



DryMAX

MINI-SPLIT AND SPLIT SYSTEM DEHUMIDIFIERS

Precise Control of Challenging and Humid Environments

Installation, Operation and Maintenance

Bulletin DM-2

Rev. 2.0



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INTRODUCTION

This document is intended for the mechanical contractor, start-up technician and the facility manager or property owner and provides essential information regarding the installation, operation and maintenance of the **DryMAX** Dehumidifier. Following installation, it should be provided to the owner as part of the building documentation.

DryMAX is a split system dehumidifier, space conditioning unit and heat recovery system, which removes latent energy (water vapor) from moisture-laden indoor air and either returns it as sensible energy to the space or rejects it to the outdoors (or to a water loop). It has been designed to deliver dehumidification without compromising comfort in heating, cooling and neutral air conditions. When both heating and cooling limits are satisfied, enough of the heat is recovered to bring the air back to approximately space neutral conditions while the remainder is rejected outdoors.

DryMAX is subject to stringent quality control and factory test procedures. Each unit is hand built by our experienced technicians in order to provide years of trouble-free service. Due to our policy of continuous improvement, specifications are subject to change without notice.

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1. PRODUCT NOMENCLATURE

DryMAX Indoor Units: Non-ducted (**HS**) units or ducted air handler (**HD**) units with coated coils and a nominal 2.5 ton capacity. Indoor units include a supplementary electric resistance heating coil.

DryMAX Condensing Units: Air-cooled (**CA**) or water-cooled (**CW**) with coated coils in a nominal 2.5 ton size.

2. MANUFACTURER CONTACT INFORMATION

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3. PRODUCT DESCRIPTION

DryMAX mini-split dehumidifier systems are designed to provide humidity and temperature control for a wide variety of applications. The system can provide the dehumidification, space cooling and a portion of the space heating requirement through the system's refrigeration system. Control is also provided for ancillary space heating, including a supplementary electric resistance heating coil.

DryMAX dehumidifier systems operate as a closed loop mechanical refrigeration system in a split system unit configuration consisting of an indoor unit containing an evaporator, reheat condenser, air filter, blower, blower motor and controls; and an outdoor condensing unit comprising the compressor, condenser, condenser fan and controls. Alternatively, the condensing unit may include the compressor and a water-cooled condenser for water loop



DryMAX Installation, Operation and Maintenance

applications. This approach provides the familiar benefits of mini-split air conditioning systems (ease of installation, small footprint, quiet operation and flexibility) to more demanding indoor environmental control applications. All **DryMAX** unit cabinets are constructed of galvanized steel with a durable epoxy finish (painted cabinets) or galvanized steel (unpainted cabinets). The **DryMAX** unit is American engineered and manufactured. Each unit is assembled, piped, wired and tested in our factory prior to shipping.

DryMAX HS-0025-C ductless indoor units have been engineered to withstand the special rigors of the indoor swimming pool environment through the use of corrosion resistant materials, heavy gauge galvanized and painted cabinets, phenolic epoxy coil coating and quality heavy-duty components. Condensing units are available in air-cooled (**CA**) with coated coils (coated coils are standard and suitable for coastal locations and similar challenging outdoor environments) and water-cooled (**CW**) versions.

DryMAX HD-0025-C ducted indoor air handler units provide the same rugged coils and construction in a low profile package for remote ducted application or integration with an existing air handling system. The ducted air handlers match up with the same **CA and CW** condensing unit options outlined above.

4. TECHNICAL DATA

DryMAX mini split dehumidifiers are designed to meet the rigorous challenges posed by difficult environments, including indoor swimming pool enclosures and industrial applications. The evaporator (dehumidifying) coil and condenser (reheat) coil are constructed of mechanically bonded aluminum fins on copper tubes. Each coil is provided with a sealed epoxy coating for maximum corrosion resistance.

The compressor is a high temperature heavy-duty scroll provided with thermal overload protection and refrigerant high-pressure control. The low-noise indoor blower is a twin forward curved double inlet molded squirrel cage type (**HS** models) or a single forward curved double inlet (**HD** models) with permanently lubricated ball-type bearings for long life and high performance. The fan is driven directly by an open drip-proof permanent split capacitor motor, class B insulated and U.L. approved. The compressor circuit includes an anti-cycling timer to prevent compressor short cycling.

5. WARRANTY

Vital Technologies warrants the **DryMAX** dehumidifier to be free of defects in materials and workmanship for a period of one year from date of system startup or one year and ninety days from the date of shipment, whichever comes first. Inquiries regarding warranty matters should be addressed to Vital Technologies.

6. MAINTENANCE

Regular maintenance is essential to the proper operation of the **DryMAX** dehumidifier over time. Performance, energy efficiency and service life will be enhanced through a responsible maintenance program following the guidelines and recommended timetables provided in this manual.

