



DRYPOINT® ACC 4 - 35

Instruction & Technical Manual

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EN



The product to which this manual refers must not be supplied, installed, used, operated or serviced until the contents of the manual has been fully read and understood by all relevant personnel.

Please complete the following information at the time of installation

found on the rating label on the upper right hand side of dryer

Model Number

Serial Number

Regulated Inlet Pressure

Filtration present with Dryer

Outlet Flow of Dryer

Compressor Outlet Flow

Supply Voltage

When contacting the manufacturer regarding this product, please have the above stated information at hand to speed up your query.

Contents

1	Safety	4
	Safety Guidelines	4
	Symbols	5
2	General Description	6
	Function of the Dryer	6
	Package Contents	7
3	Mechanical Installation	9
4	Electrical Installation	15
5	Operation	18
	Start-Up	18
	Shut Down	19
6	Maintenance	25
	Servicing	25
	Purge Plug	28
	Exhaust	29
	Replacing Shuttle Valves	31
7	Energy Management	32
8	Troubleshooting	38
9	Technical Data	42
10	Component Parts	44
11	Spares Information	47
12	Warranty	49

Safety

The following safety guidelines must be strictly observed.

- Leave this manual at the place of installation of the product.
- It is essential that only the manufacturer or its appointed agents carry out maintenance and servicing work.

Users, maintenance and servicing personnel must be familiar with:

- Accident prevention regulations.
 - Safety information (general and specific to the unit).
 - Safety devices of the unit.
 - Measures to be taken in case of an emergency.
 - Allow only suitably trained persons to be involved with installation, start-up, operation, servicing and maintenance of the product.
 - It is the responsibility of the installer to ensure that the pipe work to and from the dryer is suitable, in accordance with applicable legislation and subject to inspection and testing prior to being put into service. All piping must be adequately supported.
 - Before carrying out any maintenance or servicing work the unit must be taken out of operation. Users and others will be exposed to risk if work is carried out while the unit is running. This means electrical disconnection plus isolation from the compressed air supply and full depressurization.
 - Only trained and competent persons familiar with the electrical requirements of the unit as laid out in this manual and electrical safety rules and regulations should be allowed to carry out work on the electrical components and power supply to the unit.
 - When carrying out any work on the unit, use only correctly sized appropriate tools in good condition.
 - Only use original spare parts and accessories from the manufacturer. There is no guarantee that non-original parts have been designed and manufactured to meet the safety and operational requirements of the unit. The manufacturer assumes no liability for any equipment malfunction resulting from the use of non-approved parts.
- If carrying out installation work above head height, use suitable and safe working platforms or other means of working access.
 - Do not make any constructional changes to the product. Any changes or modifications may only be carried out by the manufacturer.
 - Any faults or defects that could affect safety must be put right fully before using the unit.
 - Used items and materials must be disposed of in the correct manner, complying with local laws and regulations, in particular the desiccant cartridge.

Figure 1.1: Definition of symbols



Manual Handling

As with all areas of the workplace, Health and Safety is of great importance and must be given due care and attention. While working with this equipment, manual handling regulations must be considered and adhered to.

Full advice, support and guidance should be detailed in your Health and Safety Policy and Manual Handling guide, please take the time to familiarize yourself with these documents.

The Manual Handling Operations Regulations apply to a wide range of manual handling activities, including lifting, lowering, pushing, pulling or carrying.

We ask every person handling this product to take the responsibility for their own Health and Safety and the Health and Safety of others around them. If you feel there is a significant risk, you must take steps to either remove the risk altogether, or reduce the risk prior to carrying out the activity. If you need further support or guidance with this, please consult your line manager or the HR Department.

There are safe systems of work and correct procedures in relation to manual handling, please consult these documents available within the workplace.

We ask everyone handling this product to:

- Follow appropriate systems of work laid down for their safety.
- Make proper use of any equipment provided for their safety.
- Inform the company if they identify hazardous handling activities.
- Take care to ensure that their activities do not put others at risk.

If in doubt, please seek further advice and ensure you always follow the correct procedures and guidance.

 For more information please see our Health and Safety manual attached.

When used in the UK, a 3 amp fuse should be fitted as per the wiring diagram (figure 4.4).

General Description

This manual is valid for the following dryer models

ACC 4	ACC 6	ACC 8
ACC 10	ACC 15	ACC 25
ACC 35		

Function of the Dryer

The dryer is designed to provide a smooth, controlled and uninterrupted delivery of dry compressed air. Wet air passes through a pre-filter and travels down to the bottom valve assembly. The air is then fed through the bottom of the desiccant bed and moves through the high performance desiccant until it becomes dry. On exit from the desiccant cartridge, the air is passed through the outlet valve assembly.

During this process, the dryer control system cycles the process air between the two desiccant towers. While one chamber is on stream removing water vapor, the other is being carefully depressurized in preparation for regeneration. The desiccant bed is regenerated by expanding a small amount of dry process air, or purge air, through the saturated desiccant.

Purge air passes to atmosphere through the silencer, which is fitted to an exhaust valve. The chamber is then repressurized, with the control system assuring each chamber is at full operational pressure prior to changeover.

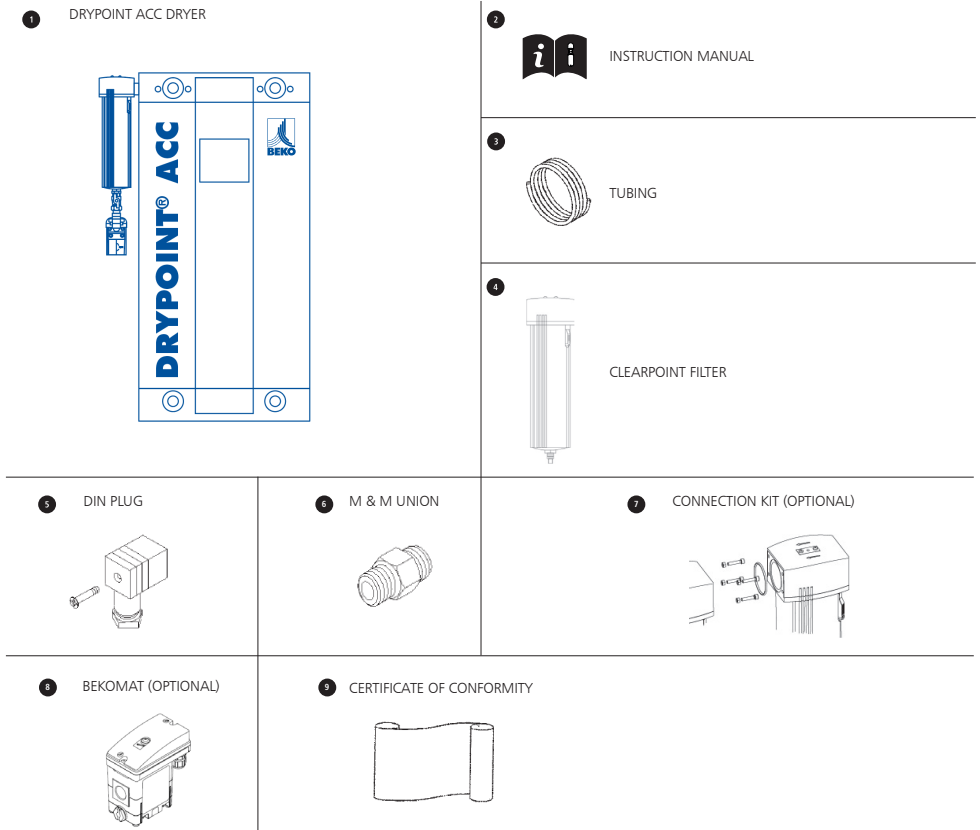
This ensures a reliable and efficient operation. The air stream is switched and the cycle repeats on a continuous basis.

Section 2: General Description

Package Contents

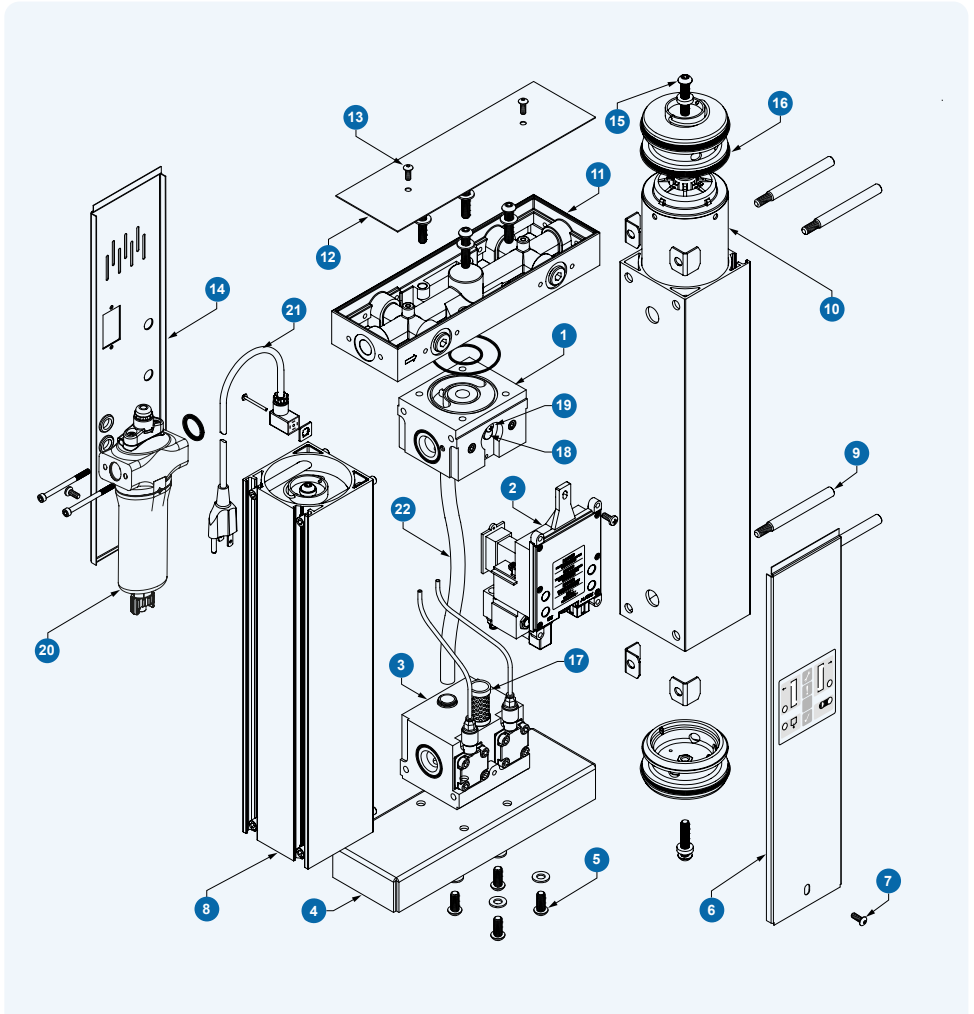
The dryer is delivered in protective packaging. Take care when transporting, loading and unloading the unit. The package contains the following items (refer to figure 2.1):

Figure 2.1: Package contents



Section 2: General Description

Figure 2.2: Models 4 SCFM – 35 SCFM




- | | | |
|-----------------------------|--|-----------------------------|
| 1. Top valve assembly | 9. Pressure housing retaining bolt | 17. Exhaust silencer |
| 2. Control unit | 10. Desiccant cartridge (comes with dust filter) | 18. Purge plug |
| 3. Bottom valve assembly | 11. Multiport manifold | 19. Purge plug fixing screw |
| 4. Dryer base | 12. Top cover | 20. Pre-filter |
| 5. Bottom valve fixing bolt | 13. Top cover fixing screw | 21. Power cord |
| 6. Front panel | 14. Rear panel | 22. Down tube |
| 7. Front panel fixing screw | 15. Banjo fixing bolt | |
| 8. Pressure housing | 16. Pressure seal | |

Mechanical Installation

Connecting the pre-filter to the dryer

- 4 SCFM – 35 SCFM, Utilize O-ring and bolts supplied to assemble filter as per figure 3.1.
- Fit 5/32" (4mm) tubing to filter and dryer's built-in drain valve inlet.
- Pipe away condensate with 5/32" (4mm) tubing from the dryer's drain outlet. Ensure condensate is drained into an oil/water separator.
- Fit any further filtration or ancillary equipment.
- Drain kits supplied with dryer and comprise of the following: Swivel elbow adapter and 5/32" (4mm) tubing.

 All tubing should be secured up to the point of drain to prevent whipping during discharge.

