



TH Heatless Desiccant Air Dryer

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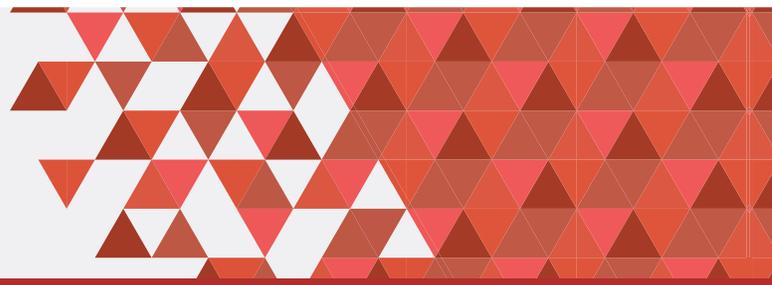


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HEATLESS DESICCANT AIR DRYER



1.1 General Information

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Range: Heatless Desiccant Air Dryers
Part Nos: 8102405500 – 8102416500
Doc No: 17-110-8009-Trident
Issue: 001

ANNOTATIONS



CAUTIONS: Indicate any situation or operation that may result in potential damage to the product, injury to the user, or render the product unsafe.



NOTES: Highlight important sections of information where particular care and attention should be paid.

HEATLESS DESICCANT AIR DRYER



1.2 Document Introduction

This manual is meant for anyone who uses or works on the TH heatless desiccant air dryer, mainly the operators. The TH heatless desiccant air dryer and this manual are protected by copyright. Any reproduction of the same shall be liable for prosecution. All rights reserved by Trident Pneumatics, particularly the rights of reproduction and distribution, as well as translation, including those relating to charges of copyright infringement. Any reproduction, processing, duplication, distribution of this document using electronic or mechanical means without the prior written authorization of Trident Pneumatics is strictly prohibited. This document may have errors and is likely to be modified with respect to technical features.

1.3 Warranty Guidelines

All products are supplied with a 18 months manufacturer's warranty from the date of shipment from the factory or 12 months from date of installation/start up, whichever occurs first and installed and maintained in accordance with the manufacturers guidelines.

1.4 Definition of Safety Symbols



Before attempting any intervention on the dryer, read carefully the instructions reported in this use and maintenance manual.



General warning sign: Risk of danger or possibility of damage to the machine. Read carefully the text related to this sign.



Electrical hazard: The relevant text outlines conditions which could result in injury. The related instructions must be strict respected.



Danger hazard: Part or system under pressure.



Danger hazard: Component or system which during the operation can reach high temperature.



Danger hazard: It's absolutely forbidden to breathe the air treated with this apparatus.



Danger hazard: It's absolutely forbidden to use water to extinguish fire on the dryer or in the surrounding area.



Danger hazard: It's absolutely forbidden to operate the machine when the parts (under pressure or electric panels) are not in place or have been tampered with and changed.



Danger hazard: Machine level noise could be higher than 85 dBA. It is mandatory to install the machine in dedicated area where people are not normally present. The installer and/or the user is responsible for correct installation of the dryer, in order to prevent noise propagation to the near work environment. The installer and/or the user is also responsible for the safety signs affixing into installation site.



Attention: The user that intervenes to the machine must wear hearing protection to operate the dryer. Each employee must select proper PPD (Personal Protection Device) hearing protector (earmuffs, ear canal caps and earplugs) in order to prevent any uneasiness that could cause dangerous situation for him.



Maintenance and/or control operation to be very carefully performed by qualified personnel¹⁷



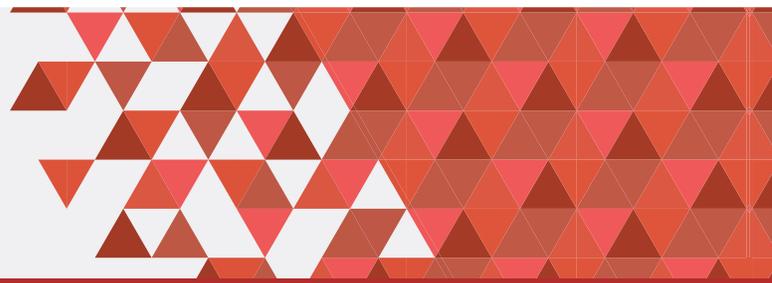
Compressed air inlet connection point.



Compressed air outlet connection



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Condensate drain connection point.



Operations which can be worked out by the operator of the machine, if qualified ¹⁷.

NOTE :

Text to be taken into account, but not involving safety precautions. In designing this unit a lot of care has been devoted to the protection of the environment:

- Dryer and relevant packaging composed of recyclable materials.
- Energy saving design.



To ensure our commitment, the user should follow the ecological suggestions marked with this sign.

1.5 General Warnings



Read the contents of this manual carefully before starting the units.



This service and maintenance manual describes the design, operation and the instructions for use and maintenance of the units manufactured by Trident Pneumatics.



Trident Pneumatics shall not be liable for any damage caused due to non-compliance with the instructions of this manual.



For any questions or any clarifications that may be required, our qualified Trident Pneumatics technicians are available to provide all the necessary information.



In order to make it easier to identify the units, it is important to always specify the technical features, especially the serial number, which are printed on the label on the outside of the dryer.



The unit should not be operated, even for a short period of time, under conditions other than the ideal conditions.



A part that does not guarantee safety should not be installed.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and/or birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

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1.6 Basic Safety Rules



Compressed air is a highly hazardous energy source. Never work on the dryer with parts under pressure. Never point the compressed air or the condensate drain jet towards anybody. The user is responsible for the installation of the dryer, which has to be executed on the basis of the instructions given in this user guide. Otherwise, the warranty will be voided and dangerous situations for the personnel and/or damages to the machine could occur.



Any change to the machine or to the relevant operating parameters, if not previously verified and authorized by the Manufacturer, may create the possibility of dangerous conditions it will void the warranty.



Don't use water to extinguish fire on the dryer or in the surrounding area.



Only qualified personnel can use and service electrically powered devices. Before attempting any maintenance action, the following conditions must be satisfied:

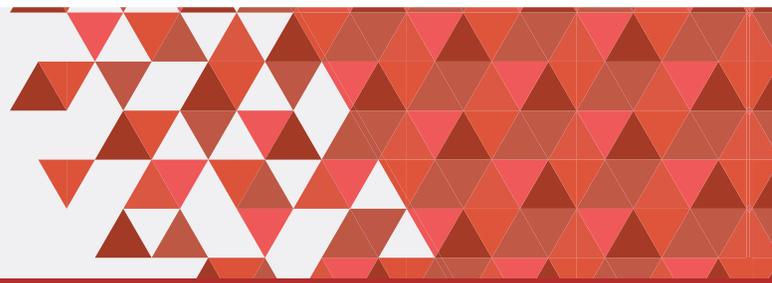
- Ensure that any part of the machine is under voltage and that it cannot be connected to the mains.
- Ensure that any part of the dryer is under pressure and that it cannot be connected to the compressed air system.

Trident Pneumatics shall not be held responsible for any possible damage caused, directly or indirectly, by persons or elements that are not non-compliant with these instructions.

Any assembling/removal carried out by THE USER, which is not provided for in this manual or not authorized by "Trident Pneumatics", will be considered as an inappropriate operation, thereby damaging safety functions, and will lead to the cancellation of the warranty.



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ESSENTIAL SAFETY RULES



Read this paragraph carefully and understand it before operating or servicing this machine. The machine is connected to hazardous power circuits (electricity, pneumatic circuit, etc.) and should be used with great care.

This paragraph explains what needs to be understood in terms of safety before operating or servicing the machine. Non-compliance with these safety instructions risks causing injuries or fatal accidents, break-down of the machine, products or installations, or a serious incident.

OPERATOR

- Prior training about the operation and maintenance of the device is a prerequisite for the use and maintenance of the dryer.
- Use and maintain the dryer with the consent of the system manager.
- It is very dangerous to let a person, with poor knowledge and poor understanding about the system and how the machine functions, use it and carry out maintenance operations in an improper or negligent manner.

BEFORE OPERATING THE DRYER:

- Anyone using the dryer or carrying out its maintenance operations must read this manual carefully and understand its contents. Pay special attention to explanations with the heading "Danger", "Warning" and "Caution" and understand them thoroughly. Follow the instructions and avoid predictable hazards when you use the dryer or carry out its maintenance operations.
- Before operating or carrying out a maintenance operation, read and understand the safety instructions stated in this manual and the safety labels affixed, on the device, and follow the instructions. Failing the above, you risk suffering facial injuries or even fatal injuries. You also run the risk of the dryer, the products or the installation breaking down or causing a serious incident.
- Other safety instructions are provided in the other paragraphs.

WARNING LABELS (WARNING)

- Warning labels are very important. Do not remove them deliberately.
- If they become dirty or illegible, or they get removed inadvertently or are lost, stick new labels in the place of the earlier ones.

DANGER WARNING

When you use the dryer or carry out a maintenance operation on it, pay attention to the three warning levels below. Understand their content and act accordingly. The warning messages appear on the warning labels placed on the dryer and given in the safety instructions paragraph of this manual.



The "danger" messages provide warning about real dangers and indicate the risks of fatal accident or serious injuries for the operator who does not strictly adhere to the safety instructions provided to avoid such dangers. They also provide warning about the risks of an accidental air leakage or fire due to improper handling.

The content of the messages is identical to the warning messages, except for indicating a higher level of severity. Danger labels generally have a red background.



The "warning" messages provide warning about real dangers and indicate the risks of serious injuries or fatal accident for the operator who does not strictly adhere to the safety instructions provided to avoid such dangers.

They also provide warning about the risks of an accidental air leakage or fire due to improper handling. Warning labels generally have an orange background.



The "caution" messages provide warning about real dangers and indicate the risks of minor injuries for the operator, or damage to the system, products and installations, if they do not strictly adhere to the safety instructions provided to avoid such dangers.

Caution labels generally have a yellow background.

HEATLESS DESICCANT AIR DRYER



1.7 Qualified Operators

Only the professionals stated below are authorized to operate the unit after having received all the necessary instructions from this manual:

SPECIALIZED MAINTENANCE ELECTRICIAN

The electrician should have a general knowledge about electrical appliances as well as specific experience working with control boxes and the electrical components of cooling units or similar equipment from the domain of industrial equipment.

The electrician is authorized to carry out only the specific operations stated in this manual by meticulously following the associated instructions.

MAINTENANCE TECHNICIAN

The maintenance technician should have a general experience working with mechanical elements and a specific experience with cooling units or similar equipment from the domain of industrial equipment.

The maintenance technician is authorized to carry out only the specific operations stated in this manual by meticulously following the associated instructions.

TRANSPORT OPERATOR

The transport operator can carry out only the specific operations stated in this manual by meticulously following the associated instructions.

STAFF ALLOCATED FOR THE START-UP AND SHUT-DOWN OF THE UNIT

(Basic operator and engineer operator)

After having understood the information contained in this manual, the basic operator will be authorized to manually operate the unit at the level of the following functions: start-up, shut-down, display of alarms.

In this case, this operator can carry out only the specific operations stated in this manual by meticulously following the associated instructions.

SAFETY OFFICER

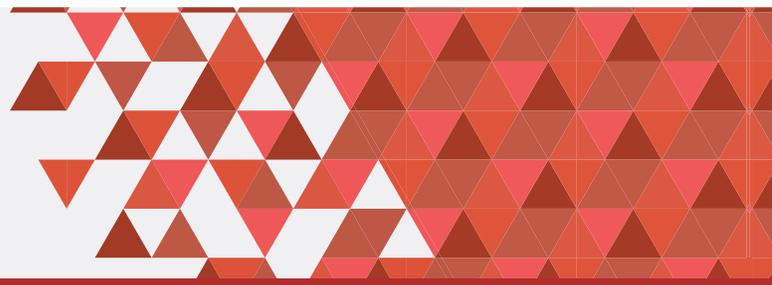
The safety officer is responsible for protection and the prevention of occupational risks as set forth in

OSHA Directive (Safety in the workplace).

The safety officer shall make certain that all the persons who operate the unit have received all applicable instructions which are contained in this manual, including the initial installation and commissioning operation.



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1.8 Storage

Keep away from:

- Direct sunshine, rain, wind and sand.
- Temperature: max. 140°F/min. 14°F
- Max. relative humidity: 90%

1.9 Transport and Handling



The carrier is always liable for any damage caused to the products entrusted to them during transport. Thus, before preparing the unit for its installation and commissioning, it is necessary to carry out a complete visual inspection in order to check that the packing cases are intact and the unit has no apparent damage. It is also important to verify that the units are the ones that have been ordered.



Any damage or complaints must be reported to Trident Pneumatics and declared to the carrier (or shipper) before the carrier leaves premises when product is delivered.



If there is damage to one or more components, do not start the unit but inform Trident Pneumatics about the problem to find a mutually agreeable course of action.



Preferably, remove the packaging at the actual place of installation.

The unit should be handled with great care on the premises. Do not use any of its components as a grip. In order to avoid any damage, it is imperative that, during their handling, the units always remain in the position set for their operation.



Do not leave the units in their packaging on premises that are exposed to direct sunlight because the ambient temperatures can affect the components and safety devices on the dryer.



The equipment should be preferably lifted using a suitable crane or forklift. We do not recommend using hands. Handle with care. Heavy blows could cause irreparable damage. Even when packaged, keep the machine protected from severity of the weather.



1.10 Proper Use of the Dryer

This dryer has been designed, manufactured and tested only to be used to separate the humidity normally contained in compressed air. Any other use has to be considered improper. The Manufacturer will not be responsible for any problem arising from improper use; the user will be in any case responsible for any resulting damage.

Moreover, the correct use requires the compliance with the installation conditions, in particular:

- Voltage and frequency of the mains
- Pressure, temperature and flow rate of the incoming air
- Ambient temperature

This dryer is supplied tested and fully assembled. The only operation left to the user is the connection to the plant in compliance with the instructions given in the following chapters.



The purpose of the machine is the separation of water and eventual oil particles present in compressed air. The dried air cannot be used for respiration purposes or for operations leading to direct contact with foodstuff, unless subject to additional treatment.

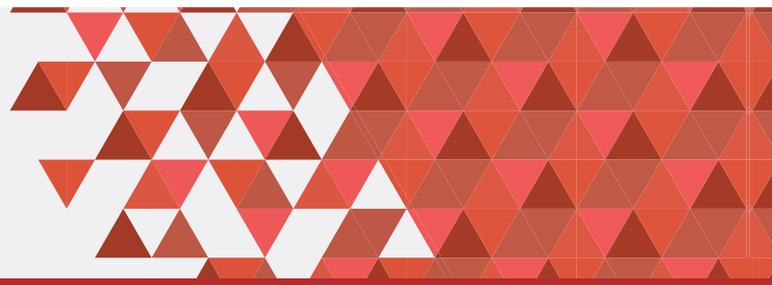
1.11 Instructions for the Use of Pressure Equipment

To ensure the safe operation of pressure equipments, the user must conform strictly to the above directive and the following:

1. The equipment must only be operated within the temperature and pressure limits stated on the manufacturers name/data plate.
2. No welding is allowed on any of the pressure components.
3. The equipment must not be stored in poorly ventilated spaces, near a heat source or inflammable substances.
4. Vibration must be eliminated from the equipment to prevent fatigue failure.
5. An internal inspection must be carried out at 12 month intervals to check for pressure equipment corrosion.
6. Automatic condensate drains should be checked for operation every day to prevent a build up of condensate in the pressure equipment.
7. The maximum working pressure stated on the manufacturers data plate must not be exceeded.
8. All documentation supplied with the equipment (manual, declaration of conformity etc.) must be kept for future reference.



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2.1 Installation Site

1. Install dryer in a vertical (upright) position. In systems where air usage fluctuates or there are sudden demands, protect dryer against air flow surges by providing sufficient piping between dryer and point of air use or by installing a receiver tank between dryer and point of air use. Allow enough space for future servicing of the unit.
2. Install by-pass piping with inlet, outlet, and by-pass valves to isolate dryer for performing routine maintenance without interruption of the plant air system. By-Pass piping can be installed on the dryer by the factory if that option is selected.
3. Install a coalescing filter(s) with automatic drain upstream of the dryer inlet, and a particulate filter(s) downstream of the dryer outlet. Bypass piping is recommended for both (all) filters. Factory pre- and after filters can be installed if those options are selected.
4. Dryer control system may have alarm relay contacts available for remote alarm indication. (Please refer to the electrical diagram for information.)
5. Connect inlet air piping to dryer inlet (bottom of dryer) and outlet air piping to dryer outlet (top of dryer).



Check all connections on the unit for tightness.

6. Connect 115/60/1 electric power terminals inside the control enclosure, in accordance with local and national codes. To prevent the solid-state timing device and solenoid valves from operating when the air supply is interrupted, it is recommended that provisions be made to shut off the dryer when the air compressor is not in use.

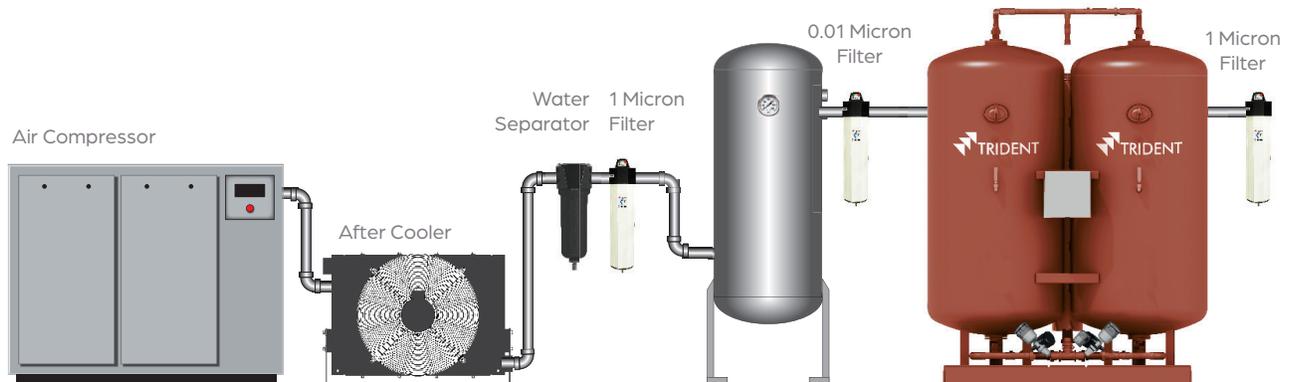


CHECK ALL ELECTRICAL CONNECTIONS!

HEATLESS DESICCANT AIR DRYER



2.2 Installation Layout



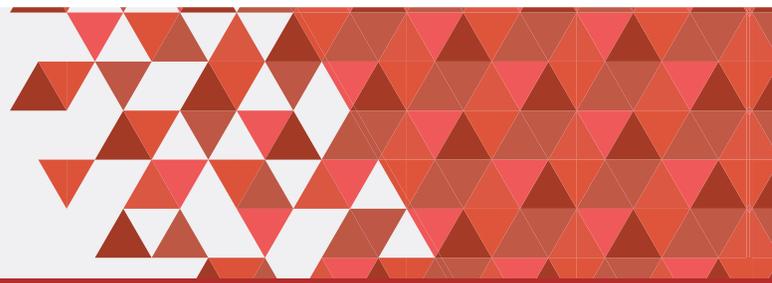
Installation is suggested when the compressed air treated from the dryer is only a part of the total flow rate of the compressor; or when the compressor operates at reduced load and the total consumption equals the compressor flow rate.



Dryer should be supplied with 0.01 micron filter on the inlet and a 1 micron filter on the outlet (both sold separately). It is recommended to install both water separator and 1 micron filter before the dryer, in order to extend the life of the inlet filter.



