User Guide

HLA heatless desiccant air dryer

revision: 004 document: 117-110-8009

www.n-psi.com

Experience.

Our team is comprised of and supported by individuals spanning all disciplines from research & development, engineering & manufacturing, marketing & sales and service & support. Our backgrounds are in air and gas purification and our experience in this field spans a wide range of industries. We combine this knowledge and experience to ensure our products and services are designed and provided to meet the objectives and expectations of you - our Customer.

Customer.

We recognize that our Customers are not only our valuable distribution partners who sell and support our products or the machine builders who depend on them as protection for their equipment. They are the contractors who install them, the manufacturers who use them in their processes and the service people who maintain them. At nano we have developed our products, packaging and support materials to ensure they exceed all of our Customers' expectations.

Service.

At nano we recognize that world-class customer service is the most important component to any successful business. Your business needs to exceed your customers' expectations to stand out from your competitors and our service must positively impact your business so you can be successful in doing so. Our commitment is simple… we will stand behind our products and ensure that our customer service is unrivaled in the industry.

Experience. Customer. Service.

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heatless desiccant air dryer

1.1 general information

range: D^5 heatless desiccant air dryers

models: HLA 100 - HLA 3000

doc no: 17-110-8009

issue: 004

1.2 manufacturers details and support

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internet: www.airtak.com
e-mail: airtak@airtak.com

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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.

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ISO 9001
UKAS MANAGEMENT SYSTEMS
001

MEMBER OF CAGI
Compressed Air & Gas Institute

1.3 document introduction

This manual is meant for anyone who uses or works on the HLA heatless desiccant air dryer, mainly the operators. The HLA 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 **nano-purification solutions**, 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 **nano-purification solutions** is strictly prohibited. This document may have errors and is likely to be modified with respect to technical features.

1.4 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.

1.5 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.

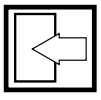
Danger hazard: It's absolutely forbidden to use water to extinguish fire on the dryer or in the surrounding area.

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.

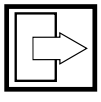
Danger hazard: Machine level noise could be higher than 85 dBA. It is mandatory to install the machine in dedicated area where people are not normally present. The installer and/or the user is responsible for correct installation of the dryer, in order to prevent noise propagation to the near work environment. 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 personnel [1].



Compressed air inlet connection point.



Compressed air outlet connection point.

Condensate drain connection point.

Operations which can be worked out by the operator of the machine, if qualified [1].

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.

1.6 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 **nano-purification solutions**.

nano-purification solutions 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 **nano-purification solutions** 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.

1.7 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 per sonnel and/or damages to the machine could occur.

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.

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.

nano-purification solutions 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 "nano-purification solutions", will be considered as an inappropriate operation, thereby damaging safety functions, and will lead to the cancellation of the warranty.

Essential safety rules

WARNING

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.

DANGER

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.

WARNING

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.

CAUTION

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.

1.8 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.

1.9 storage

Keep away from:

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

1.10 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 **nano-purification solutions** 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 **nano-purification solutions** 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 effect 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.

1.11 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.

1.12 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.

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. Remote alarm can be fed from a set of dry contacts at output 5 on the smart relay. The contacts will close if there is an alarm condition from the relay.

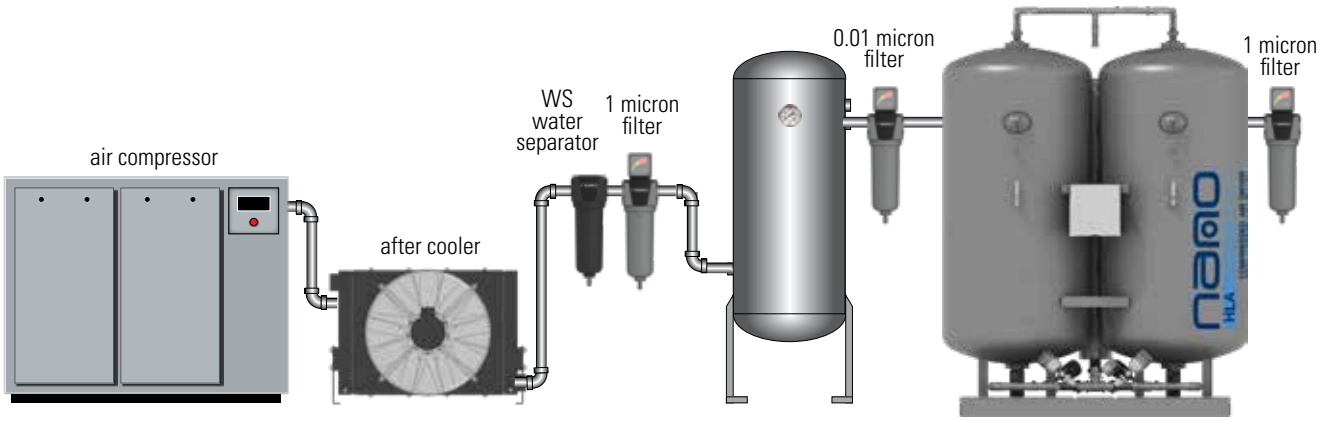
5. Connect inlet air piping to dryer inlet (bottom of dryer) and outlet air piping to dryer outlet (top of dryer).

Check all connections on the unit for tightness.

6. Connect 115/60/1 electric power to 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!

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 is supplied with 0.01 micron filter on the inlet and a 1 micron filter on the outlet. 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.

