



**INSTALLATION
OPERATION
MAINTENANCE**

Regenerative Type Heatless
Desiccant Dryer

Dryspell

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INSTRUCTION MANUAL - Dryspell

READ THIS MANUAL CAREFULLY BEFORE INSTALLING OR OPERATING THE EQUIPMENT



These symbols warn you of any dangers and the measures to be taken to prevent them.

The most important points for the correct operation of your dryer are printed in bold type.

1. Introduction

Dryspell series is a heatless adsorption air dryer range especially made for small compressed air flow treatment. Compact and easy to maintain, each dryer is equipped with a pre-filter 0.3micron to protect the dessicant from the variety of air compressed pollutant and with After filters.

1.1 DESIGN

Dryspell heatless regenerating adsorption dryers make it possible to eliminate any water vapour remaining in the compressed air at the outlet of the compressor + final condenser assembly. The dryers have been designed under nominal standard conditions in order to obtain a dew point of -40°C.

1.2 RELEVANT UNITS

This manual describes the following models :

Dryspell Model	Nominal Flow cfm
10	10
20	20
30	30
45	45
60A	60
100	100
150	150
200	200
300	300

1.3 STATEMENT OF CONFORMITY

The units listed above comply with the current legislation and, in particular, with the following European directives :

- 97/23/CE : Pressurised Equipments
- 89/392/CEE : Machine Safety
- 89/336/CEE : Electromagnetic Compatibility
- 73/23/CEE : Low Voltage

1.4 DESCRIPTION

The dryer consists of :

- 2 aluminium tanks filled with desiccant
- 2 solenoid valves
- 2 exhaust silencers
- 1 regeneration nozzle
- 1 electronic control panel
- 2 aluminium blocks including air seals and non return valve
- 1 pressure gauge
- 1 sub-micron pre-filter (0.3 to 0.6 micron)
- 2 After filters

1.5 ADSORBANT MATERIAL

The desiccant takes the form of highly porous particles with surfaces which are able to retain (adsorb) the water vapour present in the compressed air (drying phase) and restore it when the air is at atmospheric pressure (regeneration phase). The desiccant used is activated alumina (CD067A).

1.6 OPERATING PRINCIPLES

The two columns operate alternately in the drying and regeneration phases. Regeneration in one tank results from the expansion to atmospheric pressure of part of the dry compressed air in the other. The pressure reducer is responsible for this transfer. Under nominal conditions (service pressure of 7 bars), 10% of the nominal flow is depressurised. The regeneration phase is shorter than the drying phase in order to allow the regenerated column to return to service pressure before a new cycle starts.

1.7 SAFETY



Pressurised tanks may explode if used improperly. It is therefore essential to locate any equipment which contains one or more of such tanks in such a way that the risks relating to incorrect use are reduced to the absolute minimum.

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The person responsible for the staff who is going to install, operate and maintain the machines described in this manual must make sure that they have read and understood these instructions.

In particular we draw your attention to the safety procedures which are described in this manual and which must be scrupulously adhered to. Observing these measures will allow you to install, operate and maintain your dryer without risk.

Dryspell dryers are intended for the drying of compressed air. Under no circumstances should they be used to dry other gases before Trident has performed a preliminary study and provided special instructions.

The desiccants used are non 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. If dispersed in the environment, desiccants may represent a source of pollution the consequences of which are uncontrollable. By the end of its lifetime, the desiccant will have accumulated all the pollutants present in the compressed air. Use a non-polluting method of disposal.

2. Installation



Various risks (crushing, explosion, projection, noise,...): The installation operations described in this chapter should be performed only by personnel qualified in the installation of electro-pneumatic systems. Follow the procedure described below with care in order to prevent exposing personnel to danger.

