

Compressed Air Treatment Products Gas Generators & Purifiers

Global Standard Air & Gas

Operation Manual

Desiccant Air Dryer (PHL Type)



WE ARE PROUD OF LEADING THE INDUSTRIAL STANDARD OF COMPRESSED AIR AND GAS SOLUTIONS SINCE 1993 YEAR !

GSA – Global Standard Air/Gas is development and manufacturing organization producing various compressed air/gas dryers, air/gas chiller, gas generators, gas purifiers, air/gas filters, condensate drains etc.

The company was founded in Korea in 1993 and restarted as GSA in 2003. Over these years, the company has earned a reputation that has a unique combination of quality, value, trust and reliability.

GSA is a very innovative, customer oriented and technology driven company. We always strive to provide world top quality products for compressed air treatment and gas generation supporting you and your business with our solutions.

In this catalogue you will find our total techniques and products of energy saving compressed air and gas solutions to help customers focus on their production at ease.

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■ Preliminary

The usability and the life cycle of the heatless regenerative air-dryer (referred to below as PHL-dryers) as well as the avoidance of premature repairs depend on proper operation, care and competent repair under consideration of these operating instructions.

■ Product Information

Due to our position as suppliers of components, we do not always know the final usage and total range of products' applications. We constantly improve our products to the latest state of science and technology and therefore, we assume that our products are free from defects in the sense of product liability. However, it cannot be excluded that during faulty operation in critical areas of application especially at danger to life and limb of persons involved, additionally safety measures may be necessary.

Therefore, we request the user of our components / units, to ensure in his own interest, to inform us about the application of our products in order to initiate additional safety measures, if necessary.

■ General Notes

The Company does not accept responsibility if these safety measures are not met during handling, operation, maintenance and repair, even though this is not strictly stated in these operating instructions.

We recommend receipt and notice of these operating instructions verified by the operating personnel in writing (personnel file).

We request strict observation of these notes as otherwise we do not accept any liability in respect of this machine (plant).



Caution!

The operator has to observe the national working-, operating- and safety regulations. Also, existing internal factory regulations must be met. Maintenance and repair work must only be carried out by specially trained personnel and, if necessary, under supervision of a person qualified for this work.

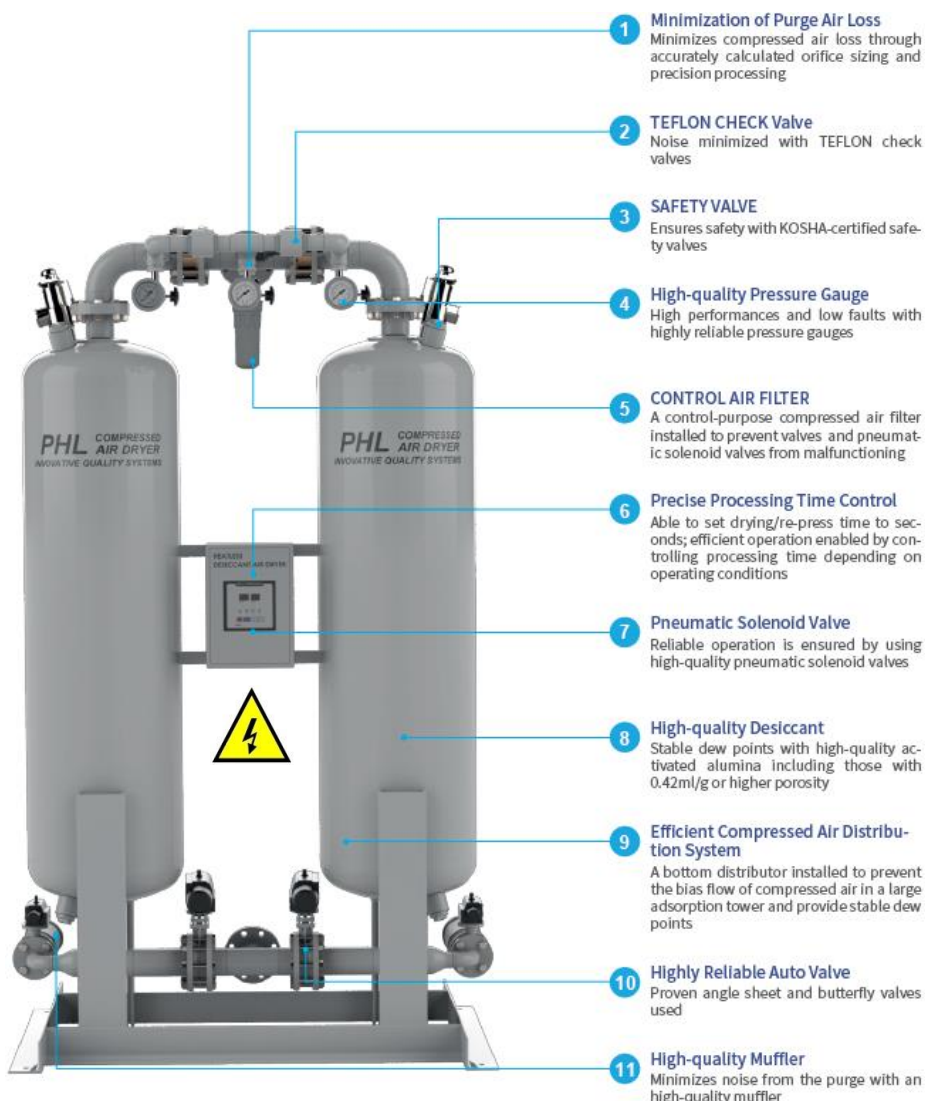
■ Safety Regulations

- Protective or safety devices must not be removed, modified or readjusted.
- During operation of the dryer none of the protective or safety devices must be removed, modified or readjusted temporarily or permanently.
- Use proper tools for maintenance and repair work only.
- Use original spare parts only.
- All maintenance works must be performed at stopped machine, disconnected power supply and pulled mains plug only. Ensure that the dryer cannot be switched on by mistake.
- Prior to dismounting a part under pressure disconnect the dryer from all pressure sources or depressurize the complete system respectively.
- Never weld the pressure vessel or modify it in any way.
- Ensure that no tools, loose parts or similar are left in the system.
- Wear eye protection and protective gloves during the change of desiccant.

■ First Aid

- Take victim immediately into the fresh air or into a very well ventilated room.
- If the victim does not breathe, perform a mouth-to-mouth resuscitation or use a respirator until the doctor's arrival.
- Never leave the victim unattended.

■ Safety Mark & Parts Location



Caution!

If the dryer is not disconnected, the risk of electric shock exists at control box.

■ Light

Dryer is not provided with a local lighting since it is designed for indoor use only. The sufficient illumination of the working area must be fulfilled by the factory in accordance with the appropriate code of practice and factory regulations.

■ Sound Pressure Level

If the sound pressure level is larger, proper safety method is needed to the operator such as ear protections and warning signs.

■ Purpose

Compressed air will be dehumidified by the dryer.

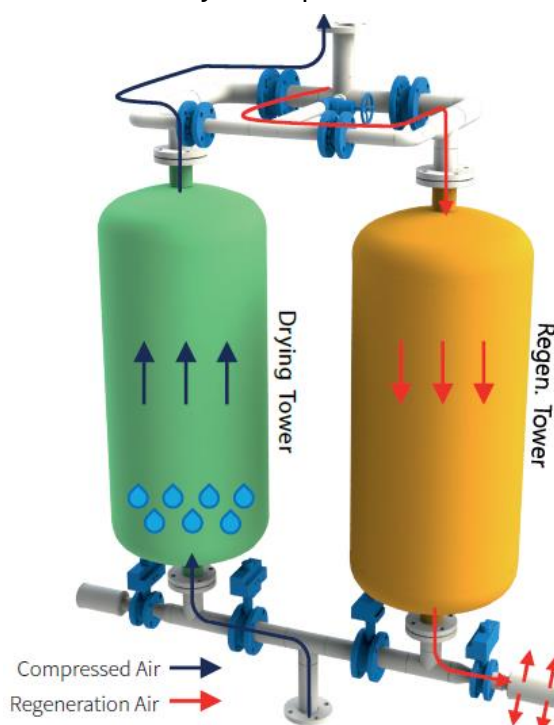
■ Component of Air Dryer(Standard)

- | | |
|---------------------------------------|------------------------------|
| 1. Control box | 5. KS coded pressure vessels |
| 2. Electronic timing sequence module. | 6. Tower pressure gauge |
| 3. Sequence lights display | 7. Purge pressure gauge |
| - Drying Time | 8. Pneumatic valves |
| - Re-pressurization Time | 9. Tower exhaust mufflers |
| 4. Tower safety relief valves | |

■ Principle of Operation

Compressed air with high moisture flows into the drying tower. While it moves from the bottom to the top of the tower, moisture is adsorbed by the charged desiccant, producing dry compressed air. While the air is being dried in the drying tower, other towers perform in regeneration process to remove adsorbed moisture. During the regeneration process, dry compressed air from the drying tower is partially used. The dry compressed air is discharged to the outside through a muffler at the bottom of the regeneration tower after moisture adsorbed into the desiccant is removed. Once the regeneration tower process is complete, the purge valve of the regeneration tower is closed. Re-pressurization process is in progress to increase the pressure of the regeneration tower. Once the re-pressurization process is done, two towers are switched. The drying tower performs regeneration process and the tower that the regeneration is completed performs a drying process.