7. TECHNICAL SERVICES

Vital Technologies provides complete factory direct technical support to its representatives, installing contractors and building owners/operators to ensure proper selection, installation, use and maintenance of **DryMAX** dehumidifiers.



MATERIAL HANDLING

RECEIVING AND UNPACKING

To ensure proper installation, an experienced HVAC/R technician or qualified contractor should install the **DryMAX** unit. The indoor and condensing units are shipped fully assembled, crated and wrapped to provide protection during shipment. Please take the following steps upon receiving the **DryMAX** unit.

- Inspect the exterior of the packaged unit for obvious damage, preferably while it is still on the truck. Refuse receipt of the unit if obvious damage is found or note any damage on carrier and consignee's copy of the waybill.
- Insist that proper unloading procedures be followed.
- Make sure you have received the correct and matching indoor and condensing units. Check the nameplates to ensure that the unit capacity and type are correct.
- Visually inspect the interior and note any damage on the carrier and/or consignee's copies of the waybill.
- Check all items against the packing list, noting any items that are missing or damaged. Controls and other small parts may be shipped inside the unit access panels or in a separate box.
- If parts are missing and not indicated as "Back-Ordered", inform your local representative or Vital Technologies within 48 hours (2 working days) of delivery.
- If parts are DAMAGED, note the damage on the carrier's waybill and file a claim with the carrier within forty-eight (48) hours. Vital Technologies is not responsible for damage incurred during shipping.

MOVING AND LIFTING

The **DryMAX** units contain valuable refrigeration and electrical components. Care must be taken while the unit is being handled and moved into its final location. If the unit must be stored for any period of time, care must be taken to ensure proper protection of the unit during storage.

- Do not "bounce" the **DryMAX** unit off the truck. Use rollers or drag the skid if the surface is smooth enough to avoid a jerking motion. Severe shocks may cause damage to the internal refrigerant piping and components. Units may be moved using a forklift truck by inserting forks into openings on skid.

CAUTION: DO NOT TILT THE DRYMAX CONDENSING UNITS MORE THAN FORTY-FIVE DEGREES FROM THE HORIZONTAL AT ANY TIME, AS THIS MAY CAUSE THE COMPRESSOR TO FAIL ON START-UP. NOTIFY YOUR REPRESENTATIVE OR VITAL TECHNOLOGIES IMMEDIATELY IF TILTING PAST 45 DEGREES HAS OCCURRED.



DryMAX Installation, Operation and Maintenance

STORAGE PRIOR TO INSTALLATION

- DryMAX** units should be stored level, evenly supported, and protected from precipitation, extreme temperature, wind and vandalism.
- Care should be taken to prevent moisture from condensing on unit surfaces. Loosen any protective wrapping to allow airflow on all sides of the unit.

INSTALLATION INFORMATION

LOCATING THE INDOOR UNIT

Non-ducted indoor units (**HS**): Any non-ducted mini-split configuration is inherently limited as regards air distribution. Location of the indoor unit is one of the most important considerations in the installation of **DryMAX**. The location of the indoor unit should take maximum advantage of the adjustable dual deflection supply register for optimized air distribution. It is important to minimize air stagnation in order to ensure that the controls see a well-mixed environment and the **DryMAX** unit performs to its full capacity. In an indoor pool environment, dry supply air should be directed insofar as possible over the outside windows, doors and skylights to minimize condensation.

Ducted indoor units (**HD**): The ducted indoor air handler unit may be located remotely, or above a hung ceiling, etc. Ensure that service maintenance access will be available after installation. Care should be taken to minimize pressure loss in the duct design and to maximize ventilation effectiveness in the location of the supply registers and return grilles. If integrating the ducted unit into an existing air handling system, it is recommended to draw return air from the return ducting and supply air to the same duct downstream (closer to the main air handler). Note that in this application, the operation of the **DryMAX** unit must be interlocked with the main air handler fan.

Condensate piping, electrical connections, refrigeration line set penetration/location and access for servicing are also important considerations in locating the **DryMAX** unit. The following points should be considered when determining the location of the unit.

- Provide adequate clearance to allow for service access around the unit. A minimum of 2 feet on either side of the wall-mounted unit is recommended.
- Allow for unimpeded airflow entering the return grill below the unit and leaving the supply register on the front of the unit (non-ducted units).
- Allow for the shortest possible air distribution system (ducted units).
- Allow for location of the refrigeration lines entering the indoor unit and for the shortest possible refrigeration line lengths. Pre-charged line sets are available in 25' and 50' lengths.
- Provide for installation of condensate drain line and the optional accessory condensate pump if required.
- Provide for electrical service connection.