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2.3 Dryer Specifications

Specifications	Standard	Optional
Maximum Particle Size (ISO Class) ⁽¹⁾	Class 2 (1 micron)	Class 1 (0.01 micron)
Maximum Water Content (ISO Class) ⁽¹⁾	Class 2 (-40°F PDP)	Class 1 (-94°F PDP)
Min/Design/Max Operating Pressure Range	70 psig / 100 psig / ⁽²⁾	-
Min/Design/Max Ambient Temperature	38°F / 100°F / 120°F	-
Min/Design/Max Inlet Temperature	38°F / 100°F / 120°F	-
Power Supply Requirements	115V/1Ph/60Hz	230V/1Ph/60Hz & 12 VDC

1. Per ISO 8573.1:2010

2. 180 psig up to 1500 scfm (200 psi relief pressure) / 135 psig above 1500 scfm (150 psi relief pressure)

2.4 Correction Factors

Correction Factor For Inlet Pressure									
psig	60	70	80	90	100	110	130	140	150
F1 factor	0.65	0.74	0.83	0.91	1.00	1.04	1.12	1.16	1.20

Correction Factor For Inlet Temperature									
°F	70	80	90	100	105	110	115	120	
F2 factor	1.12	1.10	1.06	1.00	0.93	0.86	0.80	0.75	

SIZING A DRYER

How to find the air flow capacity

$$\text{AIR FLOW CAPACITY} = \text{NOMINAL CAPACITY OF THE DRYER} \times \text{F1 FACTOR} \times \text{F2 FACTOR}$$

Example: Part No. 8102409500 has a nominal capacity of 250 scfm.

What is the maximum allowable flow through the dryer at following operating conditions:

Air Inlet Pressure : 110 psig - From table for pressure correction F1=1.04

Air Inlet temperature: 105°F - From table for temperature correction F2=0.93

$$\text{AIR FLOW CAPACITY} = 250 \text{ SCFM} \times \text{F1 FACTOR} \times \text{F2 FACTOR}$$

Air Flow Capacity= 241.8 scfm

This is the maximum air flow rate that the dryer can accept under those operating conditions.

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2.5 Operation

SET UP

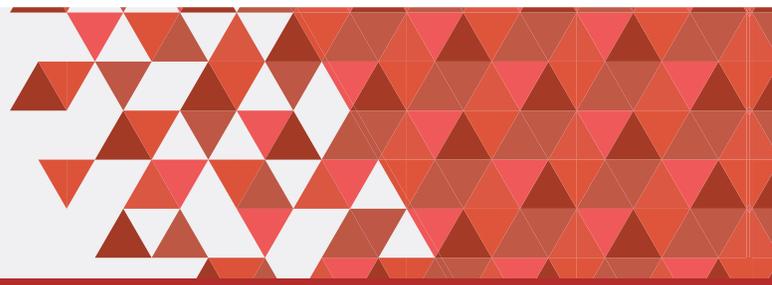
1. Regenerative Dryers and Desiccant are shipped separately on dryers of 1000 scfm and larger to prevent damage to the dryer during shipment. Fill both towers with desiccant following the procedures outlined in the section titled **REPLACING DESICCANT (Page 17)**. **Note: Always use approved desiccant. Use of desiccant that are not approved may void warranty. Contact the factory or your Distributor for more information.**
2. With dryer by-pass valve open, slowly open the inlet valve to the dryer and allow the unit to pressurize. When the pressure gauges indicate that the dryer is at full line pressure, open dryer outlet valve and close the by-pass valve. The filters should be placed on-line using a similar procedure.
3. Turn the dryer on. The dryer controller screen will turn on indicating that the dryer is operating. After a short time, one tower will depressurize and start to purge. The other tower will be drying air at full line pressure. After about 5 minutes, the low-pressure tower will re-pressurize, and the towers will switch functions.
4. Adjust the purge flow control valve to the proper pressure setting indicated on the **DRYER TECHNICAL SPECIFICATIONS (Page 47)**.

SHUT DOWN

1. Open by-pass valve. Close dryer outlet valve and dryer inlet valve. Allow the dryer to continue to operate until tower switch-over. Both towers should now be at atmospheric pressure
2. Turn the dryer off.



HEATLESS DESICCANT AIR DRYER



2.6 Recommendations for Optimal Performance

1. Do not exceed rated design flow, inlet temperature or operating pressure.
2. Make sure dryer is turned on when air is passed through the unit. Tower switching is vital to the successful drying of air.
3. Install a coalescing pre filter before the dryer (if dryer system does not have an inlet filter installed) to prevent oil carry-over from the compressor from coating the desiccant. The dew point performance of the dryer is greatly diminished when the desiccant becomes dirty or coated with oil.
4. Install a particulate after-filter in the air line immediately after the dryer (if dryer system does not have an outlet filter installed). The desiccant in your dryer can produce dust that will be passed downstream if a particulate filter is not used.
5. Change pre filter and after-filter elements regularly. The coalescing pre filter, when operating properly, will remove contaminants such as oil and liquid water as well as abrasive solids that could reduce the effectiveness of the dryer. The particulate after-filter will prevent desiccant particles from migrating downstream and possibly damaging equipment.
6. Never weld to vessel framework. This may cause damage to the digital equipment, which controls dryer operation.
7. Check and replace the muffler often during initial operation. Desiccant dust is especially heavy after shipment and tower filling. Remember to wear hearing protection.
8. A couple of weeks after filling dryer with desiccant, shut unit down and check desiccant level. Top off with fresh desiccant if necessary.
9. Should a problem arise, consult the **TROUBLE SHOOTING (Page 48)**.
10. Ensure that each tower re-pressurizes to at least 90% of line pressure before switch over.

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2.7 Maintenance

1. Change pre filter and after-filter elements regularly! Options for filters include Differential Pressure Gauges or Indicators depending upon model. For those models equipped with indicators, the element should be changed when the red indicator pops up. For models equipped with gauges, the elements should be changed when the gauge needle moves into the red zone. The dryer's built-in "service hours" may be used to track filter element life and schedule replacement. (For specific instructions on changing filter elements, refer to the section entitled **CHANGING FILTER ELEMENTS (Page 18)**.
2. Periodically check that the dryer is cycling properly. Watch for each tower to alternate between line and atmospheric pressure. The entire cycle will take about 10 minutes.
3. Approximately once a year, shut unit down and inspect all valves. (Based on an 8-hour workday).
4. Approximately once a year, check the desiccant bed for oil contamination and/or losses.
5. Approximately every three to five years the desiccant should be changed out.
6. Should a problem arise, consult the **TROUBLE SHOOTING (Page 48)**.

REPLACING DESICCANT

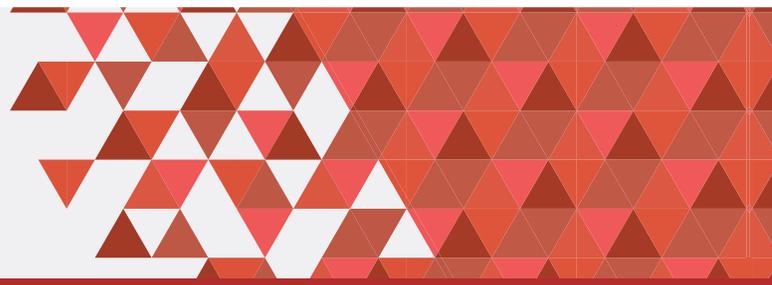
When replacing desiccant be sure to use **Approved Activated Alumina**. The 3/16" diameter is used on most models. Smaller diameters of desiccant or other brands are not recommended. **Desiccant amount required for each model is shown on page 18.**

1. Open the by-pass valve. Close the dryer outlet valve and the dryer inlet valve. Allow the dryer to continue to operate until the towers switch-over. Both towers should now be at atmospheric pressure.
2. Turn dryer off.
3. Loosen the plug at the bottom of the tower. Allow desiccant to drain, then replace the plug. Loosen plug at top of tower. Fill with fresh desiccant and replace the plug.
4. Desiccant dust may be unusually heavy after changing the desiccant. To remove this dust from the dryer: allow the dryer to cycle several times. Remember to wear hearing protection during this procedure. Change exhaust mufflers after 1 week of operation and approximately every 3 months.
5. A couple of weeks after filling the dryer with desiccants, shut the unit down and check desiccant level. Top off with fresh desiccant if necessary.
6. Should a problem arise, consult **TROUBLE SHOOTING (Page 48)**.

IMPORTANT: TH heatless desiccant air dryers are designed to use a specific desiccant. When replacing the desiccant, always use desiccant of the same size and type as that which was supplied with your dryer. For more information, please consult the factory.



HEATLESS DESICCANT AIR DRYER



Dryer (scfm)	Desiccant Per Column (Lbs)	Desiccant Total (Lbs)
70	35	70
100	50	100
150	70	140
200	100	200
250	120	240
300	150	300
350	175	350
450	225	450
500	250	500
600	300	600
750	375	750
1000	475	950

CHANGING FILTER ELEMENTS

1. Take the dryer off-line following the steps detailed in the section entitled Operating the Three-Valve Bypass. **Be sure to bleed off all air pressure from the dryer and filters before performing any maintenance.**
2. Remove any external drain valve from the filter housing.
3. Remove the bowl from the head of the filter by turning bowl in a counter clockwise direction..
4. Remove the dirty filter element by removing the threaded end cap at the bottom of the filter. Dispose of dirty elements properly.
5. Guide new element over the center rod and replace the threaded end cap, taking care to ensure that the new element is seated properly. Do not overtighten the end cap.
6. Replace the filter housing and drain valve.

Check all connections for tightness to prevent air leaks before bringing the dryer back online. See section 3.2 for bringing the dryer back online.

HEATLESS DESICCANT AIR DRYER



3.1 Operating Sequence

Dryers: 70 scfm to 750 scfm (Basic Controller)

Dryer operates on a standard 10:00 (10 Minute) cycle.

PURGE: 4:25 MIN
REPRESS: 0.45 SEC
DRYING: 5:00 MIN

1. Turn on the unit.
2. The right purge valve will open, depressurizing the right tower.
3. The purge pressure should be set to the appropriate setting according to the **HEATLESS TECHNICAL SPECIFICATIONS (Page 47)** for your model. The purge pressure will also be listed on the Serial Number sticker on the lower left inside part of the control box..
4. The air will bleed out the right muffler for 4:25 min. regenerating the desiccant bed in the right tower.
5. After the 4:25 minutes, the right purge valve will close, and the tower will start to pressurize to line pressure. It will take 45 seconds to reach line pressure.
6. The inlet valves will change states.
7. The left purge valve will open, discharging the pressure from the tower. Air will continue to flow out the muffler for 4:25 minutes while the tower is regenerated.
8. The left purge valve will close, and the tower will start pressurizing for 45 seconds to get to line pressure.
9. The cycle will repeat every 10 minutes.

Dryers: 1000 scfm (Advanced Controller)

(Refer to the 1000 scfm dryer system display navigation and description)

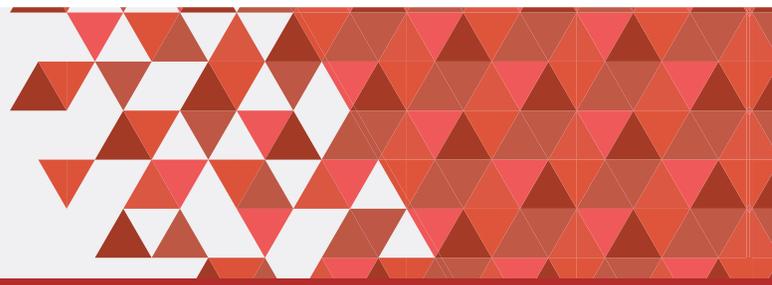
Dryer operates on a standard 10:00 (10 Minute) cycle.

PURGE: 4:00 MIN
REPRESS: 1.00 MIN
DRYING: 5:00 MIN

1. Turn on the unit.
2. The right purge valve will open, depressurizing the right tower.
3. The purge pressure should be set to the appropriate setting according to the **HEATLESS TECHNICAL SPECIFICATIONS (Page 47)** for your model. The purge pressure will also be listed on the Serial Number sticker on the lower left inside part of the control box..
4. The air will bleed out the right muffler for 4:00 min. regenerating the desiccant bed in the right tower.
5. After the 4:00 minutes, the right purge valve will close, and the tower will start to pressurize to line pressure. It will take 60 seconds to reach line pressure.
6. The inlet valves will change states.
7. The left purge valve will open, discharging the pressure from the tower. Air will continue to flow out the muffler for 60 seconds to reach line pressure.
8. The left purge valve will close, and the tower will start pressurizing for 60 seconds to get to line pressure.
9. The cycle will repeat every 10 minutes.



HEATLESS DESICCANT AIR DRYER



OPTIONAL EQUIPMENT

OPERATING THE ES ENERGY SAVER BASIC CONTROLLER (DRYERS: 70 SCFM TO 750 SCFM)

When a Dryer is equipped with Energy Saver, the controller monitors the dew point of the air leaving the dryer. At the end of the half cycle, if the dew point is better than the set point, the controller will hold the online tower from switching and leave it in service, processing air. This will save purge air. When the dew point falls below the set point, the controller will switch the towers with no interruption in flow. The online tower will now be regenerated when it is switched out of service.

To adjust the dew point set point:

1. Press and hold the 1st and 3rd buttons under the screen for five seconds.
2. When in the Dew Point Setting menu, Press and hold the White button till "PARAM" is displayed at the bottom of the screen. While holding the White button in press button 4 once to change the text from "PARAM" to "PROG".
3. When this is done the "ES SETPOINT LINE" will begin to flash.
4. Button 1 will move up a line, button 4 will move down a line, button 2 lowers the value and button 3 increases the valve.
5. Use buttons 2 and 3 to adjust the set point value. The set point should be set at -40°F when it leaves the factory. If the set point is moved higher than -40°F , such as -30°F then the dryer will hold the tower from switching until the valve goes to -29°F or higher, saving on often the unit needs to purge.
6. When finished changing the setpoint, press and hold the white button till the "PROG" is displayed. Then while holding the White button in, press button 4 once to change the text from "PROG" to "PARAM".
7. After about, 30 seconds of not pressing any button the display will return to the run screen.

If the dew point reading units need changes:

1. Press and hold buttons 1 and MENU for five seconds.
2. Press and hold the White button till "PARAM" is displayed at the bottom of the screen. While holding the White button, in press button 4 once to change the text from "PARAM" to "PROG".
3. Scroll down to "DGDISP" and change it to a 1 for F deg or 0 for C deg.
4. When done, press and hold the White button so "PROG" appears on the bottom of the screen. While holding the White button in, press button 4 once to change the text from "PROG" to "PARAM".
5. After about, 30 seconds of not pressing any button the display will return to the run screen.

If the dew point probe needs to be removed for some reason, the program can be adjusted so an alarm is not displayed:

1. Press and hold button 1 and MENU for five seconds.
2. Press and hold the White button till "PARAM" is displayed at the bottom of the screen. Then press button 4 once to change the text from "PARAM" to "PROG".
3. Scroll to "DWPT" and change the setpoint to 0000 from 0001. This will tell the program that there is no dew point probe on the unit. If the probe is reinstalled, the setpoint will need to be changed back to 0001.
4. Press and hold the White button till the text "PROG" is displayed, then while holding the White button in press button to change the text to "PARAM".
5. After about 30 seconds of not pressing any buttons, the display will return to the run screen.



3.2 Operating the Three-Valve Bypass

1. Options for dryers include three valve bypass piping that is factory installed. Three-valve bypass makes for ease in performing routine maintenance such as changing filter elements. If you do not purchase the three-valve bypass option, it is recommended that you install a three-valve bypass, like the one depicted in Figure 1.0 when installing the dryer.
2. During normal operation, valves 1 & 3 will be open and valve 2 will be closed, allowing air to flow through the filters and dryer.
3. To perform routine maintenance, operate the valves in 3-2-1 order to allow air to flow directly from the inlet connection to the outlet connection without passing through the dryer (close valve 3, open valve 2 and close valve 1).

Remember to bleed the air pressure from the dryer and filters before performing any service. See Sections entitled **MAINTENANCE (Page 17)**, **CHANGING FILTER ELEMENTS (Page 18)**, or **REPLACING DESICCANT (Page 17)** for specific instructions.

4. When bringing the dryer back on-line after maintenance, operate the valves in 1-2-3 order to prevent backflow to the dryer and filters. (Open valve 1, close valve 2, open valve 3.)

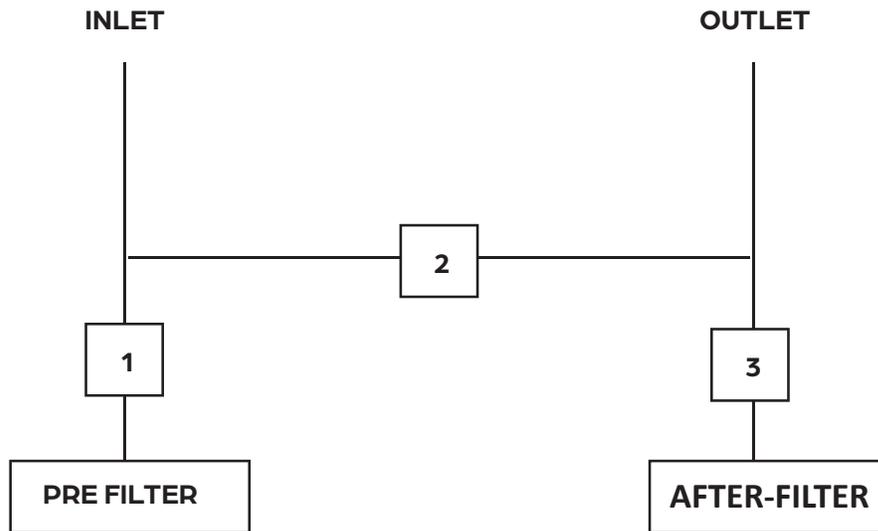
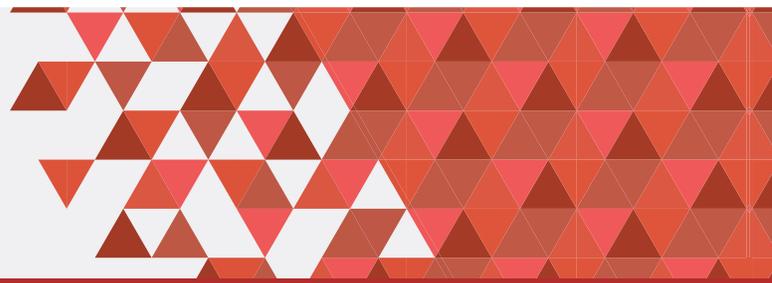


FIGURE 1.0 – TYPICAL TH F2-3V THREE-VALVE BYPASS



HEATLESS DESICCANT AIR DRYER



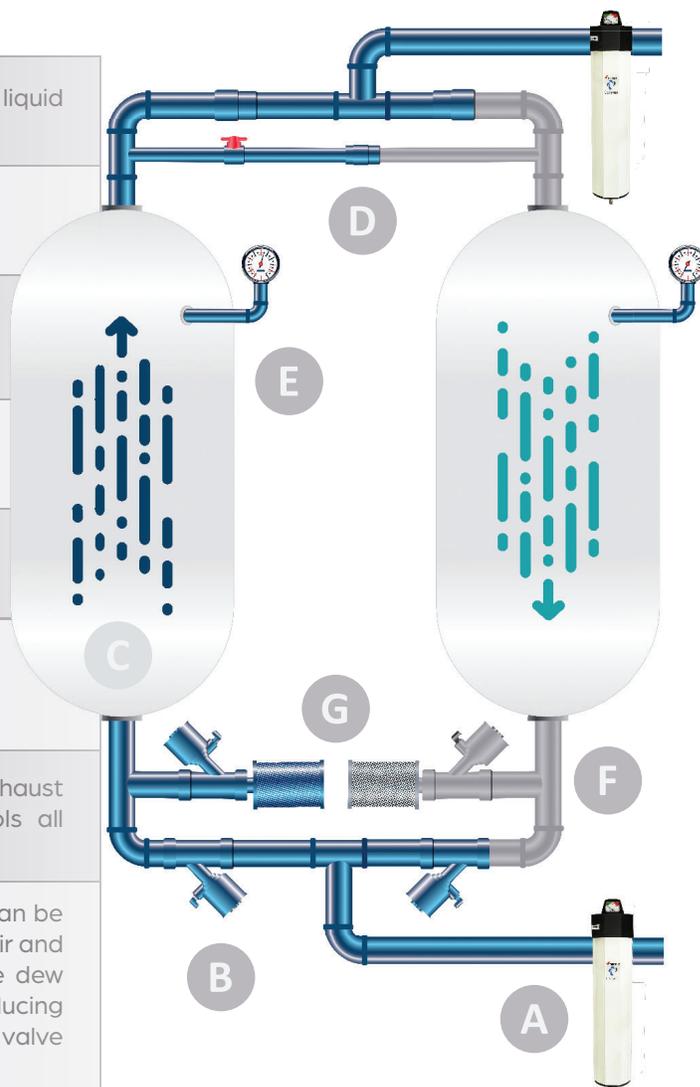
HOW IT WORKS

HEATLESS RANGE

In a twin tower desiccant air dryer, one tower is on-line drying the compressed air while the other is off-line regenerating, which means it is eliminating the water vapor it has collected so it can be used to dry again. The two towers switch back and forth so one is always drying while the other is regenerating or in standby.