A series of above processes are automatically repeated according to specific time and sequence, producing dry air consecutively. In terms of an operating cycle, it is basically operated for 10 minutes. Drying process is executed by two towers (5 minutes each). Specifically, it is regenerated for 4 minutes with 1 minute dynamic pressure.



■ Operation

Assume the dryer has completed re-pressurization and the left tower has begun drying. The inlet compressed air/gas enters the dryer and is diverted to the left tower to begin the five minute drying cycle. Approximately five seconds later the right tower purge (regeneration) exhaust valve will open depressurizing the off-line tower. The purge flow will continue for a period of three minutes and fifty-five seconds. When regeneration of the off-line tower is complete, the purge exhaust valve will close, initiating the sixty second re-pressurization phase. After re-pressurization is complete, the inlet selector valve will switch inlet valves and the inlet air/gas stream will divert from the left tower to the right tower. After five seconds the left tower purge exhaust valve will continuously cycle through the sequence described above until power is removed from the dryer.

(See Appendix Sequence Chart)

The complete standard operating cycle is ten minutes. Under normal conditions and during normal operation, the dryer should provide on outlet pressure dew point (ADP) of -40 °C or below.

■ Re-pressurizing Solenoid Valve

Re-pressurizing solenoid valve is installed Large capacity model to prevent break of activated alumina.

■ Fault Alarm

Pressure switch will transmit a outlet low pressure signal to DCS or local control panel. Then Purge solenoid valve is closed by control unit(in local control panel)

■ Receiving & inspection

Carefully inspect the packaging and dryer for external and internal damage. If you suspect damage has occurred during shipment, notify the transportation agency at once. This is the customer's responsibility.

Check the name plate for correct power supply requirements.

Inspect all piping and tubing. Vibration during shipment may have loosened the connections.

Desiccant air dryers are tested and operated before leaving the factory. They are ready to operate after connecting to proper services.



Caution!

Must install a suitable earth leakage circuit breaker.

■ Location

Locate your Desiccant Air Dryer on a level floor free from vibrations and in clean surroundings. Although the dryer is a free standing package, it may be secured by bolting the dryer base to the floor. Allow approximately three feet on each side of the dryer for ease of connecting and maintaining the dryer.

The ambient temperature in the dryer's location should range from 2°C to 40°C. The dryer will function in warmer ambient, but as a result, the degree of dew point suppression will decrease. Operation of the dryer in ambient approaching freezing could cause freezing of separated liquids in the pre-filter sump or in the dryer itself. For dryer operation at temperatures below freezing, Pioneer recommends heat tracing the pre-filter sump, drain trap and inlet manifold. For more information on heat tracing, contact your distributor or the factory.

Protective barriers are recommended for the prevention of accidental damage that may occur due to vehicular or personnel traffic, particularly for dryers located in open areas.

■ Connecting service

1. Connect inlet piping, including a shut off valve.
2. Connect outlet piping, including a shut off valve.
3. Install pre-filter(s) and after(s) if not factory installed.
4. If desired, install bypass piping using bubble tight valves.
 - Bypass piping is recommended for ease of maintenance, troubleshooting and service.
5. Connect electrical supply to the control box. This should be performed by a qualified electrician according to local and national codes. (See Appendix Control Panel)
6. Install access ports upstream and down-stream of the dryer for dew point and temperature.

■ Filtration

All regenerative desiccant dryers are designed to remove water in the vapor phase. The possibility of liquid carry over to the desiccant dryer must be avoided. A coalescing pre-filter will eliminate the carry over of droplets and aerosol-sized mists of both liquid water and compressor lubricant. The use of a coalescing filter will enhance the dew point depression capability of the dryer. It will also extend the life of the desiccant by preventing compressor lubricant fouling of the desiccant bed.

After filtration is also a very important step. All regenerative desiccant dryers gradually produce hard and abrasive desiccant fines. These contaminants should be removed with a particulate filter. The elimination of desiccant fine carry over will protect your plant air systems and reduce future system malfunctions.

When installing filters, make connections according to the arrow directions marked on the filter head.

■ Back pressure regulator

In dryer applications where sudden down-stream demand for dry air frequently occurs, a rapid pressure loss in the compressed air system is possible. To prevent this, it is recommended that a back pressure regulator be installed down-stream from the dryer.

The back pressure regulator will maintain a constant pressure within the dryer. This will eliminate any chance of saturating the desiccant bed by sudden flow surges which accompany rapid pressure loss. By eliminating saturation and desiccant bed “bumping,” the life of the desiccant charge will increase, and the after filter elements will not become prematurely clogged with desiccant fines.

■ Purge exhaust piping

To eliminate noise created by frequent tower release of purge exhaust, the dryer's exhaust may be piped to an outside or more remote location. This will also eliminate any possible problems caused by indoor accumulation of condensed moisture from the purge exhaust. If extending the exhaust pipe, install it horizontal or downward to avoid accumulation of condensate at low points. If the purge exhaust is required to run upward, install a valve at the low point. If extending the exhaust pipe farther than 5 meter, consult the factory for recommendations.

**Caution!**

Do not operate the air dryer before purge air exhaust.
Damage caused by this is not covered by the product warranty.

■ Start-Up

After all installation procedures are performed, drain water from the system prior to dryer start up. This will prevent saturation of the desiccant bed and improve performance of the dryer.

1. The inlet shutoff valve open, the outlet shutoff valve & bypass valve close.
2. Before to turning the dryer control panel switch ON, pressurize the dryer by slowly opening the Inlet shutoff of the dryer.
3. When both tower pressure gauges indicate line pressure, open the outlet shutoff valve. Compressed air now flows through the pre-filter, the dryer and the after filter.
4. Switch the control panel power switch ON. Five seconds after activating the dryer control circuit, one tower will depressurize to atmospheric pressure. Regenerating purge air will then flow through the regenerating tower.
5. Set the purge adjustment valve to 3.5 barg. The purge pressure can be properly set only the purge exhaust valve is open and the regenerating tower is at atmospheric pressure.
(See Appendix Purge Air Calibration Chart)

**Caution!**

Sudden pressurization of the dryer will cause a rush of high velocity air into the desiccant bed. This will hasten the need for after filter element and desiccant replacement and may cause premature failure of valves due to desiccant fines.
Must keep the purge pressure : 3.0~3.5barg.

■ Stop

To stop the dryer, place the switch in off.
During maintenance of dryer, disconnect main electrical source.

**Caution!**

Before servicing any component, be certain the component is depressurized and valves are closed. Otherwise, equipment damage, severe injury or death could result.

■ Pre-Filter

Under normal operating conditions, the pressure drop across the filter indicates when the element needs changing typically 6 psig or greater. However, inspect the filter element at least every three months for proper seating and condition of the element. If the element has collapsed or can not be properly seated, replace the element.

■ After Filter

Under normal operating conditions, the pressure drop across the filter indicates when the element needs changing typically 6 psig or greater. However, inspect the filter element at least every three months for proper seating and condition of the element. If the element has collapsed or can be properly seated, replace the element.

Replacement of the element will enhance system operation and prevent inflow of desiccant powder to load side.

**Caution!**

The life cycle of filter element depends of the quality of compressed air. Periodic attention must be paid to proper performance.

■ Control air filter

The control air filter should be inspected periodically and replaced when dirty. Periodic replacement of the element will ensure clean control air for operation of the valves.

■ Purge flow rate adjustment

The purge flow rate should be checked periodically for proper adjustment. The purge pressure for full load operation should be set at 45 psig(3.1barg). The purge calibration graph(Appendix) may be used for purge adjustment when the load is less than capacity.

**Caution!**

Do not operate the dryer with no purge flow. It may damage the dryer and will void the warranty.

■ Solenoid valve

Inspect solenoid valves periodically for proper operation. The inspection should include monitoring the tower pressure gauge on each tower during the cycle. The back pressure on a regenerating tower should not be greater than 5 psig. Higher pressure indicates either a malfunctioning valve or a clogged muffler.

Frequent monitoring of the tower pressure gauges in conjunction with the control will give a good indication of proper operation and can assist with troubleshooting should a problem occur.

Failure of a solenoid valve may result from:

- Faulty control circuit. Check the electrical system to verify that the solenoid coil is receiving electrical input.
- A burned out coil. Replace the coil.
- Clogged solenoid valve. Disassemble and clean.
- Damaged valve seat. Disassemble and clean.

■ Desiccant replacement

Remove contaminated desiccant from each vessel through the desiccant “drain port” located near the bottom of each vessel. Pour new desiccant into the indicated “fill port” located near the top of each vessel. Allow adequate space above the desiccant bed to permit bed motion and expansion during drying. Change the desiccant periodically for optimum dryer performance.

Store any unused desiccant in an airtight container.

**Caution!**

Use only activated alumina in your Desiccant Air Dryer.

