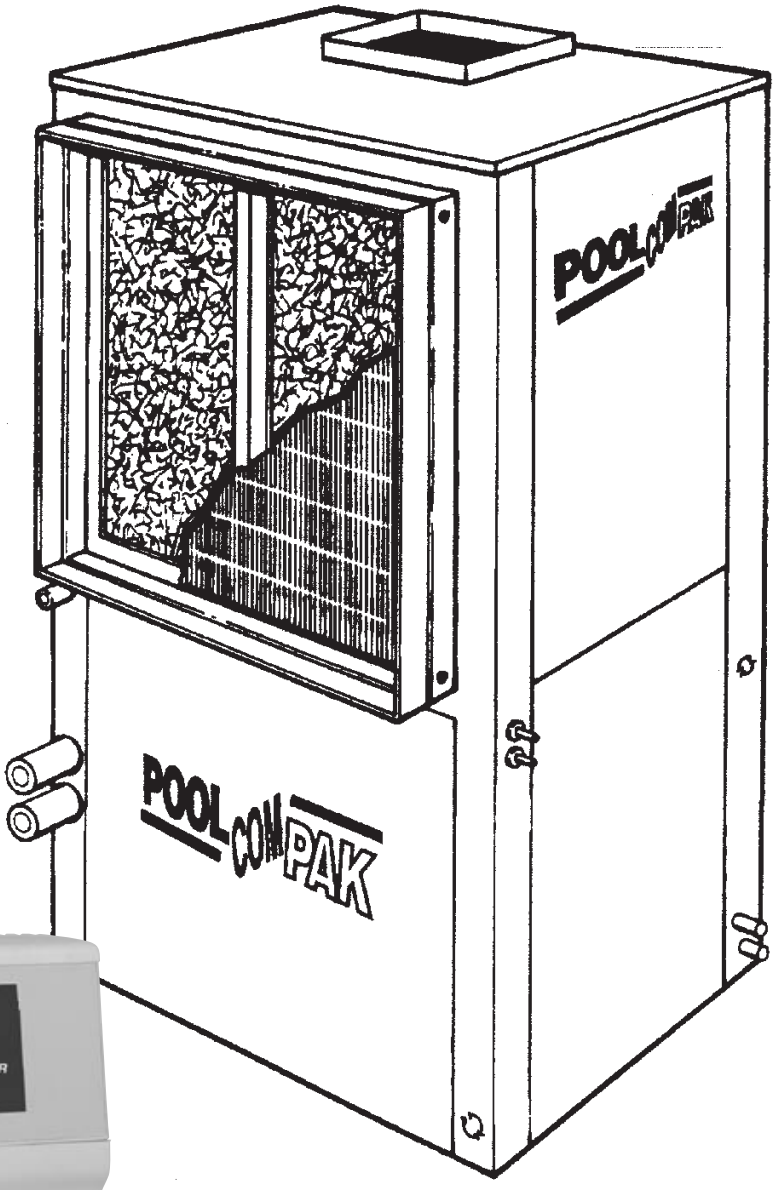
PoolPAK International

POOL COMPAK VERTICAL

# Application/Specification/Installation & Operation Manual

## Dehumidification Systems for Swimming Pool Enclosures

- Models AWV550 - AWV3500 (HCDV 550 - 3500)
- Pool water heating via heat recovery (AWV models)
- TD-2500 interface device
- Controls humidity levels to prevent condensate damage using a cold surface temperature sensor
- Controls space temperature for comfort
- Controls energy usage for reduced operating cost
- 7 to 60 #/hr. moisture removal capacity
- 800 to 5300 CFM plus code required outside air





**TD-2500**
**Remote Interface Unit**



J99006475

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# The POOLCOMPAK Dehumidification System

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. PoolComPak's major function is to dehumidify the pool enclosure air through a vapor compression cycle. During this cycle PoolComPak recycles the 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 recycles energy and blankets the walls and windows with warm, dry air.

## Environmental Issues:

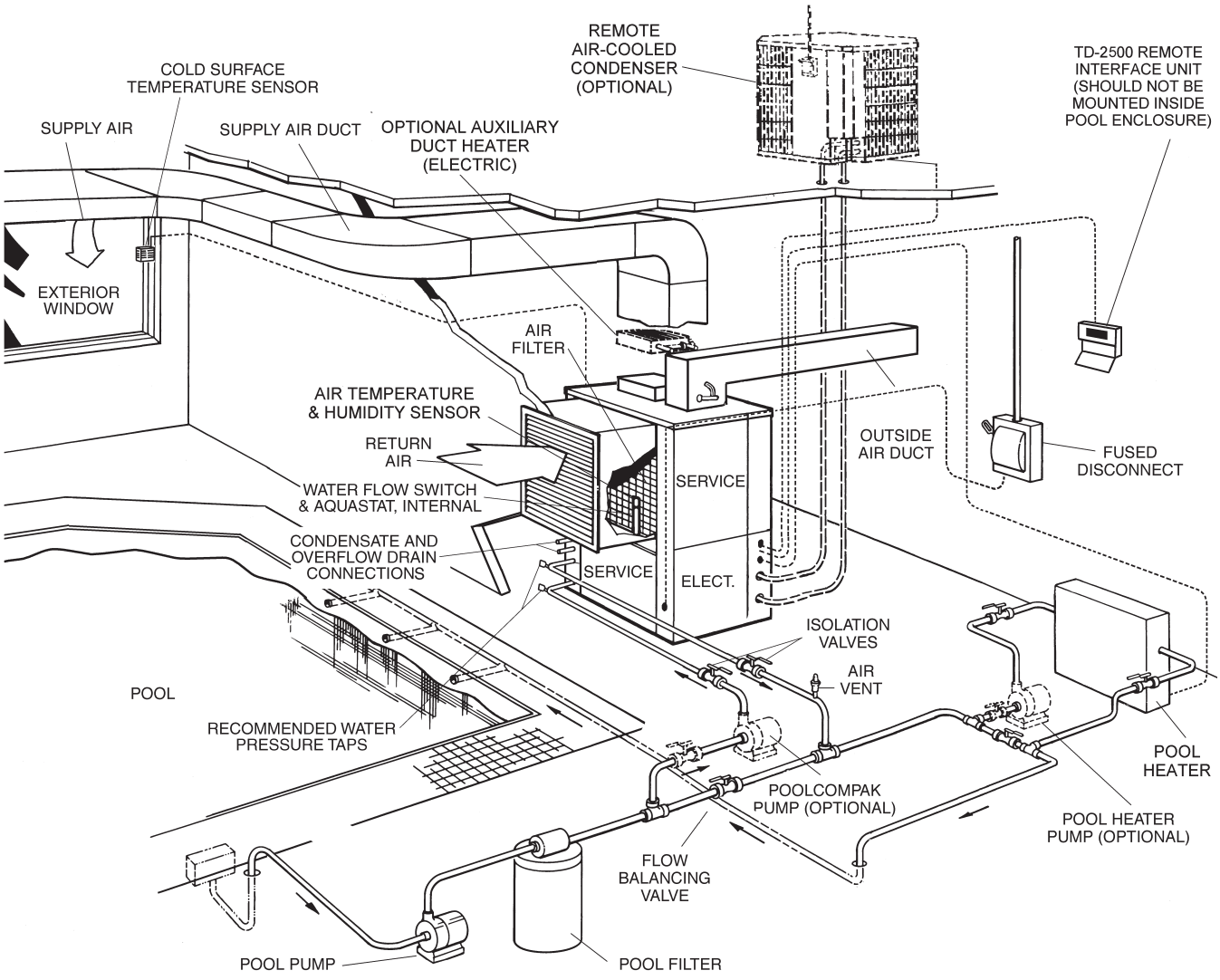
- Prevents condensation that damages both structural steel and concrete
- Eliminates rust and paint blisters in steel roofing
- Eliminates percolation of concrete that destroys structural members
- Protects the surrounding interior furnishings
- Prevents unsightly rust stains
- Creates dry-to-the-touch furnishings

## Flexible Design:

PoolComPak:

- Easily fits into a standard utility room
- Optional air conditioning
- Internal hot water coil or duct-mounted electric heater
- Economizer operation
- Vertical orientation
- Top or side supply duct connection

# TYPICAL POOLCOMPAK SYSTEM LAYOUT




## TYPICAL POO,L 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-2500 CONTROL SYSTEM

The TD-2500 is a micro-processor based system that maintains pool enclosure humidity and air and water temperatures at optimum levels, automatically.

The TD-2500 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-2500 provides accurate control and allows the user to read system parameters and change set points easily. For this purpose, a remote interface unit with a text display and keypad is provided. The remote panel should be mounted outside the pool space, such as in an office or in the equipment room. (The TD-2500 remote interface unit contains no sensors.)

## TD-2500 FEATURES

All set points are saved in the memory of the TD-2500 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.

When the PoolComPak unit is equipped with the optional economizer control, the TD-2500 will first satisfy space cooling requirements using outside air if the conditions are appropriate. The use of an economizer is instrumental in reducing cooling costs.

A built in fire trip will shut down the PoolComPak unit whenever a fire detection system alerts the TD-2500 that a fire trip mode of operation is required.

## HUMIDITY CONTROL

As the humidity within the pool enclosure rises above the desired set point, the TD-2500 activates the compressor within the PoolComPak to begin the dehumidification process. If the space temperature is below the desired set point, the heat recovered during dehumidification is directed to the air reheat coil for space heating. If the pool water temperature is also below the set point, some of the recovered heat is directed to the pool water condenser for pool water heating. If neither air heating nor pool water heating is required, the recovered heat can be directed to an auxiliary air conditioning condenser if the system is so equipped. If the system does not include an auxiliary air conditioning condenser, the TD-2500 will direct the recovered heat to the air reheat coil until the need for dehumidification is satisfied.

## COLD SURFACE TEMPERATURE HUMIDITY RESET

The TD-2500 control system includes a sensor that measures the temperature of the coldest surface in the pool enclosure, usually an exterior window or door frame. When the temperature of this surface approaches the dew point temperature of the space, the controller lowers the humidity set point to activate dehumidification. This function helps to prevent condensation on the cold surface.

## POOL WATER HEATING (AWV MODEL)

Pool water heating with recovered heat will happen whenever the compressor is running and the water temperature is below the set point. The TD-2500 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 compressor is running, the TD-2500 directs the recovered heat to the air reheat coil. Space heating will continue until the space temperature reaches the set point. The TD-2500 will activate the auxiliary space heating system if the PoolComPak unit is unable to satisfy the heating need with heat recovered during dehumidification.

## SPACE COOLING (OPTIONAL)

If space cooling is required and the PoolComPak unit is equipped with an auxiliary air conditioning condenser (air-cooled or water-cooled), the TD-2500 will activate the space cooling mode of operation. In this mode, the heat removed from the space air will be directed to the auxiliary air conditioning condenser. The air cooling mode of operation is independent of the need for dehumidification.

## ECONOMIZER (OPTIONAL)

When the PoolComPak unit is equipped with a field supplied economizer, the TD-2500 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-2500 monitors the outside air temperature. When appropriate, the controller will disable the compressor and bring in cool outside air for economical operation. A separate exhaust system must be installed to ensure negative room pressure during the economizer mode.

## NETWORKING - MULTIPLE UNITS

TD-2500 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 interface unit 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 rooms where pool water heating via heat recovery is not feasible or in commercial or industrial applications, e.g., 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 chemistry, the accelerated 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 the energy it contained. Then, additional energy was used to bring in and heat the make-up air and to heat 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

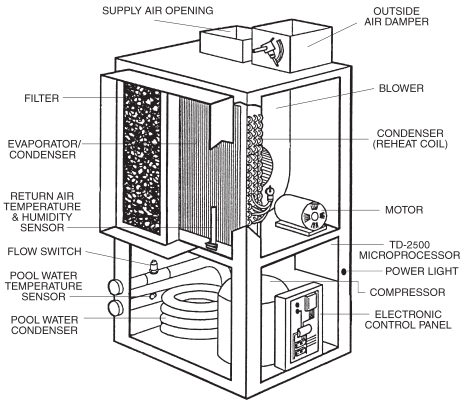
## ROOM DEW POINT CONTROL

PoolComPak units with the TD-2500 controller operate using an 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 measured as "grains of moisture per pound of dry air," and is directly related to the dew point temperature.

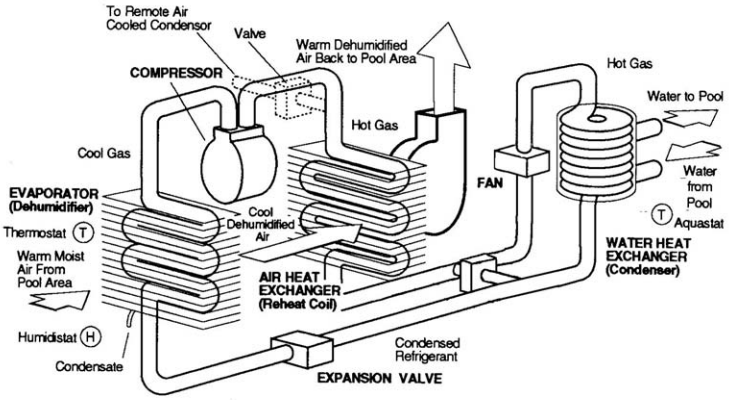
The TD-2500 uses dew point control to operate the PoolComPak unit and maintain the moisture level below the set point. The space dry bulb temperature and relative humidity determine the dew point temperature. By varying the space temperature and space relative humidity set points, the dew point set point 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-2500 controller energizes the compressor for dehumidification. As the dew point 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 | DPT | Grains of Moisture/ Pound of Dry Air |
|---|---|---|---|
| 75 | 83% | 70 | 110 |
| 85 | 61% | 70 | 110 |




**PoolComPak Cutaway**




**PoolComPak Schematic**

The PoolComPak unit is shown in the cutaway illustration and schematic above. The unit's fan draws in warm, moist air from the pool enclosure. This air passes through the evaporator (dehumidification) 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 coil, 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, the pool water condenser or to an optional auxiliary air conditioning condenser, which may be either air or water cooled. If air heating is called for, the air reheat coil is used. The hot refrigerant exchanges energy with the cooler, dehumidified air coming from the evaporator coil. 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 space cooling is called for, the refrigerant flows to the auxiliary air conditioning condenser bypassing the air reheat coil and pool water condenser and allowing cool air from the evaporator coil to provide space cooling.

## ROOM AIR DISTRIBUTION

All PoolComPak models provide continuous air recirculation, and with a good air distribution system, will promote uniform space 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, skylights, etc.).

* HCDV models do not have pool water heating capabilities.

## AIRSIDE DESIGN

The supply air volume and external static pressure capability of the fan is given for each model in the Performance Section. It is recommended that an experienced engineering or mechanical contracting firm do the design, sizing and layout of the duct system.

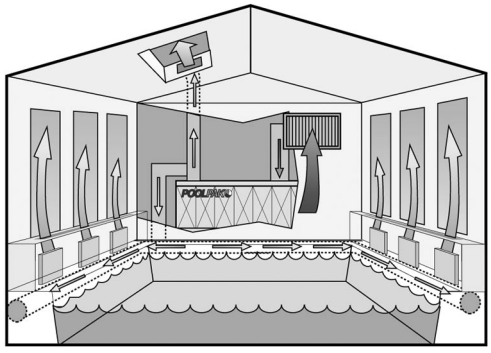
## SUPPLY DUCT

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 susceptible to condensation or down the center of the room blowing air toward the surfaces prone to have condensation. See figures below for illustration. The 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.

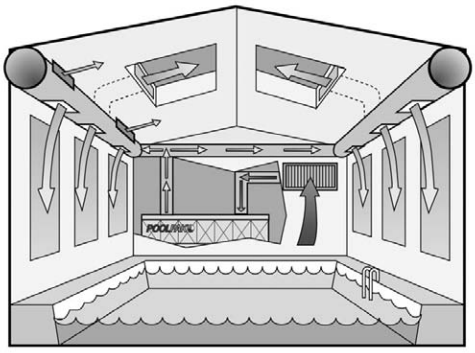
- Supply ducts should be as short and with as few turns as possible. Use turning vanes to minimize air noise and static pressure drop.
- Do not direct the supply air at or across the pool surface as this increases the evaporation rate.
- Recommended maximum supply duct air velocity is 1000 FPM. The recommended 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.



**Below Grade Air Distribution System**



**Overhead Air Distribution System**

- Short Flexible connections of rubber or canvas can be made between the return duct and the unit to eliminate vibration transmission through the duct.

  PoolPak International does not recommend the use of equipment rooms as return air plenums 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).
- 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 outside air option is selected, adequate exhaust capacity via a separate fan must be specified to ensure the natatorium remains slightly negative. Failure to specify an adequatley sized exhaust system may result in damage to the structure and pool odors may be forced into other areas of the building.

***NOTE***

***Connection of outside 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 is higher or lower than actual space conditions.
- The compressor may cycle on low pressure or defrost fault conditions dependent upon the mixed air temperature.
- Potential moisture damage in the return duct due to condensation from cold outside air mixing with warm, humid return air.

## OTHER AIRSIDE CONSIDERATIONS

- A hot water, electric or gas duct heater may be installed in the supply duct to provide auxiliary space heating. Be sure that the additional air pressure drop across the heater is accounted for in the unit fan selection. These heating components must be designed for use in swimming pool environments.
- Outside air may be introduced into the PoolComPak unit by attaching a duct to the unit as shown on the Typical PoolComPak System Layout on page 7. When outside air is ducted into the PoolComPak unit, an exhaust fan must be installed in the space 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 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 PoolComPak unit is installed in an area that is below the natatorium's dew point temperature, the ducts 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.

Typically the unit is placed on the mechanical room floor, or in an appropriate location in the pool room. 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 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 is then run from the air-cooled condenser to the PoolComPak unit. Refrigerant lines must be leak

checked and evacuated through installer-provided Schrader valves. Control and power wiring are run to complete the installation.

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 51.

Outside air can be ducted into the unit through the optional outside air duct connection. The unit can draw up to 30% of its supply air from the outside. When ventilating the natatorium in this way, an 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 within 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 PoolComPak unit as well as in the Installation section of this manual. All control wiring is low voltage. Use cable provided for wiring between unit controller and TD-2500 remote interface unit.

## CONDENSATE PIPING

The condensate may be piped to a drain or returned to the pool (if local codes allow). 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 produced in a year is about equal to the volume of the pool.

## STANDARD ITEMS FACTORY MOUNTED

- Evaporator coil (Dehumidification coil)
- Air reheat coil (hot gas reheat coil)
- Pool water condenser to add recovered heat to pool water (AW model*)
- Vertical or horizontal supply air configuration
- Filters and filter rack
- Air temperature and relative humidity sensor

## STANDARD ITEMS FACTORY SUPPLIED FOR FIELD INSTALLATION

- TD-2500 Remote interface unit
- Cold surface temperature sensor
- Pool water temperature sensor (AW model*)

* HCD models do not have pool water heating capabilities.

- Outside air temperature 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. Chilled 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
- Economizer control
- Network multiple units

# EQUIPMENT SELECTION

PoolPak International offers engineers, architects, contractors and customers a computer generated equipment. 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.

# 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: _____ Yearly Heating hours: _____

Average Winter Outside DB: _____ °F

Average Winter Outside WB:_____ °F

## Equipment - Dehumidifier Type

☐ AWV Air & Water Heating

☐ HCDV Air Heating Only

## Room Design

Length: _____ ft

Width: _____ ft

Height: _____ ft

Indoor DB Temperature: _____ °F

Indoor Relative Humidity _____ %

Design Winter Outside DB_____ °F

Design Winter Building Loss _____ MBH

Design Summer Outside DB _____ °F

Design Summer Outside WB_____ °F

Design Summer Solar/Trans/Lights & Sensible Heat Gain_____ MBH

## Pool Data

| | USAGE* | AREA | TEMP | POOL USE SCHEDULE |
|---|---|---|---|---|
| Pool 1 | _____ | _____ | _____ | Occupied hours per day _____ |
| Pool 2 | _____ | _____ | _____ | |
| Pool 3 | _____ | _____ | _____ | |
| Pool 4 | _____ | _____ | _____ | |
| Pool 5 | _____ | _____ | _____ | |

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

# PERFORMANCE AND ELECTRICAL DATA

## AWV & HCDV 550
## Performance & Electrical Data

STANDARD OPERATING CONDITIONS

| Return Air | | | Return Pool Water Temp. | Moisture Removal (lbs/hr) | Total Cooling Capacity (BTUH) | Sensible Cooling Capacity (BTUH) | Water Heating Capcity (BTUH)* | Optional AC Condenser Max Heat Rejection (BTUH) |
|---|---|---|---|---|---|---|---|---|
| Temp. | RH | CFM | | | | | | |
| 82°F | 60% | 1,000 | 80° | 9.5 | 24471 | 13765 | 13106 | 26229 |
| 82°F | 50% | 1,000 | 80°F | 7.6 | 23075 | 14541 | 11607 | 24909 |

| 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 | | | |

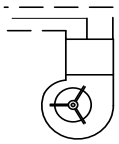
| Factory Refrigerant Charge (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 10 lbs | 1 oz |
| **W/Optional Water-Cooled Condenser** | 7 lbs | 8 oz |
| **Unit Weight** | | |
| **Shipping -** 470 lbs. | **Operating -** 430 lbs. | |

| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 4 | N/A |
| | PD-ft. | 5 | N/A |
| Optional Water Condenser | GPM | 4 | - |
| | PD-ft. | 10 | - |

* HCD models do not have pool water heating capabilities.