It is recommended that a bypass line including filter is installed, as per figure 3.13

Figure 3.1: Connecting pre-filter

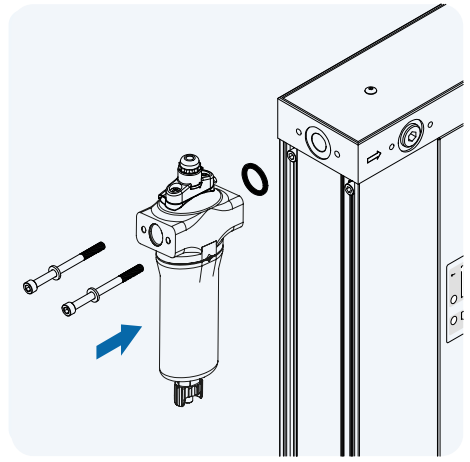
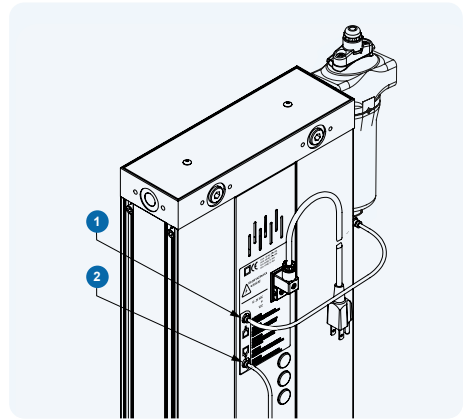


Figure 3.2: Connecting filter drain



1. Inlet
2. Outlet

Orientation

The dryers are designed to operate in both vertical and horizontal orientation.

Figure 3.3: Horizontal orientation

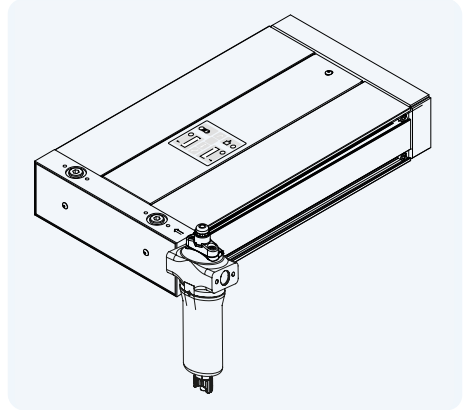
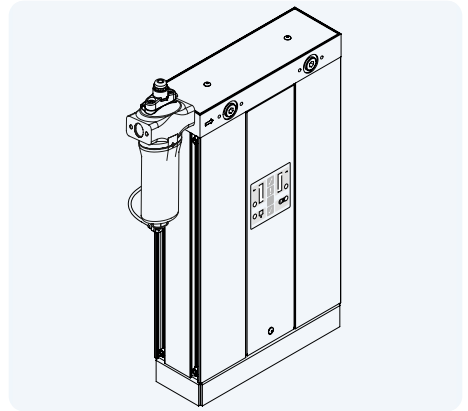


Figure 3.4: Vertical orientation



Section 3: Mechanical Installation

Reconfiguration of the inlet / outlet ports

4 SCFM – 35 SCFM models

The dryer provides a choice of 3 inlet ports (A, B & C) and 3 outlet ports (D, E & F). Any inlet or outlet port may be used. Make sure the remaining two inlet or outlet ports are blanked off using provided pressure plugs. (Figure 3.5)

If desired, the port block may be removed and rotated 180° to provide additional inlet & outlet port positions. (Figure 3.6)



Directional arrows are etched into the inlet manifold.

Any / all of the three outlet ports can be used on occasion. Please ensure combined flow at outlet should not exceed specification. Please adhere to regional regulations.

It is strongly advised to connect a non-return valve to each outlet used.

Only use one inlet port at any one time

Ensure original seals are in place.

Check dryer is leak-free prior to operation.

Tools required

- 4mm hex key
- 5mm hex key

Figure 3.5: Inlet/outlet ports

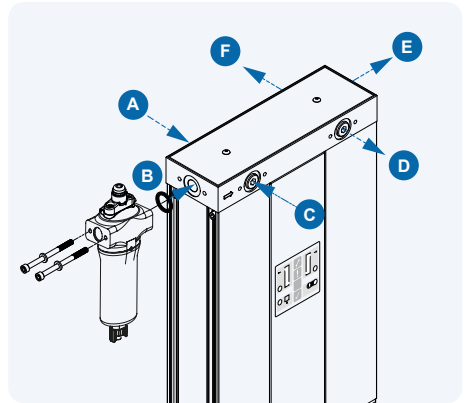
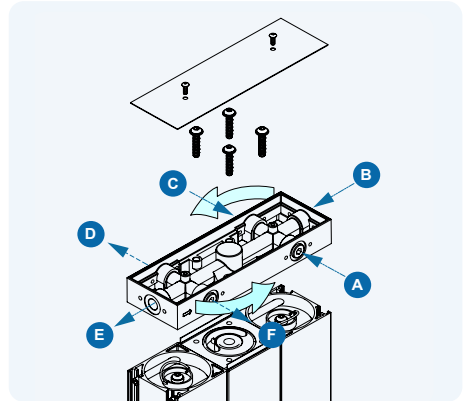


Figure 3.6: Reconfiguration of inlet/outlet ports



Section 3: **Mechanical Installation**

Figure 3.7: Level ground

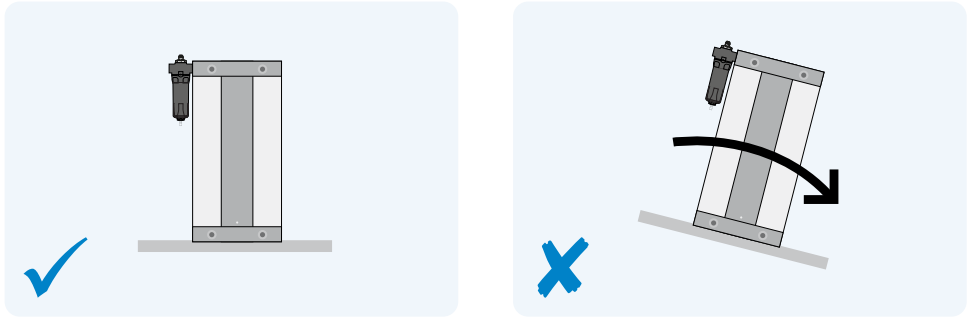
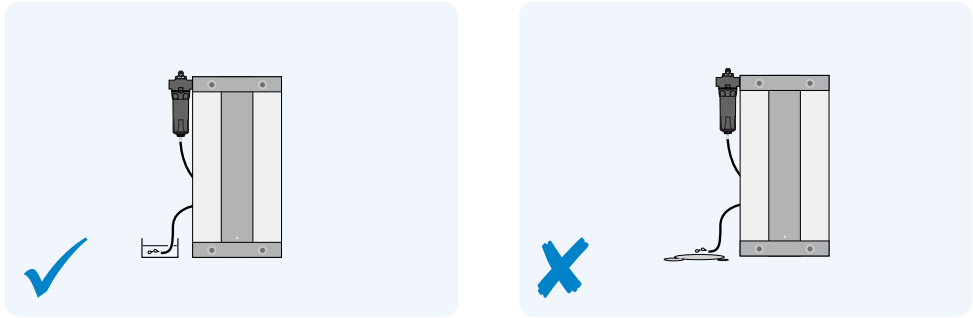


Figure 3.8: Drainage (all tubing should be secured up to the point of drain to prevent whipping during discharge)



Section 3: Mechanical Installation

Figure 3.9: Location

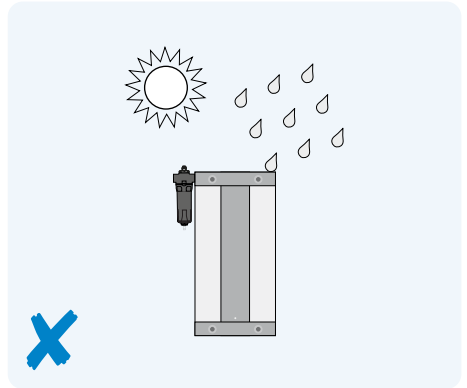
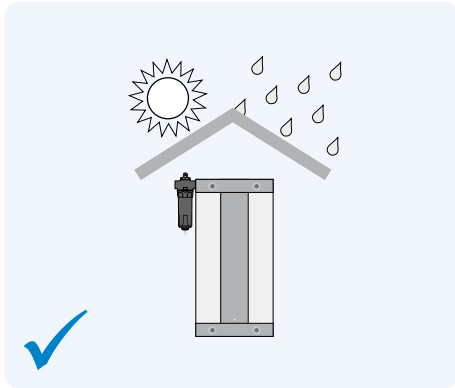


Figure 3.10: Hard piped installation

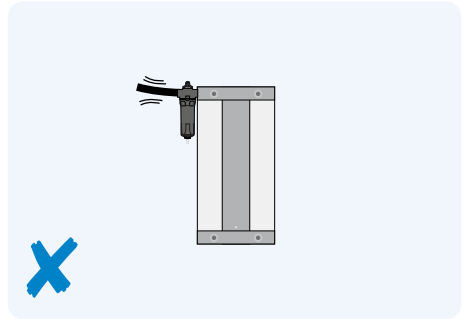
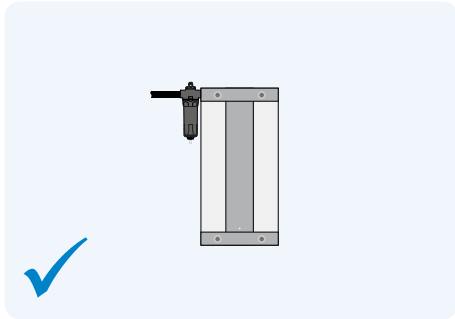
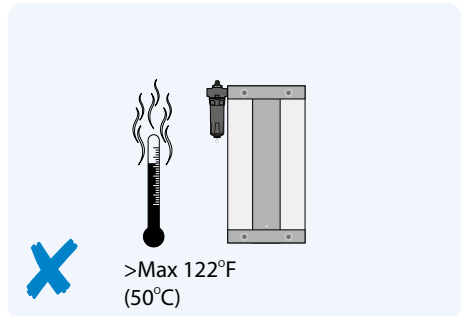
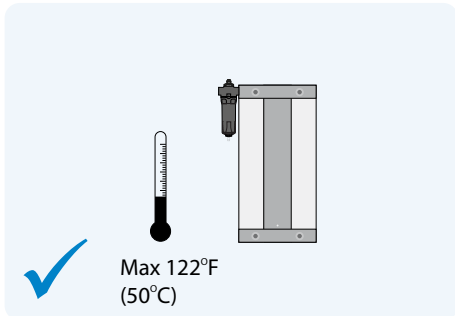


Figure 3.11: Exposure to heat



Section 3: Mechanical Installation

Figure 3.12: Direction of flow

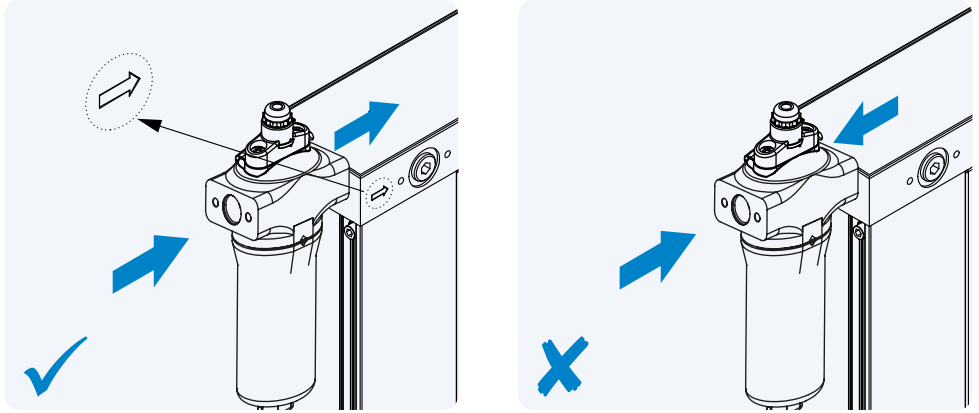
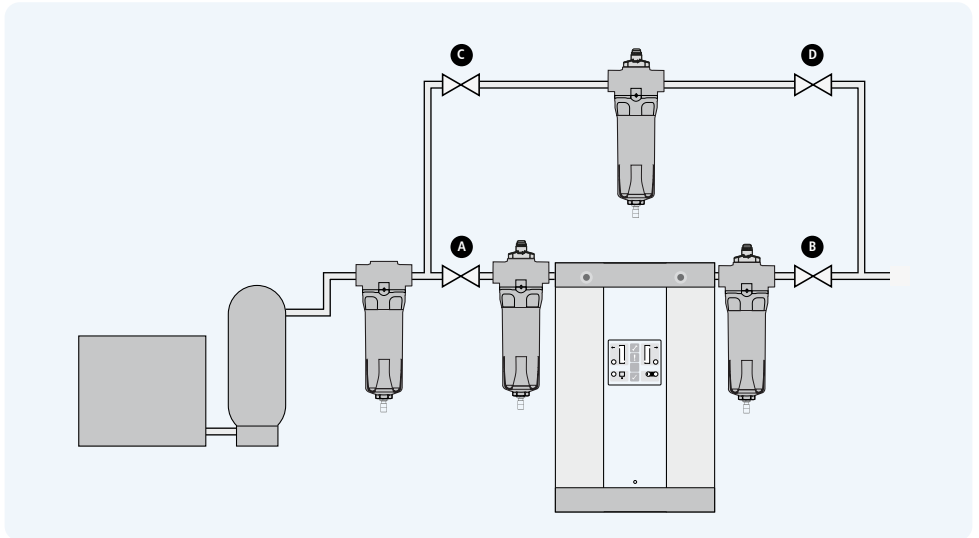


Figure 3.13: Typical installation



To prevent back flow into the dryer a non-return valve should be placed in-line, downstream of the dryer. This is essential when more than one dryer is used in a single application.

