Loco dryers Installation, Operational and Maintenance Manual

Air Dryers for Locomotives

Contents

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

Locodryer series is a heatless adsorption air dryer range made for Locomotive air treatment. Rigid and easy to maintain, the dryer is equipped with a pre-filter 0.01 microns at 99.7 % filtering efficiency to protect the desiccant from the variety of compressed air pollutant and with after filters to avoid fine desiccant powders at the outlet.

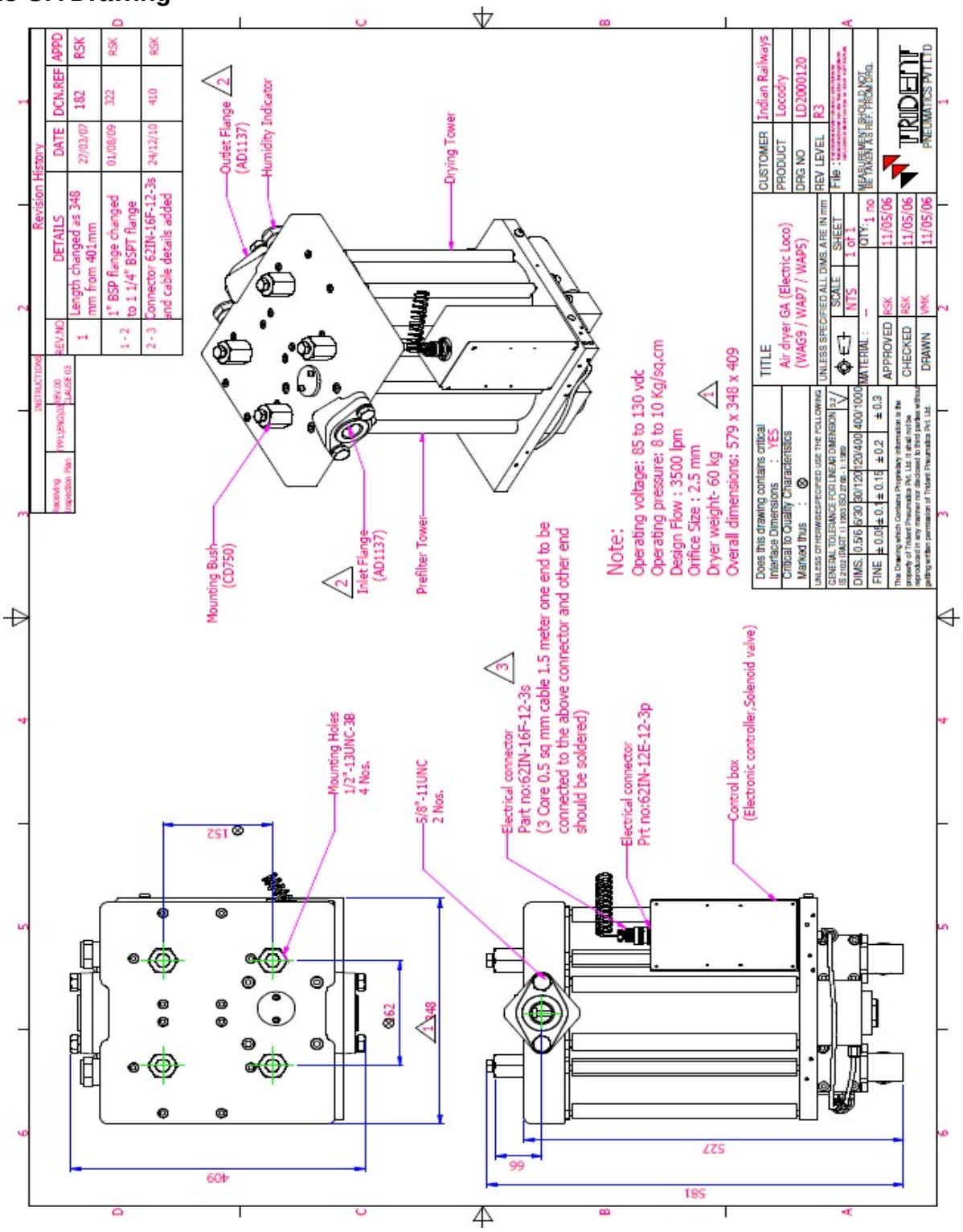
1.1 Design

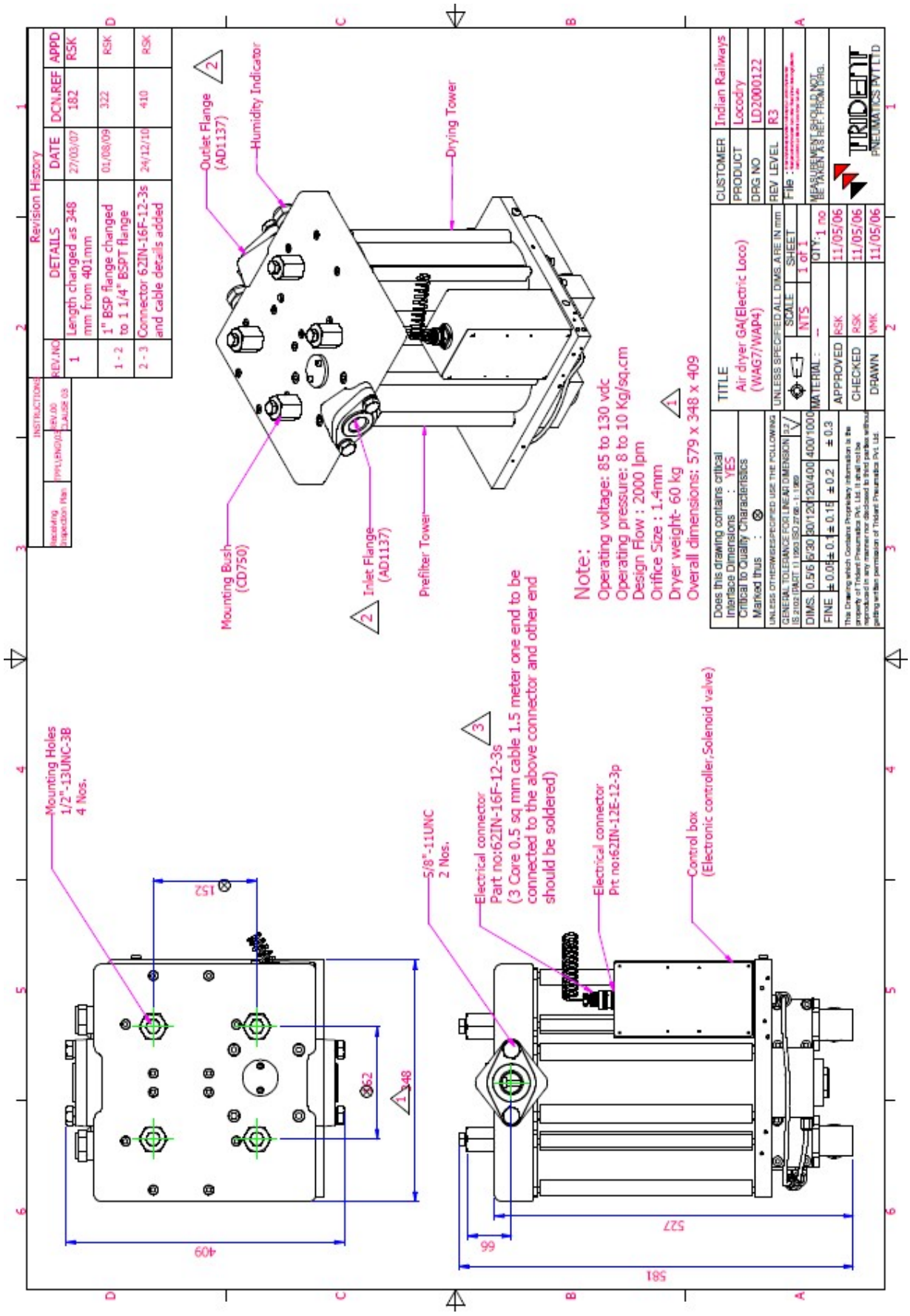
Locodryer series heatless regenerating adsorption dryers make it possible to eliminate any water vapour remaining in the compressed air at the outlet of the compressor. The dryers have been designed for various inlet and Outlet conditions in order to obtain a dew point with specified air loss as per dryness requirement.