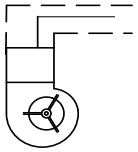
# DIMENSIONS AWV & HCDV 550

VERTICAL COUNTER CLOCKWISE



SA-08

VERTICAL CLOCKWISE



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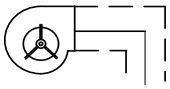
HORIZONTAL CLOCKWISE



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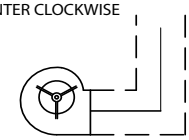
HORIZONTAL COUNTER CLOCKWISE



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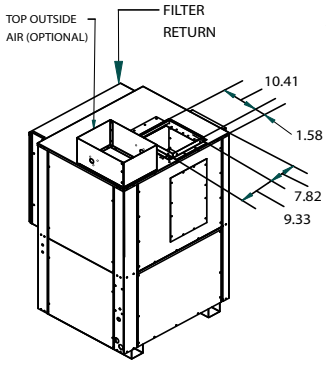
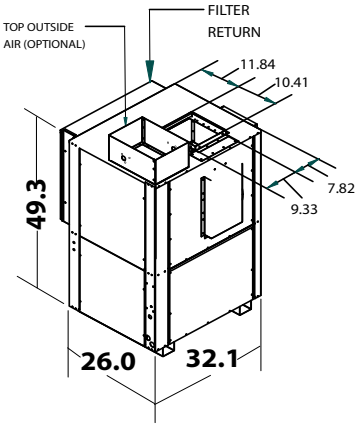
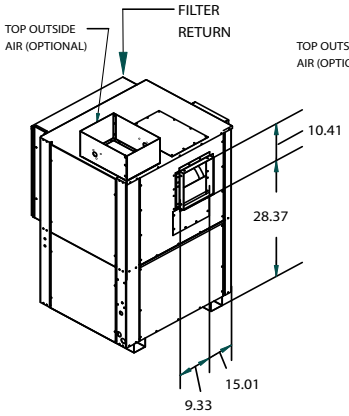
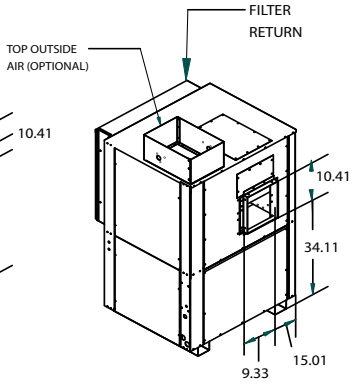
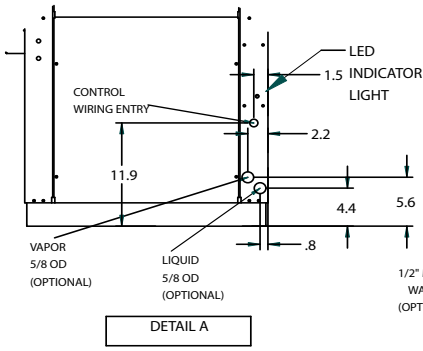


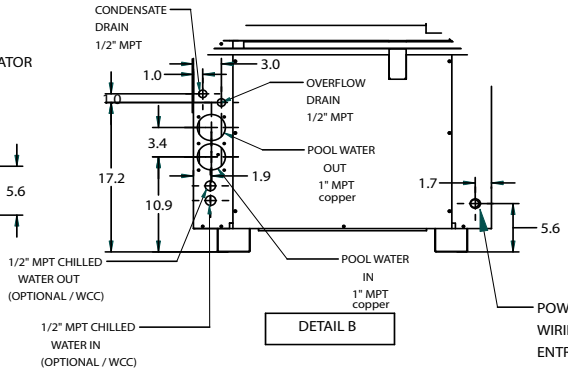



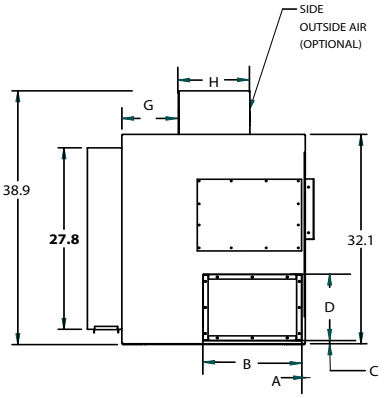



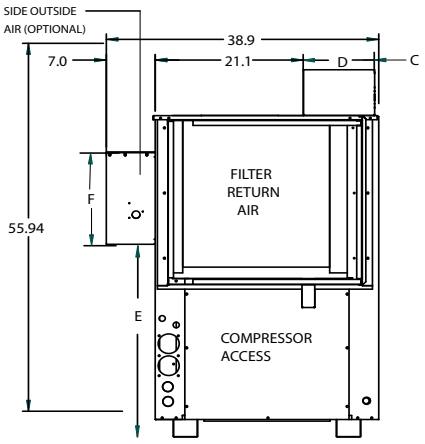

DETAIL A



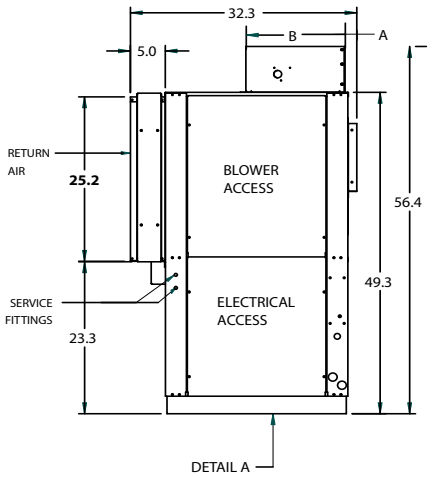

DETAIL B




| OUTSIDE AIR DAMPER - SIZE A | | |
|---|---|---|
| | TOP | SIDE |
| A | .48" | |
| B | 14.16" | |
| C | .46" | |
| D | 10.21" | |
| E | | 29.36" |
| F | | 14.16" |
| G | | 8.05" |
| H | | 10.23" |




RA opening= 25.2”H x 27.8”W




DETAIL A

# AWV & HCDV 800
# Performance & Electrical Data

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 | 37080 | 19613 | 18409 | 41834 |
| 82°F | 50% | 1,500 | 80°F | 12.3 | 35029 | 21218 | 16762 | 39958 |

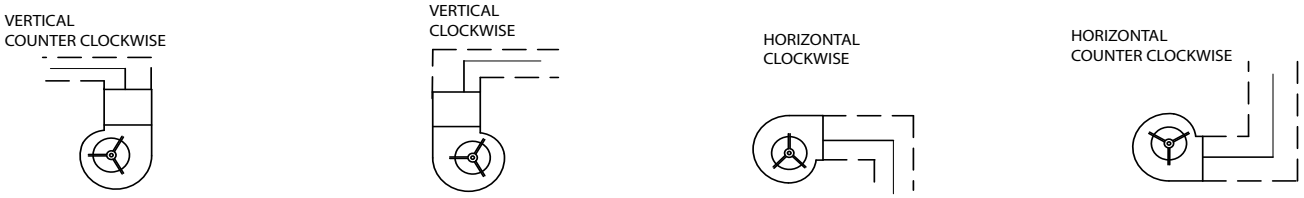
| | 208-230/160 | | | | 208-230/3/60 | | | | 460/3/60 | | | | 575/3/60 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | ½ | ¾ | 1 | 1.5 | ½ | ¾ | 1 | 1.5 | ½ | ¾ | 1 | 1.5 | ½ | ¾ | 1 | 1.5 |
| **Fan Motor FLA** | 5.1 | 6.2 | 7.3 | 9.7 | 2.4 | 3.3 | 4.6 | 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 Cirucit 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 | | | |

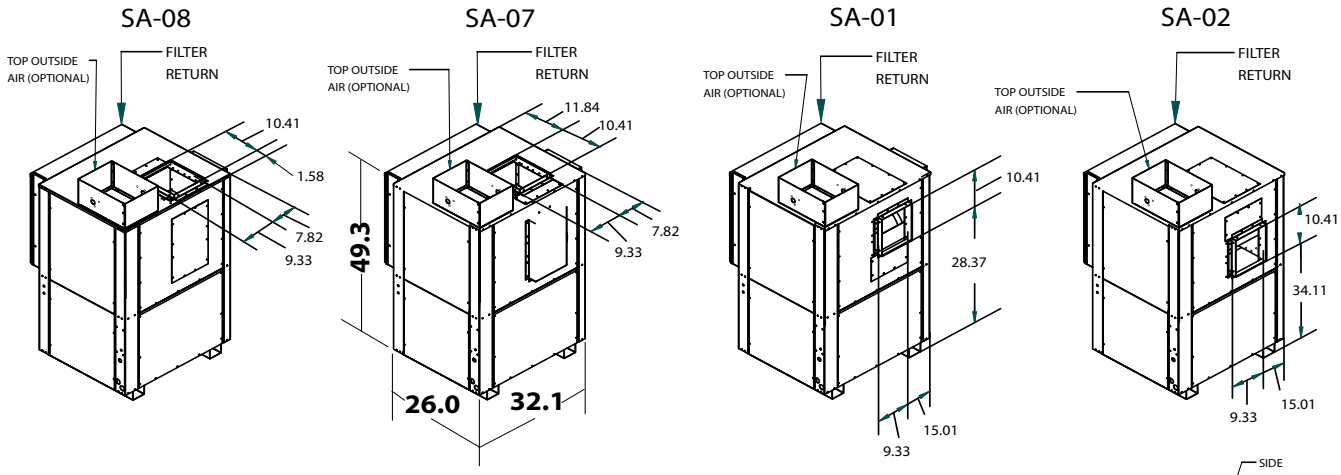
| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 11 lbs | 6 oz |
| **W/Optional Water-Cooled Condenser** | 8 lbs | 8 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 490 lbs. | **Operating** - 450 lbs. | |

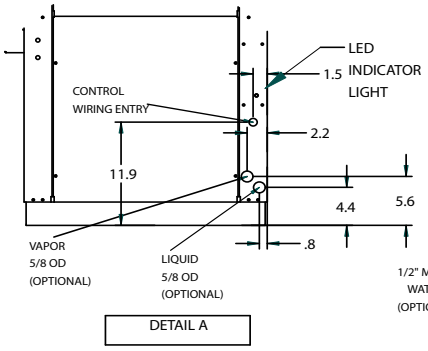
| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 5 | N/A |
| | PD-ft. | 6 | N/A |
| Optional Water Condenser | GPM | 5 | - |
| | PD-ft. | 12 | - |

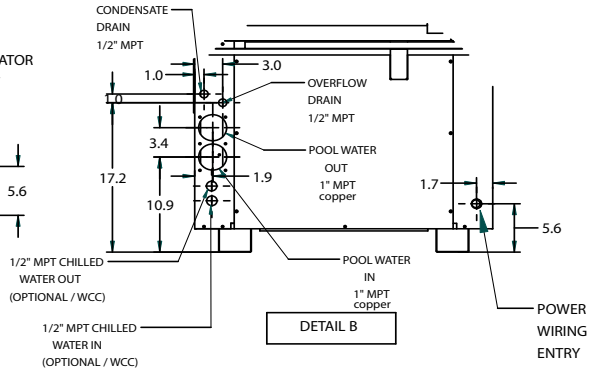
* HCD models do not have pool water heating capabilities.

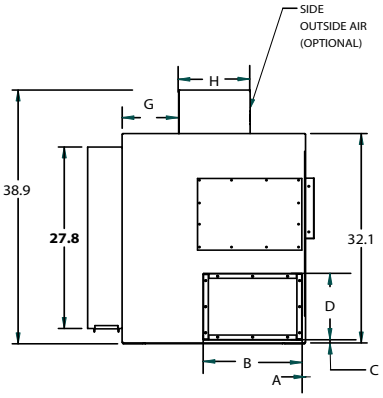
# DIMENSIONS AWV & HCDV 800



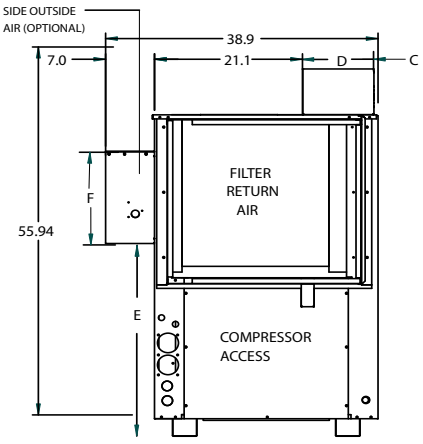



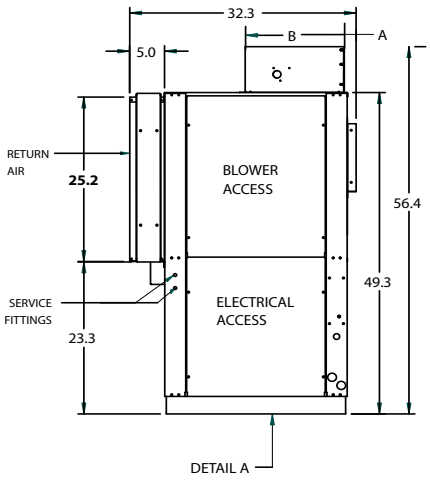




| OUTSIDE AIR DAMPER - SIZE A | | |
|---|---|---|
| | TOP | SIDE |
| A | .48" | |
| B | 14.16" | |
| C | .46" | |
| D | 10.21" | |
| E | | 29.36" |
| F | | 14.16" |
| G | | 8.05" |
| H | | 10.23" |




RA opening= 25.2"H x 27.8"W



# AWV & HCDV 1200
# Performance & Electrical Data

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 | 45758 | 22093 | 20463 | 54007 |
| 82°F | 50% | 1,800 | 80°F | 16.7 | 43259 | 24507 | 17870 | 51442 |

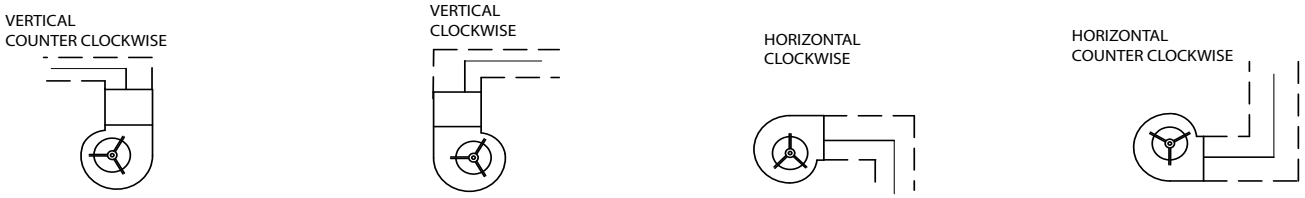
| | 208-230/160 | | | 208-230/3/60 | | | 460/3/60 | | | 575/3/60 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | ¾ | 1 | 1.5 | ¾ | 1 | 1.5 | ¾ | 1 | 1.5 | ¾ | 1 | 1.5 |
| **Fan Motor FLA** | 6.2 | 7.3 | 9.7 | 3.3 | 4.6 | 6.4 | 1.6 | 2.1 | 3.0 | 1.3 | 1.6 | 2.4 |
| **Compressor LRA** | 115 | | | 90 | | | 45 | | | 36 | | |
| **Compressor RLA** | 20.5 | | | 13.1 | | | 6.7 | | | 5.7 | | |
| **Minimum Cirucit 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 | | |

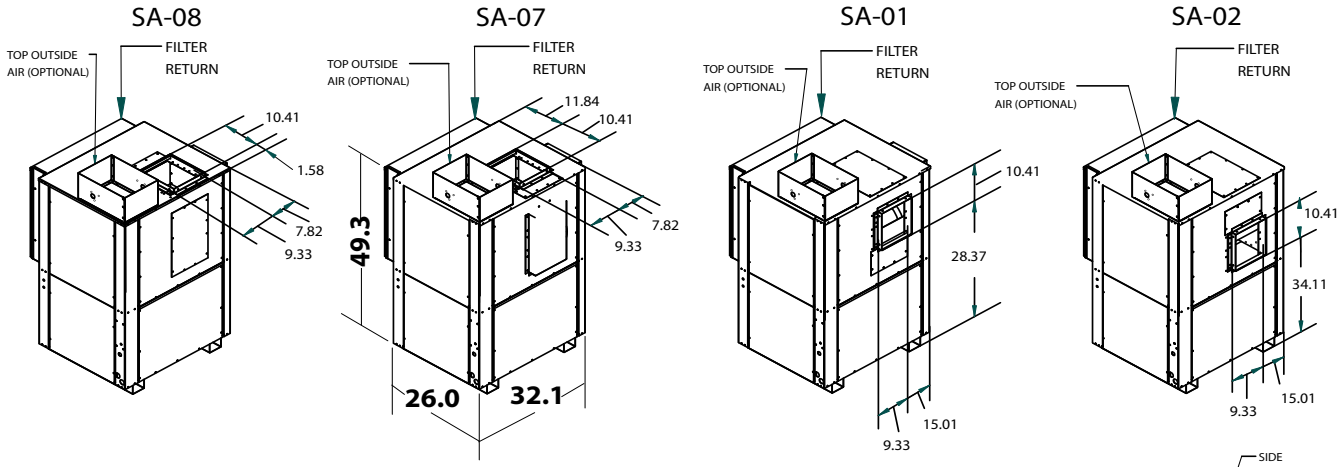
| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 13 lbs | 16 oz |
| **W/Optional Water-Cooled Condenser** | 11 lbs | 5 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 530 lbs. | **Operating** - 490 lbs. | |

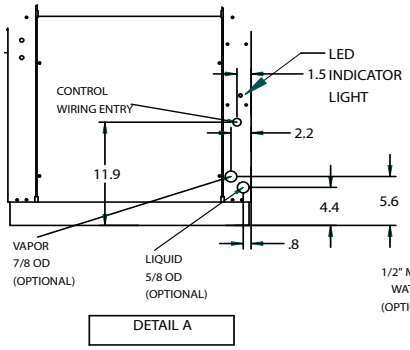
| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 8 | N/A |
| | PD-ft. | 14 | N/A |
| Optional Water Condenser | GPM | 8 | - |
| | PD-ft. | 25 | - |

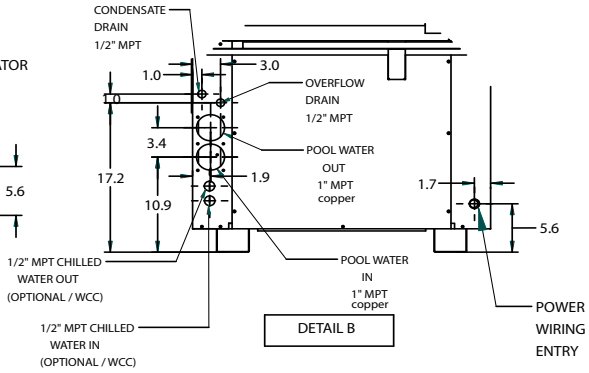
* HCD models do not have pool water heating capabilities.

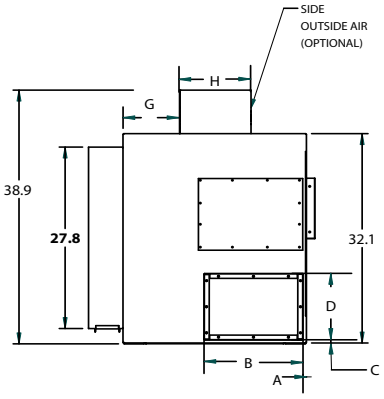
# DIMENSIONS AWV & HCDV 1200



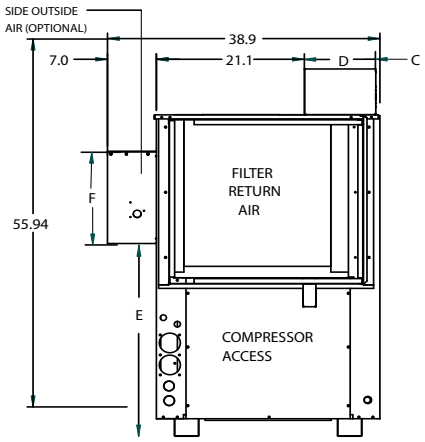



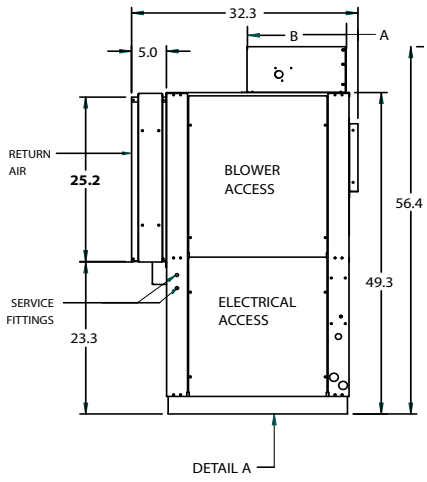




| OUTSIDE AIR DAMPER - SIZE A | | |
|---|---|---|
| | TOP | SIDE |
| A | .48" | |
| B | 14.16" | |
| C | .46" | |
| D | 10.21" | |
| E | | 29.36" |
| F | | 14.16" |
| G | | 8.05" |
| H | | 10.23" |




RA opening= 25.2”H x 27.8”W



# AWV & HCDV 1400
# Performance & Electrical Data

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 | 25.3 | 63072 | 34561 | 21542 | 75628 |
| 82°F | 50% | 2,100 | 80°F | 20.1 | 60346 | 37776 | 19059 | 72592 |

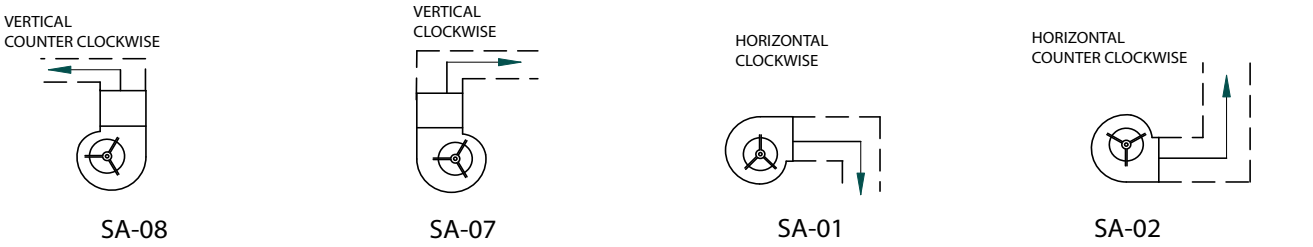
| | 208-230/1/60 | | | | | 208-230/3/60 | | | | | 460/3/60 | | | | | 575/3/60 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | ¾ | 1 | 1.5 | 2 | 3 | ¾ | 1 | 1.5 | 2 | 3 | ¾ | 1 | 1.5 | 2 | 3 | ¾ | 1 | 1.5 | 2 | 3 |
| **Fan Motor FLA** | 6.2 | 7.3 | 9.1 | 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 | | 8 | 9 | 10 | 11 | |
| **Maximum Circuit Protection** | 60 | | | | 70 | 30 | | 35 | | 40 | 15 | 20 | | | | 15 | | | | |
| **75° Field Wire Size (AWG)** | 8 | | | | 6 | 10 | | 8 | | | 14 | 12 | | | | 14 | | | | |
| **Service Ground SIze (AWG)** | 10 | | | | 8 | 10 | | | | | 14 | 12 | | | | 14 | | | | |

| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 25 lbs | 14 oz |
| **W/Optional Water-Cooled Condenser** | 19 lbs | 0 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 630 lbs. | **Operating** - 590 lbs. | |

