

# Trident Breathing Air System



## INSTALLATION, OPERATION, MAINTENANCE PSA Type Breathing Air Dryer

Dealer: This manual **MUST** be given to the end user.

User: **BEFORE** using this product, read this manual and preserve it for future reference.

For more information regarding our products and services, please visit

[www.tridentpneumatics.com](http://www.tridentpneumatics.com)

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Effective 11/15

A yellow triangle with a black exclamation mark inside, indicating a warning.  
**WARNING**

Do not use this system or any available optional equipment without completely reading these instructions and any additional instructional material such as user manuals, service manuals or instruction sheets supplied with this product or optional equipment. If you are unable to understand the warnings, cautions or instructions, contact a health care professional, dealer or technical professional before attempting to use this equipment.

A yellow triangle with a black skull and crossbones inside, indicating a danger.  
**DANGER**

DO NOT SMOKE while using this plant. Keep all matches, cigarettes, candles or other sources of ignition out of the room in which the plant is located and away from where oxygen is being delivered.

A red circle with a diagonal slash over a black cigarette with a flame, indicating no smoking.  
NO SMOKING signs should be displayed where the plant is installed.

**NOTICE**

The information contained in this document is subject to change without notice.

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## 1. GENERAL GUIDELINES

In order to ensure the safe installation, assembly and the operation of this Breathing air dryer, the following instructions MUST be followed strictly.

### **WARNINGS**

This section contains the important information for the safe operation and use of this plant.

Warning	Make sure that your back up/ emergency breathing air supply system connected to the manifold system. Without secondary breathing air supply system, Don't use this Plant
Warning	Equipment must be placed in a well-ventilated area. Avoid inhalation of gases
Warning	Medical Breathing air system, you must follow the procedure for service and maintenance instructions.
Warning	All tubes, hoses and piping used for this breathing air must be compatible with air
Warning	Exhaust gas must be lead by piping out of the room to outdoor atmospheric air
Warning	The Panel contains electrical parts that may produce electrical hazard if not handled properly. To prevent electrical shock when servicing the plant, care must be taken. In general electrical installation and servicing is to be performed by trained or authorized personnel only
Warning	Air dryer must be de-pressurized before service or inspection.
Warning	Smoking should not be permitted in the area where the dryer is located
warning	Do not try to modify or enhance the performance of an Air dryer in any way
Caution	<p>Warranty will not covered</p> <ul style="list-style-type: none"> <li>➤ If Inlet air temperature below 5 and or above 40 deg C.</li> <li>➤ Water, oil, rust, scale and/or other foreign objects carry over in the inlet air due to damaged filter elements and/or failure in drains.</li> <li>➤ If the Inlet air quality not comply with ISO 8573 class 4</li> </ul>
Important	For safety, installation and operating etc. of compressor, dryer unit or other equipment refer to the concerned manuals of the equipment.

## 2.PRODUCT DESCRIPTION

TBAS medical dryers delivers pure moisture free dry air as mandated by NFPA 99. The TBAS medical dryers working on the principle of Pressure Swing Adsorption, hence removing more moisture than refrigeration air dryers, and delivers moisture free dry air consistently irrespective of flow variation. Based on medical application criticality, the package comes with one working and one stand by dryer. So there is no need to stop the air dryers for maintenance. Purge saving system saves purge air up to 60% for a typical hospital load of 30% to 40%. Dew point and CO monitor enables to monitor dew point and CO levels as mandated by NFPA 99.

- **ACCESSORIES WARNING:** Trident products are specifically designed and manufactured for use in conjunction with Trident accessories. Accessories designed by other manufacturers have to be tested before using it and however Trident is not recommend for use with our products. It is important to note that your compressor, refrigeration dryer and filtration system is an integral part of your total operation. It should be maintained in accordance with the manuals received with the compressor, refrigeration dryer and filtration system to ensure safe and clean air supply. An improperly maintained compressor, refrigeration dryer or filtration system could affect the operation of your breathing air dryer. For use up to 24 hours a day, Trident will recommends high quality screw compressors only with external or internal refrigeration dryers and proper sized filtration systems.

### 2.1 TBAS Outstanding features and applications

- ✓ **Alarms**

Compact digital carbon monoxide (CO) monitor, Dew point monitor and Alarms.

- ✓ **Purge saving**

Efficient electronically controlled purge saving to reduce the air loss.

- ✓ **Construction**

Corrosion free aluminium towers and blocks.

- ✓ **Display**

LED indication for tower operation and sequence of operations.

- ✓ **High Reliability**

Low gas speeds through the molecular sieve beds, first-class components, stainless steel valve bodies and instrument air tubing, heavy-duty industrial PLC Manufactured to work. Always.

- ✓ **Lowest Energy Consumption**  
Energy cost is your major expense, not depreciation. Fast pay-back assured.
- ✓ **Easy Integration**  
Easy installation and integration with existing equipment: All system tie-in points are on one side.
- ✓ **Safe**  
Heavy-duty adsorption vessels, designed and certified for an unlimited number of cyclic loads.
- ✓ **Customization**  
An extended list of options allow you to define your specific Trident Twin-Tower PSA breathing air dryer adjusted to your individual need.

## 2.2 Statement of conformity

- NFPA99 : Medical air quality
- ISO 8573 Class -1 : Inlet air quality
- 97/23/CE : Pressurized Equipment's
- 89/392/CEE : Machine Safety
- 73/23/CEE : Low Voltage

## 2.3 Outlet Air quality

Contaminants	levels
Oxygen O <sub>2</sub> (%)	19.5-23.5
Carbon dioxide CO <sub>2</sub> (ppm)	≤1000
Carbon monoxide CO(ppm)	10(Alarm)
Nitrogen N <sub>2</sub> (%)	75-81
Water (dew point °c)	2(alarm)
Oil/Lubricant (mg/m <sup>3</sup> )	≤24

## 2.4 TBAS Specifications

Trident make breathing air dryers are available at various models according to the users requirements of dry air in scfm. The following table gives the available models of Breathing air dryers from Trident.

## 2.5 Models

TBAS Models	Nominal Inlet Flow SCFM
10	10
20	20
30	30
45	45
60	60
100	100
125	125
200	200

## Specification

Design Pressure	: 16 bar (g)
Maximum inlet Temperature	: 38°C
Voltage	: 100 – 240 VAC, 50/60Hz, 1ph
Power Consumption	: 15 Watt Max
Pre - filter rating	: 5 micron
After-filter Rating	: 0.01 micron
CO Level	: 10 PPM (Alarm set point) as per NFPA 99
Air Outlet Conditions	: 2 °C PDP (Alarm set point) as per NFPA 99
Cycle Time	: 4 min
Purge Loss	: 15%

## 2.6 Adsorbent Material

The desiccant used in the TBAS series is a smooth sphere of activated alumina produced by a unique manufacturing process. The benefits of using this high performance desiccant include:

- Uniform ball size

- ✓ Reduces pressure drop and channeling.
- High crush strength
  - ✓ Allows rapid pneumatic loading of towers.
- Low abrasion
  - ✓ The low abrasion ensures less dusting during transport, loading, and service life which reduces pressure drop and minimizes downstream valve and filter plugging, common with dustier products.
- High adsorptive capacity.
  - ✓ The desiccant's high surface area and tailored pore distribution provide a high dynamic H<sub>2</sub>O adsorption capacity. It also has excellent cyclical stability which leads to a long desiccant life.

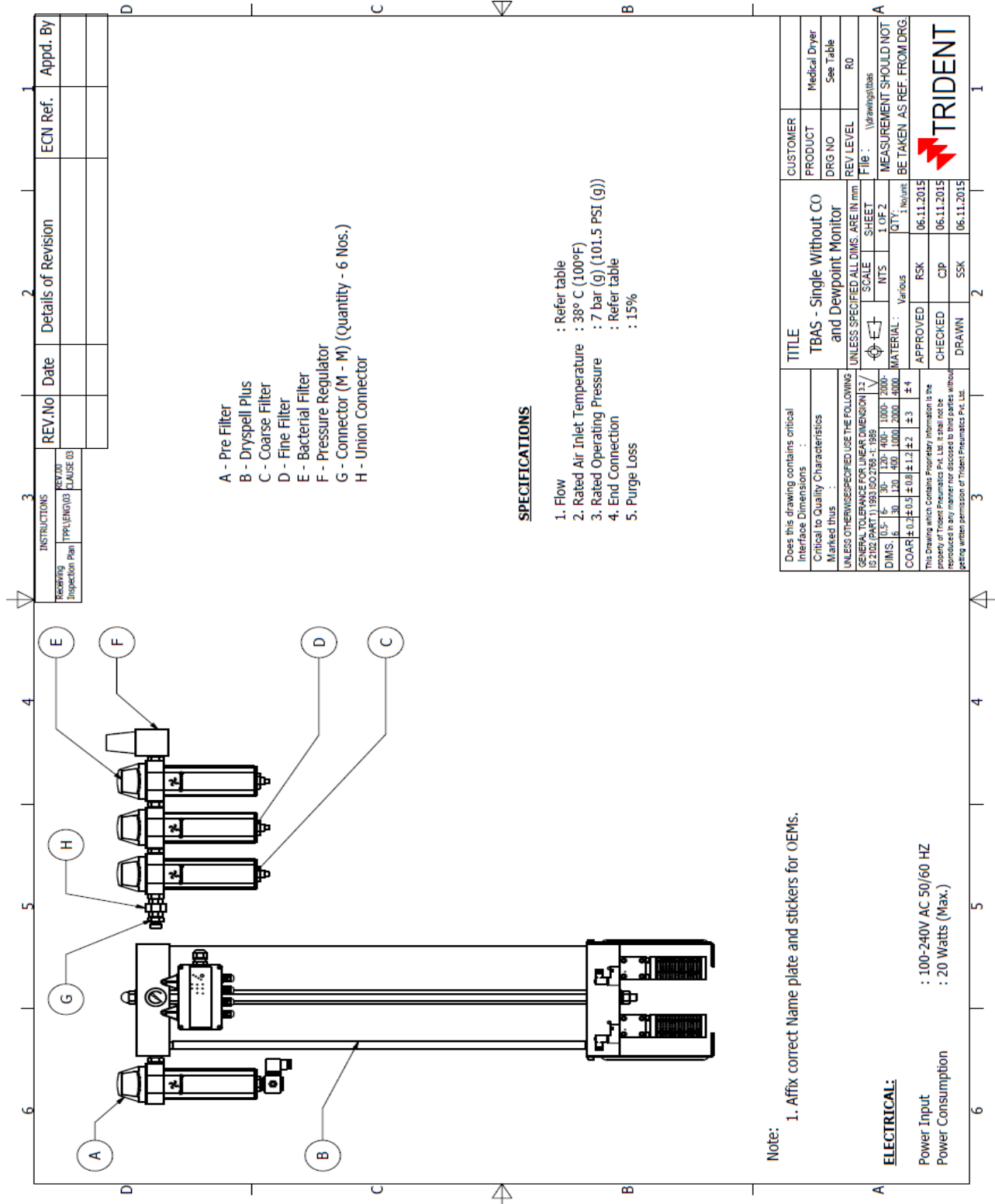
### 3. TBAS DETAILED PARTS AND FUNCTIONS

Compressed air is a vital energy medium used in almost all hospitals and clinics. The atmospheric air taken in by the compressor contains contaminants, dirt particles and humidity, i.e. water vapor. Which one affect the medical instruments, pipelines and giving struggle while patient breathing. Trident TBAS medical dryer engineered to comply with the latest NFPA 99 requirements. It is Duplex System ie one working and one standby. This complete purification system includes Pre-filter with electronic drain valve, desiccant type heatless dryer, after filter, fine filter, Bacterial filter and precise pressure regulator. Dew point and CO monitor is included in the system. All of the above are pre piped and pre wired in accordance with the latest NFPA99, standard for Health care. The Heat less type desiccant is specially made for small compressed air flows, is compact, easy to maintain, and comes standard with a 5 micron coalescing pre-filter to protect the desiccant from compressor oils and other contaminants.

#### Design

Trident's TBAS dryer is rigorously designed to suitable for the medical and pharmaceutical applications and engineered to comply with latest NFPA 99 requirements. The dryer shall be twin tower, Pressure swing adsorption, and regenerative type heatless dryer. It will capable to deliver -40 deg C PDP dew point at rated inlet flow and inlet 7 bar g pressure. The dryer has a separate controller and has dew point based stretch mode features. TBAS has three stage filtration systems. It will deliver oil up to 0.01 g/cu.m and particle of 0.01 micron air. Bacterial filter gives the bacterial free air. The pressure regulator ensures the setting pressure at the hospital pipe line. It has a separate controller box to control the total dryer performance which is including a CO monitor and a dew point meter. TBAS controller gives the indication by visual signal to change the operation to another dryer when the CO level in the output of the dryer gets high and also it gives indication when outlet dew point gets lowered.