■ Maintenance schedule

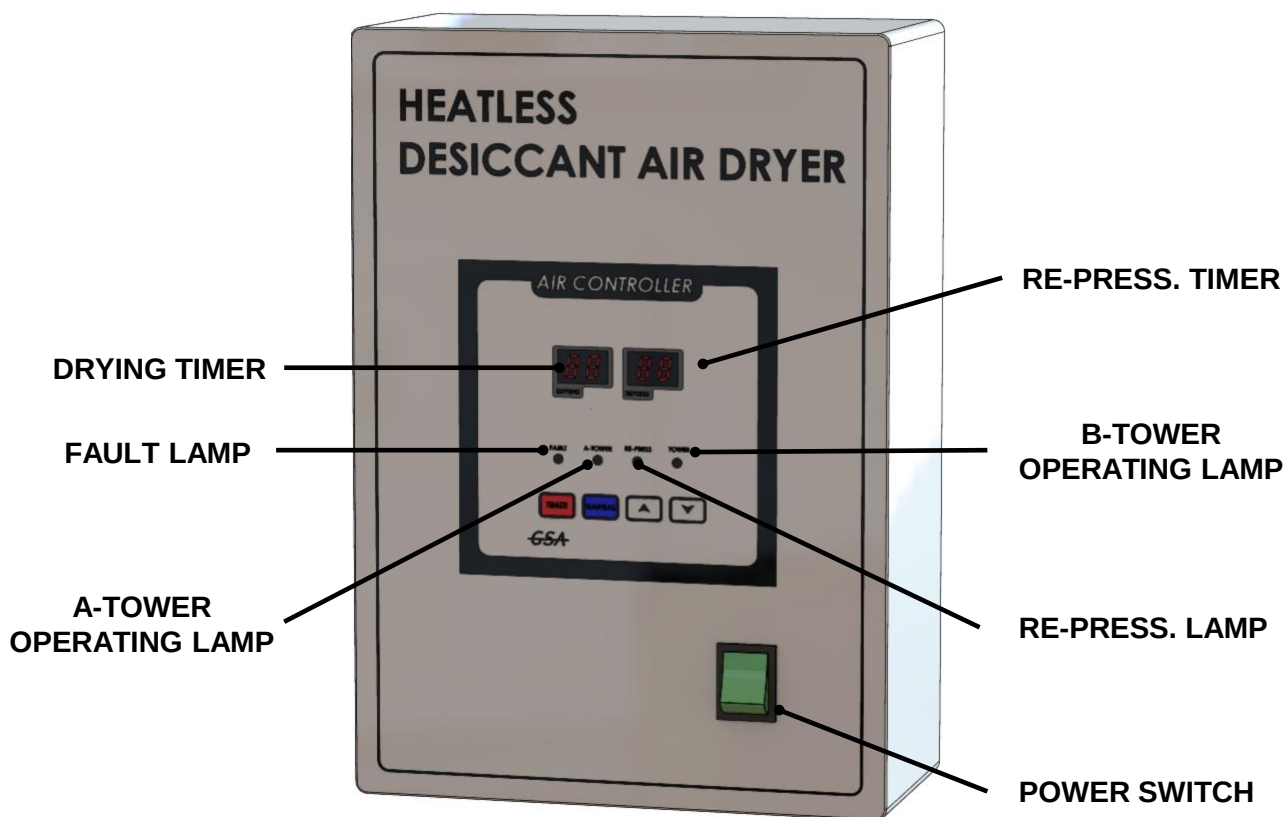
Maintenance intervals highly depend on the mode of operation and the ambient conditions on site, the intervals below air only to be understood as general recommendation.

Period	Check point	Method
Start up	Pressure indication	All pressure gauges - Drying tower pressure : same line pressure - purge pressure : 3.0~3.5 barg - Regeneration tower pressure : below 0.5barg
	Solenoid & pneumatic valve	Operation check
	Back pressure on regeneration tower	Max. 0.5 bar. If needed clean the silencer.
Every 3~4 months	Pre-filters and after-filters	Inspect pre-filter and after filter for dirt, oil and other contaminants. Replace if contaminated.
	Control air filter	Inspect filter element or regulator. if needed clean the filter & regulator.
Every 6 months	Calibrate dew point meter (if installed)	Refer to dew point meter owner's manual.
	Inspect the silencer	Replace exhaust silencer if back pressure on regeneration exceed 0.5 barg.
	Inspect solenoid valves	While dryer is operating, inspect solenoid valves. If leak or malfunction persists, replace valves.
Yearly	Replace filter elements	Replace pre-filters & after-filters.
	Inspect & replace pneumatic valves	Inspect valve seating and valve internals. If needed, clean or replace the valve.
	Inspect pressure gauge	Replace if readings are incorrect.
Every 2~3 year	Replace desiccant (recommendation)	Replace if contaminated oil moisture and other contaminants inhibit the performance of the desiccant.

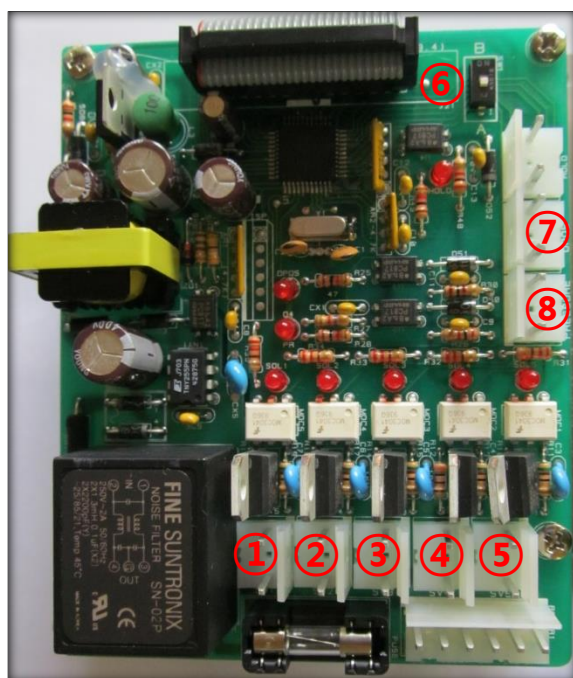
■ Troubleshooting

Problem	Probable Cause	Remedy
Excessive backpressure in regeneration tower (above 0.3barg)	Silencer is clogged	Clean or replace silencer.
	Pressure gauge malfunction	Check or replace pressure gauge.
Depressurization fail	De-press. valve & purge valve doesn't open	Check de-press. & purge valve. And check its solenoid valve.
	Silencer is clogged	Clean or replace silencer.
	Low pressure	Check control air pressure(above 5 barg)
Re-press. fail	De-press & purge valve doesn't close	Check de-press. & purge valve. And check its solenoid valve.
Excessive press. drop	Excessive flow rate	Check working pressure.
	Low Inlet pressure	Check line pressure.
Tower change failure	No control air Low control press.	Check control air line & control filter.
	Controller failure	Check the PLC or PCB controller.
Elevated dew point	Insufficient purge air	Check purge pressure.(Nor. 3.5 barg)
	Silencer is clogged	Clean or replace silencer.
	Low pressure	Check pressure sauce.
	High inlet temp.	Reduce inlet temp. Check after-cooler or ref. dryer.
	Desiccant contaminated by oil.	Install suitable pre-filter. And replace desiccant.
	Water entering	Check after-cooler or ref. dryer.
		If necessary, replace desiccant.