MOUNTING THE INDOOR UNIT

Non-ducted indoor units (**HS**):

Install the unit to the wall with mounting brackets provided (See Figure 1.). Suitable connection of the mounting bracket to building structure, such as masonry anchors or lag screws into wall studs, is required for safety. **Caution: Do not mount the DryMAX unit directly to finished wall, gypsum wallboard, paneling or other insubstantial wall structure without proper reinforcement. Serious injury or death may result.**

- Plan the location, noting the positions of studs or structural members suitable for fastening of the mounting bracket and supporting the weight of the unit. Also note the approximate locations of required electrical wiring, refrigerant line set and condensate piping.
- Attach the mounting bracket to the wall. A minimum of two (2) suitable fasteners must be secured to wall studs in two (2) locations.
- Remove access panels from right and left sides of unit to gain access to electrical wiring and piping compartments.
- Unit may be hung temporarily, using only the bracket for support, while marking exact locations for piping and wiring.
- Mark the locations of the refrigerant line set and condensate piping as well as the electrical wiring entrance.
- Remove unit from the wall, prepare access penetrations, pull line set, condensate piping and wiring.
- Rehang the unit, taking care to introduce line set, condensate piping and wiring at their respective openings in rear of cabinet.
- Optional: Attach a bottom bracket to the unit and the wall to lock the unit in place. Unit may also be locked in place by drilling fasteners into wall directly through the cabinet back.
- Make all connections prior to replacing access panels. Note that refrigerant line set connections should be completed only at the same time they are ready to be completed at the condenser. (See below under Refrigerant Piping.)

Figure 1. Wall Mounting

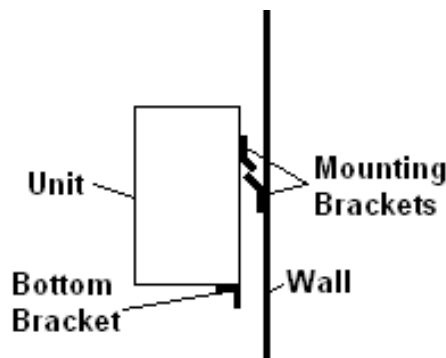
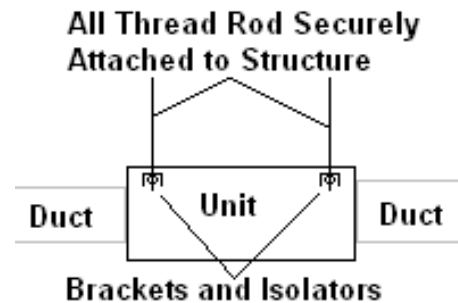


Figure 2. Ducted Unit Mounting



Ducted indoor units (**HD**):

Cabinet mounting brackets suitable for the application of 3/8-1/2" all-thread rod are supplied. Vibration isolators are recommended. Hang the unit from suitable joists, beams or ceiling structural elements. (See Figure 2). **Caution: Do not mount the DryMAX unit directly to finished ceiling or other insubstantial ceiling structure without proper reinforcement. Serious injury or death may result.**

- Securely affix 4 all-thread rods of suitable length to structural elements to match location of holes in mounting brackets.
- Attach 4 mounting brackets to all thread rods using suitable washers, nuts, locknuts and vibration isolation (if required). Adjust to approximate desired height.
- Level the unit both end-to-end and side-to-side to ensure proper function of condensate drain pan and condensate drain. (Consider a secondary drain pan below the unit in sensitive applications where a leak could prove catastrophic.) Lock the positions of the support nuts on the all-thread rod.
- Finally, attach ducting and prepare electrical, refrigerant lines and condensate drain connections.

CONDENSATE PIPING

Vital Technologies recommends that all condensate be discharged down a drain, storm drain or interceptor due to contaminants washing off the evaporator coil. Disposal of condensate must be accomplished in accordance with any applicable local, state or national codes. Note that many municipal codes do not allow the return of condensate to pools. The units ship with a cap and clamp on the drain fitting for use with the optional condensate pump. If a gravity drain is to be installed, remove the cap and clamp. Reuse the clamp to secure the drain line. The unit is equipped with a condensate drain safety switch that will interrupt power in the event that the drain becomes plugged.

- Use suitable 1/2" ID medium wall tubing (not provided). Do not over tighten clamp. Avoid pinching tubing at wall access and throughout the run to the drain.



DryMAX Installation, Operation and Maintenance

- No P-trap is required on the condensate drain line, as the drain pan is located in a pressurized compartment. Pitch the condensate drain line to allow proper gravity driven condensate flow. Connection to drain waste vent should always be “indirect”. Check the local Building or Plumbing Code to confirm requirements for your area.
- If gravity drain is not available, a drain pan mounted accessory condensate pump is available from Vital Technologies. Power connection for the accessory pump is provided in the electrical compartment. Follow the wiring diagram and instructions included with the pump to install. The accessory pump requires ¼” ID medium wall tubing (maximum 100’ length, maximum 19.5’ head).
- When piping a condensate drain, especially for an indoor pool application, remember that the dehumidifier is removing moisture throughout the year. In cold climates an unprotected condensate line may freeze. The drain must be run to an indirect waste line and must be protected from freezing.