2.1 CAUTION

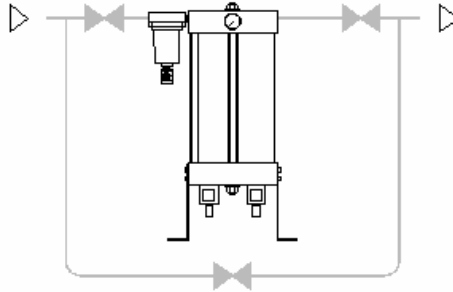
- (i) Ensure that the compressor drain port is provided with an automatic drain valve.
- (ii) If the inlet temperature is more than specified (40°C) then install an after cooler with moisture separator between compressor and dryer.
- (iii) Ensure that a microfilter of 0.01 micron is provided after the dryer as a precautionary instrument.

2.2 STORAGE

If your dryer is about to be stored during a long time before installation and use, take care to the following instructions :

- if possible, let the dryer in its original packing (In particular products fitted with marine packing with plastic film and dessicant)
- checking that air inlet and outlet are correctly blocked in order to protect the dessicant against humidity and dust.
- check that the machine is correctly protected from atmospheric dust or water.
- check that the store is frost protected
- make sure to archive correctly the attached documents.

2.3 INSTALLATION SITE AND CONNECTIONS



1. Install the dryer in a closed clean, dry room protected from frost. Access to the room should be restricted to personnel qualified in unit 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 should not exceed 43°C.
2. 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 1 m between the dryer and any other equipment which uses electricity.
3. Ensure that the dryer is installed in vertical position.
4. Fix the anchor points if it's necessary.
5. Install a system of by-pass valves between the dryer inlet and outlet so as to be able to service the installation without having to interrupt the compressed air supply from the network (see diagram above). The upstream and downstream valves must be closed during installation.
6. Connect the compressed air for processing to the dryer inlet (pre-filter connection) with strain-free ducts.
7. Connect a drain pipe to the Pre-filter lower part connection (1/4" F)
8. Connect the processed compressed air to the dryer output with strain-free ducts.
9. Check that all the connectors are airtight and that the fixings are tight.

2.4 ELECTRICAL CONNECTIONS

Connect the electrical power cable to a 220-240 V, single phase, 50 Hz grounded power supply. The electrical connecting is done by the DIN connector located on the front face of the dryer.



Risk of electrical shock: When connecting the machine, cut off the power at the connecting point.

2.5 RUNNING THE INSTALLATION



Various risks (explosion, projection, noise, ...): Do not pressurise until the installation procedure has been completed.

The valves upstream and downstream of the dryer must be closed and the by-pass valve open before the compressor is started.

1. Close the isolated switch located upstream of the dryer.
2. Check if the LED of the tower in drying operation glows and if the automatic drain valve at the bottom of the prefilter drains every 4 mins.
3. Open slowly the down stream valve and check the pressure on the dryer's pressure gauge.
4. Avoid any sudden variation in pressure as this may damage the dryer.
5. Slowly open the upstream valve and check the pressure at the dryer's pressure gauge.
6. Slowly close the by-pass valve.

3. Operation

3.1 OPERATOR

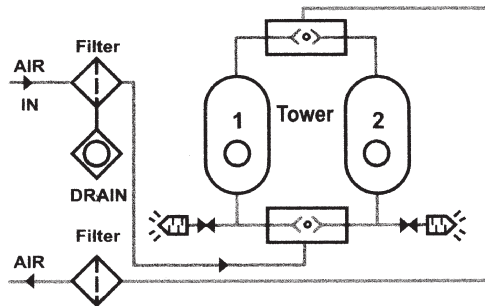
Only a minimum level of experience in handling compressed air is necessary to operate a Dryspell dryer:

- Pressure and bar unit
- Flow and m³/h unit
- Dew points and °C unit
- Components of a fluid network : compressor, valves, drains, taps, pressure gauges, filters, tanks, ...

3.2 CONTROL PANEL

The control panel presents all the instruments necessary to control and regulate the dryer (see appendix) :

- a machine diagram
- two LED's indicating the tower in drying operation.
- a LED indicating the prefilter drain operation.