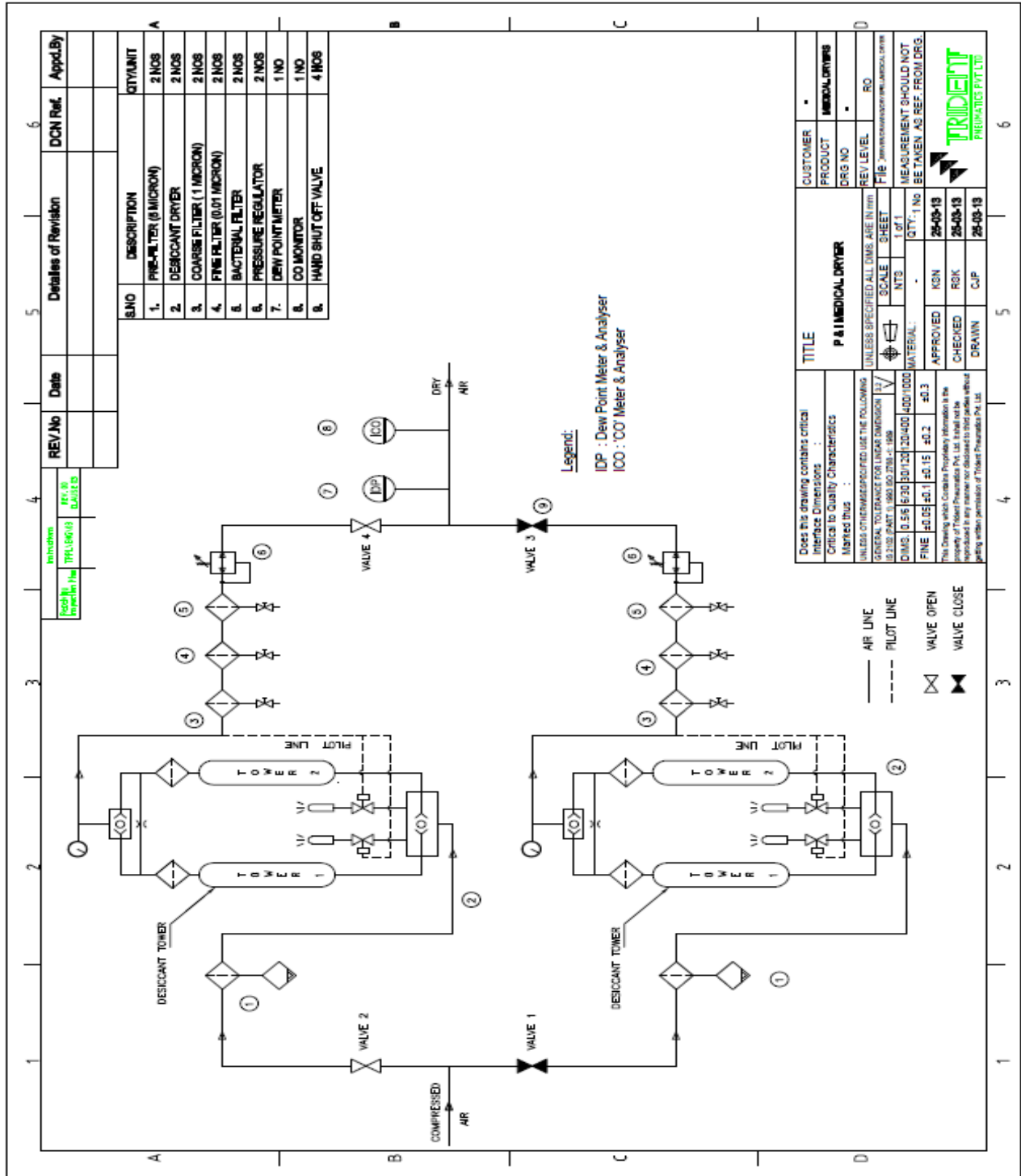




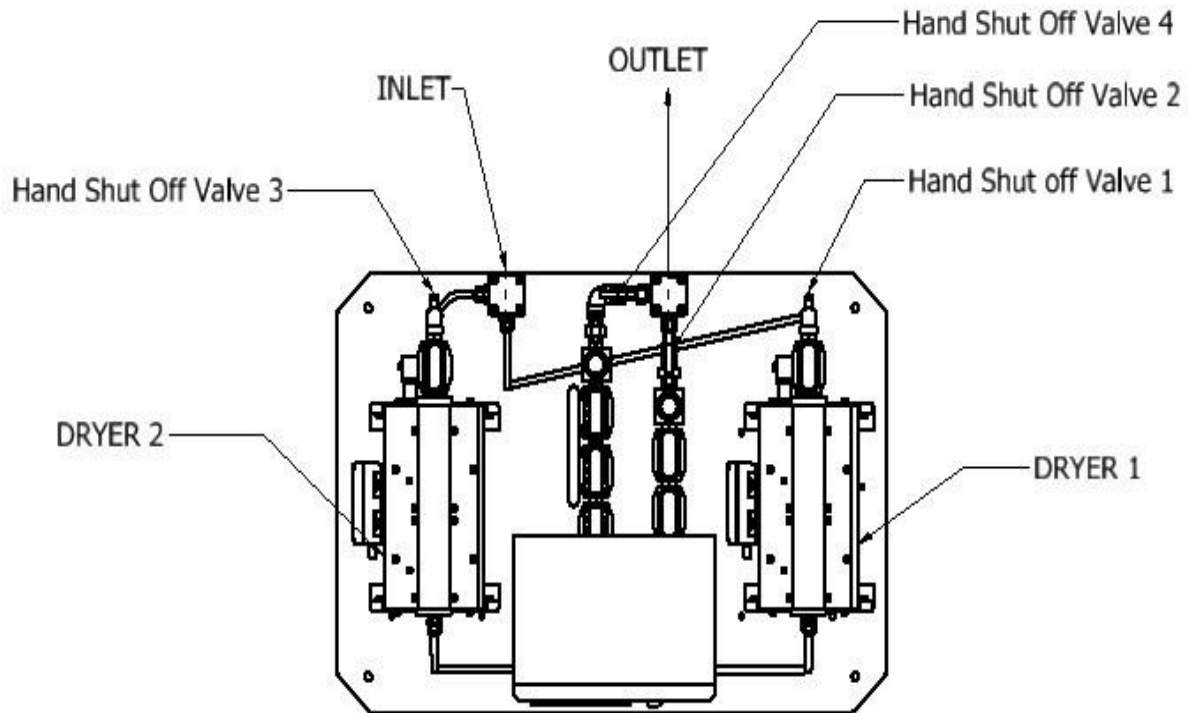
Note: 1. Affix correct Name plate and stickers for OEMs.



### 3.1 Process flow diagram



### 3.2 Parts Description



Trident Breathing air dryer consists of,

- 2 Dryspell plus Desiccant Air dryer
- 2 Pre filter
- 2 Fine filter
- 2 Carbon filter (Optional)
- 2 After filter
- 2 Bacterial filter (Optional)
- Electronic auto drain valves
- 2 Pressure regulators
- Pressure gauges (Optional)
- CO monitor
- 4 Ball valves (Hand shut off valves)
- Dew point monitor
- PLC Control panel
- Non corrosive Pipe lines

- Visual alarm

### **Air dryer**

The atmospheric contaminants including the water vapour are concentrated in the process of air compression. As a result, the dew point of the compressed air gets raised in comparison to the free atmospheric air which leads to condensation within pipes as the compressed air cools downstream of the compressor. Users of compressed air have to confront a gamut of operational problems if the compressed air carries excessive water either in liquid or vapour phase. Some of them are freezing of outdoor airlines, corrosion in piping and equipment, malfunctioning of instruments that control the pneumatic process, fouling of processes and products and more as such.

### **Pre-Filter**

This filter avoids dust, dirt, foreign materials and moisture before entering into the molecular sieves bed and damaging the working. Trident make pre-filter(5micron) is used in this plant.

### **Fine filter**

This filter avoids dust, dirt, foreign materials and moisture before entering into the molecular sieves bed and damaging the working. Trident make fine-filter(1micron) is used in this plant.

### **Carbon filter**

This filter is used to remove oil and hydrocarbon vapour from the compressed air stream before get into the desiccant bed. Trident make carbon filter(0.01micron) is used in this plant.

### **After filter**

This filter avoids the desiccant particles from the adsorbent towers coming with the oxygen after production. Trident make fine-filter(1micron) is used in this plant.

### **Bacterial filter**

Bacterial filters provide effective protection against various types of particles including bacteria, viruses, and moisture droplets in the oxygen out from the plant. This filters help to protect the patient, and the breathing circuit from contamination.

### **Electronic auto drain valves**

Electronic auto drain valve (EDV) automatically removes condensate from the filters.

### **Pressure regulators**

The air pressure regulator controls the inlet air pressure before entering into the adsorber tower in the inlet side and control the delivery oxygen pressure at delivery side.

**CO Monitor**

This sensor is used to indicate the CO level in outlet air in terms of PPM.

**Ball valves**

These valves are used to open and shut off the inlet and product outlet from the receivers based on the requirement.

**Dew point monitor**

This sensor is used to indicate the moisture level in the outlet air in terms of PDP (Pressure dew point).

**PLC Control panel**

The PLC (Programmable Logic Controller) processes the inputs and outputs to and from the system components and communicates with the controller.

**3.3 PACKAGING AND HANDLING****Unpacking**

- Check for any obvious damage to the carton or its contents. If damage is evident, notify the carrier, or your local dealer.
- Remove all loose packing from the carton.
- Carefully remove all the components from the carton. The Breathing air dryer packaging contains the following parts. If any parts are missing, please contact your equipment provider.
  - ◆ 2 Dryspell plus Desiccant Air dryer
  - ◆ 2 Pre filter
  - ◆ 2 Fine filter
  - ◆ 2 Carbon filter (Optional)
  - ◆ 2 After filter
  - ◆ 2 Bacterial filter (Optional)
  - ◆ Electronic auto drain valves
  - ◆ 2 Pressure regulators
  - ◆ Pressure gauges (Optional)
  - ◆ CO monitor
  - ◆ 4 Ball valves
  - ◆ Dew point monitor
  - ◆ PLC Control panel
  - ◆ Non corrosive Pipe lines
  - ◆ Visual alarm

**Inspection**

- Inspect/examine exterior of the Breathing air dryer and accessories for damage. Inspect all components.

**Storage**

- Store the repackaged Breathing air dryer in a dry area.

## 4. DESCRIPTION OF OPERATION

Breathing air dryer works on the PSA principle. The mixed bed desiccant adsorbs moisture, CO and CO<sub>2</sub> from the compressed air and delivers pure dry air. For proper removal of moisture, CO and CO<sub>2</sub> from the wet air regeneration of the desiccant is required. Regeneration is achieved by means of allowing a part of the the dry air from the supply outlet.

**Cycle of Operations**

The breathing air dryer works based on the following phases,

- Drying
- Pressure Equalization
- Depressurization
- Regeneration
- Re-pressurization

**Drying cycle**

The compressed wet air flows through the pre filter. The water particles get filtered by the filter. The filtered air flows in to the adsorber tower filled with activated alumina where it loses all the moisture, CO and CO<sub>2</sub> to the alumina. Purified (Moisture and oil free) air further passing through the series filter to achieve the desired quality level.

**Pressure Equalization cycle**

At the end of drying cycle the second adsorber tower is ready for the next drying cycle so in order to re-pressurize the tower to drying pressure by means of inlet air it take so much time to save that energy the air in the tower 1 is fed in to the second tower and the pressures are equalized.

**Depressurization**

After drying for the preset cycle time, the desiccant bed will be saturated with moisture, CO and CO<sub>2</sub>. For successful removal of moisture, CO and CO<sub>2</sub> in the next cycle, this moisture, CO and CO<sub>2</sub> is to be removed from the desiccant. This removal of moisture cycle starts with depressurization. In this cycle air inside the tower is vent out by the depressurization valve. The pressure is expanded to atmospheric pressure. The sudden depressurization brings out CO and CO<sub>2</sub> molecules trapped in the sieves pores to the surface of the beads

**Regeneration Cycle**

In order to remove the moisture, CO and CO<sub>2</sub> during regeneration cycle. Small portion

of dry air from the drying tower is passes over the sieves through the regeneration orifice. This results in complete regeneration of Molecular Sieves and ready for the next cycle.

### Re-pressurization cycle

At the end of drying cycle the second adsorber tower is ready for the next drying cycle so re-pressurization of the tower2 to drying pressure is necessary this is achieved by allowing the inlet feed air to the adsorbent tower.

### Operating Principles - Dryer

Wet air enters the inlet pre-filter to get filtered up to 5 micron and then flows from the top manifold to the inlet valve via the air transfer tubes. Air then flows to the shuttle inlet valve and is diverted to tower 1 by the pressure difference between the two towers. The compressed air flowing through tower 1 is dried by the principle of pressure swing adsorption to a 2°C PDP and exits via the outlet filter. A small portion (12%) of the dried compressed air i.e. purge air is taken from the outlet and it is used to remove the water vapor stored in the previous cycle in the tower 2. When the purge air is flowing through the tower 2, it will take water vapor adsorbed in the desiccant bed and comes out as a wet air. Then it is expanded to near atmospheric pressure through the exhaust valve placed under the tower which is operated by the solenoid valve.

Pressure increases the ability of the purge air to strip the previously adsorbed water vapor from the partially saturated desiccant bed in tower 2. The air exhausts through the opened two-way exhaust valve. This cycle continues for 1.5 minutes then the exhaust valve closes and tank 2 begins re-pressurization. After 30 seconds exhaust valve 1 opens and the process repeats for tower 2.

- the online tower dries for 2 minutes
- the offline tower regenerates for 1 minute and 30 seconds
- the offline tower re-pressurizes for 30 seconds

### Warning

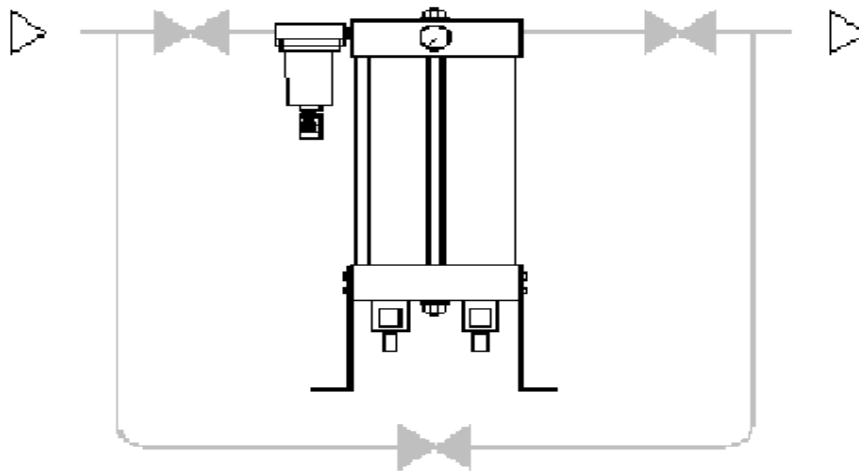
**Failure to follow these instructions can lead to serious injury or death.**  
**This dryer should be only be used for drying filtered, compressed air.**  
**Only put filtered compressed air into this air dryer.**

Only experienced and licensed electricians that are properly trained in compressed air systems should service or repair the Trident products. Before start-up or performing any maintenance on any Trident air dryer, filter, drain system or other equipment, you must first turn off and disconnect all electrical power and service to the equipment at the main disconnect switch. Also, be sure to bypass and depressurize the dryer to 0 PSIG.



Do not start or operate the dryer if there is a leak. Make sure the dryer's NEMA rating is applicable to the installation conditions. Do not operate the dryer at pressures and/or temperatures above the maximum allowable marked on the data label. Likewise, verify that incoming voltage matches, the voltage marked on the data label. Do not lift the dryer by its piping or control box or drop the dryer. Doing so, it may damage the dryer.

## 5. INSTALLATION



### Safety

**Dryspell plus dryers are intended for the drying of compressed air. Under no circumstance should they be used to dry other gases.**

The desiccants used are not toxic. However, they may cause respiratory problems if they are inhaled in dust form. The use of a dust mask is sufficient to protect personnel.

### Installation Site and Connections

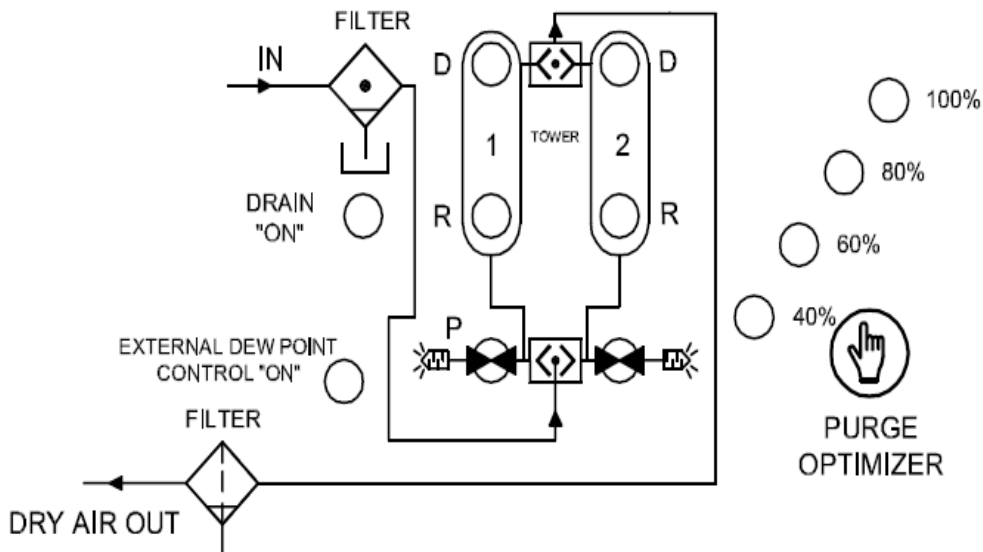
- Install the dryer in a closed clean, dry room protected from freezing. Access to the room should be restricted to personnel qualified in maintenance and operation.
- The room must be adequately ventilated. The dryer must not be directly exposed to sources of heat. The temperature of the room must not exceed 43°C/109°F.
- Make sure that the dryer is not near any equipment which does not comply with the electromagnetic compatibility directives and which may degrade dryer operation. There must be a minimum distance of 3 feet between the dryer and any other equipment which uses electricity.
- Ensure that the dryer is installed in the vertical position.