DUCTING

The ducted unit is suitable for stand-alone application with a limited dedicated duct system or for integration with an existing air handler.

- Air handler Models “HD-” are designed to deliver 650 CFM against a maximum external static pressure of 0.40 inches W.C. Keep all duct runs as short and straight as possible and minimize fittings that will reduce airflow. For stand-alone systems, it is recommended to stay with 12”x24” ducting for both supply and return. If it is desirable to divide the supply, it is recommended to use two (2) 12”x12” or equivalent ducts. Do not exceed a total external static pressure loss of 0.5” W.G.
- If integrating with an existing air handler, confirm that the installation will comply with all state and local codes. It is recommended that both the supply and return from the **DryMAX** unit be connected to the air handler return duct (the supply connection from the **DryMAX** unit must be located downstream of the return connection to the **DryMAX** unit). An auxiliary fan terminal is provided in the **HD** models to allow for on-demand operation of the existing air handler. This must be wired in parallel to the air handler’s G terminal and operate the air handler fan whenever the **DryMAX** fan operates.
- Filter Grille: Air handler Models “HD-” are supplied with a 12”x24” return filter grille. For non-ducted return applications (ceiling return plenum) affix the filter grille to the unit return flange; ensure that access is available for filter service and replacement. For ducted returns, stay with a single 12”x24” duct and install the filter grille in the ceiling or wall to allow for filter service from the conditioned space.

CONDENSING UNIT OPTIONS

The **DryMAX** unit may be equipped with either an air-cooled condenser or a water-cooled condenser.

LOCATING THE CONDENSING UNIT

Free flow of entering and exiting air (air-cooled condenser only), location of water piping (water-cooled condenser only), electrical connections and access for servicing are important considerations in locating the **DryMAX** condensing unit. The following points should be considered when determining the location of the unit.

- Provide adequate clearance to allow for airflow and service access around the air-cooled condensing unit as shown in Figure 3.
- Ensure that airflow entering the coil and exiting the fan is not obstructed by buildings, fencing or plantings (air cooled units).
- The unit should be protected from accidental damage due to vehicle parking, lawn equipment, etc.
- Allow for the shortest possible refrigeration line lengths.
- Allow for the shortest possible water loop runs (water cooled units).
- Provide adequate support for mounting the condensing unit. Mount the air-cooled condensing unit outdoors on a suitable concrete or composite pad, a special purpose mounting bracket or pressure treated sleepers on a level gravel bed. Mount the water-cooled condensing unit indoors in a suitable mechanical room or closet. Ensure that service access is available. Fasten the unit securely to the substrate using the mounting holes provided.

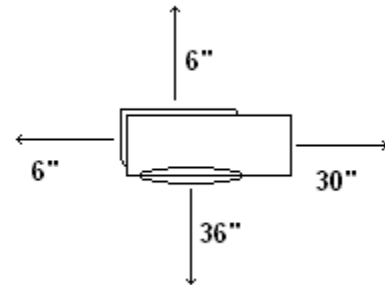


Figure 3. Air-Cooled Condenser Minimum Clearances Plan View

WATER COOLED CONDENSER

A **DryMAX** unit equipped with a water-cooled condenser will need to be provided with the required condenser water flow rate (GPM) at the water temperature within the range indicated on the **DryMAX** data plate. The unit layout is shown in Figure 4.

- It is recommended that a flow meter be installed in the water piping of a water-cooled condenser. This will provide the service technician with an efficient and accurate means of checking condenser water flow. The flow meter may be located in the inlet or the outlet piping.
- For chilled water loops, the water piping to and from the **DryMAX** condensing unit must be insulated.

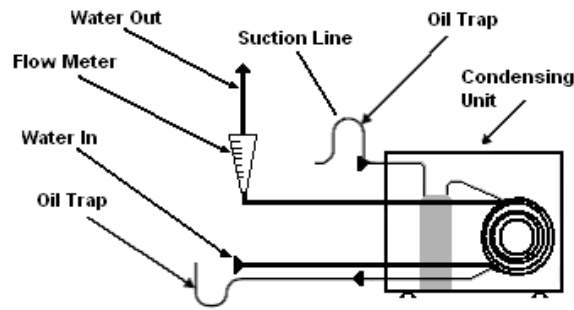


Figure 4. Water Cooled Condenser

AIR-COOLED CONDENSER - LOW AMBIENT CONTROL

When ambient conditions fall below 60 degrees, a capacity control system consisting of the variable speed fan controller, modulated on liquid line pressures, prevents the head pressure of the refrigeration cycle falling below the design pressure. This control is designed to preclude evaporator freezing, liquid slugging and possible attendant compressor failure.