Electrical Installation

Connection

The dryer is designed to operate on either AC or DC supply voltage.

Electrical wiring must comply with local regulations. Voltage requirements must be confirmed to be within the specification on the dryers rating plate.

Ensure only one power source is connected at any one time and is connected to the correct socket as shown in figure 4.3 and 4.4.

The dryer controller is double insulated therefore no earth is required on the power connector. External fuse to be connected to plug.

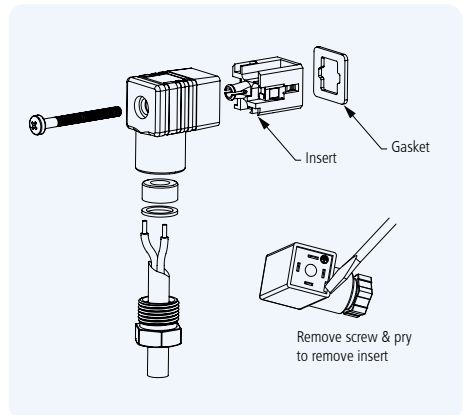
The cable selection must suit local installation regulations and be appropriate to power consumption as shown in the Power Supply table.

Power Supply	
Supply	Amp
12 VDC	0.80
24 VDC	0.40
100 VAC	0.16
115 VAC	0.14
230 VAC	0.07
240 VAC	0.07

How to wire a power connector

Figure 4.1 illustrates how to wire power connector. Please refer to wiring diagram, figure 4.2, page 16, for further information.

Figure 4.1: Din connector



Different voltage setting

Figure 4.2: Wiring diagram

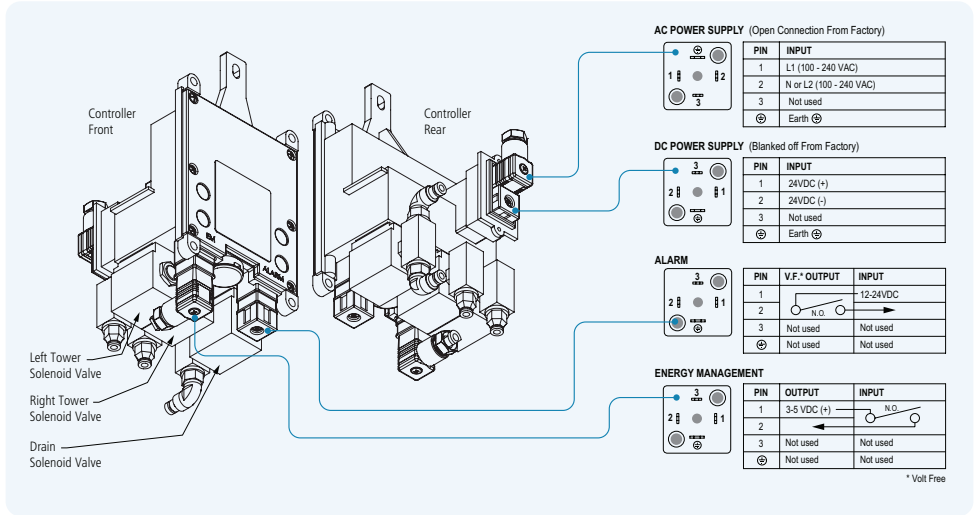


Figure 4.3: 100 to 240 VAC

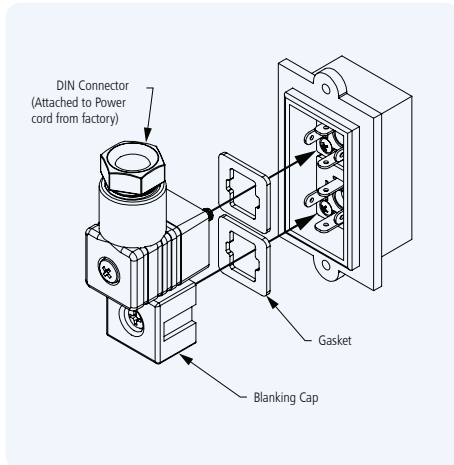
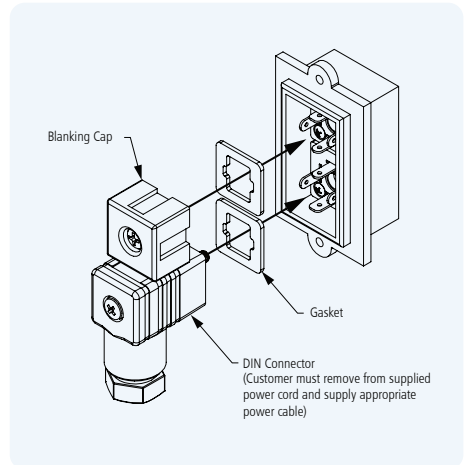


Figure 4.4: 12 to 24 VDC



Controller Description

Controller Specification

Ambient temperature	35°F to 122°F (1.5°C to 50°C)
Max. relative humidity	80% up to 87.8°F, decreasing linearly to 50% RH at 122°F
Input voltage range	100–240VAC, 50–60Hz, 12–24VDC Mains supply voltage not to exceed $\pm 10\%$ of nominal
Protection class	IP65
Transient over voltage	IEC 60664 Class II
Pollution degree	2, IEC 60664

For energy and alarm installation management please see section 8



A circuit breaker or switch must be installed near the dryer. This should be easy to reach and shall be certified according to EN60947-1 and EN60947-3. The switch or circuit breaker shall be marked as the disconnecting device for the dryer and needs to be marked with on and off positions.

Output connections do not provide isolation from the mains connectors and interconnecting wiring must meet EN61010-1:2001 requirements for reinforced insulation.

Operation

Background / Function of the dryer

The dryer operation is designed to give smooth, uninterrupted delivery of compressed air to the designated specification.

During the cycle of operation, the first pressure housing is fully pressurized and airflow is directed upwards through the desiccant cartridge, removing moisture from the air during its passage, to the minimum specified dewpoint.

During the drying cycle, a small bleed of process air is directed to the opposite pressure housing. This process air flows down through the desiccant cartridge and into the atmosphere by means of an exhaust silencer, thereby affecting regeneration of the desiccant.

After 120 seconds of operation, the cartridge under regeneration is sealed by closing of the exhaust valve and the pressure housing is brought up to full system pressure by the purge air.

After an extended time (See start-up procedure for individual sizes) the pressure in the first housing is released into the atmosphere by means of the corresponding exhaust valve and the desiccant cartridge then operates in regeneration mode. The main air flow and drying function is then transferred to the desiccant cartridge that was previously under regeneration.

The cycle of operation continues in this pattern with the cartridges switching alternately between drying and regenerating.

Start-up procedure 4 SCFM - 35 SCFM

- See figure 5.1 and 5.2.
- Close valves A, B, C and D.
- Switch on compressor.
- Open valve A slowly.
- Check there are no leaks from the dryer.
- Switch on electric power. All four display panel LED's will flash simultaneously green four times then simultaneously red four times to acknowledge application of power and readiness to function. Observe display panel for one complete cycle. Note: cycle described is factory setting.

- a. Power LED illuminates green and tower LED X illuminates green.
 - b. After 120 seconds, tower LED X switches off and drain LED Z illuminates green.
 - c. After a further 50 seconds drain LED Z switches off and tower LED Y illuminates green.
 - d. After a further 120 seconds, tower LED Y switches off.
 - e. After a further 50 seconds, tower LED X illuminates green - this is point 'a' in the cycle described above.
- The above cycle (a – e) repeats.
- On initial commissioning only run the dryer for a minimum of 6 hours to ensure dewpoint is adequate. Thereafter, continue directly to next point.
- Open valve B slowly.

Section 5: Operation

Shut-down Procedure

- Close valve B.
- Close valve A.
- Leave dryer running for 15 minutes to fully depressurize.
- Switch off all electrical power to the dryer.



Under no circumstances must compressed air be allowed to flow through the dryer following switch off of electrical power. This will result in terminal failure of the desiccant cartridges and regeneration will not be possible.

Figure 5.1: Typical installation

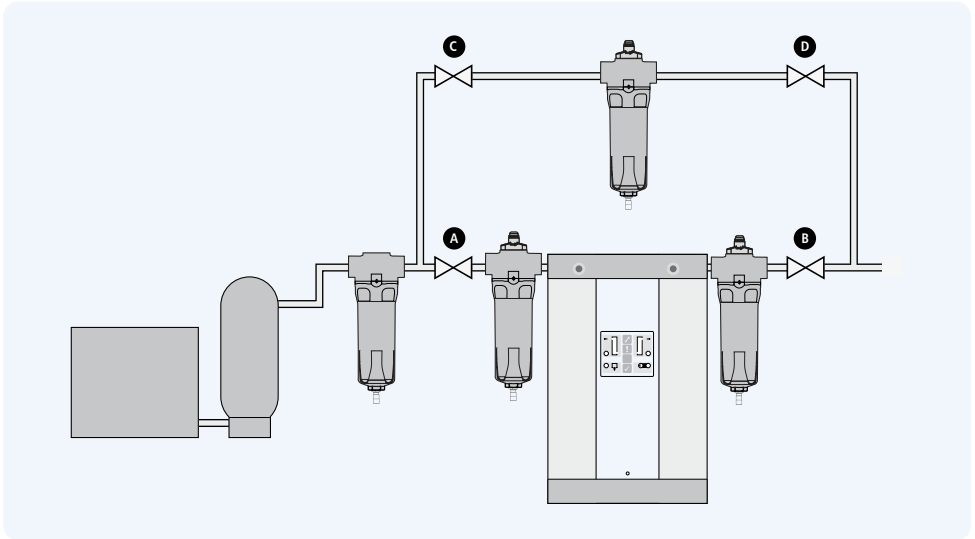
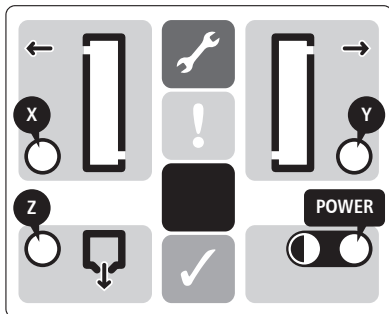


Figure 5.2: Controller description



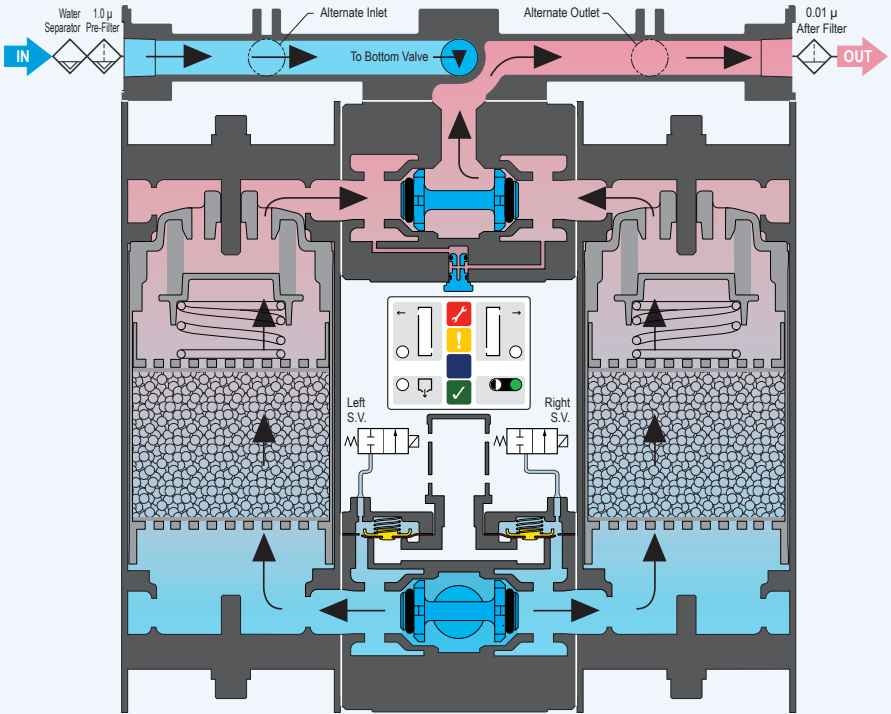
When Illuminated

- | | |
|-------|--|
| X | Left tower regenerating (Right tower drying) |
| Y | Right tower regenerating (Left tower drying) |
| Z | Drain solenoid |
| Power | Power connected to controller |

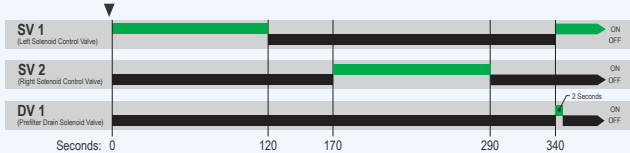
Section 5: Operation

Figure 5.3: Initial Pressurization (Power Off)

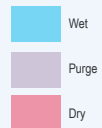
- With power off to the dryer, both towers pressurize to line pressure. The N.C., 2/2 solenoid valves are both de-energized. Air pressure on the outside of the diaphragm increases as air flows through the tiny bleed hole in the diaphragm. The air pressure on the outside of the diaphragm quickly equalizes with the internal air pressure of the dryer allowing the small spring on the outside of the diaphragm to press the diaphragm against its seat, keeping air from exiting the silencer.
- Note: Any air flowing through the dryer, passes through both towers.