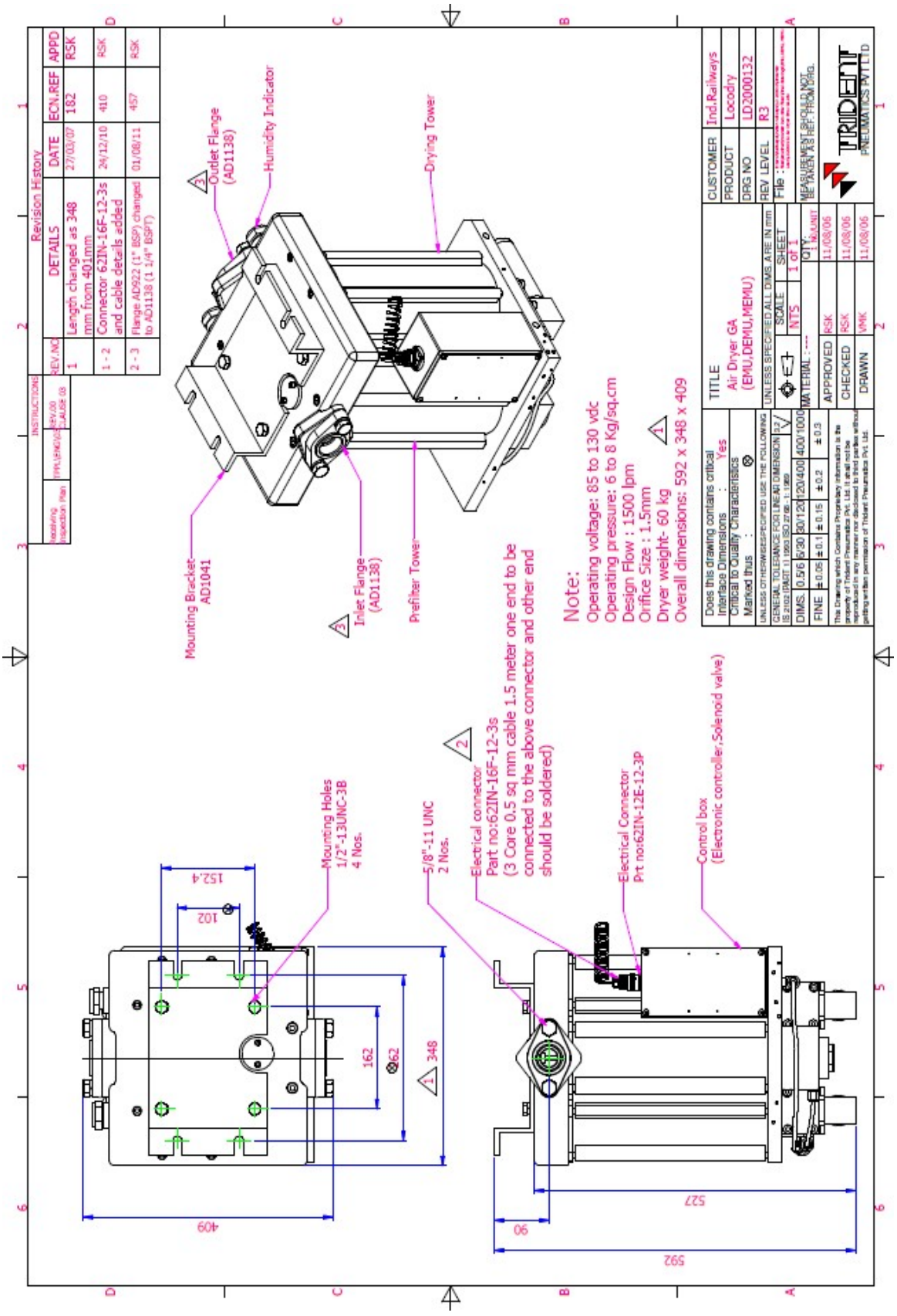
1.2 Specifications

Operational Data:	
Inlet	: Compressed Air
Inlet Temperature	: 0 to 60 deg C
Ambient temperature	: 0 to 70 deg C
Inlet Pressure	: 8 to 10 Kg/cm^2 for LD2000140, LD2000120, LD2000122 : 6 to 8 Kg/cm^2 for LD2000132
Design Pressure	: 12.5 Kg/cm^2
Inlet Air Humidity	: 100 % RH
Nominal Flow	: 3000 lpm for LD2000140 : 2000 lpm for LD2000120 : 1500 lpm for LD2000122 : 1500 lpm for LD2000132
Maximum. Flow	: 6000 lpm for LD2000140, LD2000120 : 2000 lpm for LD2000122 : 2107 lpm for LD2000132
Air loss	: 20 % for LD2000140, LD2000120, LD2000122 : 15% for LD2000132
Pre Filter rating	: 0.01 microns 99.97% efficiency
After Filter rating	: 0.01 microns 99.97% efficiency
Dew point Depression	: 30 Deg C minimum at design capacity, 15 deg C minimum at max flow and temperature.
Pressure Drop	: 3% of Inlet pressure max.
Input Voltage	: 48 to 138 VDC
Over all Dimension	: Please refer drawing
Weight of air dryer	: 65 Kg's Approx

1.3 GA Drawing




Revision History
REV.NO
DETAILS
DATE
DCN.REF
APPD
1
Length changed as 348 mm from 401mm
27/03/07
182
RSK
1 - 2
1" BSP flange changed to 1 1/4" BSPT flange
01/08/09
322
RSK
2 - 3
Connector 62IN-16F-12-3s and cable details added
24/12/10
410
RSK
Outlet Flange (AD1137)
Humidity Indicator
Drying Tower
Mounting Bush (CD750)
Inlet Flange (AD1137)
Prefilter Tower
Note:
Operating voltage: 85 to 130 vdc
Operating pressure: 8 to 10 Kg/sq.cm
Design Flow : 2000 lpm
Orifice Size : 1.4mm
Dryer weight- 60 kg
Overall dimensions: 579 x 348 x 409
Mounting Holes 1/2"-13UNC-3B 4 Nos.
5/8"-11UNC 2 Nos.
Electrical connector Part no:62IN-16F-12-3s (3 Core 0.5 sq mm cable 1.5 meter one end to be connected to the above connector and other end should be soldered)
Electrical connector Prt no:62IN-12E-12-3p
Control box (Electronic controller,Solenoid valve)
152
62
348
409
66
527
581
CUSTOMER
Indian Railways
PRODUCT
Locodiy
DRG NO
LD2000122
REV LEVEL
R3
TITLE
Air dryer G4(Electric Loco) (WAG7/WAP4)
SCALE
NTS
SHEET
1 of 1
QTY: 1 no
APPROVED
RSK
11/05/06
CHECKED
RSK
11/05/06
DRAWN
VMK
11/05/06
TRIDENT
PNEUMATICS PVT LTD


Revision History
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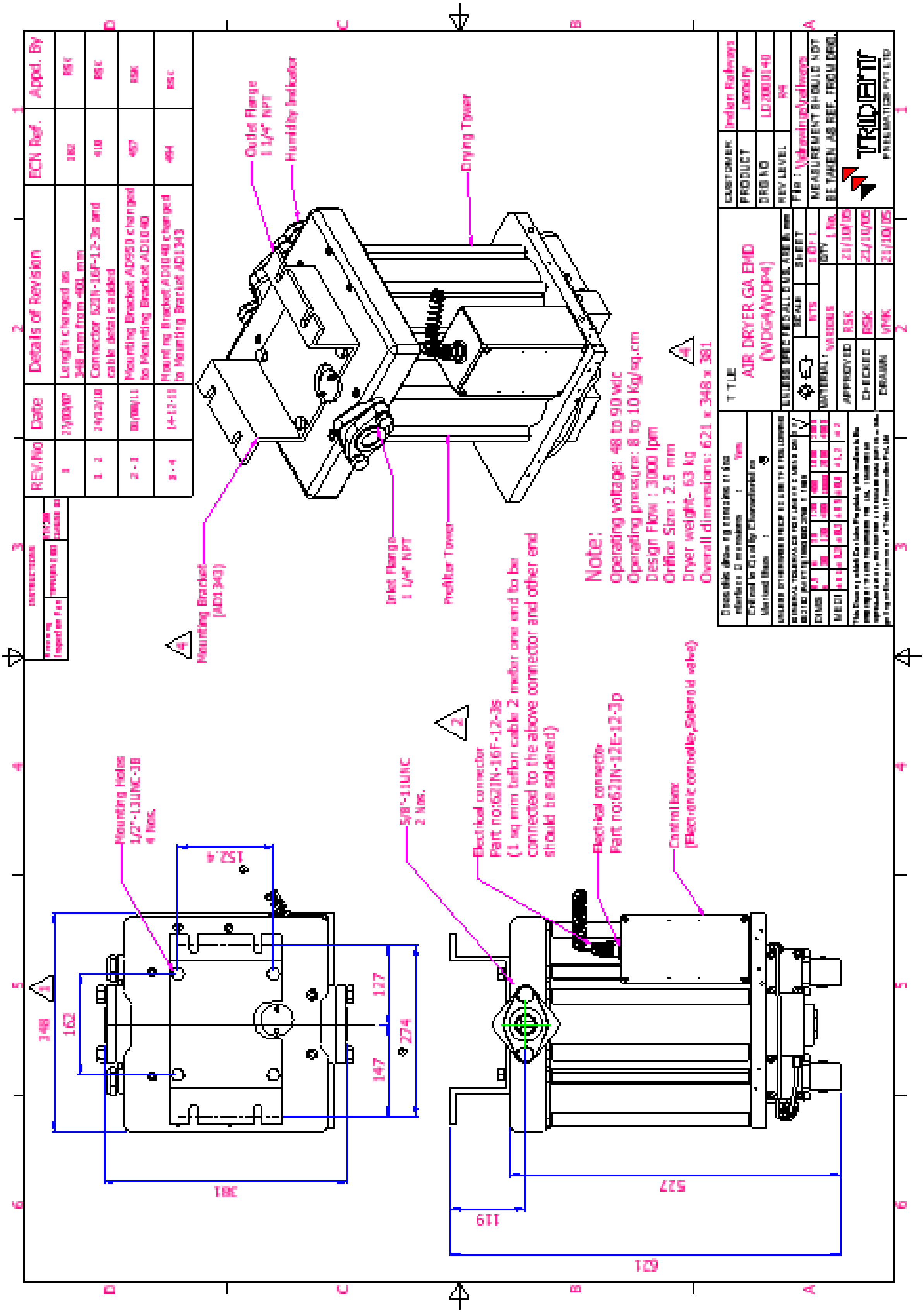
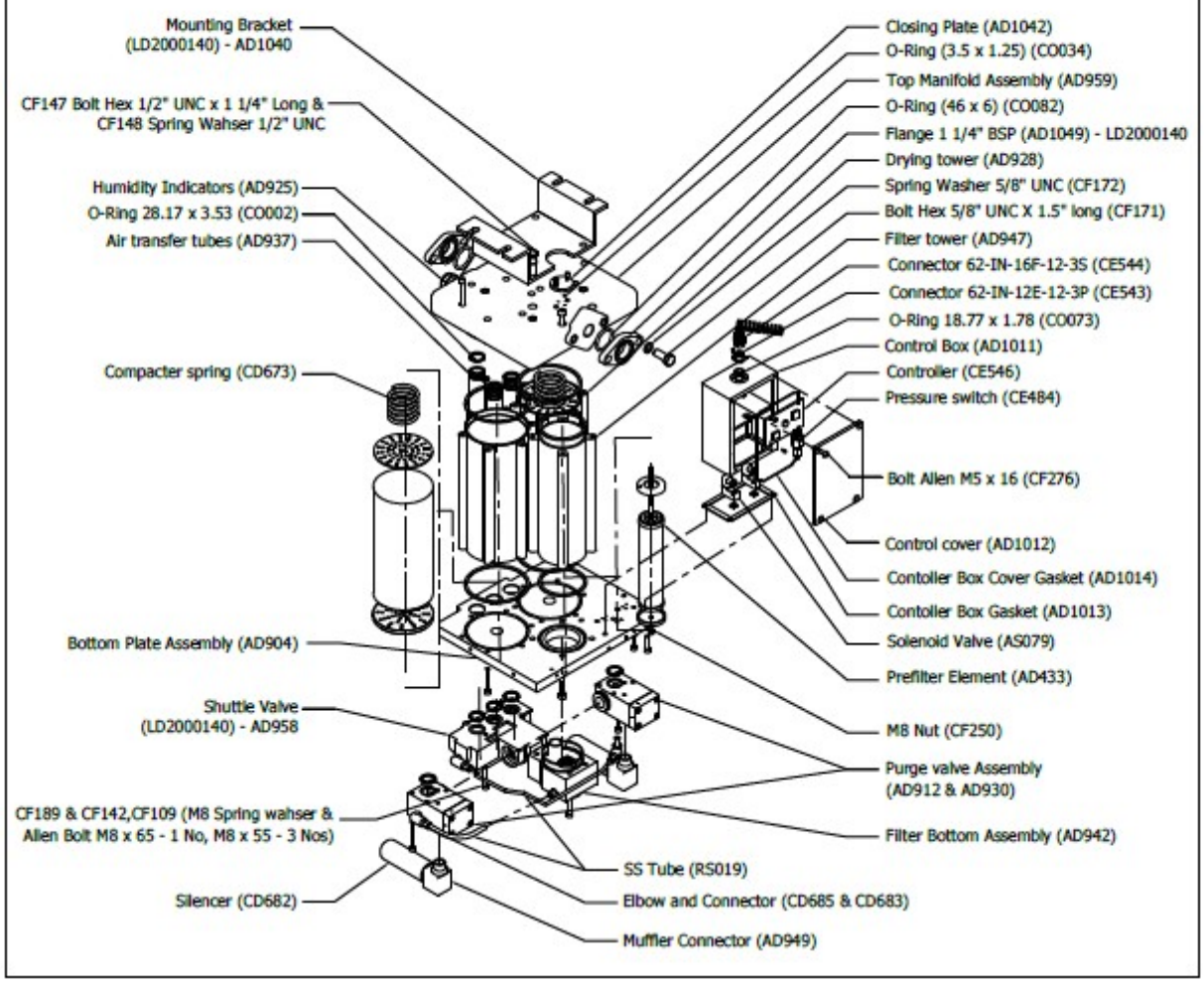
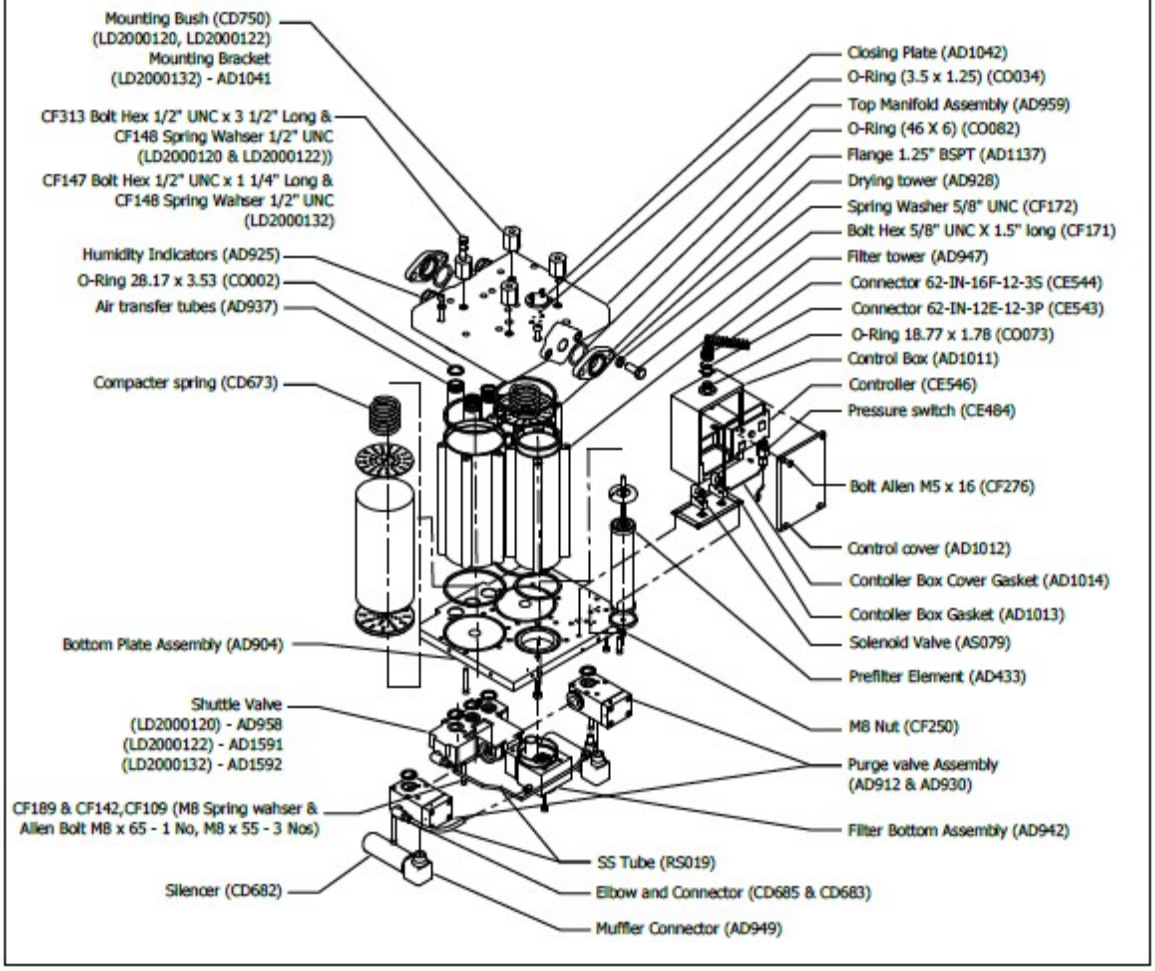
DETAILS
DATE
ECN.REF
APPD
1
Length changed as 348 mm from 401mm
27/03/07
182
RSK
1 - 2
Connector 62IN-16F-12-3s and cable details added
24/12/10
410
RSK
2 - 3
Flange AD922 (1" BSP) changed to AD1138 (1 1/4" BSP)
01/08/11
457
RSK
Outlet Flange (AD1138)
Humidity Indicator
Drying Tower
Mounting Bracket AD1041
Inlet Flange (AD1138)
Prefilter Tower
Note:
Operating voltage: 85 to 130 vdc
Operating pressure: 6 to 8 Kg/sq.cm
Design Flow : 1500 lpm
Orifice Size : 1.5mm
Dryer weight- 60 kg
Overall dimensions: 592 x 348 x 409
Mounting Holes 1/2"-13UNC-3B 4 Nos.
5/8"-11 UNC 2 Nos.
Electrical connector Part no:62IN-16F-12-3s (3 Core 0.5 sq mm cable 1.5 meter one end to be connected to the above connector and other end should be soldered)
Electrical Connector Prt no:62IN-12E-12-3P
Control box (Electronic controller,Solenoid valve)
152.4
102
162
62
348
409
527
90
592
TITLE
Air Dryer GA
(EMU,DEMU,MEMU)
CUSTOMER
Ind.Railways
PRODUCT
Locodry
DRG NO
LD2000132
REV LEVEL
R3
SCALE
NTS
SHEET
1 of 1
QTY.
1 NUMBER
MATERIAL : ---
APPROVED
RSK
11/08/06
CHECKED
RSK
11/08/06
DRAWN
VMK
11/08/06
TRIDENT
PNEUMATICS PVT LTD


