

# Instructions for installation and operation

## Dryer **DRYPOINT® AC 171 - 196**



The product that is treated in these instructions must only be installed, used, operated, or serviced when the contents of these instructions have been fully read and understood by all of the employees who are dealing with the product.

A print-out or copy of these instructions and, in particular, of the safety instructions, must be kept at the place of installation of the product. All the employees who are dealing with the product must strictly observe the instructions in the manual.

Please complete the following information at the time of installation found on the rating label on the upper right hand side of dryer

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Model Number

---

Serial Number

---

Regulated Inlet Pressure

---

Filtration present with Dryer

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Outlet Flow of Dryer

---

Compressor Outlet Flow

---

Supply Voltage

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

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## Section 1: Safety

# Safety

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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 whilst the unit is running. This means electrical disconnection plus isolation from the compressed air supply and full depressurisation.
- 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.

## Section 1: Safety

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 familiarise 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 carry 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.

When used in the UK, a 3 amp fuse should be fitted as per the wiring diagram (figure 4.2).

## Section 2: General Description

# General Description

This manual is valid for the following dryer models

DRYPOINT® AC 171	DRYPOINT® AC 191
DRYPOINT® AC 196	

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### Function of the Dryer

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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 vapour, the other is being carefully depressurised 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 repressurised, 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.

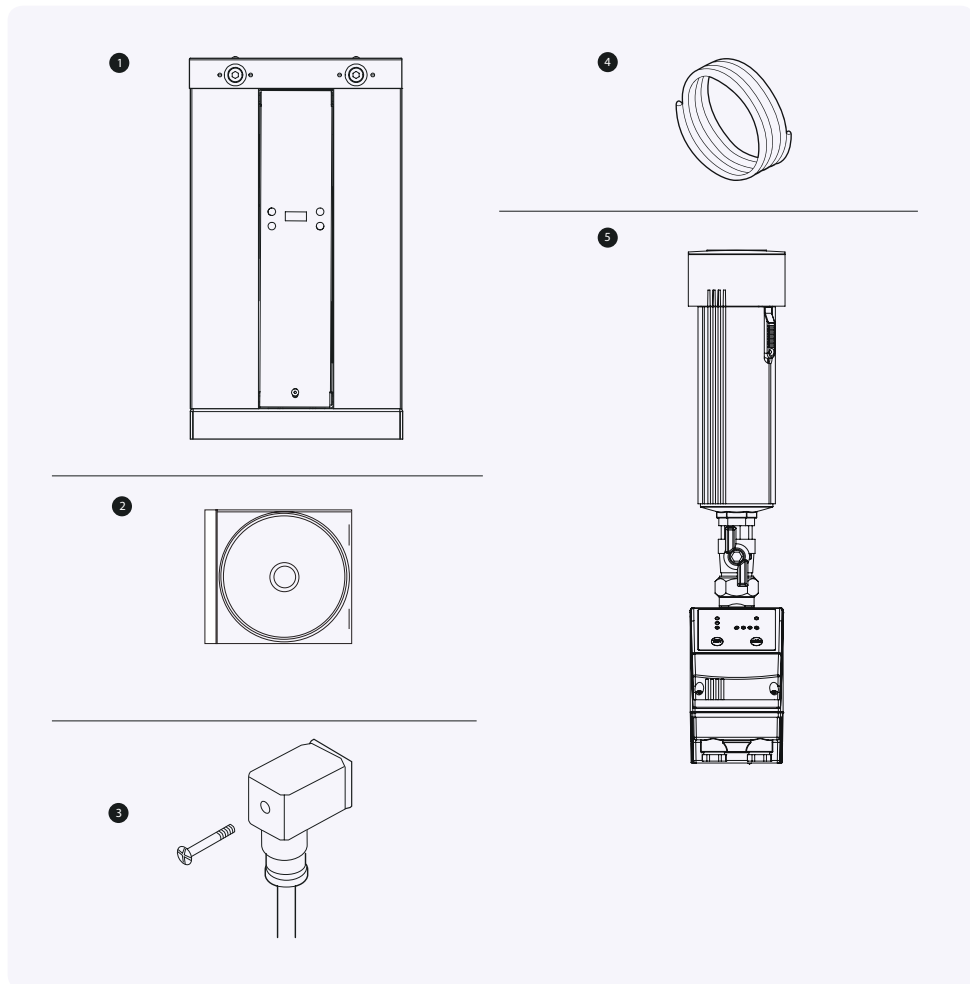
## Section 2: General Description

### 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):

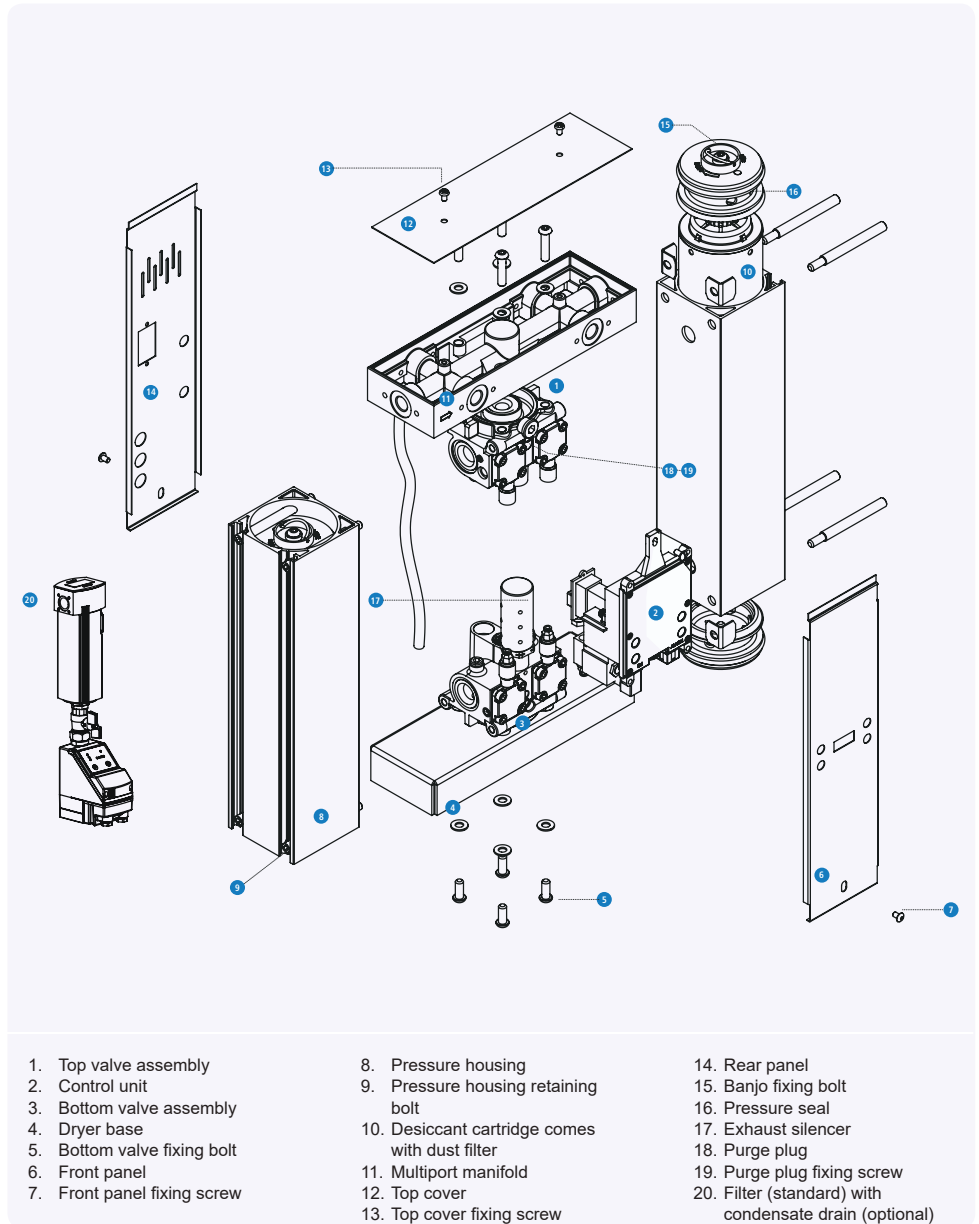
1. Dryer unit
2. Instruction manual (including certificate of conformity)
3. Power connector
4. Tubing (to connect prefilter drain to dryer)
5. Double nipple
6. BEKO CLEARPOINT® filter (standard) and BEKOMAT® condensate drain (optional)