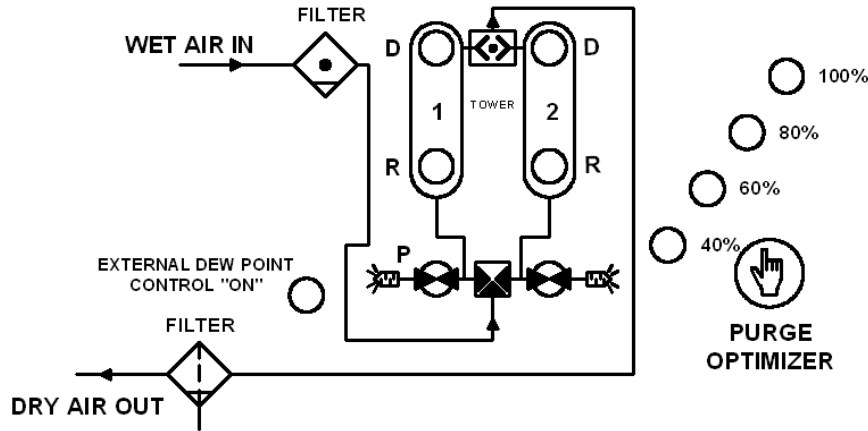
- Dryer should be secured by bolting it down.
- Install a system of by-pass valves between the dryer inlet and outlet so the dryer can be serviced without having to interrupt the compressed air supply from the circuit (see diagram above). The upstream and downstream valves must be closed during installation.
- Connect a drain line to the Pre-filter auto drain outlet.
- Check for leaks after all connections have been made.
- Always pressurize dryer before power up.

### Electrical Connections

Connect the electrical power cable to an 85-260 V, single phase, and 60 Hz grounded power supply. The electrical connection is done by the DIN connector located on the controller of the dryer.

### Control Panel DS 31-90





### Control Panel DS 31-200

The control panel presents all the instruments necessary to control and regulate the dryer:

- A machine diagram
- Two LEDs indicating the tower in drying operation (Tower 1 and Tower 2).
- A LED indicating the pre-filter drain operation (Drain) (for models equipped with electronic auto drain.)
- Press 8 sec Purge Optimizer button continuously, then set the value (40% to 100%) if needed to control the purge flow.

### Operating Cycles Time

Drying time : 2 min  
 Regeneration time : 1 min 30 seconds  
 Pressurization time : 30 seconds

First Cycle		Second Cycle	
Tower 1	Tower 2	Tower 1	Tower 2
Drying	Regeneration	Regeneration	Drying
	Re-pressurization	Re-pressurization	

When 1 is lighted, tower 1 is in drying operation and tower 2 is in regeneration mode. After tower 2 regeneration is finished, tower 2 LED will blink to show that the tower is now in the re-pressurization stage. After 30 seconds of re-pressurization, tower 1 will depressurize, the operating cycle is reversed with tower 1 is in the regeneration stage and tower 2 in the drying mode.

**Caution: At the end of the re-pressurization, the regeneration tower will depressurize by producing a loud noise.**

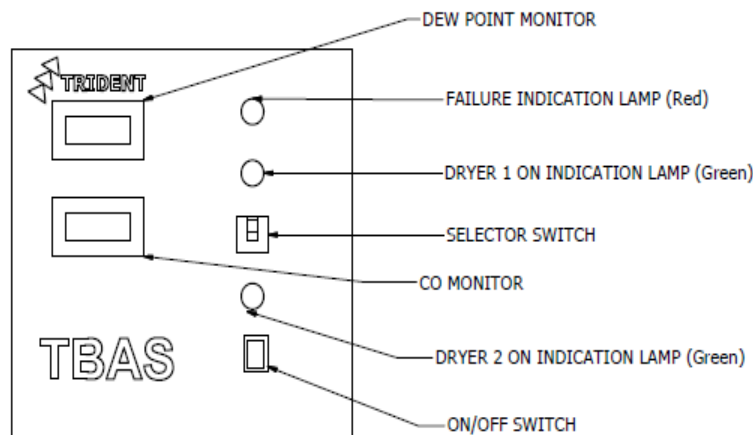
This cycle occurs every 2 minutes. (For models equipped with pre-filter and electronic auto drain, the pre-filter condensate drain discharge is programmed every 4 minutes for 4 seconds.) All these cycle times are fixed and not adjustable by user.

- Dew Point Stretch Cycle:  
It stretches the moisture loading time on the corresponding desiccant bed by increasing the drying time as per the requirement of the customer outlet condition.
- Purge Optimizer:  
It reduces the percentage of regeneration flow as for the required dew point. It has 4 options 40%,60%,80% & 100% purge optimization cycles respectively.

**PROCESS DATA**

Description	100%	80%	60%	40%
Cycle Time (min)	4	4	4	4
Drying Time (min)	2	2	2	2
Regeneration Time (Sec)	90	72	54	36
De-pressurization time (sec)	30	48	66	84

**TBAS controller box:**



The figure shows the view of the TBAS controller box.

**Dew point monitor**

Dew point is complying with NFPA 99 standard. TBAS dryer has desiccant type heatless dryer will capable to deliver -40 PDP dew point. A per standard dew point value (+2 deg C PDP) set in the controller. When the dryer dew point below 2 deg C PDP, It will indicated the visual alarm (Failure indication lamp ON (Red color)). The dryer controller will stretch the dew point of preset value of -10 deg C.

**CO Monitor**

CO is complying with NFPA 99 standard. The CO monitor will sense the CO level from 0 to 100 ppm. As per standard CO value 10 ppm set in the controller. When the air has more than 10 ppm CO level, it will indicate the visual (Failure indication lamp ON (Red color)) and Audible alarm.

**Selector Switch**

The panel has one two way switch. It will used to terminate the power supply from Dryer 1 to Dryer 2 and vice versa when the failure indication lamp ON.

Make sure that power to the dryer is OFF.

- Open the Hand shut off valve 1 and remaining all the three valves are in closed
- position if dryer 2 as a standby mode.
- Power supply given to the controller and switch ON panel when the dryer is
- pressurized.
- Check the selector switch mode is in Dryer 1 and dryer 1 Lamp ON
- Check if the LED on the tower is in the drying operation, and that the automatic
- drain valve at the bottom of the pre-filter drains every 4 minutes
- Open the Hand shut off valve 2.

The following are the features of the TBAS controller box

- Inbuilt CO monitor.
- Inbuilt dew point meter.
- Sound alarm and indication lamp for both CO monitor and Dew point meter.
- Manual ON/OFF switch for input power supply.
- Manual ON/OFF switch for dryer changeover
- Indication lamp for dryer operation.

**CO Monitor Display**

The following figure shows the display of the CO monitor

- TBAS CO monitor has the provision for giving the indication for CO level in the outlet air and indication for the changeover of the desiccant dryer by giving the sound and light indication.

- It also has a power switch to ON/OFF the monitor and it can be turned ON/OFF when it is required.
- This CO monitor has a provision for indicating the amount of flow.

## 6. HOW TO START THIS DRYER?

When you complete the installation as described in the previous section, the breathing air dryer is ready for easy start-up and operation.

### Initial Start Up

- ✓ Make sure the ON/OFF switch on the control panel is set to OFF.
- ✓ Connect the dryer with the power circuit and Make sure the power circuit cannot be turned off accidentally.

**Note: If the power is turned off unexpectedly, the unit will stop cycling.**

- ✓ Fully close the ball valve placed before the adsorber tower.
- ✓ Fully close the ball valve placed after the bacterial filter.
- ✓ Turn ON the compressor & air dryer.
- ✓ Now gradually open the inlet ball valve and allow the air to enter into the dryer.
- ✓ Now adjust the pressure regulator placed at the outlet to set required pressure
- ✓ In the control panel display go to the operator screen on that you can see the dew point and CO level..

### Shutting Down the dryer

- If there is an emergency press Emergency switch off button on the control panel.
- For Regular shut down during maintenance and below rated usage of the dryer follow the procedure below:
  - Open the secondary breathing air supply.
  - Close the outlet ball valve.
  - In the control panel touch screen display press the cycle OFF button.
  - Switch of the compressor and as well as the air dryer.
  - Now switch Off the power circuit of the dryer..

## 7.MAINTENANCE

This breathing air dryer is specifically designed to minimize routine preventive maintenance. Only professionals of the healthcare field or persons fully conversant with this process such as factory trained personnel should perform preventive maintenance or performance adjustments on the breathing air dryer.

**Note: PSA breathing air dryer are robust, reliable machines. To ensure uninterrupted, problem-free operation, regularly perform the inspections below.**

### Monthly Inspections

During the monthly routine inspection, check that:

- The drying and regeneration cycles function normally,
- The silencers are not clogged.

### Semi Annual Inspections

During the semi-annual routine inspection, check that:

- That the drying and regeneration cycles function normally
- The silencers are not clogged
- Replace filter elements

### Annual Inspections

During the annual routine inspection, check that:

- The drying and regeneration cycles function normally
- The silencers are not clogged
- Replace filter elements.
- The state all valve seals.

**Note: During the entire operation, the compressor and the dryer must be shut down. It is recommended for all personnel who are in the presence of the desiccant to wear dust masks.**

### Quantity of Desiccant in the Dryer

The replacement desiccant in your dryer must be absolutely identical to the initial desiccant. Contact the factory for desiccant kit part number.

The total quantities required for each model are as follows (weight in lbs):

<b>Dryspell plus Models</b>	<b>Quantity (Lbs)</b>
10	4.5
20	10.6
30	14.1
45	19.8
60	28.2
100	40
125	50
200	80

### Changing the Desiccant

#### **TBAS 10, 20, 30 ( Dryspell Plus Model Dryers)**

- Disconnect the dryer from airlines.
- Loosen the Tie rod and remove it
- Remove the old adsorbent and fill activated alumina then molecular sieves
- Make sure O-rings or gaskets are in place
- Install and screw the Tie rod

#### **TBAS 45, 60 ( Dryspell Plus Model Dryers)**

- Disconnect dryer from air lines.
- Loosen the M8 Allen Bolt and remove the top block and top compactor plate.
- Remove the saturated desiccant bag by pulling the bag handle in upward direction and replace the new desiccant bag. If there is no desiccant bag, just tilt the dryer remove the old desiccant and replace new desiccant bag. Refer Dryspell Plus 45, 60 Exploded view drawing.
- Make sure O-rings or gaskets are in place
- Install the top compactor plate continues by top block and screw the M8 Allen Bolt.

#### **TBAS 100, 200 ( Dryspell Plus Model Dryers)**

- Disconnect dryer from air lines.
- Loosen the M8 Allen Bolt and remove the top block and top compactor plate.



- Remove the saturated desiccant bag by pulling the bag handle in upward direction and replace the new desiccant bag. For replacement, put 3 no. Activated alumina bag (AD1398) then 1 no. Molecular sieves bag (AD1424) in each tower. If there is no desiccant bag, just tilt the dryer remove the old desiccant and replace new desiccant bag.
- Make sure O-rings or gaskets are in place
- Install the top compactor plate continues by top block and screw the M8 Allen Bolt.

### **TBAS 125 ( Dryspell Plus Model Dryers)**

- Disconnect dryer from air lines.
- Loosen the M8 Allen Bolt and remove the top block and top compactor plate.
- Remove the saturated desiccant bag by pulling the bag handle in upward direction and replace the new desiccant bag. For replacement, put 3 no. Activated alumina bag (AD1398) followed 1 no. Activated alumina + molecular sieves bag (AD1452) then 1 no. Molecular sieves bag (AD1424) in each tower. If there is no desiccant bag, just tilt the dryer remove the old desiccant and replace new desiccant bag.
- Make sure O-rings or gaskets are in place
- Install the top compactor plate continues by top block and screw the M8 Allen Bolt.

### **How to change from working unit (Dryer 1) to stand by unit (Dryer 2)**

When the failure indication lamp ON, you have to follow the following procedure.

1. Open the Hand shut off valve 3 and 4 and close the hand shut off valve 1 and 2.
2. Wait 2 min. ensure the tower 1 dryer is ON (Power supply ON, Pneumatic supply OFF)
3. Change the power supply from dryer 1 to dryer 2 by using selector switch in the panel.

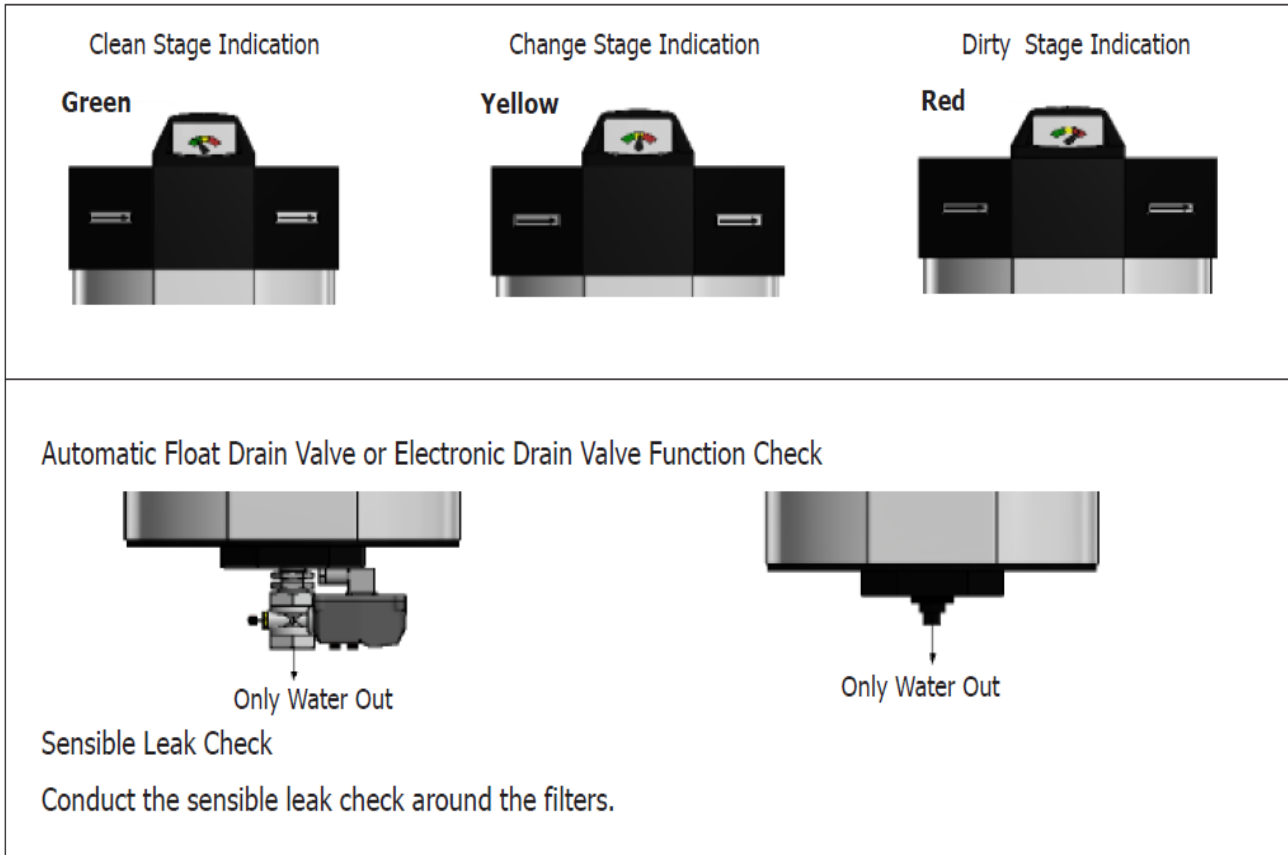
*Hand shut off valve 1 and 2 for dryer 1 and 3 & 4 for Dryer 2. The same procedure following when change the dryer from 2 to 1 after servicing.*