2.3 dryer specifications

specifications	standard	optional
maximum particle size (ISO class) (*)	class 2 (1 micron)	class 1 (0.01 micron)
maximum water content (ISO class) (*)	class 2 (-40°F pdp)	class 1 (-94°F pdp)
min/design/max operating pressure range	70 psig / 100 psig / 150 psig	-
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

*per ISO 8573.1:2010

2.4 correction factors

correction factor for inlet pressure									
psig	60	70	80	90	100	110	130	140	150
barg	4	5	6	6	7	8	9	10	10
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
°C	21	27	32	38	41	43	46	49
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

AIR FLOW CAPACITY = **NOMINAL CAPACITY OF THE DRYER** x **F1 FACTOR** x **F2 FACTOR**

Example: A HLA 250 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 (7.6 barg) From table for pressure correction F1=1.04
Air Inlet temperature: 105°F (40°C) From table for temperature correction F2=0.93

AIR FLOW CAPACITY = **250 scfm** x **F1 1.04** x **F2 0.93**

Air Flow Capacity= 241.8 scfm
This is the maximum air flow rate that the dryer can accept under those operating conditions.

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 24).**

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.

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 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. 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 contaminates 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 clean the muffler often during initial operation. Desiccant dust is especially heavy after shipment and tower filling. Allow the dryer to cycle several times without the muffler. 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 25).**

10. Ensure that each tower re-pressurizes to at least 90% of line pressure before switch over.

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 25)**.

REPLACING DESICCANT

When replacing desiccant be sure to use **Approved Activated Alumina**. The 1/8" diameter is used on most models. Smaller diameters of desiccant or other brands are not recommended. (For molecular sieve use: 1/3 activated alumina, 1/3 molecular sieve, 1/3 activated alumina) **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 without the purge muffler. Remember to wear hearing protection during this procedure.

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 25)**.

IMPORTANT: HLA heatless desiccant air dyers 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

model	desiccant per column (lbs)	desiccant total (lbs)
HLA 100	50	100
HLA 150	75	150
HLA 200	100	200
HLA 250	125	250
HLA 350	175	350
HLA 500	250	500
HLA 650	325	650
HLA 800	400	800
HLA 1000	500	1000
HLA 1250	625	1250
HLA 1500	750	1500
HLA 2000	1000	2000
HLA 2500	1250	2500
HLA 3000	1500	3000

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 entitled Operating the Three-Valve Bypass for instructions on bringing the dryer on-line.

3.1 operating sequence for HLA 100 through HLA 3000

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

PURGE: 4:15 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 24)** 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 4:15 min. regenerating the desiccant bed in the right tower.
5. After the 4:15 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 4:15 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.

OPTIONAL EQUIPMENT

OPERATING THE ES ENERGY SAVER CONTROLLER

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.)

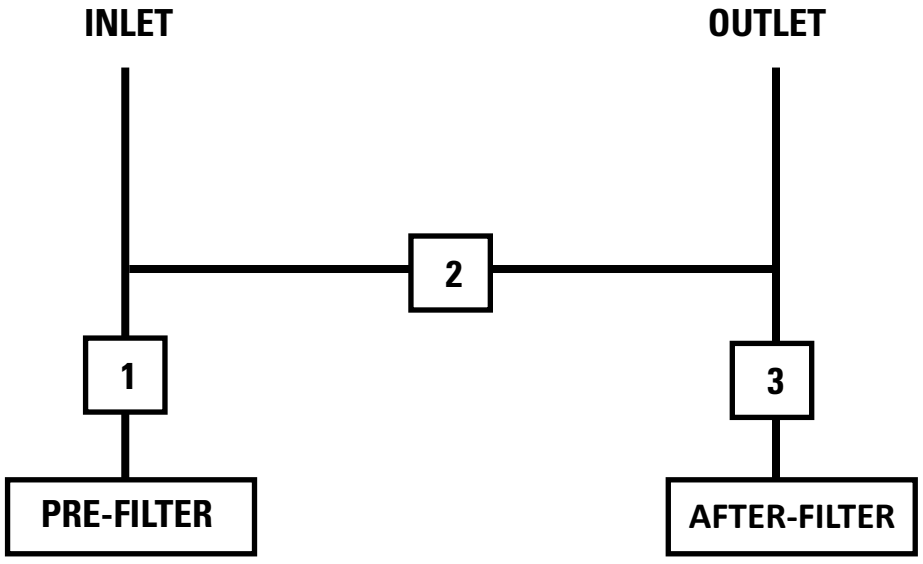
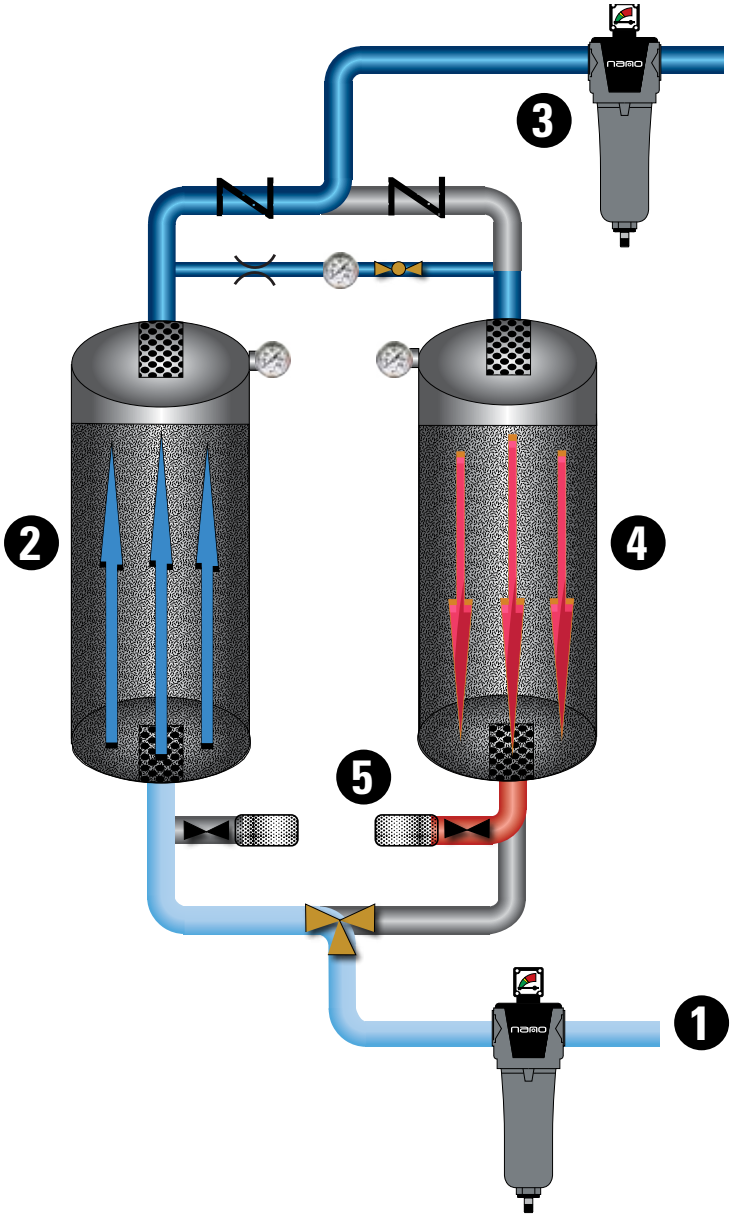


