



EN - english

Instructions for installation and operation

DRYPOINT<sup>®</sup> AC XX+XX°C HP 100

High-pressure adsorption dryer



Serial number: HPXXX.XXX.XXXXXX

Dear customer,

Thank you for deciding in favour of the DRYPOINT® AC HP 100 high-pressure adsorption dryer. Please read these installation and operating instructions carefully before mounting and starting up the DRYPOINT® AC HP 100, and follow our directions. Perfect functioning of the DRYPOINT® AC HP 100 can only be guaranteed when the provisions and notes stipulated here are strictly adhered to.

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## 1 Type plate

|  |   |
|--|---|
| <b>Manufacturer:</b>   |   |
| BEKO TECHNOLOGIES GMBH<br>41468 Neuss, GERMANY<br>Phone: +49 2131 988-0<br>www.beko.de |  |
| <b>Year of manufacture:</b>  | XX-XXXX   |
| <b>Type:</b>   | AC XXX +XX°C<br>HP<br>XXX   |
| <b>Serial number:</b>  | HPXXX.XXX.XXXXXX  |
| <b>Approvals:</b>  | TÜV NORD Systems  |
| <b>Test pressure PT:</b>   | XXX bar (g)   |
| <b>Max. permissible operating pressure PS:</b>   | 100 bar (g)   |
| <b>Working pressure compressed air:</b>  | XX bar (g)  |
| <b>Min./max. permissible temperature TS:</b>   | +5 / +55°C  |
| <b>Inlet temperature compressed air:</b>   | +XX°C   |
| <b>Max. volume flow at the INLET:</b>  | XX m <sup>3</sup> /h (ISO 1217)   |
| <b>Voltage supply:</b>   | 230V/1Ph./50Hz  |
| <b>Weight:</b>   | XXX kg  |
| <b>CE</b>  | 0045  |

## Operating conditions

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### 2 Operating conditions

|  |                       |
|--|-----------------------|
| Max. permissible operating overpressure PS:                  | 100 bar g             |
| Working pressure compressed air:                             | XXX bar g             |
| Max. volume flow at the inlet <sup>1</sup> :                 | XXX m <sup>3</sup> /h |
| Min. / max. permissible operating temperature <sup>2</sup> : | +5°C / +55°C          |
| Working temperature compressed air:                          | +XX°C                 |
| Min./max. ambient temperature <sup>2</sup> :                 | +5°C/+50°C            |
| Supply voltage:  | 230 VAC 50 Hz         |
| Protection class:  | IP 54                 |
| Pressure dew point outlet dryer <sup>3</sup> :               | -XX°C                 |

<sup>1</sup> Volume flow in accordance with ISO 1217

<sup>2</sup> At ambient conditions below +10°C and/or compressed-air inlet temperatures below +30°C, the manufacturer should be consulted. If necessary, measures must be undertaken to ensure trouble-free operation of the plant.

<sup>3</sup> In accordance with DIN ISO 7183

**3 Contents**

|       |  |    |
|-------|--|----|
| 1     | Type plate .....   | 3  |
| 2     | Operating conditions .....   | 4  |
| 3     | Contents .....   | 5  |
| 4     | Safety instructions .....  | 6  |
| 4.1   | Safety labelling .....   | 6  |
| 4.2   | Signal words in accordance with ANSI .....                                       | 7  |
| 4.3   | Authorised skilled personnel .....   | 7  |
| 4.4   | Safety instructions for operation .....  | 9  |
| 4.5   | Safety instructions for maintenance, inspection and installation works .....     | 9  |
| 5     | EC – Declaration of Conformity .....   | 11 |
| 6     | Technical specifications .....   | 12 |
| 7     | Operating principle .....  | 12 |
| 7.1   | Loading .....  | 12 |
| 7.2   | Regeneration .....   | 13 |
| 7.3   | Switching-over between the adsorption chambers .....                             | 13 |
| 7.4   | Load-dependent control (option) .....  | 13 |
| 8     | Technical data .....   | 14 |
| 8.1   | Design data for pressure vessels .....   | 15 |
| 9     | Description of the unit .....  | 16 |
| 10    | Installation .....   | 18 |
| 10.1  | Transport and set-up .....   | 18 |
| 10.2  | Installation .....   | 21 |
| 10.3  | Connection of the compressor synchronisation control .....                       | 22 |
| 10.4  | Available options .....  | 23 |
| 11    | Operation .....  | 24 |
| 11.1  | Initial start-up .....   | 24 |
| 11.2  | Operation during compressor synchronisation .....                                | 25 |
| 11.3  | Short-term removal from service .....  | 26 |
| 11.4  | Removal from service for maintenance or repair .....                             | 26 |
| 11.5  | Restart .....  | 27 |
| 11.6  | Measurement of the pressure dew point in the low-pressure range (optional) ..... | 28 |
| 11.7  | Maintenance .....  | 29 |
| 11.8  | Checking the back pressure of the silencer .....                                 | 30 |
| 11.9  | Replacement of the adsorbent .....   | 31 |
| 11.10 | Waste code .....   | 31 |
| 12    | Troubleshooting .....  | 38 |
| 12.1  | Pressure dew point is not reached .....  | 38 |
| 12.2  | No switching between the containers .....  | 38 |
| 12.3  | Regeneration pressure too high .....   | 39 |
| 13    | Technical documentations .....   | 40 |
| 14    | Notes .....  | 41 |