3.3 OPERATING CYCLES TIME FROM 5 to 300

Drying time : 2 min's
 Regeneration time : 1 min 30s
 Pressurization time : 30s

FIRST CYCLE		SECOND CYCLE	
TOWER 1		TOWER 2	
Drying	Regeneration	Drying	Regeneration
	Pressurization		Pressurization

When DL1 is lighted, the tower 1 is in drying operation and tower 2 is in regeneration one. After tower 2 regeneration finished, DL2 is blinking to show that the tank is now in pressurization stage. After 30 seconds of pressurization, the air dryer operating cycle is inversed that means tower 1 is in regeneration stage and tower 2 in drying one.

The cycles permutation occurs every 2 minutes. Prefilter condensate drain discharge is programmed every 4 minutes during 4 seconds. All these cycles times are fixed and not adjustable by user.

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3.4 HOW TO STOP THE DRYER



Various risks (projection, explosion, noise,...): Whenever working on the dryer, it is essential to disconnect it from the network. Follow the procedure below:

1. Open the by-pass valve
2. Close the upstream valve
3. Close the downstream valve
4. Cut off and lock the isolating switch before the dryer

4. Maintenance

Adsorption dryers are robust, reliable machines. To ensure uninterrupted, problem-free operation, regularly perform the inspections below.

4.1 MONTHLY INSPECTIONS

During the monthly routine inspection, check that :

- the drying and regeneration cycle functions normally,
- the silencers are not clogged.

4.2 HALF-YEARLY INSPECTIONS

- Check that the drying and regeneration cycles functions normally
- Check to see whether the silencers are clogged
- Replace the cartridge of the prefilter. Follow the following procedure:
 1. Stop the dryer.
 2. Use one hand to release the locking part and the other to turn the bottom housing of the filter until its escape.
 3. Descrew the saturated filter element
 4. Screw the new cartridge
 5. Refit the bottom housing of the filter
 6. Start the machine

4.3 ANNUAL INSPECTIONS

1. Check that the drying and regeneration cycles functions normally
2. Check to see whether the silencers are clogged
3. Replace the cartridge of the prefilter. Follow the following procedure
4. Check the state of the desiccant: if the desiccant is brown (oil pollution) or if there is a lot of dust (disintegration), then change the desiccant (see next section).

5. Check the state of block 'O' rings.
6. Replace after filters cartridge

5. Changing the desiccant



Various risks (explosion, projection, noise, ...) : This operation should be performed by professionals of adsorption dryers. During the entire operation, the compressor and the dryer must be shut down. It is obligatory for all personnel who are in the presence of the desiccant to wear dust masks.

- Loosen the Tie rod and remove it
- Replace the old dessicant by the new one
- Replace the two after filter cartridge
- Install and screw the Tie rod

5.1 QUANTITY OF DESICCANT IN THE DRYER

The replacement desiccant in your dryer must be absolutely identical to the initial desiccant. The total quantities required for each model are as follows (weight in kg) :

Dryspell model	Quantity
10	2
20	4.8
30	6.4
45	9
60A	16
100	40
150	80
200	80
300	120

6. Repair work



The repair operations described in this section should be performed only by qualified persons in electro-pneumatic systems installation.

6.1 LEDS NOT GLOWING

A - Check the power supply connection and tension

6.2 TOWER STATUS LED NOT CHANGING

A - Change the controller

6.3 LEDS STATUS CHANGES BUT TOWER NOT SWITCHING

A - Check coil connection at DIN and terminal connector in the controller

B - Check the solenoid valve

6.4 NO PURGING

A - Check the solenoid valve

B - Check the exhaust valve

C - Clean the silencer (muffler)