■ Control Panel

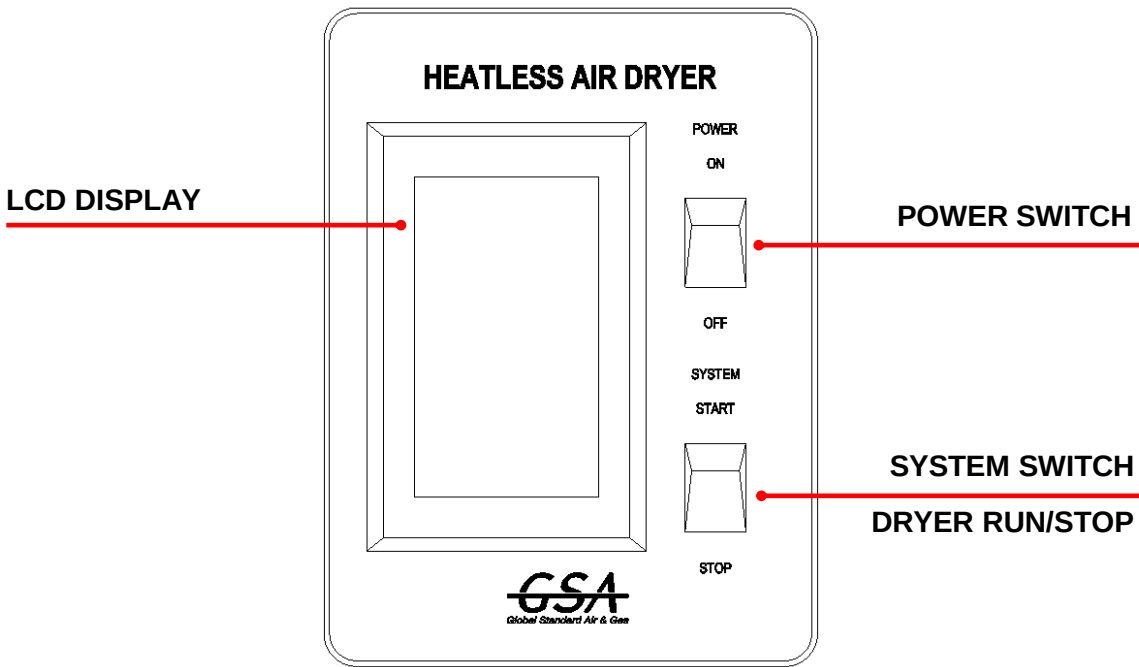


■ PCB BOARD

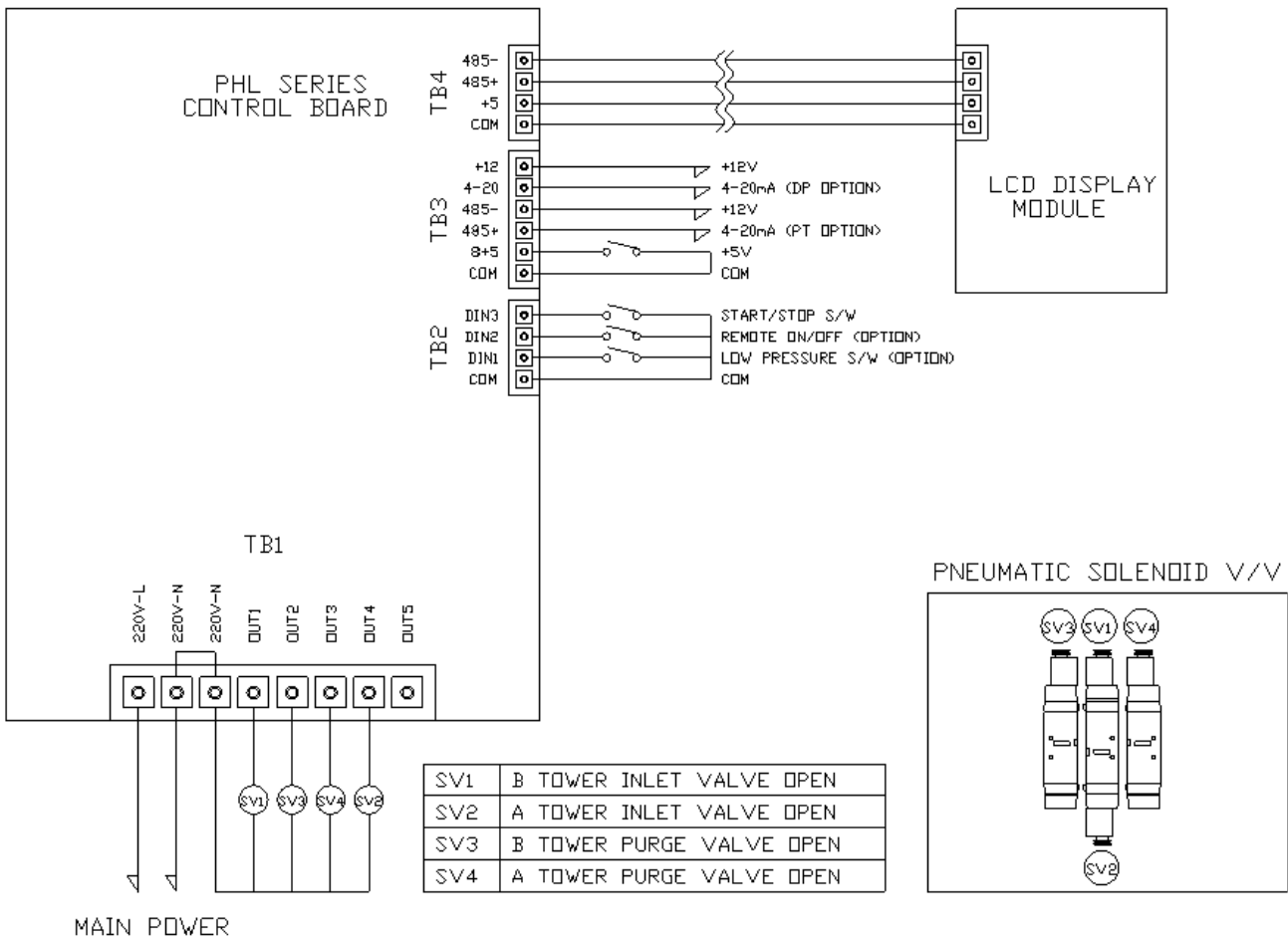


- ① SV1 – [B-Tower] Right Tower On-Line
- ② SV2 – [B-Tower] Right Tower Purge
- ③ SV3 – [A-Tower] Left Tower On-Line
- ④ SV4 – [A-Tower] Left Tower Purge
- ⑤ SV5 – Re-Pressure
- ⑥ Tower Select – A or B Tower Select
- ⑦ DPOS – Dew Point Operating System
- ⑧ PRSS. – Low Press. Switch

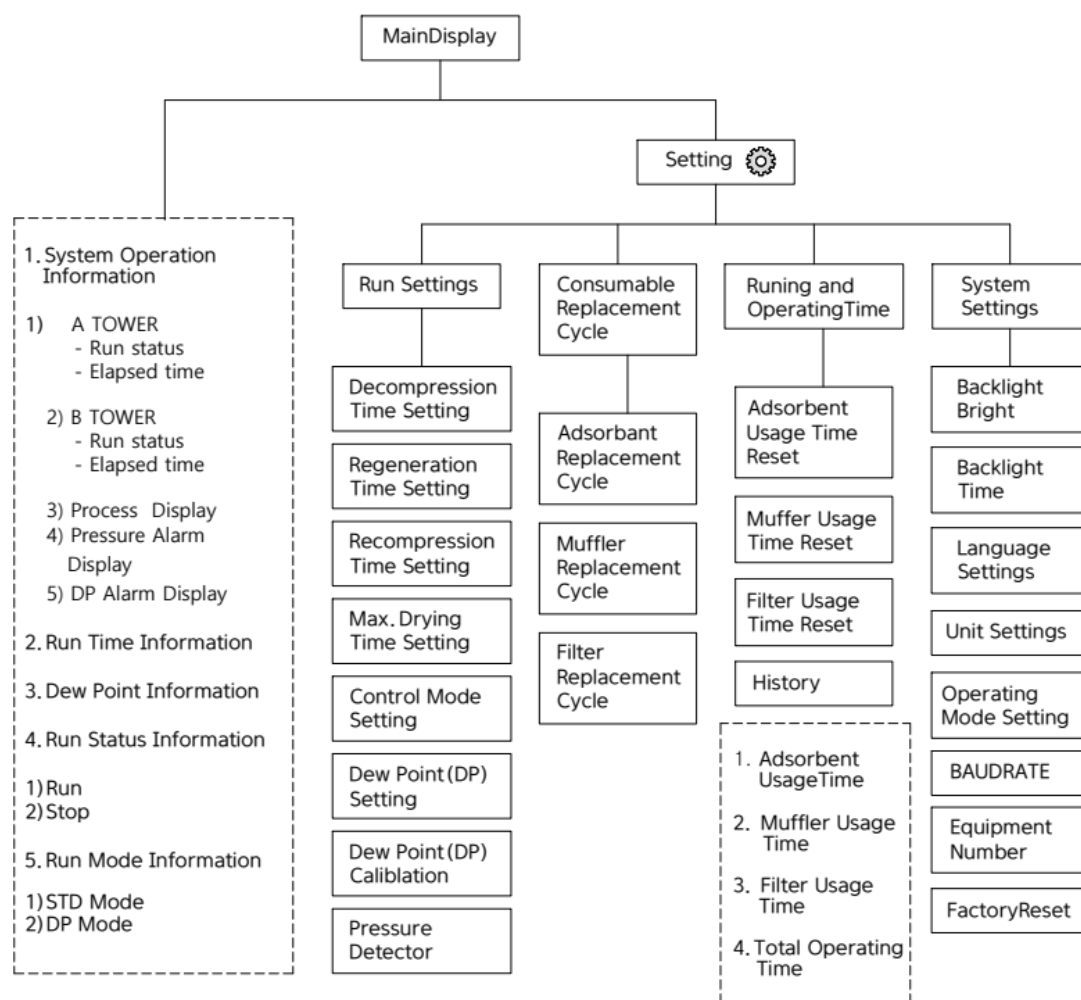
■ Control Panel



■ PCB BOARD



2) LCD Type Menu Tree



3) LCD Main Screen

When you turn on the system, the screen will display our logo and then switch to the main screen. The main screen displays various information about the equipment and alarm indicators, along with setting buttons.

(1) System Operation Information

- **Operating Status Display:** The operating status indicates the current state of the A/B TOWER and is displayed as "Drying," "Depressurizing," "Regenerating," or "At Atmospheric Pressure."
- **Operating Time Display:** The operating time displays the elapsed time in seconds (sec) based on the operating status of the A/B TOWER.
- **Process Progress Indicator:** The process progress of the A/B TOWER is indicated by lamps, allowing you to identify the direction of compressed air flow and the open/closed status of the valves. "Drying" is indicated by a green light, while "Depressurizing," "Regenerating," and "Pressurizing" are indicated by a red light.

- **Pressure Alarm Indication:** To prevent the desiccant inside the dryer from becoming compacted and to protect the screens and other components within the tower, the dryer requires a system pressure of at least approximately 5 kg/cm². Please check the pressure gauge and press START once the pressure has reached the normal level. If a pressure switch (optional) is installed, a green light indicates normal pressure; if the pressure is insufficient, a yellow warning light will illuminate along with a red light and the message "Low Pressure."
- **Dew Point Alarm Indication:** In "DP MODE," a green light turns on if the temperature is lower than the dew point, and a red light turns on along with a yellow alarm if the temperature is higher than the dew point setpoint.