# Safety instructions

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## 4 Safety instructions

Please adhere to all advice given in these operating instructions. They include essential information which must be observed during installation, operation and maintenance. Therefore, it must be ensured that these operating instructions are read by the fitter and the responsible operator / skilled personnel prior to installation, start-up and maintenance.



**The described plant must only be installed, operated and maintained in accordance with these operating instructions.**

**The operating instructions must be accessible at all times at the place of application of the adsorption dryer.**

In addition to these operating instructions, it is imperative to adhere to the relevant accident prevention regulations, the generally accepted safety rules, the EU directives and country-specific standards and provisions.

When using the dryer improperly or when disregarding these instructions, warranty or liability claims are excluded.

If you have any queries regarding these instructions or the device, please contact BEKO TECHNOLOGIES.

### 4.1 Safety labelling

Safety instructions whose non-observance represents a threat to life and physical condition or can lead to property damage are labelled in accordance with DIN 4844 and ANSI Z535.

#### Safety pictograms in accordance with DIN 4844



General danger symbol



Explosion risk, explosive material



Note



Read operating instructions carefully



Use eye protection



Wear light breathing protection



Use protective gloves



Disconnect from power supply



Wear ear protectors

#### 4.2 Signal words in accordance with ANSI

|                   |   |
|-------------------|---|
| <b>Danger!</b>    | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.  |
| <b>Warning!</b>   | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
| <b>Caution!</b>   | Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.            |
| <b>Notice!</b>    | Indicates a property damage message.  |
| <b>Important!</b> | Additional advice, info, hints<br>No danger (no signal word in accordance with ANSI)                        |

#### 4.3 Authorised skilled personnel



All installation, maintenance and repair measures on this plant must only be carried out by skilled personnel who were trained and instructed accordingly. For the qualification and expertise of the skilled personnel, the relevant valid regulations shall apply.



Read operating instructions carefully!



### **Danger!**

#### **Compressed gas!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed gas or through bursting plant components.**

It is the obligation of the operator to ensure that the connected pressure generator is protected against exceeding of the maximum operating overpressure and of the temperature limits at the adsorption dryer.

Make sure that the system is pressureless prior to integrating the dryer into the compressed-gas system!

Any installation works must only be carried out on the pressureless dryer. Only use fittings and connecting elements that are approved for this application. It is of vital importance to observe the specifications of the respective manufacturer.

De-pressurise the plant prior to any maintenance or repair works!

Check all pipes prior to the initial start-up and retighten them if necessary.

The max. permissible operating overpressure is specified on the type plate and in the technical data (see "Technical data" section).

Sudden impact through pressure build-up can cause damage and escape of compressed gas.

Avoid a sudden pressure build-up by operating the valves slowly.

Do not exceed the max. permissible operating pressure (see type plate).

Maintenance, inspection and installation works must be carried out by authorised and skilled personnel only. Prior to undertaking any measures on the adsorption dryer, the skilled personnel shall read up on the device by carefully studying the operating instructions. The operator is responsible for the adherence to these provisions. The respective directives in force apply to the qualification and expertise of the skilled personnel.

Never make structural modifications at the plant!

Use genuine parts and accessories only!

Never carry out welding on the pressure vessel or modify it in any way!

The general safety and accident prevention regulations apply!





### Caution!

#### Operational reliability at risk!

**Incorrect installation can compromise the operational reliability and affect service measures.**

The clear diameter of the pipe joint must be at least as large as the mounting dimension of the dryer.

It is strongly recommended to install a shut-off valve both upstream and downstream of the dryer for the implementation of service measures.