AIR-COOLED CONDENSER - REFRIGERANT PIPING

Vital Air Technologies provides a recommended piping schematic for both high and low elevation condenser installations. Prior to beginning the installation, refer to the diagrams shown in Figures 5. and 6. Lines must be pitched in the direction of flow to insure the return of oil in the system. Pitch should be a minimum of 1/2" in 10 feet. Maximum line length is 50 feet. 2.5 ton models utilize 7/8" hot gas and 5/8" liquid/discharge lines. It is the responsibility of the installing contractor to ensure that lines and traps are properly laid out for the particular application to ensure oil return.

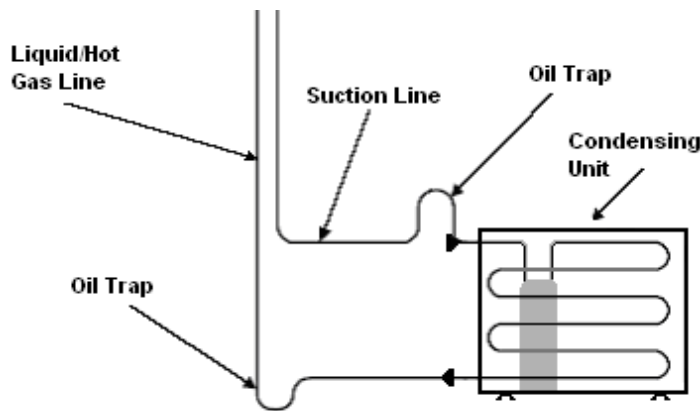


Figure 5. Piping Diagram Condenser Low

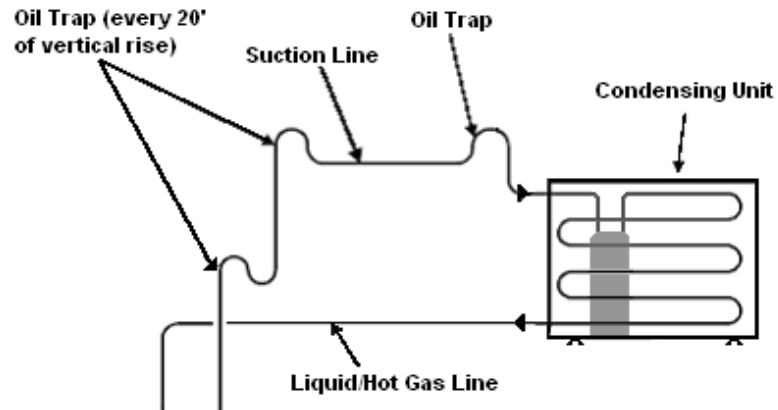


Figure 6. Piping Diagram Condenser High

INSTALLATION OF LINESETS AND SYSTEM CHARGING

Please note that the units are shipped with a holding charge in the condensing unit and the full balance locked up in the indoor units, which include the receiver. No additional refrigerant should be required to be added in the field. At installation, the line sets must be brazed while purging with nitrogen. Line sets must then be triple evacuated to 500 microns, before opening the valves. This should be "standard procedure" for a qualified technician.

Standard factory refrigerant charge is based on receiver size and a maximum line length of 50 feet. The standard **DryMAX** total charge is 6 pounds, 12 ounces of R-410A. Consult nameplate to confirm correct system charge. In some cases a "trim" charge may be required to balance the system precisely.

ELECTRICAL SYSTEM

CAUTION: Electrical shock or fire hazard. BE SURE to disconnect the power at the main electrical distribution panel to prevent injury or death from electric shock or contact with moving parts.

- All wiring shall be done in accordance with national codes and any local rules and regulations governing the installation of electrical equipment.
- Specifications list the required minimum circuit ampacity and minimum wire size for each **DryMAX** model. The nameplates on the indoor and condensing units also list the minimum ampacity as well as electrical ratings.
- Short circuit and over current protection must be field provided (standard circuit breaker). When the power is wired to the **DryMAX** condensing unit, a disconnect switch should be provided in the vicinity of the unit. This allows the unit to be serviced in a safe and efficient manner.
- The indoor unit must be wired directly to a dedicated circuit and a circuit breaker of the correct size in the electrical service panel. The indoor unit cabinet is provided with an ON/OFF power switch as well as a HI/LOW blower speed switch. (Air handler Models "HD-" are supplied with a single speed belt drive fan/motor combination. No speed switch is present on the cabinet.)