Figure 1.0 - Typical HLA F2-3V Three-Valve Bypass

heatless desiccant air dryer

OPERATING PRINCIPLE

The HLA heatless desiccant air dryers consists of two tanks filled with Activated Alumina. At any given time, one tower will be drying the compressed air while the other tower is regenerating the saturated desiccant be (Activated Alumina). A small portion of the dry air (termed Purge Air) is used for the regeneration of the saturated desiccant. The condensate that is stripped from the desiccant bed is purged into the atmosphere through the purge exhaust valve and the purge exhaust mufflers.



1. Wet, contaminated air passes through coalescing pre-filter to remove particulate and liquid down to 0.01 micron.
2. Air passes through desiccant bed where moisture vapor is adsorbed.
3. Dry air passes through after-filter which retains any dust particles.
4. Simultaneously, a small amount of dry "purge air" is counter-flowed down through opposite tower removing moisture and regenerating the desiccant bed.
5. "Purge air" is vented to atmosphere.

"Purge air" is approximately 15%.

3.3 ES ENERGY SAVER operation (optional)

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 falls below the set point point, the controller will switch the towers with no interruption in 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.

heatless desiccant air dryer

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

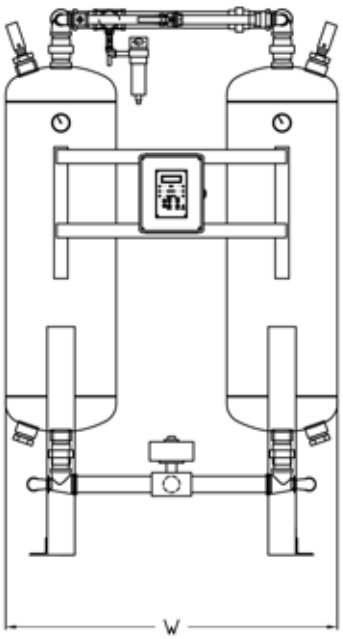
model	capacity	purge (psi)	purge (cfm)	orifice (color)	orifice (size)	desiccant per tower (lbs)	in/out connection
HLA 100	100	37	15	green	3/16"	50	1" NPT
HLA 150	150	55	22.5	green	3/16"	75	1" NPT
HLA 200	200	40	30	red	1/4"	100	1 ½" NPT
HLA 250	250	29	37.5	orange	5/16"	125	1 ½" NPT
HLA 350	350	45	52.5	orange	5/16"	175	1 ½" NPT
HLA 500	500	46	75	yellow	3/8"	250	2" NPT
HLA 650	650	43	97.5	brown	7/16"	325	2" NPT
HLA 800	800	56	120	brown	7/16"	400	2 ½" NPT
HLA 1000	1000	53	150	white	1/2"	500	3" Flg
HLA 1250	1250	39	188	black	5/8"	625	3" Flg
HLA 1500	1500	51	225	black	5/8"	750	3" Flg
HLA 2000	2000	51	300	blue	3/4"	1000	4" Flg
HLA 2500	2500	59	375	blue	3/4"	1250	4" Flg
HLA 3000	3000	63	450	blue	3/4"	1500	6" Flg

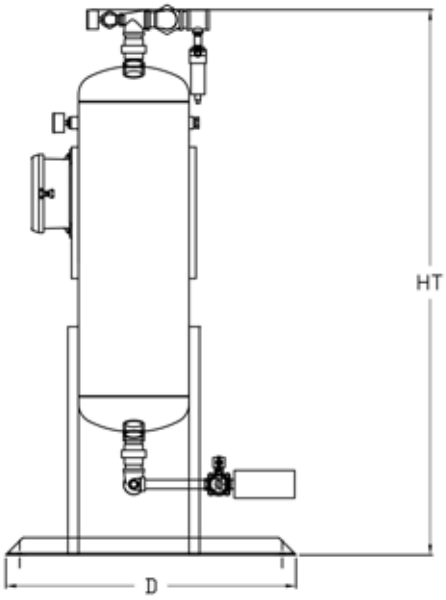
4.1 trouble shooting

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	Adjust purge control valve to appropriate setting shown in the **Heatless Technical Specifications** table - Page 24. 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 24
	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 adjusting 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
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