Furthermore it is strongly recommended to equip the dryer with a lockable bypass line.

Overloading the dryer can compromise the operational reliability! Adhere to the permissible temperature and pressure range!

Do not exceed the permissible volume flow and the permissible working pressure!

Do not drop below the working pressure!

#### 4.4 Safety instructions for operation



The noise level resulting from the regeneration air or from decompression during the switching of the dryer depends on the plant size. Please use corresponding ear protectors for works on the plant or in the vicinity of the dryer.



Do not use the dryer as a step or ladder, as this may damage the device.



Do not place tools, documents or other accessories on the dryer.

#### 4.5 Safety instructions for maintenance, inspection and installation works



### Danger!

#### High pressure!

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

Never make structural modifications at the plant!

Use genuine parts and accessories only!

Never carry out welding on the pressure vessel or modify it in any way!



### Danger!

#### Supply voltage!

**Contact with non-insulated parts carrying supply voltage involves the risk of an electric shock resulting in injury and death.**

## Safety instructions

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Maintenance, inspection and installation works must be carried out by authorised and skilled personnel only. Prior to undertaking any measures on the high pressure dryer, the skilled personnel shall read up on the device by carefully studying the operating instructions. The operator is responsible for the adherence to these provisions.



**All types of service measures must only be carried out when the dryer is switched off, pressureless and de-energised.**

The applied desiccants are not subject to any compulsory labelling in accordance with the Ordinance on Hazardous Substances. However, the usual precautions regarding the handling of chemicals must be taken.

In the event of fire, there are no restrictions regarding the applicable fire-extinguishing agents. The reaction with water and foam must be considered as heavy.

Spilled desiccant should be removed, avoiding dust to the largest possible extent.

**5 EC – Declaration of Conformity**

### 6 Technical specifications

These operating instructions apply exclusively to the DRYPOINT® AC HP 100 high-pressure adsorption dryer of BEKO TECHNOLOGIES GMBH with a maximum operating pressure of 100 bar(g).

This high-pressure dryer serves to dry air in high-pressure compressed-air systems.

**This is achieved by reducing the water content/water vapour content in the compressed air. At operating pressure, the processed compressed air has a pressure dew point in accordance with the indications under "Operating conditions".**

The dryer is equipped with a pre-filter (option: two pre-filters) and an afterfilter, and processes the input compressed air to achieve clean, dry and technically oil-free compressed air.

The control of the high-pressure dryer allows electronic coupling of the high-pressure adsorption dryer with your compressed-air compressor. The dryer only functions when the compressor supplies compressed air (compressor synchronisation control). Thereby, the purge air rate, which is found due to the characteristics of the system during continuous operation, is omitted at zero load of the compressor.

The downstream pressure retention valve (option) ensures fast pressure build-up during the start-up of the dryer. This prevents overstressing as a result of operation below the min. permissible operating pressure.

### 7 Operating principle

The DRYPOINT® AC HP 100 high-pressure adsorption dryer of BEKO TECHNOLOGIES GMBH is a cold-regenerated adsorption dryer. It functions according to the alternating pressure principle. Here, two containers filled with a strongly hygroscopic desiccant are arranged in parallel. While the compressed air is dried in one of the containers, the desiccant is regenerated in the other. In a defined rhythm, a time-dependent control switches over from one container to the other.

The adsorption dryer will only be able to function perfectly when the data specified on the type plate (operating pressure, compressed-air inlet temperature, volume flow) are adhered to. A lower volume flow and compressed-air inlet temperature have a positive effect on the pressure dew point. An increased volume flow, a lower operating pressure and a higher compressed-air inlet temperature than specified deteriorate the pressure dew point.

#### 7.1 Loading

**The compressed air to be dried enters the dryer system through the pre-filter. Free condensate is separated at the filters and needs to be drained cyclically at the manual drains. Please contact us in the event of large amounts of condensate at the inlet into the dryer or if the compressed air is strongly contaminated. We will be happy to recommend and offer you suitable measures for the protection of the dryer. Please take into account that the cooling-down of the compressed air between the compressor and the inlet of the dryer can also lead to the formation of larger condensate amounts.**

When entering the desiccant container, the compressed air flows through a special demister package. This package serves as an additional safety stage. Should free condensate have been introduced into the container despite preceding separation, it will coalesce in the demister and accumulate below the desiccant where it is discharged along with the regeneration air. In this manner, saturation of the desiccant is prevented and the reliability of the dryer enhanced.