6.5 CONTINUOUS PURGING AT TOWER 1

A - Shuttle not closing

B - Check pilot air for exhaust valve alimentation

C - Check exhaust valve piston struck

6.6 HIGH PURGE LOSS

A - Check outlet shuttle closing

B - Check for silencer chock

6.7 HIGH PRESSURE DROP ACROSS DRYER

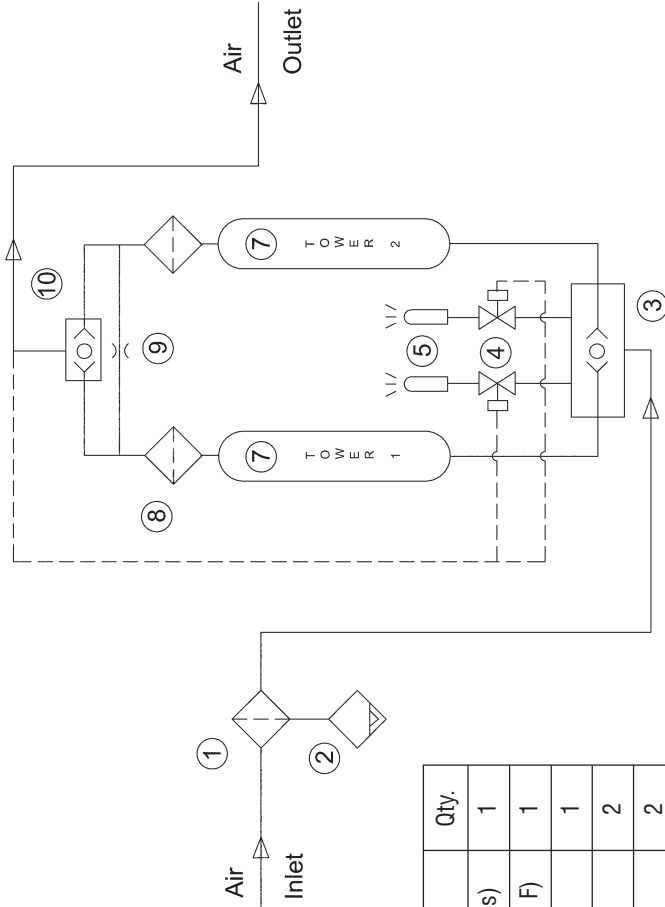
A - Pre-filter may be chocked. Check and replace filter cartridge

B - Check whether the utilisation flow is more than inlet flow as per dryer spec.

7. Diagrams

7.1 OPERATION DIAGRAM

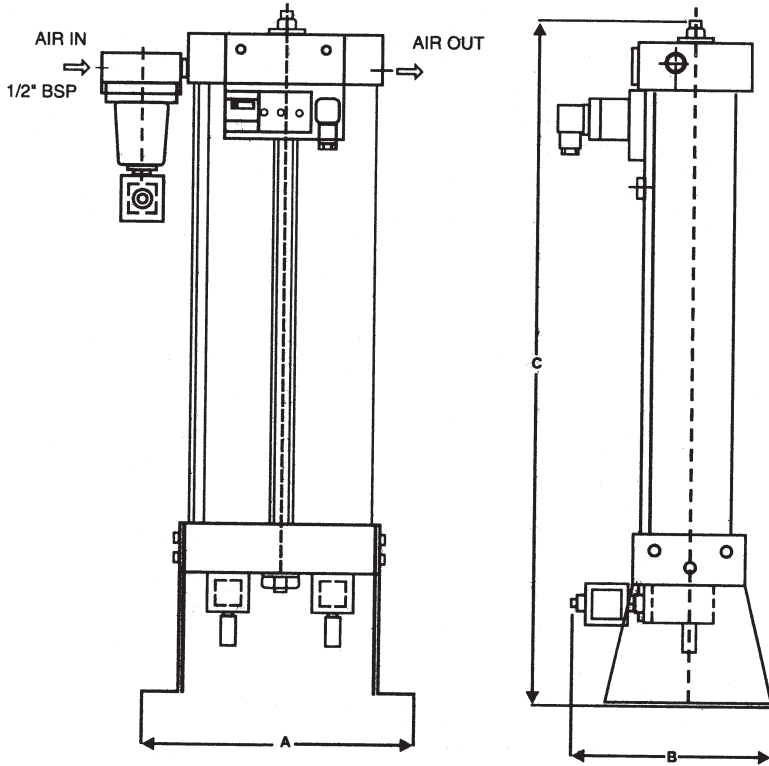
7.2 OVERALL DIMENSIONS



Rep.	Part Name	Qty.
1	Pre-filter (0.3-0.6 microns)	1
2	Pre-filter drain valve (1/4" F)	1
3	Inlet shuttle valve	1
4	Solenoid valve	2
5	Exhaust silencer	2
6	Regulation (not shown)	1
7	Desiccant tower	2
8	After filter (In built)	2
9	Regeneration nozzle	1
10	Outlet shuttle valve	1