4.2 arrangement drawings

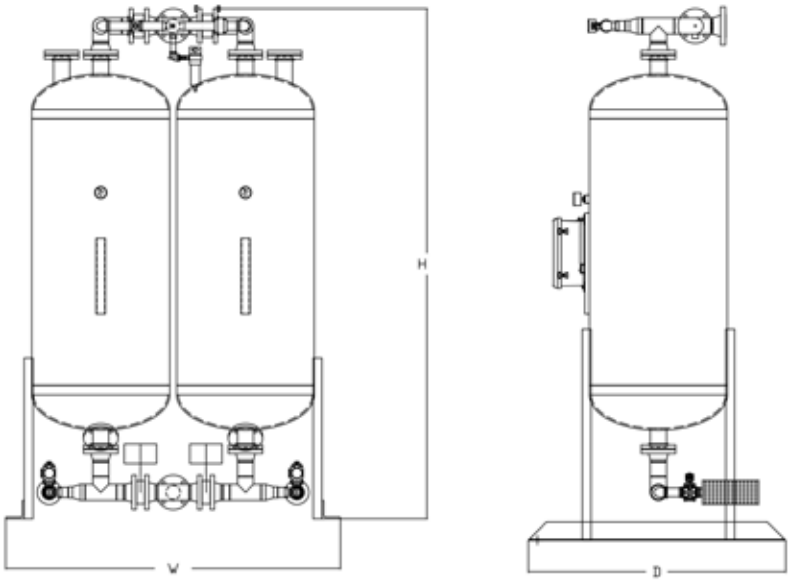
HLA 100 to HLA 800





model	dimensions					
	W		D		H	
	in	mm	in	mm	in	mm
HLA 100	37.25	946.15	29.75	755.65	86.50	2197.10
HLA 150	39.25	996.95	29.75	755.65	86.50	2197.10
HLA 200	41.75	1060.45	31.25	793.75	86.75	2203.45
HLA 250	42.75	1085.85	31.50	800.10	83.75	2127.25
HLA 350	45.75	1162.05	31.50	800.10	84.25	2139.95
HLA 500	47.75	1212.85	38.00	965.20	85.00	2159.00
HLA 650	49.75	1263.65	39.50	1003.30	85.00	2159.00
HLA 800	51.75	1314.45	39.50	1003.30	88.50	2247.90