**Filter Installation procedure**

	<p><b>Ensure the filter end connection is BSP/NPT</b></p>	
	<p><b>Check for leaks after all connections have been made. Do not start or operate the filter with leak.</b></p>	
	<p><b>If the Electronic Adjustable drain valve connection have been installed, must to ensure the input voltage supply.</b></p>	

## Replacing the filter element

1. Before replacing the element we need to check whether the replacement is required.



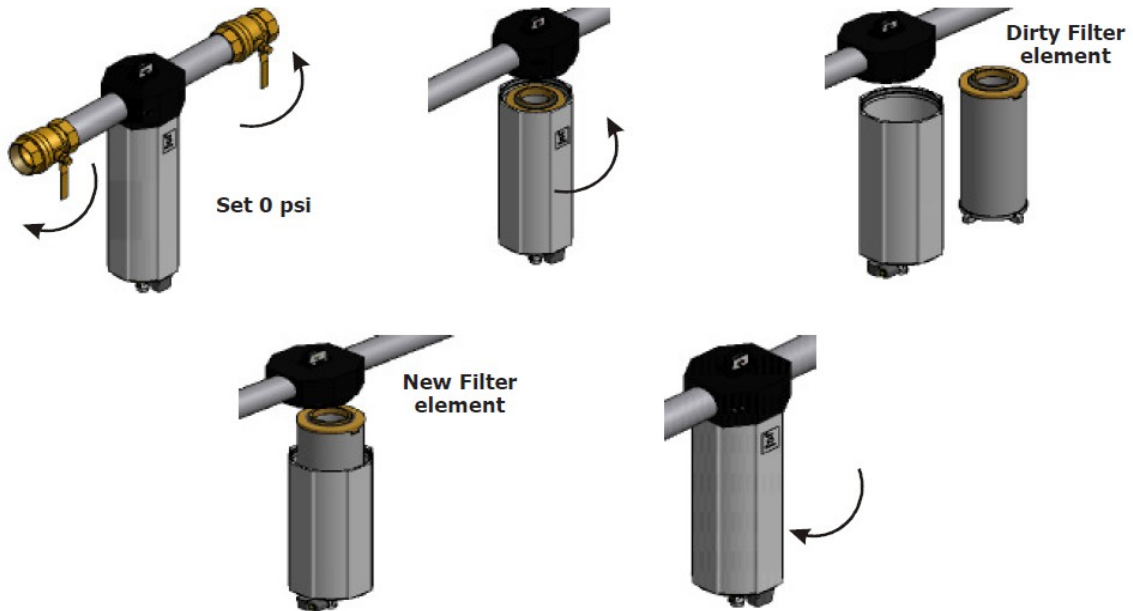
2. During the change Signal we need to prepare for the filter element change. The filter element must be changed at change stage indication.

3. If you are replacing a coalescing filter element, remove and discard the gasket where the top of the filter element connects to the filter housing.

4. If you are replacing a coalescing filter element, make sure a black gasket is attached to the top of the new element.

4. Check for leaks after all connections have been made. Do not start or operate the filter with leak.

5. If the Electronic Adjustable drain valve connection have been installed, must to ensure the input voltage supply.



During the entire operation, the compressor and the dryer must be shut down. It is recommended for all personnel who are in the presence of the desiccant to wear dust masks

	Daily	Monthly	6 Month	1 year	2 year
Pre filter – element and seals			Replace		
After filter – element and seals			Replace		
Fine filter – element and seals			Replace		
Dryer	Check function			Replace Seals and O-ring Kit	Replace desiccant
Bacterial Filter		Autoclave			
Dew point Sensor				Calibrate	
Co Monitor				Calibrate	

## 8.TROUBLESHOOTING

The following problems may exist while using the breathing air dryer. This section will give details about the problems and their remedy. Troubleshooting tree will help you to solve the problems

### 1. General troubleshooting

Before reviewing the troubleshooting chart, the following steps may be useful to isolate any malfunctions:

- ✘ Turn the dryer on. If unit does not turn on, refer to troubleshooting procedure.
- ✘ Make sure all filters are clean.
- ✘ Make sure the unit is cycling properly. If the unit is not cycling properly, refer to troubleshooting procedure.
- ✘ If dryer is not meeting specifications, make sure that the unit is leak free by testing all tubing connections and fittings with leak testing solution. Repair all leaks by tightening connections and fittings.
- ✘ Review troubleshooting procedure to isolate and repair any other malfunctions.

### LEDS not Glowing

Check the power supply connection and tension

### Tower Status LED not changing

- ✓ Change the controller

### LEDS Status Change but Tower not Switching

- ✓ Check coil connection at DIN and terminal connector in the controller
- ✓ Check the solenoid valve

### No Purging

- ✓ Check the solenoid valve
- ✓ Check the exhaust valve
- ✓ Clean the silencer (muffler)Continuous Purging at Tower 1A – Shuttle not closing
- ✓ Check pilot air for exhaust valve
- ✓ Check exhaust valve piston stuck

### High Purge Loss

- ✓ Check outlet shuttle closing
- ✓ Check for silencer choke

### High Pressure Drop across dryer

- ✓ Pre-filter may be clogged. Check and replace filter elements.
- ✓ Check whether the dryer is being overflowed.

## 2. Low Operating Pressure

Lower than normal operating pressure may indicate any of the following,

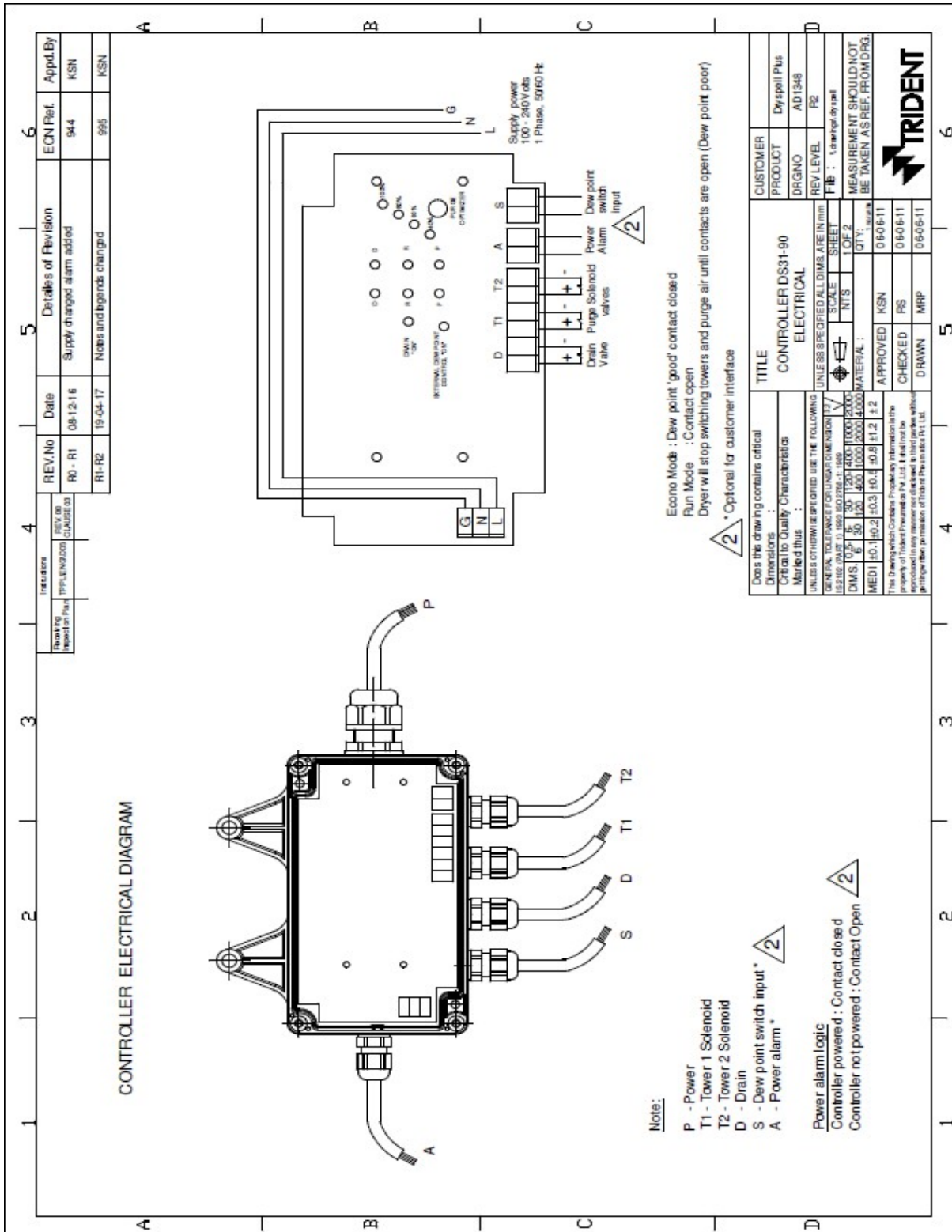
- A restriction in the suction air intake filter, which limits the amount of air pass through it to the dryer. Clean the air filters free from foreign materials.
- An improperly operating circuit board or solenoid valve. Confirm that the circuit board and solenoid valves function properly.
- A leak in the unit, which allows system pressure to escape. Perform Leak test in the unit.
- A compressor with reduced output. Ensure that the oxygen concentration level at the desired liter flow is within Trident's specifications. If it is below specifications, replace or repair the compressor.

## 3. High Operating Pressure

Higher than normal operating pressure may indicate any of the following.

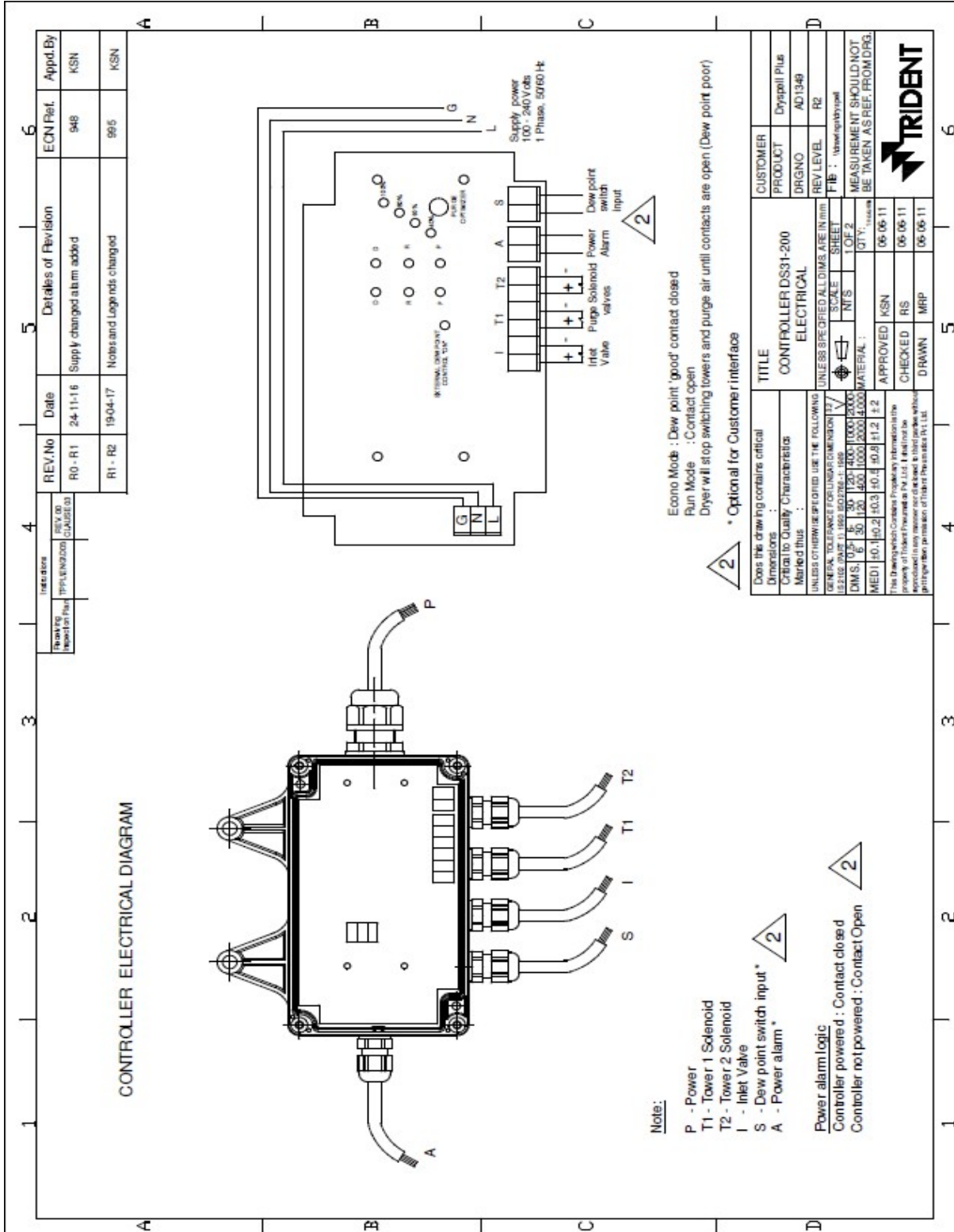
- A restrictive muffler, which does not allow the waste (purge) gas to exit the system freely. Operate the unit with the muffler disconnected to see if the operating pressure returns to normal.
- An improperly operating circuit board or solenoid valve. Confirm that the circuit board and solenoid valves function properly.
- A restrictive diffuser, which does not allow the inlet feed air as well as exhaust air from the dryer. Check the diffuser and correct it.
- Contaminated sieve beds. Change the sieve beds.