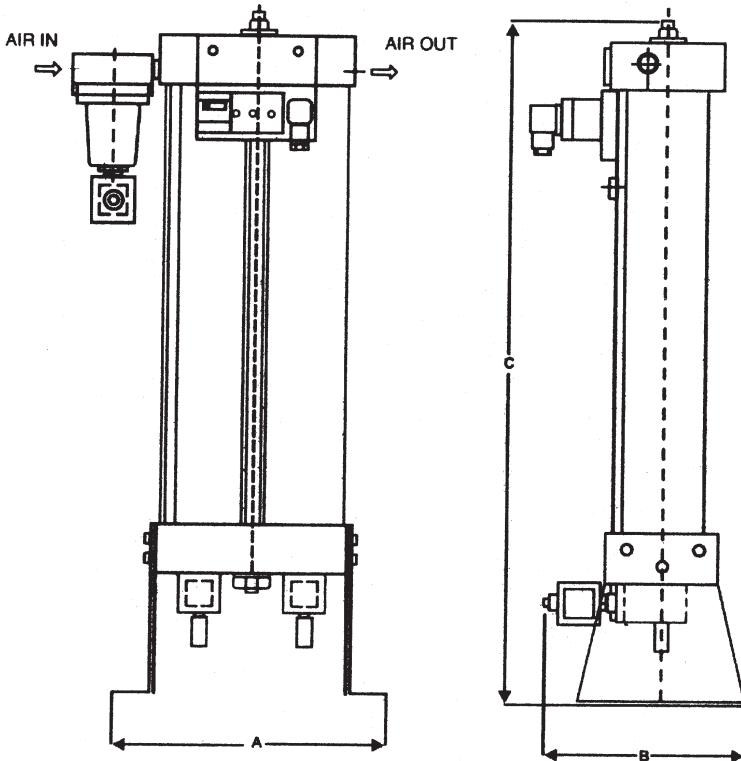
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OVER ALL DIMENSIONS - DRYSPELL 10



MODELS		Dryspell 10
Dimensions (mm)	A	200
	B	250
	C	590
Weight	(Kg)	12

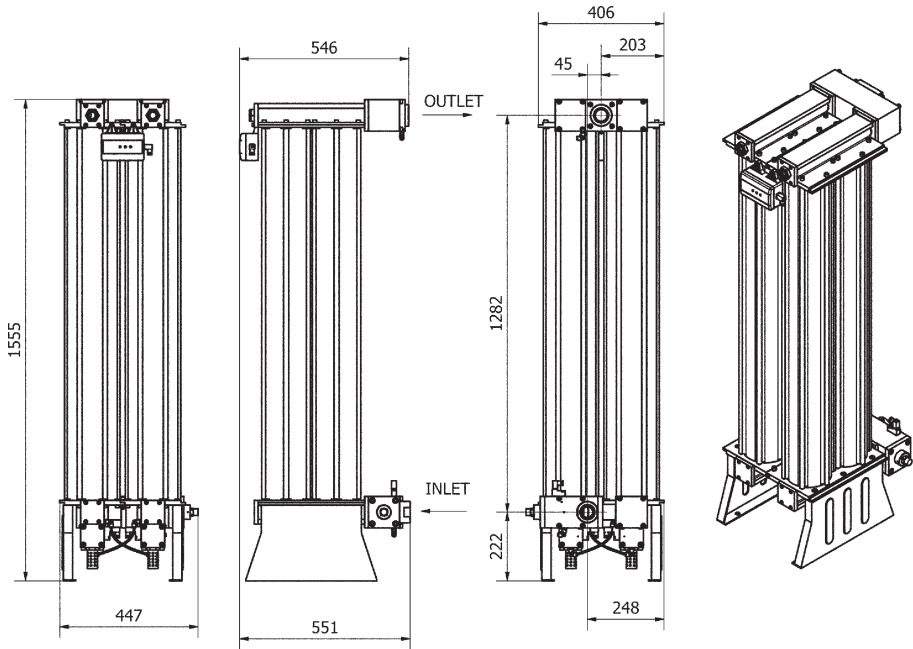
OVER ALL DIMENSIONS - DRYSPELL 20 / 30 / 45 / 60A / 100