FIELD INSTALLED CONTROLS

All wiring, including control wiring for the **DryMAX** unit must be completed in accordance with the wiring diagram for the model being installed. Wiring diagrams are provided with each unit. The combination Thermostat/Humidistat or separate thermostat and humidistat must be field installed on an appropriate wall. Refer also to the instructions packaged with the control. Note:

- Combination Thermostat/Humidistat – The TH-0015/0025 combination thermostat/humidistat should be installed on an inside wall where it will provide an accurate reading of the room temperature and humidity. Do not install near heating or air conditioning registers, in direct sunlight or anywhere it will not sense an accurate room temperature. Recommended wall mounting height is approximately at eye level. Refer to the wiring diagram for electrical connection points. Refer to the Programming section below for special set-up instructions for the combination Thermostat/Humidistat.
- Separate thermostat and dehumidistat – If preferred, a separate thermostat and humidistat may be used to control the **DryMAX** unit. Refer to the appropriate field wiring diagram for electrical connection points.
- In public occupancies, give consideration to the likelihood that occupants may tamper with the space control. In a natatorium application, if the room temperature is lowered below design conditions, pool evaporation will increase, possibly beyond the unit capacity, and condensation can occur. In commercial control or critical storage applications, tampering may result in equipment or document damage or unintended energy expenditure. A locked clear cage, with slots allowing for airflow, will help to eliminate the temptation to change system settings.
- For ducted indoor units integrated with an existing air handler, provide for operation of the air handler when the **DryMAX** unit is in operation through connection to the unit fan terminal as shown on the manufacturer's wiring instructions or diagram.

PROGRAMMING THE TH-0015/0025

Confirm that wiring conforms to the field-wiring diagram provided by Vital Technologies. The TH-0015/0025 combination thermostat humidistat is a multi-purpose control; it must be specially programmed to provide accurate control of the **DryMAX** system. The control has been pre-programmed at the factory. It should operate and allow for user changes to heating, cooling and dehumidification set points without a pass code. If further changes are desired, they may be made following the sequence below or by referring to the instructions packaged with the control. You may also reset the security settings and create a personal pass code. Default pass code is 1111. In any case, do not change system type and equipment settings, as the unit may no longer function. In this event, reprogramming according to the following sequence will restore function.



1. Confirm that wiring conforms to the field-wiring diagram.
2. Switch on the indoor unit at the cabinet mounted on/off switch. (Condensing unit need not be energized to program controls. It is recommended to leave the condensing unit off during programming.) Thermostat “Home Page” will be displayed.



DryMAX Installation, Operation and Maintenance

3. Touch the screen anywhere to display the “Control Page”. (Return to Home Page at any time by touching the house (Home Page) icon.)

4. Touch mode icon until it displays “AUTO”.

5. Touch HEAT COOL icon to select heating or cooling set points, which will begin flashing. Use + or – icons to adjust temperatures.



6. Use + or – icons next to the dehumidification display to raise or lower dehumidification set point.

7. Set thermostat operation mode to “HOLD TEMP” (not “RUN PROG”).

8. Set fan to “FAN ON” or, to save additional energy, “FAN INTER” (not “FAN AUTO”). Unless you need to make additional programming changes, return to the Home Page at this point by touching the home icon.

9. If additional changes are required, touch “MENU” to access the Menu Page.

10. Set DATE and TIME.



11. Turn VACATION MODE OFF.

12. Select DEHUMIDIFY mode.

13. Touch and hold “ADVANCED SETTINGS” icon for 5 seconds to display “ADVANCED SETTINGS” page 1. You may need to cycle back through this step repeatedly after making changes to any of the following settings.

14. Turn FILTER MONITOR ON. Enter 3 months for replacement interval (or other interval as determined through experience).

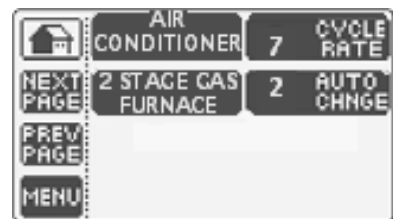
15. Change display units to °F or °C as desired.

16. Change security settings as desired. Partial lock is recommended to preclude inadvertent changes.

17. Touch “NEXT PAGE”.

18. Select “AIR CONDITIONING” for cooling equipment.

19. Select “2 STAGE GAS FURNACE” for heating equipment.



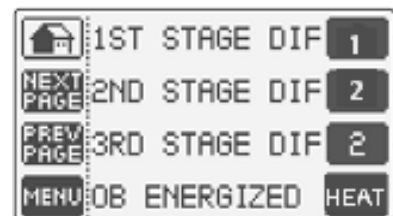
20. Set CYCLE RATE to 7.

21. Set AUTO CHANGE offset to 2 degrees F.

22. Touch “NEXT PAGE”.

23. Set 1st STAGE DIF to 1 degree F.

24. Set 2nd STAGE DIF to 2 degrees F.





DryMAX Installation, Operation and Maintenance

25. Set OB ENERGIZED to HEAT.

26. Touch "NEXT PAGE".

27. Set Time Delay to 04 minutes.

28. Touch "NEXT PAGE".

29. Set HP to OFF WHEN FURNACE ON.

30. Touch "NEXT PAGE".

31. Set HUM FAN to OFF.

32. Set DH FAN to ON.

33. Set DH REVERSE to OFF.

34. Set DH CONTROLCOMP to OFF.

35. Touch "NEXT PAGE".

36. Calibrate HUM and TEMP to fine tune humidity and temperature sensors only as necessary with experience. Use a sling psychrometer or dewpoint hygrometer to calibrate humidity. Use an accurate thermometer to calibrate temperature.