Figure 2.1: Package contents



Section 2: General Description

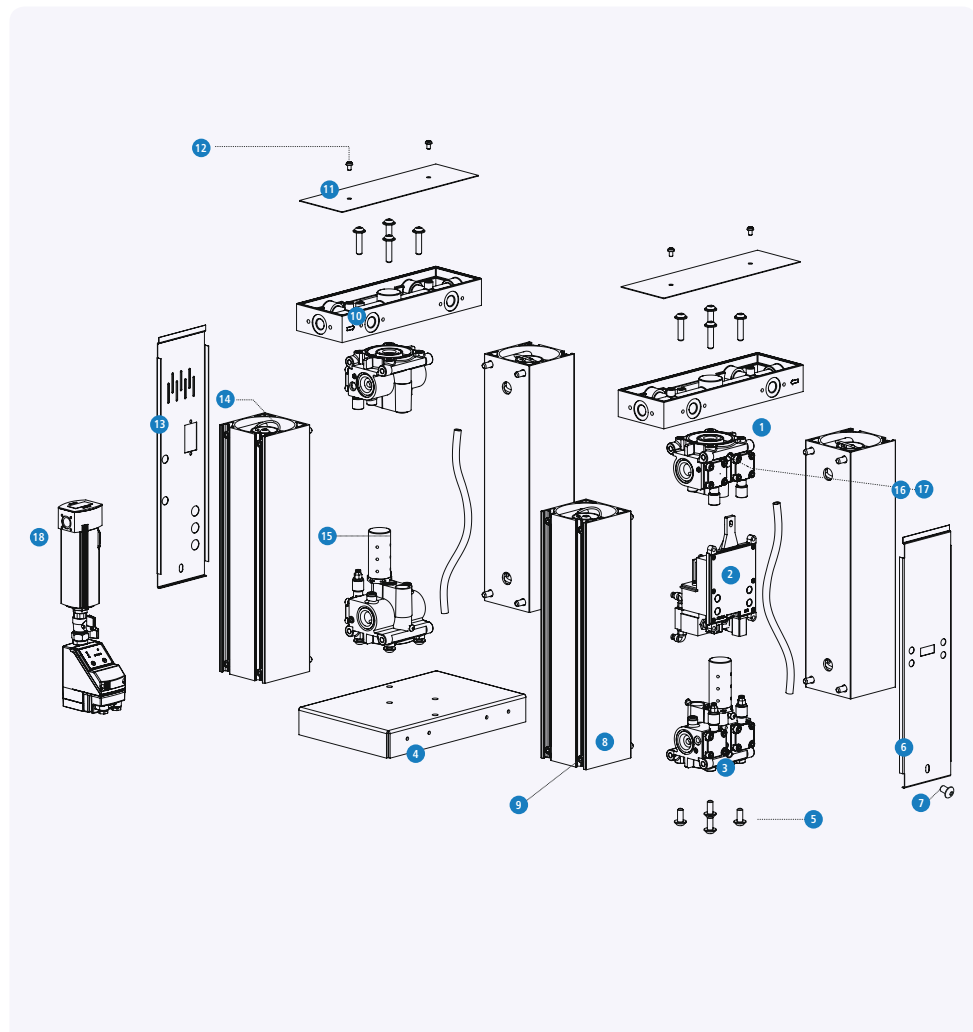
Figure 2.2: Models DRYPOINT® AC 171





Section 2: General Description

Figure 2.3: Models DRYPOINT® AC 191 - 196



- |                             |                                    |  |
|-----------------------------|------------------------------------|--|
| 1. Top valve assembly       | 8. Pressure housing                | 14. Banjo fixing bolt                                  |
| 2. Control unit             | 9. Pressure housing retaining bolt | 15. Exhaust silencer bolt                              |
| 3. Bottom valve assembly    | 10. Multiport manifold             | 16. Purge plug   |
| 4. Dryer base               | 11. Top cover                      | 17. Purge plug fixing screw                            |
| 5. Bottom valve fixing bolt | 12. Top cover fixing screw         | 18. Filter (standard) with condensate drain (optional) |
| 6. Front panel              | 13. Rear panel                     |  |
| 7. Front panel fixing screw |                                    |  |

## Section 3: Mechanical Installation

# Mechanical Installation

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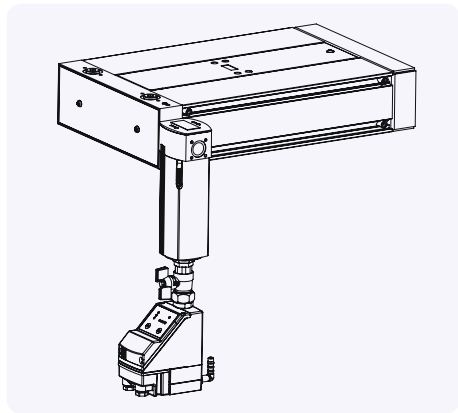
## Orientation

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The range of dryers is designed to operate in both vertical and horizontal orientation.

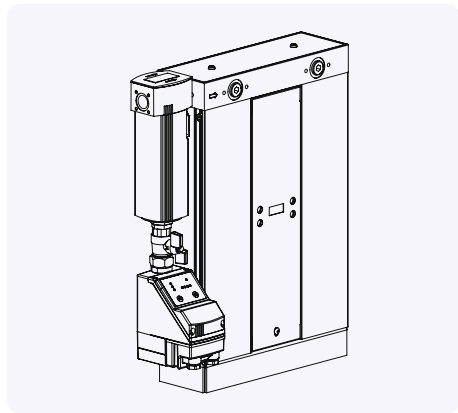
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Figure 3.1: Horizontal orientation



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Figure 3.2: Vertical orientation



## Section 3: Mechanical Installation

### Connecting the pre-filter to the dryer

- Connect filter and DRYPOINT AC using proper sealing material and the fittings supplied.
- If you are using the integrated condensate drain: Connect condensate outlet of filter with the condensate inlet on the back side of the dryer, using the tube supplied (4mm diameter). Apply another discharge tube from the condensate outlet on the back side of the dryer into an oil water separator. If you are using a BEKOMAT 20FM condensate drain: Apply a discharge tube from the condensate drain outlet of the BEKOMAT 20FM into an oil water separator.
- Fit 4mm (5/32") black tubing to filter and drain valve inlet.
- Pipe away condensate with 4mm (5/32") tubing from 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 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 3.4

Figure 3.3: Connecting pre-filter

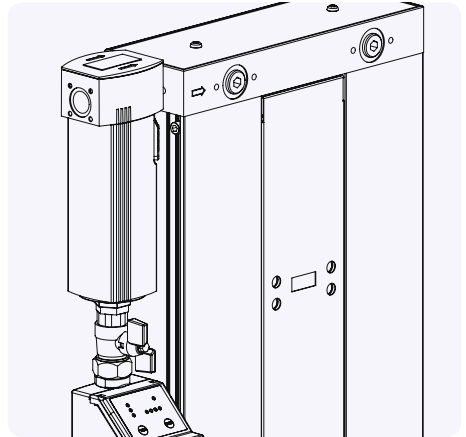
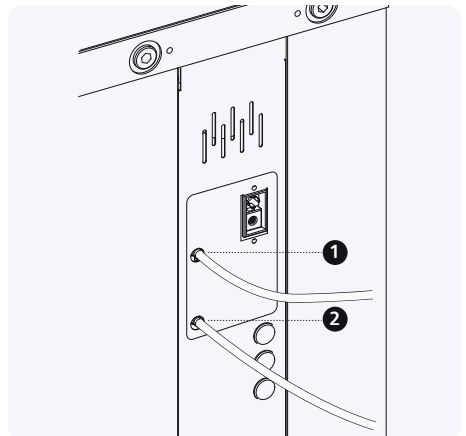


Figure 3.4: Connecting filter drain




1. Inlet
2. Outlet

## Section 3: Mechanical Installation

### Reconfiguration of the inlet / outlet ports

The Dryer has three ports on the inlet (A, B and C) and three ports on the outlet (D, E and F). Any of the three can be used for inlet (A, B or C) and outlet (D, E or F). Make sure the remaining two are blanked off with provided pressure plugs.

Dryer can be reconfigured to interchange position of inlet and outlet ports (Figure 3.5).

-  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
- 6mm hex key

Figure 3.5: Inlet/outlet ports

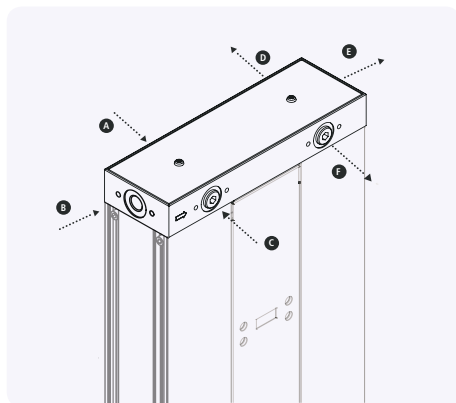
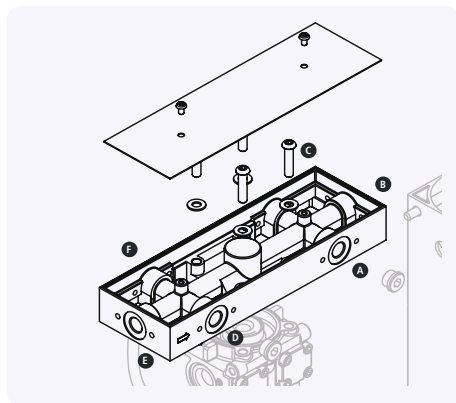


Figure 3.6: Reconfiguration of inlet/outlet ports



### Section 3: Mechanical Installation

Figure 3.7: Level ground

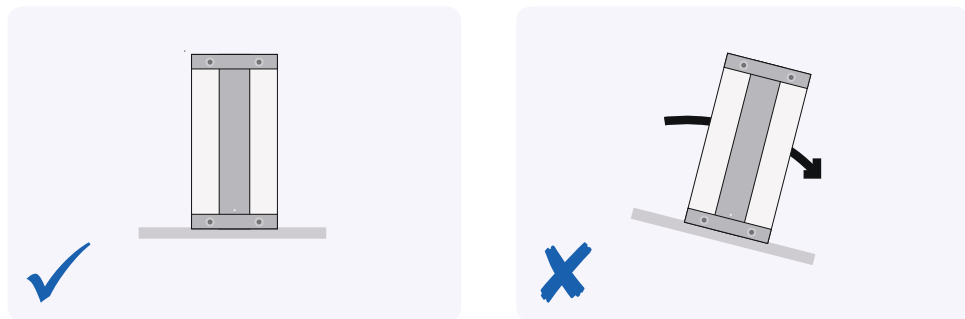
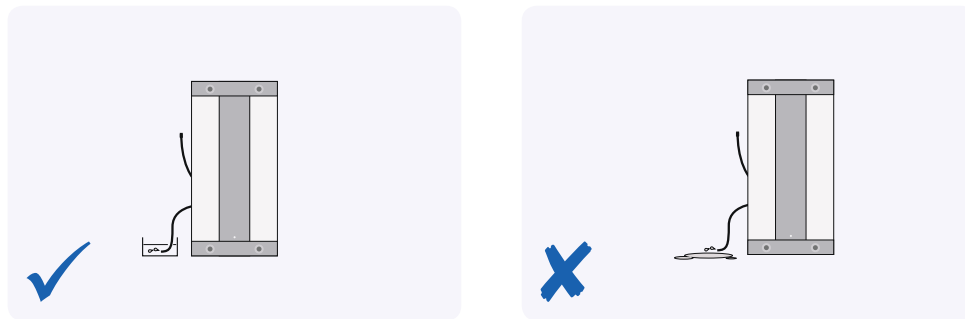


Figure 3.8: Drainage (all tubing should be secured up to the point of drain to prevent whipping during discharge)