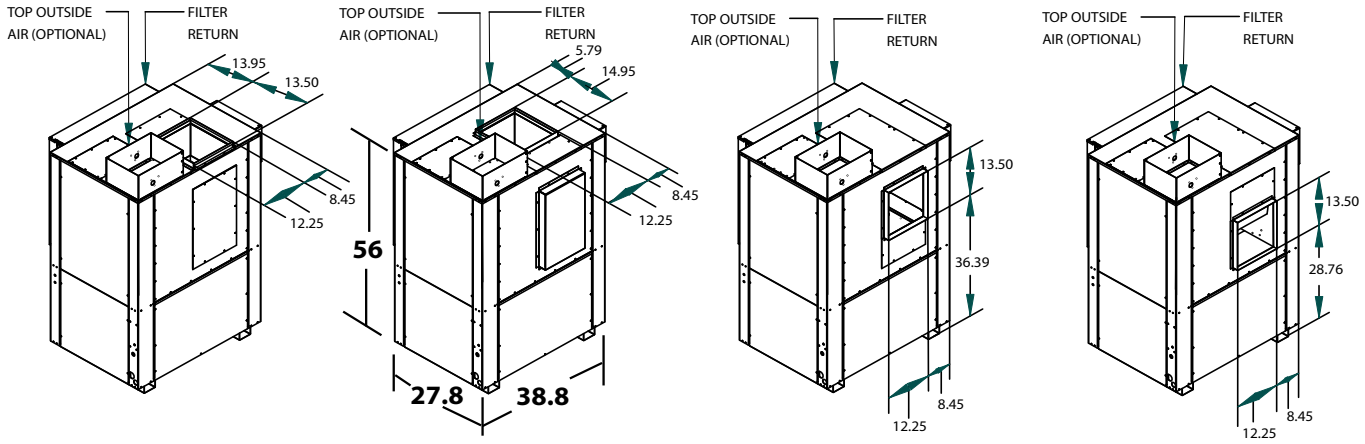
| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| **Pool Water** | **GPM** | 8 | N/A |
| **Condenser*** | **PD-ft.** | 5 | N/A |
| **Optional Water** | **GPM** | 8 | - |
| **Condenser** | **PD-ft.** | 10 | - |

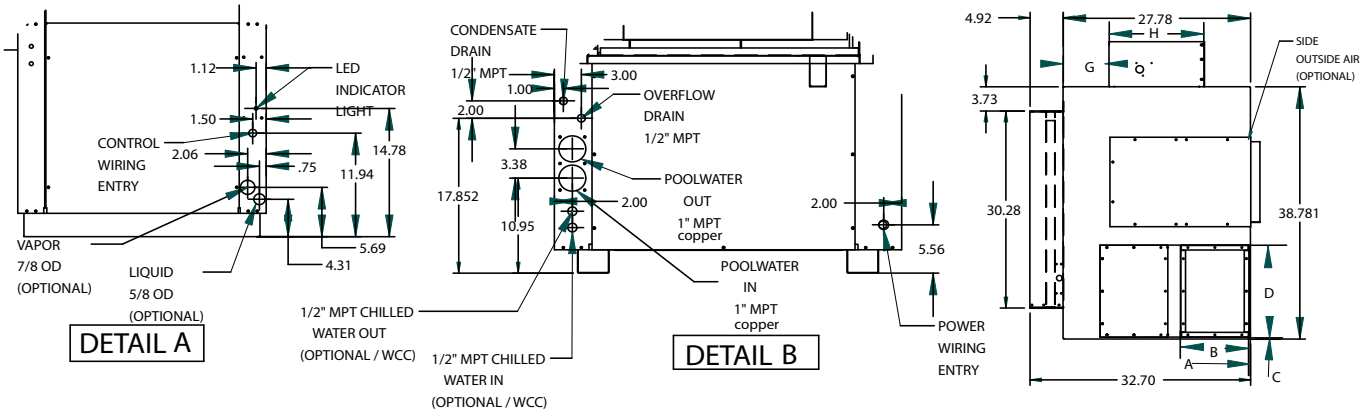
* HCD models do not have pool water heating capabilities.

# DIMENSIONS AWV & HCDV 1400

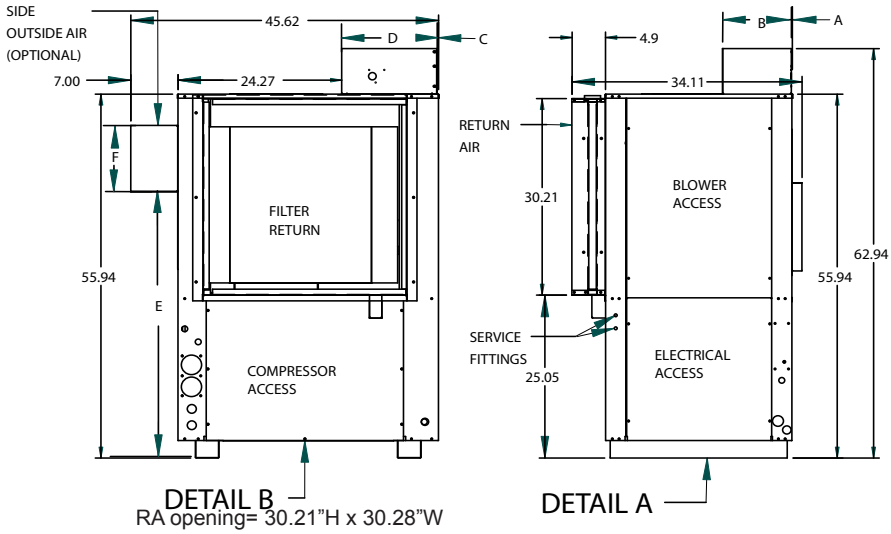



SA-08 SA-07 SA-01 SA-02




| OUTSIDE AIR DAMPER - SIZES A & B | | | | |
|---|---|---|---|---|
| | TOP | | SIDE | |
| | A | B | A | B |
| A | .21" | .16" | | |
| B | 10.21" | 22.21" | | |
| C | .27" | .27" | | |
| D | 14.16" | 14.16" | | |
| E | | | 40.92" | 28.96" |
| F | | | 10.21" | 22.214" |
| G | | | 6.81" | 6.81" |
| H | | | 14.16" | 14.16" |



# AWV & HCDV 1800
# Performance & Electrical Data

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% | 2,500 | 80°F | 31.4 | 72080 | 36695 | 23686 | 85638 |
| 82°F | 50% | 2,500 | 80°F | 25.0 | 68885 | 40813 | 21028 | 82035 |

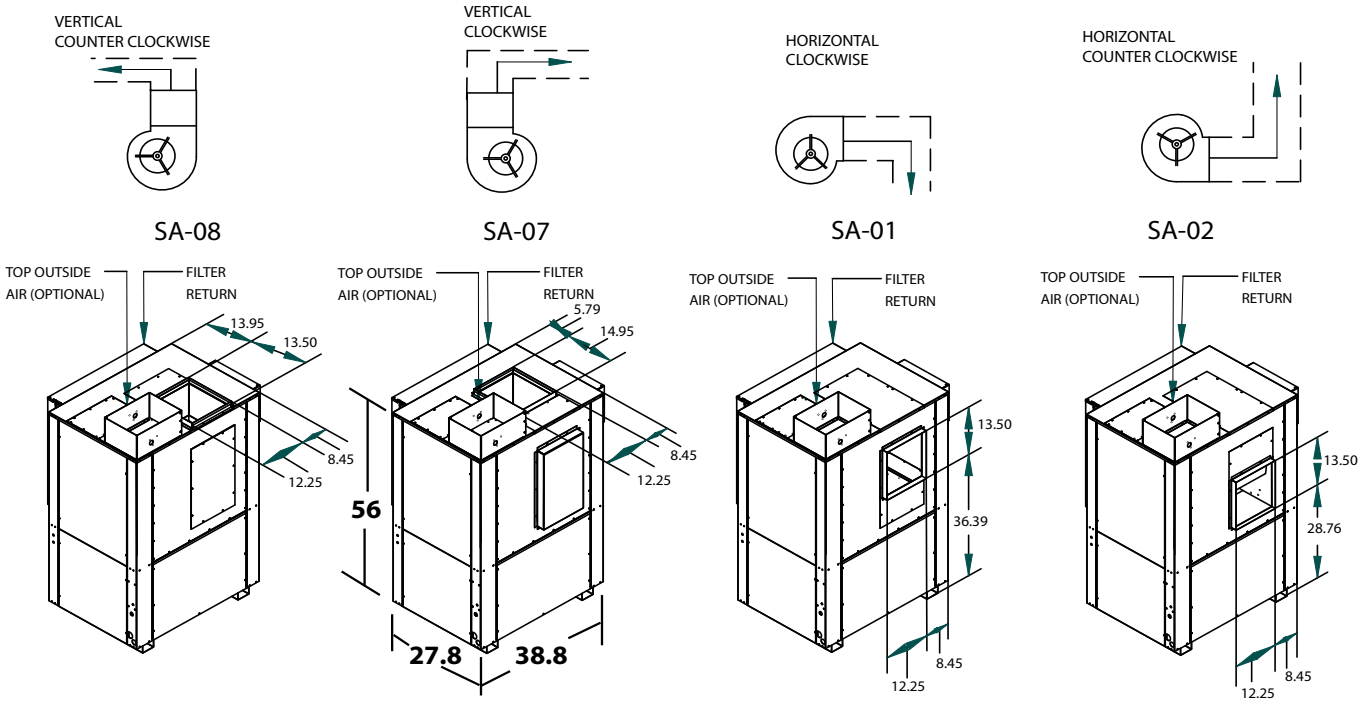
| | 208-230/1/60 | | | | 208-230/3/60 | | | | 460/3/60 | | | | 575/3/60 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 2 | 3 | 1 | 1.5 | 2 | 3 |
| **Fan Motor FLA** | 7.3 | 9.7 | 11.8 | 18.7 | 4.6 | 6.4 | 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 |

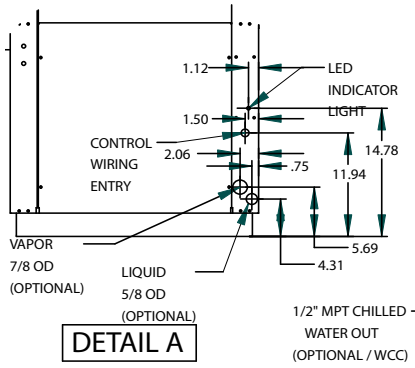
| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 27 lbs | 2 oz |
| **W/Optional Water-Cooled Condenser** | 20 lbs | 13 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 650 lbs. | **Operating** - 600 lbs. | |

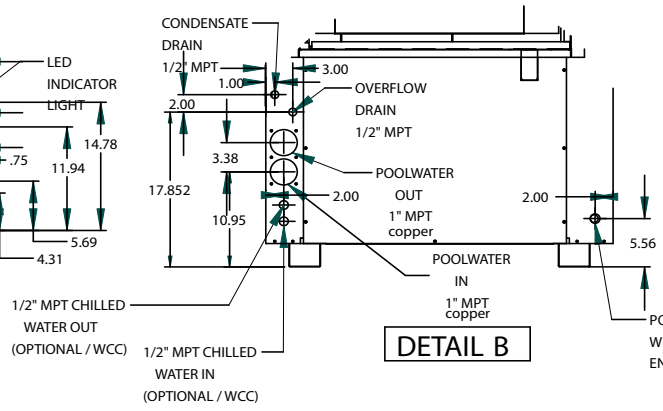
| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 10 | N/A |
| | PD-ft. | 8 | N/A |
| Optional Water Condenser | GPM | 10 | - |
| | PD-ft. | 15 | - |

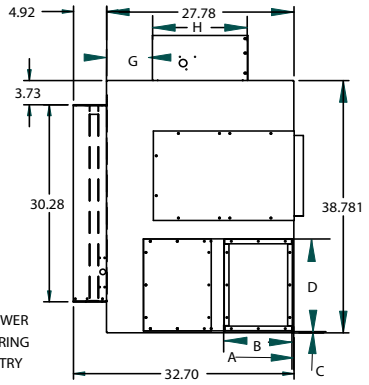
* HCD models do not have pool water heating capabilities.

# DIMENSIONS AWV & HCDV 1800

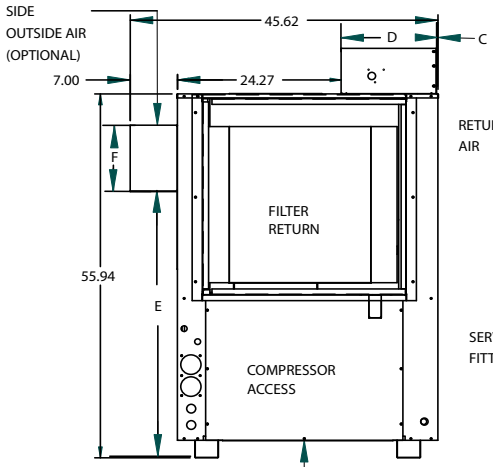


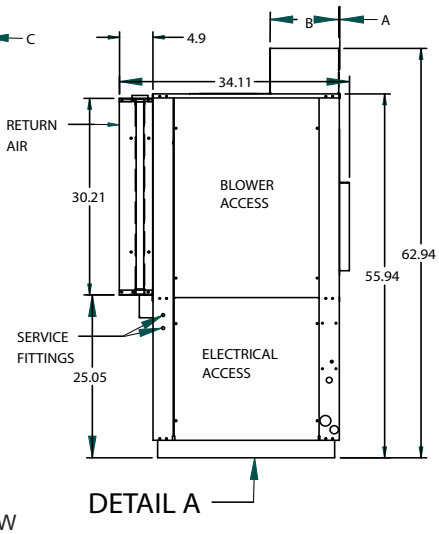




| OUTSIDE AIR DAMPER - SIZES A & B | | | | |
|---|---|---|---|---|
| | TOP | | SIDE | |
| | A | B | A | B |
| A | .21" | .16" | | |
| B | 10.21" | 22.21" | | |
| C | .27" | .27" | | |
| D | 14.16" | 14.16" | | |
| E | | | 40.92" | 28.96" |
| F | | | 10.21" | 22.214" |
| G | | | 6.81" | 6.81" |
| H | | | 14.16" | 14.16" |



# AWV & HCDV 2600
## Performance & Electrical Data

### 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% | 3,300 | 80°F | 45.2 | 91731 | 40795 | 31459 | 112787 |
| 82°F | 50% | 3,300 | 80°F | 35.9 | 87785 | 47474 | 28790 | 108411 |

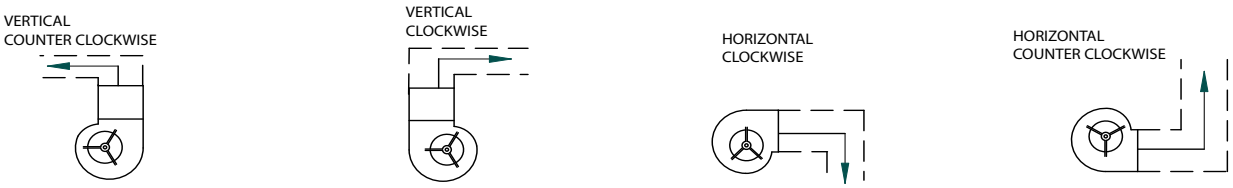
| | 208-230/3/60 | | | | 460/3/60 | | | | 575/3/60 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | 1.5 | 2 | 3 | 5 | 1.5 | 2 | 3 | 5 | 1.5 | 2 | 3 | 5 |
| **Fan Motor FLA** | 6.4 | 7.0 | 9.5 | 14.8 | 3 | 3..3 | 4.3 | 6.7 | 2.4 | 2.7 | 3.6 | 5.7 |
| **Compressor LRA** | 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˚ Field Wire Size (AWG)** | 8 | | | 6 | 10 | | | 8 | 10 | | | |
| **Service Ground SIze (AWG)** | 10 | | | 8 | 10 | | | | 10 | | | |

| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 19 lbs | 13 oz |
| **W/Optional Water-Cooled Condenser** | 19 lbs | 2 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 1100 lbs. | **Operating** - 1020 lbs. | |

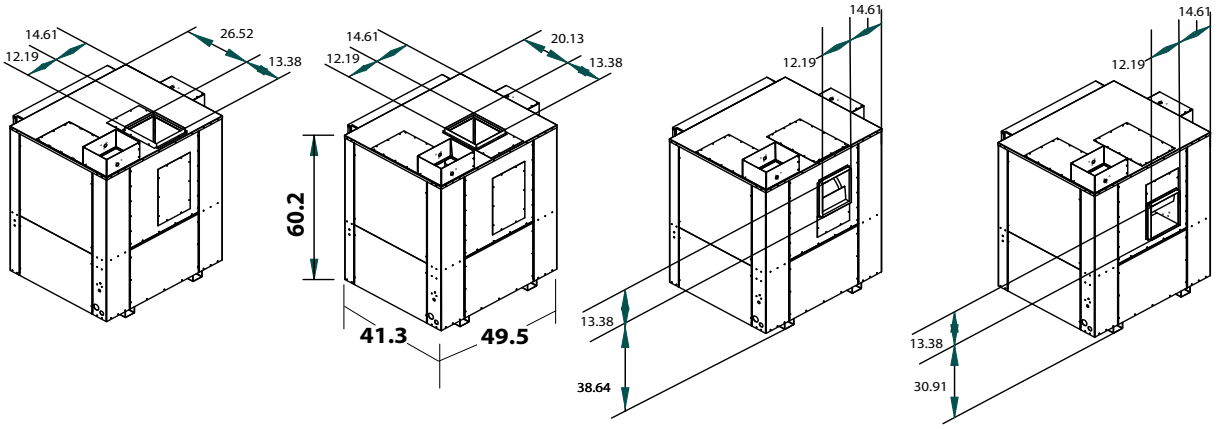
| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 13 | N/A |
| | PD-ft. | 6 | N/A |
| Optional Water Condenser | GPM | 13 | - |
| | PD-ft. | 12 | - |

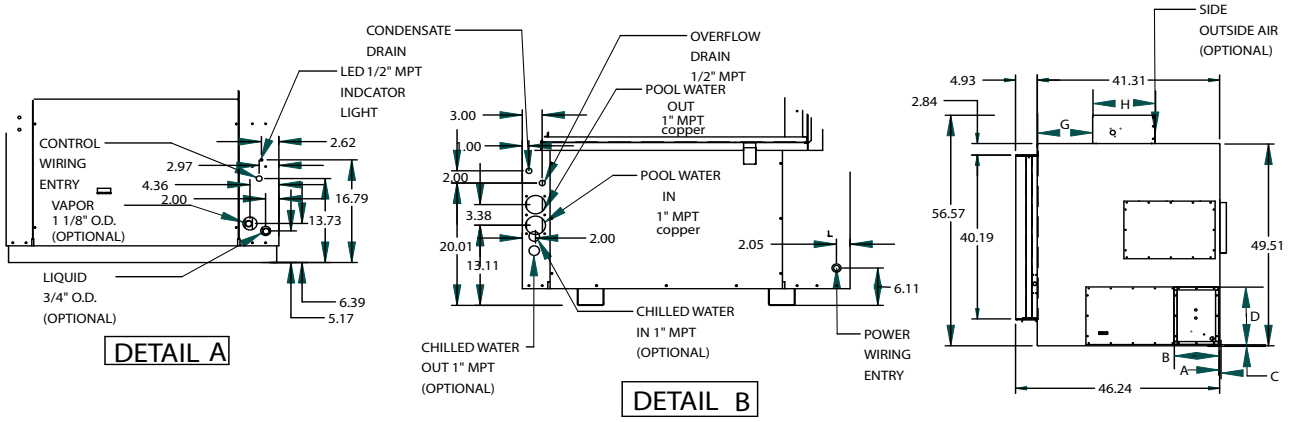
* HCD models do not have pool water heating capabilities.