Outlet Flange 1 1/4" NPT
Humidity Indicator
Drying Tower
Inlet Flange 1 1/4" NPT
Prefilter Tower
Mounting Bracket (AD1343)
Note:
Operating voltage: 48 to 90 vdc
Operating pressure: 8 to 10 Kg/sq.cm
Design Flow : 3000 lpm
Orifice Size : 2.5 mm
Dryer weight:- 63 kg
Overall dimensions: 621 x 348 x 381
AIR DRYER GA EMD (WDG4/WDP4)
Mounting Holes 1/2"-13UNC-3B 4 Nos.
5/8"-11UNC 2 Nos.
Electrical connector Part no:62IN-16F-12-3S (1 sq mm teflon cable 2 meter one end to be connected to the above connector and other end should be soldered)
Electrical connector Part no:62IN-12E-12-3P
Control box (Electronic controller-Solenoid valve)
152.4
348
162
127
147
274
381
527
119
621

EXPLODED VIEW (LD2000140)



EXPLODED VIEW (LD2000120, LD2000122 & LD2000132)



1.4 Description

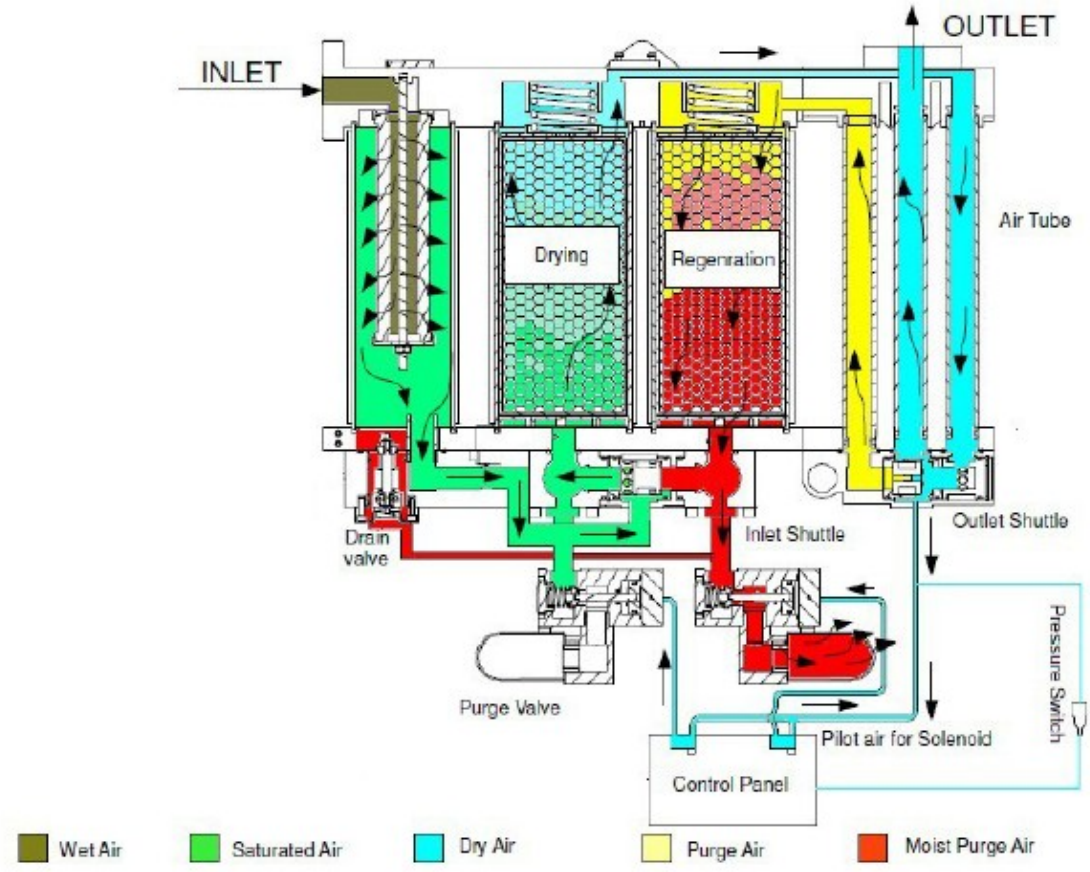
The dryer consists of:

- 2 Drying towers with compactor spring
- 1 Inlet and outlet shuttle valve assembly
- 2 Purge valves
- 2 Solenoid valves
- 1 Pressure Switch
- 1 Electronic control panel
- 2 Humidity Indicators
- 1 Filter tower with Pre-filter and drain valve
- 3 Air Transfer tubes
- 1 After filter
- 1 Mounting Bracket for Air dryer
- 1 Mounting Bracket for After filter