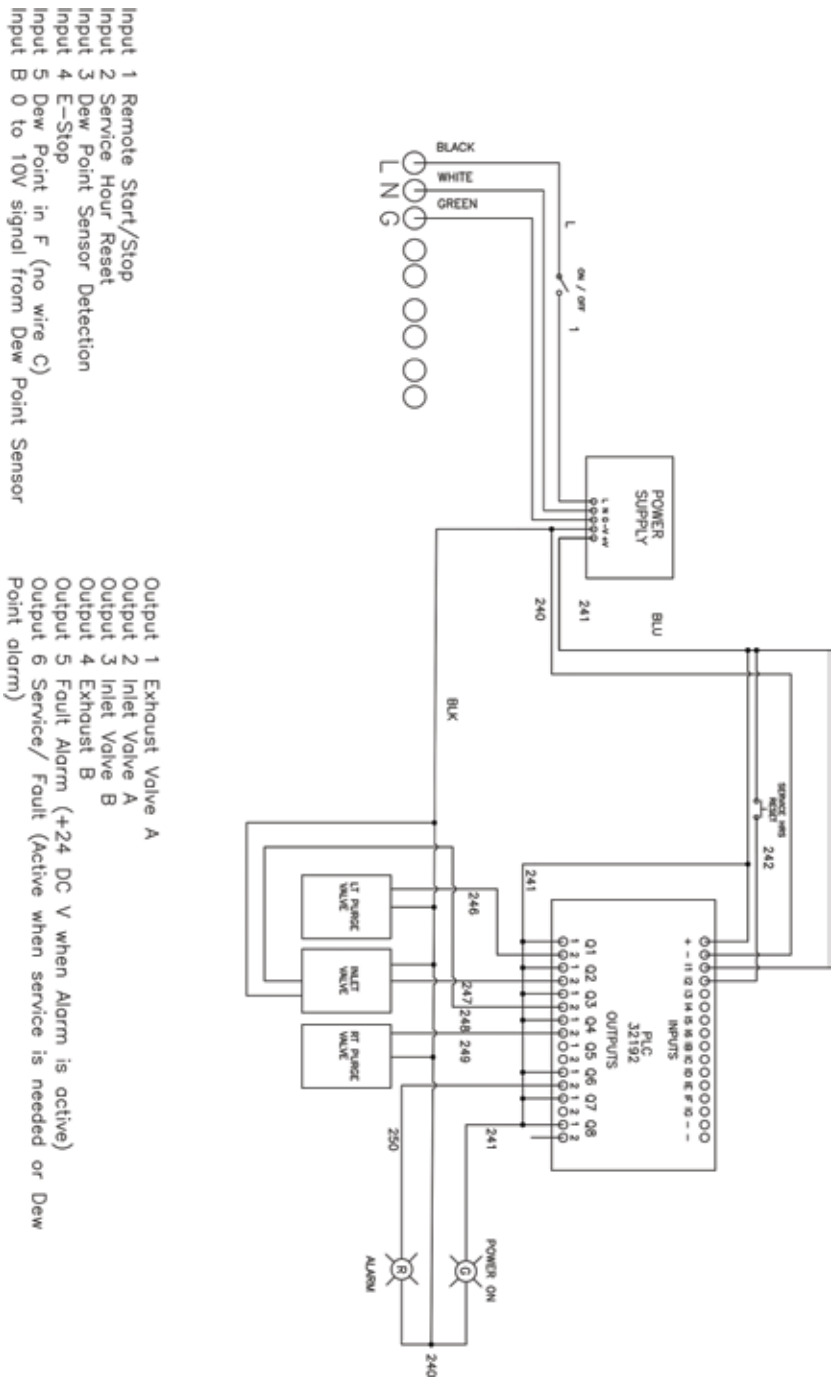
HLA 1000 to HLA 8000



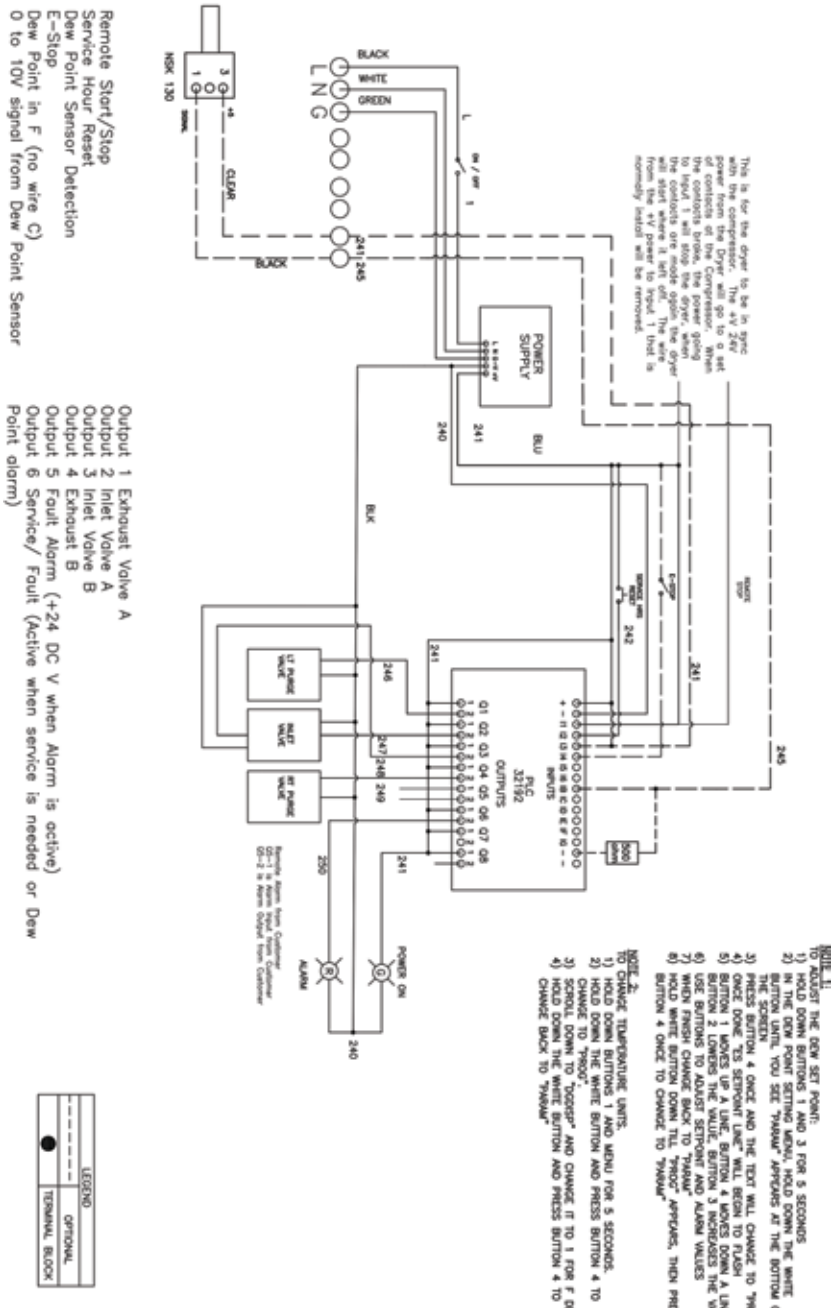
model	dimensions					
	W		D		H	
	in	mm	in	mm	in	mm
HLA 1000	63.00	1600.20	46.50	1181.10	87.50	2222.50
HLA 1250	63.00	1600.20	50.25	1276.35	103.75	2635.25
HLA 1500	72.80	1849.12	56.00	1422.40	97.00	2463.80
HLA 2000	72.80	1849.12	56.00	1422.40	111.10	2821.94
HLA 2500	99.00	2514.60	57.50	1460.50	115.50	2933.70
HLA 3000	99.00	2514.60	57.50	1460.50	125.00	3175.00