# DIMENSIONS AWV & HCDV 2600S

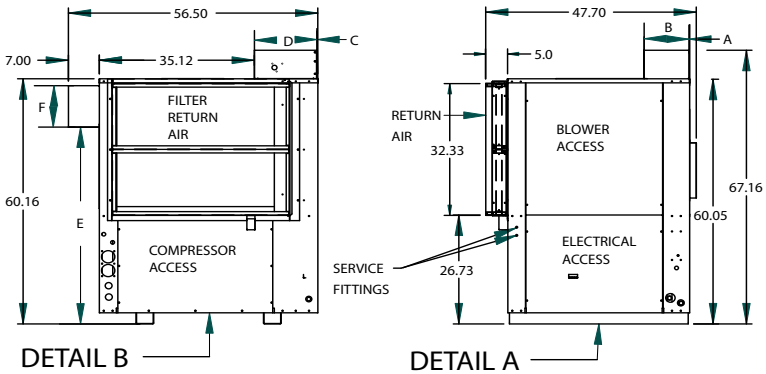



SA-08 SA-07 SA-01 SA-02




| OUTSIDE AIR DAMPER - SIZES A & C | | | | |
|---|---|---|---|---|
| | TOP | | SIDE | |
| | A | C | A | C |
| A | .17" | .17" | | |
| B | 10.21" | 30.23" | | |
| C | .25" | .25" | | |
| D | 14.16" | 14.16" | | |
| E | | | 48.32" | 28.27" |
| F | | | 10.21" | 30.23" |
| G | | | 12..63" | 12..63" |
| H | | | 14.16" | 14.16" |




RA opening= 32.3"H x 40.3"W

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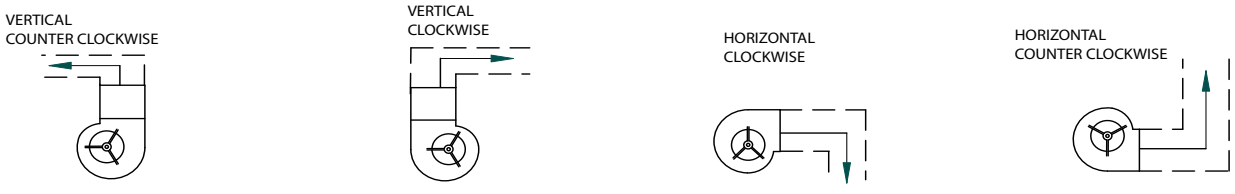
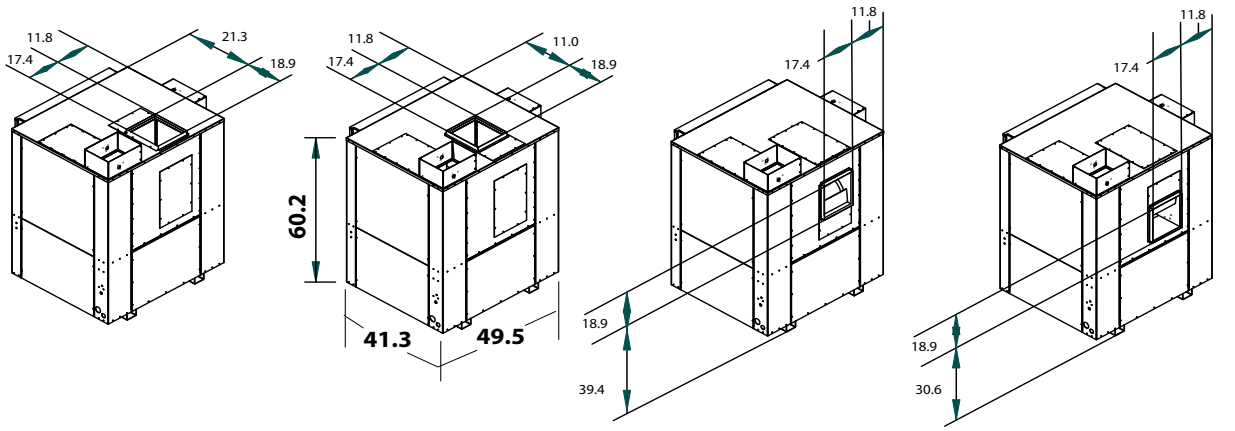
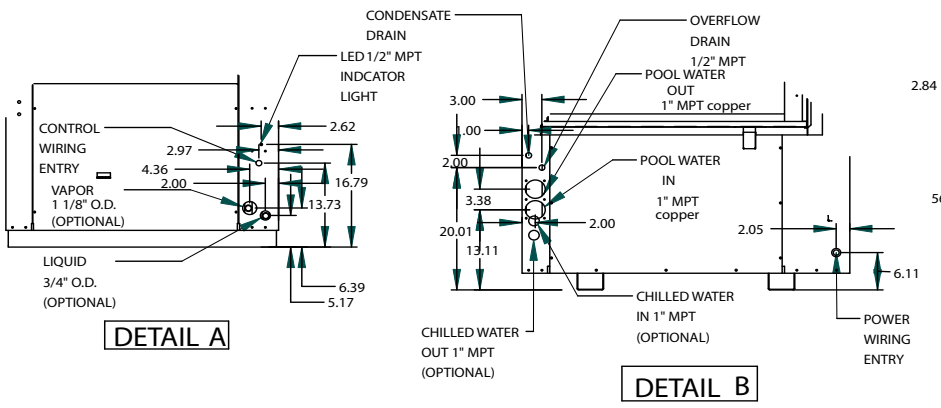
# DIMENSIONS AWV & HCDV 2600L

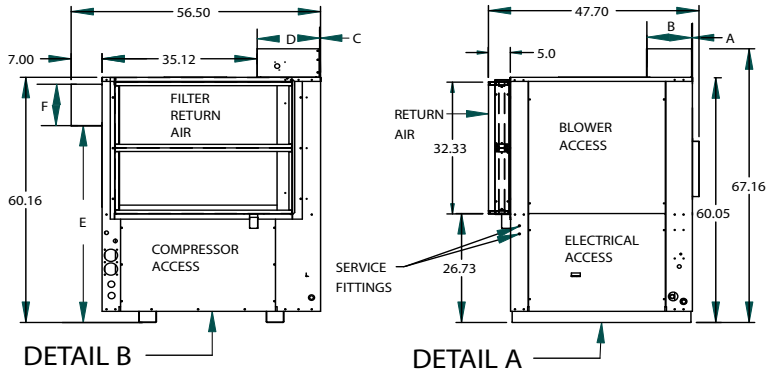



SA-08 SA-07 SA-01 SA-02




| OUTSIDE AIR DAMPER - SIZES A & C | | | | |
|---|---|---|---|---|
| | TOP | | SIDE | |
| | A | C | A | C |
| A | .17" | .17" | | |
| B | 10.21" | 30.23" | | |
| C | .25" | .25" | | |
| D | 14.16" | 14.16" | | |
| E | | | 48.32" | 28.27" |
| F | | | 10.21" | 30.23" |
| G | | | 12..63" | 12..63" |
| H | | | 14.16" | 14.16" |




RA opening= 32.30"H x 40.34"W

# AWV & HCDV 3500
# Performance & Electrical Data

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% | 5,300 | 80°F | 59.0 | 142439 | 75951 | 42076 | 165202 |
| 82°F | 50% | 5,300 | 80°F | 46.9 | 136546 | 83883 | 34121 | 160145 |

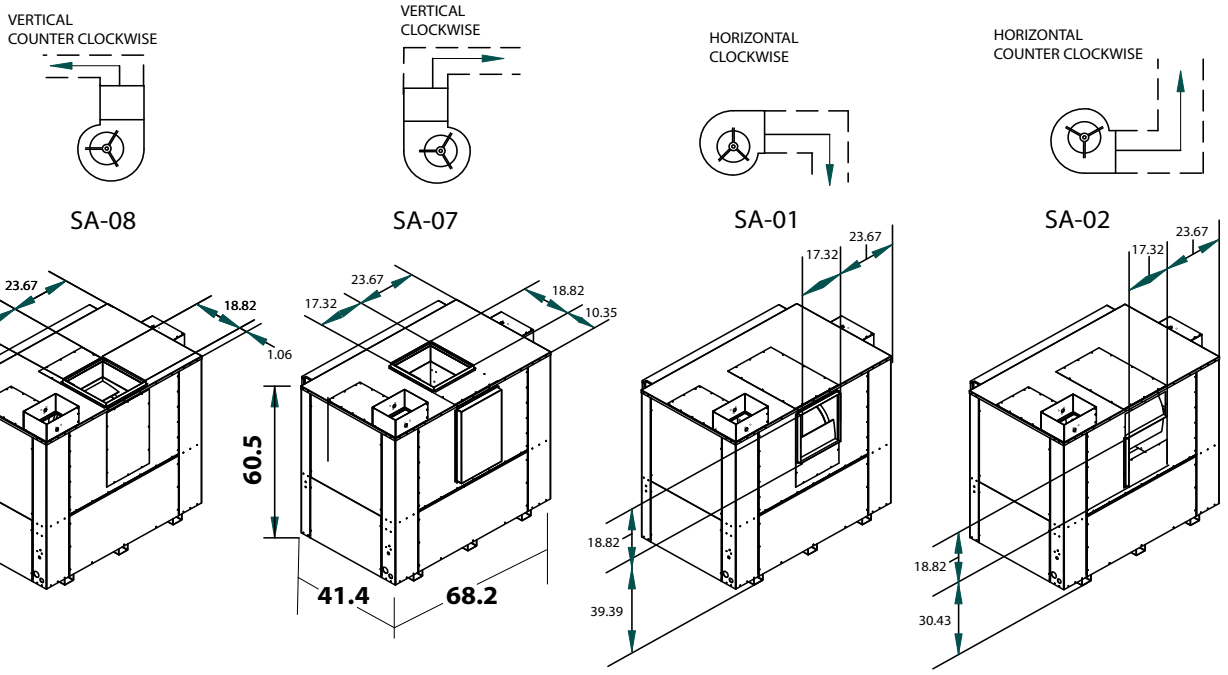
| | 208-230/3/60 | | | | 460/3/60 | | | | 575/3/60 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fan Motor HP** | 2 | 3 | 5 | 7.5 | 2 | 3 | 5 | 7.5 | 2 | 3 | 5 | 7.5 |
| **Fan Motor FLA** | 7 | 9.5 | 14.8 | 22 | 3.3 | 4.3 | 6.7 | 10 | 2.7 | 3.6 | 5.7 | 8.0 |
| **Compressor LRA** | 265 | | | | 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˚ Field Wire Size (AWG)** | 6 | | 4 | | 8 | | | | 10 | | | |
| **Service Ground SIze (AWG)** | 8 | | | | 10 | | | | 10 | | | |

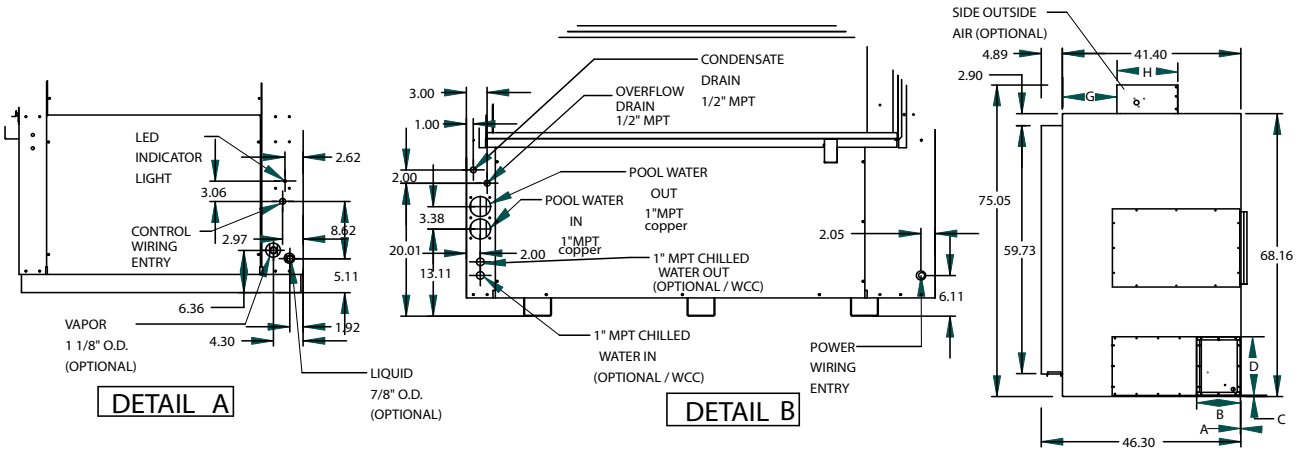
| FACTORY REFRIGERANT CHARGE (VH unit only) | | |
|---|---|---|
| **W/Optional Air-Cooled Condenser** | 36 lbs | 7 oz |
| **W/Optional Water-Cooled Condenser** | 37 lbs | 4 oz |
| **UNIT WEIGHT** | | |
| **Shipping** - 1490 lbs. | **Operating** - 1400 lbs. | |

| WATER PRESSURE DROP | | NON-VENTED | VENTED |
|---|---|---|---|
| Pool Water Condenser* | GPM | 22 | N/A |
| | PD-ft. | 12 | N/A |
| Optional Water Condenser | GPM | 22 | - |
| | PD-ft. | 26 | - |

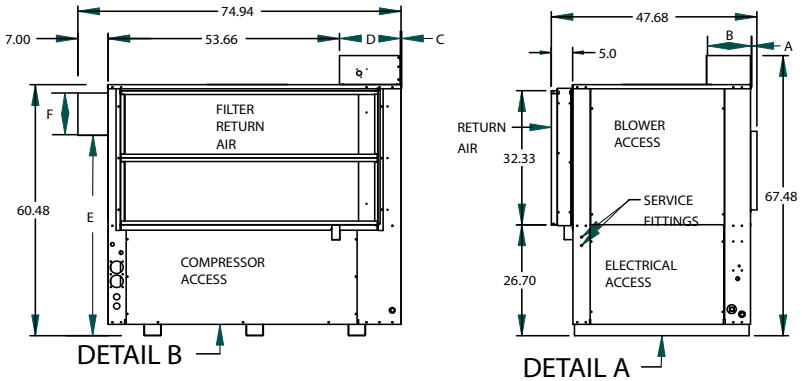
* HCD models do not have pool water heating capabilities.

# DIMENSIONS AWV & HCDV 3500



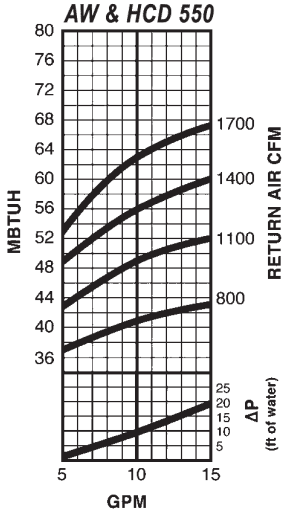

| OUTSIDE AIR DAMPER - SIZES A & C | | | | |
|---|---|---|---|---|
| | TOP | | SIDE | |
| | A | C | A | C |
| A | .17" | .17" | | |
| B | 10.21" | 30.23" | | |
| C | .25" | .25" | | |
| D | 14.16" | 14.16" | | |
| E | | | 48.32" | 28.27" |
| F | | | 10.21" | 30.23" |
| G | | | 12.63" | 12.63" |
| H | | | 14.160" | 14.160" |



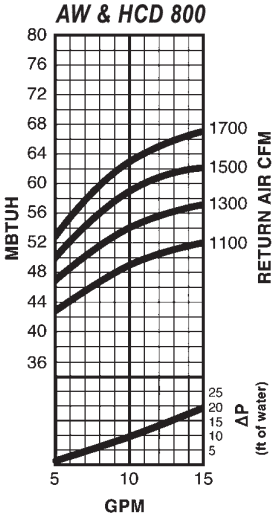

RA opening= 32.33"H x 59.73"W

# ONE ROW HOT WATER COIL CAPACITIES

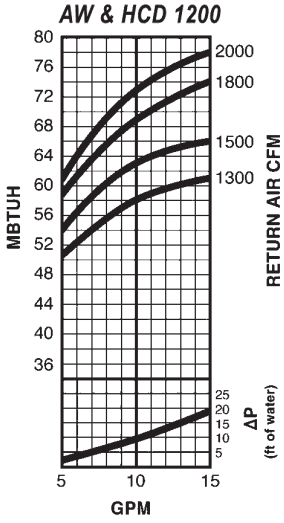
### AW & HCD 550



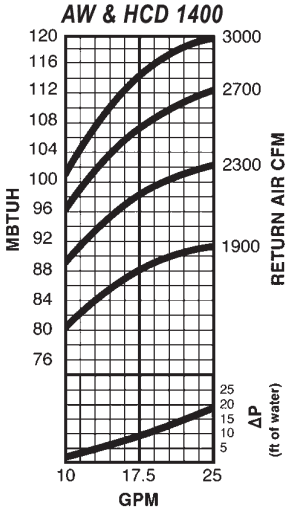

### AW & HCD 800



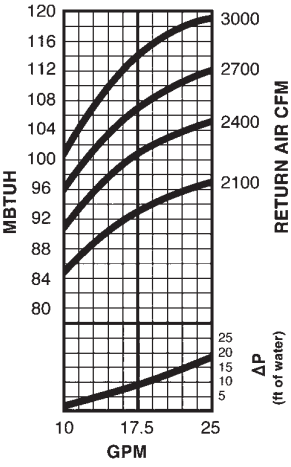

### AW & HCD 1200



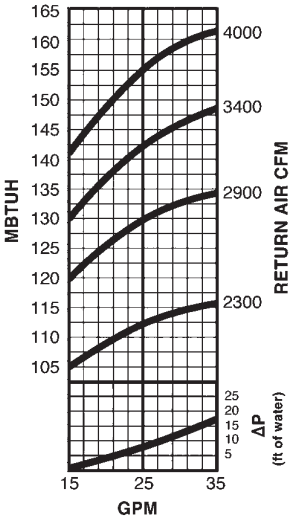

### AW & HCD 1400



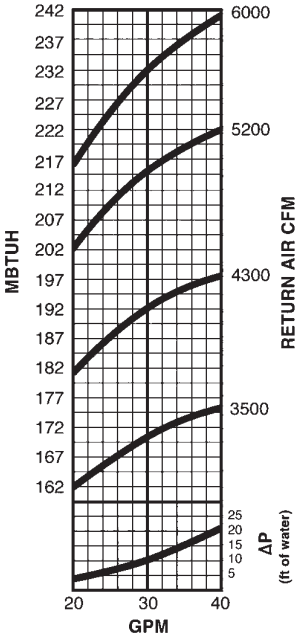

### AW & HCD 1800




### AW & HCD 2600




### AW & HCD 3500




***NOTE***

***Coils add 0.1" WC to ESP***
***Entering Air Temperature - 80°F***
***Entering Water Temperature - 180°F***
***Max. Working Pressure - 125 psi***

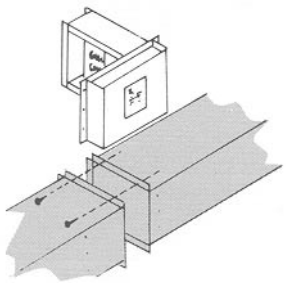
# ELECTRIC HEATER

- Galvanized steel cabinet
- Duct-mounted, flange type
- Airflow in either direction
- UL and CSA approved heater
- Airflow proving switch
- Auto and manual reset, high temperature limits
- Magnetic contactors
- 24 volt control circuit and transformer
- Standard heater for indoor installation in uninsulated duct
- Optional - outdoor installation

| VOLTS/HZ/PH | 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<br>10KW-2STG<br>---<br>--- | 10KW-1STG<br>15KW-1STG<br>15KW-2STG<br>20KW-2STG | 20KW-1STG<br>30KW-1STG<br>30KW-2STG<br>40KW-2STG | ---<br>---<br>---<br>--- |
| 208/60/3 **OR** 230/60/3 | 5KW-1STG<br>10KW-2STG<br>---<br>--- | 10KW-1STG<br>15KW-1STG<br>15KW-2STG<br>20KW-2STG | 20KW-1STG<br>30KW-1STG<br>30KW-2STG<br>40KW-2STG | 30KW-1STG<br>45KW-1STG<br>45KW-2STG<br>60KW-2STG |
| 460/60/3 **OR** 575/60/3 | 5KW-1STG<br>10KW-2STG<br>---<br>--- | 10KW-1STG<br>15KW-1STG<br>15KW-2STG<br>20KW-2STG | 20KW-1STG<br>30KW-1STG<br>30KW-2STG<br>40KW-2STG | 30KW-1STG<br>45KW-1STG<br>45KW-2STG<br>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. Please refer to the Table of Contents for the Field Wiring Diagram.



### Reference Dimensions: Fan Outlet

AW/HCD 550/800/1200 - 9-1/4 x 10-3/8 inches

AW/HCD 1400/1800/2600 - 12-1/2 x 13-1/2 inches

AW/HCD 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 sides with service panels. Sides without service access panels may be mounted against walls. Refer to DIMENSIONAL DATA for unit sizes in the Performance section of this manual.

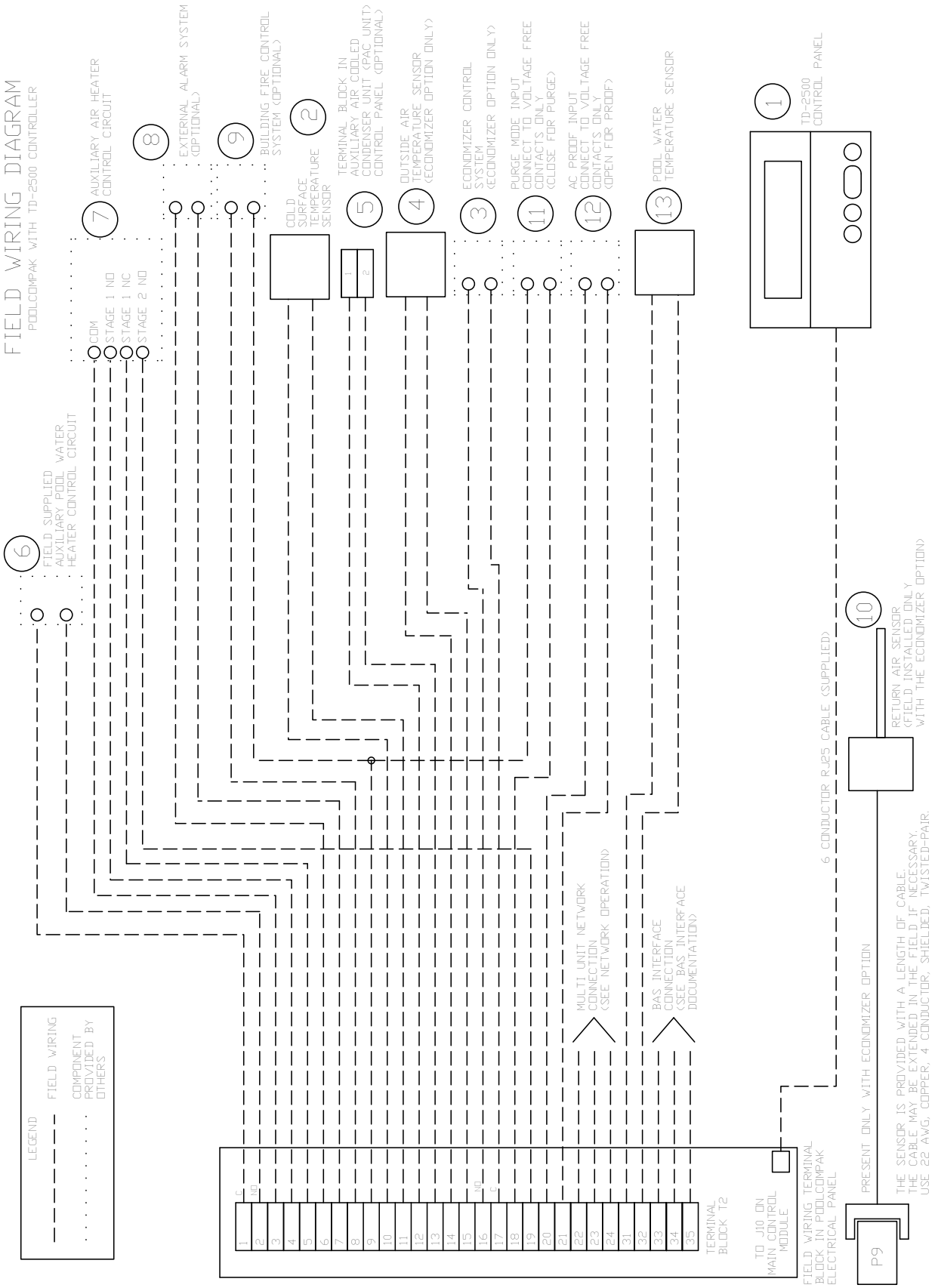
## MOUNTING OF POOLCOMPAK UNITS

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.