Section 3: Mechanical Installation

Figure 3.9: Location

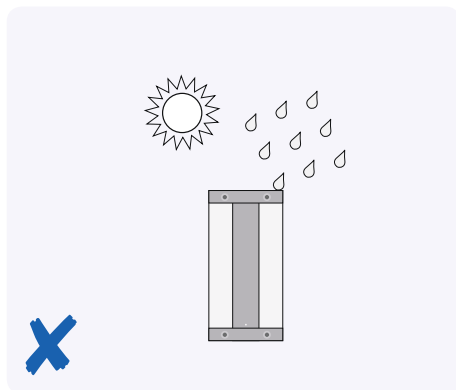
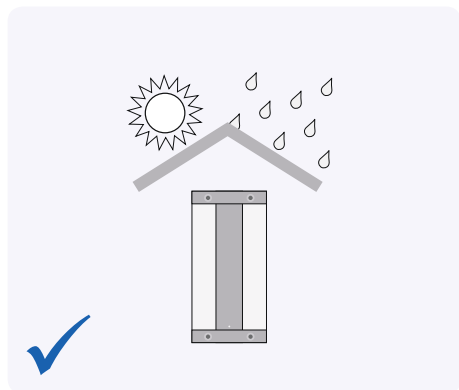


Figure 3.10: Hard piped installation

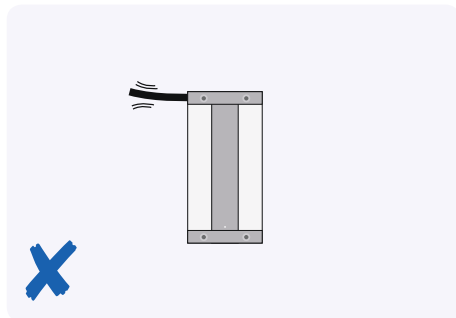
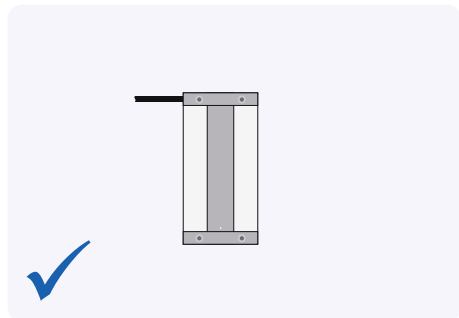
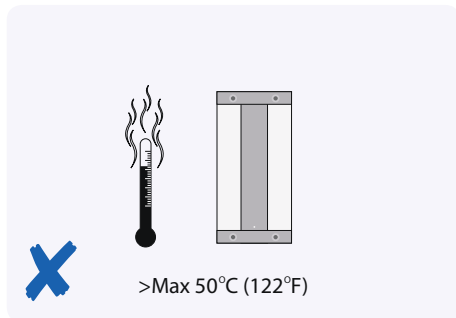
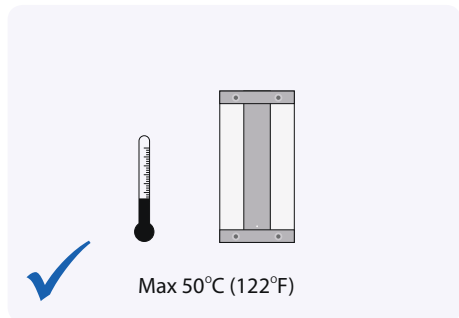


Figure 3.11: Exposure to heat



## Section 3: Mechanical Installation

Figure 3.12: Direction of flow

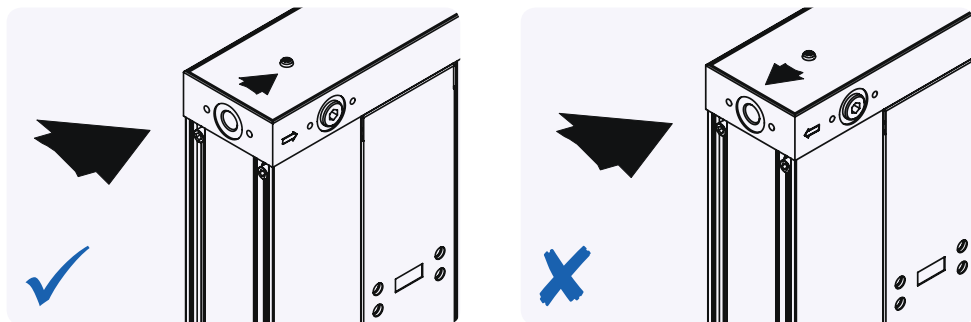
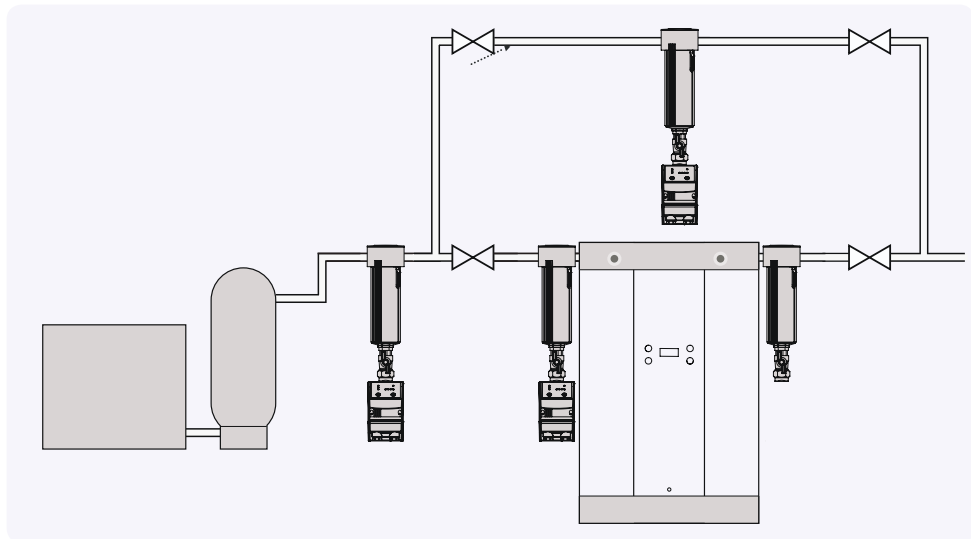


Figure 3.13: Typical installation



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.

## Section 4: Electrical Installation

# 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.

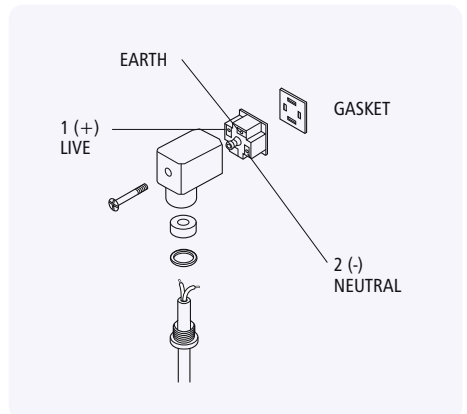
## Power Supply

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 17, for further information.

Figure 4.1: Din connector





Section 4: Electrical Installation

Different voltage setting

Figure 4.2: Wiring diagram

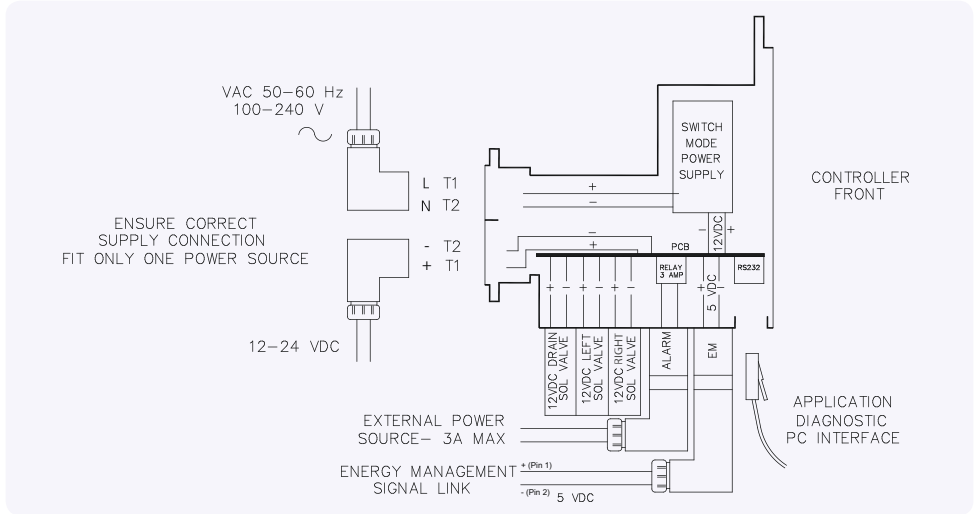


Figure 4.3: 100 to 240 VAC

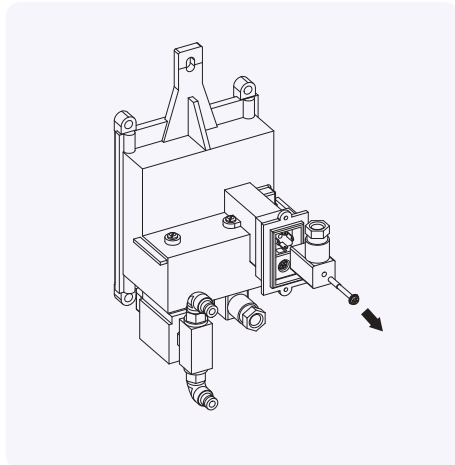
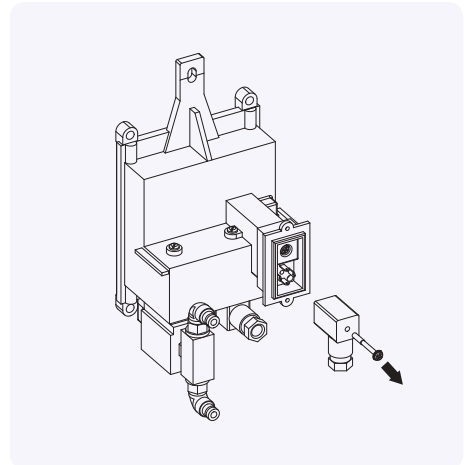


Figure 4.4: 12 to 24 VDC



## Section 4: Electrical Installation

### Controller Description

Controller Specification	
Ambient temperature	1.5°C to 50°C (35°F to 122°F)
Max. relative humidity	80% RH up to 31°C, decreasing linearly to 50% RH at 50°C
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 7



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.

When used in the UK, a 3 amp fuse should be fitted as per the wiring diagram (figure 4.2).

## Section 5: Operation

# Operation

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### Background / Function of the dryer

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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 pressurised 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.