TIMING CHART:



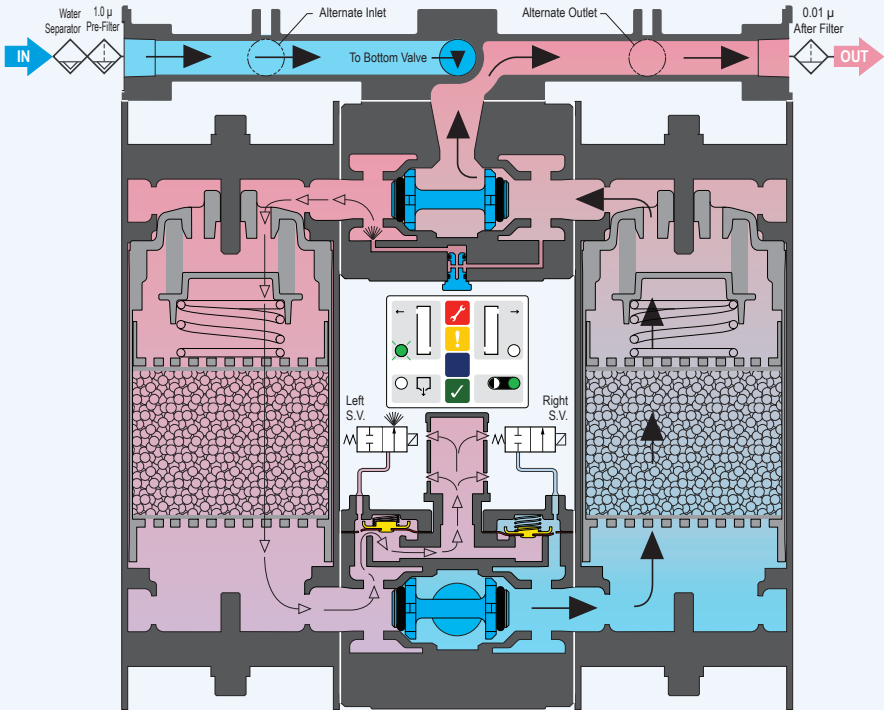
LEGEND:



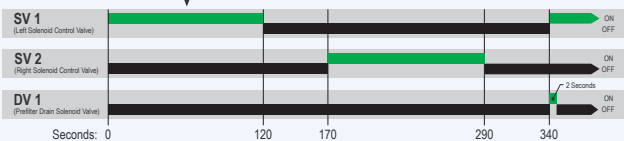
Section 5: Operation

Figure 5.4: Stage 1: Left Tower Purging, Right Tower Drying

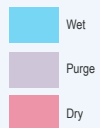
- The left solenoid is energized allowing air on the outside of the diaphragm to vent through the solenoid valve to atmosphere. As air pressure on the outside of the diaphragm drops, the diaphragm is pushed away from the valve seat by the internal air pressure of the dryer and air rushes out the silencer as the left tower depressurizes.
- The shuttle valves move to the lower pressure (left) side and seal off against the main process flow.
- Once the tower pressure drops, dry, purge air passes from the outlet of the right tower into the top of the left tower via the purge orifice. The air then flows down through the left desiccant bed evacuating the trapped moisture and venting it to atmosphere.



TIMING CHART:



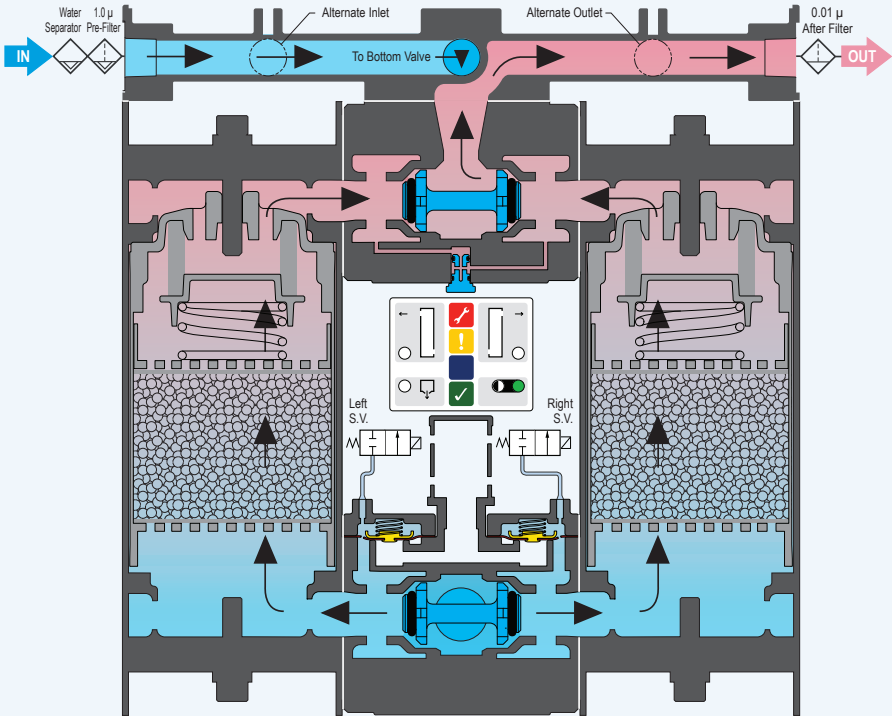
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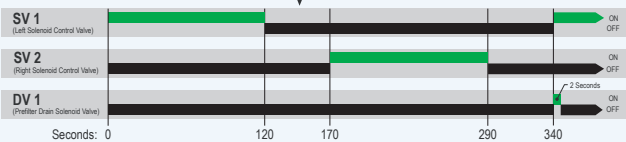
Section 5: Operation

Figure 5.5: Stage 2: Repressurization

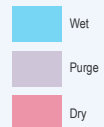
- At completion of Stage 1, the left solenoid valve is de-energized. Air pressure on the outside of the right diaphragm increases as air flows through the tiny bleed hole in the diaphragm. The air pressure on the outside of the diaphragm quickly equalizes with the internal air pressure of the dryer allowing the small spring on the outside of the diaphragm to press the diaphragm against its seat, keeping air from exiting the silencer.
- Note: Any air flowing through the dryer, passes through both towers.



TIMING CHART:



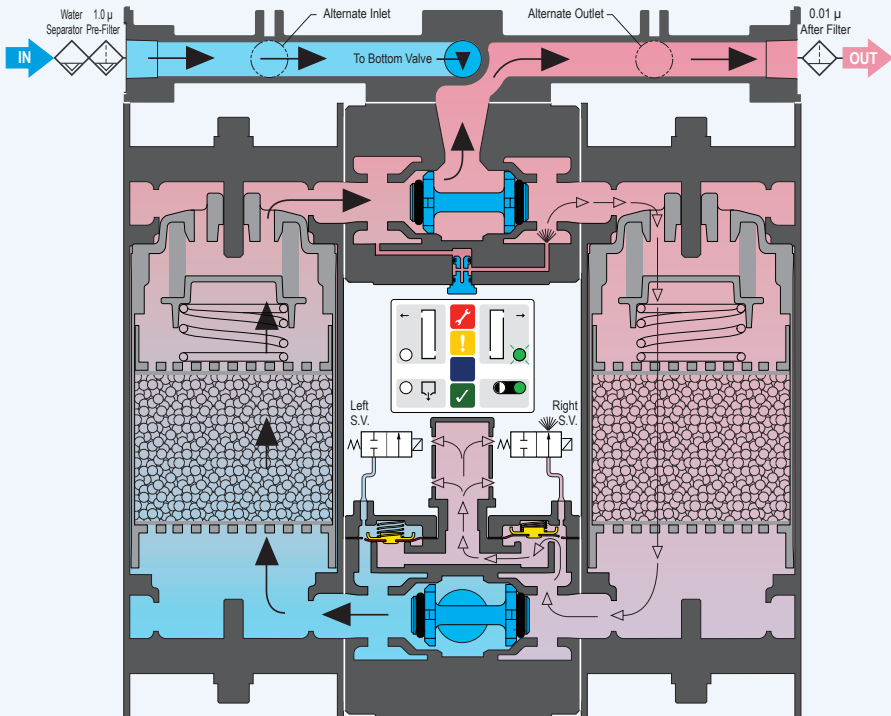
LEGEND:



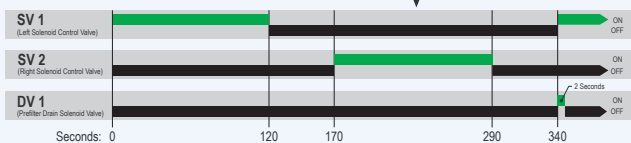
Section 5: Operation

Figure 5.6: Stage 3: Left Tower Drying, Right Tower Purging

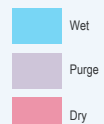
- The right solenoid is energized allowing air on the outside of the diaphragm to vent through the solenoid valve to atmosphere. As air pressure on the outside of the diaphragm drops, the diaphragm is pushed away from the valve seat by the internal air pressure of the dryer and air rushes out the silencer as the left tower depressurizes.
- The shuttle valves move to the lower pressure (right) side and seal off against the main process flow.
- Once the tower pressure drops, dry, purge air passes from the outlet of the left tower into the top of the right tower via the purge orifice. The air then flows down through the right desiccant bed evacuating the trapped moisture and venting it to atmosphere.



TIMING CHART:



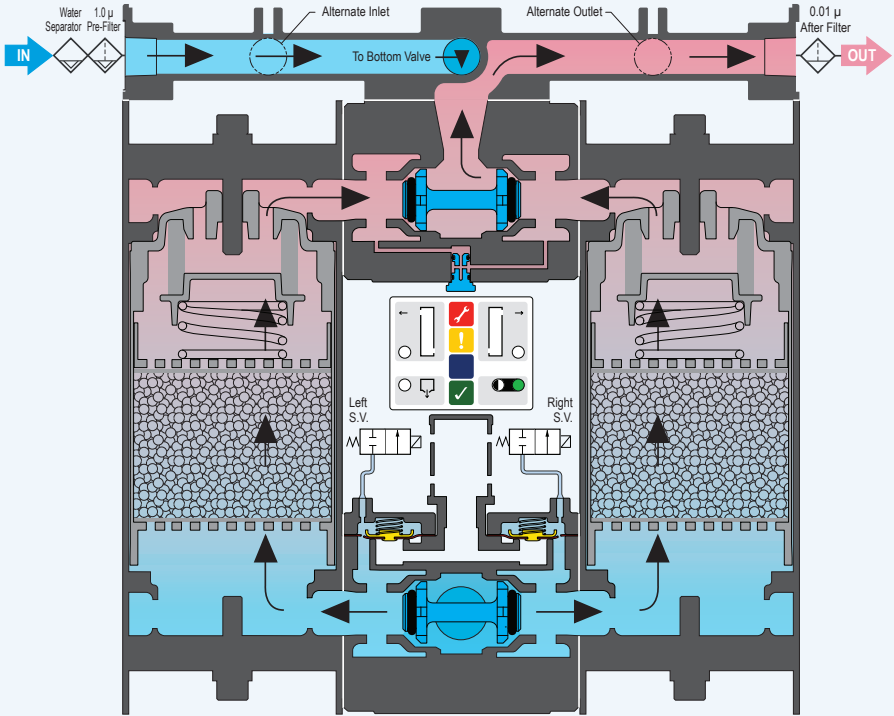
LEGEND:



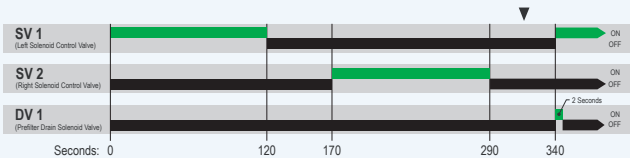
Section 5: Operation

Figure 5.7: Repressurization

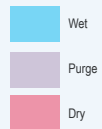
- At completion of Stage 3, the left solenoid valve is de-energized. Air pressure on the outside of the left diaphragm increases as air flows through the tiny bleed hole in the diaphragm. The air pressure on the outside of the diaphragm quickly equalizes with the internal air pressure of the dryer allowing the small spring on the outside of the diaphragm to press the diaphragm against its seat, keeping air from exiting the silencer.
- Note: Any air flowing through the dryer, passes through both towers.



TIMING CHART:



LEGEND:



Maintenance

Servicing



Important information.



Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.



The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.

Please refer to Section 11-Spares Information.

Service Intervals

Pre Filter Element	Annually (6000 hrs)
Exhaust silencer	Annually (6000 hrs)
Cartridges	Every Two Years (12000 Hrs)
Valves	Every Four Years (24000 Hrs)

Front Panel Removal

Models 4 SCFM – 35 SCFM

- See figure 6.1.
- Using a hex key remove screw from the front panel.
- Open from bottom, allowing top to drop out releasing the panel entirely.