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

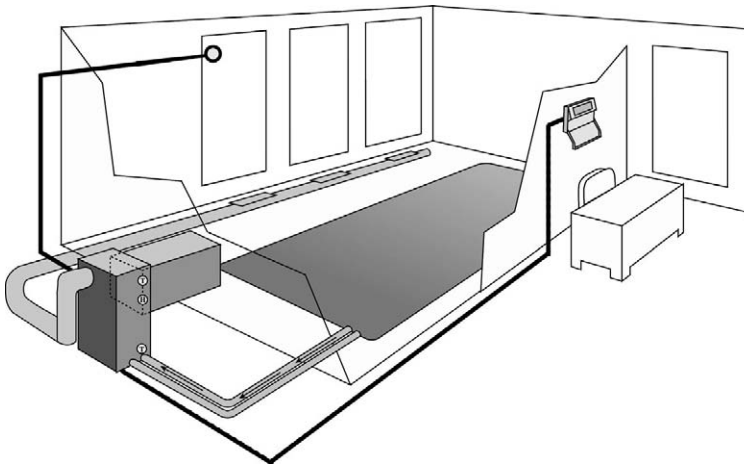



**TD-2500 Field Wiring Diagram**

# TD-2500 CONTROLS

## INSTALLATION

The following represents a typical PoolComPak unit installation. The field wiring diagram on page 51 shows the sensors and other devices necessary for operation of the TD-2500 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-2500 Installation**

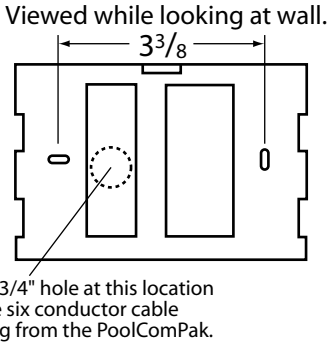
### 1. Remote Interface Unit

The remote interface unit shown on page 62 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.

> ***NOTE***
> ***The remote interface unit does not contain any sensors and should be mounted outside the pool enclosure. A factory supplied RJ12 (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. It may be extended with standard RJ12 (6 conductor) telephone extension cables and RJ12 couplers.

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 remote interface unit to the PoolComPak unit. For convenience, the control panel may be connected directly to the plug located in the PoolComPak’s electrical panel during service or start-up. Refer to the figure on page 36 for remote interface unit mounting dimensions.




**Control Panel Mounting Plate**

## 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 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.

## 3. Economizer System (Optional)

**▲WARNING!**

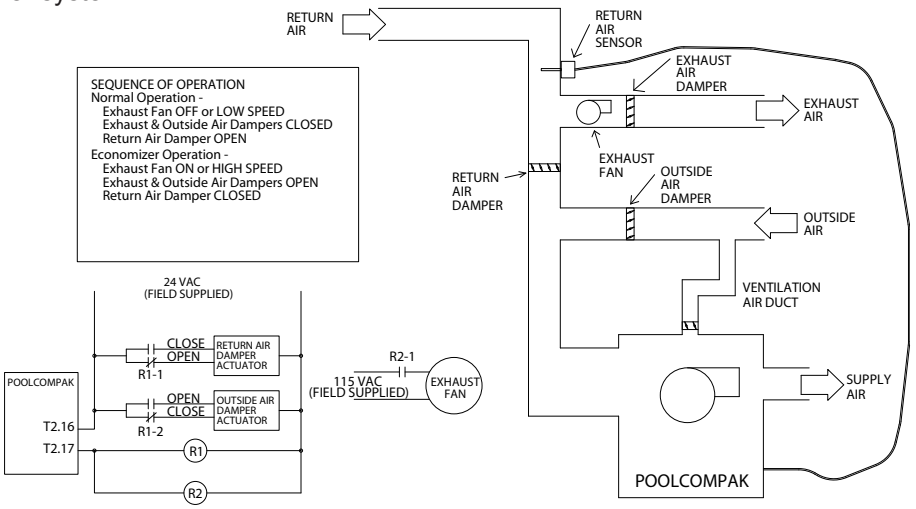
***When economizer option is selected, adequate exhaust capacity via a separate fan must be specified to ensure the natatorium remains slightly negative. Failure to specify an adequately sized exhaust system may result in damage to the structure and pool odors may be forced into other areas of the building.***

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-2500 provides a dry contact closure to activate the economizer. The contacts of the TD-2500 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-2500 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.



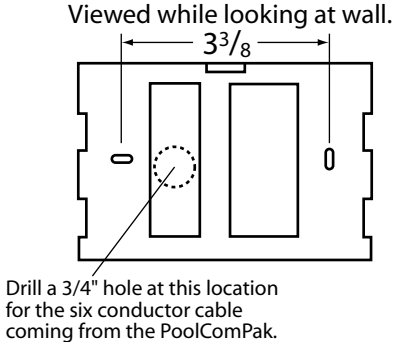

**Typical Economizer System w/Control**

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 damper positions. The compressor is energized in the space cooling mode (if so equipped). The compressor will then continue to run until the call for space cooling is satisfied.

The economizer will also be activated in the space cooling mode if the auxiliary air conditioning 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 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-2500 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 silicone caulk to prevent moisture from migrating out to the sensor and condensing inside the sensor.

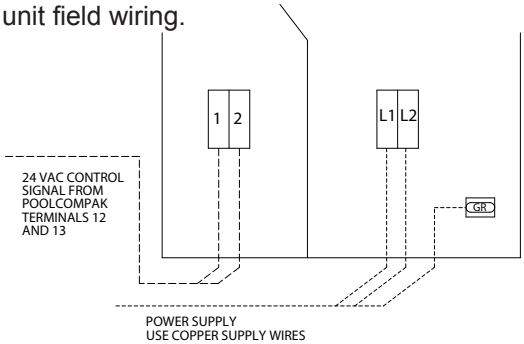



**Outside Air Temperature Sensor**

## 5. Air-Cooled Condenser (Optional)

The air-cooled condenser is used to reject heat recovered during the space cooling mode of operation. Only PoolComPak brand air-cooled condensers (PAC Units) should be used with a PoolComPak Unit. The TD-2500 provides a 24 VAC control signal to the speed controller located in the PAC unit control panel.

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



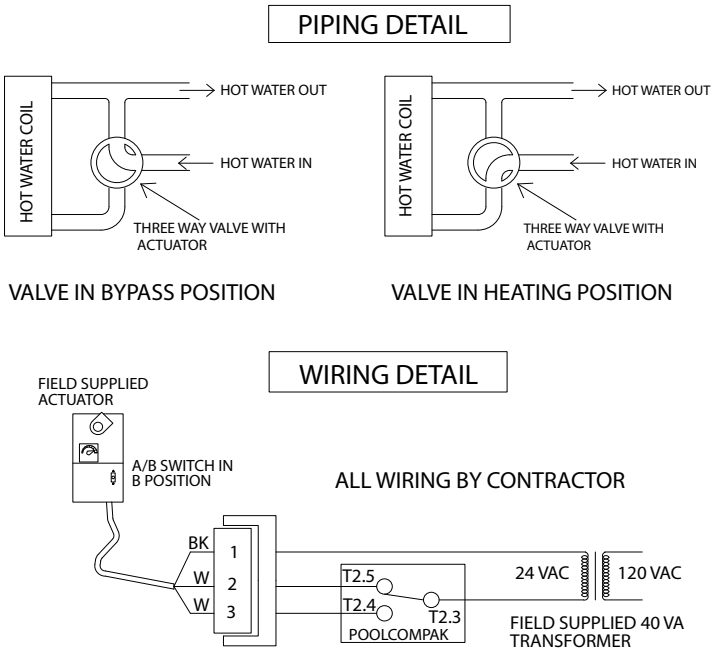

**PAC Unit Field Wiring**

## 6. Auxiliary Pool Water Heating System (AWV 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-2500 provides a dry contact closure that signals a need for auxiliary water heating. The contacts of the TD-2500 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-2500 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-2500 provides a form "C" (NO and NC) dry contact closure that signals a need for auxiliary air heating. The TD-2500 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-2500 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 remote interface unit 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-2500 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 remote interface unit 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 65 for further explanation.

### 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 53 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 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-2500 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

***NOTE***

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

## POOL WATER PIPING INSTALLATION (AWV Models only*)

If a new or existing pool water 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 downstream of 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 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

* HCD models do not have pool water heating capabilities.

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 connections in the plumbing system.

A constant flow of water is required through the PoolComPak unit's pool water condenser. The circuit to and from the unit must be capable of maintaining the flow rate as specified for the installed unit (refer to 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 pressure. Refer to the Performance Data section for the particular unit model in question for the proper flow rate and pressure drop across the pool water condenser.

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

**▲ WARNING!**

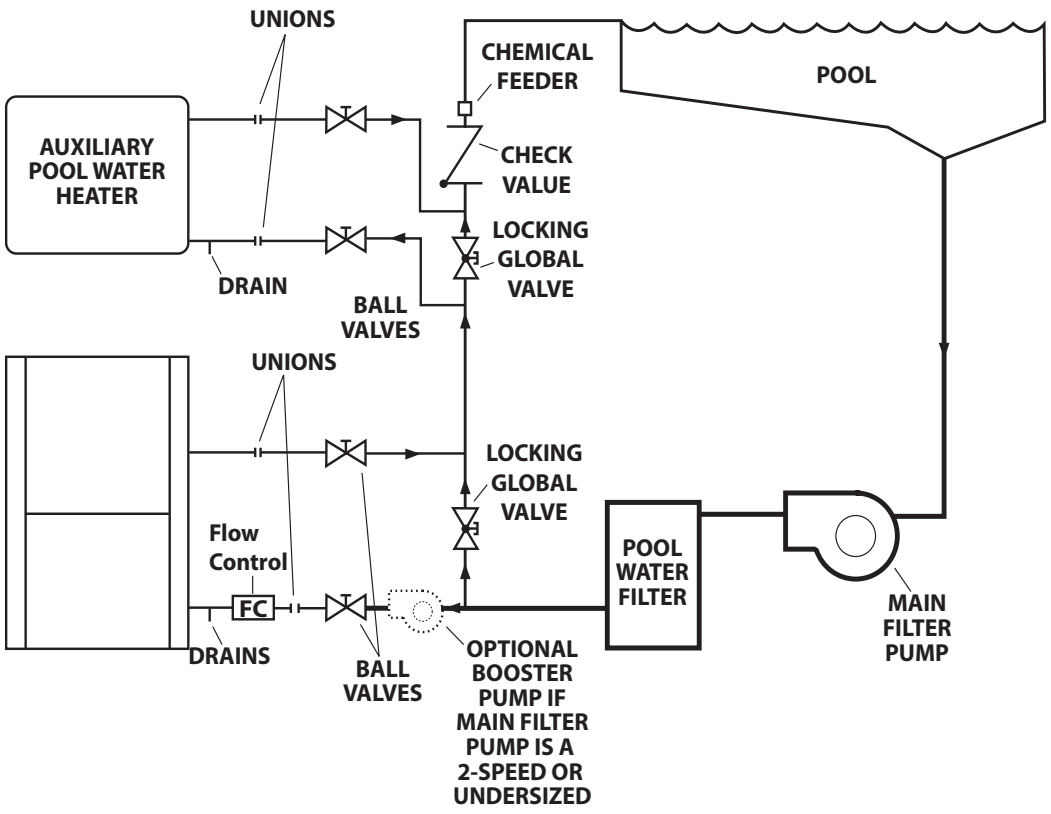
***Excessive water flow can cause premature erosion and pitting of the pool water condenser. Adjust valve so that the water flow does not exceed the GPM or pressure drop listed in the table.***

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 pool water heating systems are staged to supplement the PoolComPak unit pool 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.

Condensate may be returned to the pool (if local codes allow), but PoolPak International neither recommends nor disapproves 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 pool water piping circuit, pipe them (and any auxiliary pool water heater) in parallel. Piping PoolComPak units in series may result in the down stream unit(s) sensing the pool water temperature as satisfied and not reject heat to the water to its full capacity. The actual pool water temperature should be sensed by each PoolComPak unit and auxiliary pool water heater.

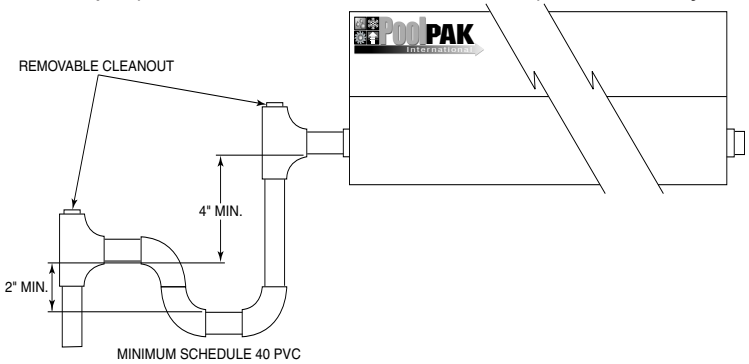



**Typical Pool Water Piping Diagram (AWV Model only*)**

## CONDENSATE DRAIN PIPING INSTALLATION

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




**Condensate Trap**

* HCDV models do not have pool water heating capability.

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.

## AIR-COOLED CONDENSER INSTALLATION

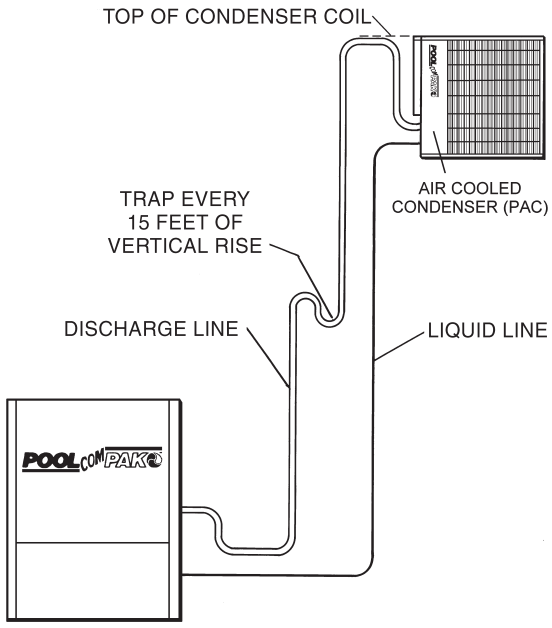
Installation of the outdoor air-cooled condenser should only be done by a qualified refrigeration mechanic familiar with this type of work. Many service problems can be avoided by taking adequate precautions to provide an internally clean and dry system and by using procedures and materials that conform 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.

**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 listed in the chart 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 or lower elevation than the PoolComPak unit and more than 25 feet, refer to figure below line sizes.
- For PAC units at the same elevation as the PoolComPak unit with lines less than 25 feet, 550-1800 units are charged with the additional refrigerant charge (PAC 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 46 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 PAC condenser coil.
    - The hot gas line should loop toward the floor if the PAC unit is located above the PoolComPak unit,

especially if the hot gas riser is long.

- When a discharge line riser is 30 feet or more in length, a trap must be installed every 15 feet of vertical rise. The trap aids in oil return and provides a drainage point for oil when the compressor stops and for liquid refrigerant which may condense during the OFF cycle.




**Hot Gas Riser**

- 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 46 for the required additional oil and refrigerant charge (PAC 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 PoolComPak units have been factory designed to accommodate the special capacity and pressure drop requirements of each PoolComPak model. These air-cooled condensers must be properly matched to the PoolComPak model so that the cooling modes work properly over the entire operating range.

# PAC AIR-COOLED CONDENSER

| POOLCOMPAK UNIT | ACC MODEL NO. | AMBIENT TEMP | DIAGRAM NO. | UNIT HEIGHT A | VAPOR O.D.** B | LIQUID O.D.** C | UNIT WEIGHT | MOTOR HP | MOTOR FLA | | MIN. CIRCUIT AMPACITY* | | PHASE Ø |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 208/230V | 460V | 208/230V | 460V | |
| AW & HCD 0550 | PAC-42 | 95/100° | 1 | 39.3” | 5/8” | 1/2” | 120 | 0.5 | 3.0 | 1.5 | 3.8 | 1.9 | 1 |
| | PAC-42 | 105° | | | | | | | | | | | |
| | PAC-42 | 110° | | | | | | | | | | | |
| | PAC-42 | 115° | | | | | | | | | | | |
| AW & HCD 0800 | PAC-42 | 95/100° | 1 | 39.3” | 5/8” | 1/2” | 120 | 0.5 | 3.0 | 1.5 | 3.8 | 1.9 | 1 |
| | PAC-42 | 105° | | | | | | | | | | | |
| | PAC-85 | 110° | | | 7/8” | 5/8” | 210 | | | | | | |
| | PAC-85 | 115° | | | | | | | | | | | |
| AW & HCD 1200 | PAC-53 | 95/100° | 1 | 39.3” | 3/4” | 1/2” | 120 | 0.5 | 3.0 | 1.5 | 3.8 | 1.9 | 1 |
| | PAC-85 | 105° | | | | | | | | | | | |
| | PAC-85 | 110° | | | 7/8” | 5/8” | 210 | | | | | | |
| | PAC-126 | 115° | 2 | | 1-1/8” | 3/4” | 416 | 2 x 0.5 | 2 x 3.0 | 2 x 1.5 | 7.5 | 3.8 | |
| AW & HCD 1400 | PAC-85 | 95/100° | 1 | 39.3” | 7/8” | 5/8” | 210 | 0.5 | 3.0 | 1.5 | 3.8 | 1.9 | 1 |
| | PAC-85 | 105° | | | | | | | | | | | |
| | PAC-126 | 110° | 2 | | 1-1/8” | 3/4” | 416 | 2 x 0.5 | 2 x 3.0 | 2 x 1.5 | 7.5 | 3.8 | |
| | PAC-126 | 115° | | | | | | | | | | | |
| AW & HCD 1800 | PAC-85 | 95/100° | 1 | 39.3” | 7/8” | 5/8” | 210 | 0.5 | 3.0 | 1.5 | 3.8 | 1.9 | 1 |
| | PAC-85 | 105° | | | | | | | | | | | |
| | PAC-126 | 110° | 2 | | 1-1/8” | 3/4” | 416 | 2 x 0.5 | 2 x 3.0 | 2 x 1.5 | 7.5 | 3.8 | |
| | PAC-126 | 115° | | | | | | | | | | | |
| AW & HCD 2600 | PAC-126 | 95/100° | 2 | 39.3” | 1-1/8” | 3/4” | 416 | 2 x 0.5 | 2 x 3.0 | 2 x 1.5 | 7.5 | 3.8 | 1 |
| | PAC-126 | 105° | | | | | | | | | | | |
| | PAC-126 | 110° | | | | | | | | | | | |
| | PAC-210 | 115° | 3 | 40.5” | 1-3/8” | 7/8” | 550 | 1/3, 1/3, 3/4 | 2.6, 2.6, 4.8 | 1.3, 1.3, 2.4 | 15 | 15 | 3 |
| AW & HCD 3500 | PAC-169 | 95/100° | 2 | 39.3” | 1-1/8” | 7/8” | 416 | 2 x 0.5 | 2 x 3.0 | 2 x 1.5 | 7.5 | 3.8 | 1 |
| | PAC-169 | 105° | | | | | | | | | | | |
| | PAC-210 | 110° | 3 | 40.5” | 1-3/8” | | 550 | 1/3, 1/3, 3/4 | 2.6, 2.6, 4.8 | 1.3, 1.3, 2.4 | 15 | 15 | |
| | PAC-226 | 115° | | | | | 580 | | | | | | 3 |

