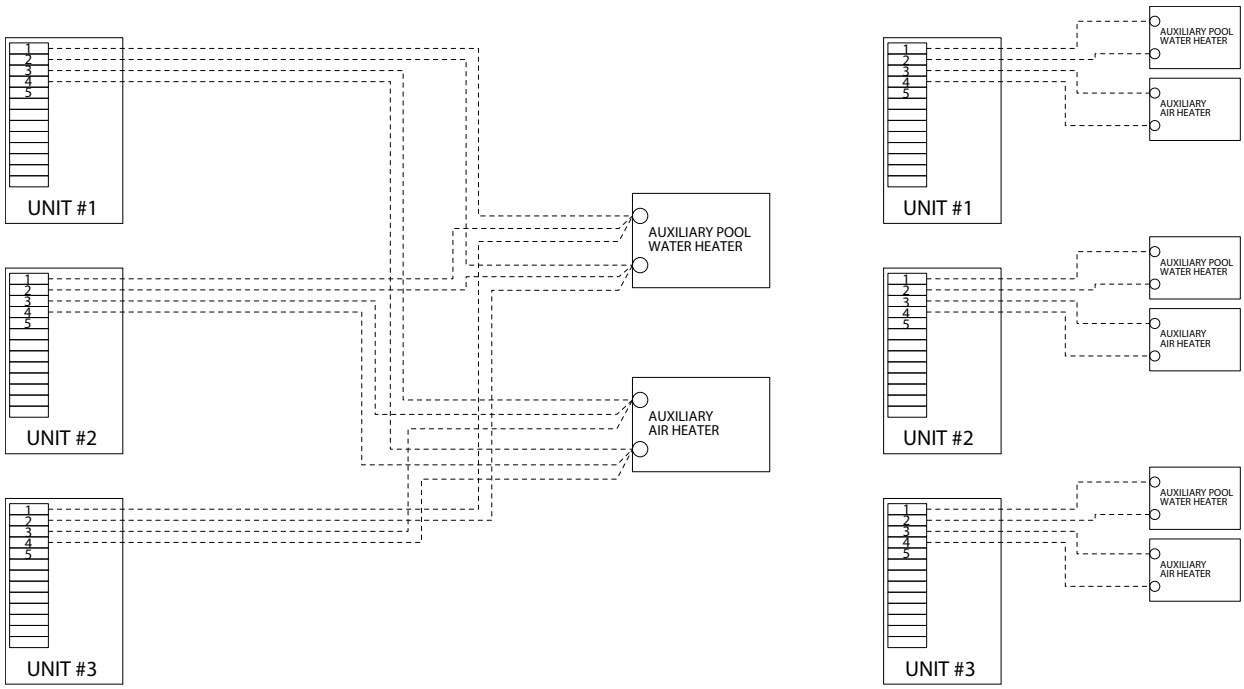
Wiring—Single Phase PoolComPak with TD-3000 Control