Tools required



- 4mm hex key

Figure 6.1: Models 4 SCFM – 35 SCFM

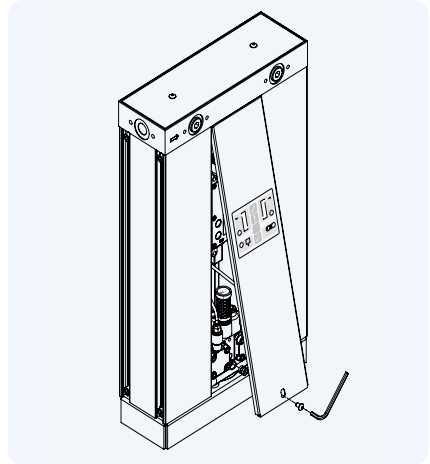
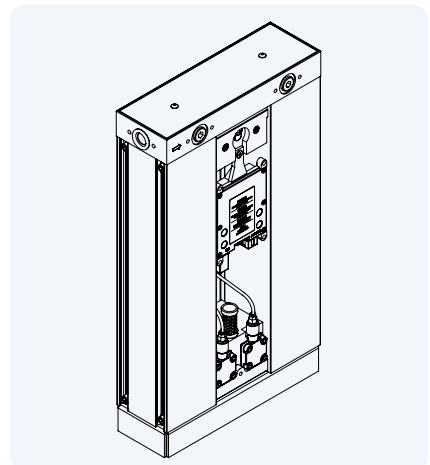


Figure 6.2: Models 4 SCFM – 35 SCFM with front panel removed



Desiccant Changeout

Models 4 SCFM – 35 SCFM

1. See figure 6.5.
2. Remove prefiltration.
3. Unscrew four bolts $\frac{3}{4}$ turn on the opposite tower to aid desiccant changeout process.
4. Unscrew the four pressure housing retaining bolts and slide out the pressure housing.
5. Remove banjo fixing bolt using hex key.
6. Extract end cap and banjo assembly from pressure housing.
7. Using banjo fixing bolt, retract the cartridge from pressure housing.
8. Replace with new cartridge supplied as part of the cartridge service kit.
9. Ensure O-ring seals are in place when installing cartridge and assembly in pressure housing.
10. Follow above steps in reverse to finish installing new cartridge into the dryer.
11. Repeat steps 1 – 10 for the second pressure housing.
12. Ensure the dryer is leak-free before operating pressure is applied to the dryer.
13. Follow start up procedure as stated on page 18 of this manual.
14. Continue to page 27 to reset the controller.

Tools required



- 5mm hex key

Important information




-  Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.
-  The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.
- 

Figure 6.5: Models 4 SCFM – 35 SCFM with pre-filter removed

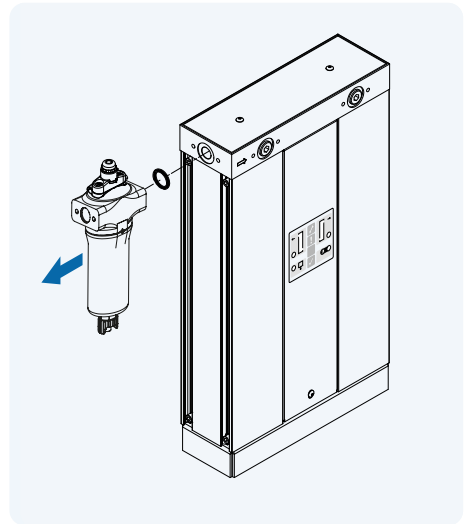
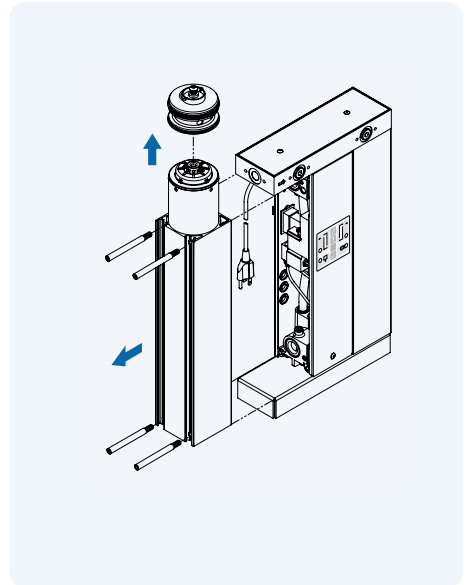



Figure 6.6: Models 4 SCFM – 35 SCFM with tower assembly removed



Resetting the Controller

- After following the start-up procedure it is necessary to reset the controller. This is done by using the re-set disc (supplied with cartridge service kit) then:
- Hold the disc against the blue pad on the front display of the dryer panel for 5 seconds.
- During the five second period the power indicator will flash green. When the reset has been successful indicator X will flash green once to confirm that it has been completed successfully.

 Sweep the reset disc on the blue pad if the LEDs do not flash as stated.

Please note: If Energy Management is activated, there will be a 6 hour delay after reset before Energy Management will be operational again.

Figure 6.9: Controller reset

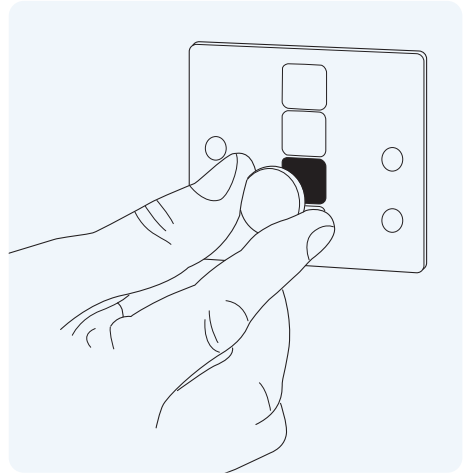
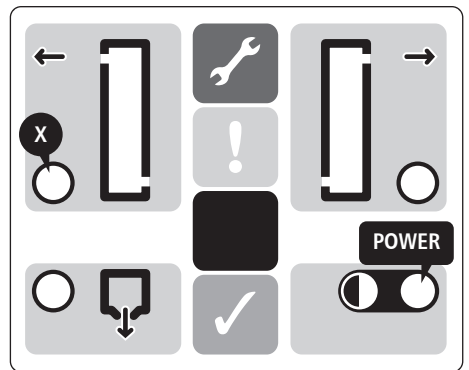



Figure 6.10: Controller description



Purge Plug Removal

Models 4 SCFM – 35 SCFM

- Remove dryer front panel.
- Remove purge plug securing screw from the upper valve block.
- Remove purge plug.
- Replace with appropriate purge plug according to inlet pressure. Refer to Spares section, page 47.
- Grease purge plug O-ring to ensure ease of fit.

 Appropriate purge plug selection is very important for function of the dryer. Failure to comply with this may affect your warranty.

Tools required



- Pozidrive screwdriver

Important information




-  Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.
-  The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.
- 

Figure 6.11: 4 SCFM – 35 SCFM - Purge plug changeout stage 1

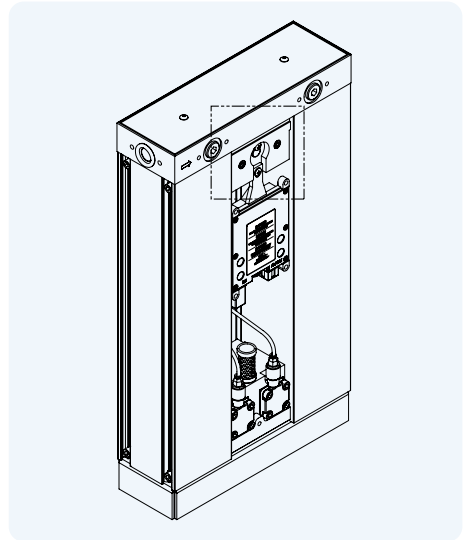
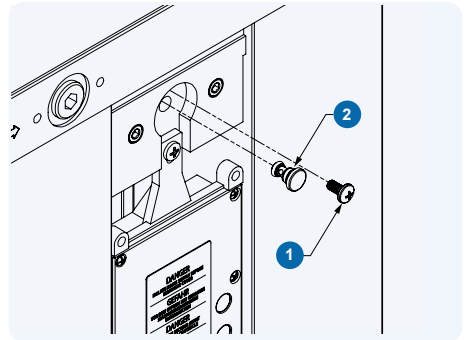


Figure 6.12: 4 SCFM – 35 SCFM - Purge plug changeout stage 2



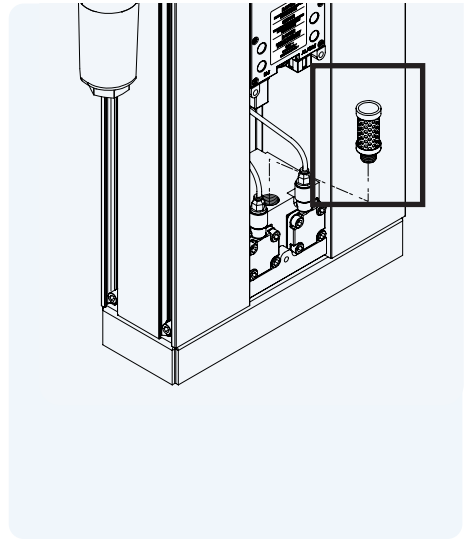
1. Securing screw
2. Purge plug

Exhaust Silencer Changeout

Models 4 SCFM – 35 SCFM

- Remove dryer front panel.
- Unscrew silencer from bottom valve block and remove.
- Replace with new silencer.

Figure 6.15: 4 SCFM – 35 SCFM Silencer changeout stage 1



Tools required



- Not required

Important information



Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.



The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.



The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.

Diaphragm Replacement

Models 4 SCFM – 35 SCFM



- Remove front panel.
- Remove bonnets by means of four fixing screws.
- Separate bonnet from valve block.
- Disconnect tubing from fitting on bonnet
- Remove diaphragm assembly.
- Insert new Diaphragms and springs, ensuring Diaphragm holes are clear.

Tools required



- 4mm hex key

Important information

-  Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.
-  The manufacturer will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.

-  A Instruction Manual is included in the changeout kit to assist Diaphragm Replacement

Figure 6.20: 4 SCFM – 35 SCFM Diaphragm changeout stage 1

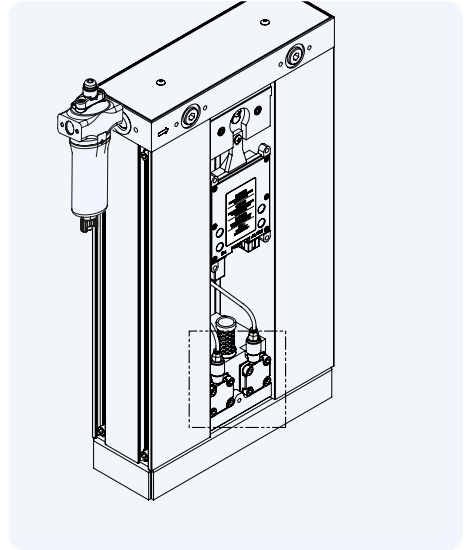
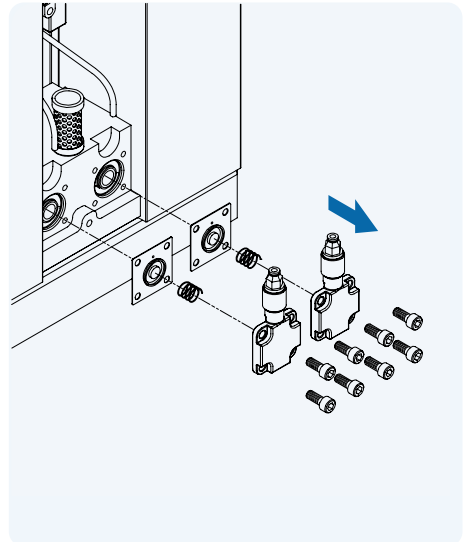


Figure 6.21: 4 SCFM – 35 SCFM Diaphragm changeout stage 2



1. Diaphragm
2. Spring

Replacing Shuttle Valves (Top and Bottom)

Models 4 SCFM – 35 SCFM

- Remove either tower
- Pull out shuttle seat
- Remove shuttle
- Replace shuttle
- Reinsert shuttle seat
- Re-secure tower

Important information

 Bottom shuttle removal shown. Same process used for top shuttle removal and installation.

Tools required



- 5mm hex key

Figure 6.22: 4 SCFM – 35 SCFM Filter and tower removal

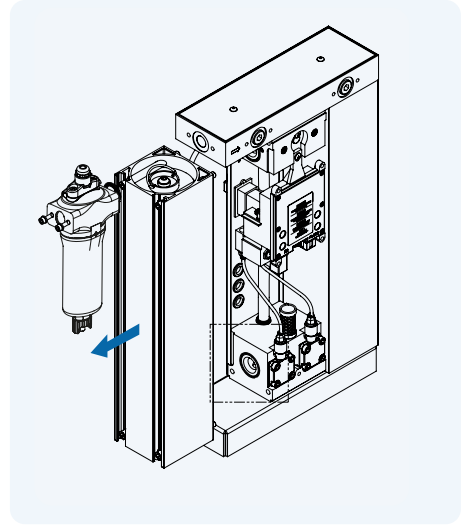
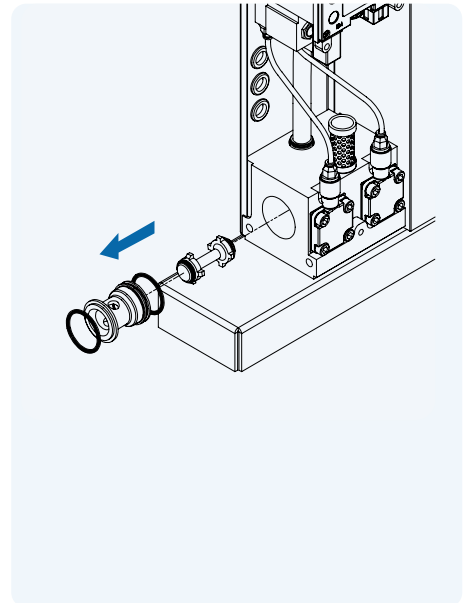


Figure 6.23: 4 SCFM – 35 SCFM Shuttle seat and shuttle removal



Energy Management

Overview

Regenerative dryers must expel a portion of the process air in order to free themselves of accumulated moisture. During periods of low air demand, however, this air loss is not necessary and is therefore undesirable. In many cases, the compressor runs almost continuously in order to keep up with the dryer's purge loss.