Subsequently, the compressed air flows from bottom to top through the desiccant bed filled with adsorbent. During this process, the desiccant adsorbs the moisture of the compressed air.

The compressed air dried in this manner then flows through the upper valve block and a dust filter. This filter retains dust and wear debris which accumulate due to the characteristics of the system.

A small amount of compressed air is separated for regeneration before the compressed air enters the system via the pressure retention valve to be used there.

### 7.2 Regeneration

While the compressed air is dried in one of the desiccant beds, as described above, the adsorbent is regenerated in the other desiccant bed.

The partial flow separated for regeneration is expanded to atmospheric pressure in two stages through the pressure reducer and the regeneration air nozzle. The relative humidity decreases when enlarging the volume of the regeneration air, as the existing residual humidity spreads across a far larger volume.

The regeneration air flows through the check valve block and downwards through the desiccant to be regenerated. As it is now dryer than the adsorbent, it takes up the humidity accumulated during loading. The regeneration air charged with the humidity flows through the pressure relief valve and is discharged into the environment via the silencers.

### 7.3 Switching-over between the adsorption chambers

Switching-over between the two containers takes place automatically.

The cycle period is fixed and was determined according to a loading period of the desiccant optimised with regard to cost-effectiveness and operational reliability.

First, the outlet valve closes. Then, the pressure build-up valve opens. In the container which, before, was regenerated under atmospheric conditions, system pressure builds up. The other container continues drying compressed air by loading the adsorbent.

When the pressure is identical in both containers, the main valve switches the compressed-air flow to the container that was just regenerated. The compressed air is now dried in this container.

By opening the pressure relief valve, the other container is decompressed via the silencer. The regeneration air flows top-down through the container and regenerates the adsorbent.

### 7.4 Load-dependent control (option)

Cold-regenerated adsorption dryers are designed in such a manner that they also work reliably during summer and during the warmest time of the day, even at highest compressed-air temperatures and at maximum volume flow.

At a lower degree of utilisation, e.g. at lower inlet temperatures or at partial load, dryers with a time-dependent standard control consume the same energy in the form of regeneration air as is the case at maximum load.

This renders operation uneconomic under certain conditions. The "dew point-dependent control" option reduces the consumption of regeneration air by up to 80% or more, depending on the load situation.

Savings are implemented through full utilisation of the possible loading, and thus of the regeneration air. Subsequent to normal loading time, the pressure dew point at the dryer outlet is monitored using a sensor. The outlet pressure dew point gives information on the loading degree of the desiccant. As long as the pressure dew point is better than a set limit value, loading of the desiccant is continued. Only when the limit value is exceeded does switching to the second desiccant bed take place. To ensure trouble-free operation, the maximum loading time per container is limited to 30 minutes.

## Technical data

### 8 Technical data

|  |  |
|--|--|
| Name   | <b>DRYPOINT® AC XXX HP XXX</b>   |
| Manufacturer                                     | BEKO TECHNOLOGIES GMBH Germany,<br>41468 Neuss, Im Taubental 7   |
| Type   | Cold-regenerated high-pressure adsorption dryer  |
| Medium   | Compressed air<br>saturated to up to 100%<br>free from water or condensate<br>free from aggressive or corrosive constituents |
| Connection                                       | XX mm Hy-Lok   |
| Max. permissible operating overpressure          | 100 bar (g)  |
| Working pressure compressed air                  | XXX bar (g)  |
| Max. volume flow at the inlet (ISO 1217)         | XXX m³/h   |
| Min./max. permissible operating temperature      | +5 °C / 55 °C  |
| Working temperature compressed air               | +XX °C   |
| Min./max. ambient temperature                    | +5°C / +50°C   |
| Pressure difference                              | 1 bar  |
| Regeneration air demand                          | X m³/h   |
| Regeneration pressure                            | 9...12 bar to 0 bar  |
| Pressure dew point dryer outlet (DIN ISO 7183)   | -40°C at XXX bar (g)   |
| Supply voltage                                   | 230 VAC 50 Hz  |
| Adsorbent per container                          | X kg molecular sieve<br>X kg water-resistant pearls  |
| Full cycle                                       | 20 minutes   |
| Inlet filter                                     | CLEARPOINT fine filter (1 µm) (option)<br>CLEARPOINT super-fine filter (0.01 µm)   |
| Outlet filter                                    | CLEARPOINT fine filter (1 µm)  |
| Weight incl. filters                             | XXX kg   |
| Dimensions with filters, length x width x height | XXX mm x XXX mm x XXX mm   |