Wiring—Single Phase PoolComPak with TD-3000 Control



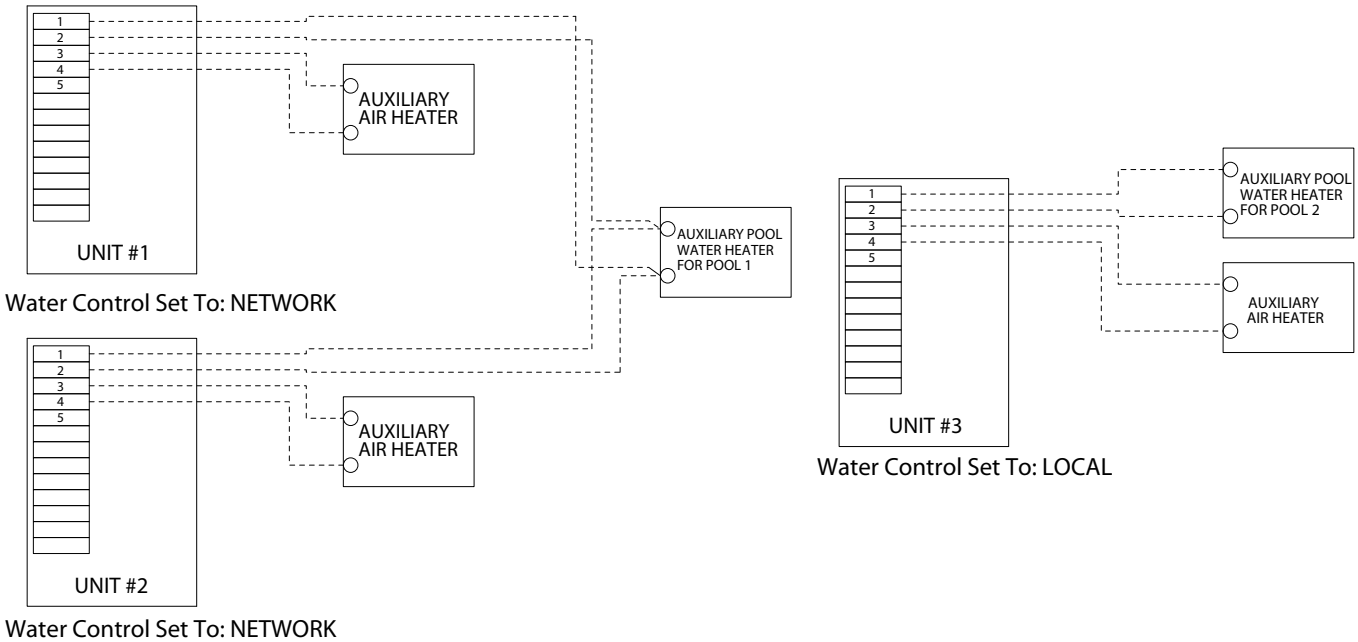
Field Wiring Diagram TD-3000 Networking Connections