The TH twin tower desiccant dryers remove moisture from your compressed air system in the same way and to the same exacting standards of performance and reliability. The difference is how they regenerate and the amount of compressed air and/or power required to do so.

A	0.01 micron pre filter removes all particulate, liquid water and oil aerosols to 0.01 ppm.
B	Clean, saturated air enters the inlet valve which directs it to one of the desiccant towers.
C	Compressed air travels through tower a for 5 minutes and moisture vapor is adsorbed to -40°F PDP or better.
D	A final filter removes particulate to 1.0 micron or better.
E	~15% purge air expands through an orifice and regenerates tower B (TH Range).
F	After, the purge exhaust valve closes and tower B repressurizes and is ready for adsorption to begin.
G	At the 5-minute mark (fixed cycle), tower a exhaust valve opens to regenerate. A PLC controls all operations.
H	Compressed air is expensive but TH dryers can be fitted with an energy savings device to save air and save money. By measuring actual pressure dew point, the PLC will extend the dryer cycle reducing compressor energy, wasted purge air and valve wear and tear.





3.3 Optional ES ENERGY SAVER Operation (Dryers 70 scfm to 750 scfm Basic Controller)

OPERATING IN ENERGY SAVER (ES) MODE

- When the dryer is with ES option, the controller monitors the dew point of the air leaving the dryer. At the end of the half cycle if the dew point is better than the set point the controller will hold the online tower from switching and leave it in service processing air. This will save purge air. When the dew point goes above the set point, the controller will switch the towers with no interruption to flow. The online tower will be regenerated when it is switched out of service.
- If, during normal operation, the outlet air fails to achieve dew point, the alarm output will be indicated on the front screen and the remote alarm output will be activated.
- The set levels for the ES and dew point alarm are adjustable. This can be achieved by holding down the A and B buttons on the PLC for 8 seconds. This will give you access to the menu.
- Select the line you want to adjust by using the up down buttons, then press OK. The digits will flash and can be changed again using the up down buttons
- When set, press OK to store the changes. Then move to the next line.
- The screen will exit after 60 seconds or when escape is pressed.

OPTIONAL EQUIPMENT

OPERATING THE ES ENERGY SAVER BASIC CONTROLLER (DRYERS 70 SCFM TO 750 SCFM)

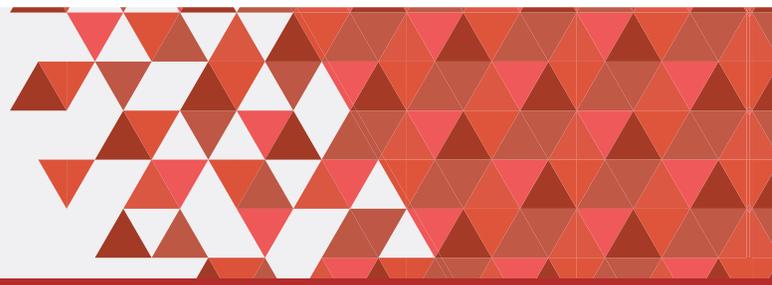
When a Dryer is equipped with Energy Saver, the controller monitors the dew point of the air leaving the dryer. At the end of the half cycle, if the dew point is better than the set point, the controller will hold the online tower from switching and leave it in service, processing air. This will save purge air. When the dew point falls below the set point, the controller will switch the towers with no interruption in flow. The online tower will now be regenerated when it is switched out of service.

To adjust the dew point set point:

1. Press and hold the 1st and 3rd buttons under the screen for five seconds.
2. When in the Dew Point Setting menu, Press and hold the White button till "PARAM" is displayed at the bottom of the screen. While holding the White button in press button 4 once to change the text from "PARAM" to "PROG".
3. When this is done the "ES SETPOINT LINE" will begin to flash.
4. Button 1 will move up a line, button 4 will move down a line, button 2 lowers the value and button 3 increases the value.
5. Use buttons 2 and 3 to adjust the set point value. The set point should be set at -40°F when it leaves the factory. If the set point is moved higher than -40°F , such as -30°F then the dryer will hold the tower from switching until the valve goes to -29°F or higher, saving on often the unit needs to purge.
6. When finished changing the setpoint, press and hold the white button till the "PROG" is displayed. Then while holding the White button in, press button 4 once to change the text from "PROG" to "PARAM".
7. After about, 30 seconds of not pressing any button the display will return to the run screen.



HEATLESS DESICCANT AIR DRYER



If the dew point reading units need changes:

1. Press and hold buttons 1 and MENU for five seconds.
2. Press and hold the White button till "PARAM" is displayed at the bottom of the screen. While holding the White button, in press button 4 once to change the text from "PARAM" to "PROG".
3. Scroll down to "DGDISP" and change it to a 1 for F deg or 0 for C deg.
4. When done, press and hold the White button so "PROG" appears on the bottom of the screen. While holding the White button in, press button 4 once to change the text from "PROG" to "PARAM".
5. After about, 30 seconds of not pressing any button the display will return to the run screen.

If the dew point probe needs to be removed for some reason, the program can be adjusted so an alarm is not displayed:

1. Press and hold button 1 and MENU for five seconds.
2. Press and hold the White button till "PARAM" is displayed at the bottom of the screen. Then press button 4 once to change the text from "PARAM" to "PROG".
3. Scroll to "DWPT" and change the setpoint to 0000 from 0001. This will tell the program that there is no dew point probe on the unit. If the probe is reinstalled, the setpoint will need to be changed back to 0001.
4. Press and hold the White button till the text "PROG" is displayed, then while holding the White button in press button to change the text to "PARAM".
5. After about 30 seconds of not pressing any buttons, the display will return to the run screen.

3.4 Optional ES ENERGY SAVER Operation (DRYER 1000 SCFM, DRYERS 70 SCFM to 750 SCFM w/ Optional Advanced Controller upgrade)

OPERATING IN ENERGY SAVER (ES) MODE

- When the dryer is with ES option, the controller monitors the dew point of the air leaving the dryer. At the end of the half cycle if the dew point is better than the set point the controller will hold the online tower from switching and leave it in service processing air. This will save purge air. When the dew point goes above the set point, the controller will switch the towers with no interruption to flow. The online tower will be regenerated when it is switched out of service.
- If, during normal operation, the outlet air fails to achieve dew point, the alarm output will be indicated on the front screen and the remote alarm output will be activated.
- The set levels for the ES and dew point alarm are adjustable. These set points can be adjusted in the "Settings" menu.
- Tap the field for "Dew Point Demand" or "High Dew Point", type the desired value, and press the enter key.

(Note: the following screen shots and descriptions provide an overview of the dryer system operation; refer to the manual for safety information, start-up, shut down, and any additional information before operation).

HEATLESS DESICCANT AIR DRYER



3.5 Heatless System Display Screenshots and Descriptions

(**WARNING:** these screen shots are for quick reference, see manual for safety information, startup, shutdown, and any additional information ... before operation)

OPERATING THE ES ENERGY SAVER BASIC CONTROLLER (DRYERS 70 SCFM TO 750 SCFM)

Door Device Descriptions:

SYSTEM DISPLAY SCREEN: The display screen provides the operator with various system operation information, alarms, etc. for quick review of dryer system operation ... discussed in the following pages.

POWER ON/OFF switch: The POWER on/off switch turns power on to the dryer control system and display

POWER ON green light: The POWER ON light indicates power is turned on to the dryer system.

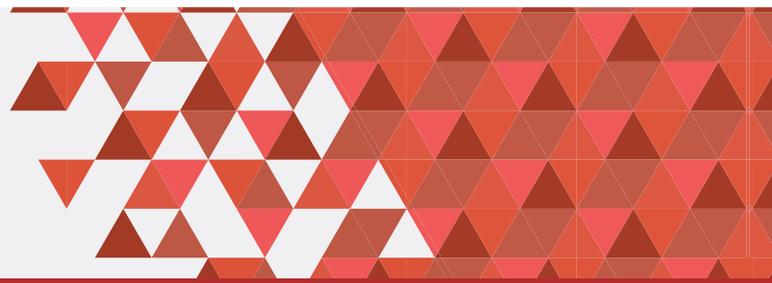
COMMON ALARM red light: The COMMON ALARM red light indicates an alarm has occurred... operator attention is required.

NORMAL DRYER SYSTEM OPERATION setup: For normal dryer system operation the following should be done: (note: for formal start-up refer to owner's manual... this operation sequence is a quick reference)

1. Make certain all gauge isolation valves, vent valves, instrument valves, pre filter drain valves, etc., are in the correct positions.
2. Make certain the system has been pressurized to line pressure.
3. Make certain control air has line pressure above 60 PSI
4. Make certain the dew point sensor valves (optional) are setup correctly... the valve upstream of the dew point sensor should be fully open... valve downstream of the sensor should be slightly open until a slight air flow is noticed at the end of the exhaust coil.
5. The 'POWER' ON/OFF switch is 'ON'
6. Verify no Common Alarms are active and require attention.
7. The system is ready to go online and dry the process air, make certain any filter, dryer, or user block and bypass valves are in the correct positions.



HEATLESS DESICCANT AIR DRYER



COLUMN A: ONLINE – COLUMN B: READY

Column A is currently drying the process air while Column B is ready to regenerate. The run hours and current alarm, if any, are also seen on the display.

```
COLUMN A: ONLINE  
COLUMN B: READY!  
HOURS RUN: ****  
DEWPOINT ALARM
```

COLUMN A: ONLINE – COLUMN B: PURGE

Column A is currently drying the process air while Column B is regenerating. The run hours and current alarm, if any, are also seen on the display.

```
COLUMN A: ONLINE  
COLUMN B: PURGE  
HOURS RUN: ****  
DEWPOINT ALARM
```

COLUMN B: ONLINE – COLUMN A: READY

Column B is currently drying the process air while Column A is ready to regenerate. The run hours and current alarm, if any, are also seen on the display.

```
COLUMN B: ONLINE  
COLUMN A: READY!  
HOURS RUN: ****  
DEWPOINT ALARM
```

COLUMN B: ONLINE – COLUMN A: PURGE

Column A is currently drying the process air while Column B is regenerating. The run hours and current alarm, if any, are also seen on the display.

```
COLUMN A: ONLINE  
COLUMN B: PURGE  
HOURS RUN: ****  
DEWPOINT ALARM
```

REMOTE STOP ACTIVE:

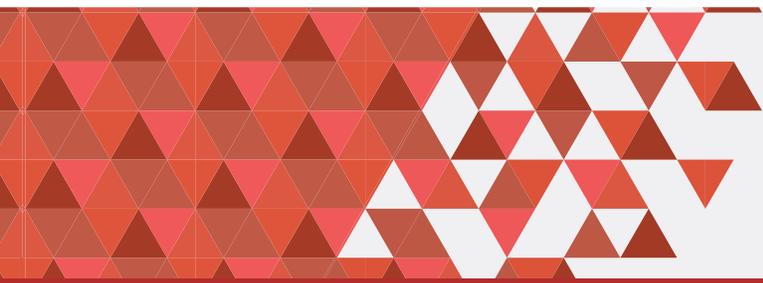
Remote Stop Active has been activated. This is an input signal, normally from the Air Compressor, that stops the unit from running when the air usage is low.

```
COLUMN A: ONLINE  
REMOTE STOP ACTIVE  
HOURS RUN: ****  
DEWPOINT ALARM
```

DEW POINT SENSOR FAULT:

Dew Point Sensor Fault alarm. Dew point sensor disconnected or out of range.

```
COLUMN A: ONLINE  
COLUMN A: READY!  
HOURS RUN: ****  
DEWPT SENSOR FAULT
```



HEATLESS DESICCANT AIR DRYER



SERVICE RESET REQUEST:

Service Reset Request active. This is a notification for service based on hours. Service for filters, mufflers, and desiccant. Reset button is located behind the controller. Press the reset button once services have been performed to reset the timer.

```
COLUMN A: ONLINE  
COLUMN A: READY!  
HOURS RUN: *****  
SERVICE RE-SET
```

DEW POINT °C SETTING:

This screen shows that the dew point setting is in Celsius. This is set by not having the input signal to the controller.

```
COLUMN A: ONLINE  
COLUMN A: READY!  
HOURS RUN: *****  
DEWP DEG C PDP
```

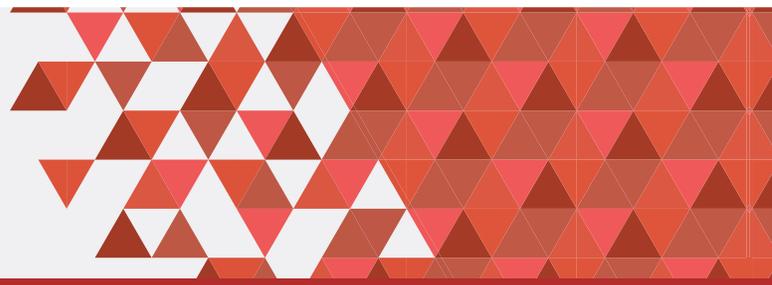
DEW POINT °F SETTING:

This screen shows that the dew point setting is in Fahrenheit. This is set by controller input.

```
COLUMN A: ONLINE  
COLUMN A: READY!  
HOURS RUN: *****  
DEWP DEG F PDP
```



HEATLESS DESICCANT AIR DRYER



3.6 Advanced Controller Screenshots and Descriptions

(Note: the following screen shots and descriptions provide an overview of the dryer system operation; refer to the manual for safety information, start-up, shut down, and any additional information before operation).

Door Device Descriptions:

- **SYSTEM DISPLAY SCREEN:** The display screen provides the operator with various system operation information, alarms, etc. for quick review of dryer system operation discussed in the following pages. (Note: the RUNNING/OPERATION screens should be the normal displayed screen).
- **POWER ON/OFF SWITCH:** The power on/off switch turns power on or off to the dryer control system and display (Note: Display takes a couple of minutes to boot-up.) (Note: When power on/off switch is ON, dryer may not actually be running. Make certain the SYSTEM on/off button in the MAIN menu screen shows the SYSTEM on/off slide switch in the ON position.)
- **POWER ON GREEN LIGHT:** The POWER ON light indicates power is turned on to the dryer system; however, the dryer may not be actually running. (Note: Dryer will not be running if POWER ON light is ON and the COMMON SHUTDOWN ALARM red light is ON. This is one indication the dryer is not running. Also, the SYSTEM on/off slide switch button may be in OFF position in the MAIN menu screen. Make certain the SYSTEM on/off slide switch button in the MAIN menu screen is in the ON position and allowing system to run.)

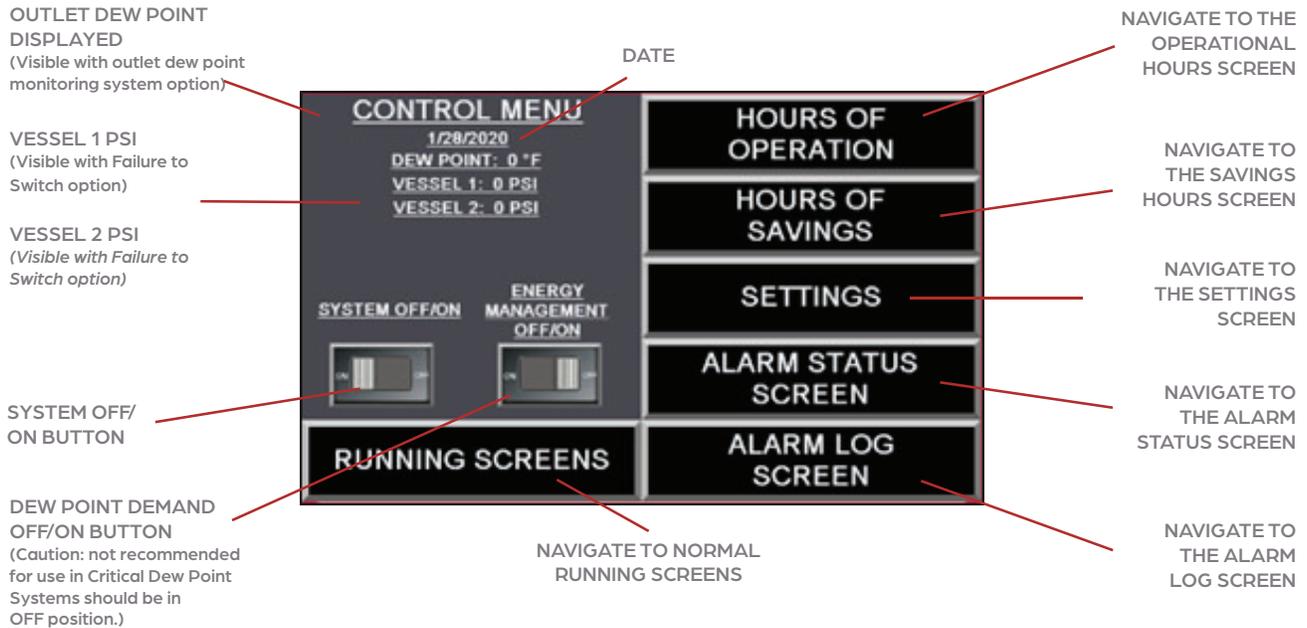
HEATLESS DESICCANT AIR DRYER



COMMON SHUTDOWN red light: The COMMON SHUTDOWN red light indicates a shutdown alarm has occurred and halted dryer operation. (Note: Anytime this light is ON the dryer will be shut down. Operator attention is required. For the alarm(s) that triggered the COMMON SHUTDOWN light, refer to the ALARM STATUS screen to find out what alarm tripped and then read the possible causes and solutions for the alarm in this display screen shot description and the manual. (Note: The ALARM STATUS screen is accessed from the CONTROL/MAIN MENU screen then press the ALARM STATUS button. The active alarm(s) will be highlighted red for shutdown and yellow for cautionary).

CONTROL/MAIN MENU SCREEN

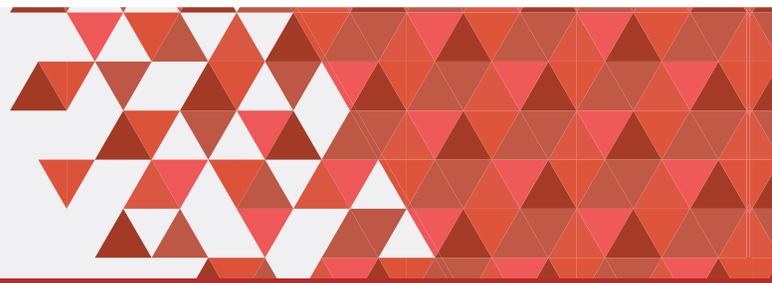
The CONTROL/MAIN MENU screen allows the user some control over system operation; as well as, navigates to the other status and alarm screens.



- SYSTEM OFF/ON: Slide switch button toggles SYSTEM OFF/ON.
- ENERGY MANAGEMENT OFF/ON: Slide switch button, toggles energy saving mode OFF/ON. When displayed ON energy saving mode is enabled, the drying period will be extended if below outlet DEW POINT DEMAND setting in the SETTINGS screen. When DEW POINT DEMAND displays OFF energy saving mode is disabled and fixed time cycle is enabled, system cycles on continuously. Caution: Energy management is not recommended for use in Critical Dew Point Systems and should be in OFF position to avoid possible contamination of critical downstream systems.
- OP HOURS: Button navigates to the operational hours screen.
- SAVINGS HOURS: Button navigates to the hours of savings screen.
- ALARM STATUS: Button navigates to the ALARM STATUS screen.
- ALARM LOG: Button navigates to the ALARM LOG screen.
- SETTINGS: Button navigates to the SETTINGS energy screen.