***Notes***

****Maximum overload protection 15 amps.***

*****For up to 25 ft. in length.***

## PAC AIR COOLED CONDENSER

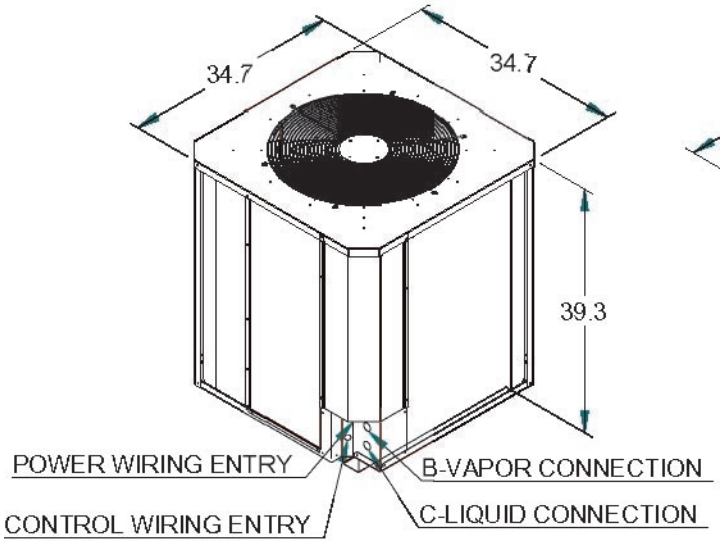



**Diagram 1**

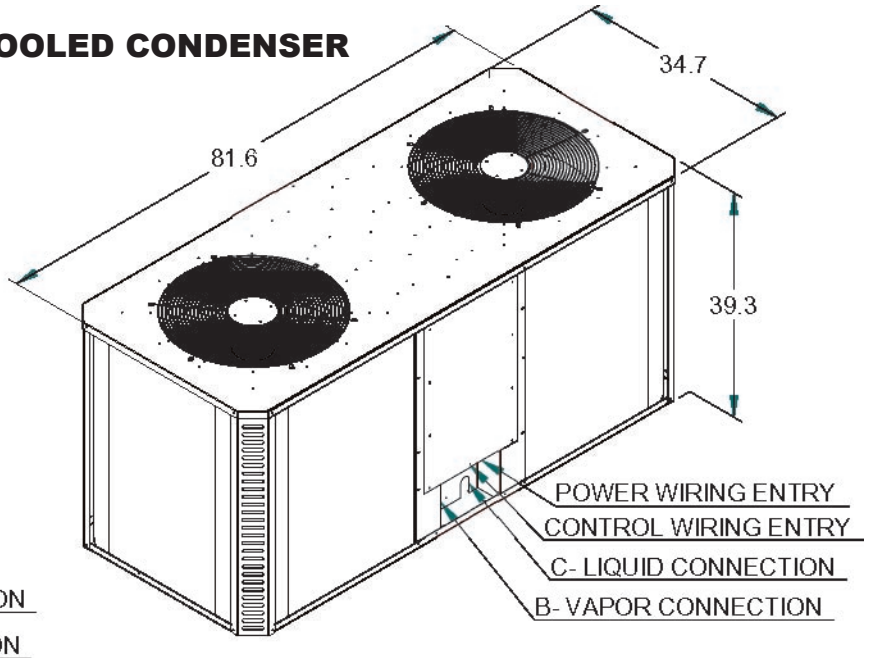



**Diagram 2**

Finish: Powder Coat
Color: Desert Sand

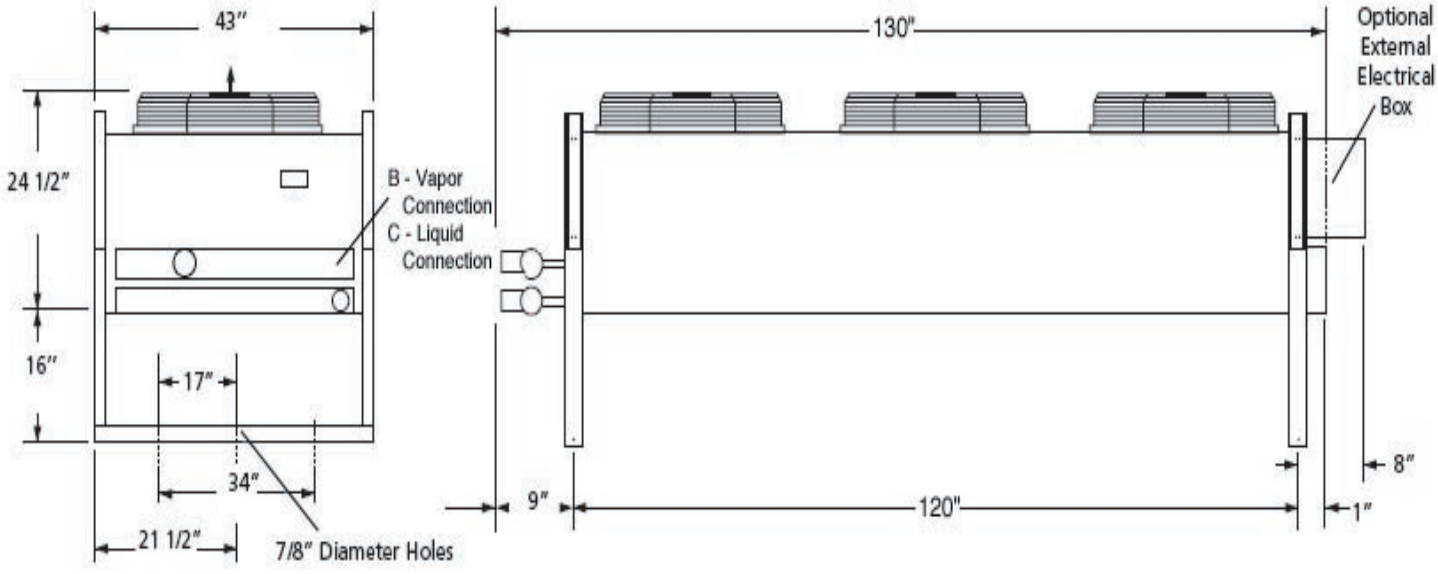
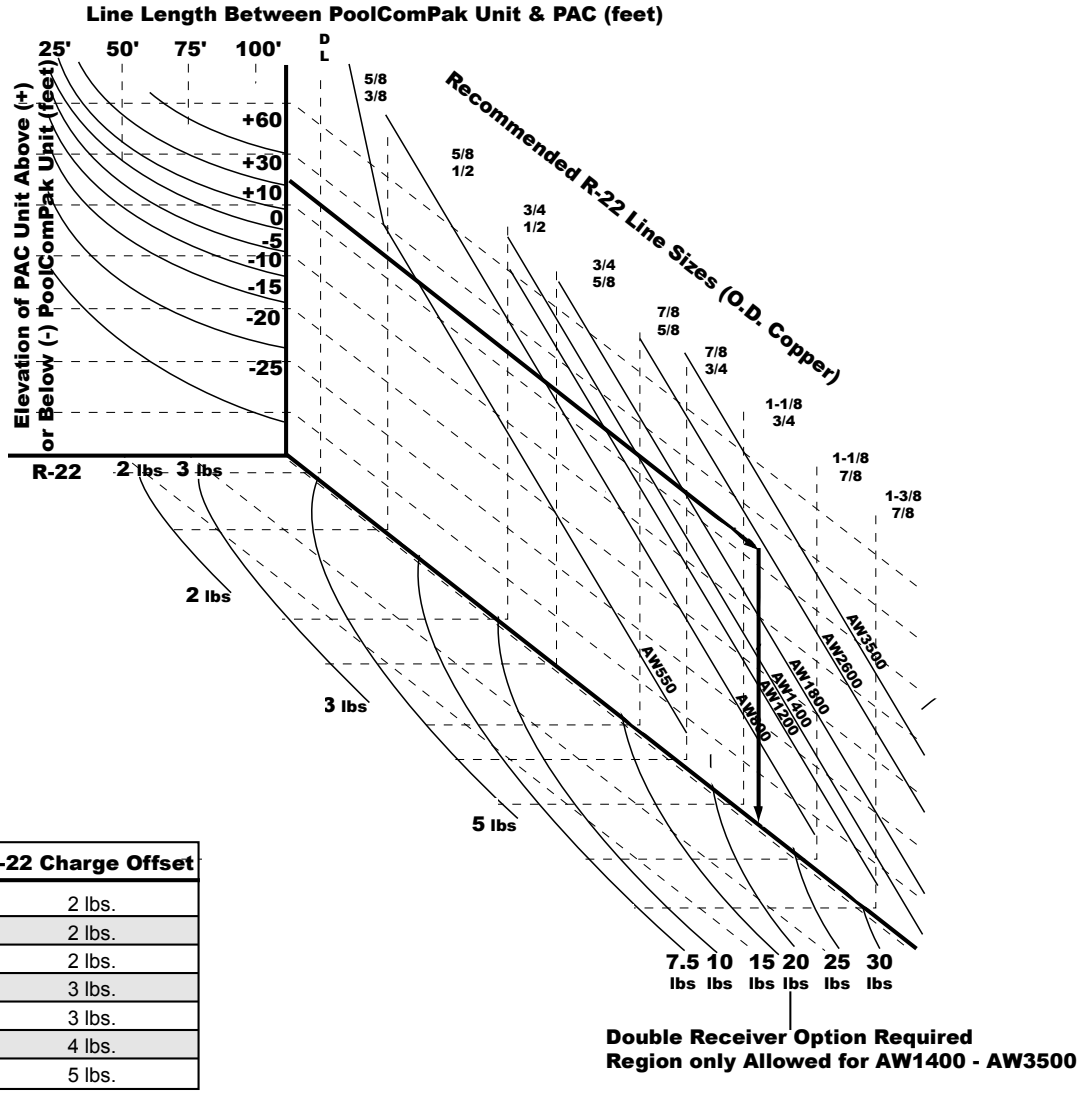



**Diagram 3**




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

***NOTE***

***Additional R22 requirements for lines longer than 25 ft. must be calculated according to the ASIO. AW & HCD 2600 and 3500 units require an additional 10 ½ lbs. R22 for the first 25 ft. line length. Contact factory for refrigerant lines longer than 100 ft.***

## Required Additional Refrigerant Charge Suniso-3GS Oil Charge, and Line Sizing for PAC Unit at 95˚F - 105˚F Ambient Temperature

| Lubricant Types for Compressors | | | | |
|---|---|---|---|---|
| **Compressor Mfr** | **Compressor Model** | **Refrigerant** | **Oil type** | **Equivalent** |
| Bristol | H2*B | R-22 | Suniso_3GS | Mineral Oil (3GS) |
| Bristol | H2*C, H2*R | R-22 | Zerol 150 w/3% Syn-O-Ad | Alkylbenzene (150T) (w/3% syn-o-ad 8478) |
| Bristol | H2*G | R-22 | Zerol 150 w/1.5% Syn-O-Ad | Alkylbenzene (150T) (w/3% syn-o-ad 8478) |
| Trane | Trane | R-22 | TRANE OIL 00042 | Mineral Oil |

# TD-2500 SET-UP/CONFIGURATION


**TD-2500 Remote Interface Unit**

## STATUS SCREENS

Normally the remote interface unit 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 FLOW | YES |
| WATER TEMP | 80ºF |

### Screen 2 displays:

WATER HEATING YES or NO

Yes indicates that the unit is returning 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

| | |
|---|---|
| SPACE [COOLING] | YES |
| AUX AIR HEAT | NO |
| DEHUMIDIFY | NO |
| ECONOMIZER MODE | NO |

### 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 is enabled under the service setup screen.

## CHANGING SET POINTS

Three set points, air temperature, relative humidity, and water temperature, can be accessed through the remote interface unit. To change a set point, press the corresponding set point key. See figure on page 62. 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 the unit is turned off 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

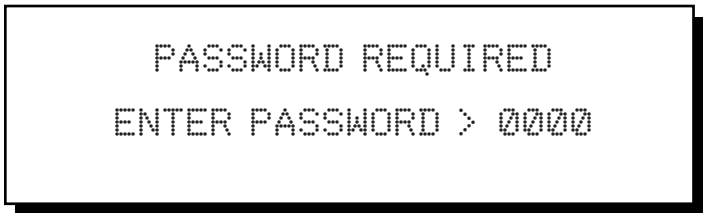
- Compressor
- Fan motor
- Air-cooled condenser fan motor
- Auxiliary air heat

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-2500 SERVICE PARAMETERS

The following instructions detail the service functions of the TD-2500 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-2500 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 unit 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-2500 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-2500 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-2500 into a manual mode. In this mode, the compressor and fan are shut off and the individual parts of the TD-2500 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-2500 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 unit 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-2500 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-2500’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-2500 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.

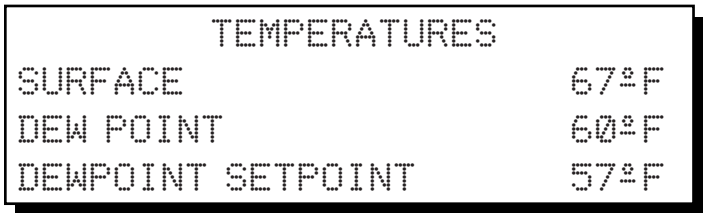
## SERVICE INFORMATION SCREENS- Key III

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. If 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

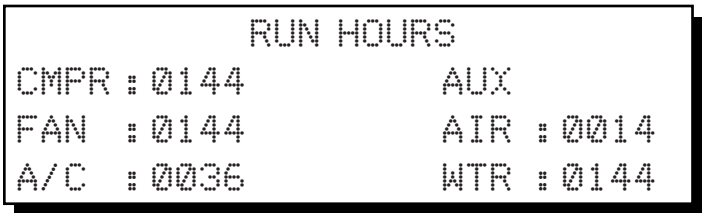



The second screen displays the number of hours the following components have been active since the unit was last powered up. These values are reset to 0000 when the unit is powered on.

- 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

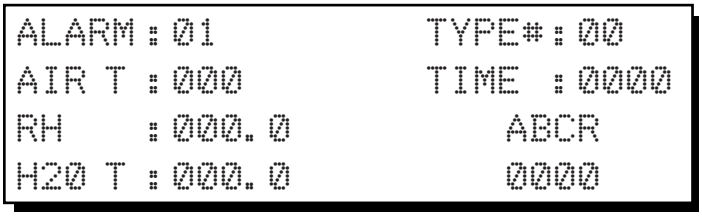



The third screen shows the number of faults that have occurred since the unit was powered up. Faults included in this count are high pressure, low pressure and high compressor motor temperature. If the number of faults reaches ten, the TD-2500 will lockout the compressor to protect it from damage and 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 PoolComPak unit for at least ten seconds and then reapplying power.

## Service Info Screen 3

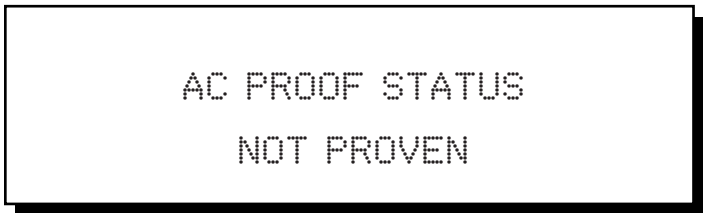

The fourth screen shows Enhanced Alarm History. For information on how to read the enhanced alarm history, refer to the Enhanced Alarm History on page 77.

## 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 outside air intake damper and exhaust dampers fully open to introduce a high volume of outside 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-2500 - 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
  Allows operation of an optional remote air-cooled condenser 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, AW or HCD.
  AW or HCD
  Determined by the model of the unit. Unit model # verifies if the unit is AW or HCD.
  HCD 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 reheat coil and pool water condenser; providing that none of the other test modes are energized.

> ***Note***
> ***The bypass solenoid may or may not be energized depending on the pool water temperature and pool 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-2500 NETWORK OPERATION

Networked TD-2500 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 remote interface unit.

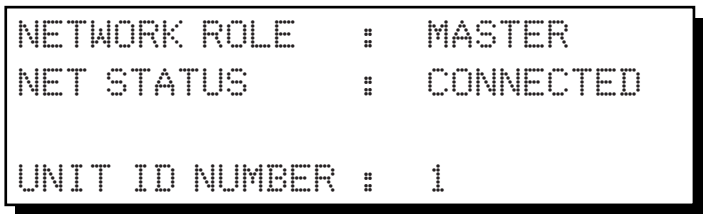
A single remote interface unit is used to monitor all units on the network. ***Indicator lights beside Roman numeral buttons*** I ***through*** IV ***indicate which unit is currently being displayed. The next unit in line can be selected by pressing button*** V***.*** If an alarm condition occurs in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

### Network Status Screen 1

```
UNIT 1 PRESENT    :   YES
UNIT 2 PRESENT    :   YES
UNIT 3 PRESENT    :   YES
UNIT 4 PRESENT    :   NO
```

The remote interface unit 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 remote interface unit, 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-2500 network to accommodate a wide variety of installation options. Press button I at the remote interface unit 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 pool 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 pool 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 pool water temperature on its own, it is necessary to select the correct PoolComPak unit with the remote interface unit before changing the pool water temperature set point.

**Staged Dehumidification Control - YES or NO**

Determines whether the PoolCompak 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 point 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-2500 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 remote interface unit. Like the LOCAL pool water temperature setting, this parameter, when set to NO, requires this unit to be displayed on the remote interface unit 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 remote interface unit 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 remote interface unit is displaying the unit, they will be changed in all units configured for Network control. The pool water temperature set point will only be changed in the unit currently being displayed by the remote interface unit. Units that are not configured for Network Control will use all local set points. Therefore any set points changed while the remote interface unit 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.***

**▲ 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-UP 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 downstream of the filter and upstream of 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 air conditioning condenser, 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 air conditioning condenser, 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 51. Check all connections to be sure they are tight.
- Check 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 82.

## START-UP

1. After making sure that all personnel are clear of the unit and the pool water flow to the unit is OFF, turn on the electrical power supply. The remote interface unit will briefly sound a buzzer and the display will come on. On three phase units with power protection modules, if the remote interface unit 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 remote interface unit 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 63 to correct the readings on the TD-2500. 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 remote interface unit. 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-2500.
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 64. 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 operation for 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 PoolComPak 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 PoolComPak 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 that the remote air-cooled condenser fan is running or that water is flowing through the auxiliary water-cooled air conditioning condenser. The temperature of the supply air from the PoolComPak 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 air conditioning 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 remote interface unit back on the wall if it was removed during start-up. It is not necessary to disconnect power from the unit before unplugging the remote interface unit.
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.

> ***NOTE***
> ***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 remote interface unit 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 remote interface unit 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 69 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 remote interface unit to the permanent mounting location.
11. The PoolComPak TD-2500 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 77 per National Spa and Pool Institute values.
- PoolPak International recommends daily logging of your pool water chemistry. MAINTENANCE AND 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-2500 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 reheat coils. This will ensure proper heat transfer and reduce static pressure losses. Caution should be taken not to wet electrical components inside the unit.

***NOTE***
***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 | 10.0q |
| **Combined Chlorine (ppm)** | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| **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 | 80 | 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-2500 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-2500 has many features that will help a service technician resolve the issue.

The PoolComPak 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 PoolComPak 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 above the dew point temperature set point. The dew point temperature and dew point temperature set point are 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 remote interface unit will display the fault condition and a recommended course of action. If the fault is a high pressure, low pressure, or defrost, the TD-2500 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-2500 remote interface unit reads that the unit is calling for dehumidification, make sure the PoolComPak has sufficient water flow. The TD-2500 will lock out the compressor if the unit does not have sufficient water flow.

After a fault condition has been eliminated, the remote interface unit 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 remote interface unit.

Fault conditions detected by the TD-2500 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 80-81 for possible causes and solutions. The TD-2500 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 80 for possible causes and solutions. The TD-2500 will restart the compressor five minutes after the fault occurred.
- EEPROM FAILURE - indicates that a problem with the TD-2500 has been detected through self diagnostics. The PoolComPak unit will be shut down if this fault occurs. Contact a qualified service provider to correct the problem.
- FIRE TRIP - indicates that the TD-2500 has received an alarm signal from the building fire control system. The PoolComPak 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-2500 has failed. Depending on which sensor has failed, some functions of the PoolComPak 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-2500 will shut down the compressor until the protection module resets. See the Troubleshooting Guide on pages 80-81 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-2500 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-2500 will shut down the PoolComPak 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 80-81 for causes and solutions.
- DEFROST TRIP ACTIVE - indicates that the defrost thermostat is open (opens at 30° F). The TD-2500 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 80-81 for causes and solutions.

## ENHANCED ALARM HISTORY

The TD-2500 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.

```
ALARM# :01          TYPE# :03
AIR T  :82.3        TIME  :0078
RH     :63.0           ABCR
H20 T  :81.2         0 1 1 1
```

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:

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-2500 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.