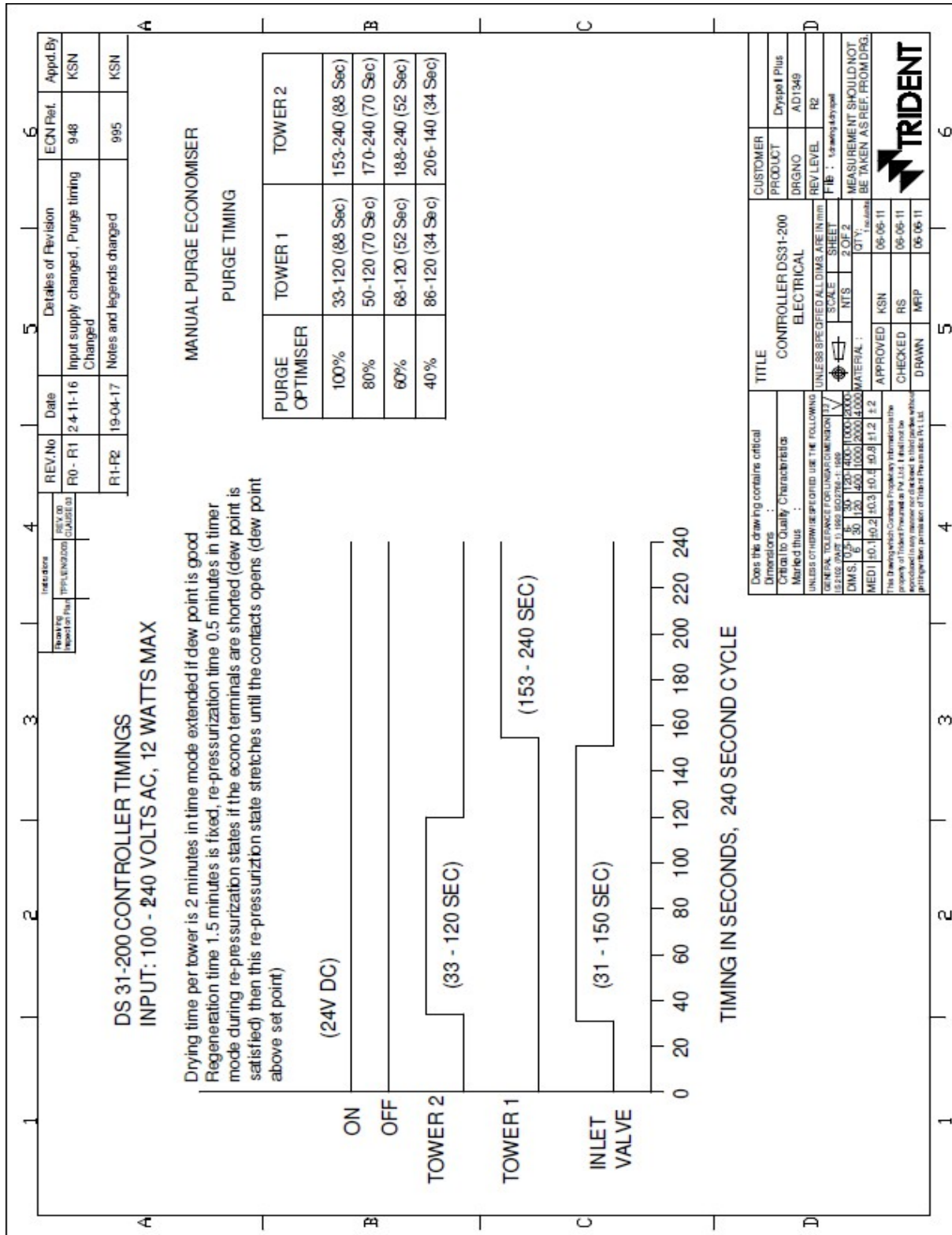




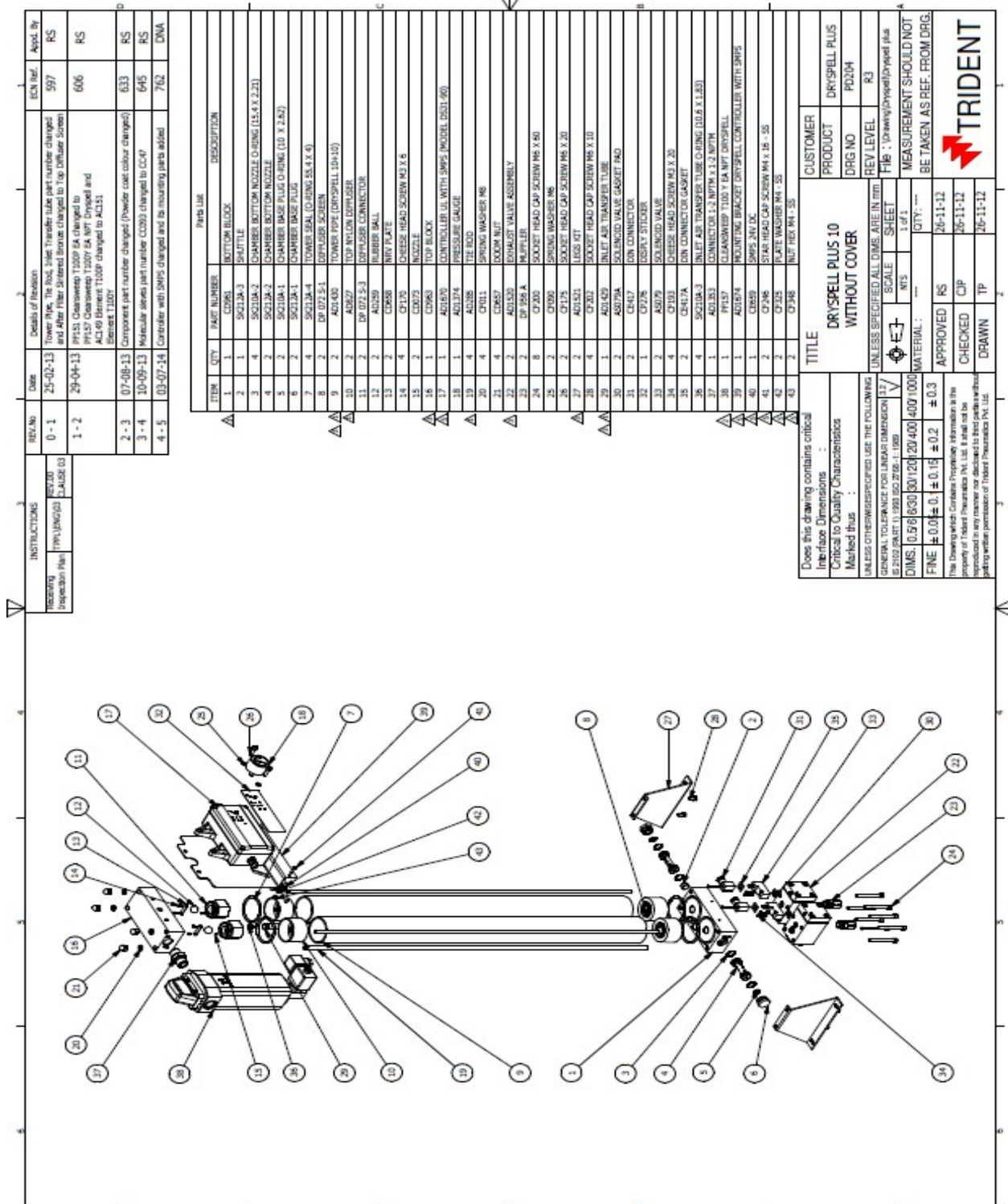








### 10. Dryspell Plus Exploded view



REV. NO	DATE	DETAILS OF REVISION	ECN REF.	APPD. BY
0-1	25-02-13	Tower Pipe, The Road, Inlet Transfer tube part number changed and After Filter Screened Screen changed to Top Diffuser Screen	597	RS
1-2	29-04-13	PF53 Coarseware T100P BA changed to PF57 Coarseware T100P BA NPT Dryspell and AC149 Borenet T100P changed to AC151 Borenet T100P	606	RS
2-3	07-08-13	Component part number changed (Powder coat colour changed)	633	RS
3-4	10-09-13	Molecular sieve part number C0380 changed to C04P	645	RS
4-5	03-07-14	Controller with Smps changed and its mounting parts added	762	DVA

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CDW63	BOTTOM BLOCK
2	1	SO21A-3	SHUTTLE
3	4	SO21A-2	CHAMBER BOTTOM NOZZLE O-RING (13.4 X 2.21)
4	2	SO21A-2	CHAMBER BOTTOM NOZZLE
5	2	SO21A-1	CHAMBER BASE PLUS O-RING (10 X 2.62)
6	2	SO21A-1	CHAMBER BASE PLUS
7	4	SO21A-4	TOWER SEAL O-RING (5.4 X 4)
8	2	DP 075 5-1	TOP USER SCREEN
9	2	AD149	TOWER PIPE (DRYSPELL 104-10)
10	2	AD527	TOP INLET DIFFUSER
11	2	DP 072 5-3	DIFFUSER CONNECTOR
12	2	AD259	RUBBER BALL
13	2	CD688	RNY PLATE
14	4	CF175	CHEESE HEAD SCREW M3 X 6
15	2	CD073	NOZZLE
16	1	CDW63	TOP BLOCK
17	1	AD1675	CONTROLLER UL WITH Smps (MOORE DS01-90)
18	1	AD1374	PRESSURE GAUGE
19	4	AD208	TEE ROD
20	4	CF111	SPRING WASHER M6
21	4	CD657	DOOM NUT
22	2	AD2035	EXHAUST VALVE ASSEMBLY
23	2	DP 106 A	MUFFLER
24	8	CF200	SOCKET HEAD CAP SCREW M6 X 80
25	2	CF090	SPRING WASHER M6
26	2	CF175	SOCKET HEAD CAP SCREW M6 X 20
27	2	AD1521	LAGS KIT
28	4	CF202	SOCKET HEAD CAP SCREW M6 X 10
29	1	AD1429	INLET AIR TRANSFER TUBE
30	2	CD179A	SOLINGO VALVE GASKET PAD
31	2	CD167	CON CONNECTOR
32	1	CF276	GASKY STUDER
33	2	AD579	SOLINGO VALVE
34	4	CF193	CHEESE HEAD SCREW M3 X 20
35	2	CD174	CON CONNECTOR GASKET
36	4	SO21A-3	INLET AIR TRANSFER TUBE O-RING (10.6 X 1.83)
37	1	PF137	CLEANWIP TUB Y BA NPT DRYSPELL
38	1	AD1633	CLEANWIP TUB Y BA NPT DRYSPELL
39	1	CD1674	MOUNTING BRACKET DRYSPELL CONTROLLER WITH Smps
40	1	CD1674	Smps 2AV DC
41	2	CF246	STAR HEAD CAP SCREW M4 X 35 - 35
42	2	CF262	PLATE WASHER M4 - 25
43	2	CF246	NUT HEX M4 - 25

**TITLE**  
**DRYSPELL PLUS 10**  
**WITHOUT COVER**

**CUSTOMER**  
**PRODUCT** DRYSPELL PLUS  
**DRG NO** RD204  
**REV LEVEL** R3

**SCALE** 1 of 1  
**SHEET** 1 of 1  
**FILE** : (www)dryspellplus

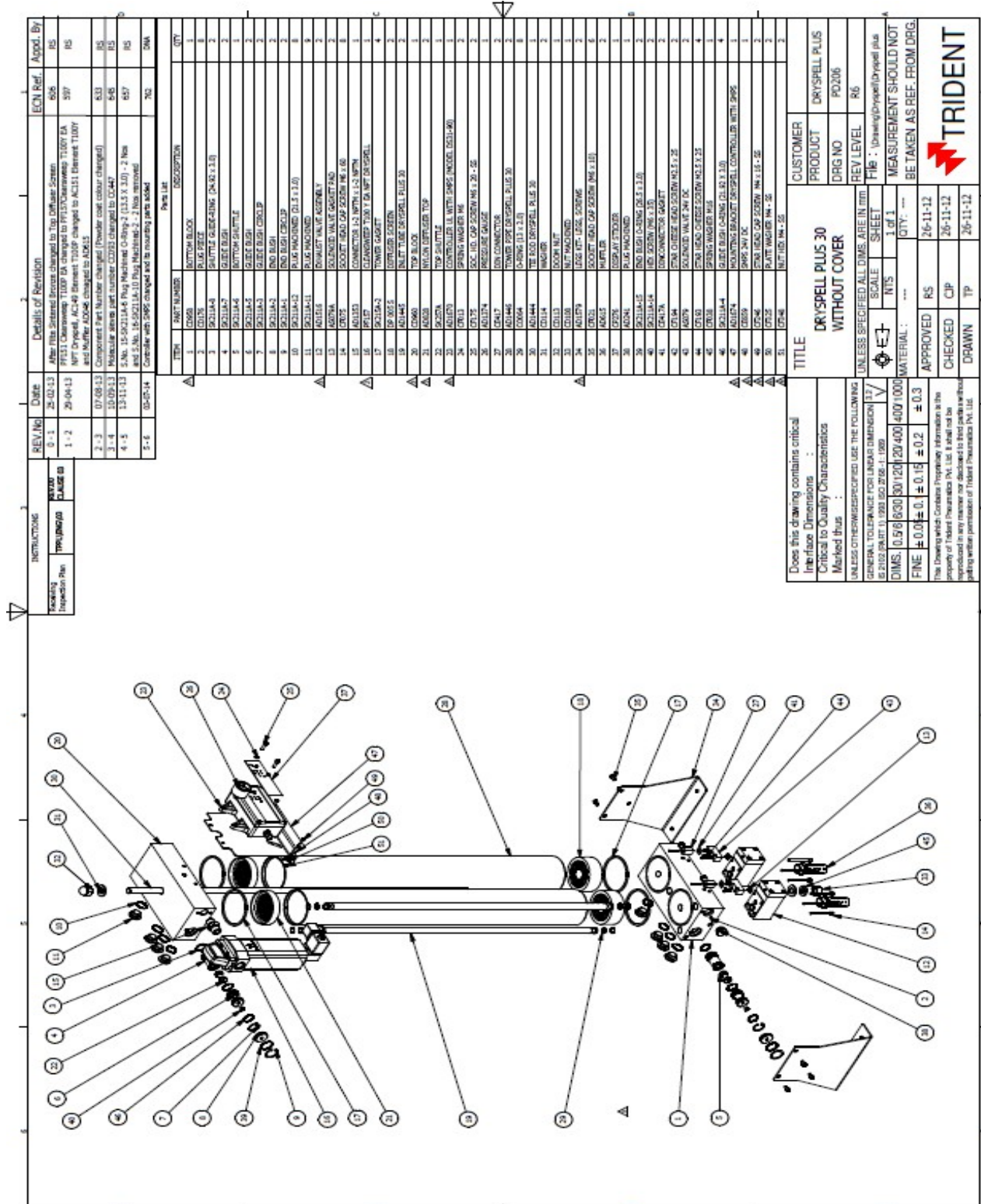
**CITY** : ---  
**APPROVED** RS 26-11-12  
**CHECKED** CIP 26-11-12  
**DRAWN** TP 26-11-12

UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING  
 GENERAL TOLERANCE FOR LINEAR DIMENSION (1:7)  
 IS 2102 (PRACT. 0, 1993 ISO 2768 - 1, 1999)

**DIMS** 0.5/6/630/30/120/20/400/400/1000  
**FINE** ± 0.01 ± 0.15 ± 0.2 ± 0.3

MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.