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### Start-up procedure

---

- 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 depressurise.
- 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

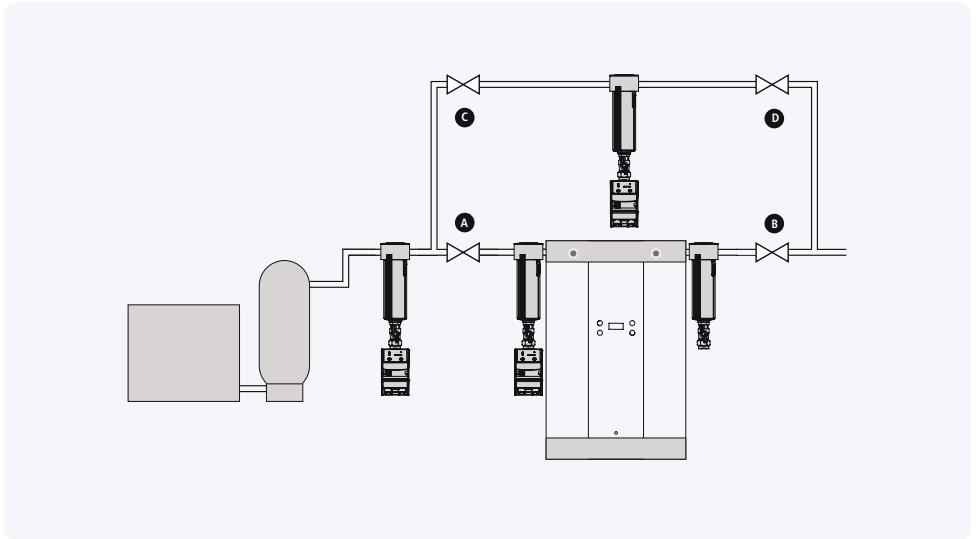
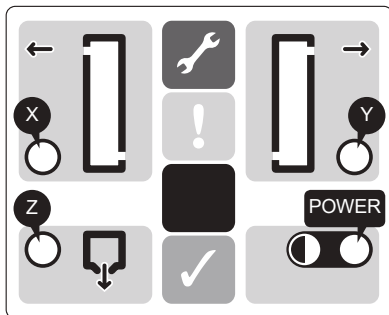


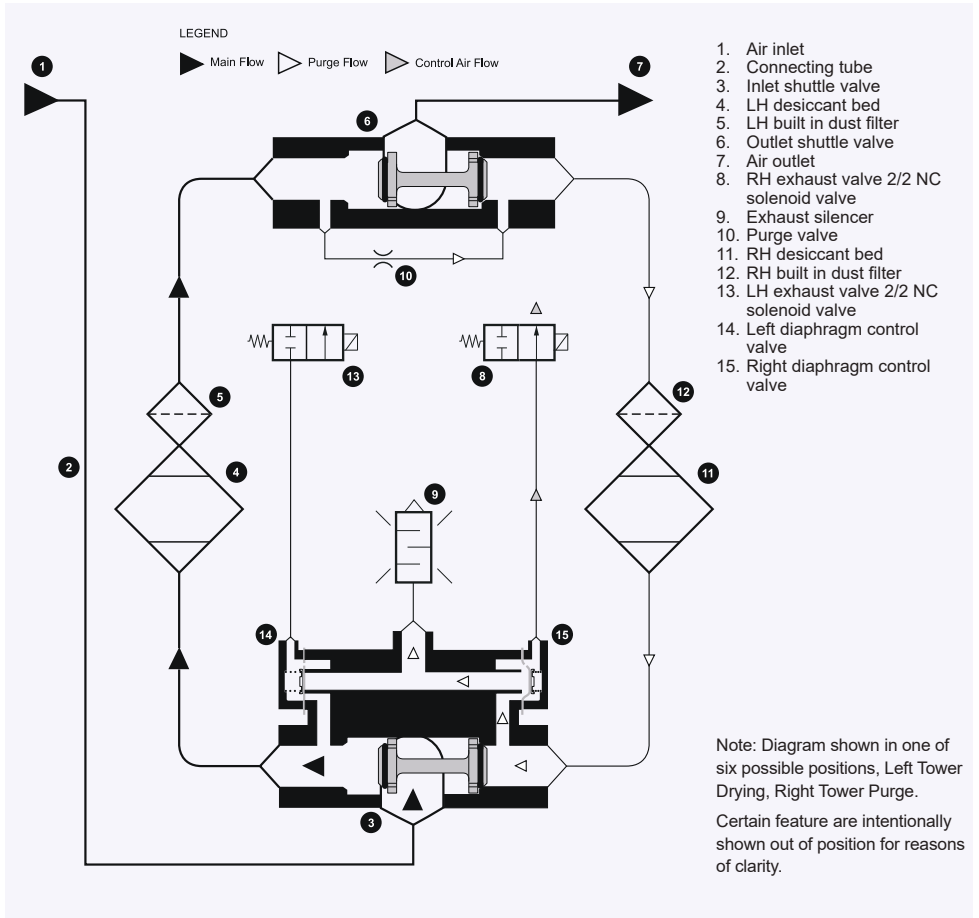
Figure 5.2: Controller description



- 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: Process & Instrumentation diagram



Stage	Time (Sec-onds)	SV Valve Status	Dryer Operation
1.	0	Left valve closed, right valve opens	Left tower at pressure (drying), right tower depressurises and Then purges (this stage is shown on pd1 pneumatic schematic)
2.	120	Both valves closed	Right tower repressurising
3.	170	Left valve opens, right valve closed	Left tower depressurises and then purges, right tower at pressure (drying)
4.	290	Both valves closed	Left tower repressurising
	340	Back to stage 1	-

Section 6: Maintenance

# 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)
Cartridges	Every Two Years (12000 hrs)
Valves	Every Four Years (24000 hrs)
Silencer	Annual change recommended

Front Panel Removal

- 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 DRYPOINT® AC 171 – DRYPOINT® AC 196

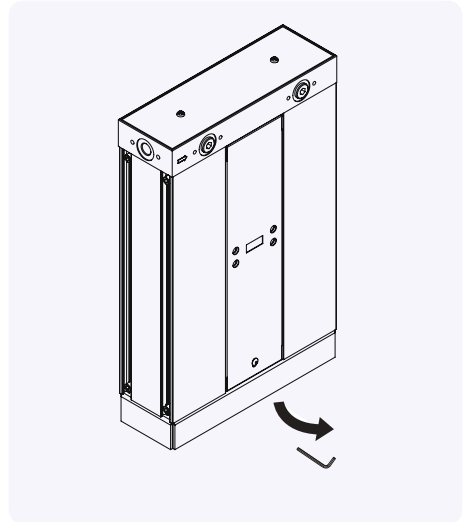
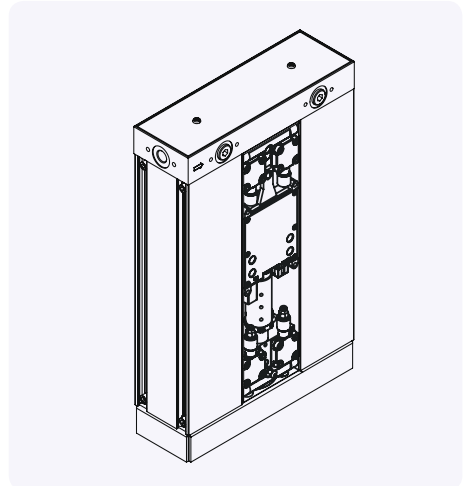


Figure 6.2: Models DRYPOINT® AC 171 – DRYPOINT® AC 196 with front panel removed



## Section 6: Maintenance

### Desiccant Changeout


1. See figure 6.3.
2. Unscrew four bolts ¾ turn on the opposite tower to aid desiccant changeout process.
3. Unscrew the four pressure housing retaining bolts and slide out the pressure housing.
4. Remove banjo fixing bolt using hex key.
5. Extract end cap and banjo assembly from pressure housing.
6. Using banjo fixing bolt, retract the cartridge from pressure housing.
7. Replace with new cartridge supplied as part of the cartridge service kit.
8. Ensure O-ring seals are in place when installing cartridge and assembly in pressure housing.
9. Follow above steps in reverse to finish installing new cartridge into the dryer.
10. Repeat steps 1 – 9 for the second pressure housing
11. Ensure the dryer is leak-free before operating pressure is applied to the dryer.
12. Follow start up procedure as stated on page 19 of this manual.
13. Continue to page 24 to reset the controller.

### Tools required



- 5mm hex key.
- 6mm 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 6.3: Models DRYPOINT® AC 171 – DRYPOINT® AC 196

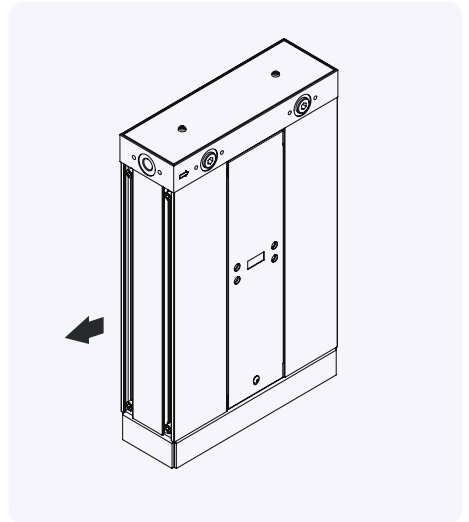
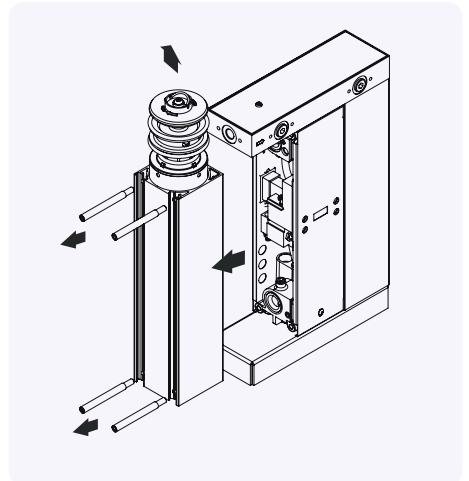


Figure 6.4: Models DRYPOINT® AC 171 – DRYPOINT® AC 196 with tower assembly removed



## Section 6: Maintenance

### 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, (see figure 6.5).
- 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, (see figure 6.6).