## 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. | 1. Correct the network connection. |
| | 2. Unit is not powered on. | 2. Apply power to all units. |
| Unit not available at the control panel. | 1. Unit is not properly connected to network. | 1. Correct the network connection. |
| | 2. Unit is not powered on. | 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. | 1. Set Network Control to YES for units that are to operate together. |
| | 2. Unit is not properly connected to the network. | 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. | 1. Apply power to all units. |
| | 2. All units have uncleared alarm conditions. | 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. | 1. Turn disconnect ON. |
| | | 2. Blown main power fuse. | 2. Replace blown fuse. |
| | | 3. Tripped circuit breaker. | 3. Reset circuit breaker. |
| | | 4. No 24 VAC output from transformer T2. | 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. | 1. Adjust pulley to lower current. |
| | | 2. Very low static pressure on supply duct. | 2. Connect duct if not connected; correct |
| | | 3. Fuse FU3 blown. | 3. Replace fuse. |
| | | 4. Fuse FU1 & FU2 blown. | 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. | 1. Replace or tighten fan belt. |
| | | 2. Obstruction in supply duct. | 2. Remove duct obstruction. |
| | | 3. Excessive refrigerant in system. | 3. Remove charge to proper amount. |
| | | 4. Non-condensibles in system. | 4. Recover, evacuate and charge system. |
| | | 5. Reheat solenoid not opening. | 5. Repair reheat solenoid. |
| Fan On Compressor Off | Display shows: Compress Hi Pressure Trip code 100 or 101 | 1. A/C condenser power off. | 1. Restore power to A/C condenser |
| | | 2. A/C condenser fan blocked. | 2. Remove blockage. |
| | | 3. Excessive refrigerant charge. | 3. Remove charge to proper amount. |
| | | 4. Non-condensibles in system. | 4. Recover, evacuate and charge syste |
| | | 5. A/C solenoid not opening. | 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. | 1. Replace or tighten fan belt. |
| | | 2. Dirty air filter. | 2. Replace air filter. |
| | | 3. Obstruction in return duct. | 3. Remove duct obstruction. |
| | | 4. Plugged filter drier. | 4. Replace filter drier. |
| | | 5. TXV valve malfunctioning. | 5. Replace TXV valve. |
| Fan On Compressor Off | Display shows: Defrost Trip Active | 1. Dirty air filter | 1. Replace air filter |
| | | 2. Ambient air temp below 75°F | 2. Heat space with auxiliary heat |
| | | 3. Low refrigerant charge | 3. Properly charge system |
| | | 4. Not enough return air | 4. Adjust air flow to unit |
| Fan On Compressor Off (Scroll Compressor Only) | Display shows: Compressor Motor Thermal Overload | 1. Low refrigerant charge | 1. Properly charge system |
| | | 2. Plugged filter drier | 2. Replace filter drier |
| | | 3. Defective thermal overload | 3. Replace thermal overload module |
| | | 4. Defective compressor | 4. Replace compressor |

# WARRANTY REGISTRATION AND START-UP LOG SHEET

## PoolComPak AW/HCD Series with the TD-2500 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 #: _____

Outside 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 3331
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-2500 Operating Logsheet

***NOTE***

***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 _____ Dewpoint _____ Dewpoint Setpoint _____

**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, AW or HCD. | AW | HCD |
| Does this unit have a hot gas bypass valve? | Yes | No |
| Read the analog inputs 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: | _____ |

| | | |
|---|---|---|
| Enable the water heating first options? | Yes | No |
| Select the type of unit, AW or HCD. | AW | HCD |

| | | |
|---|---|---|
| Does this unit have a hot gas bypass valve? | Yes | No |
| Read the analog inputs every _____ seconds. | | |
| Does the unit have a compressor module? | Yes | No |
| Enable the Fan Overload? | Yes | No |

**Test Modes:**

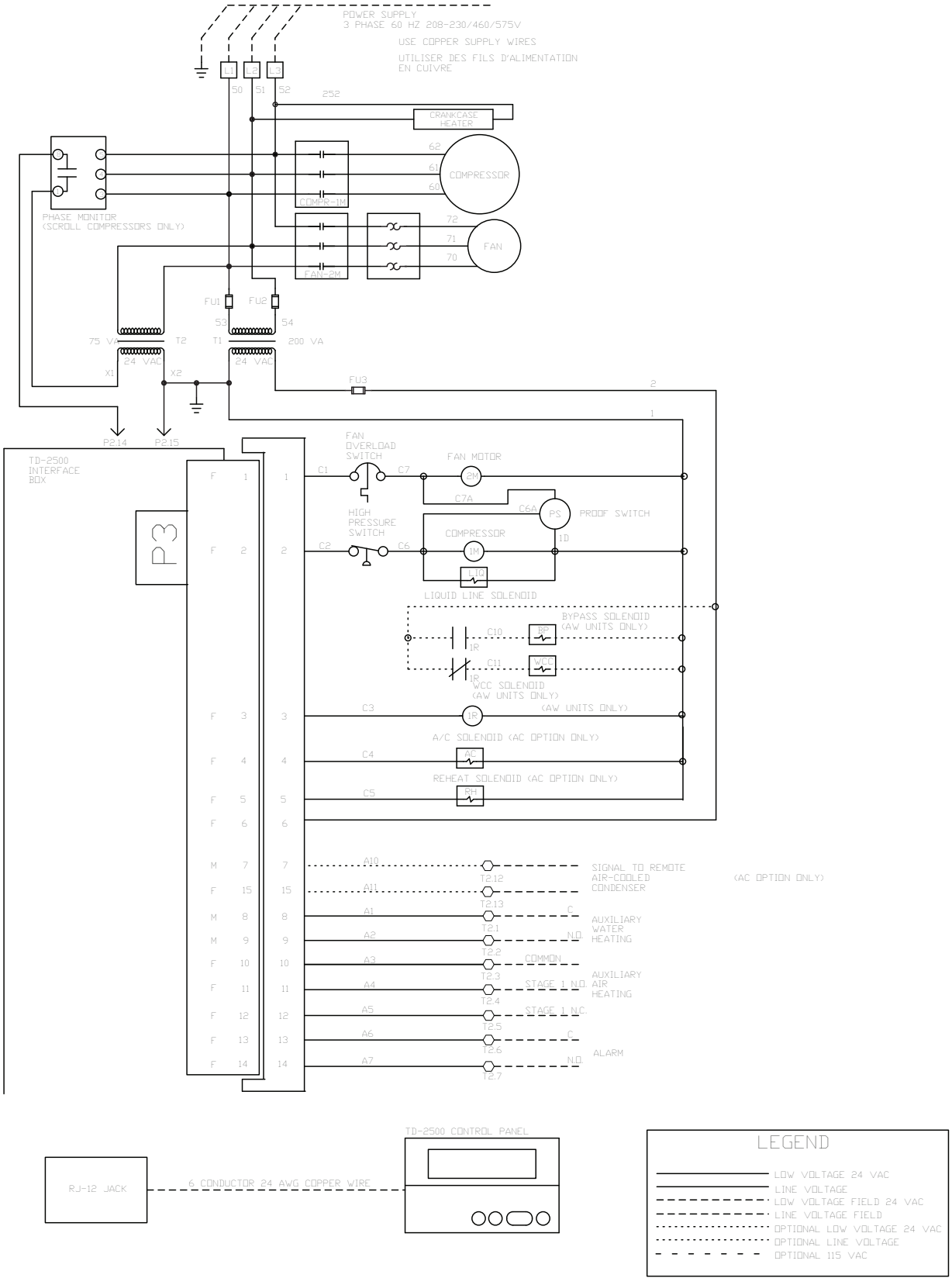
| | | |
|---|---|---|
| Dehumidification: | On | Off |
| Air Cooling: | On | Off |
| Water Heating: | On | Off |
| Aux. Water Heating: | On | Off |
| Aux. Air Heating: | On | Off |

**Cool:**

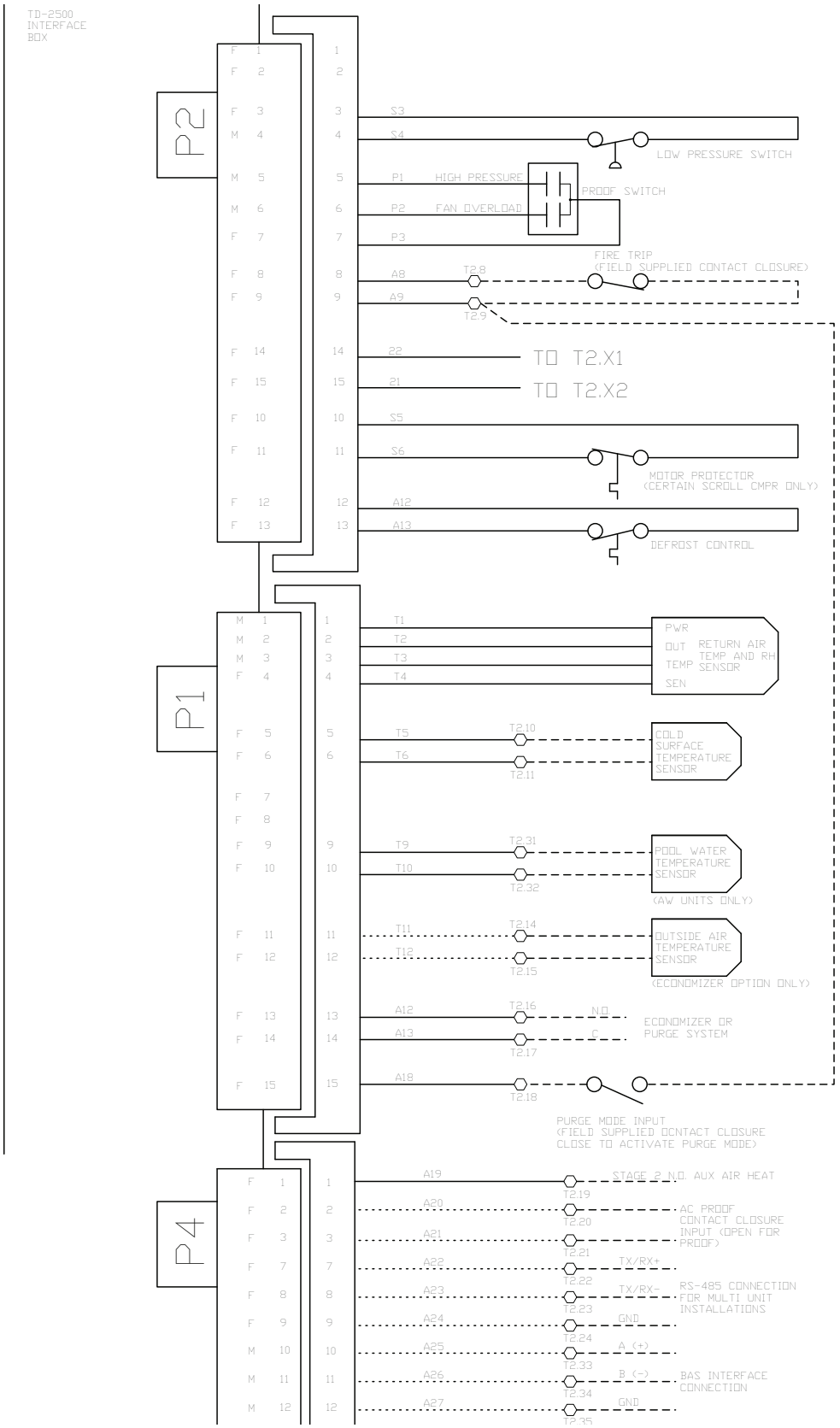
| | |
|---|---|
| Top Deadband | _____ |
| Bottom Deadband: | _____ |
| Min. Value: | _____ |
| Max. Value: | _____ |

**Heat:**

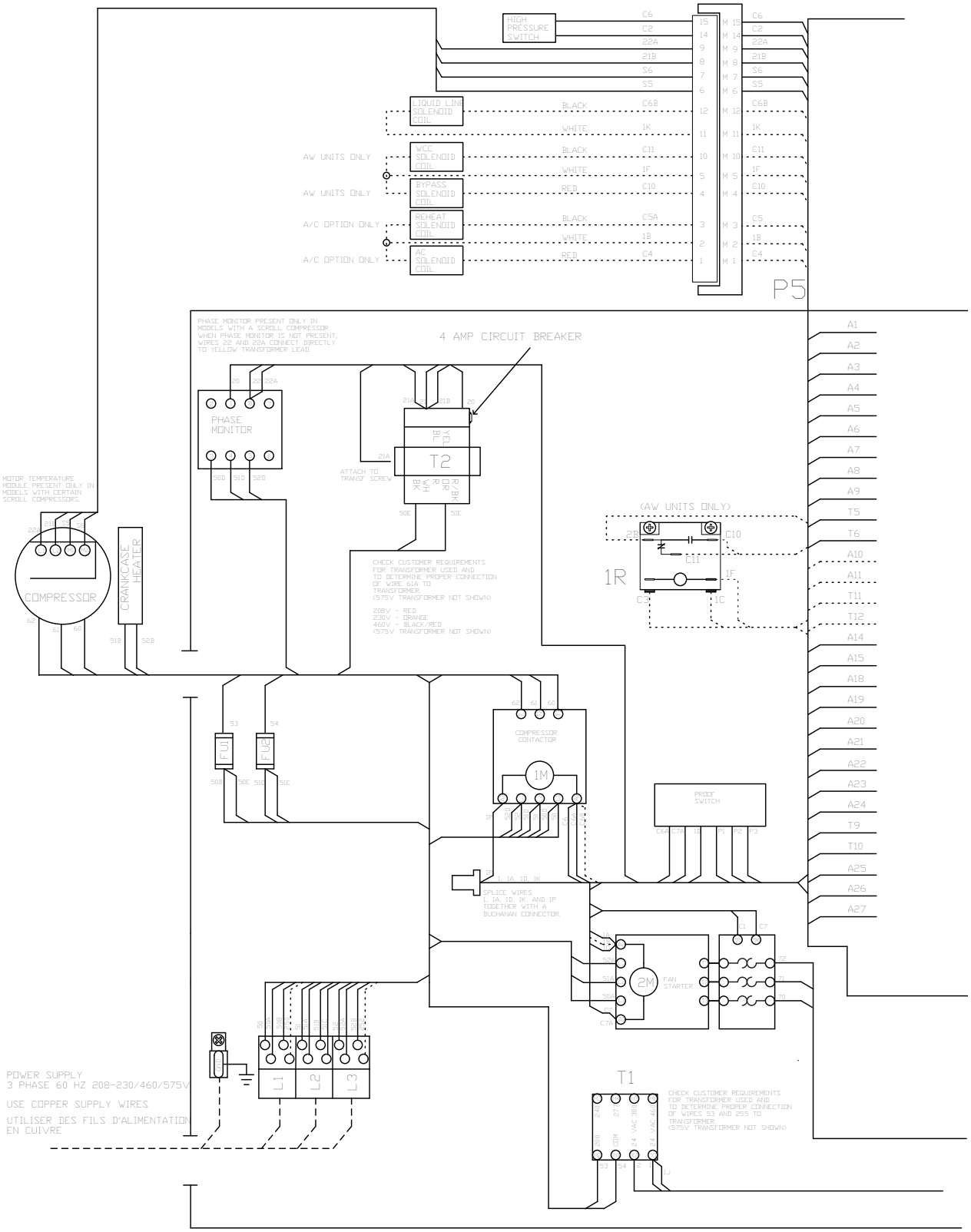
| | |
|---|---|
| Top Deadband: | _____ |
| Bottom Deadband: | _____ |
| Min. Value: | _____ |
| Max. Value: | _____ |