REV. No	Date	Details of Revision	EON Ref.	Appd. By
0-1	25-02-13	After first standard circuit changed to Top Diffuser Screen	606	RS
1-2	29-04-13	FR131 Chatter sweep 1100V DA changed to FR131 Chatter sweep 1100V DA NPT Dryspell, AC-40 Element TDSIP changed to AC151 Element 1100V and buffer AD006 changed to AD063	599	RS
2-3	07-08-13	Component Part Number changed (Powder coat colour changed)	633	RS
3-4	10-09-13	Molecular sieve part number CD033 changed to CD447	646	RS
4-5	13-11-13	S.No. 15-50-211A-6 Plug Machine 0-80y-2 (13.2 X 3.0) - 2 New and S.No. 16-50-211A-10 Plug Machine 2 - 2 New removed	657	RS
5-6	05-05-14	Corrector with 0405 changed and to mounting arms added	702	DML

ITEM	PART NUMBER	DESCRIPTION	QTY
1	0260	BOTTOM BLOCK	1
2	02076	PLUG FEELER	8
3	50218A-3	SHUTTLE GUIDE-ARM (2x42 x 3.0)	2
4	50218A-7	GUIDE BUSH	2
5	50218A-4	BOTTOM RAIL/PIN	1
6	50218A-5	GUIDE BUSH	2
7	50218A-2	GUIDE BUSH GROUP	2
8	50218A-2	END BUSH	2
9	50218A-1	END BUSH GROUP	2
10	50218A-12	PLUG MACHINING (21.3 X 3.0)	2
11	50218A-11	PLUG MACHINING	8
12	AD018	DISMOUNT VALVE ASSEMBLY	2
13	AD018A	SCREWED VALVE CASSETT PART	2
14	AD018B	SCREWED VALVE CASSETT PART	2
15	AD018C	SCREWED VALVE CASSETT PART	2
16	AD018D	SCREWED VALVE CASSETT PART	2
17	AD018E	SCREWED VALVE CASSETT PART	2
18	AD018F	SCREWED VALVE CASSETT PART	2
19	AD018G	SCREWED VALVE CASSETT PART	2
20	AD018H	SCREWED VALVE CASSETT PART	2
21	AD018I	SCREWED VALVE CASSETT PART	2
22	AD018J	SCREWED VALVE CASSETT PART	2
23	AD018K	SCREWED VALVE CASSETT PART	2
24	AD018L	SCREWED VALVE CASSETT PART	2
25	AD018M	SCREWED VALVE CASSETT PART	2
26	AD018N	SCREWED VALVE CASSETT PART	2
27	AD018O	SCREWED VALVE CASSETT PART	2
28	AD018P	SCREWED VALVE CASSETT PART	2
29	AD018Q	SCREWED VALVE CASSETT PART	2
30	AD018R	SCREWED VALVE CASSETT PART	2
31	AD018S	SCREWED VALVE CASSETT PART	2
32	AD018T	SCREWED VALVE CASSETT PART	2
33	AD018U	SCREWED VALVE CASSETT PART	2
34	AD018V	SCREWED VALVE CASSETT PART	2
35	AD018W	SCREWED VALVE CASSETT PART	2
36	AD018X	SCREWED VALVE CASSETT PART	2
37	AD018Y	SCREWED VALVE CASSETT PART	2
38	AD018Z	SCREWED VALVE CASSETT PART	2
39	AD019	SCREWED VALVE CASSETT PART	2
40	AD019A	SCREWED VALVE CASSETT PART	2
41	AD019B	SCREWED VALVE CASSETT PART	2
42	AD019C	SCREWED VALVE CASSETT PART	2
43	AD019D	SCREWED VALVE CASSETT PART	2
44	AD019E	SCREWED VALVE CASSETT PART	2
45	AD019F	SCREWED VALVE CASSETT PART	2
46	AD019G	SCREWED VALVE CASSETT PART	2
47	AD019H	SCREWED VALVE CASSETT PART	2
48	AD019I	SCREWED VALVE CASSETT PART	2
49	AD019J	SCREWED VALVE CASSETT PART	2
50	AD019K	SCREWED VALVE CASSETT PART	2
51	AD019L	SCREWED VALVE CASSETT PART	2

**INSTRUCTIONS**  
 Assembly Inspection Plan  
 DRAWN: [Signature]

**DETAILS OF REVISION**

**REVISIONS**

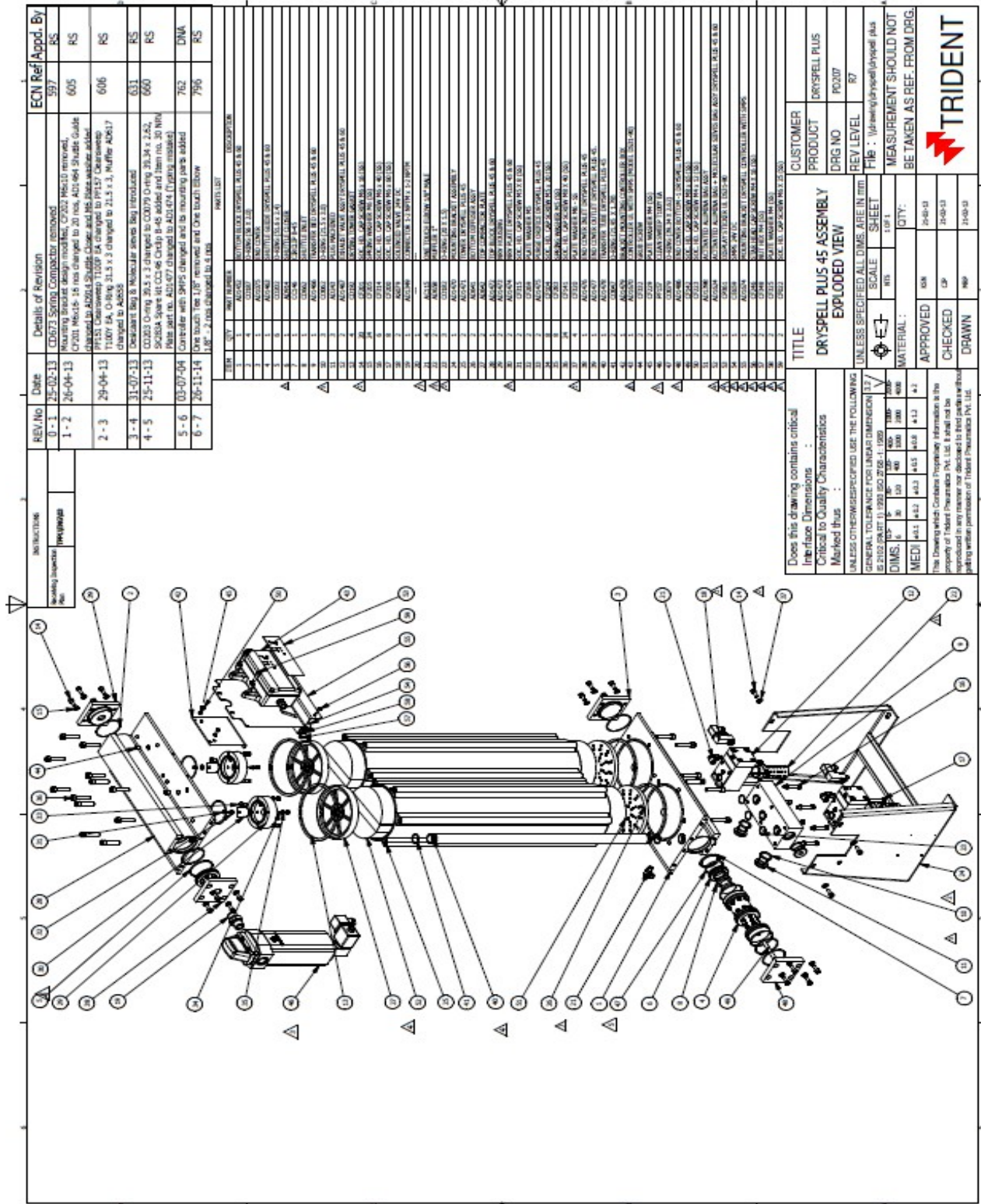
**DATE**

**DESCRIPTION**

**APPROVED** RS 26-11-11  
**CHECKED** CJP 26-11-12  
**DRAWN** TP 26-11-12

**MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.**

**TRIDENT**



REV No	Date	Details of Revision	ECN Ref	Appd. By
0 - 1	25-10-13	CD673 Solenoid Compactor removed	597	RS
1 - 2	26-04-13	Remaining bracket design modified, CD602 Microlid removed, CD201 Microlid - 16 has changed to 20 nos, A21-694 Shuttle Guide changed to A201-5 Shuttle Choke and HS plate washer added	605	RS
2 - 3	29-04-13	PT123 Clearovers T1007 SA changed to PT127 Clearovers T1007 SA, O-ring 21.5 x 3 changed to 21.5 x 3, Muffler AD0617 changed to AD058	606	RS
3 - 4	31-07-13	Decantant Bag 8 Molecular sieves bag introduced	631	RS
4 - 5	25-11-13	CD203 O-ring 26.5 x 3 changed to CD079 O-ring 26.34 x 2.62, Souda Spare kit CD056 Chp B-45 added and Item no. 30 NIM added, Part no. A21-677 changed to A21-674 (Typing mistake)	660	RS
5 - 6	03-07-04	Controller with 36V5 changed and its mounting plate added	762	DNA
6 - 7	26-11-14	One touch 'on' removed and One touch 'off' added 1.08 - 2.18m changed to 4.0m	796	RS

ITEM NO	QTY	PART NUMBER	DESCRIPTION
1	1	A21502	DRYSPELL PLUS 45 B.S.B
2	1	A21503	DRYSPELL PLUS 45 B.S.B
3	1	A21504	DRYSPELL PLUS 45 B.S.B
4	1	A21505	DRYSPELL PLUS 45 B.S.B
5	1	A21506	DRYSPELL PLUS 45 B.S.B
6	1	A21507	DRYSPELL PLUS 45 B.S.B
7	1	A21508	DRYSPELL PLUS 45 B.S.B
8	1	A21509	DRYSPELL PLUS 45 B.S.B
9	1	A21510	DRYSPELL PLUS 45 B.S.B
10	1	A21511	DRYSPELL PLUS 45 B.S.B
11	1	A21512	DRYSPELL PLUS 45 B.S.B
12	1	A21513	DRYSPELL PLUS 45 B.S.B
13	1	A21514	DRYSPELL PLUS 45 B.S.B
14	1	A21515	DRYSPELL PLUS 45 B.S.B
15	1	A21516	DRYSPELL PLUS 45 B.S.B
16	1	A21517	DRYSPELL PLUS 45 B.S.B
17	1	A21518	DRYSPELL PLUS 45 B.S.B
18	1	A21519	DRYSPELL PLUS 45 B.S.B
19	1	A21520	DRYSPELL PLUS 45 B.S.B
20	1	A21521	DRYSPELL PLUS 45 B.S.B
21	1	A21522	DRYSPELL PLUS 45 B.S.B
22	1	A21523	DRYSPELL PLUS 45 B.S.B
23	1	A21524	DRYSPELL PLUS 45 B.S.B
24	1	A21525	DRYSPELL PLUS 45 B.S.B
25	1	A21526	DRYSPELL PLUS 45 B.S.B
26	1	A21527	DRYSPELL PLUS 45 B.S.B
27	1	A21528	DRYSPELL PLUS 45 B.S.B
28	1	A21529	DRYSPELL PLUS 45 B.S.B
29	1	A21530	DRYSPELL PLUS 45 B.S.B
30	1	A21531	DRYSPELL PLUS 45 B.S.B
31	1	A21532	DRYSPELL PLUS 45 B.S.B
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33	1	A21534	DRYSPELL PLUS 45 B.S.B
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37	1	A21538	DRYSPELL PLUS 45 B.S.B
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41	1	A21542	DRYSPELL PLUS 45 B.S.B
42	1	A21543	DRYSPELL PLUS 45 B.S.B
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44	1	A21545	DRYSPELL PLUS 45 B.S.B
45	1	A21546	DRYSPELL PLUS 45 B.S.B
46	1	A21547	DRYSPELL PLUS 45 B.S.B
47	1	A21548	DRYSPELL PLUS 45 B.S.B
48	1	A21549	DRYSPELL PLUS 45 B.S.B
49	1	A21550	DRYSPELL PLUS 45 B.S.B
50	1	A21551	DRYSPELL PLUS 45 B.S.B
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56	1	A21557	DRYSPELL PLUS 45 B.S.B
57	1	A21558	DRYSPELL PLUS 45 B.S.B
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67	1	A21568	DRYSPELL PLUS 45 B.S.B
68	1	A21569	DRYSPELL PLUS 45 B.S.B
69	1	A21570	DRYSPELL PLUS 45 B.S.B
70	1	A21571	DRYSPELL PLUS 45 B.S.B
71	1	A21572	DRYSPELL PLUS 45 B.S.B
72	1	A21573	DRYSPELL PLUS 45 B.S.B
73	1	A21574	DRYSPELL PLUS 45 B.S.B
74	1	A21575	DRYSPELL PLUS 45 B.S.B
75	1	A21576	DRYSPELL PLUS 45 B.S.B
76	1	A21577	DRYSPELL PLUS 45 B.S.B
77	1	A21578	DRYSPELL PLUS 45 B.S.B
78	1	A21579	DRYSPELL PLUS 45 B.S.B
79	1	A21580	DRYSPELL PLUS 45 B.S.B
80	1	A21581	DRYSPELL PLUS 45 B.S.B
81	1	A21582	DRYSPELL PLUS 45 B.S.B
82	1	A21583	DRYSPELL PLUS 45 B.S.B
83	1	A21584	DRYSPELL PLUS 45 B.S.B
84	1	A21585	DRYSPELL PLUS 45 B.S.B
85	1	A21586	DRYSPELL PLUS 45 B.S.B
86	1	A21587	DRYSPELL PLUS 45 B.S.B
87	1	A21588	DRYSPELL PLUS 45 B.S.B
88	1	A21589	DRYSPELL PLUS 45 B.S.B
89	1	A21590	DRYSPELL PLUS 45 B.S.B
90	1	A21591	DRYSPELL PLUS 45 B.S.B
91	1	A21592	DRYSPELL PLUS 45 B.S.B
92	1	A21593	DRYSPELL PLUS 45 B.S.B
93	1	A21594	DRYSPELL PLUS 45 B.S.B
94	1	A21595	DRYSPELL PLUS 45 B.S.B
95	1	A21596	DRYSPELL PLUS 45 B.S.B
96	1	A21597	DRYSPELL PLUS 45 B.S.B
97	1	A21598	DRYSPELL PLUS 45 B.S.B
98	1	A21599	DRYSPELL PLUS 45 B.S.B
99	1	A21600	DRYSPELL PLUS 45 B.S.B
100	1	A21601	DRYSPELL PLUS 45 B.S.B

Does this drawing contain critical Interface Dimensions :  
Critical to Quality Characteristics Marked thus :

UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING GENERAL TOLERANCE FOR LINEAR DIMENSION (mm)  
DIMENSIONS : 0 - 100 ±0.250  
100 - 1000 ±0.300  
1000 - 10000 ±0.400  
MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.