MODELS		Dryspell 20	Dryspell 30	Dryspell 45	Dryspell 60A	Dryspell 100
Dimensions	A	265	265	265	285	300
	B	300	300	300	350	415
	C	635	785	1035	1250	1540
Weight	(Kg)	16	28	34	43	81
Inlet/Outlet	BSP	½"	½"	½"	¾"	1"

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OVER ALL DIMENSIONS - DRYSPELL 150



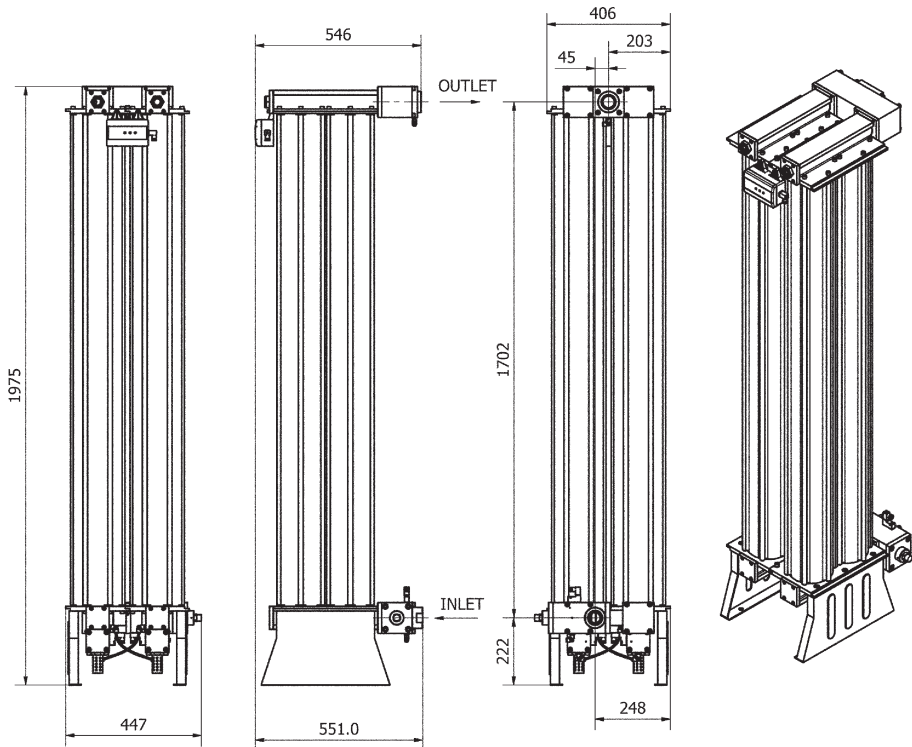
SPECIFICATION :

1. Flow : 150 scfm
2. Maximum working pressure : 16 bar g
3. Operating Pressure : 7 bag g
4. Maximum Inlet Temperature : 45°C
5. Minimum Inlet Temperature : 3°C
6. Desiccant Qty per tower : 15 kg
7. Total No. of Tower : 4
8. End condition : 1½" BSP (F)

ELECTRICAL :

- Power Input : 85-260V AC
50/60 HZ
- Power Consumption : 12 Watts (Max.)