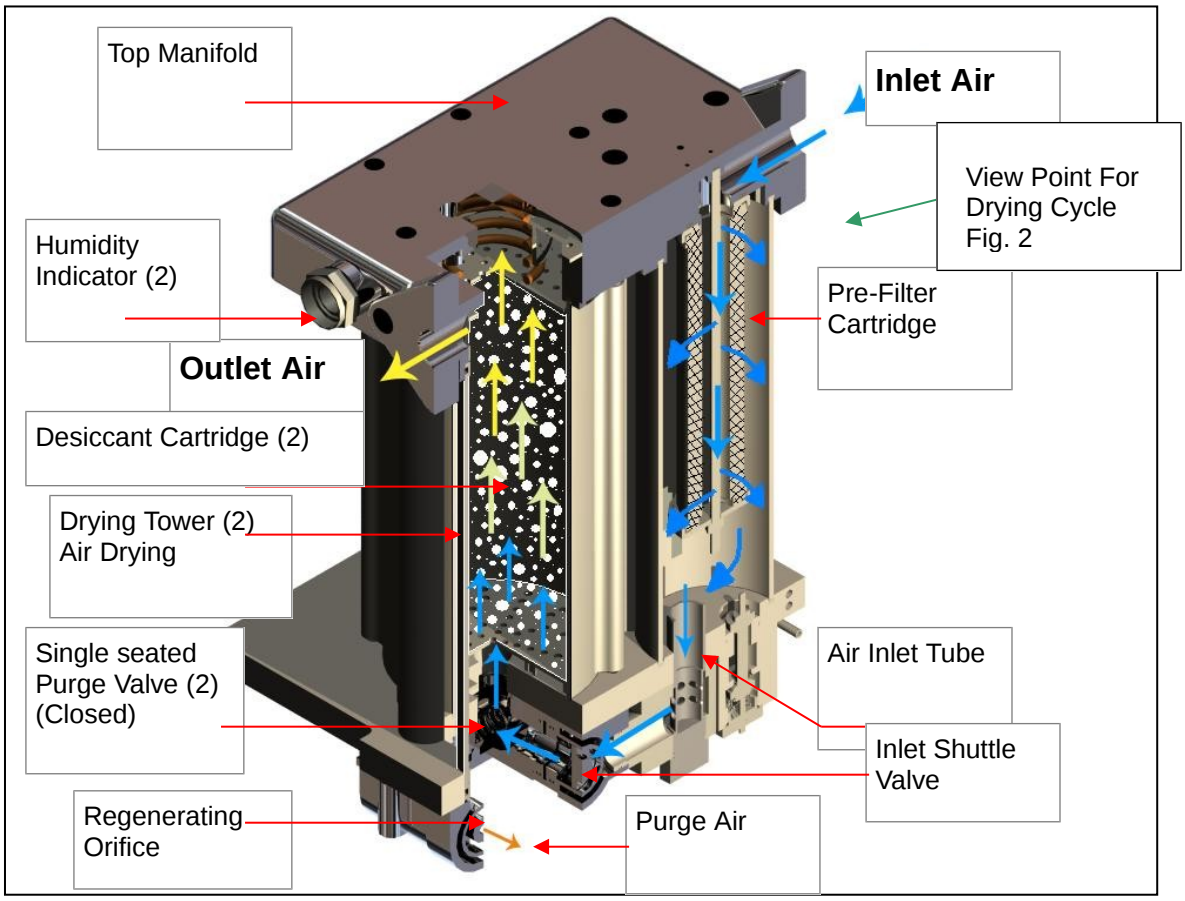
1.5 Adsorbent Material

The desiccant is of highly porous particles with surfaces, which are able to retain (adsorb) the water vapour present in the compressed air (drying phase) and releases it when the air is at atmospheric pressure during contact with dry air (regeneration phase). The desiccant used is activated alumina (Al_2O_3) 2 to 3mm.

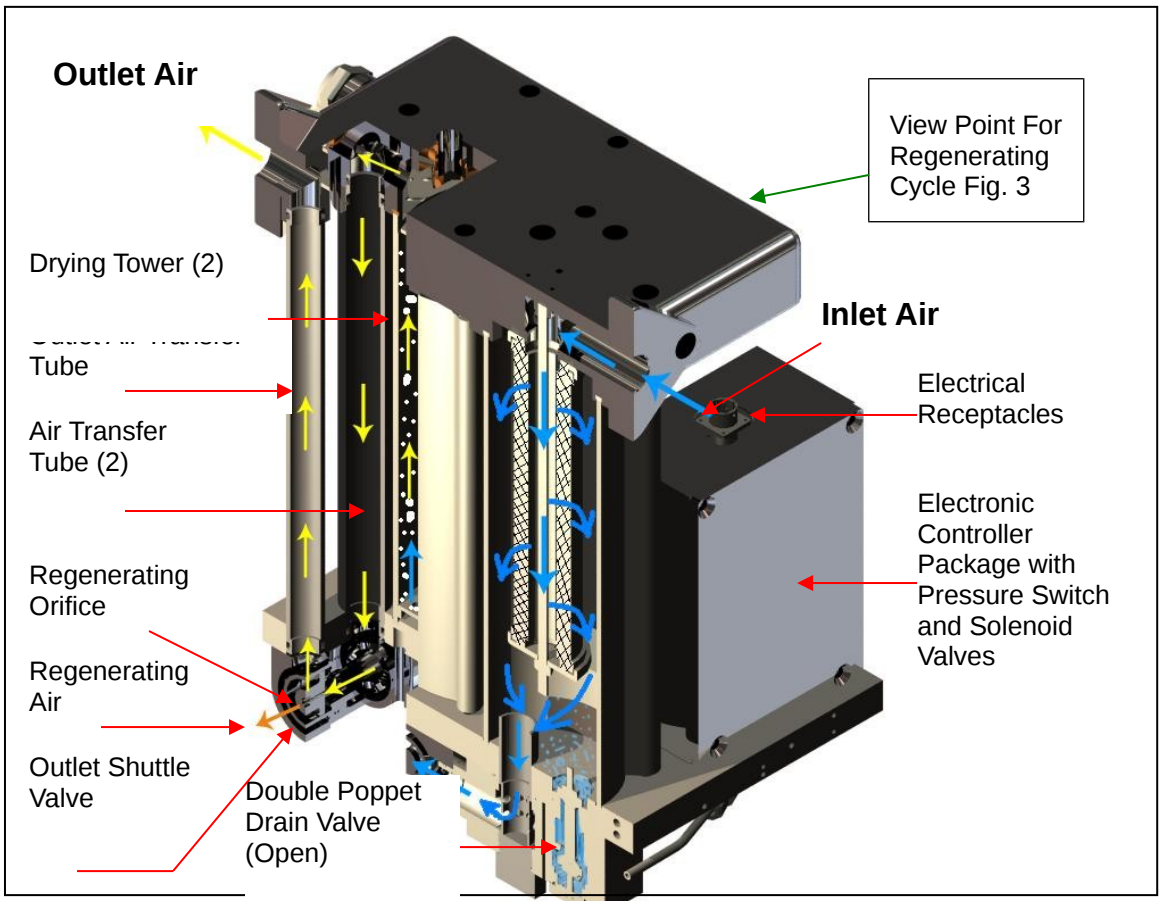
1.6 Operating Principle



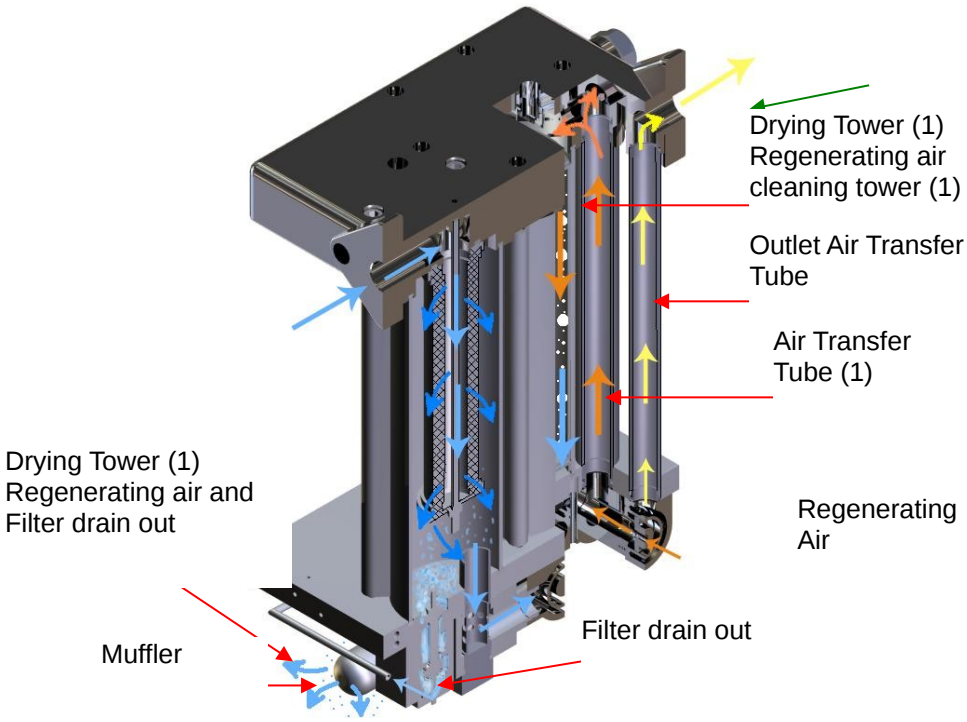
Drying cycle Fig. 1:



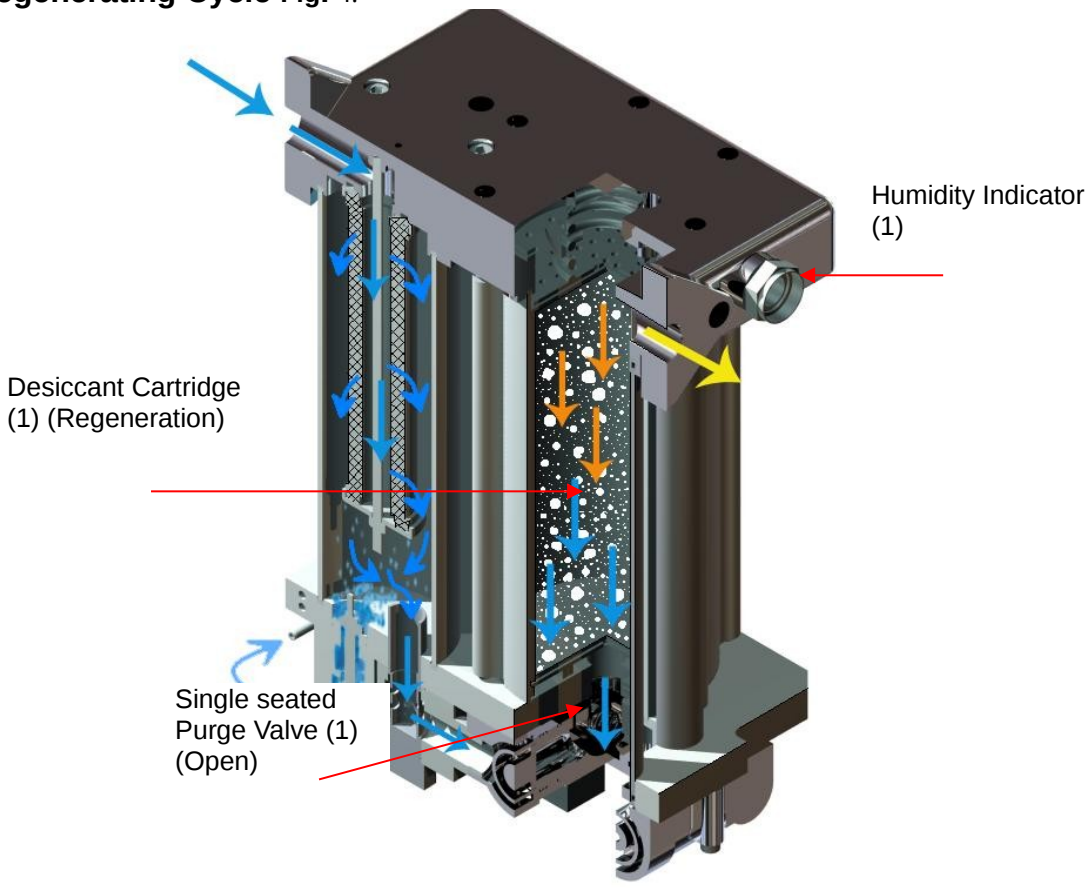
Drying Cycle Fig. 2:



Regenerating Cycle Fig.3:



Regenerating Cycle Fig. 4:



- Moist Air from the compressor enters into the Pre-filter through the top manifold, water and oil coalesces here. The condensate is drained by Drain valve (double poppet valve through Tower1 purge valve).
- Then it passes through the Inlet Shuttle valve and Drying tower.
- In the drying tower, Alumina adsorbs the water vapour present in air and drops the dewpoint of the incoming air.
- Fine Alumina fines will be removed in the after filter provided separately.
- Clean air is let out through the outlet shuttle valve through air transfer tubes.
- The outlet shuttle is provided with a purge orifice, which will provide dry air loss for regeneration.
- The regenerating air passes through regenerating tower, which is in parallel to the drying tower.
- Two humidity indicators are provided to show the dryness of each tower.
- An Electronic control module with Solenoid valve and Pressure switch is provided to cycle air dryer and safe operation.