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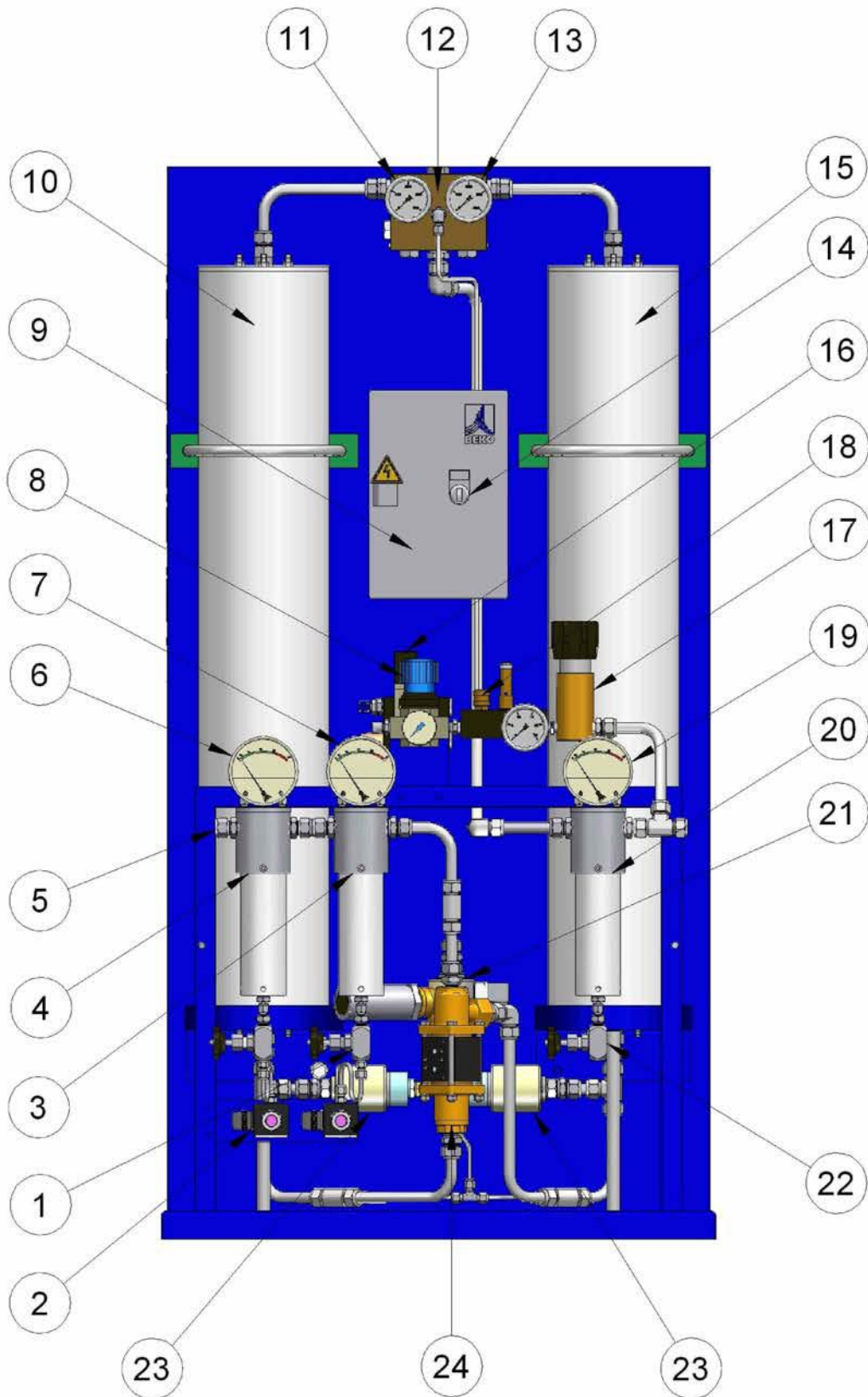
### 8.1 Design data for pressure vessels

|                            |   |
|----------------------------|---|
| Design pressure            | 100 bar(g)                                  |
| Design temperature         | -10 / +60 °C                                |
| Test pressure (hydraulic)  | XXX bar(g)                                  |
| Alternating pressure range | 100 bar(g) – 0 bar(g)                       |
| Pressure vessel volume     | X litres                                    |
| Category according to PED  | XXX   |
| Load alteration            | XXX.XXX                                     |
|                            |   |
| Design and construction    | In accordance with PED 97/23/EC and AD-2000 |
| Labelling                  | XXXXXX                                      |