OVER ALL DIMENSIONS - DRYSPELL 200



SPECIFICATION :

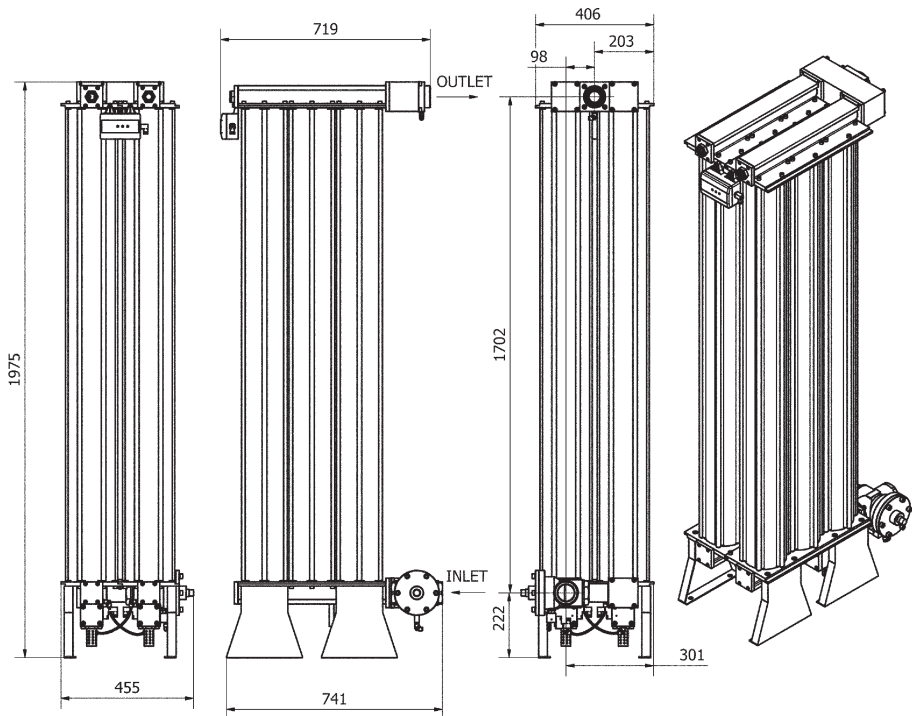
- | | |
|------------------------------|---------------|
| 1. Flow | : 200 scfm |
| 2. Maximum working pressure | : 16 bar g |
| 3. Operating Pressure | : 7 bag g |
| 4. Maximum Inlet Temperature | : 45°C |
| 5. Minimum Inlet Temperature | : 3°C |
| 6. Desiccant Qty per tower | : 20 kg |
| 7. Total No. of Tower | : 4 |
| 8. End condition | : 1½" BSP (F) |

ELECTRICAL :

- | | |
|-------------------|--------------------------|
| Power Input | : 85-260V AC
50/60 HZ |
| Power Consumption | : 12 Watts (Max.) |

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OVER ALL DIMENSIONS - DRYSPELL 300



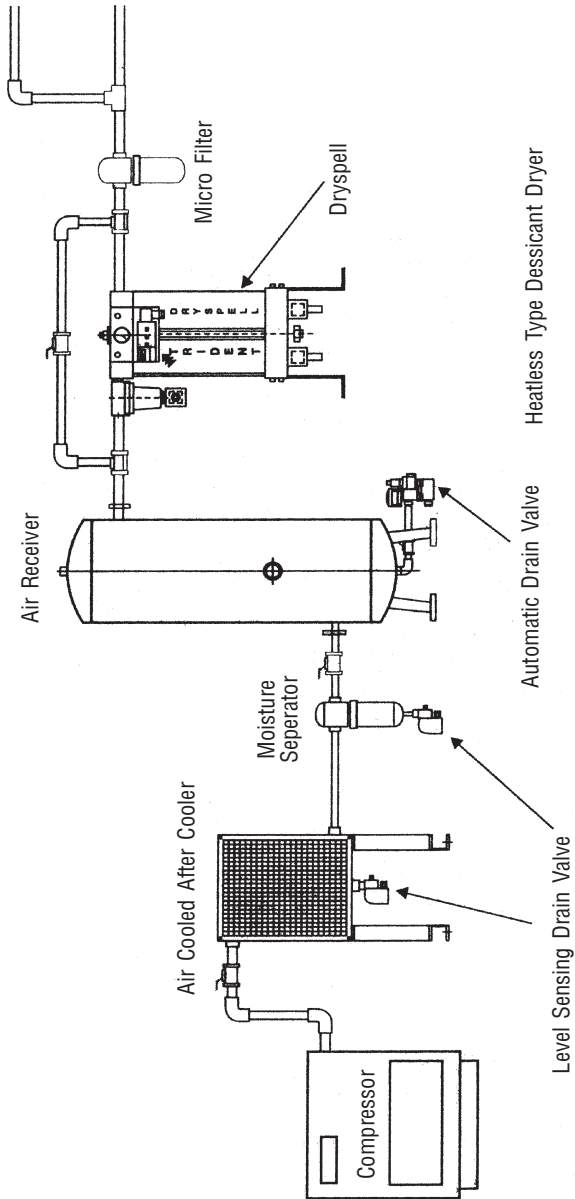
SPECIFICATION :