The two towers operate alternatively in the drying and regeneration phases. Regeneration in one tower results from the expansion to atmospheric pressure in the regeneration tower. Under given operating conditions (service pressure of 7-8 Kg/cm^2), 15% of the airflow is used for regeneration. The regeneration phase is shorter than the drying phase in order to allow the regenerated tower to return to service pressure before a new cycle starts.

1.7 Safety

Pressurized 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.

The person responsible for the stuff 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.

Locodryer Series 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 not noxious. 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…): personnel qualified in the installation of electro - pneumatic systems should perform the installation operations described in this chapter. Follow the procedure described below with care in order to prevent exposing personnel to danger.

2.1 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 desiccant)
- Check that air inlet and outlet are correctly blocked in order to protect the desiccant against humidity and dust.
- Check the machine is correctly protected from atmospheric dust or water.
- Check the store is frost protected
- Make sure to archive correctly the attached documents.

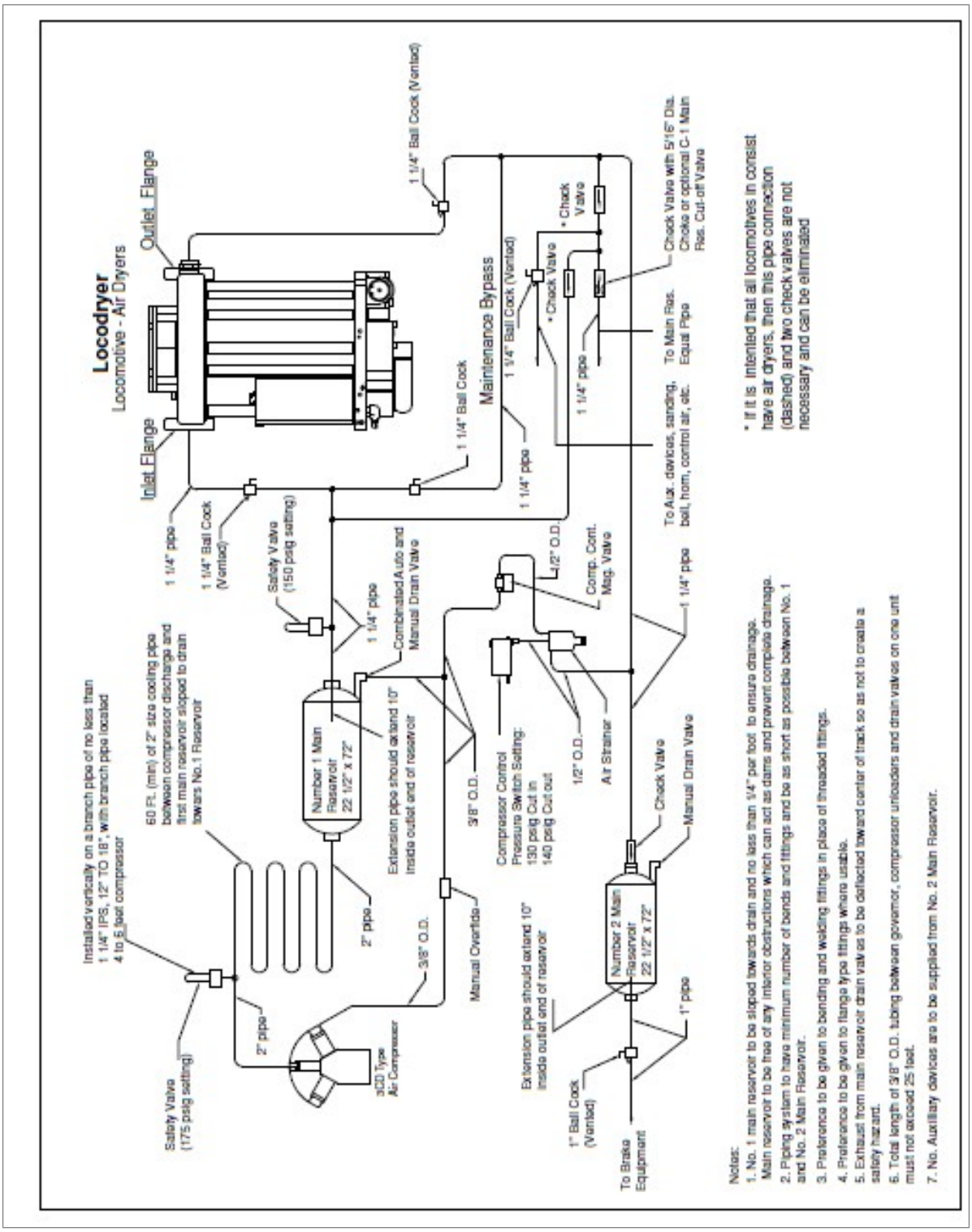


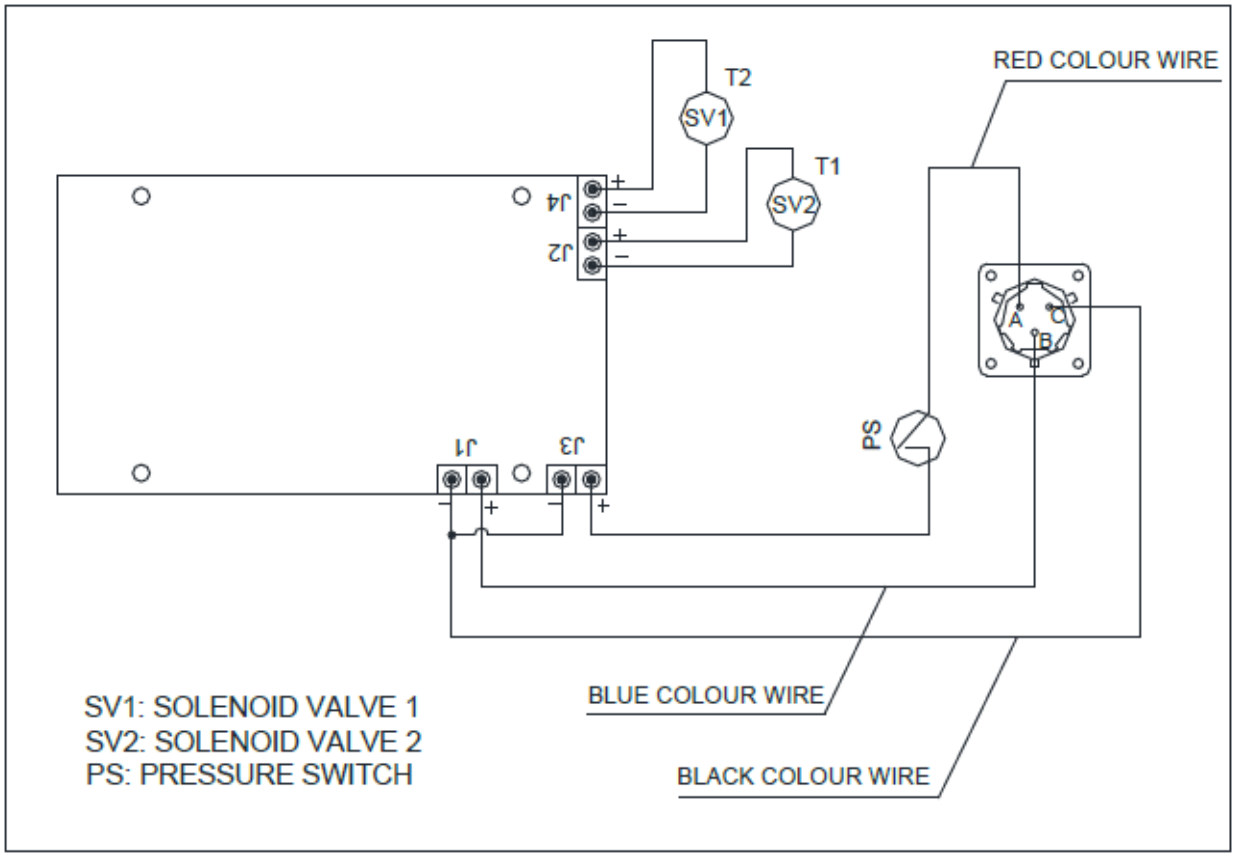
Fig. 5. Air Supply Piping Diagram – Locodryer Air dryer

2.2 Installation site and connections

Close all the air connection connected to the Air dryer Top Manifold Bracket before Installing the Dryer.

1. Check the Air Dryer Pipeline as per above drawing to ensure proper installation.
2. Mount the dryer with mounting bracket in the Locomotive.
3. Remove Inlet and outlet dummy caps.
4. Place the Inlet and outlet O-Rings in the grooves of the Inlet and Outlet ports of Air Dryer.
5. Attach and fix the inlet and outlet pipelines to the Air dryer Package.
6. Check that all the connections are airtight and that the fixings are tight.
7. Remove the Controller connector protection cap above the controller.

Fig. 6. Electrical Wiring Diagram:



BLUE

2.3 Electrical connections

Connect the electrical power connector to the controller connector. Ensure the voltage lies between 48 – 138 VDC.

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

2.4 Running the Installation

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

1. Open slowly the Inlet Air connection connected to the Air Dryer.
2. Avoid any sudden variation in pressure as this may damage the dryer.
3. Open slowly the outlet Air connection connected to the Air Dryer.
4. Switch on the Dryer and check the function timing as per chart given in 3.2 operating cycle time.

3. Operation

3.1 Operator

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

- Pressure in Kg/cm^2 unit
- Flow in lit./min (LPM) unit
- Dew point depression in deg C unit
- Components of a fluid network: compressor, valves, drains, taps, pressure gauges, filters, tanks...

3.2 Operating cycle time

- **Drying Cycle** – One tower goes on drying cycle for a period of 68 seconds while the other tower goes on Regeneration and Re-pressurizing cycle. During drying cycle, the activated alumina removes moisture from the compressed air present in the form of vapor.

- **Regeneration cycle** – occurs every 68 seconds. During this cycle, air is depressurized in the tower. Sudden depressurization brings the water molecules trapped in the desiccant pores to the surface. Dry air purged for a period of 49 seconds over the desiccant removes the water molecules.

- **Re-pressurizing cycle** – To prevent Dryer from pressure spike, Regenerated tower is pressurized before it starts to drying cycle for a period of 19 seconds.

Cycle time (Out of 68 seconds)	
Regeneration	Re-pressurization
49 seconds	19 seconds
Filter drain valves open for every 2minutes 16 seconds	

FIRST CYCLE		SECOND CYCLE	
TOWER 1	TOWER 2	TOWER 1	TOWER 2
Drying	Regeneration	Regeneration	Drying
	Re-pressurization	Re-pressurization	

3.3 Initial charging/ Loading of compressor:

During this time the pressure switch is not connected. Since it was setting at 4 bar (g). It connects the power to the dryer, when the air pressure reaches at 4 bar (g). After that the cycle will continues as mentioned in the para 3.2.