UNLESS SPECIFIED ALL DIMS ARE IN mm  
SCALE : AS SHOWN  
SHEET : 1 OF 1  
MATERIAL :  
APPROVED :  
CHECKED :  
DRAWN :

TITLE :  
DRYSPELL PLUS 45 ASSEMBLY EXPLODED VIEW

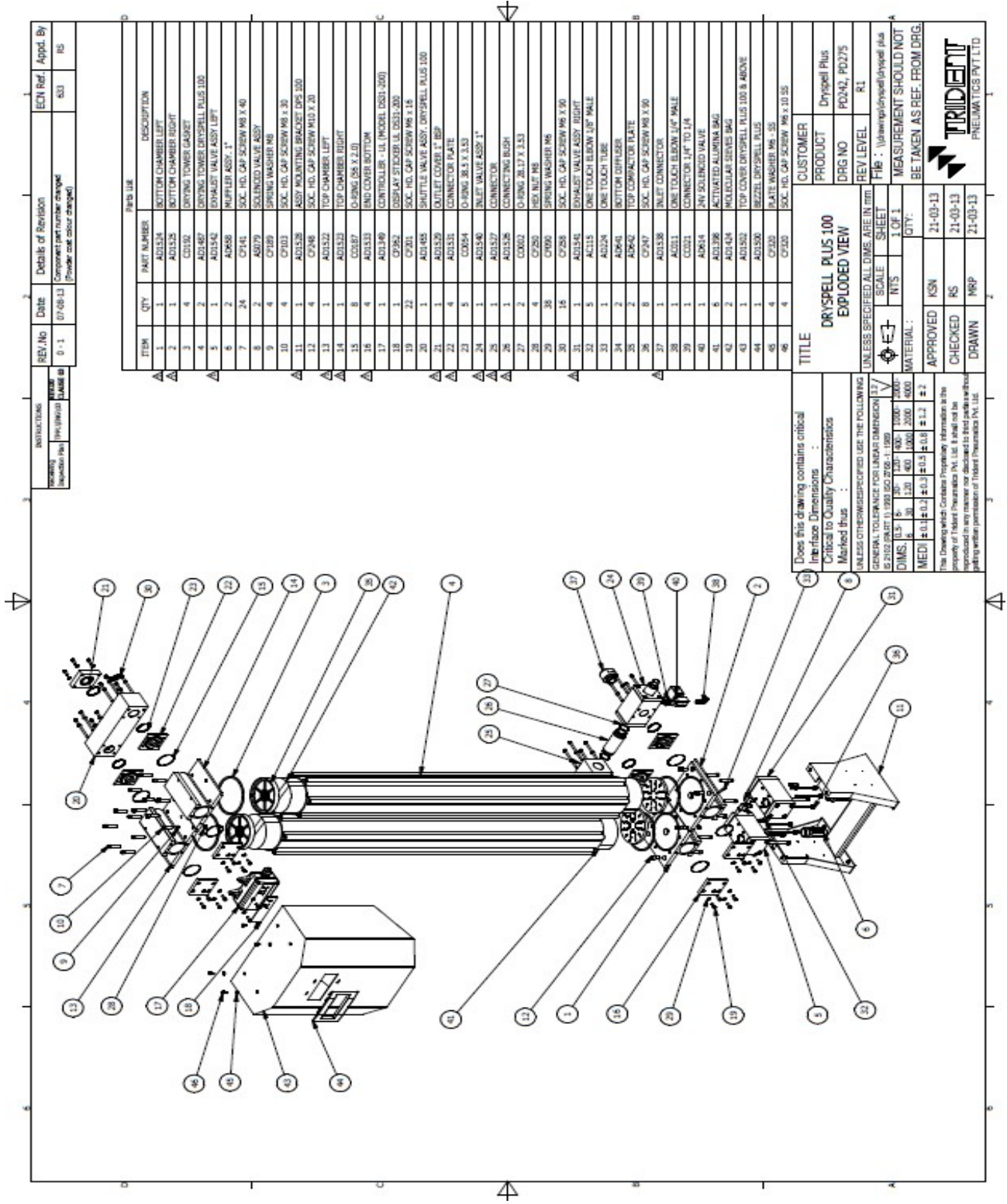
CUSTOMER :  
PRODUCT :  
DRG NO :  
REV LEVEL :  
FILE :  
MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.

APPROVED :  
CHECKED :  
DRAWN :

TRIDENT







ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	AD3134	BOTTOM CHAMBER LEFT
2	1	AD3135	BOTTOM CHAMBER RIGHT
3	4	CD310	DRYING TOWER GAUZE
4	2	AD3487	DRYING TOWER DRYSPELL PLUS 100
5	1	AD3142	EXHAUST VALVE ASSY LEFT
6	2	AD368	MUFFLER ASSY. 1"
7	24	CF141	SOCL. NO. CAP SCREW M6 X 4.0
8	2	AD3079	SOLENOID VALVE ASSY
9	4	CF189	SPRING WASHER M6
10	4	CF103	SOCL. NO. CAP SCREW M6 X 2.0
11	1	AD3138	ASSY MOUNTING BRACKET DPS 100
12	4	CF148	SOCL. NO. CAP SCREW M10 X 2.0
13	1	AD3132	TOP CHAMBER LEFT
14	1	AD3133	TOP CHAMBER RIGHT
15	8	CS317	O-RING 26.5 X 2.01
16	4	AD3131	END COVER BOTTOM
17	1	AD3149	CONTROLLER - ILL (MODEL DS01-200)
18	1	CF262	DISPLAY STEERING LE DS01-200
19	22	CF201	SOCL. NO. CAP SCREW M6 X 1.6
20	1	AD3485	SHUTTLE VALVE ASSY. DRYSPELL PLUS 100
21	1	AD3139	OUTLET COVER 1" BSP
22	4	AD3131	CONNECTOR PLATE
23	5	CO354	O-RING 26.5 X 2.53
24	1	AD3140	INLET VALVE ASSY. 1"
25	1	AD3137	CONNECTOR
26	1	AD3136	CONNECTING BUSH
27	2	CO301	O-RING 26.17 X 1.51
28	4	CF285	HEX NUT M6
29	38	CF206	SPRING WASHER M6
30	16	CF268	SOCL. NO. CAP SCREW M6 X 1.6
31	1	AD3146	EXHAUST VALVE ASSY RIGHT
32	5	AC115	ONE TOUCH ELBOW 1/4" MALE
33	1	AD324	ONE TOUCH TUBE
34	2	AD348	BOTTOM DISPENSER
35	2	AD346	TOP COMPACTOR PLATE
36	8	CF247	SOCL. NO. CAP SCREW M6 X 1.6
37	1	AD3138	INLET CONNECTOR
38	1	AD311	ONE TOUCH ELBOW 1/4" MALE
39	1	CO301	CONNECTOR 1/4" TO 1/4"
40	1	AD314	1/4" SOLENOID VALVE
41	6	AD308	ACTIVATED ALUMINA BAG
42	2	AD345	MOLECULAR SIEVES BAG
43	1	AD343	TOP COVER DRYSPELL PLUS 100 B ABOVE
44	1	AD300	BEZEL DRYSPELL PLUS
45	4	CF102	PLATE WASHER M6 - S5
46	4	CF102	SOCL. NO. CAP SCREW M6 X 10 S5

**TITLE**  
**DRYSPELL PLUS 100**  
**EXPLODED VIEW**

Does this drawing contains critical Interface Dimensions :  
 Critical to Quality Characteristics :  
 Marked true :

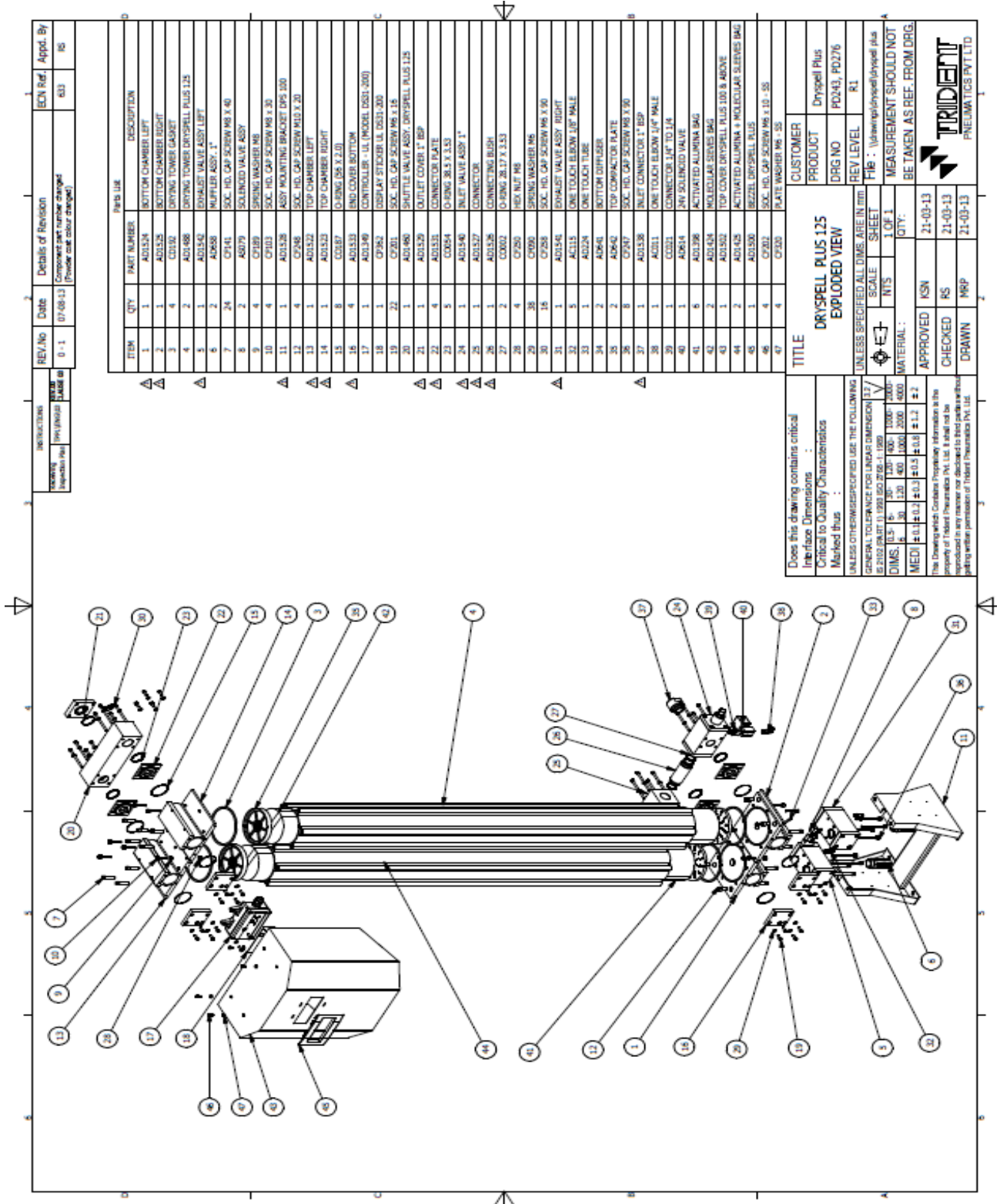
UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING GENERAL TOLERANCE FOR LINEAR DIMENSION 13.7 IS 2102 (PART 1) 2003 ISO 2768 - 1: 1999

DIMS	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	15.0	20.0	30.0	40.0	50.0	60.0	80.0	100.0
MED	±0.1	±0.1	±0.1	±0.2	±0.2	±0.3	±0.4	±0.5	±0.6	±0.8	±1.0	±1.2	±1.5	±2.0	±2.5	±3.0	±4.0	±5.0

File : \\smp\p\m\m\trident\plus  
 MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.

APPROVED KSN 21-03-13  
 CHECKED NS 21-03-13  
 DRAWN NRP 21-03-13

**TRIDENT**  
 PNEUMATICS PVT LTD



INSTRUCTIONS	REV. No	Date	Details of Revision	ECN Ref.	Appd. By
REVISION	0 - 1	07/08/13	Component part number changed (Pneum. coil colour changed)	633	RS

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A0152A	BOTTOM CHAMBER LEFT
2	1	A0152B	BOTTOM CHAMBER RIGHT
3	4	C0100	DRYING TOWER GAUDET
4	2	A0168B	DRYING TOWER DRYSPRELL PLUS 125
5	1	A0154G	EXHAUST VALVE ASSY LEFT
6	2	A0R58	MUFFLER ASSY. 1"
7	24	C0141	SCK. HD. CAP SCREW M8 X 40
8	2	A0079	SOLINOID VALVE ASSY
9	4	C0189	SPRING WASHER M8
10	4	C0103	SCK. HD. CAP SCREW M8 X 35
11	1	A0152B	ASSY MOUNTING BRACKET DPS 100
12	4	C0198	SCK. HD. CAP SCREW M10 X 20
13	1	A0152Z	TOP CHAMBER LEFT
14	1	A0152Z	TOP CHAMBER RIGHT
15	8	C0087	O-RING 26 X 2.0
16	4	A0153S	END COVER BOTTOM
17	1	A0154B	CONTROLLER - UL (MOORE D501-200)
18	1	C0162	OSM AY FITTING 1.8 (D501-200)
19	22	C0081	SCK. HD. CAP SCREW M8 X 18
20	1	A0198B	SHUTTLE VALVE ASSY: DRYSPRELL PLUS 125
21	1	A0152N	OUTLET COVER 1" BSP
22	4	A0153S	CONNECTOR PLATE
23	5	C0054	O-RING 26.5 X 2.53
24	1	A0154G	INLET VALVE ASSY 1"
25	1	A0152Z	CONNECTOR
26	1	A0152K	CONNECTING BUSH
27	2	C0060	O-RING 26.13 X 2.53
28	4	C0250	PIST NUT M8
29	38	C0090	SPRING WASHER M8
30	18	C0258	SCK. HD. CAP SCREW M8 X 90
31	1	A0154E	EXHAUST VALVE ASSY RIGHT
32	5	A0115	ONE TOUCH ELBOW 1/2" MALE
33	1	A0224	ONE TOUCH TUBE
34	2	A0145	BOTTOM DIFFUSER
35	2	A0146	TOP CONNECTION PLATE
36	3	C0147	SCK. HD. CAP SCREW M8 X 90
37	1	A0153B	INLET CONNECTOR 1" BSP
38	1	A0211	ONE TOUCH ELBOW 1/2" MALE
39	1	C0021	CONNECTOR 1/4" TO 1/4"
40	1	A0R54	2WY SOLINOID VALVE
41	6	A0129B	ACTIVATED ALUMINA BAG
42	2	A0147A	MOLECULAR SIEVES BAG
43	1	A0150	TOP COVER DRYSPRELL PLUS 100 & ABOVE
44	2	A0142B	ACTIVATED ALUMINA & MOLECULAR SIEVES BAG
45	1	A0150B	BEZEL DRYSPRELL PLUS
46	4	C0192	SCK. HD. CAP SCREW M8 X 10 - SS
47	4	C0190	PLATE WASHER M8 - SS