37. Touch "MENU".

38. Touch house (Home Page) icon.



START-UP AND TESTING

A careful and thorough start-up procedure is the best way to ensure satisfactory performance of the **DryMAX** unit. Proper training for the owner/operator in the areas of operation, maintenance and troubleshooting should be provided as part of this process. The following guidelines and checklists are provided to assist the installing contractor and the owner/operator.

START-UP CHECKLIST

Before attempting to start the **DryMAX** unit, the following items must be accomplished:

- Turn indoor unit cabinet power switch to OFF. Turn the main power disconnect at the condensing unit to ON. Allow at least two (2) hours between energizing the main power disconnect to the **DryMAX** condensing unit and startup to allow the compressor crankcase heater to warm the crankcase and prevent refrigerant slugging.
- Air temperature in the space must be over 65 F and below 90 F. If the air temperature is below 65 F, auxiliary heating must be used to increase the temperature to over 65F. If the air temperature is over 90°F, action should be taken to lower the temperature before starting the unit.



DryMAX Installation, Operation and Maintenance

- Check the power connections to the **DryMAX** condensing unit and the indoor unit. Be certain that the incoming wire size matches the minimum ampacity rating on the nameplates. (See specification sheet and unit nameplate.)
- Check the fuse in the **DryMAX** unit low voltage circuit (mounted on the transformer).
- Check the connections of the external controls (humidistat, thermostat) and verify that they are correct.
- Leak check the entire system to below 1/2 oz/year with a halogen leak detector or equivalent. Any leaks should be repaired before starting the system.
- After the condensing unit has been energized for at least 2 hours, turn indoor unit cabinet power switch on.
- Test all three operating modes by temporarily changing humidity, heating and cooling set points.

OPERATION

Operation may vary depending on the application, however, the following general principles should be observed to obtain the maximum benefit from your **DryMAX** unit:

- Indoor temperature conditions should be set to between 65 and 90 degrees F.
- Indoor humidity conditions should be set to between 40% and 60%.
- Speed switch should be set to the high position for greatest throw and mixing of supply air in the space. Low speed will provide reduced sound levels and airflow for smaller or sensitive applications. Dehumidification capacity may be reduced slightly on low speed. (Air handler Models "HD-" are supplied with a single speed belt drive fan/motor combination. No speed switch is present on the cabinet.)
- Fan should be set to "ON" (not "AUTO") in an indoor pool or other strong localized humidity source application. Continuous fan operation provides for enhanced mixing and more accurate sensing of space conditions. AUTO fan operation may save energy in cases where accurate sensing of conditions is not a challenge.
- The **DryMAX** unit does not incorporate outside air for ventilation. Ventilation requirements should be met through other means, including transfer air from adjacent space and/or a local exhaust fan.



PREVENTIVE MAINTENANCE SCHEDULE

Like any piece of mechanical equipment, the **DryMAX** unit requires a preventive maintenance schedule to help ensure its continued long-term operation. In addition to insuring that the pool water chemistry is maintained within acceptable limits, the attached chart is provided to highlight the major maintenance items and recommended schedule.

Item	Description	Schedule Notes
Air Filter	Inspect/Replace	Quarterly More often if required
Dehumidification Coil	Inspect and Clean	Quarterly Inspect the dehumidification coil for signs of fouling, microbial growth. Clean the coil as needed. Apply an anti-microbial agent if growth is found.
Outdoor Air-Cooled Condenser (CA units only)	Inspect and Clean	Semi-Annually Remove leaves and debris from coil, coil guard, fan, fan guard and fan compartment. Clean condensing coil as necessary.
Water Piping (CW condensing units only)	Inspect	Quarterly Inspect the water piping for leaks, and insure that the system flow is still per the manufacturer' s recommendations.
Electrical	Inspect	Annually After disconnecting the electrical power, inspect all field and factory electrical connections for tightness and cleanliness.
Refrigeration System	Operation and Inspection	Annually Request a service inspection by a certified refrigeration service technician to confirm refrigeration parameters and system charge.
Drain Pan	Inspect and Clean	Semi-Annually If fouling or microbial growth is found, clean thoroughly with an anti-microbial agent.
Blower and Motor	Inspect	Annually Check for dirt fouling ventilation holes or cooling fins. Clean as necessary. Note: Sealed motor bearings are permanently lubricated and do not require servicing. Replace motor assembly if required.
Belt Drive Fan (Ducted Air Handler only)	Inspect Adjust	Annually The belt should be checked for tension and alignment annually in keeping with standard HVAC maintenance practice.

Vital Technologies recommends that all systems serving a space in conjunction with the **DryMAX** unit be inspected and maintained according to the guidelines outlined in Table 8-1 found in the ANSI/ASHRAE Standard 62.1-2004 "Ventilation for Acceptable Indoor Air Quality".