3.4 Unloading of compressor/ Memory feature:

When the compressor unloads, power to the line B disconnected. The controller puts the status of cycle in the memory and it stops working. When the compressor loads again, the controller takes the memory status of cycle and starts continuing the cycle from where it left.

3.5 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. Close the inlet and outlet air connection connected to Air Dryer package.
2. Leave the Dryer controller in switched on condition.
3. Ensure the 2-tower pressure comes down to 0 Kg/cm^2 pressure.
4. Disconnect the controller power supply.

4. Maintenance

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

- Cycle functions normally.

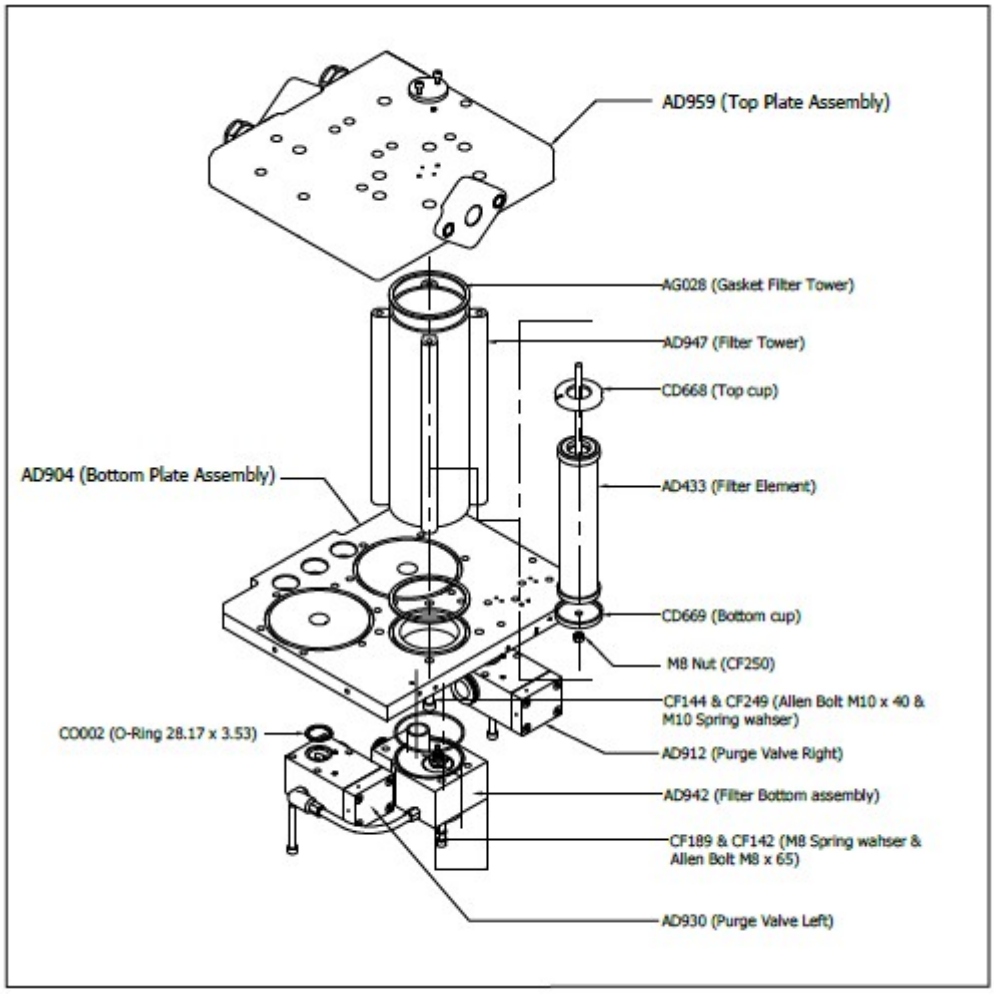
- ❖ Double poppet drain valve functions proper.
- ❖ Regeneration is proper.
- ❖ Pressure drop across the dryer is as per Specification
- ❖ Repeat the Daily, Monthly, Quarterly and Yearly Inspections periodically as per RDSO specification mentioned in Table 2
- ❖ Apply Grease to the piston type Purge valves only

Table 2

Type of Inspection	Filter Element	Purge valve	Desiccant	O rings, Gaskets
Timings	-	D	-	-
Function	-	D	-	-
Choke	M	-	-	-
Replace	Y or R	-	4Y or R	4Y or R
Cleaning	-	4Y or R	-	-
Quality check	-	-	Y	-

D - Daily M - Monthly Q – ¼ Yearly H – ½ Yearly Y - Yearly 4Y – Four year R – As required

Fig. 7. Pre-Filter Changing



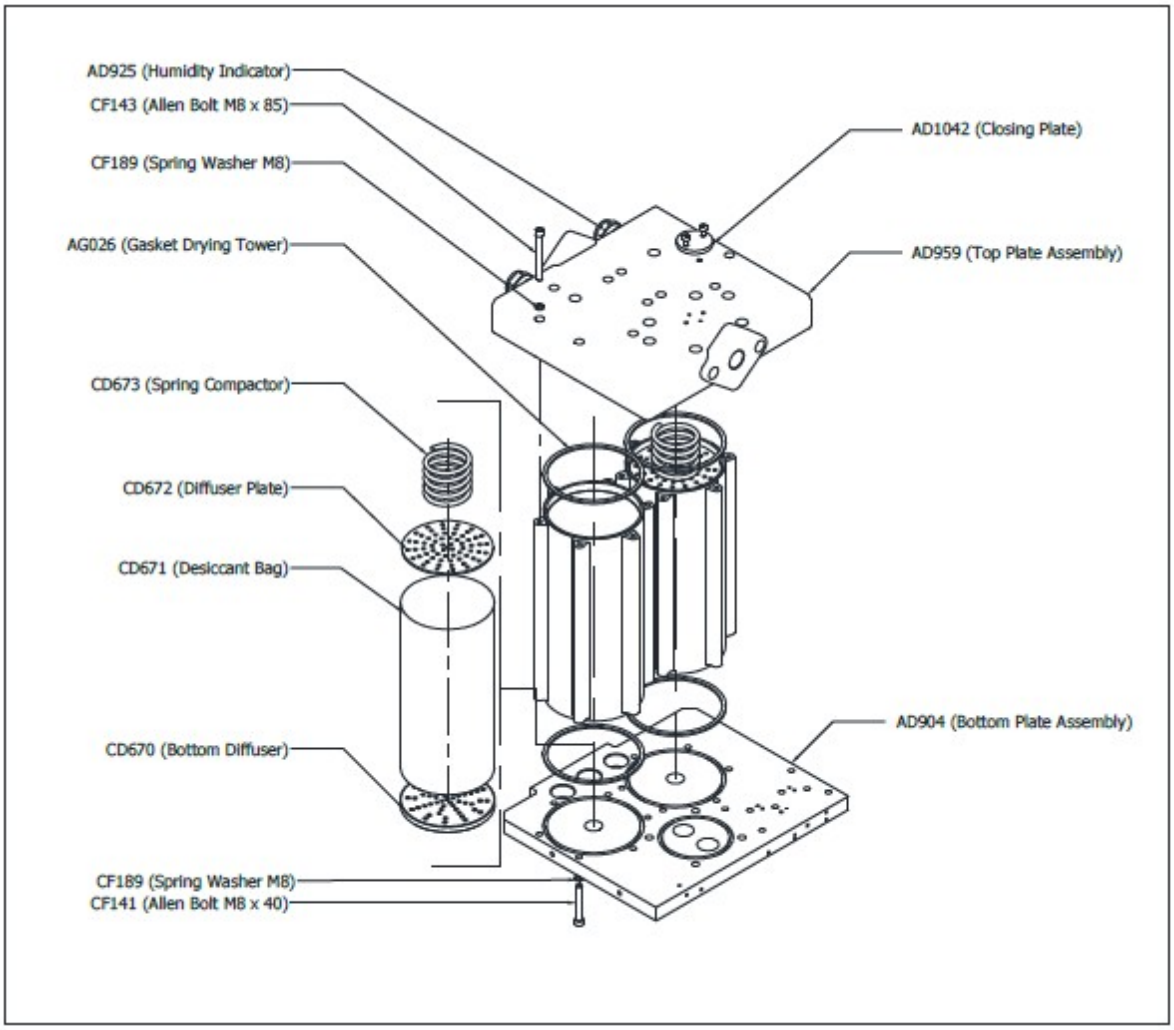
4.1 Changing the Pre filter element.

Various risks (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.

1. Refer fig. 6.
2. Stop the dryer.
3. Loosen the four bolts CF142 of Drain valve AD942
4. Loosen the connectors AD930 and remove the stainless steel piping.
5. Remove the drain valve from the bottom plate.
6. Allow the hand to enter into the filter tower through bottom plate bore.
7. Unscrew the filter bottom cap AD959
8. Remove the Filter element CD667 from the tie rod, which is fixed with Top manifold AD959.
9. Insert the Trident supplied new filter element CD667 in the top manifold tie rod assembly; tight the filter bottom cap in the tie rod till it tightens the inserted new filter element.

10. Ensure the inserted new filter element located properly on the top filter element cap CD668
11. Place the drain valve AD942 on the bottom plate
12. Tight the bolts CF142 and connectors AD930 with S.S piping.
13. Ensure the joints are leak proof.
14. Start the machine.

Fig. 8. Desiccant Cartridge Changing



4.2 Changing the Desiccant

Various risks (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 and ensure there is no pressure in the Air dryer package. It is obligatory for all personnel who are in the presence of the desiccant to wear dust masks.

1. Stop the Dryer.
2. Remove Inlet and Outlet connection of the air dryer package.
3. Remove the dryer from the mounting bracket and take it to the service place.
4. Remove the Top manifold AD959 by loosening the top Allen bolts CF143 of the drying tower and filter tower CF145.
5. Remove the compactor springs CD673.
6. Remove the top compactor discs CD672.
7. Remove the desiccant bag CD671 from both the towers.
8. Ensure to close air transfer tubes while changing the desiccant, entry of desiccant inside air transfer tube will create malfunctioning of shuttle valve.
9. Ensure there is no old desiccant in the tower.
10. Replace the Trident supplied new Desiccant bag CD671 in the two towers.
11. Close the desiccant bag top with compactor discs CD672
12. Place the compactor springs CD673 on the discs.
13. Replace the Gaskets AGO26, in the Top manifold grooves.
14. Replace the Air transfer tubes O-rings.
15. Locate and mount the Top manifold and tight the Allen bolts CF143, CF145 with 25Nm torque.
16. Ensure the Inlet and Outlet ports O-rings are placed in the Port grooves.
17. Check the dryer for leakage and proper functioning in the test rig.
18. Mount the Dryer in the Mounting Bracket AD925
19. Connect the air inlet and outlet piping to the Air Dryer package.
20. Start the Dryer as per procedure recommended.