HEATLESS DESICCANT AIR DRYER



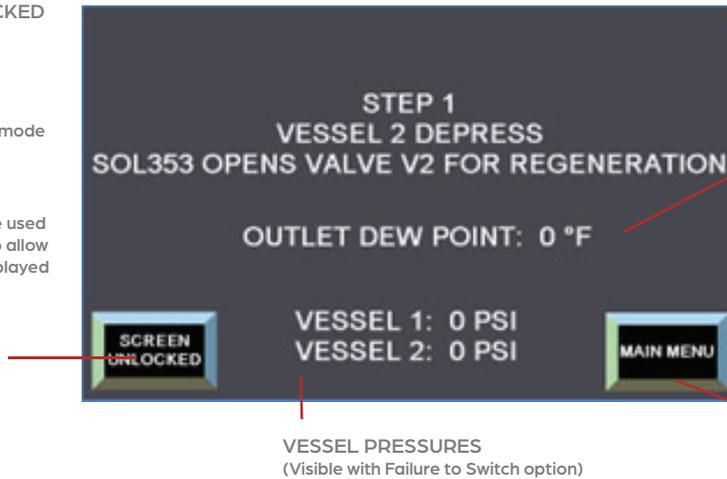
STEP 1 VESSEL 2 DEPRESS

Running/Operating Screen

SCREEN LOCKED/UNLOCKED button

LOCKS OR UNLOCKS
The running screens (Note: SCREEN must be in LOCKED mode for normal operation.)

SCREEN LOCKED
(Button blinking) is only to be used to exit running screens and to allow MAIN MENU screen to be displayed on control display screen.)



OUTLET DEW POINT DISPLAY
(Visible with outlet dew point monitoring system option)

VESSEL PRESSURES
(Visible with Failure to Switch option)

NAVIGATE TO MAIN MENU
(Note: SCREEN button must be UNLOCKED and blinking before pressing MAIN MENU button)

STEP 1:

Vessel 2 is depressurizing prior to regeneration to near zero pressure on Vessel 2... Control system energizes solenoid SOL353, which closes Vessel 2 inlet valve and opens Vessel 2 purge exhaust valve ... Vessel 1 inlet valve should be opening or open and drying the inlet air. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

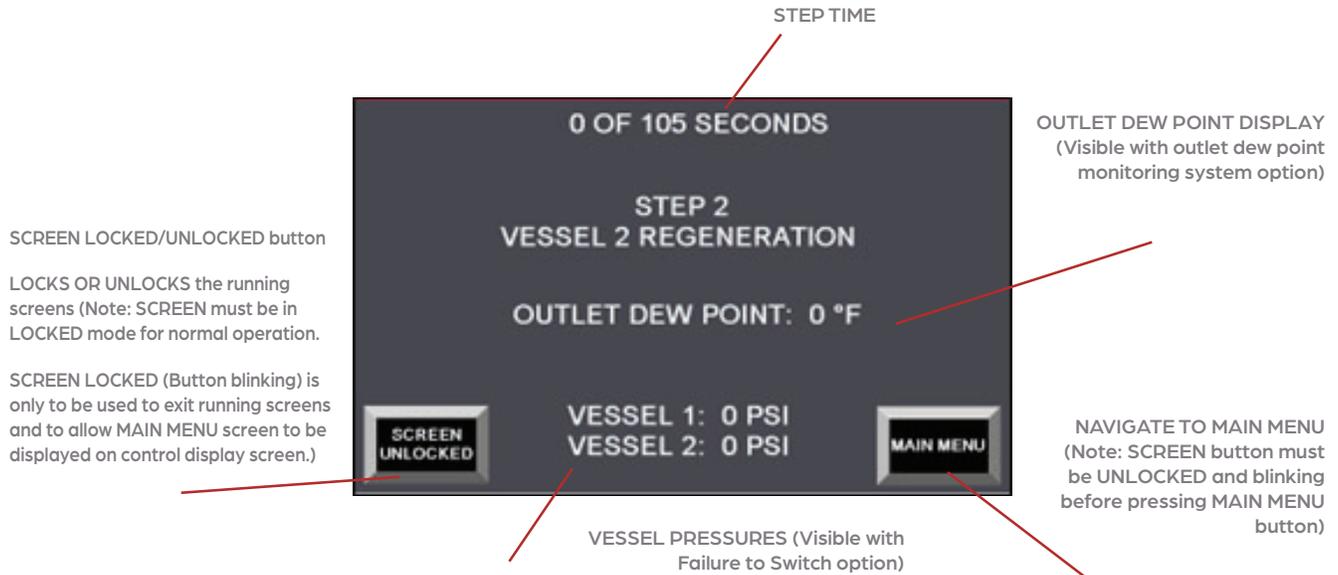
(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

HEATLESS DESICCANT AIR DRYER



STEP 2 VESSEL 2 DEPRESS

RUNNING/OPERATING SCREEN



STEP 2:

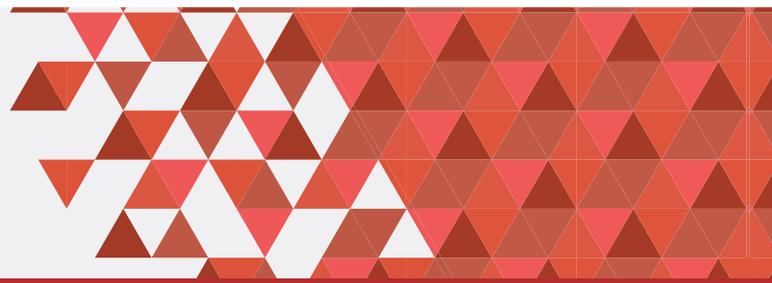
Vessel 2 is regenerating at near zero tower pressure. Control system continues to energize solenoid SOL353, which closes Vessel 2 inlet valve and opens Vessel 2 purge exhaust valve... Vessel 1 inlet valve should be open and drying the inlet air. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

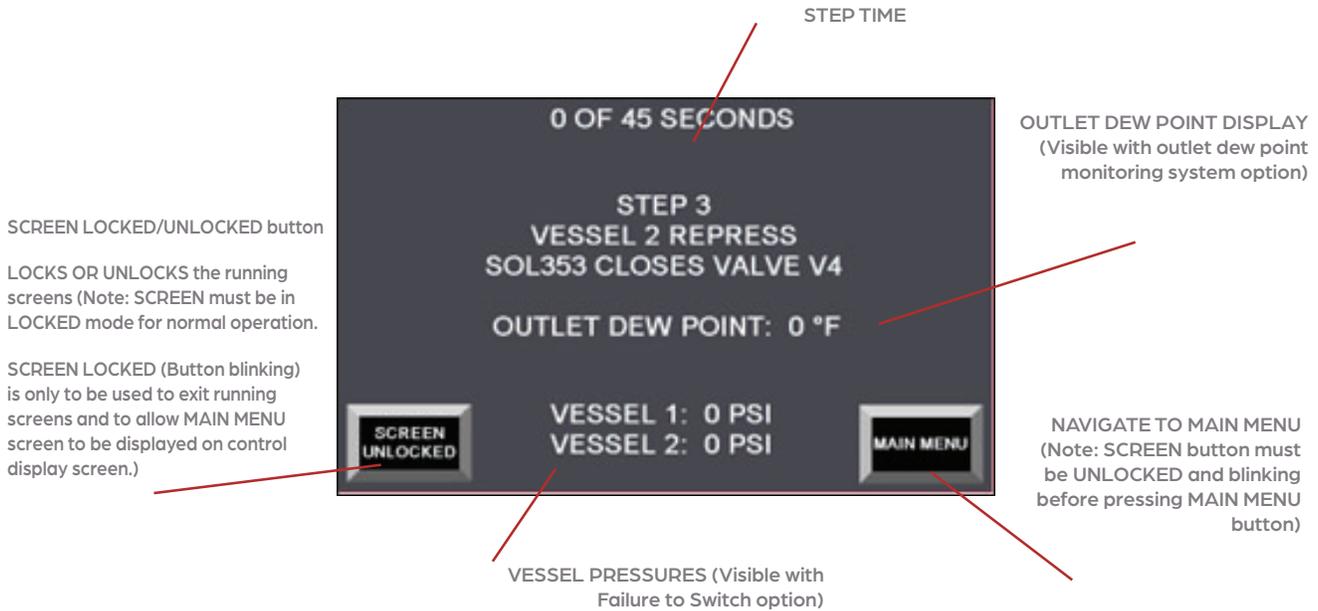


HEATLESS DESICCANT AIR DRYER



STEP 3 VESSEL 2 DEPRESS

RUNNING/OPERATING SCREEN



STEP 3:

Vessel 2 is re-pressurizing. Purge exhaust valves on lower piping should be closed and remain closed during the re-pressurization cycle. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

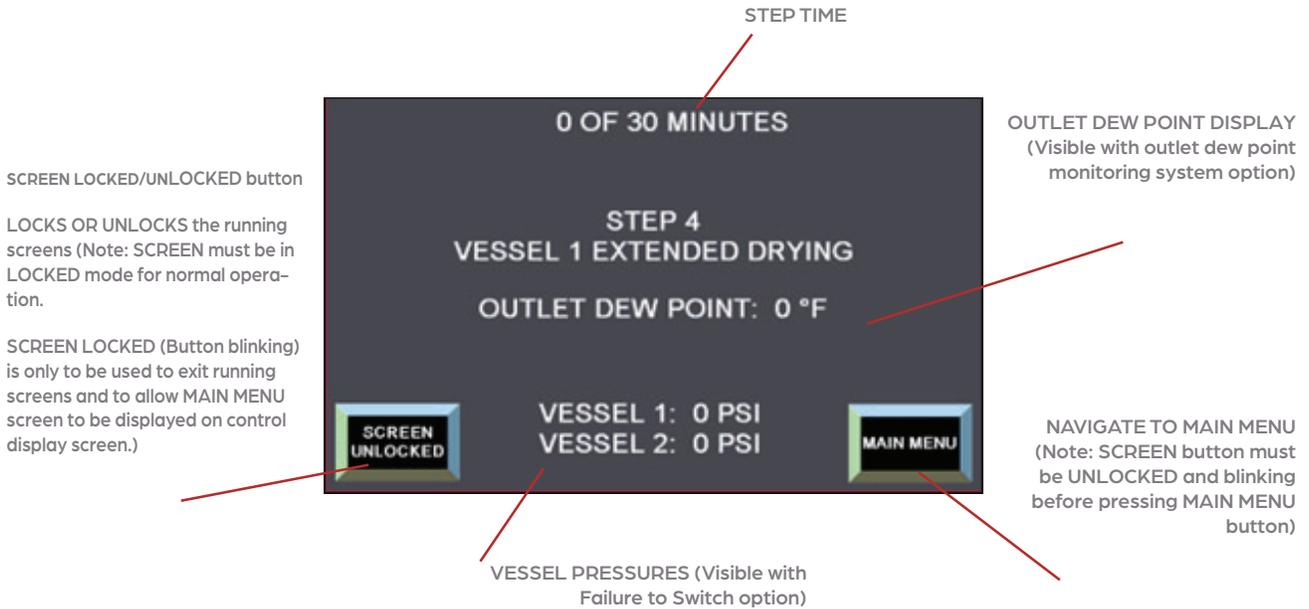
(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

HEATLESS DESICCANT AIR DRYER



STEP 4 VESSEL 1 EXTENDED DRYING

RUNNING/OPERATING SCREEN



STEP 4:

(This step 4 screen is only visible if in energy management system is on and dew point is below the dew point demand set point.)

Vessel 2 is in standby and pressurized to line pressure... Vessel 1, is drying the inlet process air while the dew point sensor monitors the outlet air for a maximum of 30 minutes or until the dew point rises above the setting pre-set in the settings menu screen. Vessel 1 will continue drying the inlet air for an extended time period up to a maximum of 30 minutes. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

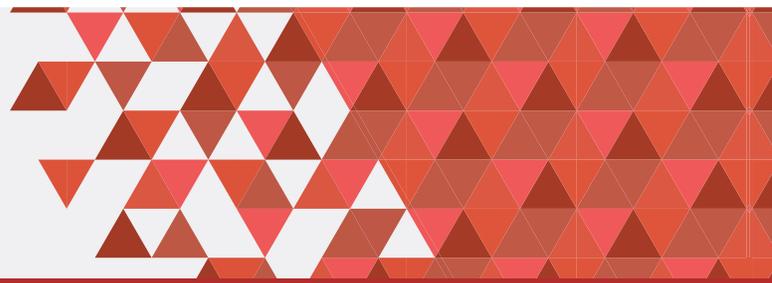
(Caution: Energy management is not recommended for use in Critical Dew Point Systems and should be in OFF position to avoid possible contamination of critical downstream systems)

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)



HEATLESS DESICCANT AIR DRYER



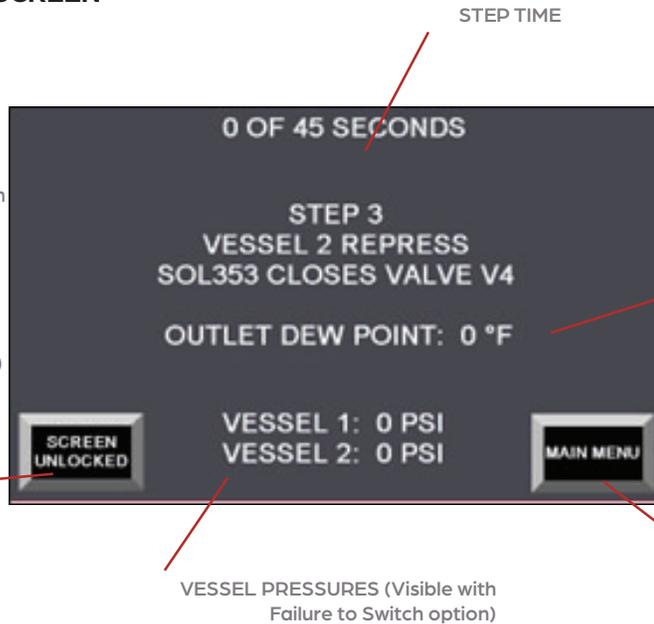
STEP 5 VESSEL 1 DEPRESS

RUNNING/OPERATING SCREEN

SCREEN LOCKED/UNLOCKED button

LOCKS OR UNLOCKS the running screens (Note: SCREEN must be in LOCKED mode for normal operation.)

SCREEN LOCKED (Button blinking) is only to be used to exit running screens and to allow MAIN MENU screen to be displayed on control display screen.)



STEP 5:

Vessel 1 is depressurizing prior to regeneration to near zero pressure on Vessel 1... Control system energizes solenoid SOL348, which closes Vessel 1 inlet valve and opens Vessel 1 purge exhaust valve ... Vessel 2 inlet valve should be opening or open and drying the inlet air. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

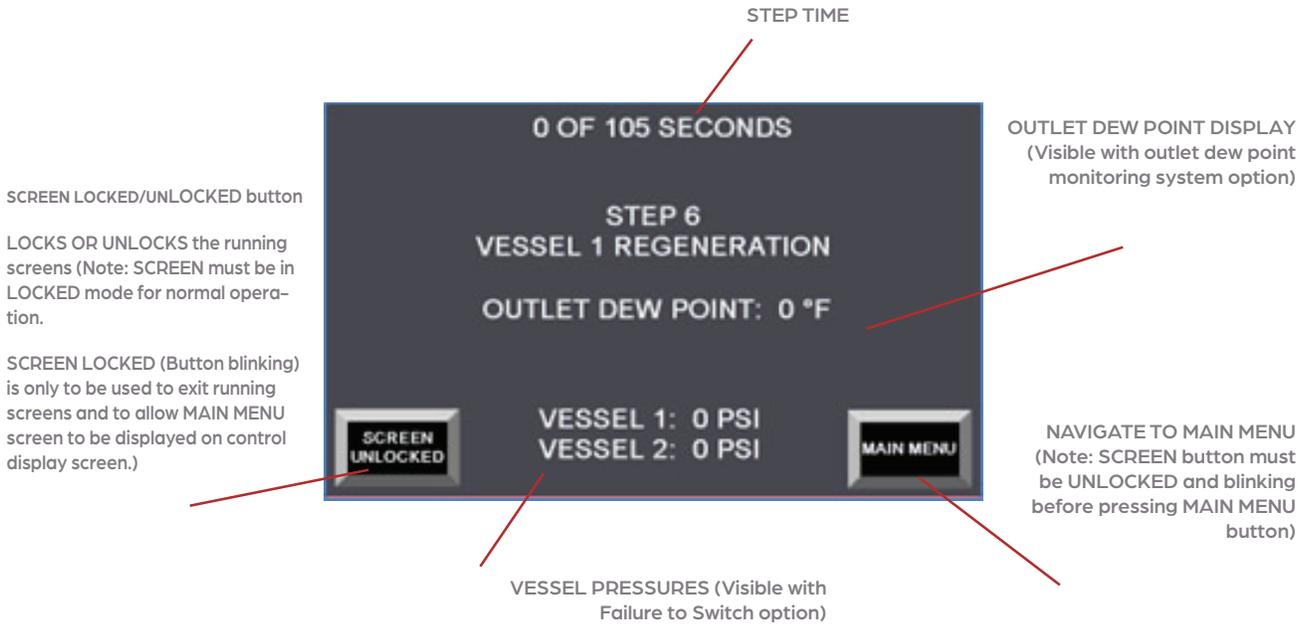
(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

HEATLESS DESICCANT AIR DRYER



STEP 6 VESSEL 1 REGENERATION

RUNNING/OPERATING SCREEN



STEP 6:

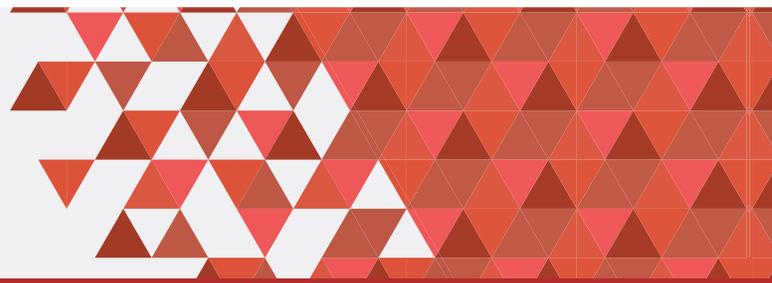
Vessel 1 is regenerating at near zero tower pressure. Control system continues to energize solenoid SOL348, which closes Vessel 2 inlet valve and opens Vessel 1 purge exhaust valve... Vessel 2 inlet valve should be open and drying the inlet air. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

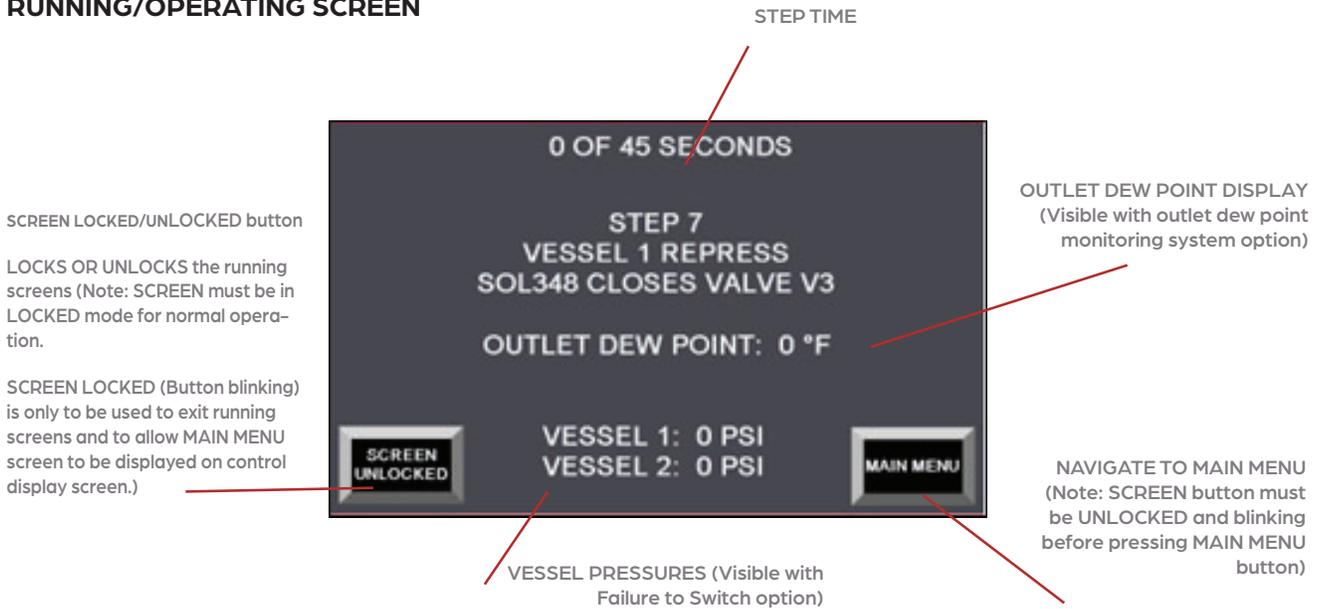


HEATLESS DESICCANT AIR DRYER



STEP 7 VESSEL 1 REPRESS

RUNNING/OPERATING SCREEN



STEP 7:

Vessel 1 is re-pressurizing. Purge exhaust valves on lower piping should be closed and remain closed during the re-pressurizing cycle. Vessel 2 inlet valve should be open and Vessel 2 continues to dry the inlet air. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

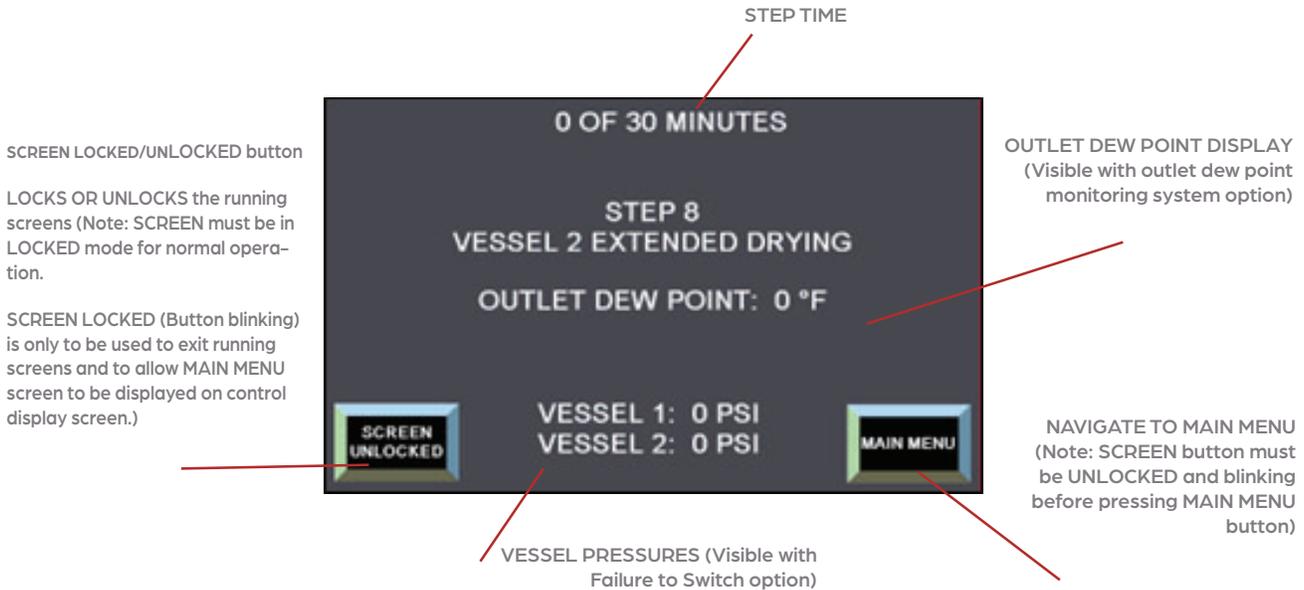
(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)

HEATLESS DESICCANT AIR DRYER



STEP 8 VESSEL 2 EXTENDED DRYING

RUNNING/OPERATING SCREEN



STEP 8:

(This step 8 screen is only visible if in energy management system is on and dew point is below the dew point demand set point)

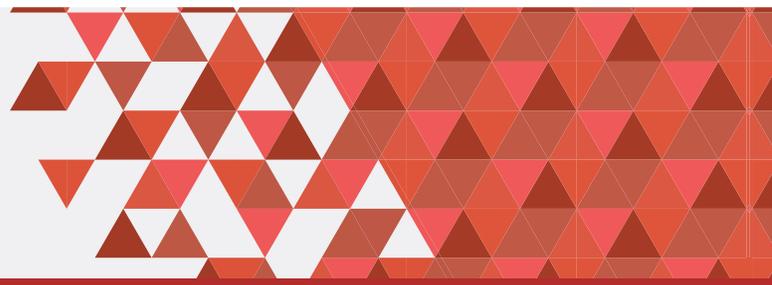
Vessel 1, is in standby and pressurized to line pressure... Vessel 2, is drying the inlet process air while the dew point sensor monitors the outlet air for a maximum of 30 minutes or until the dew point rises above the setting pre-set in the settings menu screen. Vessel 2 will continue drying the inlet air for an extended time period up to a maximum of 30 minutes. (Note: If valves are not in the correct open and closed positions, check the pilot solenoid valves, PLC outputs and the control air system).

The step screens/running screens allow the user to view each step of the process. To navigate from these screens to MAIN MENU screen, press the "SCREEN UNLOCKED" button, it will start blinking, then press the "MAIN MENU" button, the MAIN MENU screen will be displayed.

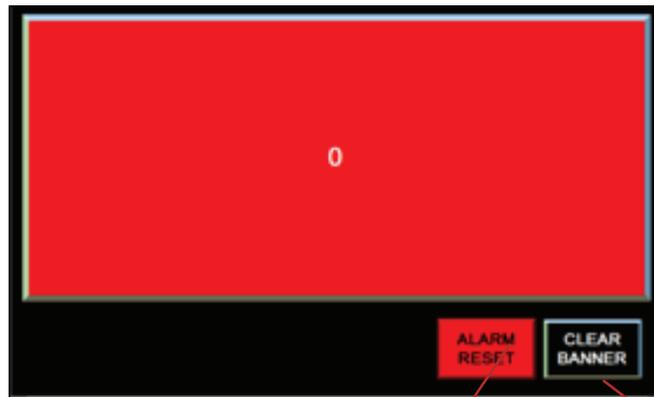
(CAUTION: if the running screens are left unlocked, the screen will not advance. For normal operation screen lock/unlocked button is to be in locked mode)



HEATLESS DESICCANT AIR DRYER



ALARM BANNER SCREEN



ALARM RESET BUTTON - RESETS
VISIBLE ACTIVE ALARM ON SCREEN
IF ALARM IS READY TO BE RESET

CLEAR BANNER BUTTON -
CLEARS ALARM BANNER ONLY.
RETURNS TO LAST SCREEN
VISIBLE

ALARM BANNER SCREEN:

The alarm banner screen is visible or pops-up when there is an active alarm. It is not recommended to reset the alarm until the issue has been resolved. This banner provides a quick visual full screen alarm indication. The alarm is captured in the Alarm Status Screen and logged in the Alarm log screen ... refer to the Alarm Status Screen after clearing alarm banner and after troubleshooting to make certain the alarm has been reset or can be manually reset. (Note: Common shutdown alarm red light will be ON when active... and OFF if no shutdown alarms are active... the system should be back in operation when the Common shutdown alarm red light is OFF)

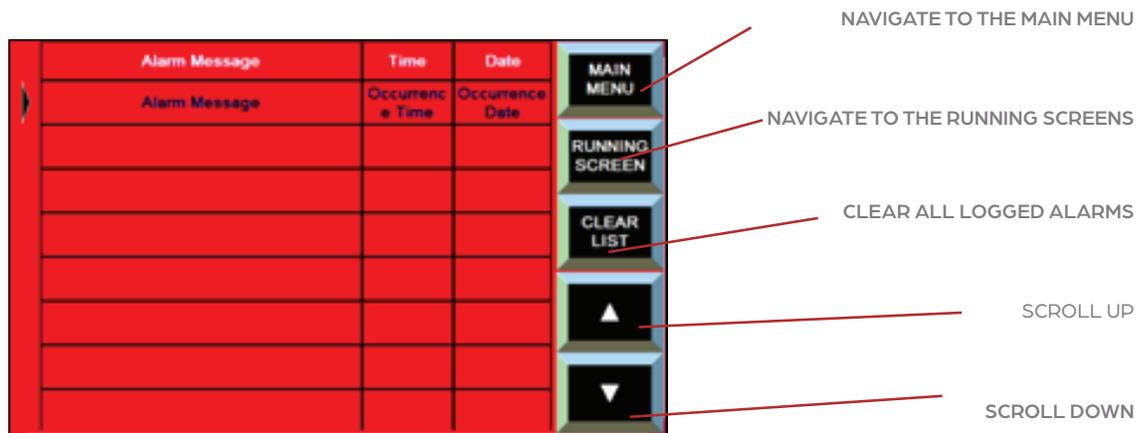
ALARM RESET BUTTON: RESETS THE ACTIVE ALARM (if the alarm condition has been corrected or able to be reset)

CLEAR BANNER BUTTON: CLEARS THE ALARM BANNER ONLY (will return to the last screen visible... other screens can be accessed after clear banner button is pushed... note: The alarm may still be active, and troubleshooting will be required).

HEATLESS DESICCANT AIR DRYER



ALARM LOG SCREEN



ALARM LOG SCREEN: The ALARM LOG SCREEN lists the alarm triggered, provides time and date at which the alarm occurred.

The alarm log will list 50 alarm occurrences, after the 50th alarm ... the first or no.1 alarm is pushed out to allow the new current alarm to be logged ... if another alarm is triggered, then alarm no.2 will be pushed out to make room ... This alarm logging process will be repeated.

MAIN MENU BUTTON: NAVIGATE BACK TO THE MAIN MENU

RUNNING SCREENS BUTTON: NAVIGATE TO THE MAIN OPERATION SCREEN

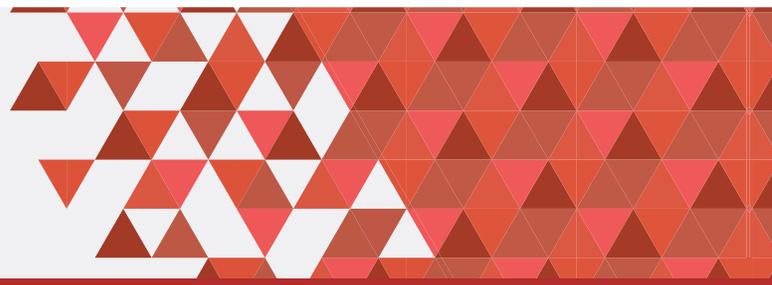
CLEAR LIST BUTTON: CLEARS ALL INACTIVE ALARMS (NOT RECOMMENDED WITHOUT APPROVAL FROM TRIDENT PNEUMATICS' SERVICE TECH)

▲ BUTTON: SCROLLS UP THE ALARM LOG

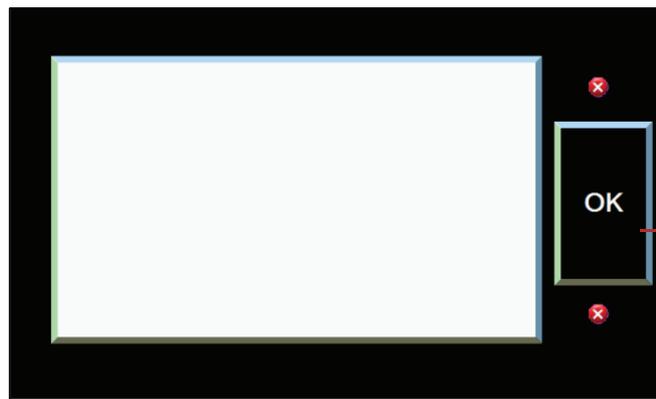
▼ BUTTON: SCROLLS DOWN THE ALARM LOG



HEATLESS DESICCANT AIR DRYER



DIAGNOSTICS SCREEN



OK BUTTON:
ACKNOWLEDGMENT OF ERROR

DIAGNOSTIC SCREEN: is visible if a communication or HMI error or failure occurs.

OK BUTTON: USED TO VERIFY THE ERROR HAS BEEN READ AND ACKNOWLEDGED (this screen is provided by the HMI to show communications errors, between the host and the HMI, and diagnostic failures of the HMI)

HEATLESS DESICCANT AIR DRYER

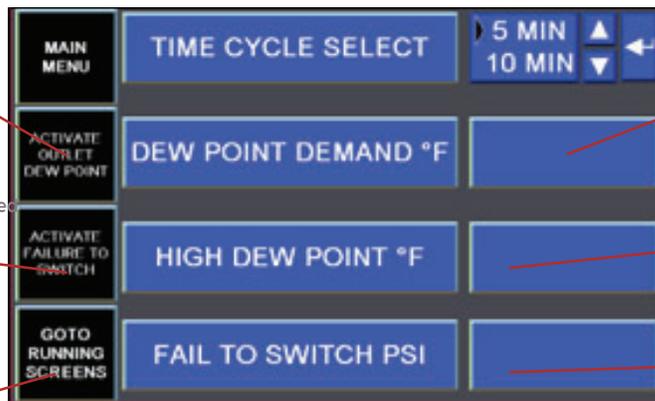


SETPOINT ENTRY MENU SCREEN

ACTIVATE OUTLET DEW POINT
(Note: only available
if the option was included
with system)

ACTIVATE FAILURE TO
SWITCH (Note: only
available if the option was included
with system)

NAVIGATE TO THE
RUNNING SCREEN



SET OUTLET DEW POINT
DEMAND SETPOINT (FOR EN-
ERGY MANAGEMENT CONTROL
SYSTEM)

SET HIGH HUMIDITY ALARM SET
POINT

SET FAILURE TO SWITCH
SETPOINT

SETPOINT ENTRY MENU SCREEN: The set point entry menu screen is where some system operating settings can be set and maintained.

The entry boxes to the right of the screen can be selected to make changes as needed. A pop-up number screen will appear when the box or button is pressed to make the desired set point entry change.

The initial factory settings are:

TIME CYCLE SELECT:	10 min
DEW POINT DEMAND:	-40°F
HIGH DEW POINT:	10°F
FAIL TO SWITCH:	60 psi

MAIN MENU BUTTON: NAVIGATE TO THE MAIN MENU SCREEN

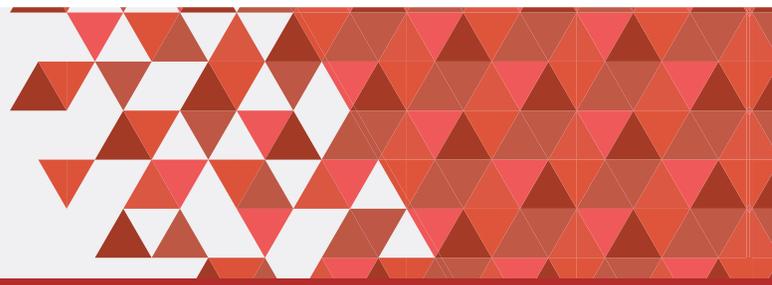
RUNNING SCREENS BUTTON: NAVIGATE TO THE MAIN OPERATION SCREEN

TIME CYCLE SELECT: To select between the 5 min cycle and the 10 min cycle, simply use the up or down arrow respectively then press the enter button to change the selection. The current selection will be highlighted in black and will change to the new selection if completed correctly.

DEW POINT DEMAND: SETTING is the air outlet pressure dew point temperature at which the energy management/dew point demand system will be controlled. (Note: the dew point demand slide switch button in the MAIN/CONTROL MENU screen would need to be in the ON position to enable the energy management control system ... if OFF, the dryer system will be in a fixed; continuous cycle mode).



HEATLESS DESICCANT AIR DRYER



The energy management system\demand cycle control is an energy saving control system to conserve energy and money. This dryer control system feature option monitors the outlet pressure dew point to allow extended drying time of the on-line drying vessel until the DEW POINT DEMAND set point of -40°F is reached, or goes above, such as -38°F outlet dew point, or a maximum drying time of 30 minutes has elapsed (failsafe max time) ... when the DEW POINT DEMAND set point or 30 minute maximum time has been reached the control system will advance to the next step and continue operation.

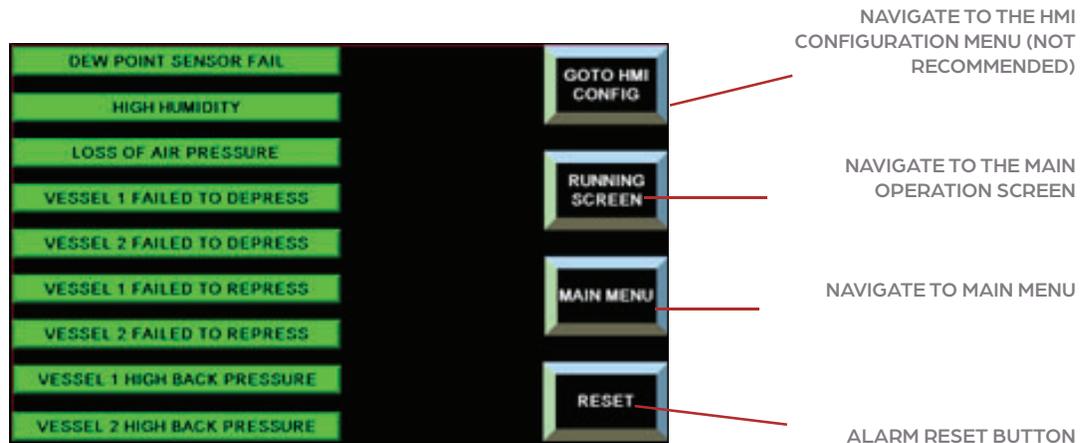
HIGH DEW POINT: SETTING is the air outlet pressure dew point temperature at which the high humidity or high outlet dew point alarm will be activated (Note: user may want to set this to a lower value if system can't tolerate the initial factory setting of 10°F outlet pressure dew point)
(Note: only available if the outlet dew point monitoring option was included with system)

FAIL TO SWITCH PSI: SETTING is the point at which the unit will fail if the pressure in each vessel does not reach the selected set point pressure. For example, if vessel 2 did not reach the factory setting of 50 PSI during Step-3 (Vessel 2 repress) within the allotted time (55 sec) then the FAIL TO SWITCH alarm would be Vessel 2 failed to re-pressurize.
(Note: only available if the Failure to Switch option was included with system)

HEATLESS DESICCANT AIR DRYER



ALARM STATUS SCREEN



ALARM STATUS screen: gives the user a quick view of alarms and conditions.

The green highlighted condition is an ok or not active condition or status.

The highlighted red condition is an active shut down alarm and requires quick attention... any shutdown alarm will energize the enclosure door red common shutdown alarm light, an alarm banner is also displayed on the display screen... the system and timing is halted.

(Note: the system will continue to dry the inlet air if the dryer inlet and outlet valves are ok and the purge valves adjacent to the drying vessel containing pressure are ok, but regeneration will be shut down or halted) When the common shutdown alarm red light is active, the customer common shutdown alarm 'dry contact' in the electrical enclosure will change state or de-energize for remote indication.

The highlighted yellow condition is an active non-shut down alarm and does not require quick attention... any non-shutdown alarm will not energize the enclosure door red common shutdown alarm light, an alarm banner is still displayed on the display screen... the system and timing continues normal operation.

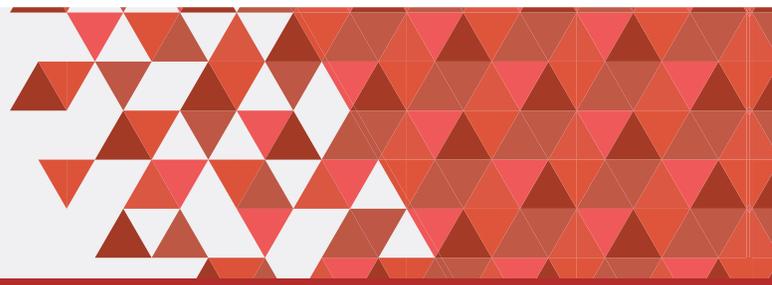
When the cautionary alarms are active, the customer dew point system alarm 'dry contact' in the electrical enclosure will change state or de-energize for remote indication.