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

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

Figure 6.5: Controller reset

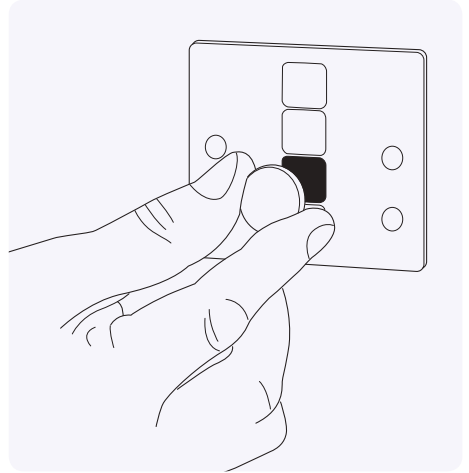
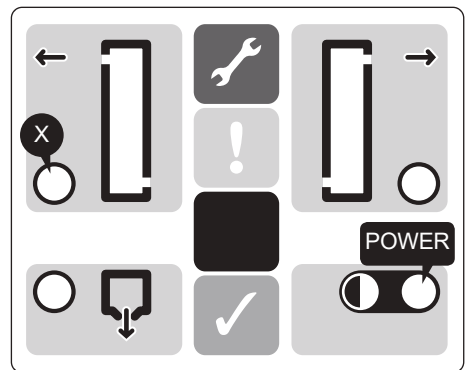


Figure 6.6: Controller description






## Section 6: Maintenance

### Purge Plug Removal

- Remove dryer front panel, (see figure 6.2).
- 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 11.
- 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 6.7: Purge plug changeout stage 1

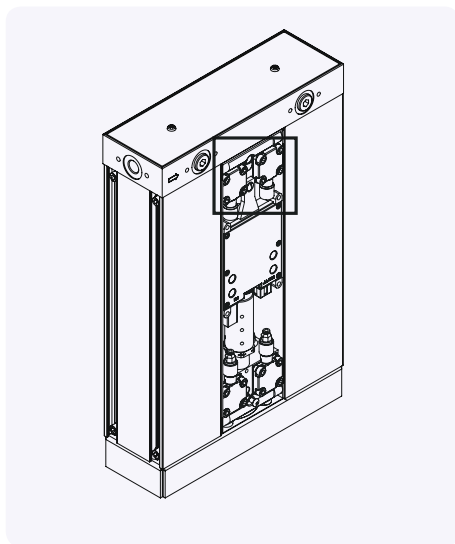
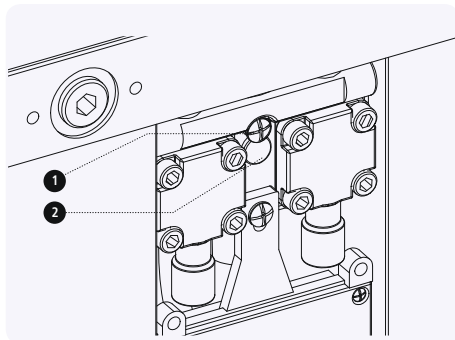


Figure 6.8: Purge plug changeout stage 2



1. Securing screw
2. Purge plug

## Section 6: Maintenance

### Exhaust Silencer Changeout

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

### Tools required



- Not required

### Important information




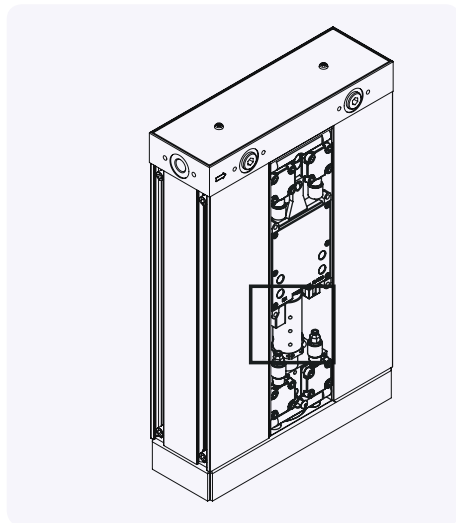
-  Ensure shutdown and start-up procedures are followed prior to carrying out any maintenance work on the dryer.
-  Walker Filtration will not accept responsibility for physical injury, damage or delays caused by failure to observe the instructions in this manual and manuals provided with your equipment.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

Figure 6.9: Models DRYPOINT® AC 119 – DRYPOINT® AC 171  
Silencer changout stage 1



## Section 6: Maintenance

### Diaphragm Replacement


- 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 6.10: Diaphragm changeout stage 1

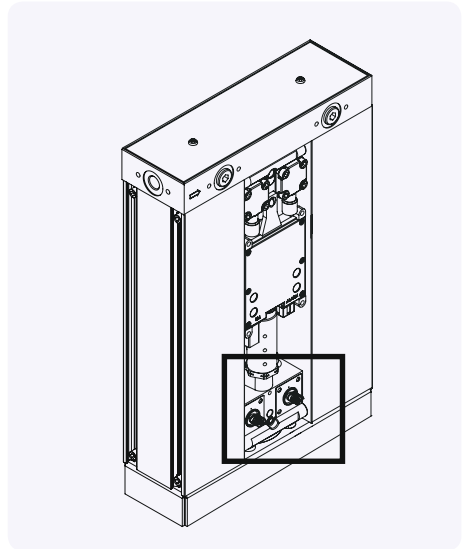
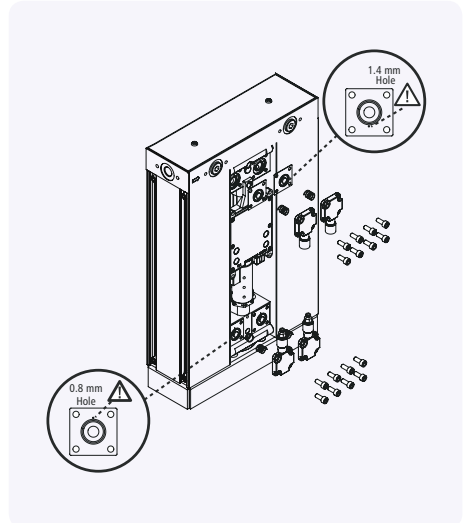


Figure 6.11: Diaphragm changeout stage 2



1. Diaphragm
2. Spring

## Section 6: Maintenance

### Replacing Shuttle Valves

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

#### Tools required



- 5mm hex key

Figure 6.12: Filter and tower removal

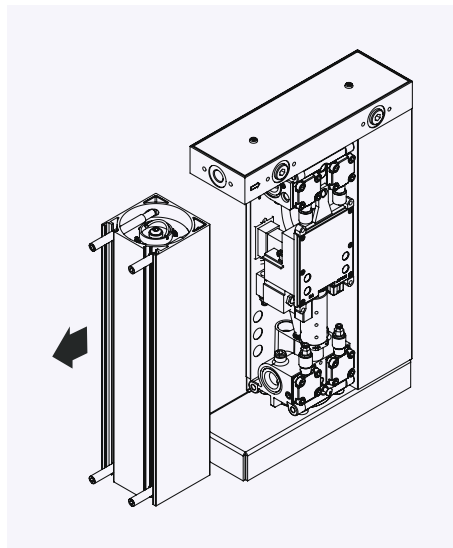
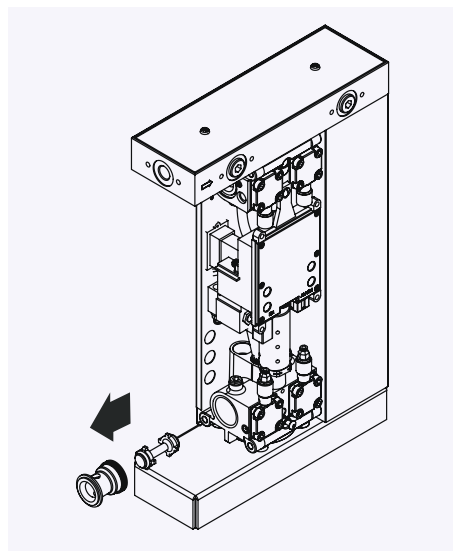


Figure 6.13: Shuttle seat and shuttle removal



## Section 7: Energy Management

# 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 utilise 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.

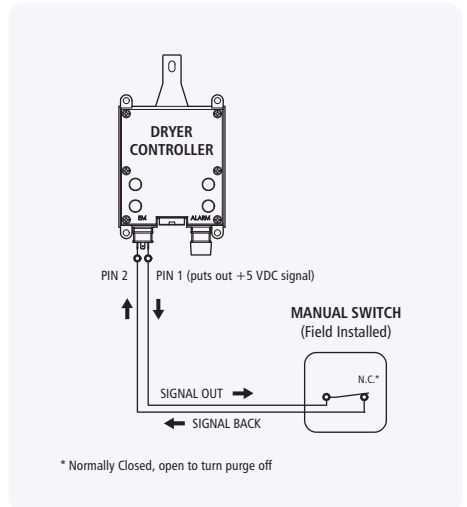
## Using a Manual Switch for Purge Control

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



## Section 7: Energy Management

### Using a Standard Pressure Switch for Purge Control

Many compressors come equipped with pressure switches with extra contacts that can be utilised 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.

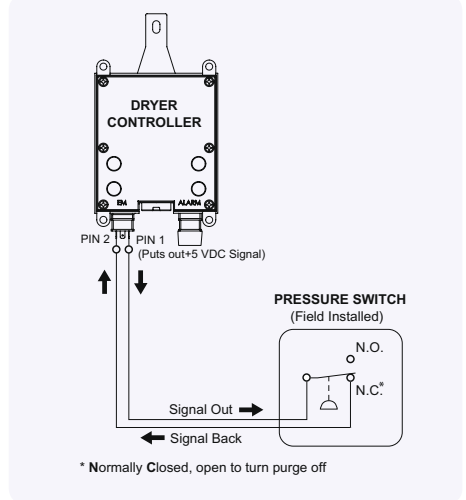
When using a stand-alone pressure switch, the dryer is wired into the normally closed contacts on the pressure switch. When the switch is actuated (at 100 psig in the example), the purge shuts off until the pressure switch deactuates (at 95 psig in example). The point at which the switch deactuates,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

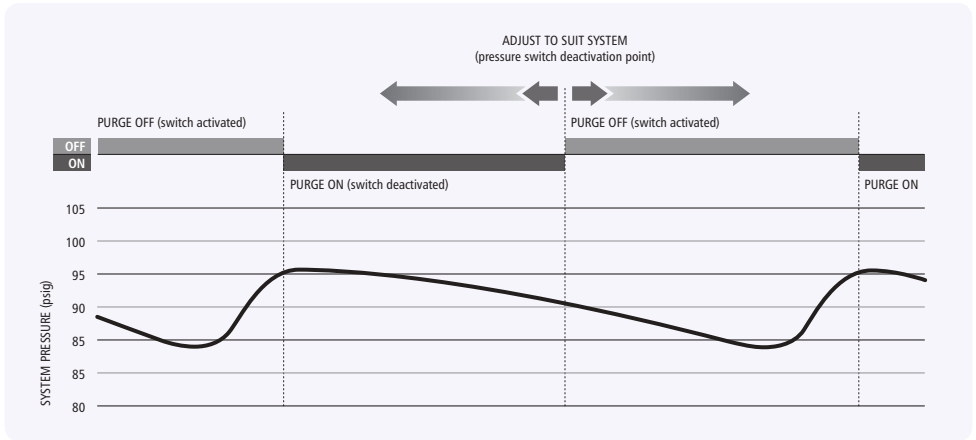
The following schematic offers an overview of the devices mentioned as they might be connected for use in controlling a dryer's purge function. Please note that specific details differ between device manufacturers, so in all cases the manufacturer's specifications should be adhered to.