### 9 Description of the unit

- 1 Manual drain condensate at the super-fine filter
- 2 Automatic condensate drain at the fine filter (optional)
- 3 Super-fine filter
- 4 Fine filter (optional)
- 5 Compressed air inlet
- 6 Differential manometer fine filter (for optional fine filter)
- 7 Differential manometer super-fine filter (optional)
- 8 Pressure reducer 2<sup>nd</sup> stage 9 bar
- 9 Electric control
- 10 Left adsorbent container
- 11 Manometer left container
- 12 Check valve block
- 13 Manometer right container
- 14 Electric main switch
- 15 Right adsorbent container
- 16 Pilot valves
- 17 Pressure reducer 1<sup>st</sup> stage 10 bar
- 18 Connection for pressure dew point measuring device
- 19 Differential manometer fine filter (option)
- 20 Fine filter
- 21 Pressure build-up valve
- 22 Manual drain condensate at the fine filter
- 23 Pressure relief valve
- 24 Main valve





### 10 Installation

#### 10.1 Transport and set-up



**Caution!**  
**Danger through improper transport**

The dryer must only be transported and set up by qualified and authorised skilled personnel.

Only use suitable and technically sound lifting tools.

Only use lifting tools with a sufficient carrying capacity.

The respective national regulations and directives in force must be adhered to. Otherwise, personal injuries may occur.

The dryer is generally supplied in a firmly-closed wooden case.

Despite all due care and attention, transport damage cannot be excluded. Therefore, check the dryer for possible damage subsequent to transport and removal of the packaging material. The forwarding agent and BEKO TECHNOLOGIES or the BEKO TECHNOLOGIES agency must be informed immediately about any kind of damage.



**Caution!**  
**Danger through damaged components!**  
**Defective components can impair the operational reliability and cause further damage.**

Under no circumstances should you start up a damaged dryer.

Provide suitable lifting tools for the transport and installation.

Secure the dryer against shifting on the load platform or fork-lift truck.

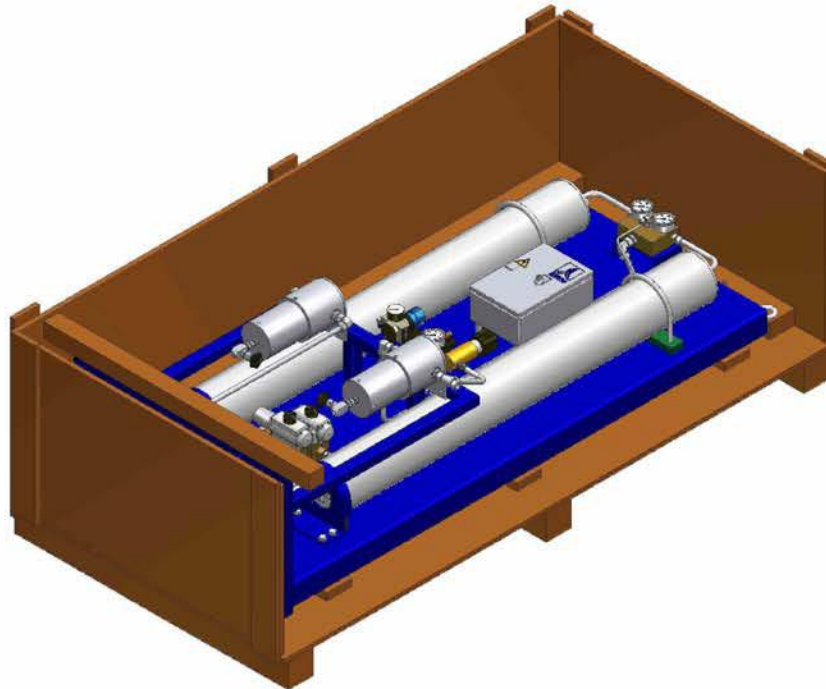
Move the dryer to the place of installation.

The function and service life of the dryer depends on the conditions at the place of installation. This place must meet the following requirements:

1. The device is installed weather-proof within a building.
2. The ambient temperature must not drop below/exceed the indications on the type plate.
3. Choose an even, solid and vibration-free set-up area. The weight of the dryer must be taken into account when choosing the area.

In the event of doubt, we recommend obtaining expert advice regarding the place of installation.