The following is a list of each alarm with a description of possible causes and troubleshooting suggestions:

- DEW POINT SENSOR FAIL: (requires ES Option) alarm occurs when the dew point sensor drifts out of range. This alarm may be caused by the following (note: a cautionary non-shutdown alarm):
 - The sensor cable is unplugged or wire is broken
 - The sensor is out of calibration
 - A bad PLC input or analog card
 - A damaged dew point sensor



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- **HIGH HUMIDITY:** (requires ES option) alarm occurs when the dew point reading rises above the high humidity alarm point setting (factory set at -80°F ... can be adjusted as needed). Possible causes below (**note:** a cautionary non-shut down alarm):
 - The sensor is out of calibration.
 - A bad PLC input or analog card
 - A damaged dew point sensor
 - Poor regeneration
 - Desiccant media is contaminated and in need of replacement.
 - System not functioning properly. Check system operation
- **VESSEL 1 HIGH BACK PRESSURE:** Alarm occurs when vessel 1 pressure comes up above 8 PSI during regeneration. Possible causes are (**note:** a cautionary non-shutdown alarm – not visible if the failure to shift option is not installed):
 - Depressurization valve failure
 - Depressurization pilot solenoid valve failure
 - Dirty or restricted purge exhaust muffler/s
- **VESSEL 2 HIGH BACK PRESSURE:** Alarm occurs when vessel 2 pressure comes up above 8 PSI during regeneration. Possible causes are (**note:** a cautionary non-shutdown alarm – not visible if the failure to shift option is not installed):
 - Depressurization valve failure
 - Depressurization pilot solenoid valve failure
 - Dirty or restricted purge exhaust muffler/s
- **DEPRESS V1 FAILURE:** Alarm occurs when vessel 1 fails to depressurize within the allotted time. Possible causes are (**note:** a shutdown alarm – not visible if the failure to shift option is not installed):
 - Loss of air pressure on control air line
 - Depressurization valve failure
 - Depressurization pilot solenoid valve failure
 - Bad vessel pressure transducer
 - PLC input or output problem
 - Wiring issue
 - A main switching valve leaking high pressure air into the low pressure regenerating vessel.
- **DEPRESS V1 FAILURE:** Alarm occurs when vessel 1 does not reach the minimum operating pressure (set in the setting screen) within the allotted time. Possible causes are (**note:** a shutdown alarm – not visible if the failure to shift option is not installed):
 - Loss of air pressure on control air line
 - Depressurization valve failure
 - Depressurization pilot solenoid valve failure
 - Bad vessel pressure transducer
 - PLC input or output problem
 - Wiring issue
 - A main switching valve leaking high pressure air into the low pressure regenerating vessel.
- **DEPRESS V2 FAILURE:** alarm occurs when vessel 2 does not reach the minimum operating pressure (set in the setting screen) within the allotted time. Possible causes are (**note:** a shutdown alarm – not visible if the failure to shift option is not installed):
 - Loss of air pressure on control air line
 - Repressurization valve failure
 - Repressurization pilot solenoid valve failure
 - Bad vessel pressure transducer
 - PLC input or output problem
 - Wiring issue
 - A main switching valve leaking high pressure air into the ambient

HEATLESS DESICCANT AIR DRYER



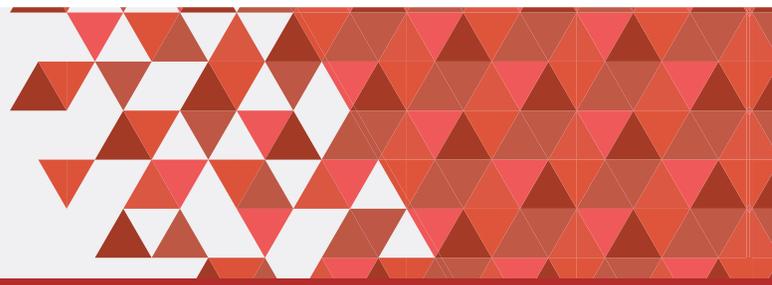
OPERATIONAL ACCUMULATED TIME SCREEN



OPERATIONAL ACCUMULATED TIME screen: give the user a quick view of the total time that the unit has been operational.



HEATLESS DESICCANT AIR DRYER



SAVINGS ACCUMULATED TIME SCREEN



SAVINGS ACCUMULATED TIME screen: gives the user a quick view of the total savings time of the unit. This is the total accumulated time of the unit achieved energy savings.

HEATLESS DESICCANT AIR DRYER



3.7 Setting Purge Pressure

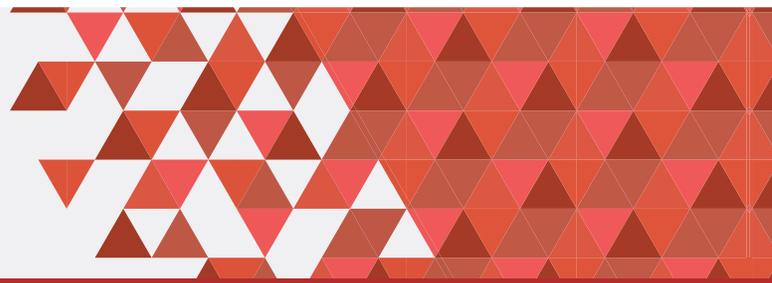
To set the purge pressure on the dryer, first locate the Purge Valve and gauge on the dryer. Typically, they are located between the towers. Review HEATLESS TECHNICAL SPECIFICATIONS (below) and find your model. Move across the row to the PURGE PSI column for what pressure to set the purge pressure at. While the dryer is pressurized and operating with the right tower drying and the left purging, adjust the PURGE VALVE till the PURGE GAUGE reads the pressure from the matrix.

HEATLESS TECHNICAL SPECIFICATIONS

DRYER (scfm)	Capacity	Purge (psi)	Purge (cfm)	Orifice (Color)	Orifice (Size)	Desiccant per tower (lbs)	In/Out Connection
70	70	59	11	GOLD	1/8"	35	3/4" NPT
100	100	53	15	TAN	5/32"	50	1" NPT
150	150	56	22	GREEN	3/16"	70	1" NPT
200	200	38	30	RED	1/4"	100	1 1/2" NPT
250	250	52	37	RED	1/4"	120	1 1/2" NPT
300	300	65	45	RED	1/4"	150	1 1/2" NPT
350	350	44	52	ORANGE	5/16"	175	2" NPT
450	450	60	75	ORANGE	5/16"	225	2" NPT
500	500	44	75	YELLOW	3/8"	250	2" NPT
600	600	55	90	YELLOW	3/8"	300	2" NPT
750	750	50	112	BROWN	7/16"	375	2" NPT
1000	1000	50	150	WHITE	1/2"	475	3" Flg



HEATLESS DESICCANT AIR DRYER



4.1 Trouble Shooting

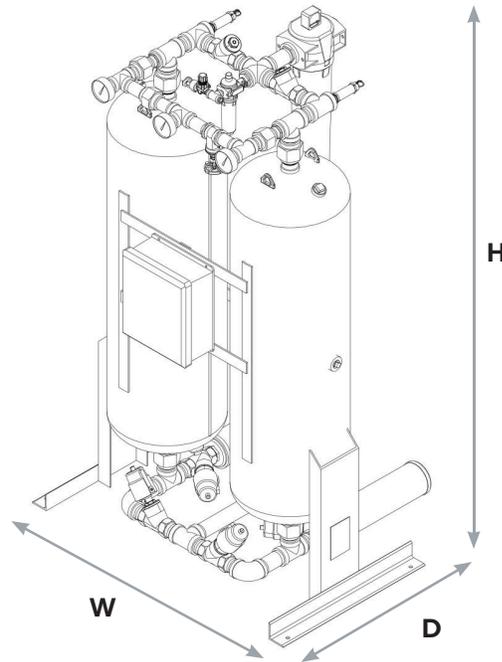
Problem	Cause	Solution
Poor dew point performance	Flow exceeds rated capacity	Reduce flow or consult factory if increased flow volume is needed
	Low inlet pressure	Increase inlet pressure. Reduce inlet flow – Page 18. Check and replace pre filter element if necessary
	Excessive water	Check upstream separator, pre filter and drain
	Insufficient purge flow	Check Heatless Technical Specifications table – Page 47
	Desiccant contamination	Replace desiccant and filter elements
	High inlet temperature, above 110°F	Check after cooler
Excessive pressure drop across dryer	Excessive inlet flow	Reduce flow or consult factory if increased flow volume is needed
	Low inlet pressure	Check pre filter and replace element if necessary
	Switching valve failure	Check for proper valve operation. If valve hangs up, check pilot air filter and replace element if necessary. Inspect valve, solenoid and actuator and replace if necessary
Switch-over failure	Electric power loss	Turn dryer off. Check power to unit. Check all connections to timer
	Switching valve failure	Check for proper valve operation. If valve hangs up, check pilot air filter and replace element if necessary. Inspect valve, solenoid and actuator and replace if necessary.
Pressurization failure	Purge flow control valve orifice clogged	Clean or replace
	Failure of check valve	Clean or replace
	Purge exhaust solenoid valve failure	Turn dryer off. Check connections to solid state time. Inspect valve and solenoid. Replace if necessary
Purge failure	Purge adjustment valve closed	Open and adjust as needed
	Purge adjustment valve orifice clogged	Clean or replace
	Failure of check valve	Clean or replace
	Purge exhaust solenoid valve failure	Turn dryer off. Check connections to digital timer. Inspect valve and solenoid. Replace if necessary
	Purge exhaust muffler clogged	Clean or replace
	Purge adjustment valve closed	Open and adjust as needed – Page 14
Excessive desiccant dust	Low inlet pressure	Increase inlet pressure
	Inadequate re-pressurization	Increase purge air pressure
Back-pressure build-up in tower being purged	Purge exhaust muffler clogged	Clean or replace
	Failure of check valve	Clean or replace
	Purge flow may be too high	Purge adjustment valve may need to be adjusted
	Vessel screen may be clogged	Check screen, clean or replace

HEATLESS DESICCANT AIR DRYER



4.2 Arrangement Drawings

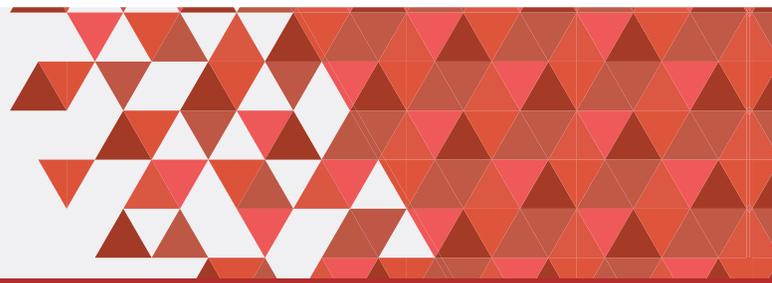
70 SCFM to 750 SCFM



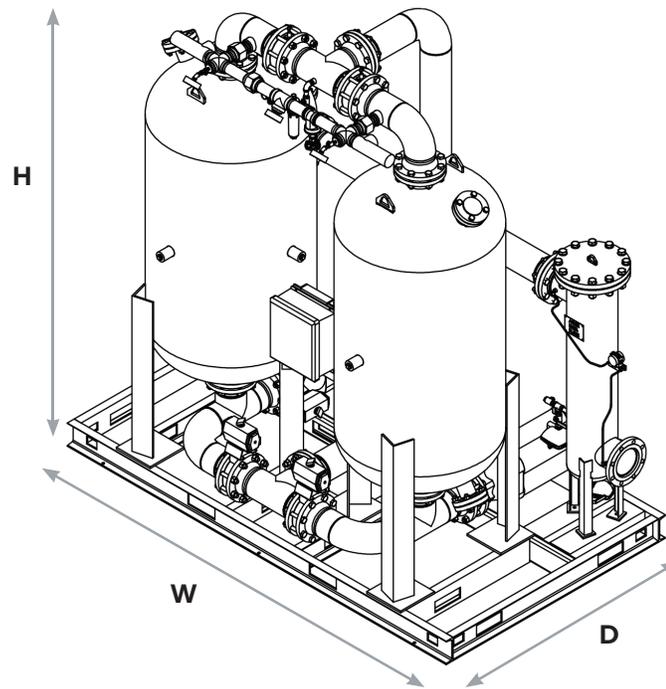
Dryer (scfm)	Dimensions					
	W		D		H	
	in	mm	in	mm	in	mm
70	30.5	775	22	559	71.5	1816
100	34	864	25.5	648	74	1880
150	34	864	25.5	648	74	1880
200	43.5	1105	32.75	832	83.5	2121
250	43.5	1105	32.75	832	83.5	2121
300	48	1219	35.5	902	84.5	2146
350	48.5	1232	42.5	1080	82.5	2096
450	48.75	1238	42.5	1080	82.5	2096
500	50.75	1289	42.5	1080	84.5	2146
600	50.75	1289	42.5	1080	86.5	2197
750	53	1346	42.5	1080	86.5	2197



HEATLESS DESICCANT AIR DRYER



1000 SCFM



Dryer (scfm)	Dimensions					
	W		D		H	
	in	mm	in	mm	in	mm
1000	66	1676	61	1549	103	2617

HEATLESS DESICCANT AIR DRYER



4.3 Electrical Drawings

70 SCFM to 750 SCFM

HEATELESS DESICCANT AIR DRYER ELECTRICAL SCHEMATICS

WIRING METHODS
 POWER 460V = BLACK THHN
 120VAC = RED 16AWG
 NEUTRAL = WHITE 16AWG
 24VDC = BLUE 18AWG
 24V COMMON = WHITE/BLUE 18AWG
 GROUND = GREEN

SCHEMATIC TYPICAL INDEX
 POWER DISTRIBUTION/BRANCH CIRCUITS
 PLC BASE UNIT INPUT/OUTPUTS
 PLC OUTPUT CARD
 PLC THERMOCOUPLE CARD
 TERMINAL LAYOUTS
 ENCLOSURE

MAX VOLTAGE _____ 115 _____

TOTAL MCA _____ 1.6 AMP _____

LARGEST MOTOR FLA _____ N/A _____

NUMBER OF PHASES _____ 1 _____

FREQUENCY _____ 60HZ _____

CUSTOMER SERIAL

NO. _____

UNDERWRITERS LAB SERIAL

NO. _____

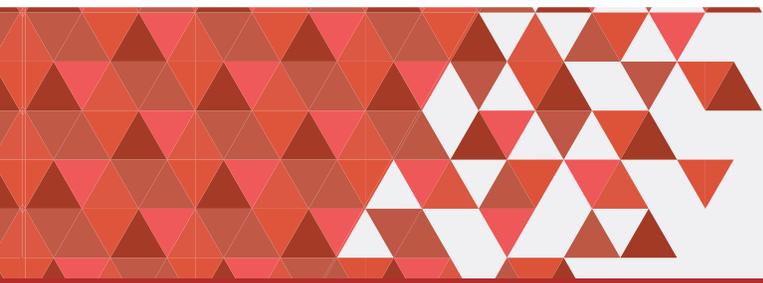


Test Wire Size Installed In Connector AWG or MCM (mm ²)		Tightening Torque, Pound-Inches (N.m)			
		Slotted Head No. 10 and Larger ¹		Hexagonal Head - External Drive Socket Wrench	
		Slot Width - 0.047 inch (1.2 mm) or Less and Slot Length 1/4 inch (6.4 mm) or Less	Slot Width - Over 0.047 inch (1.2 mm) or Slot Length - Over 1/4 inch (6.4 mm)	Spill-Bolt Connectors	Other Connectors
18-10 (082-5.3)	20 (2.3)	35 (4.0)	80 (9.0)	75 (8.5)	
8 (8.4)	25 (2.8)	40 (4.5)	80 (9.0)	75 (8.5)	
6-4 (13.3-21.2)	35 (4.0)	45 (5.1)	165 (18.6)	110 (12.4)	
3 (26.7)	35 (4.0)	50 (5.6)	275 (31.1)	150 (16.9)	
2 (33.6)	40 (4.5)	50 (5.6)	275 (31.1)	150 (16.9)	
1 (42.4)	-	50 (5.6)	275 (31.1)	150 (16.9)	
1/0-2/0 (53.5-67.4)	-	50 (5.6)	385 (43.5)	180 (20.3)	
3/0-4/0 (85.0-107.2)	-	50 (5.6)	500 (56.5)	250 (28.2)	
250-350 (127-177)	-	50 (5.6)	650 (73.4)	325 (36.7)	
400 (203)	-	50 (5.6)	825 (93.2)	325 (36.7)	
500 (253)	-	50 (5.6)	825 (93.2)	375 (42.4)	
600-750 (304-380)	-	50 (5.6)	1000 (113.0)	375 (42.4)	
800-1000 (406-508)	-	50 (5.6)	1000 (124.3)	500 (56.5)	
1250-2000 (635-1010)	-	-	1100 (124.3)	600 (67.8)	

TABLE 7.4:

¹ For values of slot width or length not corresponding to those specified, select the largest torque value associated with the

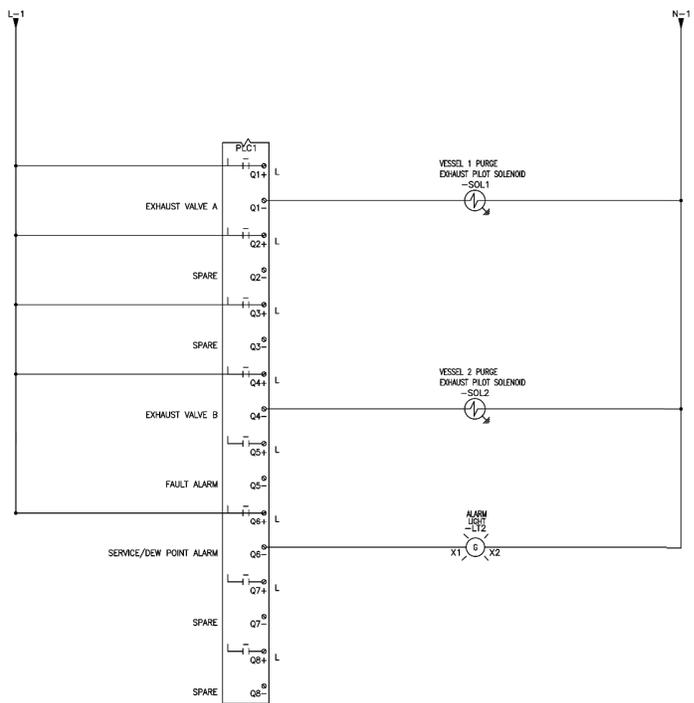
conductor size. Slot width is the nominal design value. Slot length is measured at the bottom of the slot.