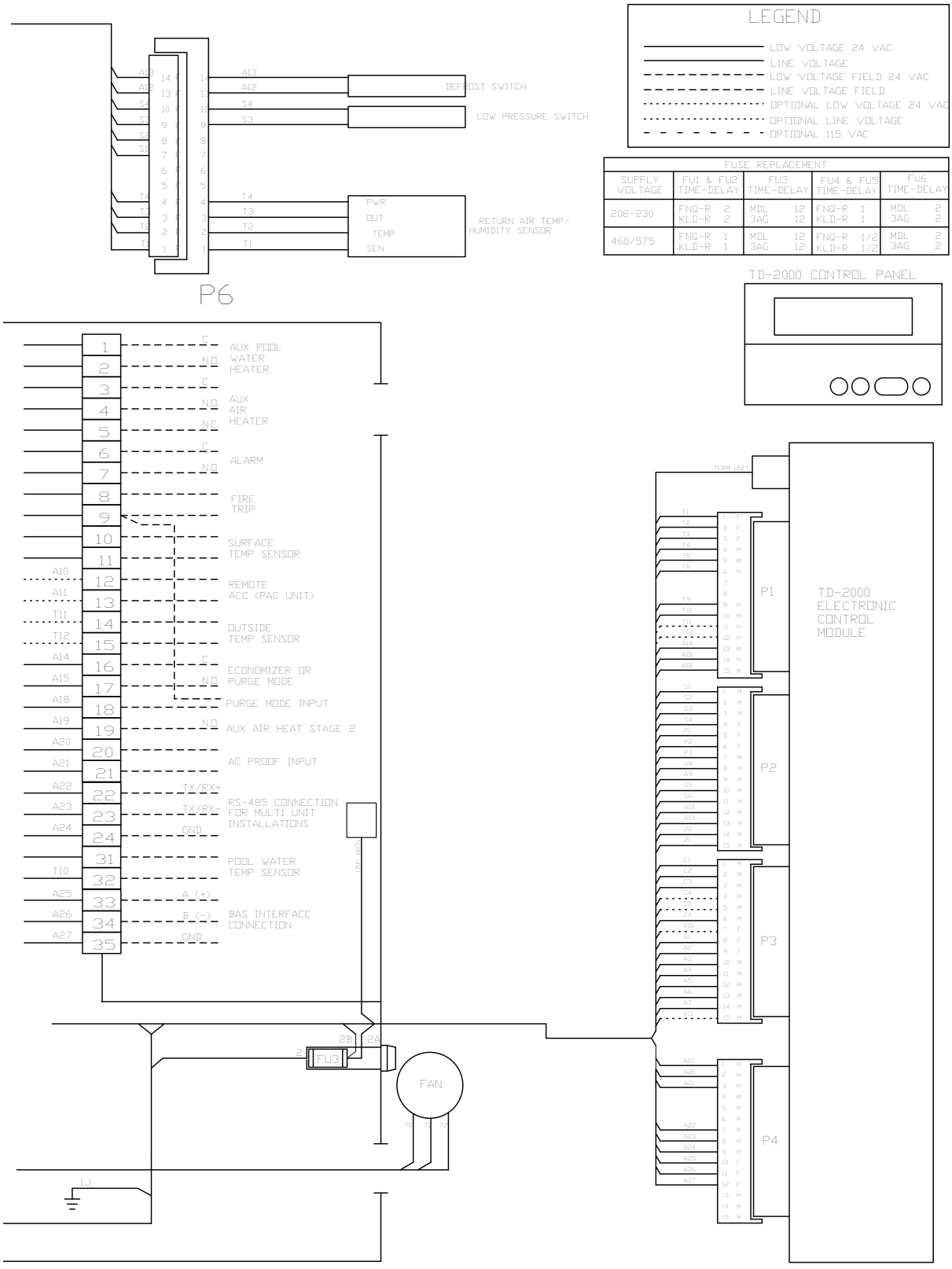

**Schematic—Three Phase PoolComPak with TD-2500 Control**



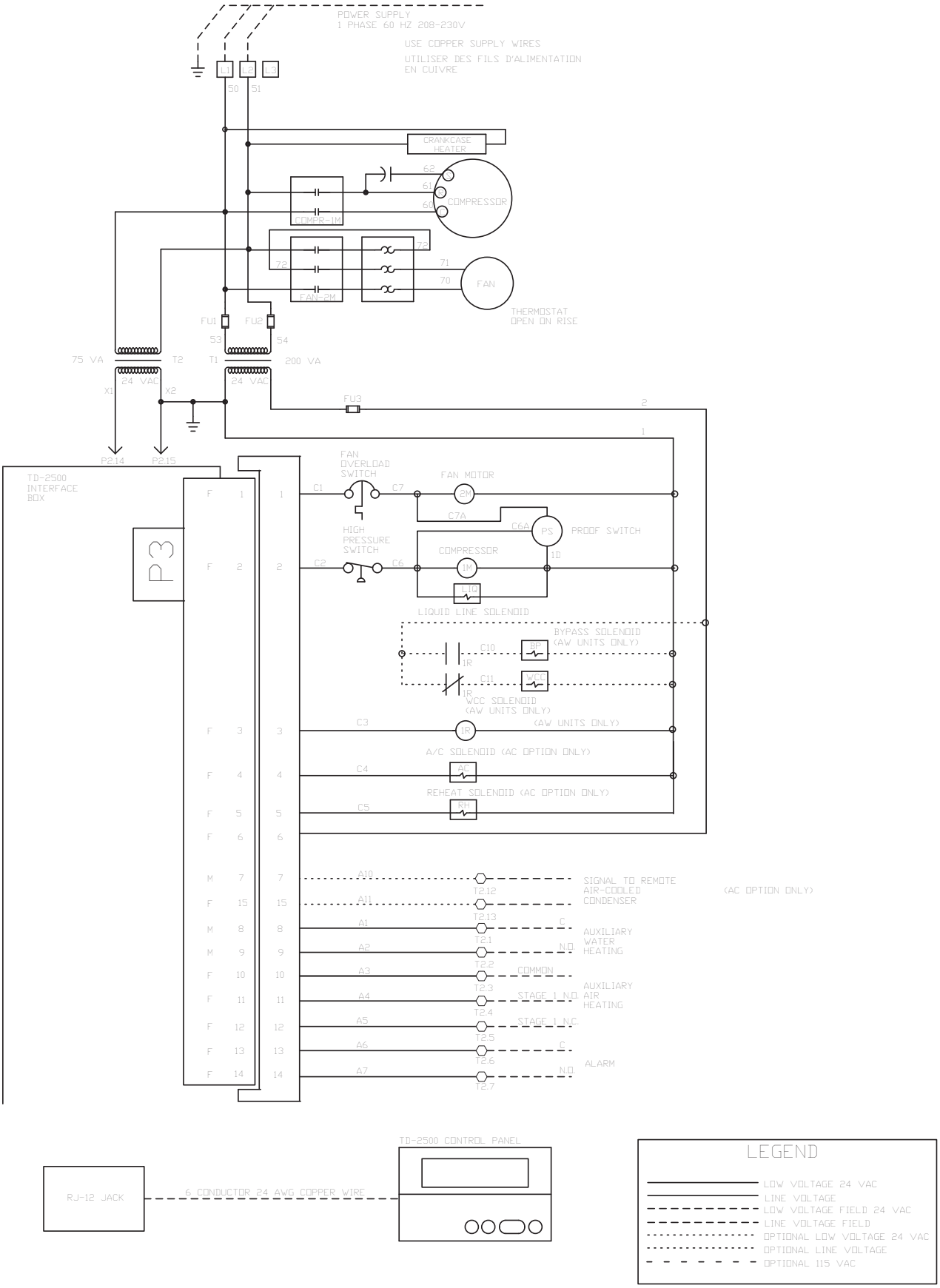

**Schematic—Three Phase PoolComPak with TD-2500 Control**



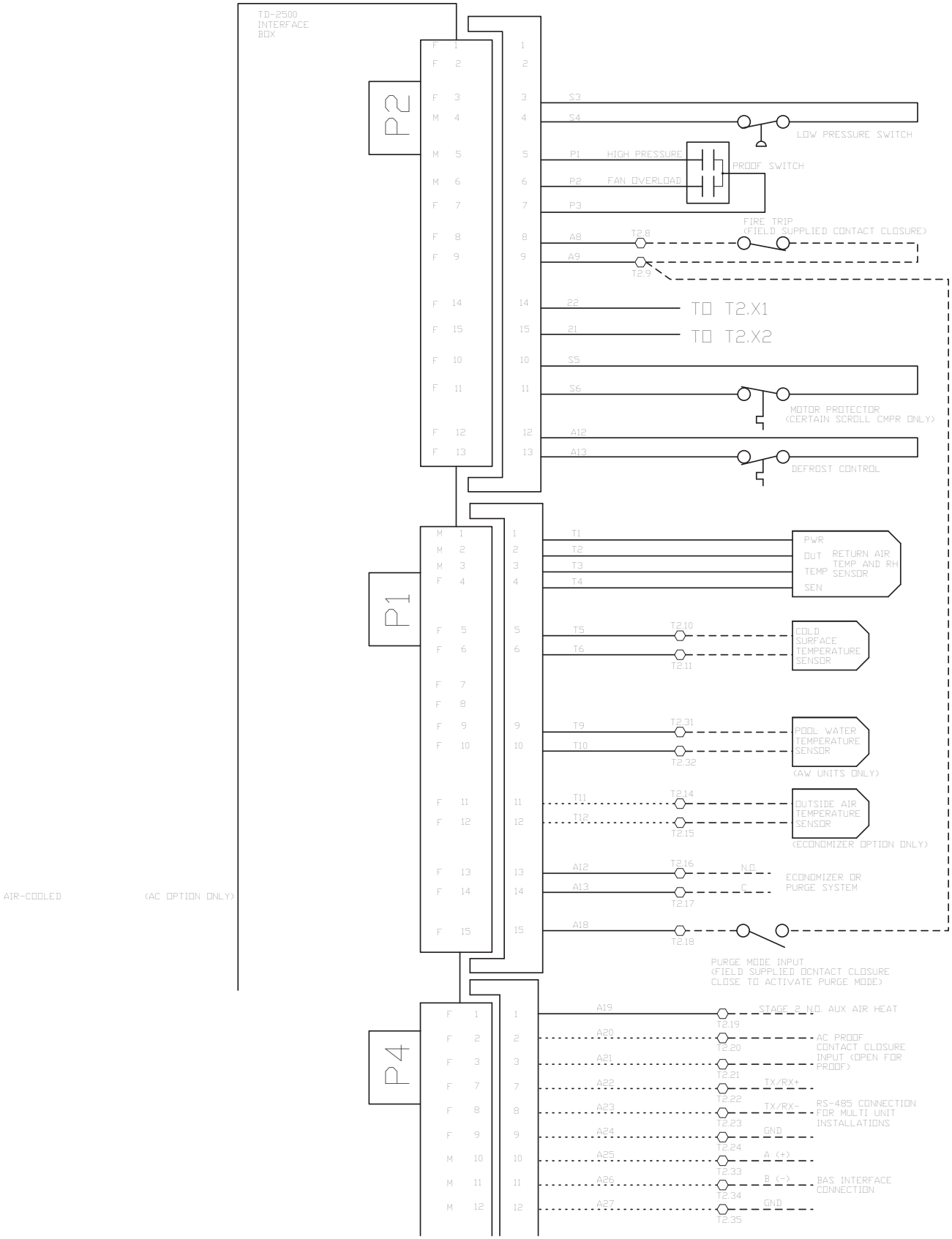

## Ladder—Three Phase PoolComPak with TD-2500 Control



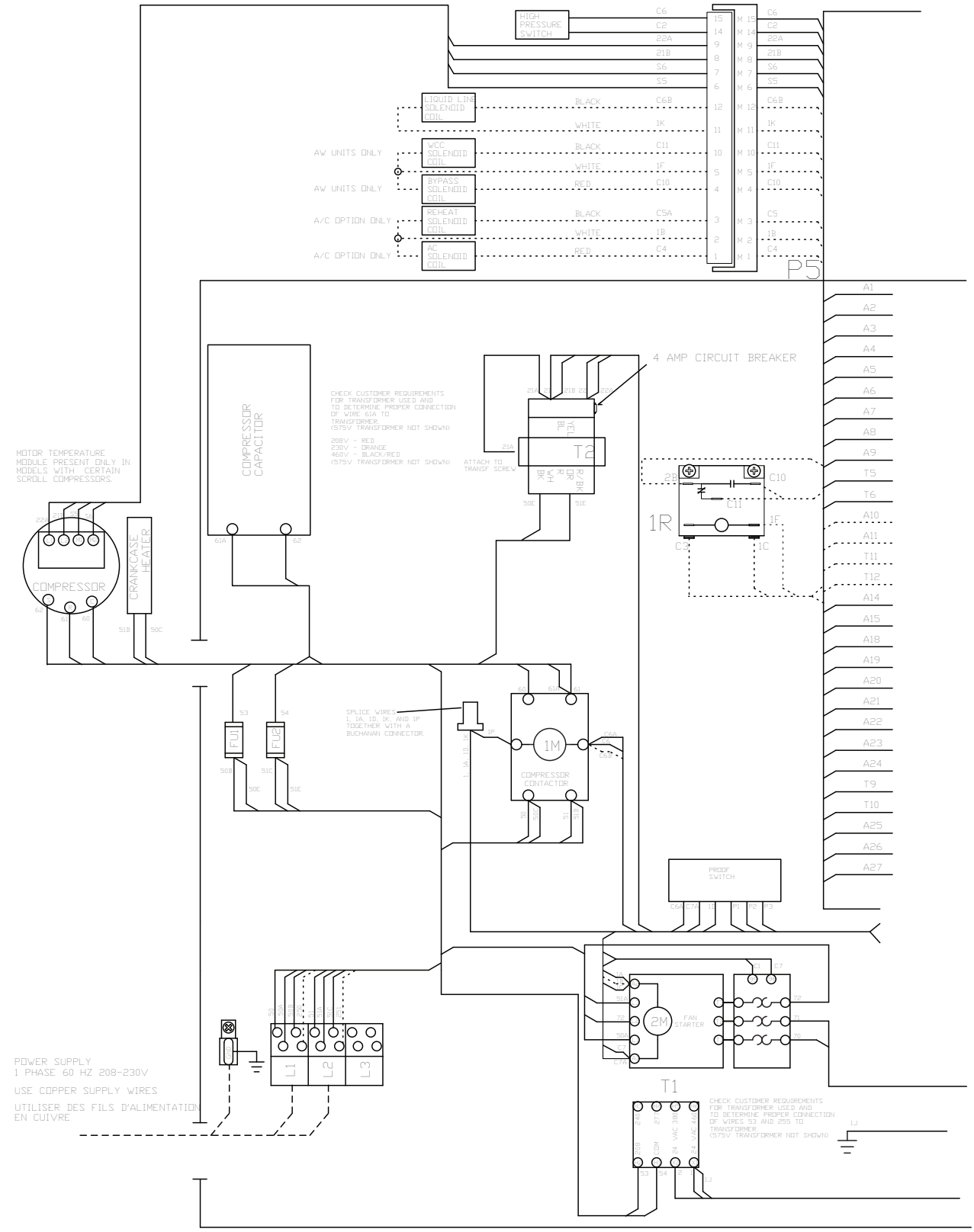

## Ladder—Three Phase PoolComPak with TD-2500 Control



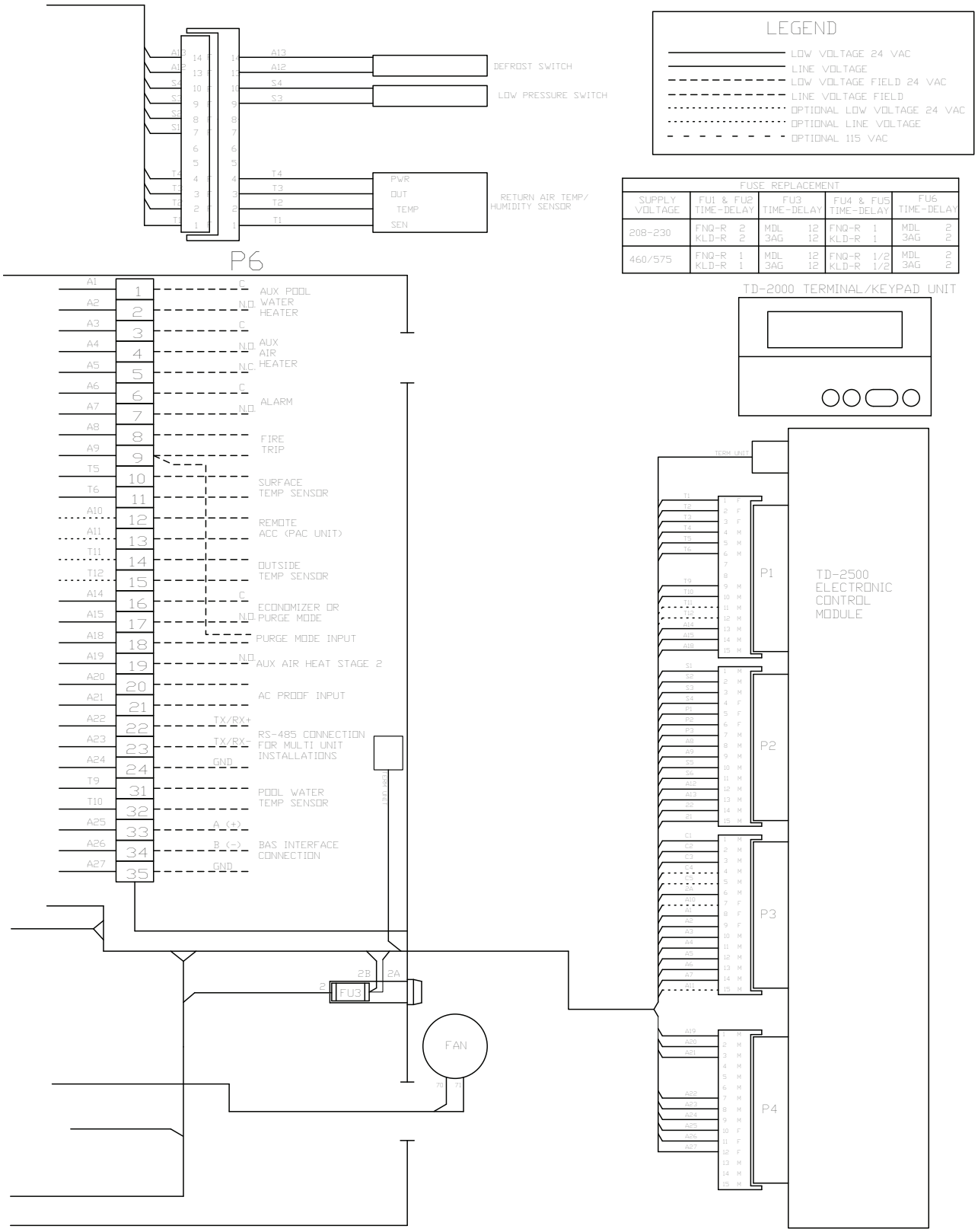

**Schematic—Single Phase PoolComPak with TD-2500 Control**



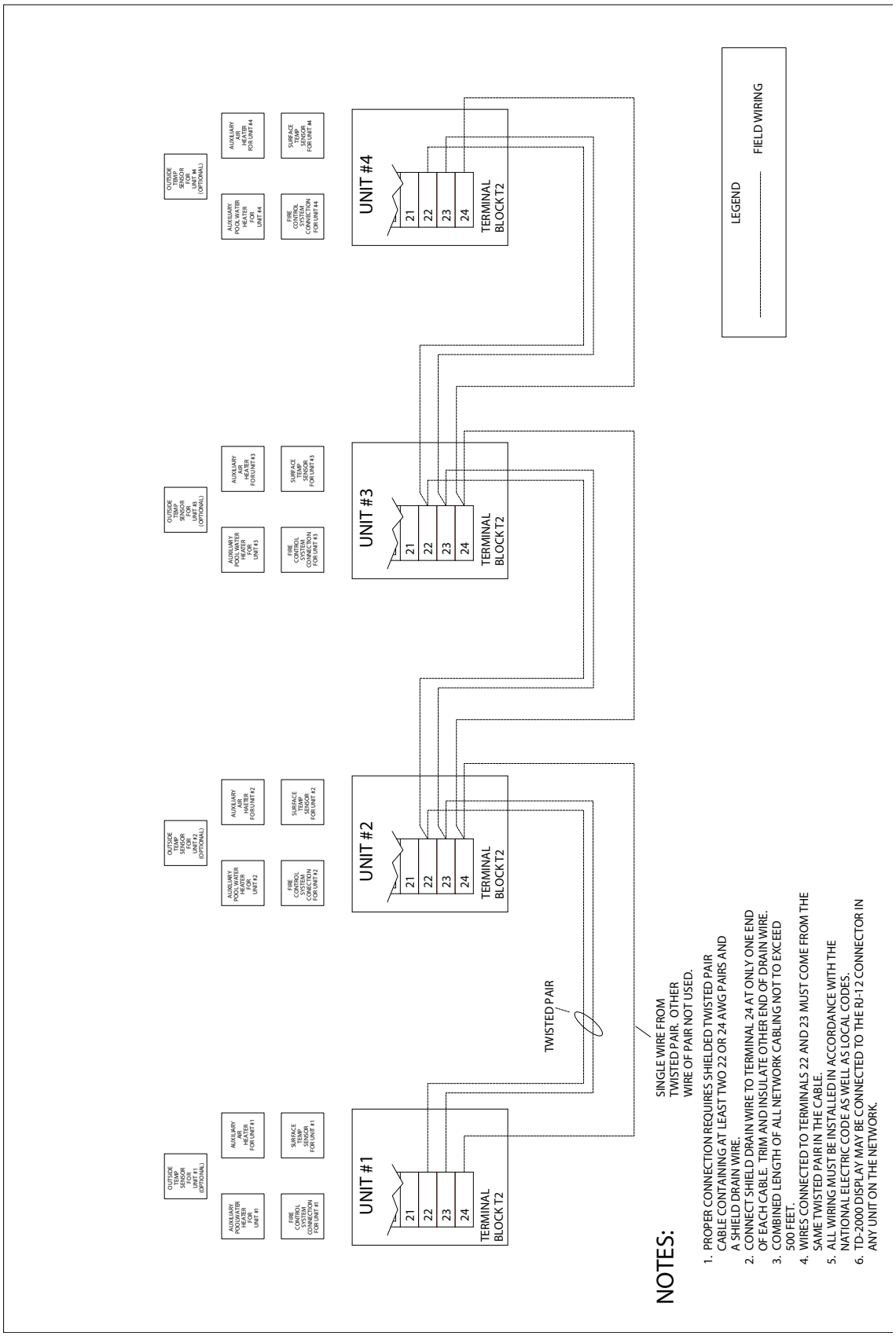

**Schematic—Single Phase PoolComPak with TD-2500 Control**



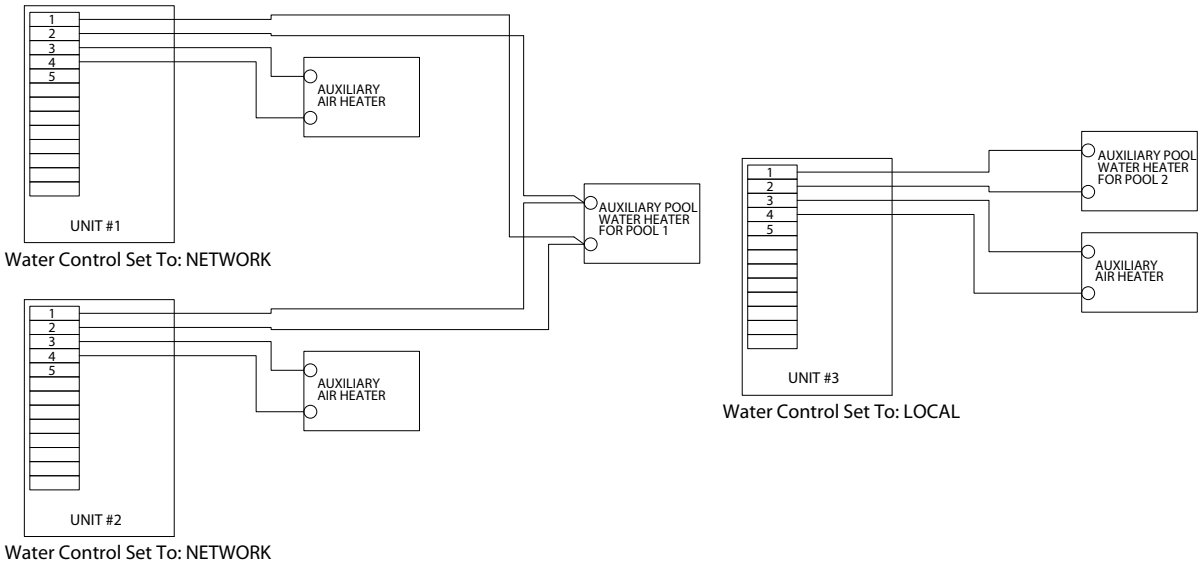

**Ladder—Single Phase PoolComPak with TD-2500 Control**



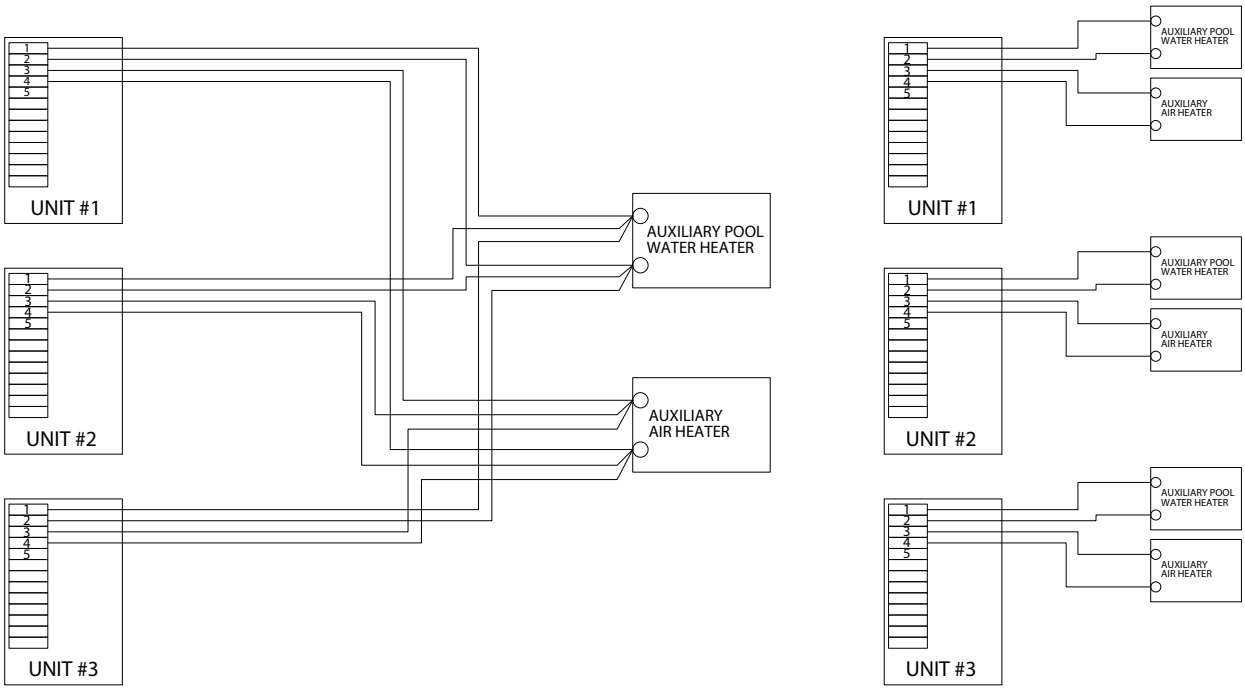

**Ladder—Single Phase PoolComPak with TD-2500 Control**



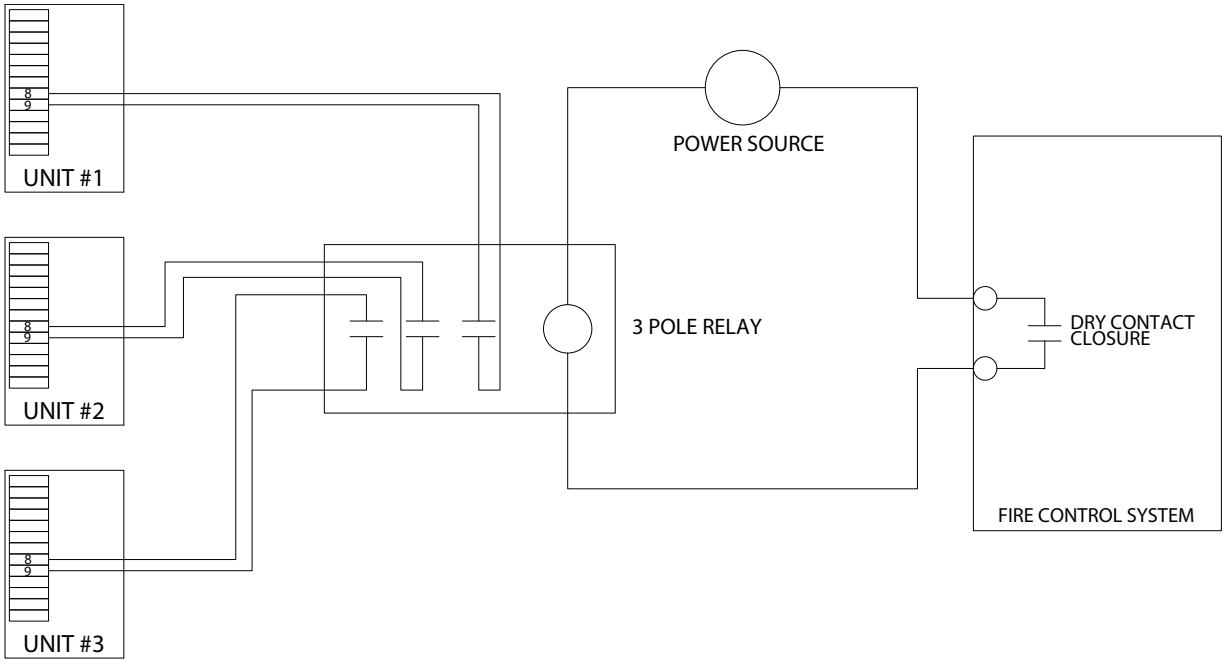

**Field Wiring Diagram TD-2500 Networking Connections**




## Auxiliary Heater Connection for a Standard Installation




## Auxiliary Heater Connection for a Two Pool Installation




**Fire Control System Connection**

For more information contact:


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