(2) Operating Time Information

The total operating time of the equipment is displayed in the upper-left corner of the main screen.

(3) Dew Point (DEWPOINT) Information

The dew point temperature is displayed in the upper-right corner of the main screen. If a dew point sensor is not installed, "N/A" is displayed.

(4) Operating Status Information

The operating status is displayed in the lower-left corner of the main screen. Depending on the equipment's operating status, it displays either "Running" or "Stopped."

(5) Operating Control Mode Information

The center of the bottom of the main screen displays the operating control mode. The operating control modes are displayed as "STD (Standard) MODE" and "DP (Dew Point) MODE." A dew point sensor must be installed to operate in Dew Point mode.

(6) SETTING Button

Pressing the SETTING button changes the screen to display the "Operation Settings," "Consumable Replacement Intervals," "Operation and Usage Time," and "System Settings" buttons. The date, time, and serial number are displayed at the bottom of the screen.

• Operation Settings

Pressing the Operation Settings button displays the "Depressurization Time," "Regeneration Time," "Equilibrium Pressure Time," "Maximum Drying Time," "Control Settings," "DP Settings," "DP Calibration," and "Pressure Detection" buttons.

- Depressurization Time:** Sets the depressurization time during the regeneration process. The default setting is 10 seconds.
- Regeneration Time:** Sets the regeneration time during the regeneration process. The default setting is 230 seconds.
- Stable Pressure Time:** Sets the stable pressure time during the regeneration process. The default setting is 60 seconds.
- Maximum Drying Time:** In DP MODE, if the temperature falls below the set dew point, the system switches to the regeneration process once the set drying time has elapsed to prevent an excessive load on one side of the A/B TOWER. The default setting is 1,800 seconds.
- Control Settings:** The operating control modes are divided into "STD MODE" and "DP MODE." "STD MODE" uses TIMER CONTROL, in which the drying or regeneration process proceeds according to the set time. The default cycle per TOWER is 10 minutes (5 minutes drying, 5 minutes regeneration). "DP MODE" is a control method based on the dew point temperature setting; if the dew point temperature or the maximum drying time setting is exceeded, a TOWER switch occurs.

- A. DP Setting: Sets the dew point temperature. The default setting is -40 °C.
- B. DP Calibration: Calibrates the dew point temperature sensor. The default setting is 0 °C.
- C. Pressure Detection: Configure the system's pressure detection device.
 - "NO": Do not detect pressure (default).
 - "PS": Detect via a PRESSURE SWITCH (optional).
 - "PT": Detect via a PRESSURE TRANSDUCER (optional).

• Setting Consumable Replacement Intervals

Periodic replacement of consumables is essential to maintain the performance of a non-heated adsorption dryer. Consumable replacement intervals must be adjusted according to the plant's operating environment and conditions.

- A. Desiccant Replacement Interval: Typically replaced every 2 to 3 years. The default setting is 16,000 hours.
- B. Muffler Replacement Interval: The muffler removes dust from the desiccant and reduces noise; if the muffler becomes clogged and regeneration is not smooth, it will cause a decline in the dryer's performance. The replacement interval is 3 or 4 months, and the default setting is 3,000 hours.
- C. Control Air Filter Replacement Interval: This is the replacement interval for the filter (regulator) that ensures smooth operation of the dryer's pneumatic valves. The default setting is 8,000 hours.

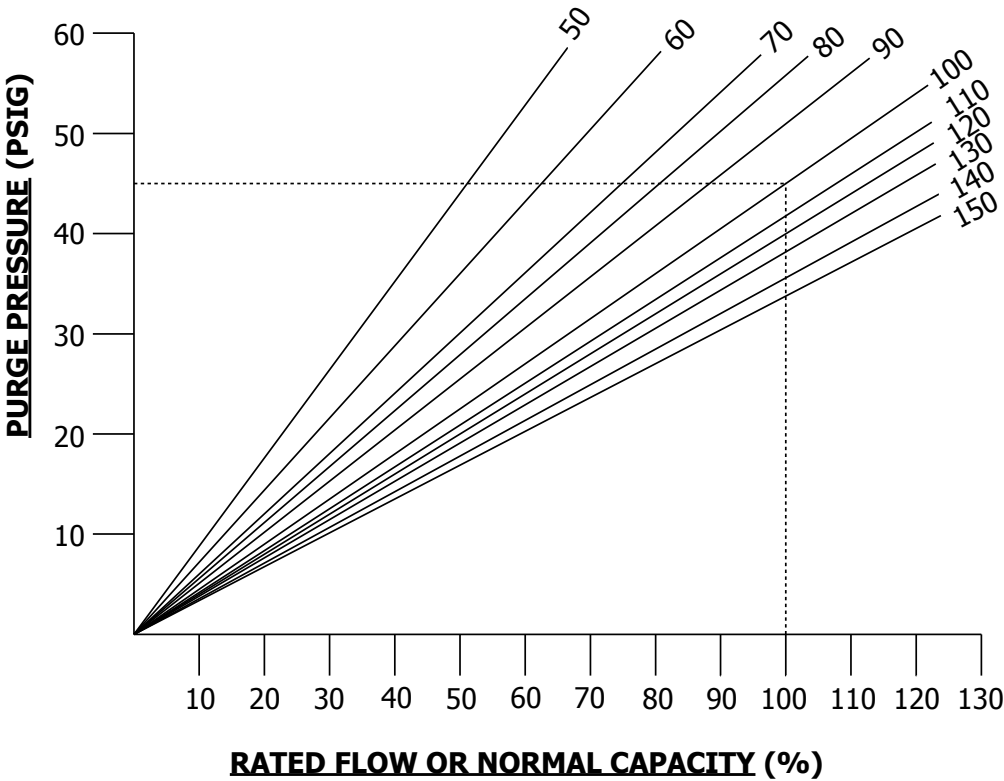
• Operation and Usage Time Settings

- A. Desiccant Usage Time: This is the usage time recorded until desiccant replacement. After replacement is complete, be sure to press the "Reset Desiccant Usage Time" button.
- B. Muffler Service Hours: This is the operating time leading up to muffler replacement. Be sure to press the "Reset Muffler Service Hours" button after replacement is complete.
- C. Filter Service Hours: This is the operating time leading up to filter replacement. Be sure to press the "Reset Filter Service Hours" button after replacement is complete.
- D. Total Operating Time: This refers to the total operating time.
- E. Reset Adsorbent Service Hours: Resets the adsorbent service hours.
- F. Muffler Usage Time: Resets the muffler usage time.
- G. Filter Usage Time: Resets the filter usage time.
- H. History: Records the history of consumable replacements.

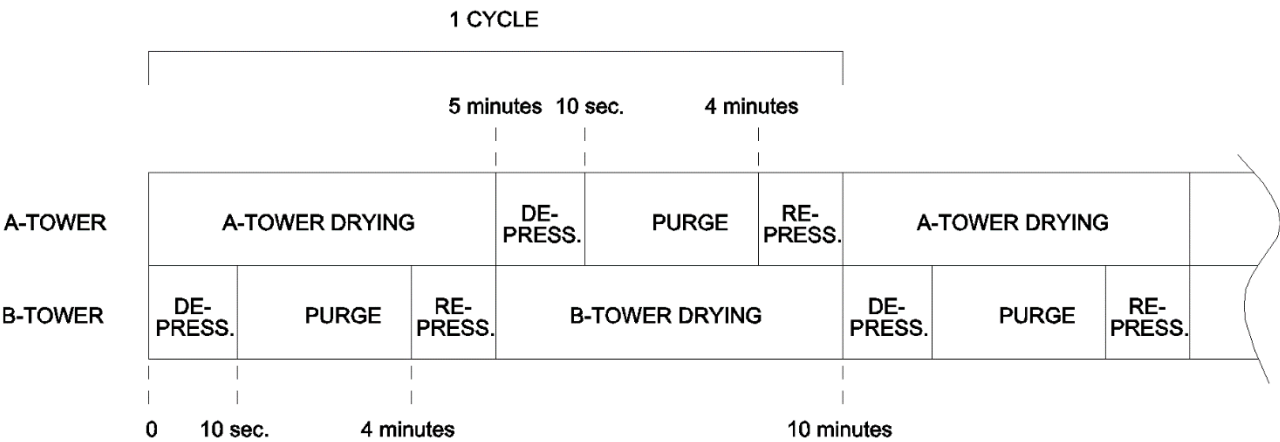
• System Settings

- A. Backlight: Adjusts the screen brightness. The default setting is 10%.
- B. Backlight Time: Adjusts the time before the screen returns to the main screen. The default setting is 30 seconds.
- C. Language: Korean or English
- D. Unit: °C or °F, bar or Mpa
- E. Operating Mode: Can be operated via "LOCAL," "REMOTE," and "RS485 Communication."
- F. Baud Rate: "9600", "19200", "38400", and "57600". The default setting is 9600 baud.
- G. Equipment Number: Equipment numbers can be assigned from 0 to 12.
- H. Factory Reset: A reset function is available for all items; this is set before the unit leaves the factory.