**TITLE**  
**DRYSPRELL PLUS 125**  
**EXPLODED VIEW**

**CUSTOMER**  
 Dryspell Plus  
 PD243, PD276

**REV LEVEL**  
 R1

**FILE :** (to be implemented/shield plus)

**MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.**

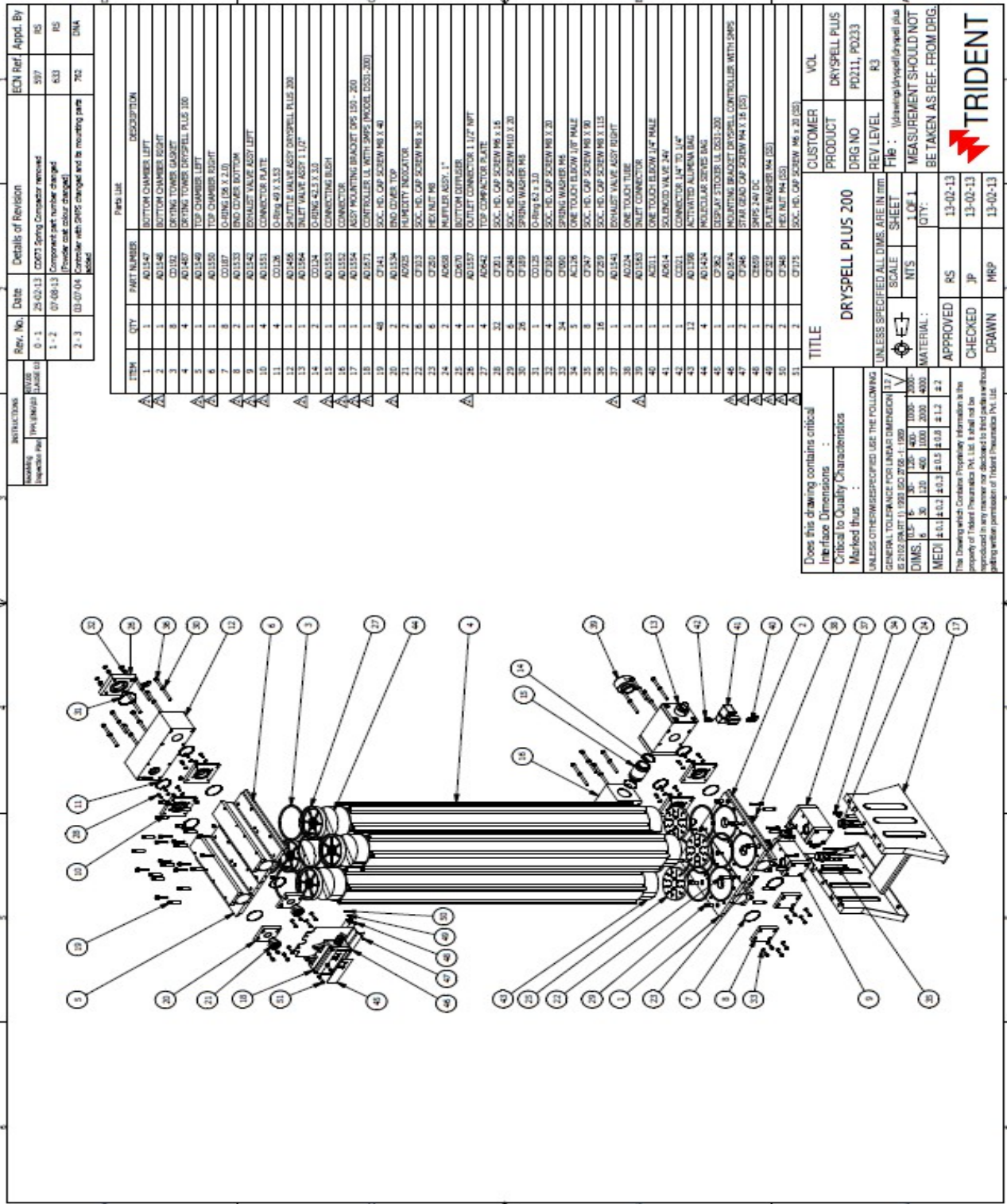
UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING  
 GENERAL TOLERANCE FOR LINEAR DIMENSION 27  
 IS 2102 PART 1: 1993 ISO 2768-1:1999

DIMS.	6 - 25	25 - 120	120 - 500	500 - 1000	1000 - 2000	2000 - 4000	4000 - 6000
MED	± 0.1	± 0.15	± 0.2	± 0.3	± 0.5	± 1.0	± 2.0

Does this drawing contain critical interface dimensions :  
 Critical to Quality Characteristics :  
 Marked thus : \*

APPROVED KSN 21-03-13  
 CHECKED RS 21-03-13  
 DRAWN MRP 21-03-13

**TRIDENT**  
 PNEUMATICS PVT LTD



REV. NO.	DATE	DETAILS OF REVISION	ECN REF.	APPL. BY
0-1	29-02-13	COG3 Spring Connector removed	397	RS
1-2	07-08-13	Component part number changed (Provide call. colour changed)	633	RS
2-3	03-07-04	Connector with O-Rings changed and its mounting parts added	702	DMA

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	A01347	BOTTOM CHAMBER LEFT
2	1	A01348	BOTTOM CHAMBER RIGHT
3	3	C0102	SPRING TOWER GAUZE
4	4	A01407	SPRING TOWER DRYSPELL PLUS 100
5	1	A01349	TOP CHAMBER LEFT
6	1	A01350	TOP CHAMBER RIGHT
7	3	C0107	ORING 1/8 X 2.0
8	1	A01333	END COVER BOTTOM
9	1	A01342	EXHAUST VALVE ASSY LEFT
10	4	A01351	CONNECTOR PLATE
11	4	C0126	O-Ring 4/8 X 3.5
12	1	A01456	SHUTTLE VALVE ASSY DRYSPELL PLUS 200
13	1	A01354	INLET VALVE ASSY 1.1/2"
14	2	C0124	O-RING 4.2 X 3.3
15	1	A01353	CONNECTING BUSH
16	1	A01352	CONNECTOR
17	1	A01354	ASSY MOUNTING BRACKET EPS 150 - 200
18	1	A01371	CONTROLLER U.S. WITH SAMS (MODEL D551-200)
19	48	C0141	END COVER TOP
20	2	A01334	SO.C. HD. CAP SCREW M8 X 30
21	2	A0265	HUMIDITY INDICATOR
22	6	C0250	SO.C. HD. CAP SCREW M8 X 30
23	6	C0250	REV. NUT M8
24	2	A0268	MUFFLER ASSY. 1"
25	4	C0267	BOTTOM DETAILER
26	1	A01357	OUTLET CONNECTOR 1.1/2" NPT
27	4	A0264	TOP COMPACTOR PLATE
28	32	C0263	SO.C. HD. CAP SCREW M8 X 15
29	6	C0246	SO.C. HD. CAP SCREW M10 X 20
30	26	C0189	SPRING WASHER M8
31	1	C0128	O-Ring 6.3 X 3.0
32	4	C0126	SO.C. HD. CAP SCREW M8 X 20
33	34	C0266	SPRING WASHER M8
34	3	A0176	ONE TOUCH ELBOW 1/8" MALE
35	8	C0247	SO.C. HD. CAP SCREW M8 X 30
36	18	C0253	SO.C. HD. CAP SCREW M8 X 15
37	1	A01341	EXHAUST VALVE ASSY RIGHT
38	1	A01324	ONE TOUCH TUBE
39	1	A01363	INLET CONNECTOR
40	1	A0131	ONE TOUCH ELBOW 1/4" MALE
41	1	A0261	SOLINEX VALVE 2"
42	1	C0214	CONNECTOR 1/4" 1/4"
43	12	A01358	ACTIVATED ALUMINA BAG
44	4	A01434	INLET VALVE SPRING BAG
45	1	C0262	COUPLER ATTACHED U.S. D551-200
46	1	A01374	MOUNTING BRACKET DRYSPELL CONTROLLER WITH SAMS
47	2	C0246	SO.C. HD. CAP SCREW M8 X 30 (20)
48	1	C0259	SAMS 24V DC
49	2	C0265	PLATE BRIDGE M4 (20)
50	2	C0246	REV. NUT M4 (20)
51	2	C0275	SO.C. HD. CAP SCREW M6 X 20 (20)

**TITLE**  
**DRYSPELL PLUS 200**

**CUSTOMER** VOL  
**PRODUCT** DRYSPELL PLUS  
**DRG NO** PD011, PD033

**REV LEVEL** R3

**FILE** : \\savage\proj\dryspell plus

**MEASUREMENT SHOULD NOT BE TAKEN AS REF. FROM DRG.**

**APPROVED** RS 13-02-13  
**CHECKED** JP 13-02-13  
**DRAWN** MRP 13-02-13

**SCALE** 1:1  
**SHEET** 1 OF 1  
**CITY**

**MATERIAL**

**UNLESS SPECIFIED ALL DIMS. ARE IN MM**


**GENERAL TOLERANCE FOR LINEAR DIMENSION** 3/7  
 IS 2102 (PART 1) 1993 ISO 2768-1 1999

DIMS.	6	30	125	300	1000	2000
	±0.1	±0.1	±0.1	±0.1	±0.2	±0.3


**MECH** ±0.1 ±0.1 ±0.1 ±0.1 ±0.2 ±0.2

This drawing and its contents (including information in the property of our firm) are the property of Trident Insurance and getting written permission of Trident Insurance Pvt. Ltd.

11. Detailed spares List

		TBAS Detailed Two year Spares List	
<b>TBAS 10</b>			
Spares	Spare kit consisting of	Item code	
PreFilter	Filter element with O ring	AS703	
After Filter	Filter element with O ring	AS702	
Micron Filter	Filter element with O ring	AS704	
Desiccant	Desiccant with seal kit	SK278A	
Exhaust valve	Exhaust valve spare kit	SK220A	
Dryspell plus 10	Seals and O rings spare kit	SK210A	
Bacterial Filter	Seals and O rings spare kit		
<b>TBAS 20</b>			
Spares	Spare kit consisting of	Item code	
PreFilter	Filter element with O ring	AS703	
After Filter	Filter element with O ring	AS702	
Micron Filter	Filter element with O ring	AS704	
Desiccant	Desiccant with seal kit	SK279A	
Exhaust valve	Exhaust valve spare kit	SK222A	
Dryspell plus 20	Seals and O rings spare kit	SK281A	
Bacterial Filter	Seals and O rings spare kit		
<b>TBAS 30</b>			
Spares	Spare kit consisting of	Item code	
PreFilter	Filter element with O ring	AS703	
After Filter	Filter element with O ring	AS702	
Micron Filter	Filter element with O ring	AS704	
Desiccant	Desiccant with seal kit	SK280A	
Exhaust valve	Exhaust valve spare kit	SK222A	
Dryspell plus 30	Seals and O rings spare kit	SK282A	
Bacterial Filter	Seals and O rings spare kit		
<b>TBAS 45</b>			
Spares	Spare kit consisting of	Item code	
PreFilter	Filter element with O ring	AS703	
After Filter	Filter element with O ring	AS702	
Micron Filter	Filter element with O ring	AS704	
Desiccant	Desiccant with seal kit	SK284A	
Exhaust valve	Exhaust valve spare kit	SK222A	
Dryspell plus 45	Seals and O rings spare kit	SK283A	
Bacterial Filter	Seals and O rings spare kit		

\* The above spares lists are applicable for single system only for dual system need to order 2Nos\*

		TBAS Detailed Two year Spares List	
<b>TBAS 60</b>			
Spares	Spare kit consisting of		Item code
PreFilter	Filter element with O ring		AS695
After Filter	Filter element with O ring		AS694
Micron Filter	Filter element with O ring		AS696
Desiccant	Desiccant with seal kit		SK286A
Exhaust valve	Exhaust valve spare kit		SK222A
Dryspell plus 60	Seals and O rings spare kit		SK285A
Bacterial Filter	Seals and O rings spare kit		
<b>TBAS 100</b>			
Spares	Spare kit consisting of		Item code
PreFilter	Filter element with O ring		AS695
After Filter	Filter element with O ring		AS694
Micron Filter	Filter element with O ring		AS696
Desiccant	Desiccant with seal kit		SK272A
Exhaust valve	Exhaust valve spare kit		SK239A
Inlet valve	Seals and O rings spare kit		SK240A
Shuttle valve	Seals and O rings spare kit		SK266A
Bacterial Filter	Seals and O rings spare kit		
Dryspell plus 100	Seals and O rings spare kit		SK238A
<b>TBAS 125</b>			
Spares	Spare kit consisting of		Item code
PreFilter	Filter element with O ring		AS695
After Filter	Filter element with O ring		AS694
Micron Filter	Filter element with O ring		AS696
Desiccant	Desiccant with seal kit		SK273A
Exhaust valve	Exhaust valve spare kit		SK239A
Inlet valve	Seals and O rings spare kit		SK240A
Shuttle valve	Seals and O rings spare kit		SK267A
Bacterial Filter	Seals and O rings spare kit		
Dryspell plus 125	Seals and O rings spare kit		SK238A
<b>TBAS 200</b>			
Spares	Spare kit consisting of		Item code
PreFilter	Filter element with O ring		AS699
After Filter	Filter element with O ring		AS698
Micron Filter	Filter element with O ring		AS700
Desiccant	Desiccant with seal kit		SK274A
Exhaust valve	Exhaust valve spare kit		SK239A
Inlet valve	Seals and O rings spare kit		SK244A
Shuttle valve	Seals and O rings spare kit		SK268A
Bacterial Filter	Seals and O rings spare kit		
Dryspell plus 200	Seals and O rings spare kit		SK243A

**\* The above spares lists are applicable for single system only for dual system need to order 2Nos\***

# WARRANTY

Products of Trident Pneumatics Pvt Ltd are guaranteed to be free from defects in material and workmanship when installed and operated in accordance with the instructions outlined in the instruction manual.

Trident Pneumatics pvt. Ltd.'s obligation under this warranty shall be limited to repair or replacement (at the discretion of Trident) of defective goods returned to Trident Plant within one (1) year from the date of commissioning or 18 months from the date of invoicing which ever is occurring earlier.

Product	:	
Model	:	
Serial No.	:	

-----  
Quality Assurance Dept

**Trident Pneumatics Pvt Ltd**  
5/232, K.N.G Pudur Road, Somayampalayam,  
Coimbatore 641 108. Ph: 0422 2400492, 2401373  
Fax: 0422 2401376 e-mail: [sales@tridentpneumatics.com](mailto:sales@tridentpneumatics.com)  
Website: [www.tridentpneumatics.com](http://www.tridentpneumatics.com)

## INSTALLATION & COMMISSIONING REPORT

### PSA Type breathing air dryer

Customer :  Contact person :  Designation :	Model :  Sl. No. :  Phone :  Fax :
---	--

(Please add any comments or remarks here found while unpacking)

#### 1. INSTALLATION

a) Installation at :	Before / After Air Receiver	LED Glowing	Yes / No
b) Inlet air Temperature :	Normal / High	Tower 1 and 2 Drying	Yes / No
c) Side clearance provided :	Yes / No	Depressurizing	Yes / No
d) Power Grounded :	Yes / No	Regeneration	Yes / No
e) Air Flow Outlet :	Normal / Faulty		
f) Change over sequence :	Normal / Faulty		

#### 2. COMMISSIONING

Installation	Date of Completion
Commissioning	Date of Completion

#### Comments:

Customer	Installation Engineer
----------	-----------------------

Signature & Name of Installing Engineer	Dealers Signature & Seal	Customer's Signature & Seal
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