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



## Section 7: Energy Management

Fig 7.3 Pressure switch setting



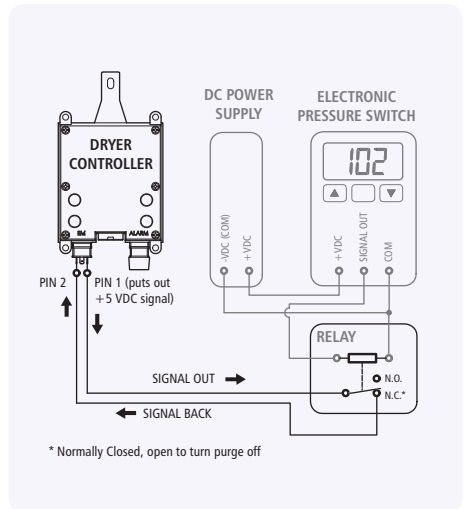
### Using an Electronic Pressure Switch for Purge Control

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.

## Section 7: Energy Management

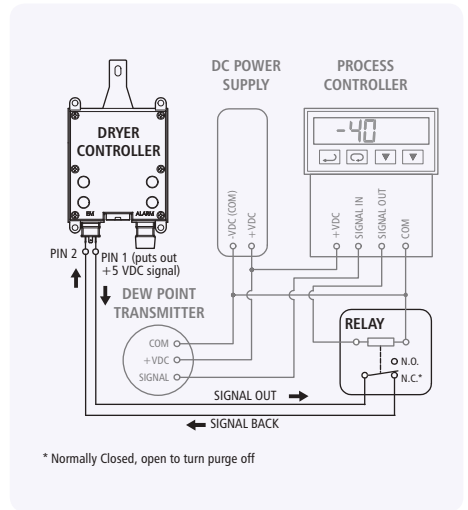
### Using a Dew Point Transmitter and Process Controller for Purge Control


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.

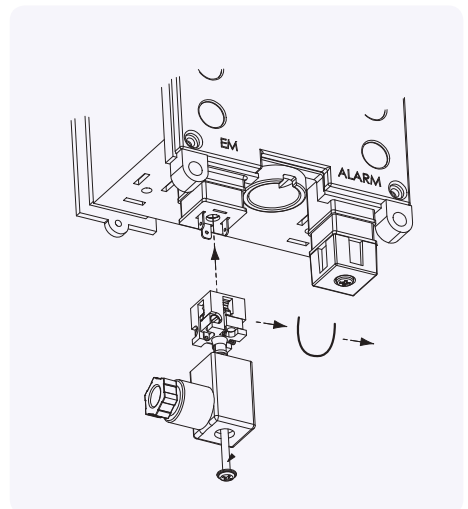
### Making Connections between a Switching Device & Dryer EM Contact

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 6mm (1/4"). 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.

Figure 7.6: connecting to EM port



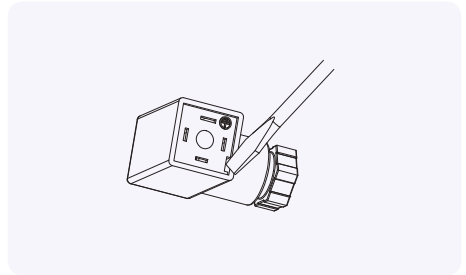


## Section 7: Energy Management

### 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.
  - Remove the DIN connector blanking plug from the dryer controller by loosening the centre DIN connector screw and pulling downward.
  - Remove the screw completely from the centre of the connector.
  - Insert a small flat screwdriver into the small recess at the edge of the insert, pry the insert out of the DIN connectors outer shell (Figure 7.7).
  - 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 20mm (3/4").
  - Strip the conductor insulation back approx 3mm (1/8").
  - 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 7.7: DIN connector



## Section 7: Energy Management

### 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.

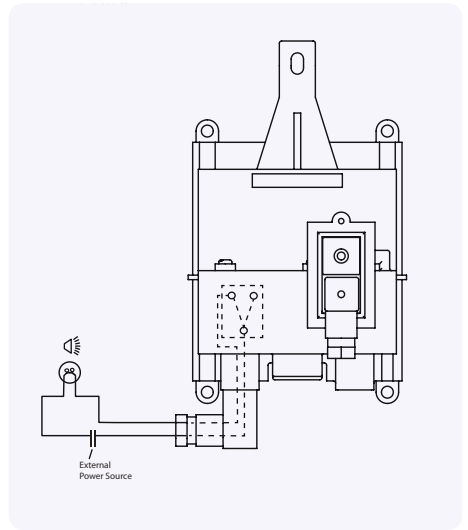
#### Alarm connection details

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.

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

Figure 7.8: Remote alarm wiring diagram



## Section 8: Troubleshooting

# 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?


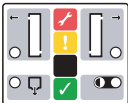
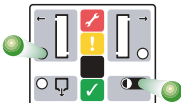
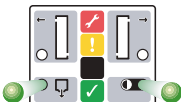

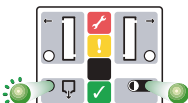


Troubleshooting: General		
Problem	Possible Cause	Action
Poor dewpoint	Liquid water at dryer inlet	Check pre-filtration and drains
	Excessive flow	Check actual flow against maximum specified
	Low inlet pressure	Check against specification
	High inlet temperature	Check against specification
	Silencer 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 7)

## Section 8: Troubleshooting


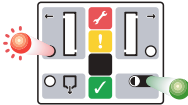
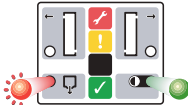
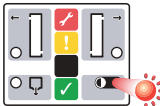
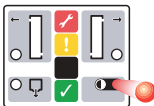
Troubleshooting: Electrical					
Problem	Possible Cause	Display	Prior-ity	Location	Action
No dryer function	No power supply	None	-	-	Check supply
Incorrect dryer operation	Left solenoid open or short circuit	Flashing red	P1	X LED	Replace solenoid valve
	Right solenoid open or short circuit	Flashing red	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 and/or 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. Consult section 7 of this guide to 'Select the Correct EM Mode' section of these instructions, verify EM function.
	Faulty switching device	Consult device manufacturer

Section 8: Troubleshooting

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

Section 8: Troubleshooting

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

## Section 9: Technical Data

# Technical Data

## Environmental Conditions

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

- Indoor use
- Altitude up to 2,000m
- Inlet temperature 1.5°C to 50°C
- Maximum RH 80% for temperatures up to 31°C, decreasing linearly to 50% RH at 50°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	7 barg
Effective inlet temperature	35 °C	95 °F
Relative humidity of air at inlet	95%	
Pressure dewpoint, standard version	-40 °C	-40 °F

## Specified Limitation for Operation

Measurement	Performance	
	Maximum inlet air pressure	16 barg
Minimum inlet air pressure	4 barg	58 psig
Maximum ambient air temperature	50 °C	122 °F
Minimum ambient air temperature	1.5 °C	41 °F
Standard pressure dewpoint	-40 °C	-40 °F
Optional pressure dewpoint with application of flow correction factor*	-70 °C	-94 °F
Electrical supply voltage	12 VDC to 24 VDC	100 VAC to 240 VAC

\* Max inlet temperature at a pressure dewpoint of -70°C / -94°F is 35°C / 95°F

Section 9: Technical Data

Dryer Sizing Table												
Dryer Model	Pipe size"	Inlet Flow Rate		Dryer Config.	Dimension (mm)			Weight		Dimension (inches)		
		m <sup>3</sup> /h	CFM		A	B	C	Kg	lb	A	B	C
AC 171	3/8	59	35	simplex	1459	281	92	31	68	57	11	3.6
AC 191	1/2	84	50	duplex	1064	281	184	47	103	42	11	7.1
AC 196	1/2	118	70	duplex	1459	281	184	61	134	57	11	7.1

Pressure Correction Factor (PCF)													
Operating Pressure													
barg	4	5	6	7	8	9	10	11	12	13	14	15	16
psig	58	73	87	102	116	131	145	160	174	189	203	218	232
PCF*	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.12

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

Inlet Temperature Correction Factor (TCF)				
Temperature				
°C	35	40	45	50
°F	95	104	113	122
TCF	1.00	0.88	0.67	0.55

Dewpoint Correction Factor (DCF)		
Temperature		
°C	-40	-70
°F	-40	-94
DCF	1.0	0.7



### Section 9: Technical Data

#### Dimensional drawings

Figure 9.1: Models DRYPOINT® AC 171

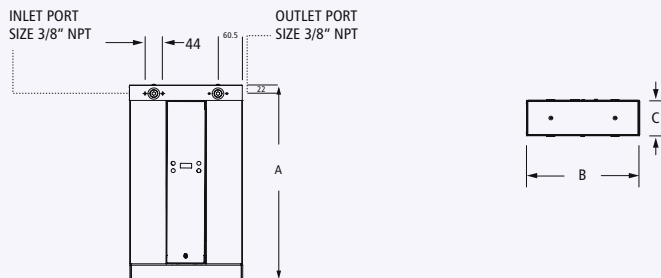
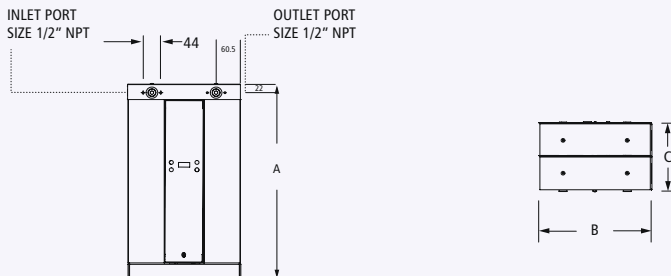