Purge Air Flow Calibration Chart

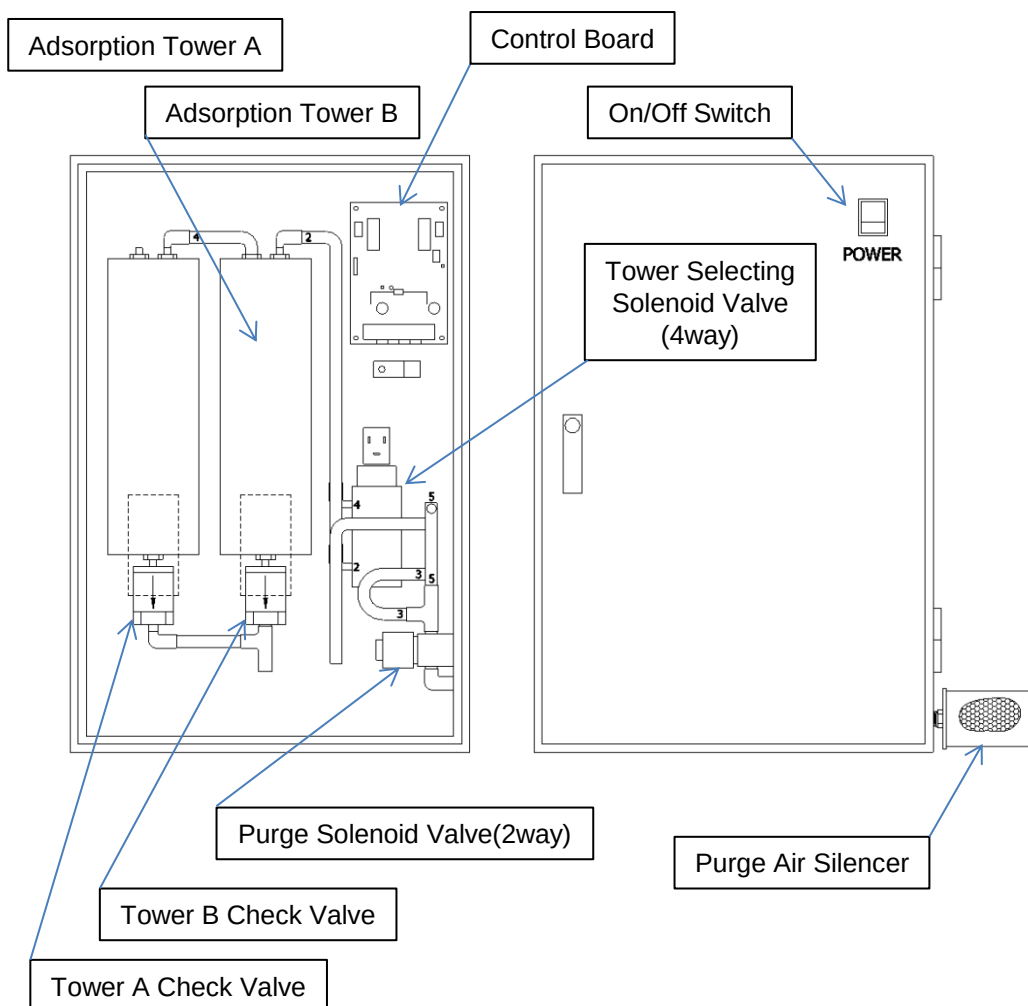


Sequence chart(5 minutes drying cycle)

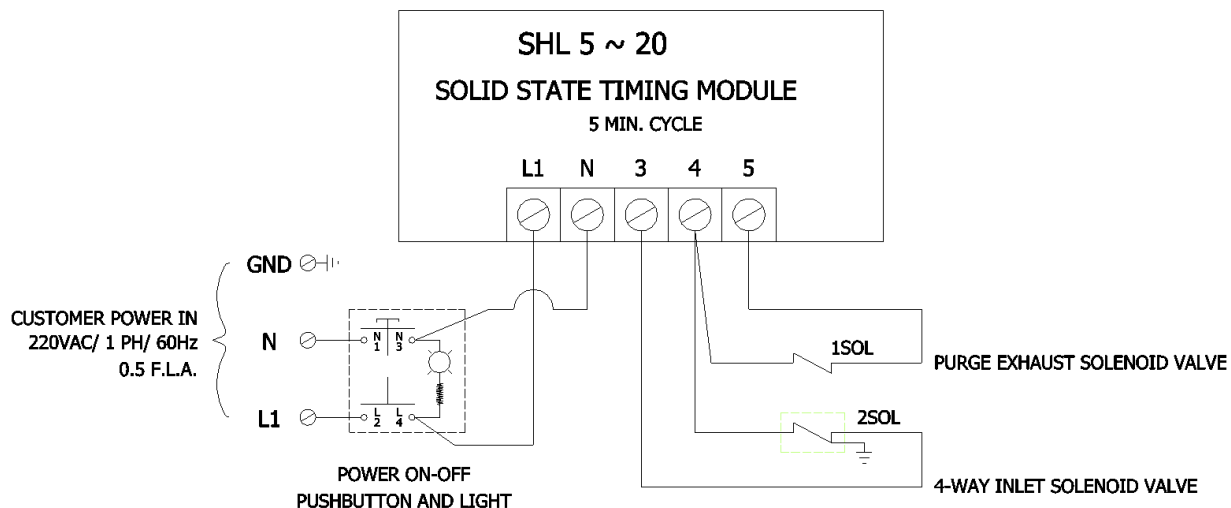


■ Mini Type Desiccant Air Dryer(SHL Type)