HEATLESS DESICCANT AIR DRYER

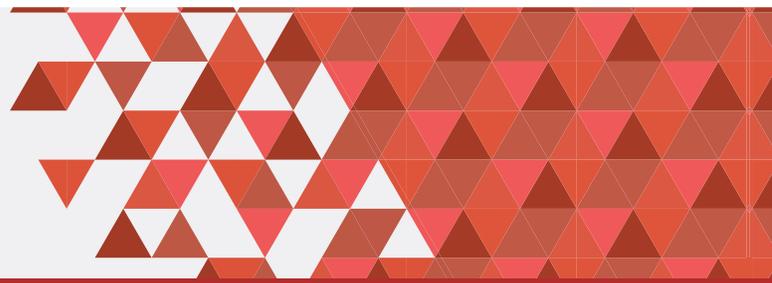


70 SCFM to 750 SCFM



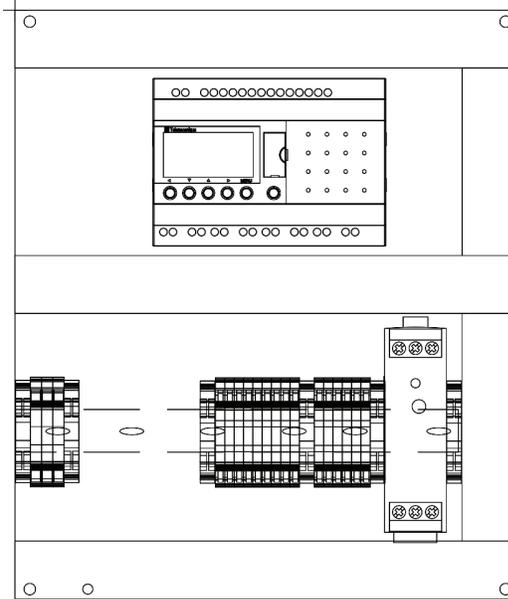


HEATLESS DESICCANT AIR DRYER



70 SCFM to 750 SCFM

Description for BOM	Item Number/Stock Number	Quantity per Dryer
CONTROLLER, ZELIO SMART RELAY	32192	1
POWER SUPPLY, 24 VDC, 15 WATTS	AG3948924	1
TERMINAL BLOCK, GRAY, J4	AG3253101	2
TERMINAL BLOCK GREEN/YELLOW, JG4	AG3253001	1
TERMINAL BLOCK GRAY, J3	AG3933345	13
TERMINAL BLOCK GREEN/YELLOW, JG3	AG3933346	2
END ANCHOR	AG3251901	4
BACK PLATE, FITS A14128PHC	AG3197201	1
PUSHBUTTON, SWITCH, MOMENTARY	AG3956013	1



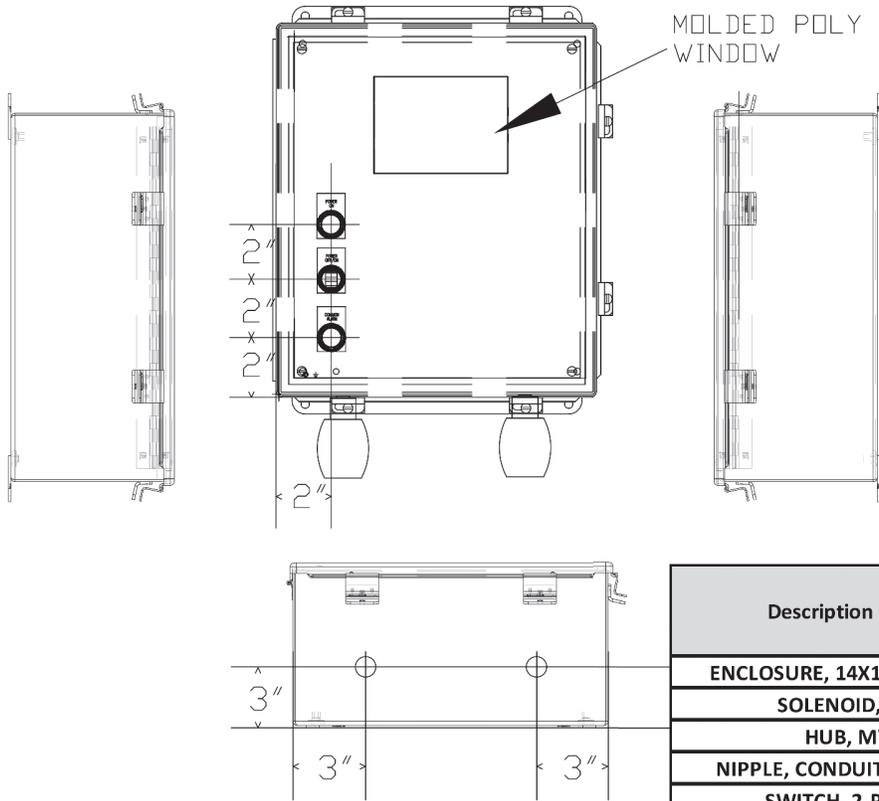
END ANCHOR
L1 - J4
L2 - J4
GND - J4
END ANCHOR

END ANCHOR
N
N
N
L
L
L
11
14
16
END ANCHOR
24V
24V
COM
COM
GND
GND
END ANCHOR
PWR SUPPLY
END ANCHOR

HEATLESS DESICCANT AIR DRYER



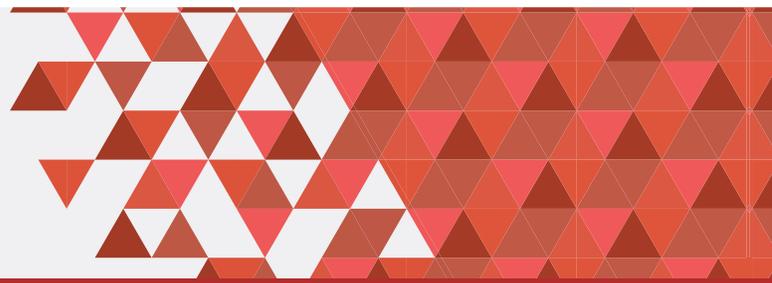
70 SCFM to 750 SCFM



Description for BOM	Item Number/Stock Number	Quantity per Dryer
ENCLOSURE, 14X12 W/WINDOW	AG3956012	1
SOLENOID, 3-WAY	AG3101501	2
HUB, MYERS	AG3288701	2
NIPPLE, CONDUIT, 1/2"x CLOSE	AG3342801	2
SWITCH, 2-POSITION	AG3956014	1
LIGHT, LED, GREEN, PILOT	AG3956015	1
LIGHT, LED, RED, PILOT	AG3956016	1



HEATLESS DESICCANT AIR DRYER

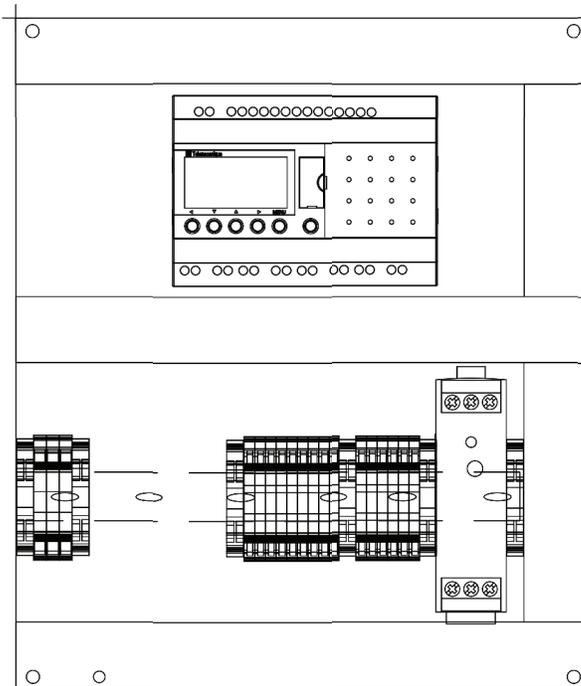


70 SCFM TO 750 SCFM

Description for BOM	Item Number/Stock Number	Quantity per Dryer
CONTROLLER, ZELIO SMART RELAY	32192	1
POWER SUPPLY, 24 VDC, 15 WATTS	AG3948924	1
TERMINAL BLOCK, GRAY, J4	AG3253101	2
TERMINAL BLOCK GREEN/YELLOW, JG4	AG3253001	1
TERMINAL BLOCK GRAY, J3	AG3933345	13
TERMINAL BLOCK GREEN/YELLOW, JG3	AG3933346	2
END ANCHOR	AG3251901	4
BACK PLATE, FITS A14128PHC	AG3197201	1
PUSHBUTTON, SWITCH, MOMENTARY	AG3956013	1

END ANCHOR
L1 - J4
L2 - J4
GND - J4
END ANCHOR

END ANCHOR
N
N
N
L
L
L
11
14
16
END ANCHOR
24V
24V
COM
COM
GND
GND
END ANCHOR
PWR SPPLY
END ANCHOR



HEATLESS DESICCANT AIR DRYER

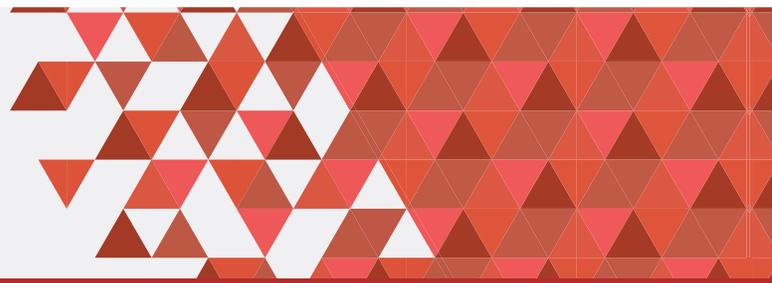


70 SCFM to 750 SCFM

Description for BOM	Item Number/Stock Number	Quantity per Dryer
ENCLOSURE, NO-WINDOW	AG3956012	1
CONTROLLER, ZELIO SMART RELAY	32192	1
POWER SUPPLY, 24 VDC, 15 WATTS	AG3948924	1
TERMINAL BLOCK, GRAY, J4	AG3253101	2
TERMINAL BLOCK GREEN/YELLOW, JG4	AG3253001	1
TERMINAL BLOCK GRAY, J3	AG3933345	13
TERMINAL BLOCK GREEN/YELLOW, JG3	AG3933346	2
SOLENOID, 3-WAY	AG3101501	2
HUB, MYERS	AG3288701	2
NIPPLE, CONDUIT, 1/2"x CLOSE	AG3342801	2
SWITCH, 2-POSITION	AG3956014	1
PUSHBUTTON, SWITCH, MOMENTARY	AG3956013	1
LIGHT, LED, GREEN, PILOT	AG3956015	1
LIGHT, LED, RED, PILOT	AG3956016	1
END ANCHOR	AG3251901	4
BACK PLATE, FITS A14128PHC	AG3197201	1
WIRE #18, BLUE	AG3480463	20
WIRE #18, RED	AG3480947	15
WIRE #18, WHITE	AG3480948	10
WIRE #18, WHITE/BLUE	AG3480991	15
WIRE #16, ORANGE	AG3373901	6
WIRE #16, GREEN	AG3372301	12



HEATLESS DESICCANT AIR DRYER



Optional up to 800 SCFM and standard for 1000 SCFM

HEATLESS DESICCANT AIR DRYER ELECTRICAL SCHEMATICS

WIRING METHODS
 POWER 460V = BLACK THHN
 120VAC = RED 16AWG
 NEUTRAL = WHITE 16AWG
 24VDC = BLUE 18AWG
 24V COMMON = WHITE/BLUE 18AWG
 GROUND = GREEN

SCHEMATIC TYPICAL INDEX
 POWER DISTRIBUTION/BRANCH CIRCUITS
 PLC BASE UNIT INPUT/OUTPUTS
 PLC OUTPUT CARD
 PLC THERMOCOUPLE CARD
 TERMINAL LAYOUTS
 ENCLOSURE

MAX VOLTAGE _____ 115 _____
 TOTAL MCA _____ 1.6 AMP _____
 LARGEST MOTOR FLA _____ N/A _____
 NUMBER OF PHASES _____ 1 _____
 FREQUENCY _____ 60HZ _____

CUSTOMER SERIAL NO. _____
 UNDERWRITERS LAB SERIAL NO. _____



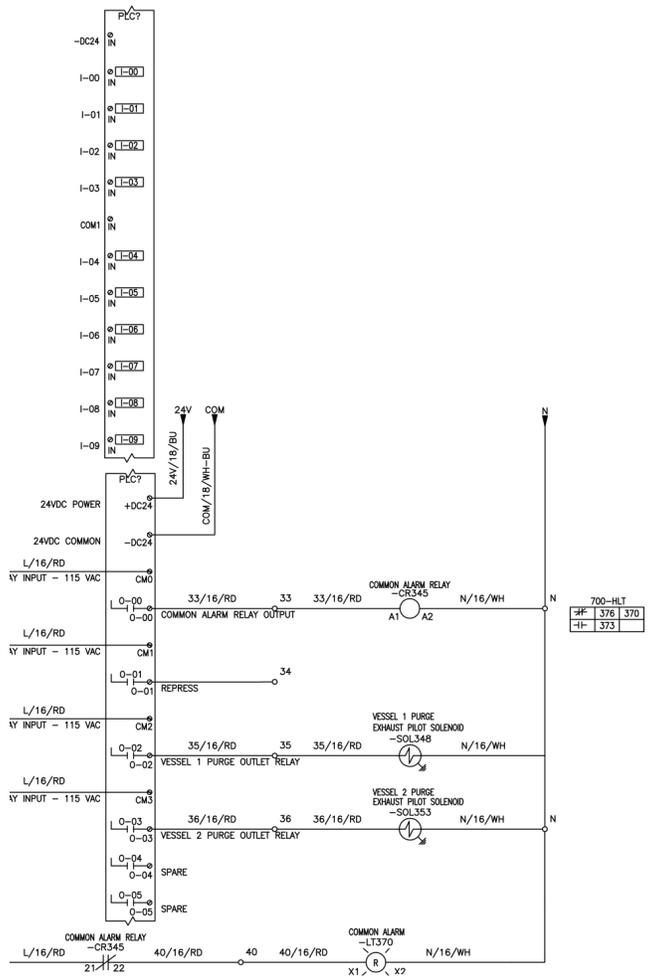
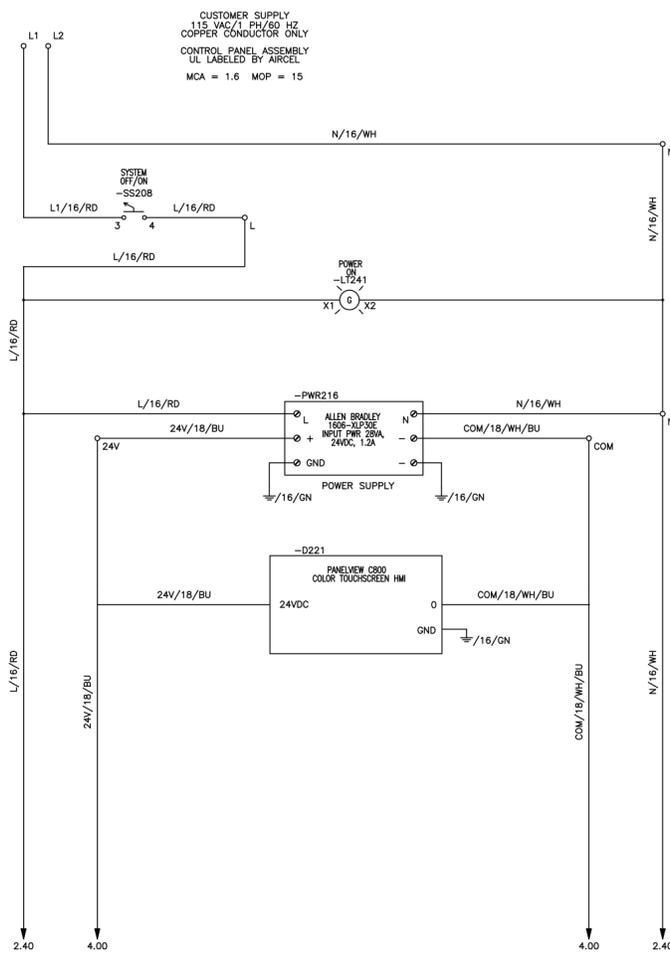
Test Wire Size Installed In Connector AWG or MCM (mm ²)	Tightening Torque, Pound-Inches (N.m)			
	Slotted Head No. 10 and Larger ¹		Hexagonal Head - External Drive Socket Wrench	
	Slot Width - 0.047 Inch (1.2 mm) or Less and Slot Length 1/4 Inch (6.4 mm) or Less	Slot Width - Over 0.047 Inch (1.2 mm) or Slot Length - Over 1/4 Inch (6.4 mm)	Split-Bolt Connectors	Other Connectors
18-10 (.082-5.3)	20 (2.3)	35 (4.0)	80 (9.0)	75 (8.5)
8 (8.4)	25 (2.8)	40 (4.5)	80 (9.0)	75 (8.5)
6-4 (13.3-21.2)	35 (4.0)	45 (5.1)	165 (18.6)	110 (12.4)
3 (26.7)	35 (4.0)	50 (5.6)	275 (31.1)	150 (16.9)
2 (33.6)	40 (4.5)	50 (5.6)	275 (31.1)	150 (16.9)
1 (42.4)	-	50 (5.6)	275 (31.1)	150 (16.9)
1/0-2/0 (53.5-67.4)	-	50 (5.6)	385 (43.5)	180 (20.3)
3/0-4/0 (65.0-107.2)	-	50 (5.6)	500 (56.5)	250 (28.2)
250-350 (127-177)	-	50 (5.6)	650 (73.4)	325 (36.7)
400 (203)	-	50 (5.6)	825 (93.2)	325 (36.7)
500 (253)	-	50 (5.6)	825 (93.2)	375 (42.4)
600-750 (304-380)	-	50 (5.6)	1000 (113.0)	375 (42.4)
800-1000 (406-508)	-	50 (5.6)	1000 (124.3)	500 (56.5)
1250-2000 (635-1010)	-	-	1100 (124.3)	600 (67.8)

TABLE 7.4:
¹ For values of slot width or length not corresponding to those specified, select the largest torque value associated with the conductor size. Slot width is the nominal design value. Slot length is measured at the bottom of the slot.

HEATLESS DESICCANT AIR DRYER

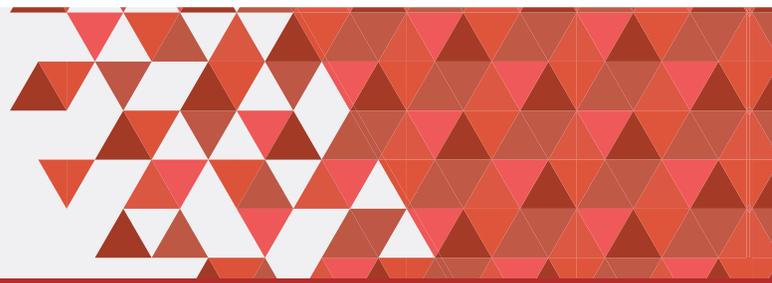


Optional up to 800 SCFM and standard for 1000 SCFM

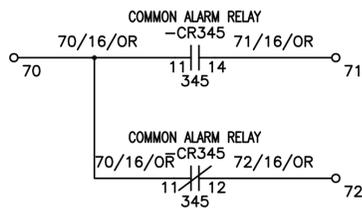
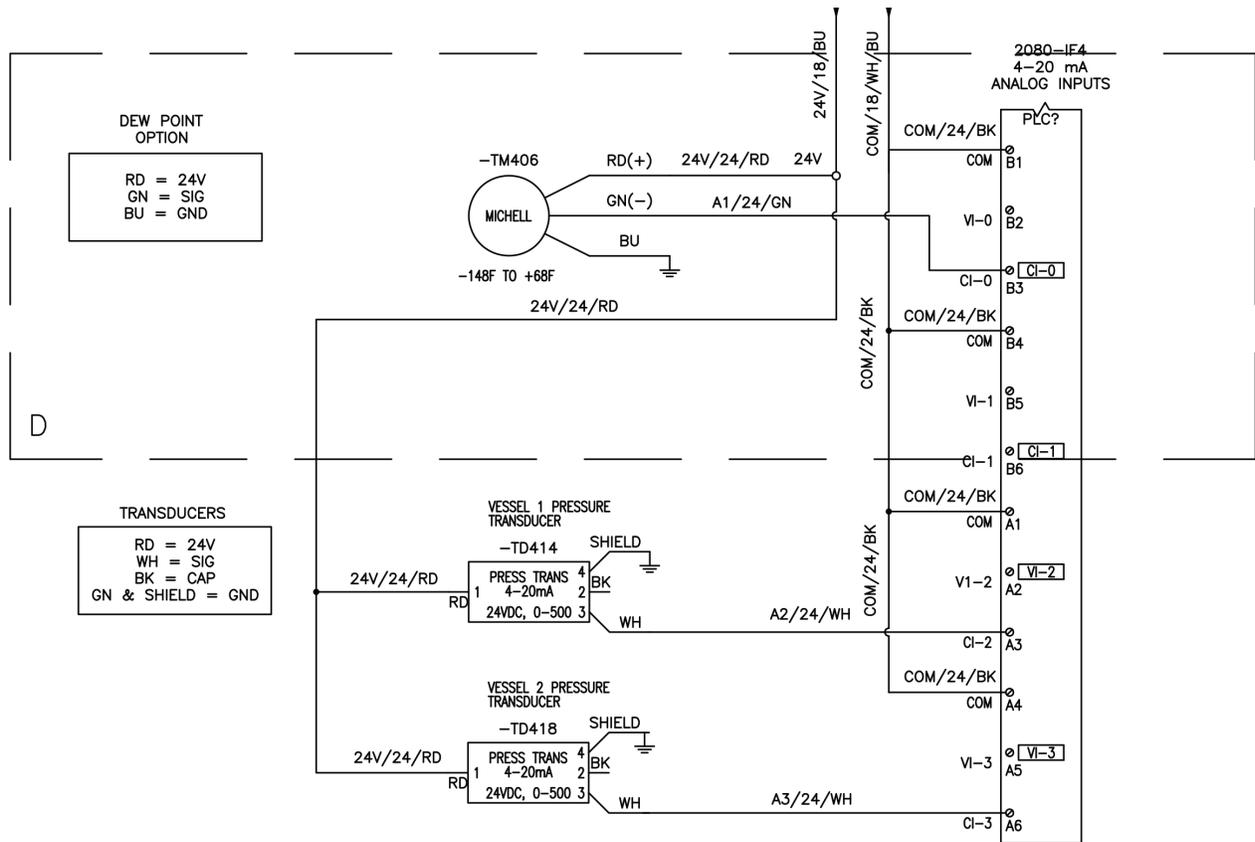