Figure 9.2: Models DRYPOINT® AC 191 - DRYPOINT® AC 196

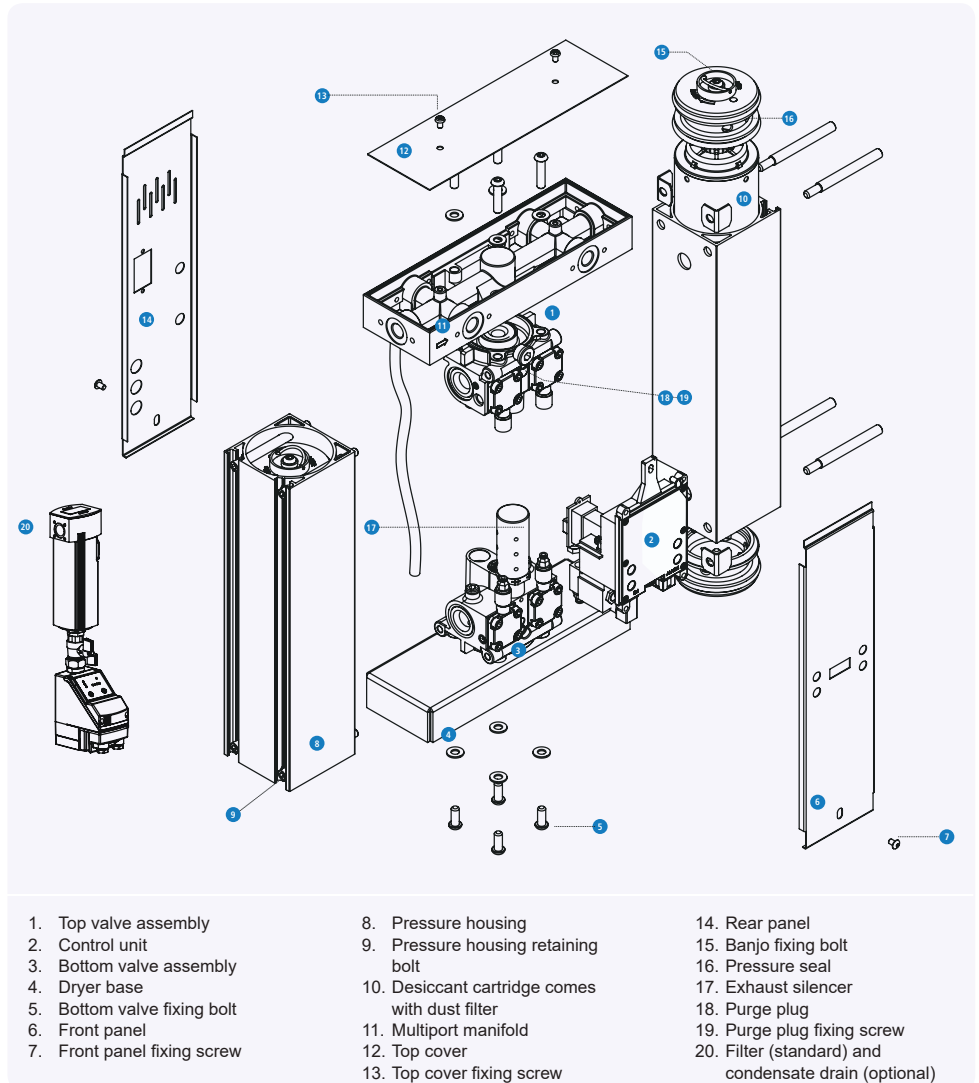


## Section 10: Component Parts

# Component Parts

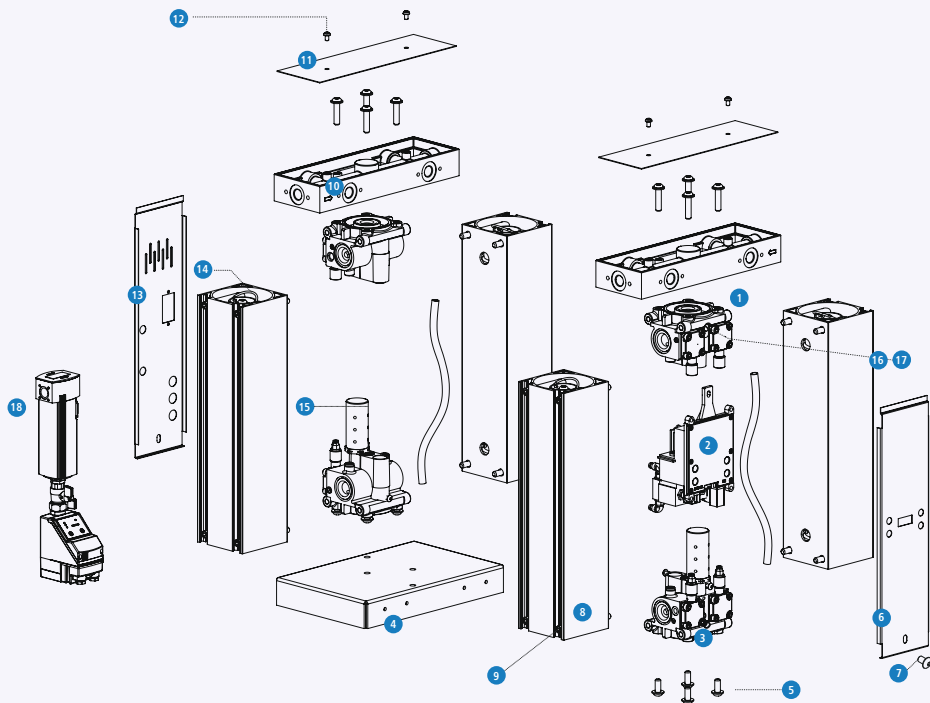
Dimensional drawings

Figure 10.1: Models DRYPOINT® AC 171



Section 10: Component Parts

Figure 10.2: Models DRYPOINT® AC 191 - 196

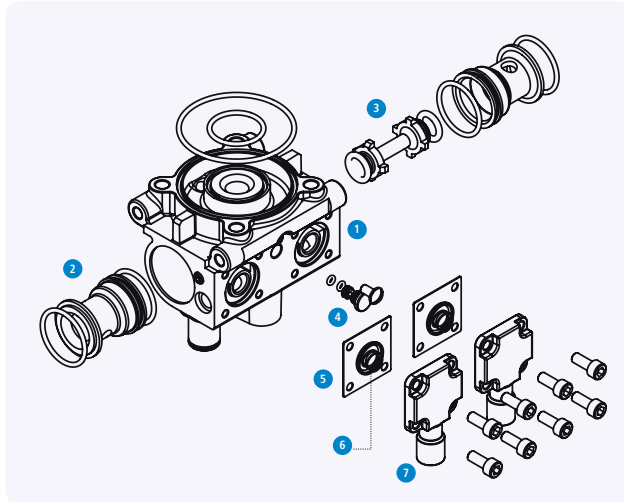


- |                             |                                    |   |
|-----------------------------|------------------------------------|---|
| 1. Top valve assembly       | 8. Pressure housing                | 14. Banjo fixing bolt                                 |
| 2. Control unit             | 9. Pressure housing retaining bolt | 15. Exhaust silencer                                  |
| 3. Bottom valve assembly    | 10. Multiport manifold             | 16. Purge plug  |
| 4. Dryer base               | 11. Top cover                      | 17. Purge plug fixing screw                           |
| 5. Bottom valve fixing bolt | 12. Top cover fixing screw         | 18. Filter (standard) and condensate drain (optional) |
| 6. Front panel              | 13. Rear panel                     |   |
| 7. Front panel fixing screw |                                    |   |

Section 10: Component Parts

Top & Bottom Block Assembly AC 171 - AC 196

Fig 10.3 Top block assembly

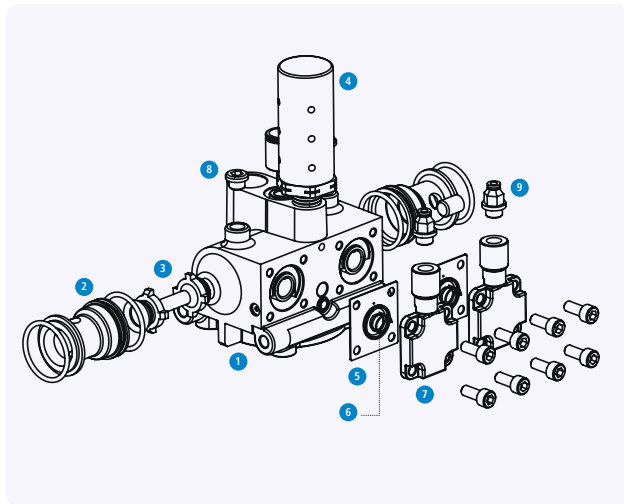


1. Top Block
2. Shuttle seat
3. Shuttle
4. Purge Plug
5. Diaphragm with disc
6. Compression spring
7. Top bonnet



Refer to figure 10.1 or 10.2 to determine the number of components per model.

Fig 10.4 Bottom block assembly



1. Bottom block
2. Shuttle seat
3. Shuttle
4. Silencer
5. Diaphragm with disc
6. Compression spring
7. Bottom bonnet
8. 1/8 pressure plug
9. 4mm straight adaptor



Refer to figure 10.1 or 10.2 to determine the number of components per model.