All dryers are equipped with an Energy Management feature that allows the purge to be shut off during periods of low or no demand. The dryer controller is fitted with a set of field accessible contacts, that can be employed to shut off the solenoid valves which control the purge function of the dryer, therefore eliminating any air loss from the dryer.

Developing a Purge Control Strategy

In order to utilize this function, the operator must provide a switching system that provides acceptable logic to indicate to the dryer that there is little or no air demand. On the following pages, some examples of commonly used switching systems are provided in ascending order of complexity.

Using a Manual Switch for Purge Control

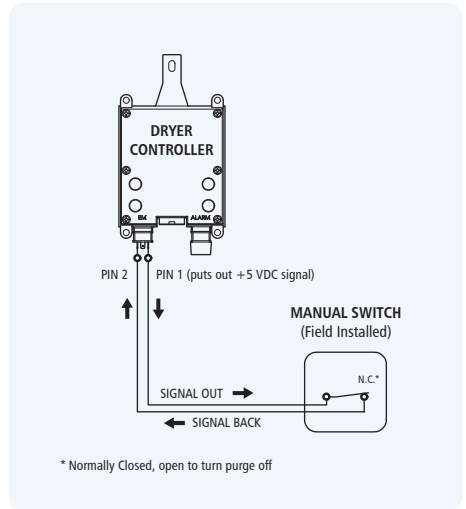
The simplest of arrangements, a manual switch may be employed to shut the purge off when the air downstream of the dryer is not being used. Commonly used on point of use systems. For example, if the dryer is only used to supply air of an appropriate dryness to a specific machine or application, the dryer will only be required when the machine is in use and may be shut off either manually or possibly via extra contacts provided in the machine's on/off switch.

It is extremely important to understand that the purge may only be shut off during periods of low or no demand. This feature, if used otherwise, can result in permanent damage to the desiccant beds resulting in loss of drying capacity and possibly mechanical failure. The cartridges must not be allowed to become fully saturated at any time.

The following schematic (Fig 7.1) offers an overview of the

devices mentioned as they might be connected for use in controlling a dryer's purge function. Please note that specific details differ between device manufacturers, so in all cases the manufacturer's specifications should be adhered to.

Fig 7. 1 Manual switch purge control



Using a Standard Pressure Switch for Purge Control

Many compressors come equipped with pressure switches with extra contacts that can be utilized to switch off the dryer’s purge when the compressor is in an unloaded state. Unfortunately, many of these switches have significantly large dead bands (difference between the load (on) and unload (off) settings that in most cases cannot be altered). The amount of air that can pass downstream, through the dryer, while the compressor is unloaded must be taken into consideration as it can be significant, especially if there is a large dead band and/or large wet receiver.

Often, a stand-alone pressure switch is a better option as it allows the user to adjust it independently from the compressor’s pressure switch. When selecting a stand-alone pressure switch, the smaller the dead band the better.

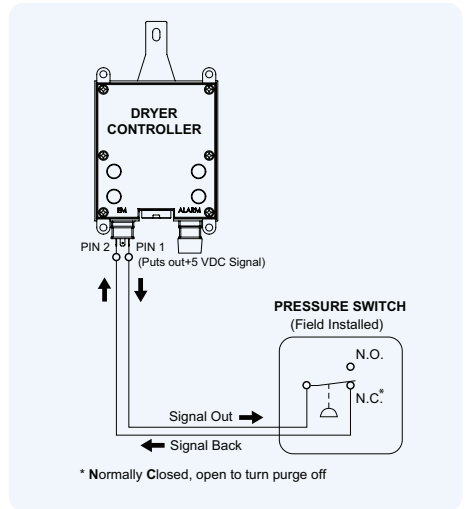
When using a stand-alone pressure switch, the dryer is wired into the normally closed contacts on the pressure switch. When the switch is actuated (at 100 psig in the example), the purge shuts off until the pressure switch deactuates (at 95 psig in example). The point at which the switch deactuates, may be adjusted to suit the system.

If it is determined that the dew point drops to an unacceptable level, the deactuation point must be increased. Please note that with most standard pressure switches, the dead band is fixed such that the activation and deactuation points move together.

It is extremely important to understand that the purge may only be shut off during periods of low or no demand. This feature, if used otherwise, can result in permanent damage to the desiccant beds resulting in loss of drying capacity and possibly mechanical failure. The cartridges must not be allowed to become fully saturated at any time.

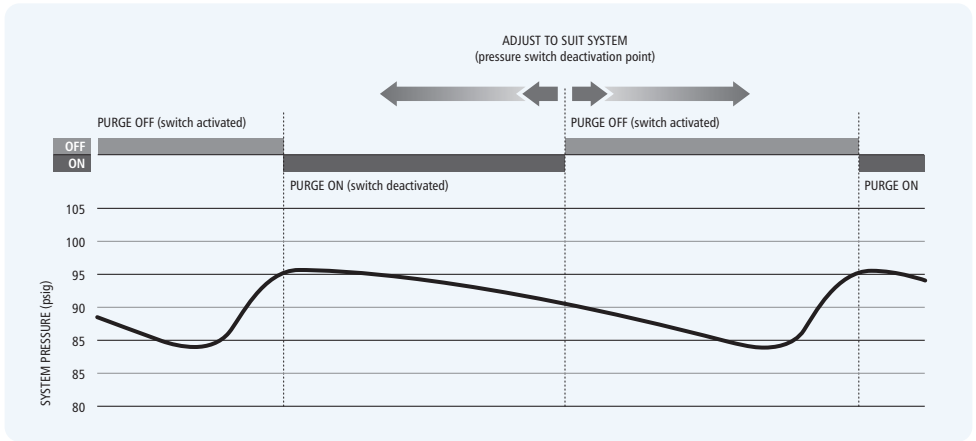
The following schematic offers an overview of the devices mentioned as they might be connected for use in controlling a dryer’s purge function. Please note that specific details differ between device manufacturers, so in all cases the manufacturer’s specifications should be adhered to.

Figure 7.2: Using a standard pressure switch for Purge Control.



Section 7: Energy Management

Fig 7.3 Pressure switch setting



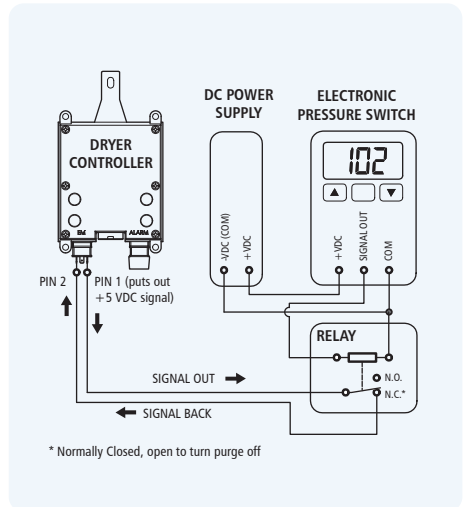
Using an Electronic Pressure Switch for Purge Control

The best choice if using a pressure switch is to select an electronic programmable type pressure switch which is effectively a pressure transmitter and process controller built into one device. While significantly more costly than a standard pressure switch, an electronic programmable pressure switch can be setup to provide a much more customized operation. Typically, the dead band can be reduced or eliminated so that an immediate reaction to changes, in system pressure indicating air flow, can be obtained.

It is extremely important to understand that the purge may only be shut off during periods of low or no demand. This feature, if used otherwise, can result in permanent damage to the desiccant beds resulting in loss of drying capacity and possibly mechanical failure. The cartridges must not be allowed to become fully saturated at any time.

The following schematic offers an overview of the devices mentioned as they might be connected for use in controlling a dryer's purge function. Please note that specific details differ between device manufacturers, so in all cases the manufacturer's specifications should be adhered to.

Figure 7.4 Using an Electronic Pressure Switch for Purge Control



⚠ This setup is for example only. This configuration can be amended, depending on application.

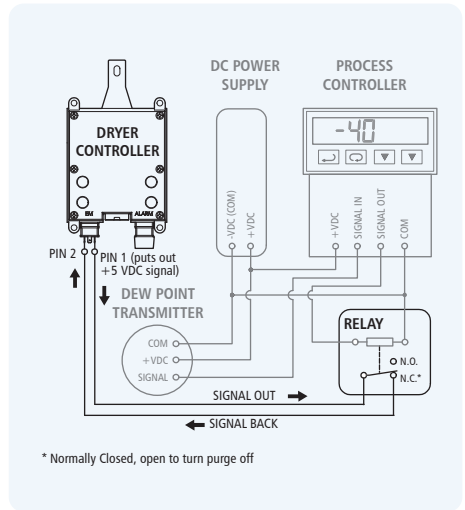
Using a Dew Point Transmitter and Process Controller for Purge Control

The best option for purge control if the delivered dryness (pressure dew point) of the air from the dryer is critical. If the air is deemed dry enough, than the purge can be shut off until the air’s moisture starts to climb. If the purge is turned off, care must be taken to ensure that the desiccant beds are not allowed to wet out too far before the purge is turned back on. Also, after turning the purge back on, the air’s pressure dew point may increase a bit before starting to drop again. This should be taken into consideration to ensure that the air flow remains sufficiently dry.

It is extremely important to understand that the purge may only be shut off during periods of low or no demand. This feature, if used otherwise, can result in permanent damage to the desiccant beds resulting in loss of drying capacity and possibly mechanical failure. The cartridges must not be allowed to become fully saturated at any time.

The following schematic offers an overview of the devices mentioned as they might be connected for use in controlling a dryer’s purge function. Please note that specific details differ between device manufacturers, so in all cases the manufacturer’s specifications should be adhered to.

Figure 7.5: Using process controller



⚠ This setup is for example only. This configuration can be amended, depending on application.

Making Connections between a Switching Device & Dryer EM Contact

Cable / Wire Selection Criteria:

Selected wire should have...

- *at least 2 conductors. More conductors can be useful in the case of a conductor break. Conductors can be swapped without having to run new cable.*
- *a conductor gauge of no greater than 18 awg is recommended to fit comfortably into the DIN connector insert.*
- *an outside diameter of no greater than 1/4" (6mm). Larger diameters do not fit well into the cable gland of the EM DIN connectors.*
- *an insulation type compatible with the environment that it will be run in.*

Installation

- *Make the connection at the switch end first. This way you can check continuity at the dryer end before connecting to the dryer. Make sure that the contacts on the switch are normally closed. Pin 1 of the dryer EM connection puts out a 5 VDC signal. Take care to ensure that the contacts on the switching device are 'dry' and free of any voltage which could harm the dryer controller.*
- *Locate the DIN connector on the base of the controller.*
- *Remove the screw completely from the centre of the connector.*
- *Remove the blanking plug from the connector and discard*
- *Insert a small flat screwdriver into the small recess at the edge of the insert, pry the insert out of the DIN connector's outer shell (Figure 7.7).*
- *Remove the jumper wire which is between pins 1 and 2 and discard.*
- *Slip cable end through DIN connector's cable gland and out through the front of the DIN connector.*
- *Strip the outer insulation of the cable back approx 3/4" (20mm).*
- *Strip the conductor insulation back approx 1/8" (3mm).*
- *If possible using a meter, check the continuity between the two wires to ensure that the switch is in a closed position. If it is possible to verify the switch function as well this may be helpful.*
- *Insert conductors into pins 1 & 2 of insert. Tighten retaining screws securely.*
- *Determine which direction the cable gland should point.*
- *Carefully pull the cable back through the shell until the insert snaps back into place. Take care to work the wires around the retaining screw hole as they can become fairly easily pinched.*
- *Plug the DIN connector back onto the dryer's EM connection taking care to make sure that sealing gasket is in place.*

Note: The male ground pin is slightly wider than pins 1 & 2. Take care to ensure that the female connector is oriented correctly.