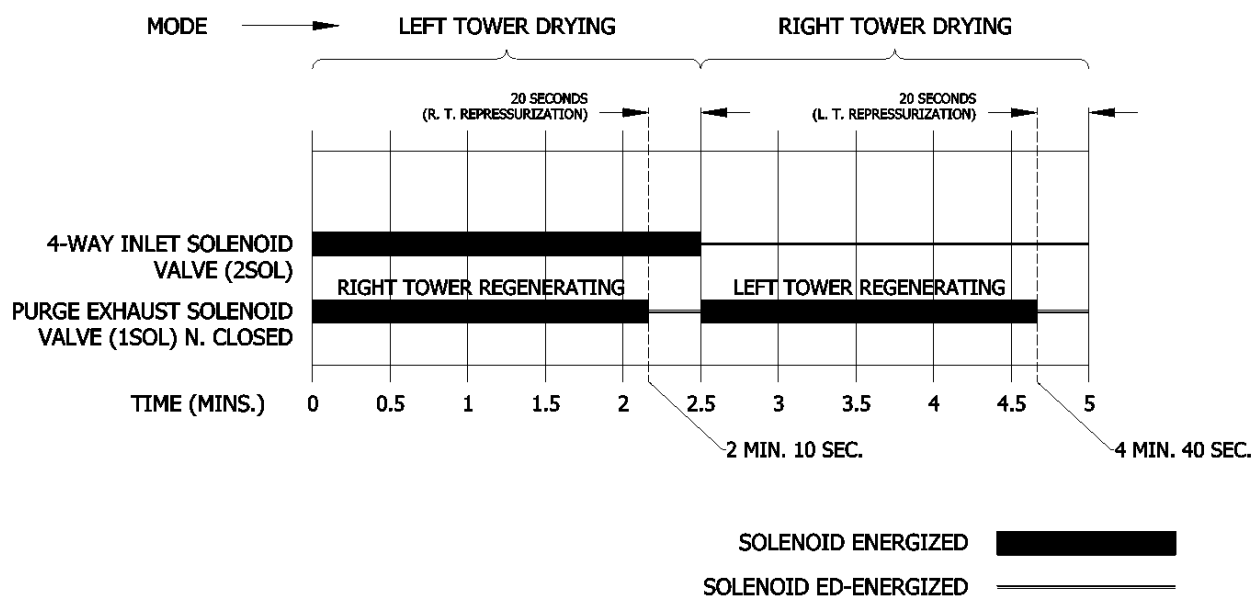
1. Component of SHL



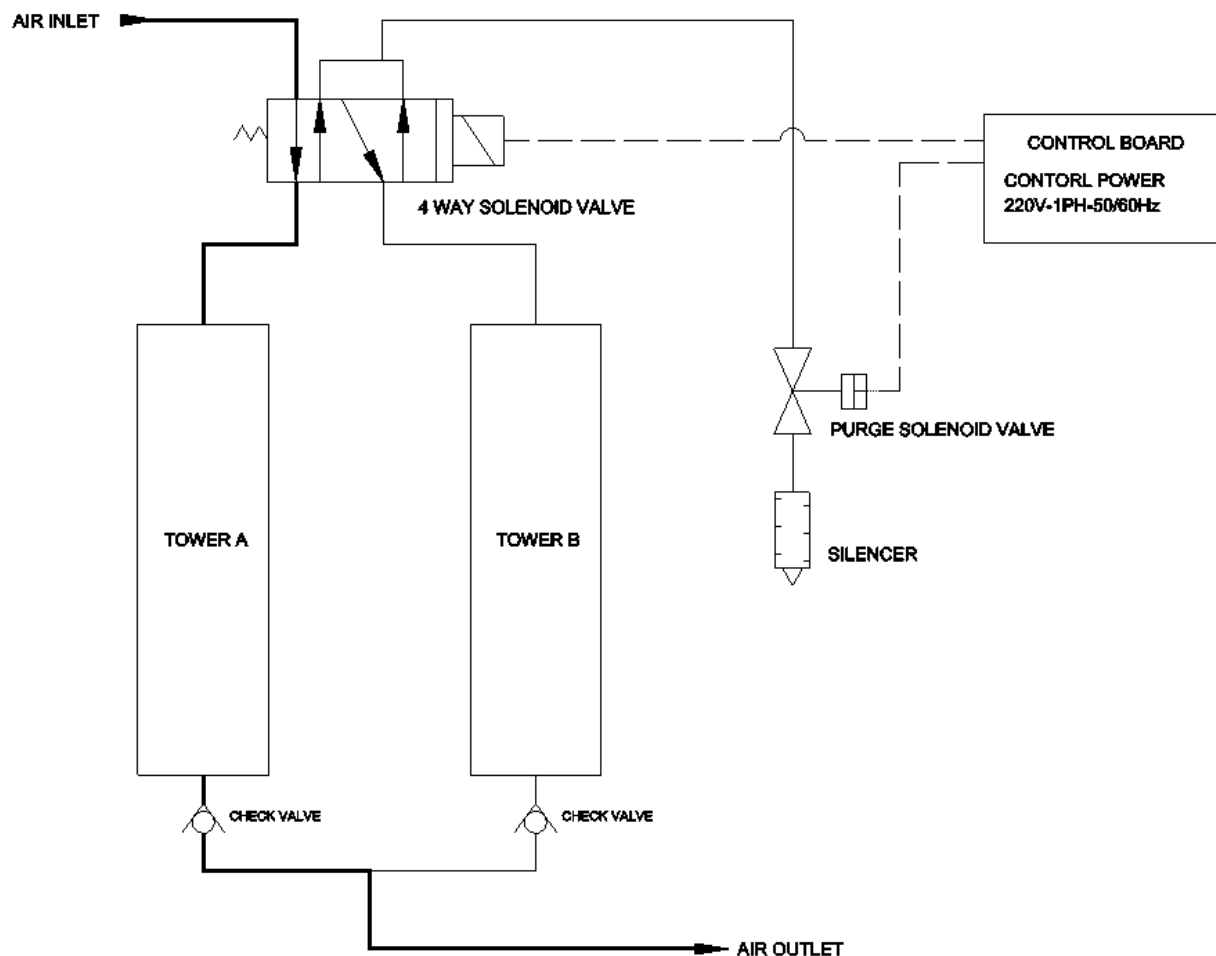
2. Electric Connection Diagram



3. Sequence



4. Flow Diagram



5. Maintenance schedule

Period	Check point	Method
Every months	Solenoid valve	Inspect the solenoid valve. - 4 way sol. v/v & 2way purge sol. v/v.
	Purge Silencer	Clean the silencer.
Every 6 months	Calibrate dew point sensor (if installed)	Refer to dew point meter owner's manual.
	Purge Silencer	Replace exhaust silencer if back pressure is high
	Inspect solenoid valves	While dryer is operating, inspect solenoid valves. If leak or malfunction persists, replace valves.
Yearly	Calibrate dew point meter (if installed)	Refer to dew point meter owner's manual.
	Electric connection	Check for loose wiring.
	Air Leakage	Check air connections for leaks.
Every 2~3 year	Inspect & replace solenoid valves	Inspect solenoid valve. If needed, clean or replace the valve.
	Replace desiccant (recommendation)	Replace if contaminated oil moisture and other contaminants inhibit the performance of the desiccant.

6. Troubleshooting

Problem	Probable Cause	Remedy
Tower Switching Fail	4 Way solenoid valve	Check the 4 way solenoid valve.
	Control Board	Check the control board output.
Purge fail	Purge valve doesn't open	Check purge sol. valve. Check the control board output.
	Silencer is clogged	Clean or replace purge silencer.
Re-press. fail	4 way or purge sol. valve doesn't operate.	Check 4 way & purge sol. v/v.
High dew point	Silencer is clogged	Clean or replace silencer.
	Low pressure	Check supplied air pressure.
	High inlet temp.	Reduce inlet temp. Check after-cooler or ref. dryer.
	Desiccant aging	Replace desiccant. Use only activated alumina.
	Water entering	Check after-cooler or ref. dryer. If necessary replace desiccant.

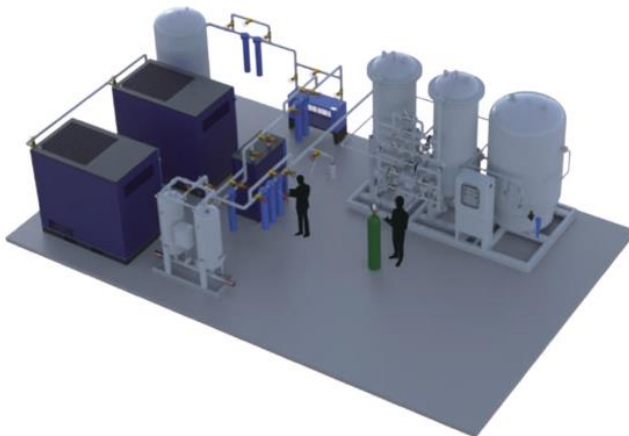
5G. IoT compressed air system



If required, we can also get you monitor remotely your compressed air system centrally via the Internet, 24 hours a day, 365 days a year, allowing you to depend on the productivity and availability of your system at all times.

Optional functions

- Wi-Fi, Bluetooth wireless communication
- Ethernet, RS-485 wire communication
- Monitoring through mobile devices
- User-friendly easy interface
- Easy to check running status through data logging
- Optimal performance with easy and simple setting
- Energy saving with cycling and VSD technique
- Easy maintenance management with testing function
- Intuitive interface



Monitoring unit by mobile phone

Refrigerated Air Dryer



HYD-N3 series

3rd generation cycling type

Flow rate : 0.5~85 Nm³/min

Energy storage heat exchanger

High Purity Alkanes PCM

Max. 90% energy saving

environmentally friendly dryer

Zero air loss magnetic float drain v/v

Wifi/BT Communication

4.3" TFT touch screen / Real Time Monitoring

HYD-20~600N3

(Upon request, customized product)



HYD-N2 series

2nd generation cycling type

Flow rate : 0.5~180 Nm³/min

Energy storage heat exchanger

Energy saving technology

environmentally friendly dryer

ECO mode lamp / Max. 50% energy saving

Zero air loss magnetic float drain v/v

Temp. Controller

HYD-5~1200N2

(Upon request, customized product)



HYD-N series

Non cycling type

Flow rate : 0.5~14.2 Nm³/min

Highly efficient Al. heat exchanger

Dew point indication

Air-cooled type

Zero air loss magnet float drain v/v

High Performance

HYD-5~100N



HYD-N series

Non cycling type

Flow rate : 21~210 Nm³/min

Highly efficient Al. heat exchanger

Dew point indication

Zero air loss level sensor drain v/v

Air-cooled type / 4.3" TFT touch screen

Safety devices / High Performance

HYD-150~1500N

(Upon request, customized product)



HYD-WN series

Non cycling type

Flow rate : 22.5~330 Nm³/min

Highly efficient Al. heat exchanger

Dew point indication

Water-cooled type

Zero air loss level sensor drain v/v

4.3" TFT touch screen

Safety devices / Powerful performance

HYD-150~2500WN



HYD-HTN series

Non cycling type

For High inlet temperature

Flow rate : 0.7~14.2 Nm³/min

Highly efficient Al. heat exchanger

Dew point indication

Zero air loss magnet float drain v/v

Automatic control of after-cooler

Built-in aftercooler & 1~2 air filters

HYD-5~100HTN



HYD-HTNS series

Non cycling type

For High inlet temperature

Flow rate : 0.7~2.7 Nm³/min

Highly efficient Al. heat exchanger

Dew point indication

Zero air loss magnet float drain v/v

Automatic control of after-cooler

Built-in aftercooler & 3 air filters

HYD-5~20HTNS

(Upon request, customized product)



HYD-HT series

Non cycling type

For High inlet temperature

Flow rate : 21~210 Nm³/min

Highly efficient Al. heat exchanger

High Performance

Zero air loss level sensor drain v/v

High inlet & ambient temp.

Large cooling capacity

HYD-5~100HTN

Refrigerated Air Dryer (Customized)



HYD-ID series

Indirect refrigeration system
Cycling type
Flow rate : 21~210 Nm³/min

Highly efficient heat exchanger

Dew point indication
Air/water cooled type
Built-in
Circulation pump & coolant

HYD-150~2500ID



HYD-LP series

Low press. type
Flow rate : 0.5~85Nm³/min

Customized system

Highly efficient heat exchanger
Low differential pressure
Air & gas cooling under 1 barg
Intake air cooling of air comp.

HYD-5~600LP

(Upon request, customized product)



Compressed Air Supply System

All-in-one skid air dryer package
Flow rate : 0.5~85 Nm³/min

Customized system

Basic composition
Ref. air dryer / air filters / bypass piping

Optimized & compact design
Easy installation / Integrated management



Customized Ref. Air Dryer

Outdoor type(IP54)
Stainless steel material type
High pressure type
Marine applications
Special gas type
EPC project

Air & Gas Chiller



HYD-CH Series

1-stage refrigeration system
Above zero point type
Flow rate : 0.5~85 Nm³/min

Outlet temp. control system

Wifi/BT communication
4.3" TFT touch screen
Real time monitoring
Optimized & compact design
Easy installation
(Upon request, customized product)



HYD-CL Series

2-stage refrigeration system
Sub-zero point type

Customized system Max. -70°C outlet temp

RS485 or other communication
TFT touch screen
Real time monitoring
Optimized & compact design

Pre-treatment unit required

After-cooler



HYA Series

Air cooled type
Aluminum fin tube
Flow rate : 1~180 Nm³/min

Eliminating over 80% of the water in compressed air

HYA-20~1200

(Upon request, customized product)



HYA-W Series

Water cooled type
Shell & tube type
Flow rate : 18~180 Nm³/min

Eliminating over 80% of the water in compressed air
Water separator : option.