TROUBLESHOOTING

Troubleshooting any piece of mechanical equipment is simplified by a thorough understanding of the equipment and sequence of operation. The following inspection checklists are offered to aid the technician:

ELECTRICAL SYSTEM INSPECTION

- Determine that the installation has been done per NEMA and local codes.
- Confirm that entering lines are rated to the nameplate ampacity and are correctly installed.
- Check that system voltage is within 95% of design voltage.
- Ensure separation of low and line voltages.
- Ensure external controls are properly wired according to the diagrams provided and that controls function as designed.
- The compressor does not have to run while these tests are being performed.

AIR DISTRIBUTION INSPECTION

- Inspect the duct system for integrity and leak tightness (ducted models only).
- Ensure that the rated CFM is available (ducted models only).
- Check the entering air conditions, and determine if they conform to the design requirements.
- Check the blower operating amps against the FLA nameplate rating.

WATER SYSTEM INSPECTION (WATER-COOLED CODENSER MODELS ONLY)

- Determine if the proper materials have been used.
- Determine that the piping is per submittal schematic.
- Ensure that adequate system pressure and flow (GPM) meet the rates specified on the unit nameplate.
- Remove handles from manual valves after adjusting flow rate.

REFRIGERATION SYSTEM INSPECTION

- Review the refrigeration system operation.
- Operate the system in all operating modes and record specific system information. Inspect all



DryMAX Installation, Operation and Maintenance

external piping.

☐ Refer to the Troubleshooting section below for specific system failures.

TROUBLESHOOTING REFRIGERATION SYSTEM

PROBLEM: COMPRESSOR DOES NOT RUN.

CAUSE: Disconnect switch open.

ACTION: Close switch.

CAUSE: Compressor internal thermal motor protector problem.

ACTION: Protector is automatic reset. Allow compressor time to cool down so protector will reset.

CAUSE: Defective compressor contactor or holding coil.

ACTION: Replace compressor contactor or holding coil.

CAUSE: Open high-pressure control (manual reset).

ACTION: Check for (and remedy) possible causes for high pressure. Reset high-pressure control.

CAUSE: Liquid line solenoid.

ACTION: Check holding coil. Replace coil if it is defective.

CAUSE: Blower motor not operating.

ACTION: Check motor for open circuit, short circuit, grounded windings or burn out.

CAUSE: Loose wiring.

ACTION: Check all wire terminals & tighten as necessary.

CAUSE: Drain is plugged. Condensate drain pan safety switch has interrupted power.

ACTION: Remove clog and ensure that condensate drain functions normally.

PROBLEM: NOISY COMPRESSOR

CAUSE: Flooding of liquid refrigerant into crankcase.

ACTION: Check expansion valve superheat setting.

CAUSE: Compressor hold-down nuts too tight.

ACTION: Loosen compressor hold nut until compressor floats freely on mounts.

CAUSE: Worn compressor.

ACTION: Replace compressor.

PROBLEM: HIGH HEAD PRESSURE

CAUSE: Too much refrigerant in system.

ACTION: Remove and reclaim excess refrigerant.

CAUSE: Non-condensables in system.

ACTION: Remove and reclaim refrigerant. Recharge with new R-22.



DryMAX Installation, Operation and Maintenance

CAUSE: Dirty condenser coil(s).
ACTION: Clean condenser coil(s).

CAUSE: Blower or outdoor fan not operating.
ACTION: Check electrical circuit. Check motor for short circuit, open circuit, or burn-out.

PROBLEM: LOW HEAD PRESSURE

CAUSE: Insufficient refrigerant.
ACTION: Check system for leaks. Repair leaks & add refrigerant.

CAUSE: Damaged compressor.
ACTION: Replace compressor.

CAUSE: Low entering air temperature.
ACTION: Raise space temperature (minimum 65°F).

PROBLEM: HIGH SUCTION PRESSURE

CAUSE: Expansion valve overfeeding.
ACTION: Check expansion valve superheat setting.

CAUSE: High entering air temperature.
ACTION: Lower the space temperature (maximum 90°F).

PROBLEM: LOW SUCTION PRESSURE

CAUSE: Insufficient refrigerant.
ACTION: Check system for leaks. Repair leaks and add refrigerant.

CAUSE: Evaporator coil iced up or dirty.
ACTION: Check operation and correct faulty condition.

CAUSE: Expansion valve starving coil.
ACTION: Check expansion valve superheat setting.

CAUSE: Dirty air filters.
ACTION: Replace filters.



ADDENDA

The following items may be included in the information package as they pertain to the specific unit ordered for this installation:

1. Unit Electrical Diagrams
2. Field Wiring Diagrams
3. Thermostat/Humidistat Manufacturer's Installation and Operation Manual
4. Specification Sheet or Submittal Data Information
5. Water Cooled Condenser Flow Chart
6. Warranty
7. Warranty Registration and Start-Up Form