5.0 Recommended spares list

Recommended Spare Parts List For Air Dryer of M/s Trident Pneumatics

(A) (Kit for Air Dryer LD2000140 fitted on Diesel Locos including WDP4 & WDG4)

Parts to be renewed in M-12 schedule(AS657)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1

Parts to be renewed in M-48 schedule (AS660A)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Spare Kit Valve Shuttle	AS445	1
7	Spare Kit Valve Purge	AS446	2
8	Bag Cartridge desiccant	CD671	2
9	Spring Compactor	CD673	2
10	Spare Kit Seals Tower	AS447	1
11	Sub Assy Humidity Indicator	AD925	2
12	Gasket Pad Amisco Solenoid Valve	AS079A	2
13	Seal Kit Controller Box	AS709	1

Parts to be renewed in electrical spare kits Loco Dryer(AS659)

Sl No	Item	Trident part No	Quantity
1	Controller loco Dryer	AD1224	1
2	Solenoid Valve	AS079	2
3	Pressure Switch	CE484	1

B) (Kit for Air Dryer LD2000120 fitted on Electric Locos except 3 phase - WAG-9, WAP-7 & WAP-5 Locos.)

Parts to be renewed in AOH Schedule (AS882)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1

Parts to be renewed in IOH schedule(AS881)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1
7	Spare Kit Valve Shuttle	AS445	1
8	Spare Kit Valve Purge	AS446	2
9	Bag Cartridge desiccant	CD671	2
10	Spring Compactor	CD673	2
11	Spare Kit Seals Tower	AS447	1
12	Sub Assy Humidity Indicator	AD925	2
13	Gasket Pad Amisco Solenoid Valve	AS079A	2
14	Seal Kit Controller Box	AS709	1

Parts to be renewed in electrical spare kits Loco Dryer(AS659)

Sl No	Item	Trident part No	Quantity
1	Controller loco Dryer	AD1224	1
2	Solenoid Valve	AS079	2
3	Pressure Switch	CE484	1

(C) (Kit for Air Dryer LD2000122 fitted on Electrical Locos including – WAG-7 & WAP-4)

Parts to be renewed in AOH Schedule(AS882)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1

Parts to be renewed in IOH Schedule(AS705A)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1
7	Spare Kit Valve Shuttle	AS706	1
8	Spare Kit Valve Purge	AS446	2
9	Bag Cartridge desiccant	CD671	2
10	Spring Compactor	CD673	2
11	Spare Kit Seals Tower	AS447	1
12	Sub Assy Humidity Indicator	AD925	2
13	Gasket Pad Amisco Solenoid Valve	AS079A	2
14	Seal Kit Controller Box	AS709	1

Parts to be renewed in electrical spare kits Loco Dryer(AS659)

Sl No	Item	Trident part No	Quantity
1	Controller loco Dryer	AD1224	1
2	Solenoid Valve	AS079	2
3	Pressure Switch	CE484	1

(D) (Kit for Air Dryer LD2000132 fitted on EMU, DEMU & MEMU)

Parts to be renewed in POH /Eighteen Monthly Schedule (AS882)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1

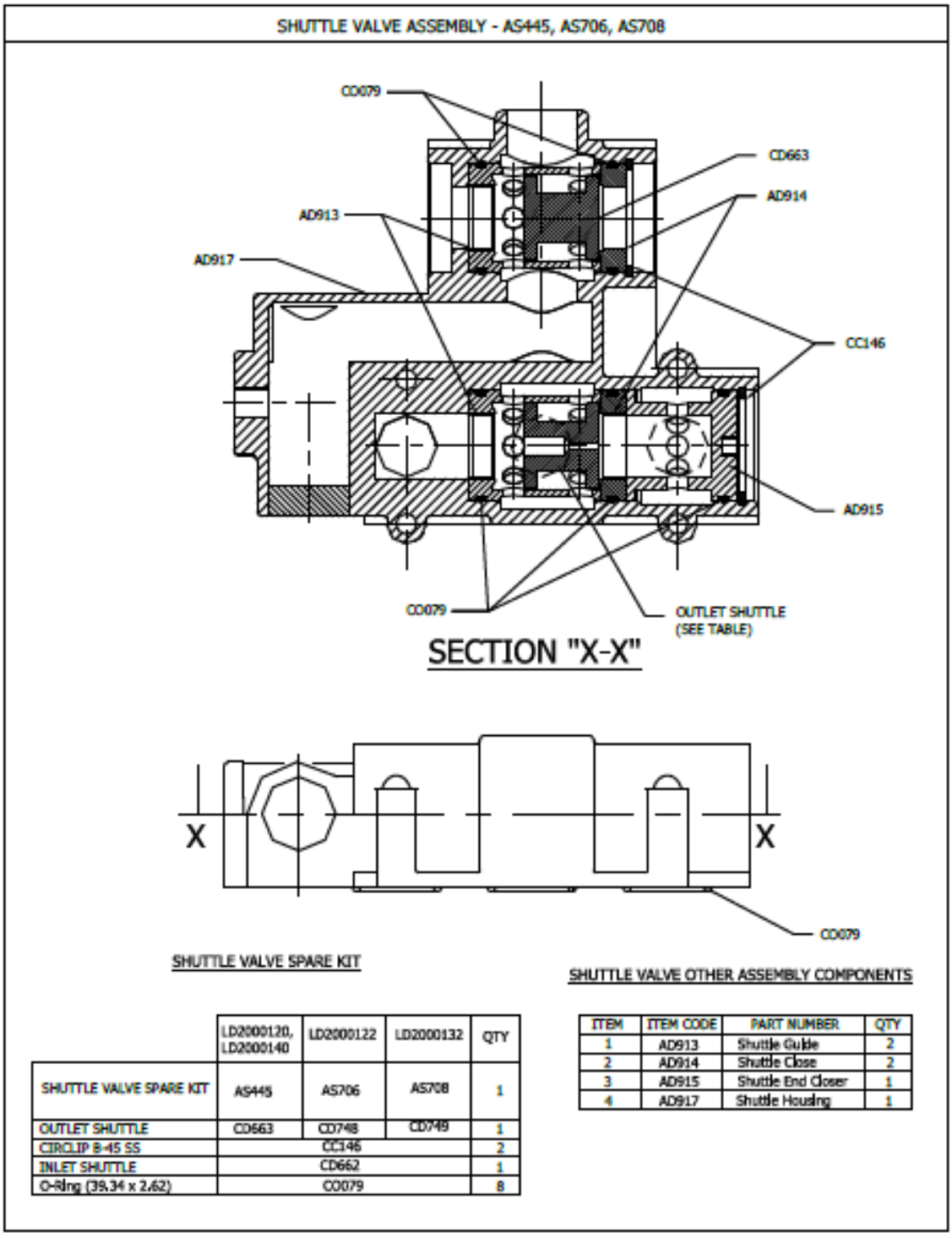
Parts to be renewed in Every Alternate POH schedule(AS707A)

Sl No	Item	Trident part No	Quantity
1	Filter Element	AD433	1
2	Filter Top Cup	CD668	1
3	Filter Bottom Cup	CD669	1
4	Spare Kit Filter Bottom	AS443	1
5	Spare Kit Valve Double Poppet	AS444	1
6	Filter Element M250Y	AC077	1
7	Spare Kit Valve Shuttle	AS708	1
8	Spare Kit Valve Purge	AS446	2
9	Bag Cartridge desiccant	CD671	2
10	Spring Compactor	CD673	2
11	Spare Kit Seals Tower	AS447	1
12	Sub Assy Humidity Indicator	AD925	2
13	Gasket Pad Amisco Solenoid Valve	AS079A	2
14	Seal Kit Controller Box	AS709	1

Parts to be renewed in electrical spare kits Loco Dryer(AS659)

Sl No	Item	Trident part No	Quantity
1	Controller loco Dryer	AD1224	1
2	Solenoid Valve	AS079	2
3	Pressure Switch	CE484	1

Fig. 9. Shuttle Valve Sectional View



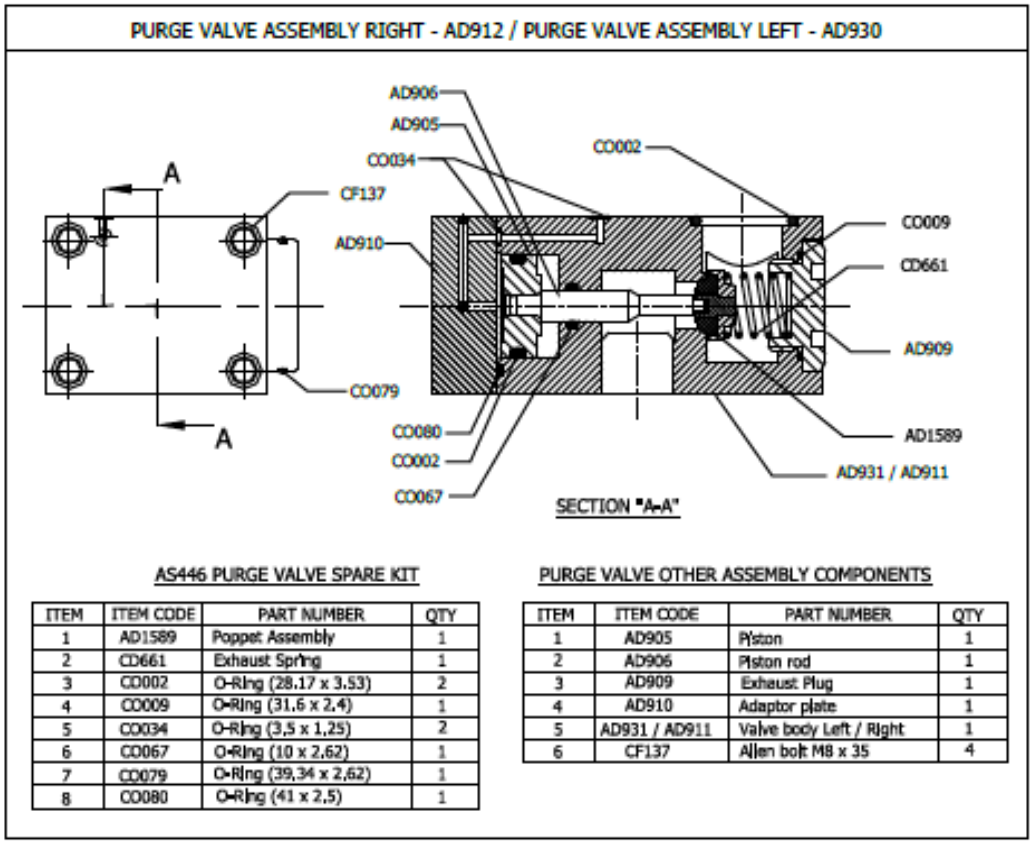
SHUTTLE VALVE SPARE KIT

	LD2000120, LD2000140	LD2000122	LD2000132	QTY
SHUTTLE VALVE SPARE KIT	AS445	AS706	AS708	1
OUTLET SHUTTLE	CD663	CD748	CD749	1
CIRCLIP B-45 SS	CC146			2
INLET SHUTTLE	CD662			1
O-Ring (39.34 x 2.62)	CD079			8

SHUTTLE VALVE OTHER ASSEMBLY COMPONENTS

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD913	Shuttle Guide	2
2	AD914	Shuttle Close	2
3	AD915	Shuttle End Closer	1
4	AD917	Shuttle Housing	1