HYA-100~1200W

(Upon request, customized product)

Desiccant Air Dryer



PHL series

Heatless type
Flow rate : 45~6800 Nm³/hr

Variable cycle control

Solid state controller
Control air filter / Safety valve
Purge pressure indicator
-40°C dew point
Lower dew point : option

PHL-25~4000



POM series

Heatless type with carbon tower
Flow rate : 45~3400 Nm³/hr

Variable cycle control

Solid state controller
Control air filter / Safety valve
Purge pressure indicator
-40°C dew point
Lower dew point : option

POM-25~2000

(Upon request, customized product)



PEH series

Heated purge type
Flow rate : 150~15300 Nm³/hr

Variable cycle control

Solid state controller / PLC
High performance electric heater
Reliable desiccant (AA/MS)
Energy-saving technology
-40°C dew point
(Upon request, customized product)

PEH-100~9000



PEHB series

Heated blower purge type
Flow rate : 255~15300 Nm³/min

Variable cycle control

PLC & touch screen
High performance electric heater
Reliable blower motor / valves
Reliable desiccant (AA/MS)
Energy-saving technology / -40°C dew point
(Lower dew point : option)

PEHB-150~9000



ZEHB/ZEHC series

Zero purge loss type
Ambient air cooling (ZEHB)
Water cooling (ZEHC)
Flow rate : 730~11890 Nm³/hr

PLC & touch screen

High performance electric heater
Reliable blower motor / valves
Reliable desiccant (AA/MS)
Energy-saving technology
(Lower dew point : option)

ZEHB(C)-430~7000



Combination Air Dryer

Desiccant air dryer combined
with a ref. air dryer
Flow rate : 45~3400 Nm³/hr

Extreme performance
Maximum energy efficiency
Low maintenance costs
Optimized & compact design
Easy installation



Compressed Air Supply System

All-in-one skid for air dryer package
Flow rate : 45~3400 Nm³/hr

Customized system

Basic composition
Desiccant air dryer / air filters / bypass piping

Optimized & compact design
Easy installation
Integrated management



Customized Desiccant Air Dryer

Outdoor type (IP54)
Stainless steel material type
High pressure type
Marine applications
Various design code
KS / ASME / DOSH / GOST / JIS

EPC project

Gas Generator / Gas Purifier / Gas Dryer



Nitrogen Generators

PSA type
Low(95%)~high(99.999%) purity
Max. 2000 Nm³/hr

Variable cycle control

Solid state controller / PLC
Reliable valves & CMS
Basic components :
(Nitrogen generators / filters / float flow meter / pressure regulator / receiver tank)



Oxygen Generators

PSA & VSA type
90%~95% purity / Max. 2500 Nm³/hr

Variable cycle control

Solid state controller / PLC
Reliable valves & ZMS
Basic components :
(Oxygen generators / filters / float flow meter / pressure regulator / receiver tank / air blower / vacuum pump)



Gas Purifiers

- H₂ purifier • He purifier
- N₂ purifier • O₂ purifier
- Ar purifier

Impurities gas removal up to
10 ppb from 10 ppm

High reliability and performance
Explosion / weather proof
Various design code
KS / ASME / DOSH / GOST / JIS



Gas Recovery & Purification equipment

- CO recovery & purification
- CO₂ recovery & purification
- CH₄ recovery & purification

environmentally friendly technology

High reliability and performance
Low operating cost
Various design code
KS / ASME / DOSH / GOST / JIS



Gas Dryer

- C₂H₄ gas dryer
- CnH_(2n+2) gas dryer
- CO₂ gas dryer
- Other gas dryer

Customized engineering

High reliability and performance
Low operating cost
Compact & optimized design
Various design code
KS / ASME / DOSH / GOST / JIS



Gas Liquefiers

- CO₂ liquefier
- Other gas liquefiers

Customized system

High reliability and performance
Low operating cost
Optimized design
Various design code
KS / ASME / DOSH / GOST / JIS



Gas Dryer (special)

H₂ deoxidization equipment
Gas dehumidifier

Customized engineering

Explosion / weather proof
High reliability and performance
Low operating cost
Optimized design
Various design code
KS / ASME / DOSH / GOST / JIS



Breathing Air Systems

All-in-one skid package
CO₂ below 1 ppm
CO below 1 ppm

High reliability and performance
Basic components :
(Ref. air dryer / desiccant air dryer / catalyst tower / filters)
Low operating cost
Various design code
KS / ASME / DOSH / GOST / JIS

Membrane Dryer / Other equipment



PMD series

Membrane air dryer
Flow rate : 135~600 LPM

Variable purge volume control environmentally friendly dryer
All Aluminum material
High performance hollow fiber
Easy expansion / Easy maintenance
Long operating life
Small installation space
Easy & short installation time

PMD-135 ~ 600



HYF-AN series

Compressed air filters
Flow rate : 1~14 Nm³/min

Differ. Pressure indicator
All ALDC material
High performance element
Easy maintenance
Long operating life
Compact design / lightweight
Small installation space

HYF-15~50AN



HYF-A series

Compressed air filters
Flow rate : 26~504 Nm³/min

Inlet/outlet Pressure gauge
Stainless or carbon steel
High performance element
Long operating life
Pressure vessel
Various design code
KS / ASME / DOSH / GOST / JIS

HYF-65~300A



HYE-N series

Element cartridge for filter
Particulate / coalescing type

Easy replacement
High quality element
High efficiency multilayers
Long operating life
40/5 μ m particulate element
1/0.0/0.01/0.01F coalescing element

HYE-15~50N



GS series

Air & gas receiver tank
Design pressure : 9.7 barg
Volume : 0.3~20 m³

Pressure gauge
Safety valve
Stainless or carbon steel
Pressure vessel
Various design code
KS / ASME / DOSH / GOST / JIS

GS-003A ~ 20
(Upon request, customized product)



Condensate drain trap

Zero air loss float type
Electronic timer type
Zero air loss level sensor type

- Magnetic float drain
- HAD-10 / 20 auto drain
- HAD-100 power drain
- EDV-15/40T timer drain
- DM series level sensor drain

Easy maintenance
Long operating life
Higher resistance to foreign matter



DPI Series

Differ. pressure indicator
Max. operating press. : 16 barg
Measuring range : 0 ~ 0.9 bar



Differential pressure indicator is designed to indicate pressure drop across the filter element in compressed air system.

HDI 30 / HDI 50



Adsorbent

Activated alumina
Carbon molecular sieve
Zeolite molecular sieve(3A/4A/5A/13X)

Long life
High crush strength
High adsorptive capacity
Low abrasion

Customer Satisfaction

Our Customers are our priority and we provide them with first class products and service in a timely manner and listen to their needs attentively. We achieve our excellence through tireless effort of our staff that we support enthusiastically.

Quality Assurance

GSA provides high-quality products to serve our customers to keep their production optimal at all time and at the lowest operating cost. Standards and policies are used to ensure and maximize the quality of all our products. GSA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Reliability

Our aim is to achieve ZERO (0) defect for all of our products at all time. Defects are caused because of flaws in the process or work activity. As such, we are doing our best effort to create and design processes to literally eliminate defects. Our Quest for Zero Defects leads reliability for our products from our customers in the market.

Flexibility

We adopt maximum flexibility not only for production but also for design and manufacturing of our products. For example, we are not hesitated to lower the height or width of products to be put into container helping our customers save big charge of transportation or sea freight of the order products.



Timely Delivery

To ensure proper execution of production in the right time and on time delivery/shipment, our production planners distribute line wise production from buyer order list and set production target. At the same time, we exercise the greatest flexibility for meeting urgent special delivery orders.

Reasonable Price

We do all in our power to keep reasonable price of our products by introducing economies in the manufacturing process without lowering standards, and by buying our materials in greater bulk. These economies have enabled us to keep our increase below those of our competitors.



Air/Gas Dryer

GSA leads the compressed air processing equipment industry. The following items are designed and manufactured by us: Refrigerated dryers (cycling, noncycling, high temperature, filter-in), adsorption dryers (non-heating, heating, compression heat, zero purge gas type), membrane dryers, natural gas dryers, and breathing dryers are customized and manufactured according to customers' orders.



Gas Generator/Purifier

GSA leads the gas generators and refineries industry. The following items are designed and manufactured by us: PSA-type nitrogen generators, oxygen generators, hydrogen purifiers, argon/carbon monoxide/carbon/methane recovery purification plants, and other various gas separation and purification plants are custom-made.



Air/Gas chiller

GSA designs and manufactures special purpose air/gas chiller. GSA's air-cooled and water-cooled chiller boasts excellent efficiency and convenient control by employing the latest heat exchanger, solder evaporator, and microchannel type condenser. It's also easy to install, so you can experience significant savings over traditional chiller.