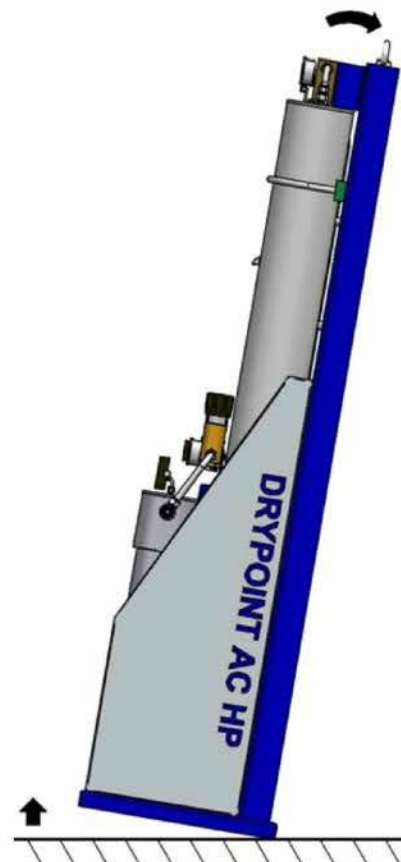
Remove the packaging (open the wooden case) of the dryer.



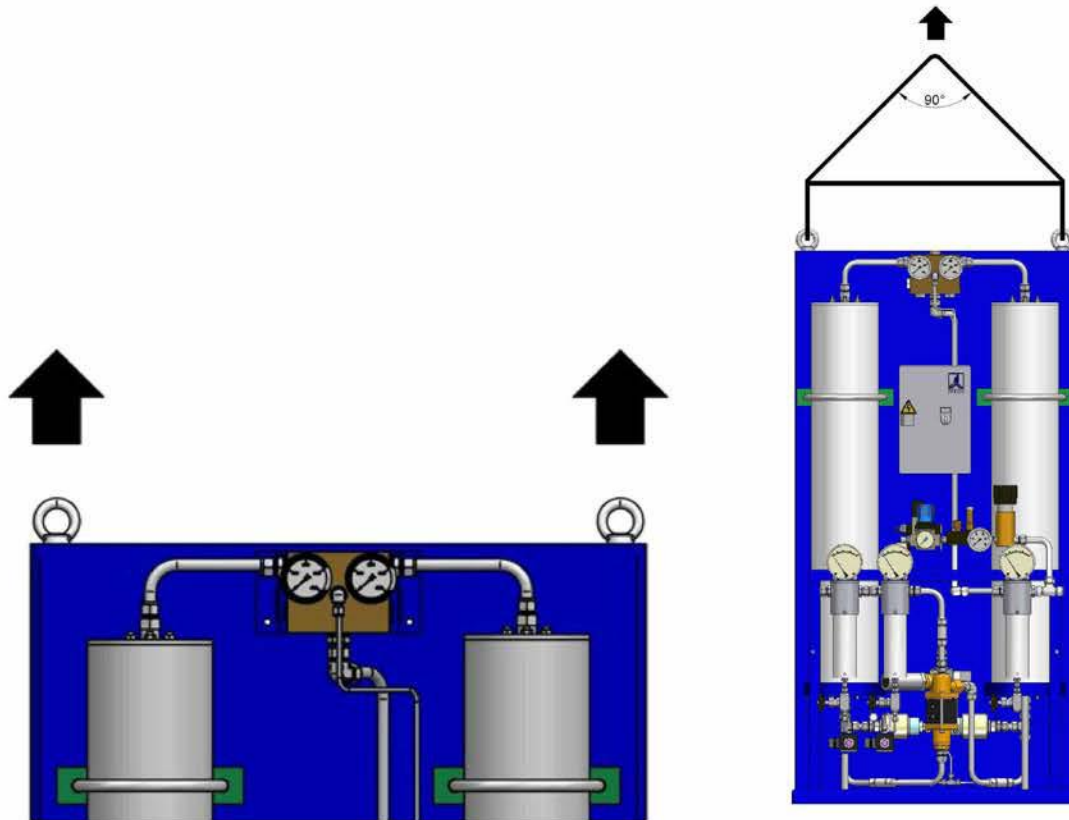
**Caution!**  
**Danger through tilting of the dryer**

Please consider during the transport and set-up that the dryer may tilt over when handled incorrectly.

Fix the dryer properly to the ground using mounting anchors.