Figure 7.6: connecting to EM port

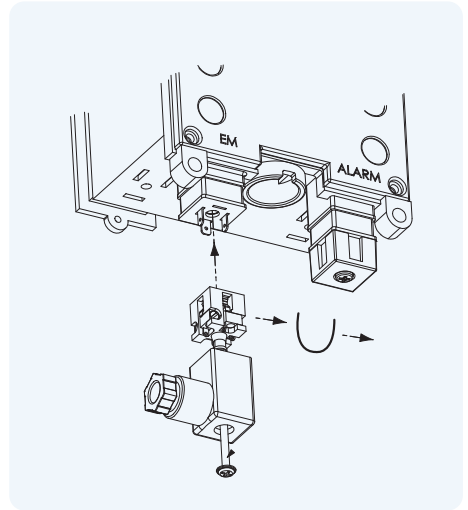
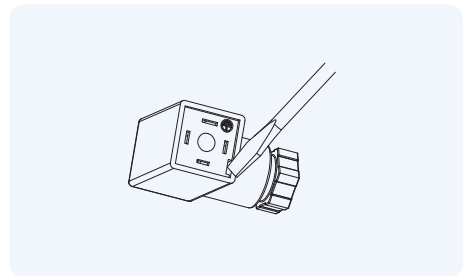


Figure 7.7: DIN connector



Alarm

Remote fault alarm: -

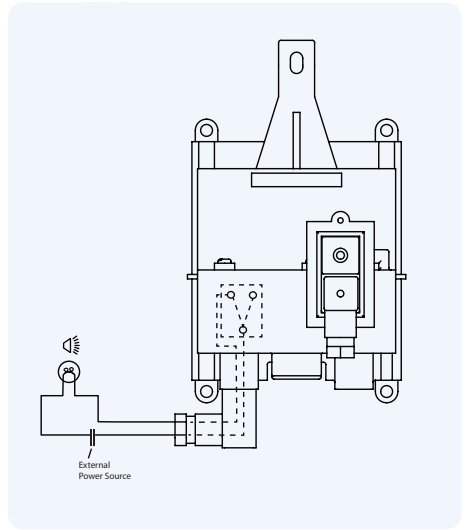
A remote alarm relay is built into the controller. This facilitates the activation of a remote audible or visual indicator. The alarm can be set to activate at the service interval and/or after a pre-defined number of electrical faults.

Alarm connection details

To enable the alarm facility it is recommended that a suitable cable is brought into the controller via the rear panel with a grommet. An external power source is required.

1. Connect the switching pole of an externally powered alarm device to terminals 1 and 2 of alarm DIN connector.
2. With the power removed from the dryer and the alarm lead wired as described in 1 above, remove the cover from the DIN connection marked 'Alarm' and connect the wired DIN connector ensuring the seal and screw are fitted.

Figure 7.8: Remote alarm wiring diagram



Alarm relay rating	Alarm connection type
3 Amp Max 28 VDC	Hirschmann GDS 207 industrial standard DIN connector or equivalent

Troubleshooting

General troubleshooting

Before specific identification of any fault is looked for, the following general points must be verified:


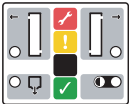
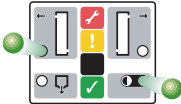

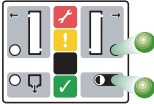
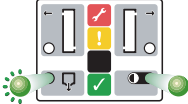


- *Has the unit been damaged externally or are any parts missing?*
- *Is power being supplied to the unit?*
- *Was start-up carried out in accordance with the instructions in this manual?*
- *Are all external valves correctly set for operation?*
- *Do the operational conditions meet those specified at time of ordering and used for product selection?*


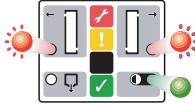
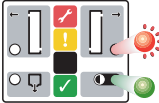
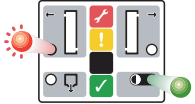
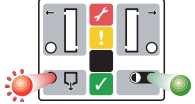
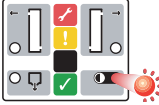
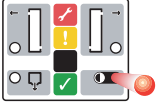
Troubleshooting: General		
Problem	Possible Cause	Action
Poor dewpoint	Liquid water at dryer inlet	Check pre-filtration and drains
	Excessive flow	Check actual flow against maximum specified
	Low inlet pressure	Check against specification
	High inlet temperature	Check against specification
	Silencer blocked or damaged	Replace silencer
	Air leaks	Tighten joints or fit new seals
	Desiccant life exceeded	Replace desiccant cartridges
	Desiccant contaminated	Check inlet filter and drains, replace cartridges
	EM is active when air is flowing through dryer	Check EM wiring, logic and/or control method used
	Power to dryer off while air is flowing through dryer	Ensure that power is on whenever air is flowing through dryer
Incorrect dryer operation	Jammed shuttle valves or faulted electrical components	See electrical operation troubleshooting section
Excessive or loud purge, or purge on only one tower	Jammed Main Shuttle Valve	Clean or replace shuttles
	Faulty Solenoid Valve	Clean or replace solenoid valve
	Not utilizing Energy Management feature	Refer to Energy Management instructions (Section 8)

Section 8: Troubleshooting

Troubleshooting: Electrical					
Problem	Possible Cause	Display	Priority	Location	Action
No dryer function	No power supply	None	-	-	Check supply
Incorrect dryer operation	Left solenoid open or short circuit	Flashing red	P1	X LED	Replace solenoid valve
	Right solenoid open or short circuit	Flashing red	P1	Y LED	Replace solenoid valve
	Controller fault	Flashing red	P2	POWER LED	Replace controller
	Low power fault	Continuous red	P1	POWER LED	Check supply
Drain not operating	Energy Management active	None	-	-	Check installation
	Drain solenoid open or short circuit	Flashing red	P1	Z LED	Replace solenoid valve
	Controller fault	Flashing red	P2	POWER LED	Replace controller
	Tube connections from filter into dryer and from filter to drain reversed	None	-	-	Reverse tubes

Troubleshooting: Energy Management		
Problem	Possible Cause	Action
Dryer does not enter Energy Management when switching device is activated <i>and/or</i> Dryer does not enter Energy Management when EM contacts are opened.	Shorted or incorrect device wiring	Remove external wiring from the dryers EM contacts and place jumper between pins 1 & 2. To test with Energy Mangement not connected.
	Faulty switching device	Consult device manufacturer
	Recent cartridge change, where the control does not have a minimum of 6 hours on the 'Service hours from new' found on the dryer's main software window	Allow dryer to be energized for 6 hours

LED Controller Display		
Status	LED Signal	Description
		Power off
		Left-hand tower purge cycle
		Repressurization cycle
		Right-hand tower purge cycle
		Repressurization including drain
		Service warning every 11,500 hours

LED Controller Display		
Status	LED Signal	Description
		Service due every 12,000 hours
		Right-hand solenoid fault
		Left-hand solenoid fault
		Drain valve fault
		Controller fault
		Low power fault

Technical Data

Environmental Conditions

All dryers are designed to be safe under the following conditions:

- *Indoor use*
- *Altitude up to 6560 ft.*
- *Ambient temperature 41°F (5°C) to 104°F (40°C)*
- *Maximum RH 80% for temperatures up to 87.8°F (31°C), decreasing linearly to 50% RH at 104°F (40°C)*
- *Mains supply voltage fluctuations not to exceed +/- 10% of nominal*
- *Transient over voltage IEC 60664 Class II*
- *Pollution degree 2, IEC 60664*

For operation extended from the above conditions, please contact the manufacturer.



Excessive vibrations from external sources may cause failure of this product.

Reference Conditions

Measurement	Performance	
Effective inlet pressure	101.5 psig	7 barg
Effective inlet temperature	95°F	35°C
Relative humidity of air at inlet	95%	
Pressure dewpoint, standard version	-40°F	-40°C

Specified Limitation for Operation

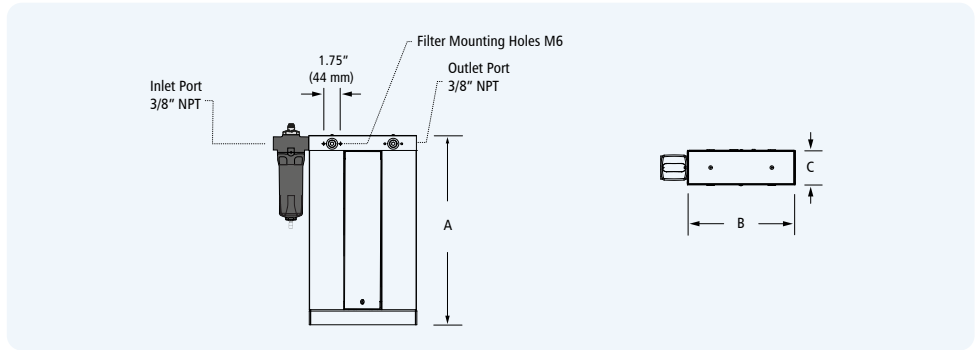
Measurement	Performance	
Maximum inlet air pressure	232 psig	16 barg
Minimum inlet air pressure	58 psig	4 barg
Maximum ambient air temperature	122°F	50°C
Minimum ambient air temperature	41°F	5°C
Standard pressure dewpoint	-40°F	-40°C
Optional pressure dewpoint with application of flow correction factor	-94°F	-70°C
Electrical supply voltage	100 VAC to 240 VAC	12 VDC to 24 VDC

Section 9: Technical Data

Dryer Sizing Table

Dryer Model	Unit	Inlet Flow Rate		Dryer Config.	Dimension inches (mm)			Weight	
		SCFM	Nm ³ /hr		A	B	C	lb	Kg
ACC 4	3/8	4	7	simplex	17.52 (445)	11.06 (281)	3.6 (92)	28.7	13.0
ACC 6	3/8	6	10	simplex	19.84 (504)	11.06 (281)	3.6 (92)	30.9	14.0
ACC 8	3/8	8	14	simplex	22.20 (564)	11.06 (281)	3.6 (92)	33.1	15.0
ACC 10	3/8	10	17	simplex	24.96 (634)	11.06 (281)	3.6 (92)	36.4	17.0
ACC 15	3/8	15	25	simplex	32.05 (814)	11.06 (281)	3.6 (92)	43.0	20.0
ACC 25	3/8	25	42	simplex	41.89 (1064)	11.06 (281)	3.6 (92)	52.9	24.0
ACC 35	3/8	35	59	simplex	57.44 (1459)	11.06 (281)	3.6 (92)	68.4	31.0

Figure 9.1: Models 4 SCFM – 35 SCFM



Pressure Correction Factor (PCF)

Operating Pressure

psig	58	73	87	102	116	131	145	160	174	189	203	218	232
barg	4	5	6	7	8	9	10	11	12	13	14	15	16
PCF*	0.62	0.75	0.87	1.00	1.12	1.25	1.37	1.50	1.62	1.75	1.87	2.00	2.12

*Always use the pressure correction factor (PCF) closest to actual inlet pressure condition

Temperature Correction Factor (TCF)

Temperature

°F	68	77	86	95	104	113	122
°C	20	25	30	35	40	45	50
TCF	1.07	1.06	1.04	1.00	0.88	0.67	0.55

Dewpoint Correction Factor (DCF)