4.3 electrical drawings

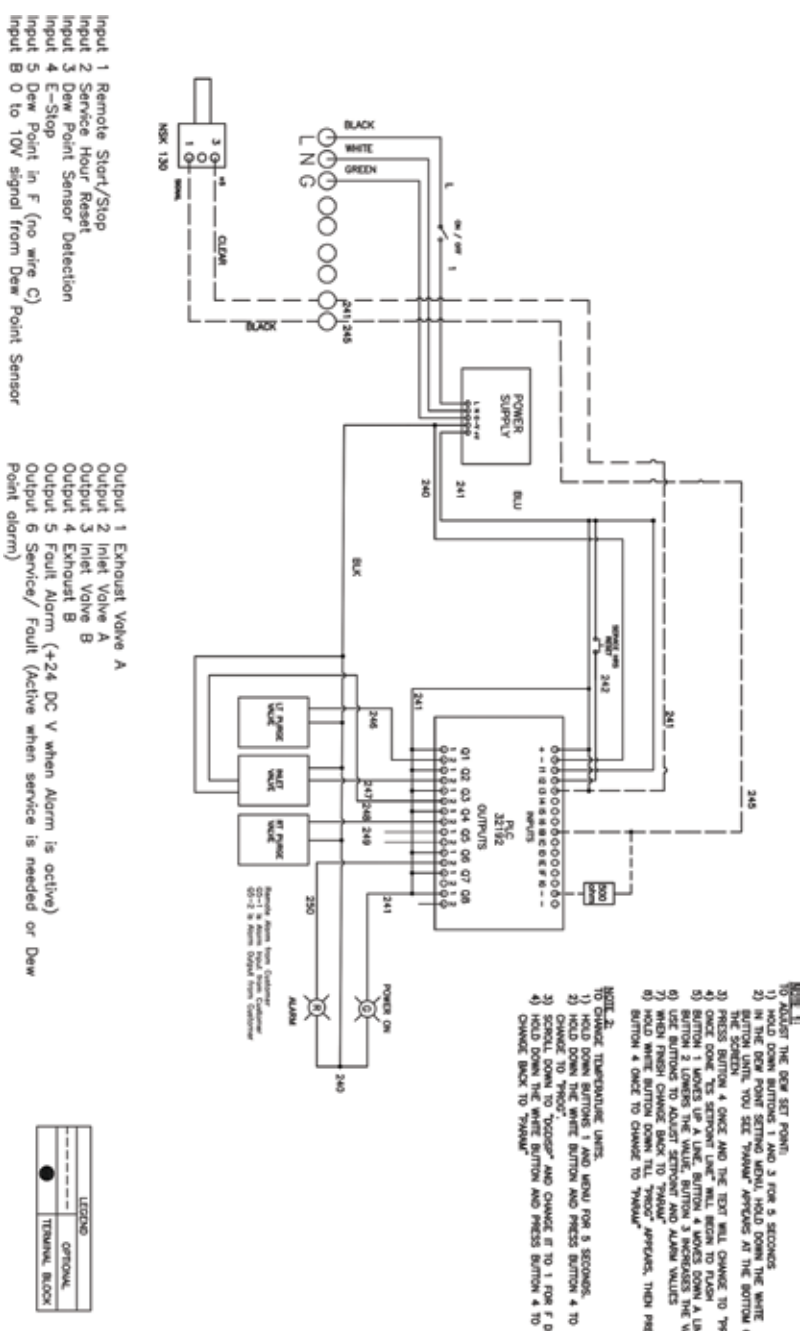
HLA 100 to HLA 3000 BASIC (3-VALVE)



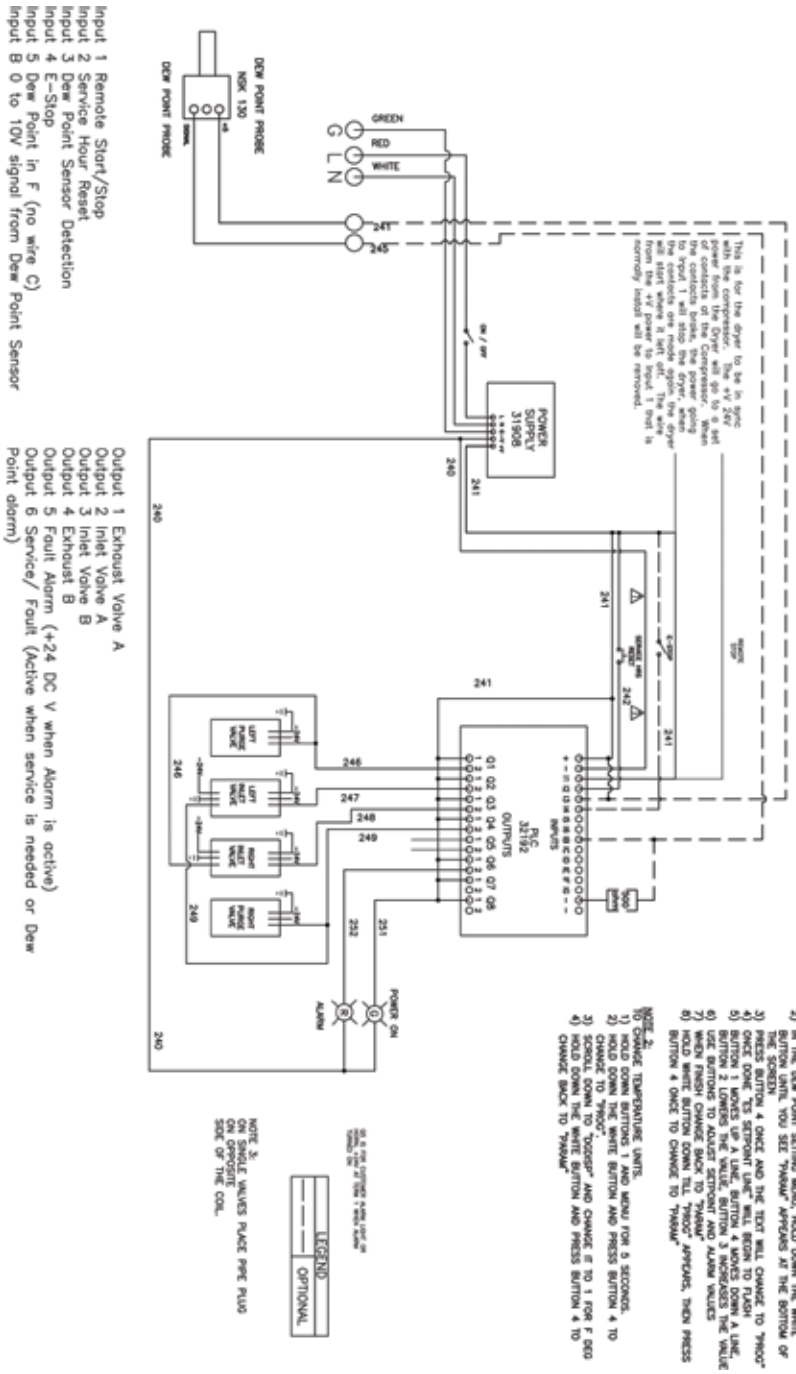
HLA 100 to HLA 3000 ALL OPTIONS (3-VALVE)