HEATLESS DESICCANT AIR DRYER



Optional up to 800 SCFM and standard for 1000 SCFM



HEATLESS DESICCANT AIR DRYER



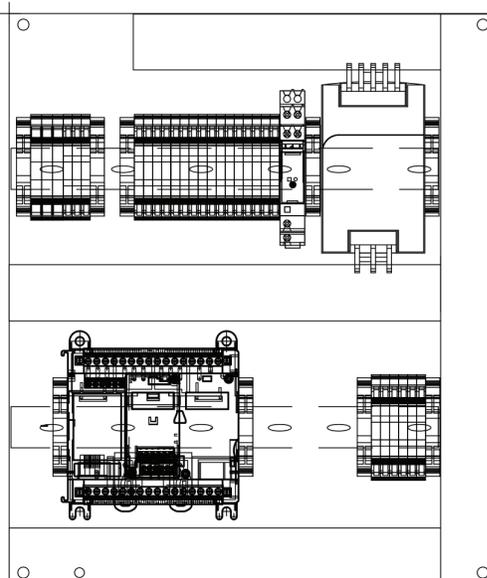
Optional up to 800 SCFM and standard for 1000 SCFM

Description for BOM	Line Number	Stock Number	QTY
PLC, MICRO-820	10	AG3942710	1
PLC, ANALOG CARD	20	AG3942710	1
RELAY, SCREW TYPE, DPDT	30	AG3948855	1
ANCHOR, SCREW END, GRAY	40	AG3251901	6
TERMINAL BLOCK, GRAY, J3	50	AG3933345	14
TERMINAL BLOCK, BLUE, J3	60	AG3933672	4
TERMINAL BLOCK, GREEN/YELLOW, J3	70	AG3933346	2
TERMINAL BLOCK, GRAY, J4	80	AG3253101	2
TERMINAL BLOCK, GREEN/YELLOW, J4	90	AG3253001	1
POWER SUPPLY, 24VDC	100	AG3934654	1
PANEL, BACKPLATE, FITS 14x12	110	AG3197201	1
COVER, WHITE DUCT, 1"	120	AG3480590	7.5

END ANCHOR
L1 - J4
L2 - J4
GND - J4
50
51
52
END ANCHOR

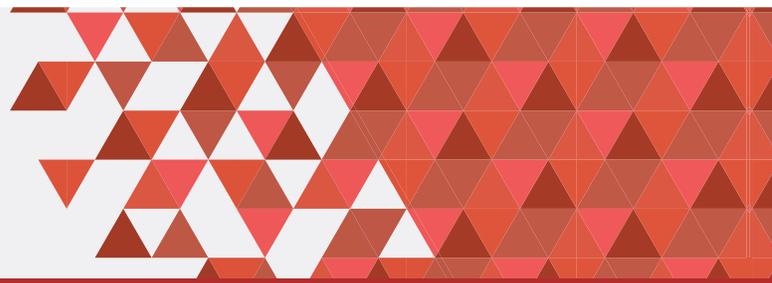
END ANCHOR
N
N
N
N
N
N
L
L
L
L
L
L
L
GND
GND
GND
GND
RELAY DPDT
END ANCHOR
24V PWR SPLY
END ANCHOR
END ANCHOR

END ANCHOR
24V
24V
24V
COM
COM
COM
END ANCHOR
5V PWR SPLY
END ANCHOR



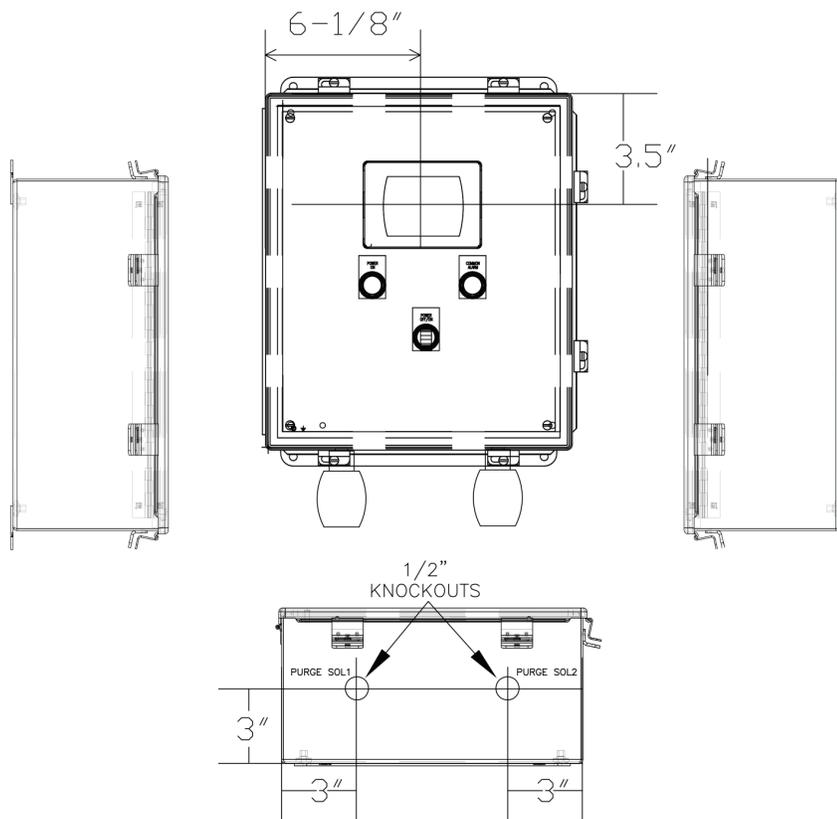


HEATLESS DESICCANT AIR DRYER



Optional up to 800 SCFM and standard for 1000 SCFM

Description for BOM	Line Number	Stock Number	QTY
ETHERNET PATCH CABLE, 5'	130	AG3935891	1
HMI, PANELVIEW C800 - 4"	140	AG3992107	1
LIGHT, LED, GREEN, PILOT	150	AG3956015	1
LIGHT, LED, RED, PILOT	160	AG3956016	1
SWITCH, 2-POSITION	170	AG3956014	1
ENCLOSURE, 14X12, POLYCARB	180	AG3956011	1
VALVE, SOLENOID, 3 WAY, NEMA 4, 1/4"	190	AG3101501	2
HUB, MYERS, 1/2"	200	AG3288701	2
NIPPLE, CONDUIT, 1/2" x CLOSE	210	AG3342801	2



HEATLESS DESICCANT AIR DRYER



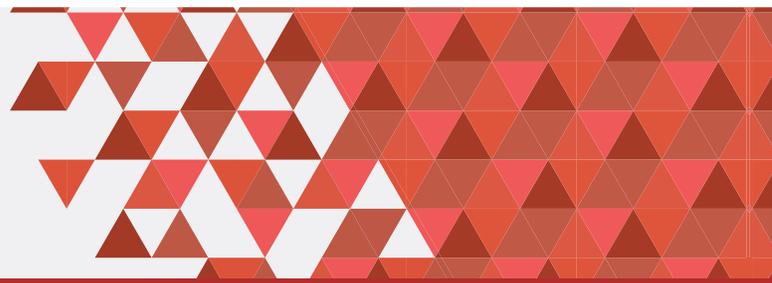
Optional up to 800 SCFM and standard for 1000 SCFM

Description for BOM	Stock Number	Quantity per Dryer
PLC, MICRO-820	AG3942710	1
ETHERNET PATCH CABLE, 5'	AG3935891	1
HMI, PANELVIEW C800 - 4"	AG3992107	1
RELAY, SCREW TYPE, SPDT	AG3948856	1
ANCHOR, SCREW END, GRAY	AG3251901	6
TERMINAL BLOCK, GRAY, J3	AG3933345	14
TERMINAL BLOCK, BLUE, J3	AG3933672	4
TERMINAL BLOCK, GREEN/YELLOW, J3	AG3933346	2
TERMINAL BLOCK, GRAY, J4	AG3253101	2
TERMINAL BLOCK, GREEN/YELLOW, J4	AG3253001	1
POWER SUPPLY, 24VDC	AG3934654	1
PANEL, BACKPLATE, FITS 14x12	AG3197201	1
COVER, WHITE DUCT, 1"	AG3480590	7.5
DUCT, WHITE, NARROW, SLOT, 1"x 3"	AG3480591	7.5

Description for BOM	Stock Number	Quantity per Dryer
PLC, ANALOG CARD	AG3942716	1
LIGHT, LED, GREEN, PILOT	AG3956015	1
LIGHT, LED, RED, PILOT	AG3956016	1
SWITCH, 2-POSITION	AG3956014	1
ENCLOSURE, 14X12, POLYCARB	AG3956011	1
VALVE, SOLENOID, 3 WAY, NEMA 4, 1/4"	AG3101501	2
HUB, MYERS, 1/2"	AG3288701	2
NIPPLE, CONDUIT, 1/2" x CLOSE	AG3342801	2
WIRE #18, BLUE	AG3480463	80
WIRE #18, RED	AG3480947	98
WIRE #18, WHITE	AG3480948	17
WIRE #18, WHITE/BLUE	AG3480991	9.5
WIRE #16, ORANGE	AG3373901	6
WIRE #16, GREEN	AG3372301	12
TRANSDUCER, 0-500 PSI	AG3936238	2

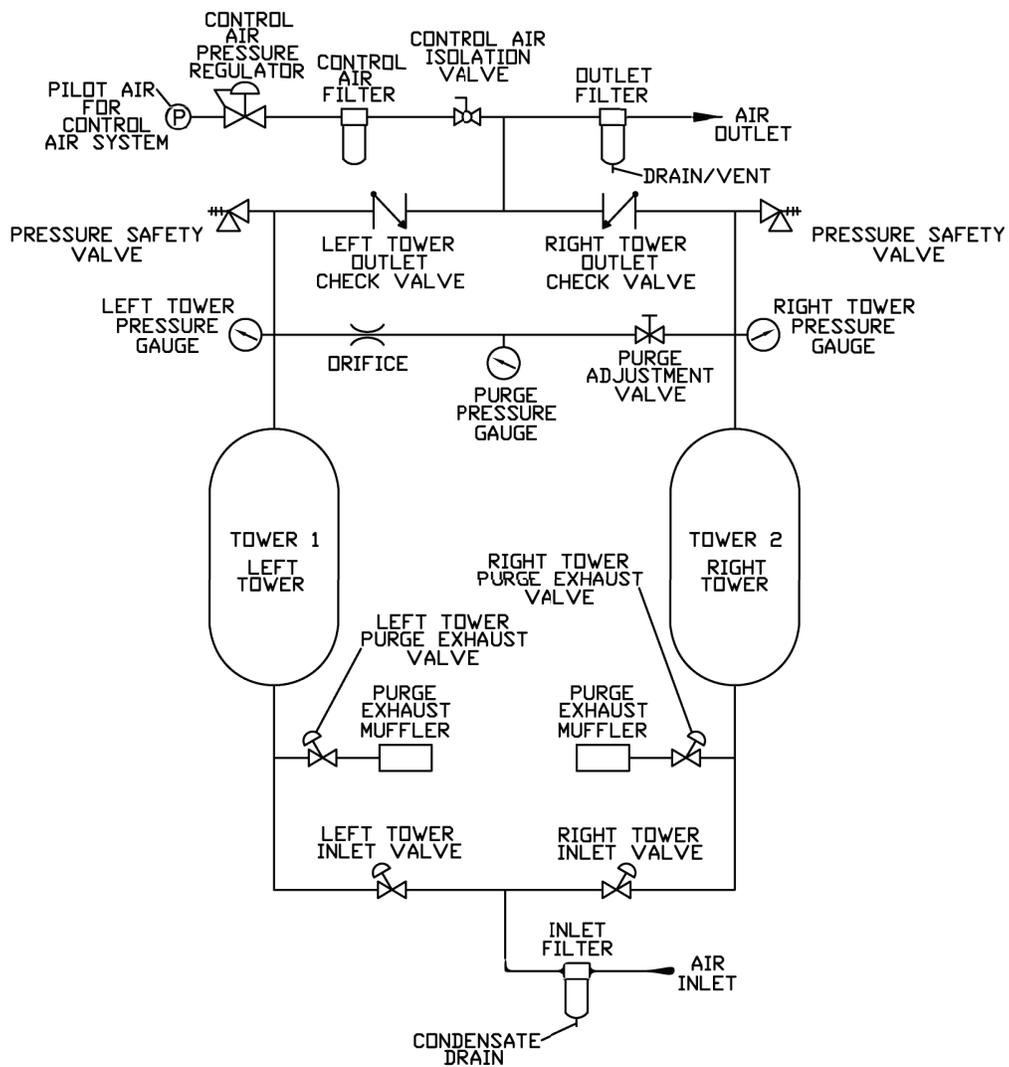


HEATLESS DESICCANT AIR DRYER



4.4 P & ID Drawings

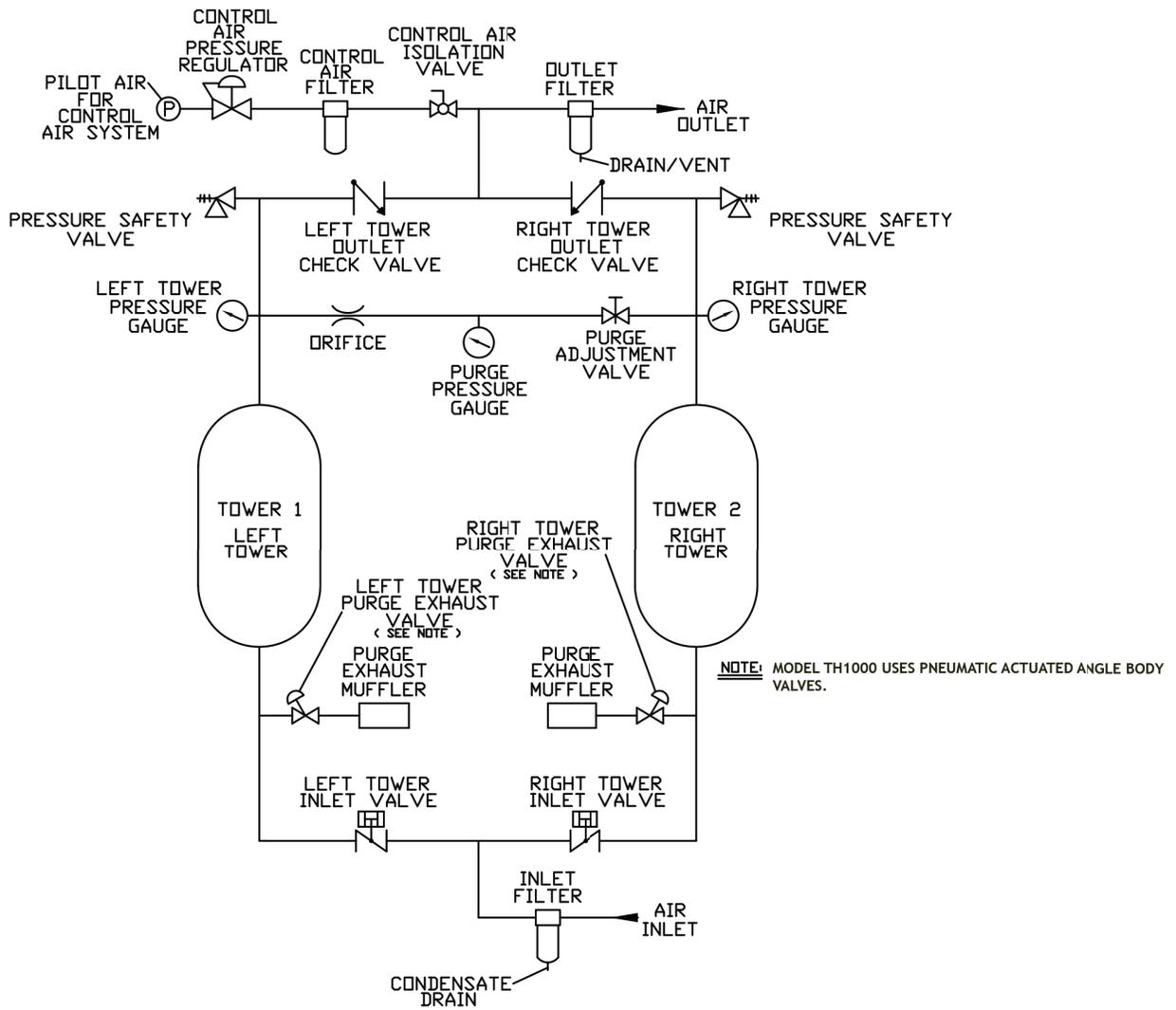
70 SCFM to 750 SCFM



HEATLESS DESICCANT AIR DRYER

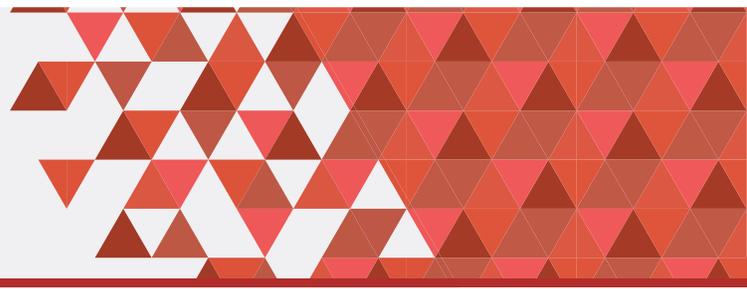


1000 SCFM





HEATLESS DESICCANT AIR DRYER



4.5 Appendixes

Reference	Dryer Flow	Power Supply	Power Input	Inlet & Outlet ⁽¹⁾	Max Working Pressure	Dimensions			Approx. Weight ⁽²⁾
Part No.	scfm	60 Hz only	kW	NPT(F)/Flg	(psi)	W (in)	D (in)	H (in)	lbs
8102 4055 00	70	115V /1 Ph/60 Hz	0.138	3/4"	180	30.5	22	71.5	275
8102 4065 00	100	115V /1 Ph/60 Hz	0.138	1"	180	34	25.5	74	300
8102 4075 00	150	115V /1 Ph/60 Hz	0.138	1"	180	34	25.5	74	415
8102 4085 00	200	115V /1 Ph/60 Hz	0.138	1 1/2"	180	43.5	32.75	83.5	540
8102 4095 00	250	115V /1 Ph/60 Hz	0.138	1 1/2"	180	43.5	32.75	83.5	590
8102 4105 00	300	115V /1 Ph/60 Hz	0.138	1 1/2"	180	48	35.5	84.5	600
8102 4115 00	350	115V /1 Ph/60 Hz	0.138	2"	180	48.5	42.5	82.5	735
8102 4125 00	450	115V /1 Ph/60 Hz	0.138	2"	180	48.75	42.5	82.5	1000
8102 4135 00	500	115V /1 Ph/60 Hz	0.138	2"	180	50.75	42.5	84.5	1100
8102 4145 00	600	115V /1 Ph/60 Hz	0.138	2"	180	50.75	42.5	86.5	1300
8102 4155 00	750	115V /1 Ph/60 Hz	0.138	2"	180	53	42.5	86.5	1500
8102 4165 00	1000	115V /1 Ph/60 Hz	0.138	3"	180	66	61	103	2600

(1) 3" and below are NPT(F) threaded. 4" and above are flanged. All units with 3" piping and above will be ANSI welded pipe.

(2) approx. weight for all models does not include desiccant installed.

(3) safety relief valve pressure is 200 psi for dryer flows 70 scfm to 1000 scfm.

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