SINGLE HEATER FOR ALL UNITS

SEPARATE HEATER FOR EACH UNIT

Auxiliary Air & Pool Water Heater Connections for Multiple Unit Installation

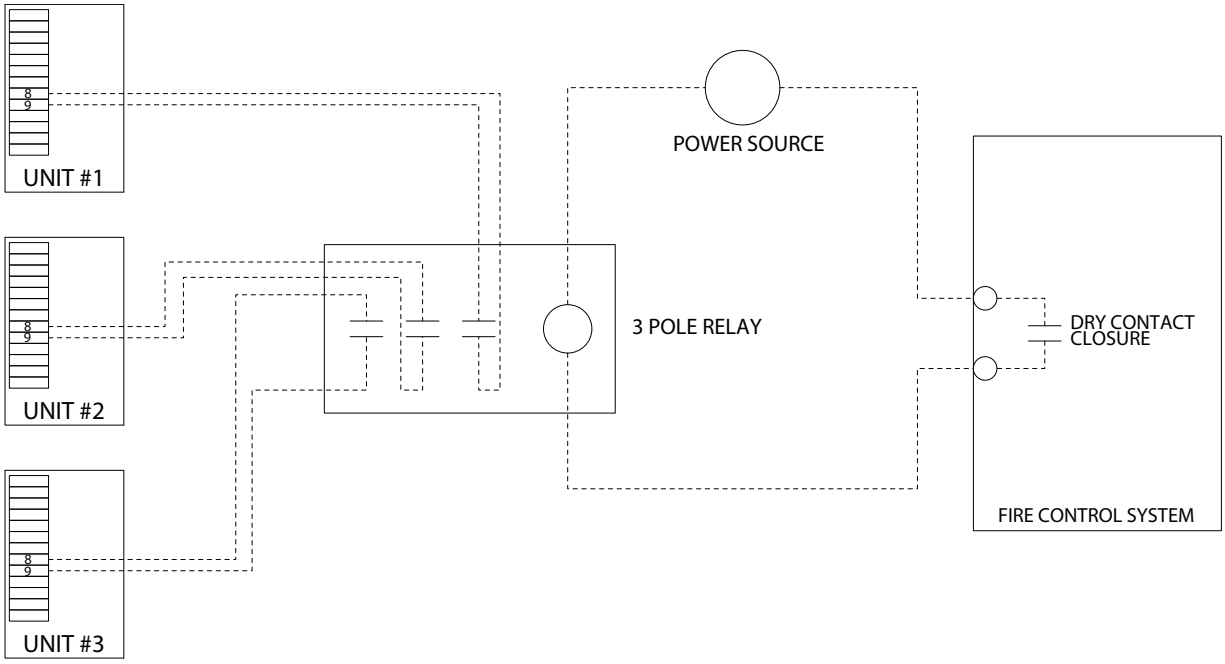


Water Control Set To: NETWORK

Water Control Set To: NETWORK

Water Control Set To: LOCAL

Auxiliary Air & Pool Water Heater Connection for a Two Pool Installation



Fire Control System Connection

WARRANTY

General Policy

This warranty applies to the original equipment owner and is not transferable. Under this warranty, PoolPak International will furnish a new or rebuilt part(s) for a component(s) which has failed because of a defect in workmanship or material through a PoolPak International authorized agent, dealer, installing contractor or service organization. PoolPak International reserves the right to apply handling and inspection charges when a part(s) or equipment has been improperly returned as defective under the terms of this warranty.

Detailed terms of limited warranty policy:

Warranty Registration and Start-Up Log Sheet

The warranty of the unit is void if the "Warranty Registration and Start-Up Log Sheet" is not completed and sent to PoolPak International within one week of initial start-up. This is important as this document registers the warranty of the compressor and other major components with the manufacturer of the components.

Labor Warranty

During the first month (30 days) after the initial start-up date and with prior approval/authorization from the company, PoolPak International will provide and/or reimburse the required labor, material and shipping costs incurred in replacing or repairing a defective component(s). The terms and conditions applicable for labor, material and other item costs will be governed by PoolPak International's Warranty Guideline for Initially Defective Equipment.

Component Warranty

If any component(s) fails within one year from the date of initial start-up or 15 months from the date of shipment (whichever is earlier) PoolPak International will furnish a new or rebuilt component(s) (F.O.B. Factory) if the failure is because of a defect in workmanship or material.

Extended Compressor Warranty

PoolPak International will provide a replacement compressor, or reimbursement to replace compressor for 60 months from the date of initial start-up or 63 months from the date of shipment (whichever is earlier) provided the compressor fails as a result of a manufacturing defect and is returned with transportation prepaid to the factory. This extended compressor warranty is subject to all terms and conditions of the standard PoolPak International warranty.

No charges attributable to the replacement of a component, except as detailed in the above Labor Warranty, will be allowed unless specifically and specially approved beforehand, by PoolPak International, in writing.

Admissibility and Applicability of Warranty

Warranty is applicable for products that are purchased and installed in the U.S.A. and Canada. This warranty is

NOT applicable to the following:

1. Products/components that have become defective /damaged due to the use of contaminated water or operation at abnormal water flow rates or water temperatures. If a claim is being made for a component that is in contact with the air stream or the pool water, a complete log of pool water chemistry during the warranty period must be provided with the claim.
2. Parts that wear out due to normal use/operation such as filters, belts, fuses. Reimbursement for refrigerant lost from the system during this Component Warranty period will be made in accordance with the schedule based on the current market price of refrigerant at the time the repair is made. PoolPak International shall not be responsible for refrigerant lost from the system due to improperly installed contractor piping for a remote auxiliary air-cooled condenser.
3. Products which have been displaced from their original installation location.
4. Products which have been tampered with or altered or have become defective/damaged due to unauthorized work on the refrigerant or water circuit, improper wiring, transportation, abuse, misuse, or incorrect electrical supply characteristics, and/or misapplication of the product.
5. Product/component failure due to poor maintenance including situations where units have been run without clean, properly installed filters.
6. Products not installed, operated and maintained as per the START-UP section of this manual.
7. Products which have been used in conjunction with or part of a system not supplied by PoolPak International and whose use is detected to be at the cause of failure.
8. Products whose original unit dataplate and/or serial number of the component(s) has been tampered with, defaced or removed.
9. Products on which payment, whole or in part, is in default with the terms of sale.

Force Majeure

PoolPak International will not be held liable for any delays or failure to provide warranty service due to material shortages, government restrictions, job restraints, wars, strikes, acts of God or other causes, beyond PoolPak International's control.

Transportation Costs

After the first 30 days, all freight related costs for the supply/return of any defective component(s) are not covered by PoolPak International.

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 expressed warranty. The manufacturer expressly disclaims and excludes any liability for consequential or incidental damage for breach of any expressed 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.

For more information contact:

PoolPak International • P.O. Box 3331, York, PA 17402-0452 USA • 717-757-2648 or 1-800-959-7725 • Fax: 717-757-5085