HLA 100 to HLA 3000 ES ENERGY SAVER (3-VALVE)

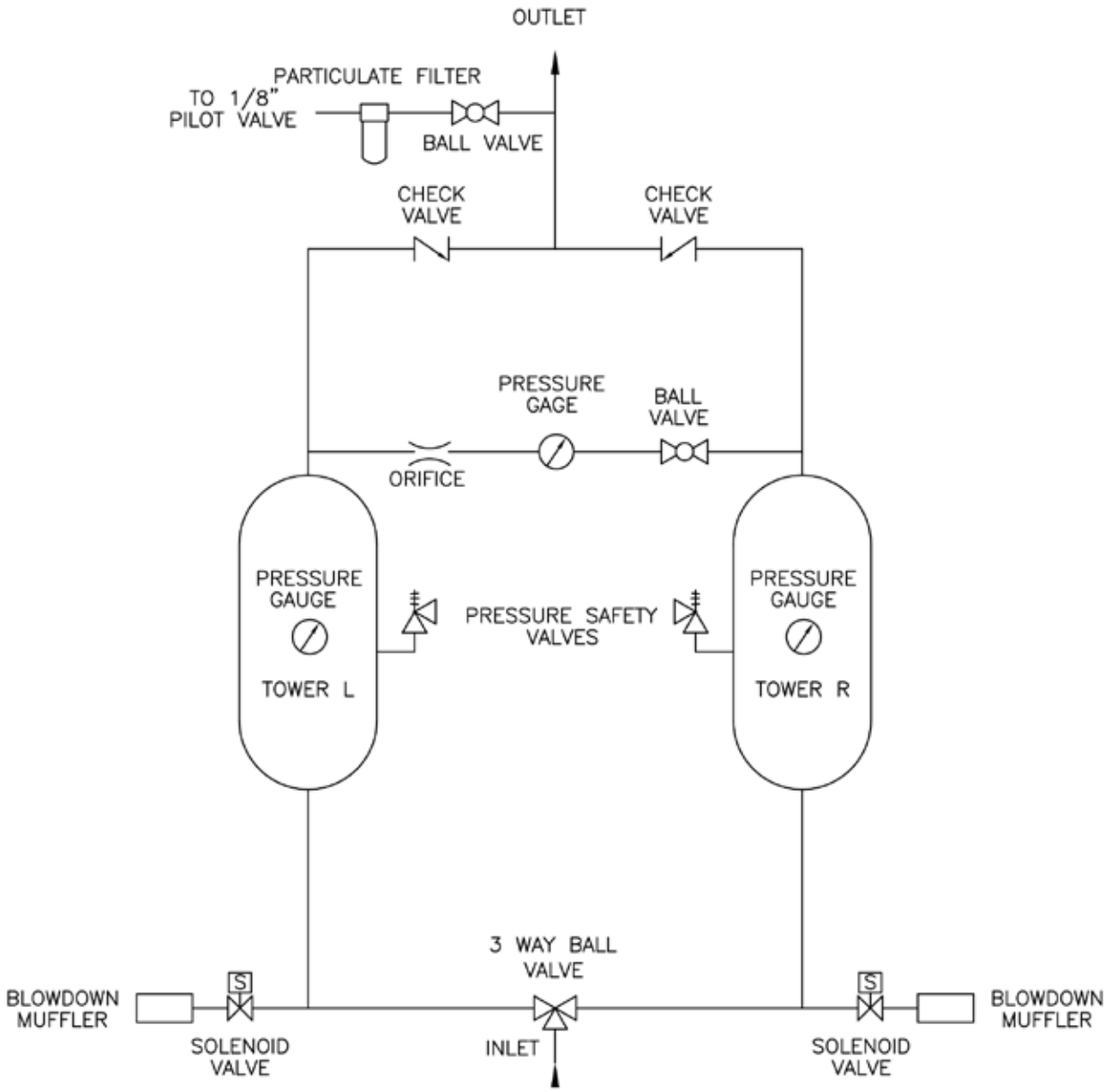


HLA 100 to HLA 3000 ALL OPTIONS (4-VALVE)