Section 10: Component Parts

Tower Assembly

Fig 10.5 Tower assembly

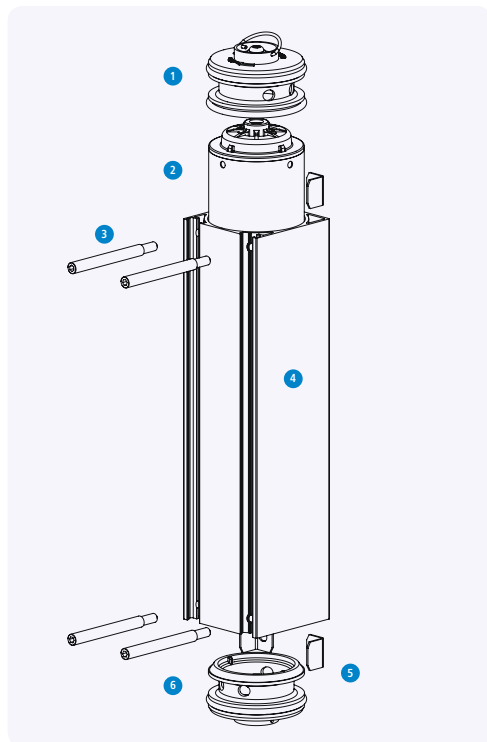


Fig 10.6 Top tower plug assembly

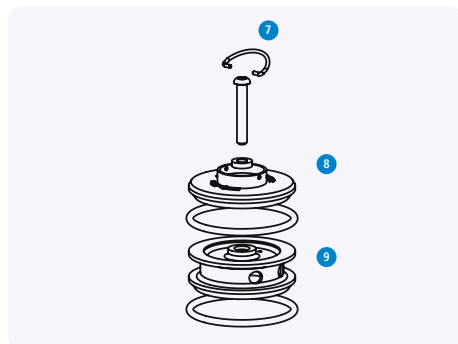
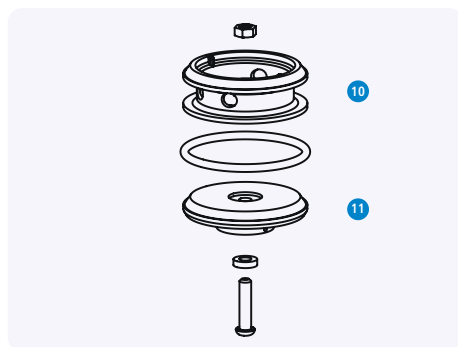



Fig 10.7 Bottom tower plug assembly



1. Top tower plug assembly
2. Cartridge
3. Extrusion bolt
4. Extrusion
5. Extrusion corner bracket
6. Bottom tower plug assembly
7. Wire handle
8. Tower plug
9. Banjo adaptor
10. Banjo adaptor
11. Tower plug

 Refer to figure 10.1 or 10.2 to determine the number of components per model.

Section 11: Spares Information


# 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 (barg)												
	4	5	6	7	8	9	10	11	12	13	14	15	16
DRYPOINT® AC 171	PAC28	PAC23	PAC21	PAC20	PAC18	PAC18	PAC16	PAC15	PAC15	PAC14	PAC14	PAC14	PAC14
DRYPOINT® AC 191	2x PAC20	2x PAC18	2x PAC16	2x PAC15	2x PAC14	2x PAC14	2x PAC13	2x PAC13	2x PAC13	2x PAC12	2x PAC12	2x PAC12	2x PAC12
DRYPOINT® AC 196	2x PAC28	2x PAC23	2x PAC21	2x PAC20	2x PAC18	2x PAC18	2x PAC16	2x PAC15	2x PAC15	2x PAC14	2x PAC14	2x PAC14	2x PAC14



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

Section 11: Spares Information

	Dryer Model	Kit Number	Description	Service Kit Includes
Service Kit Set 1	AC 119	4010095	12,000 hour service cartridge kit includes: desiccant cartridges, spare pre-filter element, pack of sealing 'O' rings and washers, instruction leaflet.	
	AC 122	4013882		
	AC 126	4009061		
	AC 136	4007292		
	AC 148	4008040		
	AC 171	4007290		
	AC 191	4008063		
Service Kit Set 2	AC 119	4009342	24,000 hour valve service kit includes: exhaust solenoid valves, diaphragms, shuttle valve and 'O' rings, required seals (not including desiccant cartridges).  To complete a 24,000 hour service, both cartridge service kit and valve service kit will be required.	
	AC 122	4009342		
	AC 126	4009342		
	AC 136	4009342		
	AC 148	4009342		
	AC 171	4009342		
	AC 191	4008064		
Spares	AC 119 - AC 171	4024746	Silencer Kit	
	AC 191 - AC 196	2x 4024746		
	AC 119 - AC 196	4024747	Controller assembly kit includes: electronic controller complete with solenoid valves	
	AC 119 - AC 196	4024750	DIN Plug Kit includes: DIN plug, gasket, screws	
	AC 119 - AC 171*	4008702	Wall Mounting Bracket	
AC 119 - AC 171*	4009870	Foot Mounting Bracket		

\* Not available for AC191 and AC196

## Section 12: Warranty

# 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 manufacturer 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.



## Section 13: Declaration of Conformity

Installations- und Betriebsanleitung

DE

## Declaration of Conformity

## EU Declaration of Conformity

We declare herewith that the products described below correspond with the requirements of the respective guidelines and technical norms. This declaration only refers to products in the conditions, in which we put them into circulation. Parts not supplied by the manufacturer and/or interventions carried out later are not covered by this declaration.

Product description:	DRYPOINT®
Model:	AC171, AC191, AC196
Voltage Variations:	12 ... 24 VDC, 100 ... 240 VAC
Max. Operating Pressure:	16 bar (g)
Product Description and Function:	Cold regenerated Adsorption Dryer for Compressed Air

**Machinery Directive 2006/42/EC**

Harmonised standards applied:	ISO 12100-2:2003 + A1:2009 EN 60204-1:2006 + A1:2009
Authorized representative for document:	Simon Wise Birtley Road, Washington, Tyne & Wear, NE38 9DA, England

**Pressure Equipment Directive 2014/68/EU**

Standards applied:	Generally in accordance with ASME VIII Div. I Rules for construction of pressure vessels Cat II – Module D1
Conformity Assessment Module:	Assessment based on Group 2 Gas service
Notified Body:	Lloyd's Register EMEA 71 Fenchurch Street, London, EC3M 4BS, England.
Certificate no.:	COV0310124/1

**EMC Directive 2014/30/E**

Harmonized standards applied:	EN 61000-6-1:2007 EN 61000-6-2:2005 EN 61000-6-3:2007 + A1:2011 EN 61000-6-4:2007 + A1:2011
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**ROHS II- Directive 2011/65/EU**

The requirements of Directive 2011/65/EU for limiting the use of certain dangerous materials in electrical and electronic devices have been fulfilled.

Name of Manufacturer:	Walker Filtration Ltd. for BEKO TECHNOLOGIES GMBH
Address of Manufacturer	Birtley Road, Washington, Tyne & Wear, NE38 9DA, England.

The products bear the CE Mark:



This declaration of conformity is issued under the sole responsibility of the manufacturer. I declare on behalf of Walker Filtration Ltd (the manufacturer) and as authorised representative, that the stated products fulfil the requirements of the new approach directives.

Washington, 07.08.2017

Walker Filtration Ltd.



Simon Wise  
Chief Technical Officer (CTO)

## Notes / Notizen

## Notes / Notizen

**Headquarter****Deutschland / Germany**

BEKO TECHNOLOGIES GMBH  
Im Taubental 7  
D - 41468 Neuss  
Tel. +49 2131 988 0  
beko@beko-technologies.de

**United Kingdom**

BEKO TECHNOLOGIES LTD.  
Unit 11-12 Moons Park  
Burnt Meadow Road  
North Moons Moat  
Redditch, Worcs, B98 9PA  
Tel. +44 1527 575 778  
info@beko-technologies.co.uk

**France**

BEKO TECHNOLOGIES S.à.r.l.  
Zone Industrielle  
1 Rue des Frères Rémy  
F - 57200 Sarreguemines  
Tél. +33 387 283 800  
info@beko-technologies.fr

**Benelux**

BEKO TECHNOLOGIES B.V.  
Veenen 12  
NL - 4703 RB Roosendaal  
Tel. +31 165 320 300  
benelux@beko-technologies.com

**中华人民共和国 / China**

BEKO TECHNOLOGIES (Shang-  
hai) Co. Ltd.  
Rm. 606 Tomson Commercial Bui-  
lding  
710 Dongfang Rd.  
Pudong Shanghai China  
P.C. 200122  
Tel. +86 21 508 158 85  
info.cn@beko-technologies.cn

**Česká Republika / Czech Republic**

BEKO TECHNOLOGIES s.r.o.  
Na Pankraci 58  
CZ - 140 00 Praha 4  
Tel. +420 24 14 14 717  
info.cz@beko-technologies.cz

**España / Spain**

BEKO Tecnológica España S.L.  
Torruella i Urpina 37-42, nave 6  
E - 08758 Cervelló  
Tel. +34 93 632 76 68  
info.es@beko-technologies.es

**中華人民共和國香港特別行政區 /****Hong Kong SAR of China**

BEKO TECHNOLOGIES LIMITED  
Unit 1010 Miramar Tower  
132 Nathan Rd.  
Tsim Sha Tsui Kowloon Hong Kong  
Tel. +852 5578 6681 (Hong Kong)  
Tel. +86 147 1537 0081 (China)  
tim.chan@beko-technologies.com

**India**

BEKO COMPRESSED AIR  
TECHNOLOGIES Pvt. Ltd.  
Plot No.43/1 CIEEP Gandhi Nagar  
Balanagar Hyderabad  
IN - 500 037  
Tel. +91 40 23080275  
madhusudan.masur@bekoindia.com

**Italia / Italy**

BEKO TECHNOLOGIES S.r.l  
Via Peano 86/88  
I - 10040 Leini (TO)  
Tel. +39 011 4500 576  
info.it@beko-technologies.com

**日本 / Japan**

BEKO TECHNOLOGIES K.K  
KEIHIN THINK Building 8 Floor  
1-1 Minamiwatarida-machi  
Kawasaki-ku, Kawasaki-shi  
JP - 210-0855  
Tel. +81 44 328 76 01  
info@beko-technologies.jp

**Polska / Poland**

BEKO TECHNOLOGIES Sp. z o.o.  
Ul. Pańska 73  
PL - 00-834 Warszawa  
Tel. +48 22 314 75 40  
info.pl@beko-technologies.pl

**South East Asia**

BEKO TECHNOLOGIES S.E.Asia  
(Thailand) Ltd.  
75/323 Soi Romkloa, Romkloa Road  
Sansab Minburi  
Bangkok 10510  
Tel. +66 2-918-2477  
info.th@beko-technologies.com

**臺灣 / Taiwan**

BEKO TECHNOLOGIES Co.,Ltd  
16F.-5 No.79 Sec.1  
Xintai 5th Rd. Xizhi Dist.  
New Taipei City 221  
Taiwan (R.O.C.)  
Tel. +886 2 8698 3998  
info.tw@beko-technologies.tw

**USA**

BEKO TECHNOLOGIES CORP.  
900 Great SW Parkway  
US - Atlanta, GA 30336  
Tel. +1 404 924-6900  
beko@bekousa.com

Translation of the original manual/instructions.

Original instructions are in German.

Subject to technical modifications without notice / errors accepted.

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