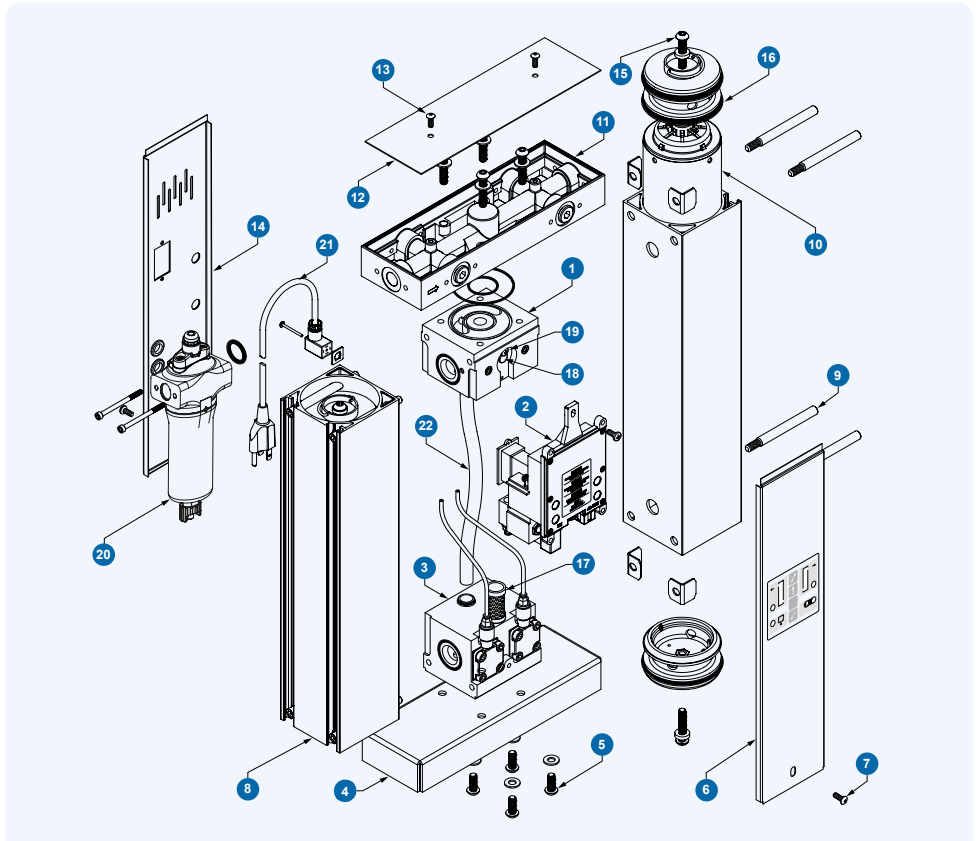
Temperature

°F	-40	-94
°C	-40	-70
DCF	1.0	0.7

Component Parts

4 SCFM - 35 SCFM

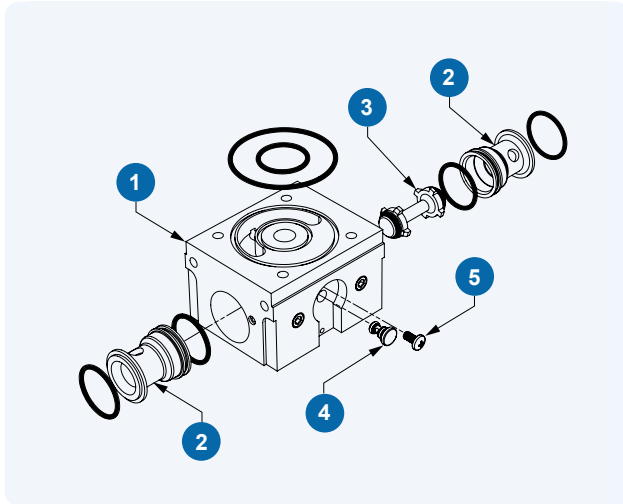
Fig 10.1 4 SCFM – 35 SCFM



- | | | |
|-----------------------------|--|-----------------------------|
| 1. Top valve assembly | 9. Pressure housing retaining bolt | 17. Exhaust silencer |
| 2. Control unit | 10. Desiccant cartridge (comes with dust filter) | 18. Purge plug |
| 3. Bottom valve assembly | 11. Multiport manifold | 19. Purge plug fixing screw |
| 4. Dryer base | 12. Top cover | 20. Pre-filter |
| 5. Bottom valve fixing bolt | 13. Top cover fixing screw | 21. Power cord |
| 6. Front panel | 14. Rear panel | 22. Down tube |
| 7. Front panel fixing screw | 15. Banjo fixing bolt | |
| 8. Pressure housing | 16. Pressure seal | |

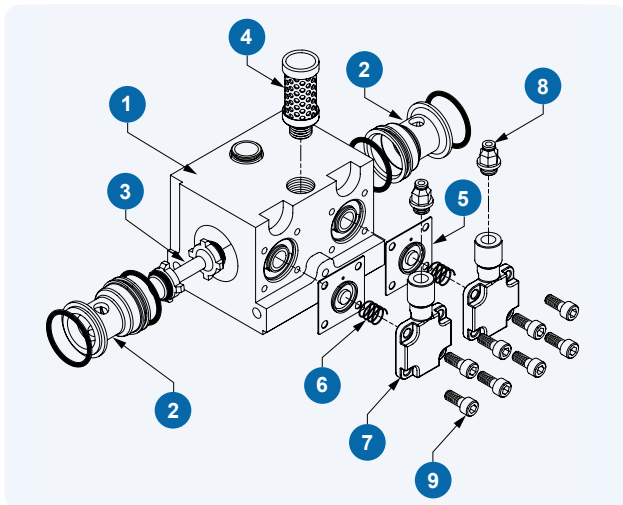
4 SCFM - 35 SCFM

Fig 10.2 Top block assembly



1. Top Block
2. Shuttle seat
3. Shuttle
4. Purge Plug
5. Purge Plug Fixing Screw

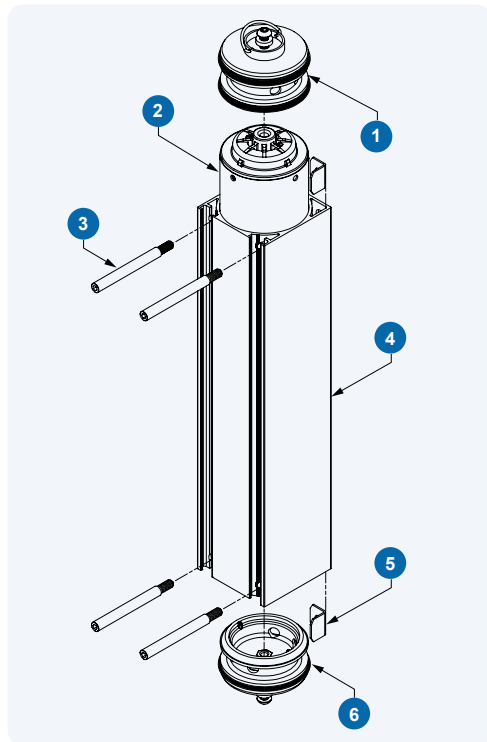
Fig 10.3 Bottom block assembly



1. Bottom block
2. Shuttle seat
3. Shuttle
4. Silencer
5. Bottom diaphragm (small hole) with disc
6. Compression spring
7. Bottom bonnet
8. 4mm straight adaptor
9. Bonnet Retention Screws

4 SCFM - 35 SCFM

Fig 10.4 Tower assembly



1. Top tower plug assembly
2. Cartridge
3. Extrusion bolt
4. Extrusion
5. Extrusion corner bracket
6. Bottom tower plug assembly

Fig 10.5 Top tower plug assembly

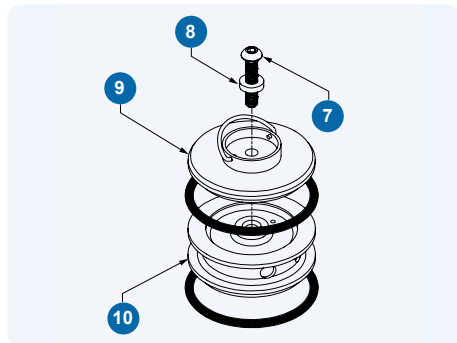
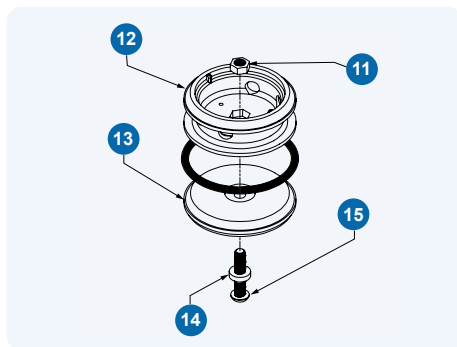


Fig 10.6 Bottom tower plug assembly



7. Tower plug screw
8. Seal
9. Top tower plug
10. Top banjo adapter
11. Nut
12. Bottom banjo adapter
13. Bottom tower plug
14. Seal
15. Tower plug screw

Spares

Purge Plug Identification

Each dryer is set with the appropriate purge plug for the operating pressure specified at point of order. The purge plug fitted on the unit will be identified on the purge plug label, located underneath the rating plate on the right. If the inlet pressure to the dryer is adjusted to operate at an alternative working pressure other than initially specified, please contact the manufacturer and order an appropriate purge plug (identified in the table below). Before operating at the new working pressure this purge plug must be installed into the dryer. Failure to comply with these instructions could result in component failure and affect any warranty claims.

Purge Plug Identification													
Model	Operating Pressure psig (barg)												
	58 (4)	72.5 (5)	87 (6)	101.5 (7)	116 (8)	130.5 (9)	145 (10)	159.5 (11)	174 (12)	188.5 (13)	203 (14)	217.5 (15)	232 (16)
ACC 4	PPK008	PPK008	PPK007	PPK007	PPK006.5	PPK006.5	PPK006	PPK006	PPK006	PPK006	PPK005	PPK005	PPK005
ACC 6	PPK011	PPK010	PPK009	PPK008	PPK007.5	PPK007.5	PPK007.5	PPK007	PPK007	PPK007	PPK006.5	PPK006.5	PPK006.5
ACC 8	PPK012	PPK011	PPK010	PPK010	PPK009	PPK008	PPK008	PPK007.5	PPK007.5	PPK007.5	PPK007	PPK007	PPK007
ACC 10	PPK013	PPK012	PPK011	PPK011	PPK010	PPK009	PPK009	PPK009	PPK008.5	PPK008.5	PPK008.5	PPK008	PPK008
ACC 15	PPK015	PPK014	PPK013	PPK013	PPK012	PPK011	PPK011	PPK010	PPK010	PPK010	PPK009	PPK009	PPK009
ACC 25	PPK02.1	PPK01.9	PPK01.8	PPK01.7	PPK01.6	PPK01.5	PPK01.4	PPK013	PPK013	PPK012	PPK012	PPK012	PPK012
ACC 35	PPK028	PPK023	PPK021	PPK020	PPK018	PPK018	PPK016	PPK015	PPK015	PPK014	PPK014	PPK014	PPK014

 Appropriate purge plug selection is very important for function of the dryer. Failure to comply with this may affect your warranty.

Service kits

6,000 hours or Annual Maintenance Kit				
Dryer Model	Kit Part Number (with float drain)	Kit Part Number (with BEKOMAT®)	Description	Change-Out Period
ACC 4 - ACC 35	4048821	4022723	Pre-filter replacement element and drain service kit	Every 6,000 Hours or 1 Year
12,000 hours or 2 years, Maintenance Kit A				
Dryer Model	Kit Part Number (with float drain)	Kit Part Number (with BEKOMAT®)	Description	Change-Out Period
ACC 4	4048826	4023687	12,000 Hour Maintenance Kit A (Kit includes all components in the 1-year kit plus desiccant cartridges, pre-filter replacement element, drain service kit, sealing O-rings with washers and service manual)	Every 12,000 Hours or 2 Years
ACC 6	4048827	4023688		Every 12,000 Hours or 2 Years
ACC 8	4048828	4023689		Every 12,000 Hours or 2 Years
ACC 10	4048829	4023690		Every 12,000 Hours or 2 Years
ACC 15	4048830	4023691		Every 12,000 Hours or 2 Years
ACC 25	4048831	4023692		Every 12,000 Hours or 2 Years
ACC 35	4048832	4023693		Every 12,000 Hours or 2 Years
24,000 hours or 4 years, Maintenance Kit B				
Dryer Model	Kit Part Number (with float drain)	Kit Part Number (with BEKOMAT®)	Description	Change-Out Period
ACC 4	4048843	4023705	24,000 Maintenance Kit B (Kit includes all components in the 1-year and 2-year kits plus a complete valve service kit and service manual)	Every 24,000 Hours or 4 Years
ACC 6	4048844	4023706		Every 24,000 Hours or 4 Years
ACC 8	4048845	4023707		Every 24,000 Hours or 4 Years
ACC 10	4048846	4023708		Every 24,000 Hours or 4 Years
ACC 15	4048847	4023709		Every 24,000 Hours or 4 Years
ACC 25	4048848	4023710		Every 24,000 Hours or 4 Years
ACC 35	4048849	4023711		Every 24,000 Hours or 4 Years

NOTE: preventative maintenance is to be performed at intervals of 1-year, 2-years and 4-years or 6,000, 12,000 and 24,000 hours, whichever comes first.

Accessory kits

Shuttle Service Kit			(Kit includes shuttle seats, shuttles and O-rings)
Dryer Model	Kit Part Number	Description	
ACC 4 - ACC 35	4035867	Shuttle Service Kit	
Bottom Diaphragm Kit			(Kit includes bottom valve diaphragms and diaphragm springs)
Dryer Model	Kit Part Number	Description	
ACC 4 - ACC 35	4022208	Bottom Diaphragm Kit	
Controller Kit (with valves)			(Kit includes (1) controller, (2) control solenoids, (1) drain solenoid with installed fittings)
Dryer Model	Kit Part Number	Description	
ACC 4 - ACC 35	4027273	Controller Kit (with valves)	
Valve Service Kit			(Kit includes all dryer valve service components)
Dryer Model	Kit Part Number	Description	
ACC 4 - ACC 35	4022889	Valve Service Kit	
Silencer Kit (replaced every 6,000 hours)			(Kit includes (1) silencer)
Dryer Model	Kit Part Number	Description	
ACC 4	4035862	Silencer Kit	
ACC 6 - 35	4035863	Silencer Kit	

Warranties and liabilities

Claims for warranty and liability concerning personal injury or material damage are excluded if they resulted due to one or more of the following factors:

- *Inappropriate use.*
- *Inappropriate application of the dryer.*
- *Technically incorrect installation, start-up operation or maintenance of the dryer.*
- *Operation of a known damaged dryer.*
- *Failure to observe the information given in this manual concerning all life phases of the dryer.*
- *Undertaking constructional or operational modifications to the dryer without prior agreement with the manufacturer.*
- *Inadequate monitoring and replacement of components of the dryer that are subject to wear.*
- *Improper completion of repairs.*
- *Use of non-original or non-approved parts for service or maintenance.*

Important Note

Industrial Compressed Air Desiccant Dryers

The desiccant dryer range is designed for, warranted and intended for use in fixed industrial compressed air applications only.

Use on non-fixed installations such as:

- *marine (e.g. offshore, shipboard)*
- *transportable (e.g. portable air treatment units)*
- *non-fixed (e.g. rolling stock, railway etc)*

are not strictly prohibited, however use in such applications is not recommended nor endorsed as additional design features, function testing, certification (both mechanical and electrical) and validation may be required to satisfy relevant end user application specific specifications and/or mandatory and non-mandatory local, national or international standards and legislation.



Such additional undertakings are the responsibility of the package or system builder, installer or end user.



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