- | | |
|------------------------------|--------------|
| 1. Flow | : 300 scfm |
| 2. Maximum working pressure | : 16 bar g |
| 3. Operating Pressure | : 7 bag g |
| 4. Maximum Inlet Temperature | : 45°C |
| 5. Minimum Inlet Temperature | : 3°C |
| 6. Desiccant Qty per tower | : 20 kg |
| 7. Total No. of Tower | : 6 |
| 8. End condition | : 2" BSP (F) |

ELECTRICAL :

- | | |
|-------------------|--------------------------|
| Power Input | : 85-260V AC
50/60 HZ |
| Power Consumption | : 12 Watts (Max.) |

COMPRESSED AIR LAYOUT





WARRANTY

Products of Trident Pneumatics Pvt Ltd are guaranteed to be free from defects in materials 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's 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	:	Refer Name Plate
Serial No.	:	
	:	

Quality Assurance Dept.

Trident Pneumatics Pvt Ltd

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Website : www.tridentpneumatics.com

INSTALLATION & COMMISSIONING REPORT HEATLESS DESICCANT DRYER

Customer :	Model :
Contact person :	Sl.No :
Designation :	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 : Normal / High Temperature	Tower 1 and 2 Drying	Yes / No
c) Side clearance : Yes / No provided	Depressurizing	Yes / No
d) Power Grounded : Yes / No	Regeneration	Yes / No
e) Air Flow Outlet : Normal / Faulty		
f) Change over : Normal / Faulty sequence		
g) Change over : Normal / Faulty sequence		

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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INSTALLATION & COMMISSIONING REPORT HEATLESS DESICCANT DRYER

Customer :	Model :
Contact person :	Sl.No :
Designation :	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
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g) Change over : Normal / Faulty sequence		

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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Compressed Air Quality can be maximized through

Application : Power Coating & Spray Painting	
Flow Taken : Example 20 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 20 / Equivalent

Application : Food Pharma & Hospital	
Flow Taken : Example 10 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 24 P / Equivalent
After the dryer	G 24 Y / Equivalent
Desiccant Dryers	Dryspell 10 / Equivalent

Application : Instrumentation	
Flow Taken : Example 10 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 24 P / Equivalent
After the dryer	G 24 Y / Equivalent
Desiccant Dryers	Dryspell 10 / Equivalent

Application : Engineering Industry	
Flow Taken : Example 30 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 100 P / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 30 / Equivalent

Application : CNC M/C	
Flow Taken : 20 cfm	
Model Name	Model Code
Condensate Drain Ports	LDV 1000 / Equivalent
Desiccant Dryers	Dryspell 20 / Equivalent

Application : Cement Plant	
Flow Taken : Example 45 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 100 P / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 45 / Equivalent

Application : Process & Chemical Industry	
Flow Taken : Example 45 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 100 P / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 45 / Equivalent

Application : Packing M/c	
Flow Taken : Example 20 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 20 / Equivalent

Application : Process & Chemical Industry	
Flow Taken : Example 45 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 100 P / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 45 / Equivalent

Application : Printing Industry	
Flow Taken : Example 45 cfm	
Location	Product
Condensate Drain Ports	LDV 1000 / Equivalent
Before the dryer	G 100 P / Equivalent
After the dryer	G 100 Y / Equivalent
Desiccant Dryers	Dryspell 45 / Equivalent