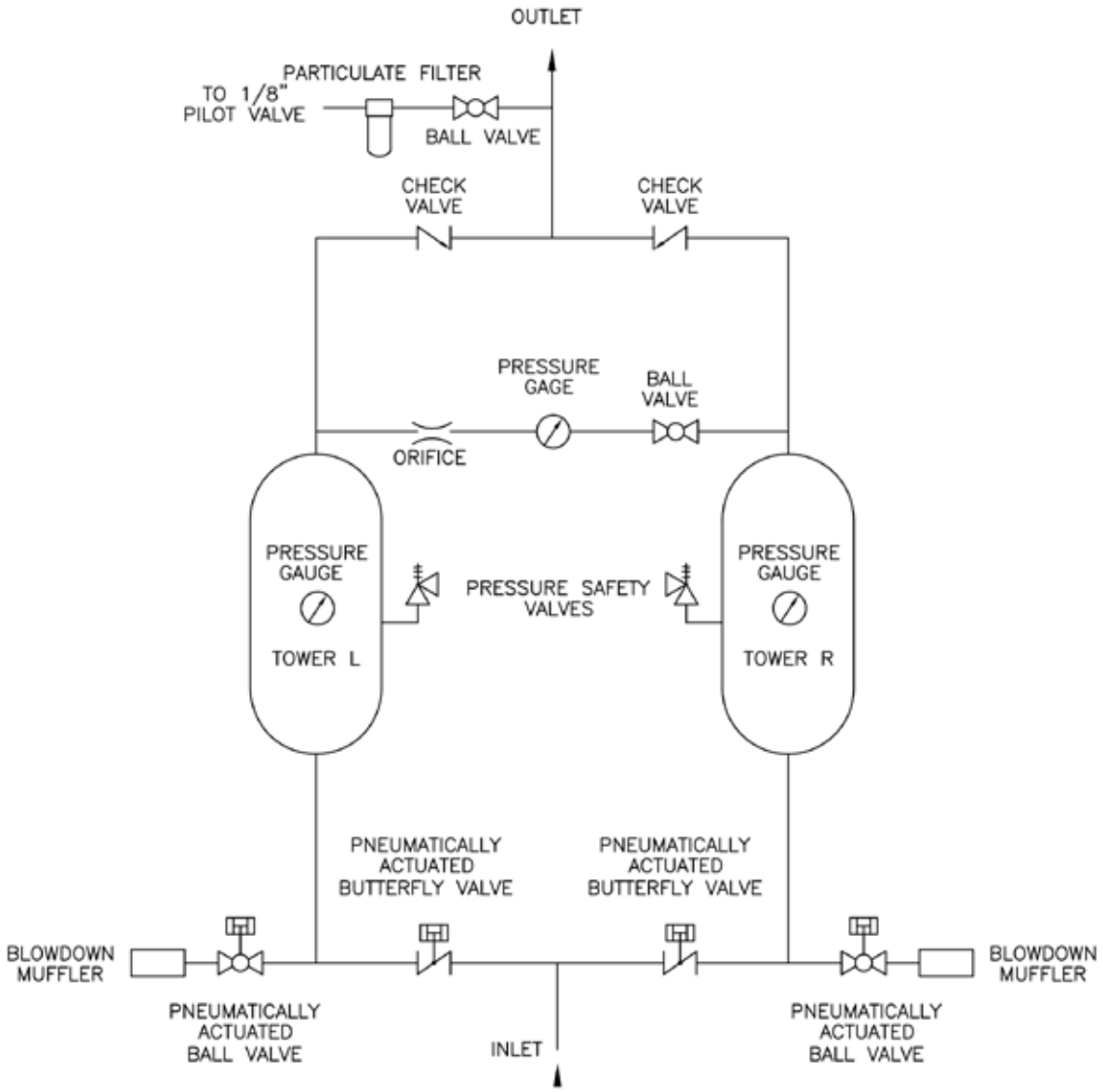


4.4 P & ID

HLA 100 to HLA 800



HLA 1000 to HLA 3000



4.5 appendixes

reference	power supply	power input	inlet & outlet (1)	max working pressure	dimensions			approx. weight (2)
model	60 Hz only	kW	NPT(F)/Flg	(psi)	W (in)	D (in)	H (in)	lbs
HLA 100	115V /1 Ph/60 Hz	0.24	1"	150	37.25	29.75	86.50	300
HLA 150	115V /1 Ph/60 Hz	0.24	1"	150	39.25	29.75	86.50	415
HLA 200	115V /1 Ph/60 Hz	0.24	1 ½"	150	41.75	31.25	86.75	540
HLA 250	115V /1 Ph/60 Hz	0.24	1 ½"	150	42.75	31.50	83.75	590
HLA 350	115V /1 Ph/60 Hz	0.24	1 ½"	150	45.75	31.50	84.25	735
HLA 500	115V /1 Ph/60 Hz	0.24	2"	150	47.75	38.00	85.00	1100
HLA 650	115V /1 Ph/60 Hz	0.24	2"	150	49.75	39.50	85.00	1600
HLA 800	115V /1 Ph/60 Hz	0.24	2 ½"	150	51.75	39.50	85.00	2000
HLA 1000	115V /1 Ph/60 Hz	0.24	3"	150	63.00	46.50	88.50	2650
HLA 1250	115V /1 Ph/60 Hz	0.24	3"	150	63.00	50.25	87.50	3000
HLA 1500	115V /1 Ph/60 Hz	0.24	3"	150	72.80	56.00	97.00	3500
HLA 2000	115V /1 Ph/60 Hz	0.24	4"	150	72.80	56.00	111.10	4600
HLA 2500	115V /1 Ph/60 Hz	0.24	4"	150	99.00	57.50	115.50	5100
HLA 3000	115V /1 Ph/60 Hz	0.24	6"	150	99.00	57.50	125.00	6500

(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.

notes

Experience. Customer. Service.

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