Fig. 10. Purge Valve Sectional View



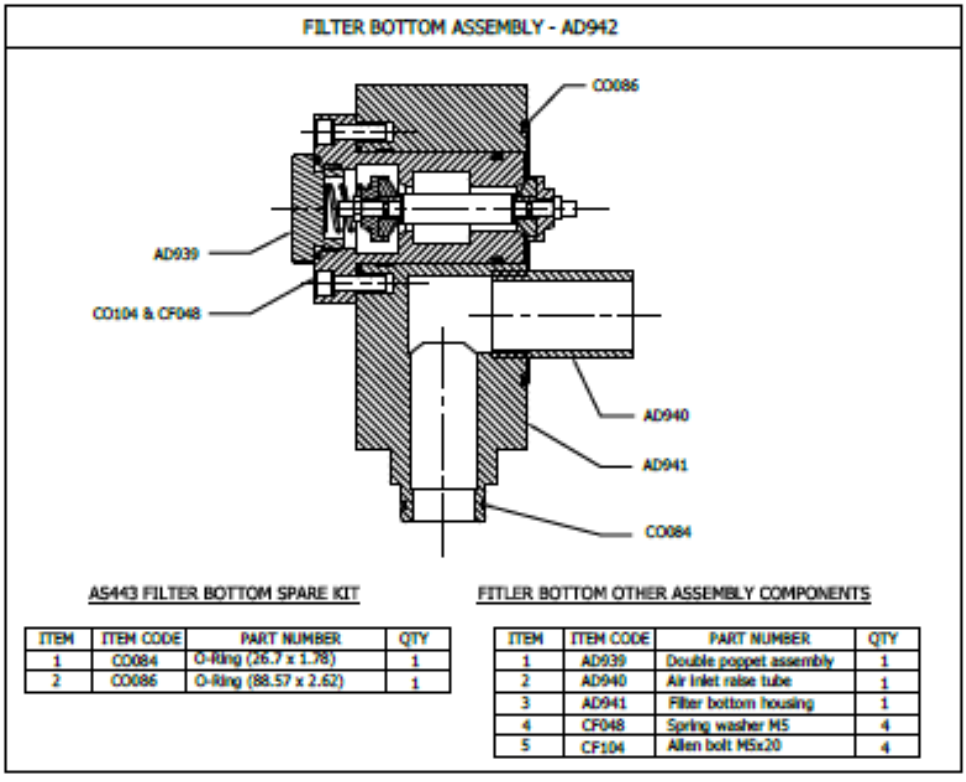
AS446 PURGE VALVE SPARE KIT

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD1589	Poppet Assembly	1
2	CD661	Exhaust Spring	1
3	CD002	O-Ring (28.17 x 3.53)	2
4	CO009	O-Ring (31.6 x 2.4)	1
5	CO034	O-Ring (3.5 x 1.25)	2
6	CO067	O-Ring (10 x 2.62)	1
7	CO079	O-Ring (39.34 x 2.62)	1
8	CO080	O-Ring (41 x 2.5)	1

PURGE VALVE OTHER ASSEMBLY COMPONENTS

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD905	Piston	1
2	AD906	Piston rod	1
3	AD909	Exhaust Plug	1
4	AD910	Adaptor plate	1
5	AD931 / AD911	Valve body Left / Right	1
6	CF137	Allen bolt M8 x 35	4

Fig. 11. Drain Valve Assembly Sectional View



AS443 FILTER BOTTOM SPARE KIT

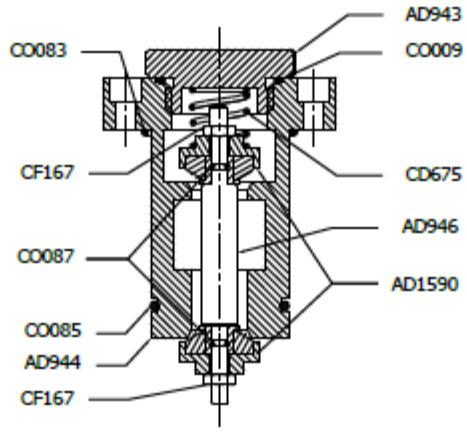
ITEM	ITEM CODE	PART NUMBER	QTY
1	CO084	O-Ring (26.7 x 1.78)	1
2	CO086	O-Ring (88.57 x 2.62)	1

FITLER BOTTOM OTHER ASSEMBLY COMPONENTS

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD939	Double poppet assembly	1
2	AD940	Air inlet raise tube	1
3	AD941	Filter bottom housing	1
4	CF048	Spring washer M5	4
5	CF104	Allen bolt M5x20	4

Fig. 12. Double Poppet Assembly Sectional View

DOUBLE POPPET ASSEMBLY - AD939



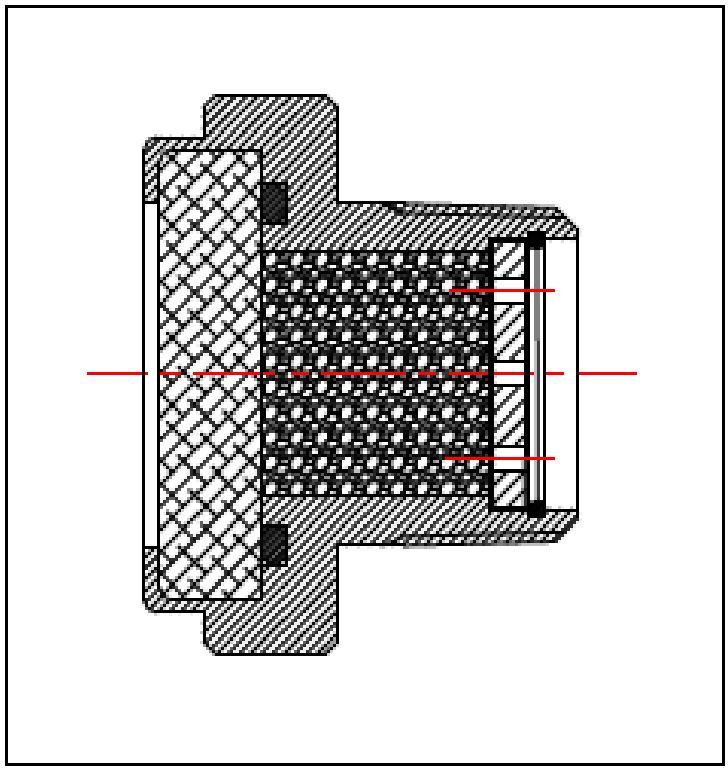
AS444 DOUBLE POPPET VALVE SPARE KIT

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD1590	Poppet Assembly	2
2	CD675	Filter bottom spring	1
3	CO009	O-Ring (31.6 x 2.4)	1
4	CO083	O-Ring (41 x 1.78)	1
5	CO085	O-Ring (34.59 x 2.62)	1
6	CO087	O-Ring (3 x 1.25)	2

DOUBLE POPPET OTHER ASSEMBLY COMPONENTS

ITEM	ITEM CODE	PART NUMBER	QTY
1	AD943	Poppet plug	1
2	AD944	DOUBLE POPPET HOUSING	1
3	AD946	Double poppet stem	1
4	CF167	Nut M5 S.S	2

Fig. 13. Humidity Indicator Sectional View - AD925



6. Trouble Shooting Instructions

Only qualified persons in electro-pneumatic systems installation should perform the repair operations described in this section.

Problem	Cause	Solution
1 No purging of drying Towers	➢ PCB problem	✓ Change Controller PCB
	➢ Outlet Shuttle Orifice blocked	✓ Remove the shuttle and clean the orifice
	➢ Power connector removed from Dryer	✓ Check the connector whether it's been connected or not
	➢ Supply Voltage is not Coming	✓ Check the supply Voltage
	➢ Solenoid valve orifice blocked	✓ Check & replace the Solenoid valve
2 Very high Purge Loss during Regeneration		
2.1 Tower 1	➢ Dust or particles in the shuttle guides	✓ Clean the Shuttle guides
	➢ Plunger and Spring of solenoid valve may be damaged	✓ Replace the Solenoid valve
	➢ Solenoid valve orifice may be partially choked	✓ Replace the Solenoid valve
	➢ Tower 1 Purge valve Poppet damaged	✓ Check and replace the poppet
	➢ Double poppet valve poppet damaged	✓ Check and replace the poppet
2.2 Tower 2	➢ Dust or particles in the shuttle guides	✓ Clean the Shuttle guides
	➢ Plunger and Spring of solenoid valve may be damaged	✓ Replace the Solenoid valve
	➢ Piston stuck in Purge valve Tower 2	✓ Service valve or replace
	➢ Tower 2 Purge valve Poppet damaged	✓ Check and replace the poppet

Problem	Cause	Solution
3 Moisture at the outlet	➢ Inlet air oil level may be more than 20 ppm or filter element life may be gone	✓ Replace filter element or check the inlet air oil content
	➢ Cycle may not be changing	✓ Change Controller
	➢ Purge may not take place during regeneration	✓ Service the valves
	➢ Inlet or Outlet shuttle face damaged	✓ Change the shuttle
	➢ Including causes of problem 1	✓ Solution for the same
4 Humidity Indicator is white	➢ Dryer Inlet and Outlet Dummy cap may be removed during storage of dryer.	✓ Keep the dryer Inlet & Outlet Dummy cap closed condition During storage, keep originally in packed condition
	➢ Allowing the air to pass through the dryer without giving power supply	✓ The indicator color become blue automatically when the dryer is running condition.
5 Higher Differential Pressure across the dryer	➢ Pre-filter element may be choked	✓ Check & Replace with the M12 Spare kit pre-filter Element
	➢ Drying Tower or Filter tower Gasket leaks	✓ Check and Replace the Gaskets
	➢ Inlet or Outlet shuttle damaged	✓ Check & Replace the shuttle
	➢ Purge valve piston struck	✓ Service the purge valve
	➢ Solenoid valve partially open condition	✓ Check & Replace the solenoid valve

7. Test Specification

Only qualified persons in electro-pneumatic systems testing should perform the Testing of Air dryer described in this section.

Please Loco dryer has been assembled, but before it is returned to service, it must pass a series of tests as listed below

1. Test the dryer for a nominal flow *
2. Check for leakage in the Dryer.
3. Check the operation of controller at various voltages ranging from 48 to 138 V D.C.
4. Check the controller memory feature
5. Measure the pressure drop across the dryer.
6. Measure the regeneration and re-pressurization cycle time.
7. Measure the purge loss.
8. Measure the dew point depression.

Also, refer Trident functional Qualification test Plan TPPL/IR/FQT/01.

After installing a New of properly repaired Trident Loco dryer in the locomotive, a stationary test must be made to be sure that the Air Dryer has no Leakages and Functions properly in the total air brake arrangement.

Consult Trident Pneumatics Representatives if additional information is required.

*

Refer Below Table for Trident Model No & Loco Model No.

Sl.No	TRIDENT MODEL	LOCO MODEL
1	LD2000140	WDG4 / WDP4
2	LD2000120	WAG9 /WAP7 /WAP5
3	LD2000122	WAG7 / WAP 4
4	LD2000132	EMU / DEMU / MEMU

8. Commissioning report

Dryer Model Serial No. Commissioning date Result of Commissioning	: : : : Successful / Pending	Customer (Full Address)

Unpacking condition

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

Installation:

a. Installation at	: Before MR1 and MR2 receiver
b. Inlet Air Temperature	: Normal / High
c. Side clearance provided	: Yes / No
d. Power Grounded	: DC
e. Air Flow Outlet	: Normal / Faulty
f. Change over sequence	: Normal / Faulty

Tower 1 and 2 Drying	Yes / No
Depressurizing	Yes / No
Regeneration	Yes / No
Air loss	Normal/ faulty
Humidity Indicator	Normal/ faulty
Differential pressure Indicator	Normal/ faulty

Comments

Signature & Name of Installing Engineer

Customer Signature & Seal

Signature of Regional Engineer