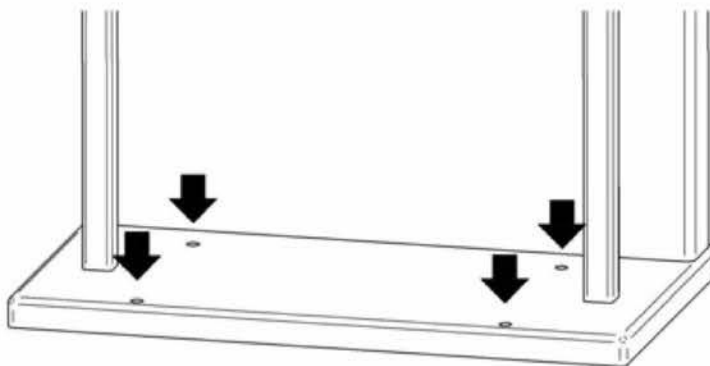
Use the transport eyebolts at the base frame of the dryer to fasten a suitable lifting tool.



Set the dryer in an upright position and move it to the place of installation.

The base plate of the dryer is provided with four drill holes for the reception of suitable mounting anchors (see illustration).

In the event of vibrating surfaces, the dryer must be mounted on suitable vibration-damping elements.



## 10.2 Installation



### **Danger!**

#### **High pressure!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

De-pressurise the plant prior to any installation, maintenance or repair works!

It is the obligation of the operator to ensure that the connected air compressor is protected against exceeding of the maximum operating overpressure at the high pressure dryer.

Pressure relief valves used must be arranged in such a manner that danger to persons is excluded. Observe possible additional advice of the manufacturer.

The max. permissible operating overpressure is specified on the type plate and in the technical data (see "Technical data" section).

Make sure that the system is pressureless prior to integrating the dryer into the compressed-air system! All types of installation works must only be carried out when the dryer is switched off, pressureless and de-energised.

Only use fittings and connecting elements that are approved for this high-pressure application. It is of vital importance to observe the specifications of the respective manufacturer.



### **Caution!**

#### **Operational reliability at risk**

**Incorrect installation can compromise the operational reliability and affect service measures.**

The clear diameter of the pipe joint must be at least as large as the mounting dimension of the dryer.

For the implementation of service measures a high-pressure shut-off valve should be installed both upstream of the dryer inlet and downstream of the dryer outlet.

If necessary, a bypass line must be installed.



### **Danger!**

#### **Supply voltage!**

**Contact with non-insulated parts carrying supply voltage involves the risk of an electric shock resulting in injury and death.**

It is imperative to adhere to the voltage indicated on the type plate!

The installation works must only be carried out by correspondingly qualified personnel and in accordance with the regulations in force!

Remove the packaging material.

Set up the high-pressure dryer in such a way that the front panel with the control elements is easily accessible.

## Installation

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Make sure the device is set up on suitable ground (sufficiently stable and even).  
If necessary, install each corner of the dryer on a vibration damper (optionally available).

It is strongly recommended to install a shut-off valve both upstream and downstream of the dryer.  
Furthermore, it is strongly recommended to equip the dryer with a lockable bypass line.  
A check valve should be installed between the compressor and the dryer.

Implement the electrical terminal assignment of the mains connection according to the circuit diagram.

### 10.3 Connection of the compressor synchronisation control



**Caution!**

**Operational reliability at risk**

**Incorrect installation can compromise the operational reliability and affect service measures.**

The **DRYPOINT® AC HP** functions with a separate, continuous voltage supply.

To use the compressor synchronisation control, the potential-free contact of your high-pressure compressor is connected with the control of the **DRYPOINT® AC HP**.

Remove jumper "X2" between contacts 1 and 2 in the control of the **DRYPOINT® AC HP**.

Connect the potential-free contact (zero-potential) of your compressor to contacts 1 and 2.

You will find detailed information regarding the connection of the potential-free contact of your compressor in the operating instructions of the compressor.

**10.4 Available options**

|   |  |
|---|--|
| <b>Second pre-filter</b>                    | The installation of a second pre-filter is recommended in the event that the compressed air at the inlet into the dryer is strongly contaminated and if it cannot be excluded that liquid water exists at the inlet into the dryer.  |
| <b>Differential manometer</b>               | Monitoring of the filters by means of the differential manometers allows monitoring of the filter elements and thus replacement of the filter elements at economically appropriate times.  |
| <b>Pressure retention valve</b>             | The installation of a pressure retention valve prevents overloading of the dryer during the start-up from the pressureless state.  |
| <b>Pressure dew point-dependent control</b> | <p>At a lower degree of utilisation, e.g. at lower inlet temperatures or at partial load, dryers with a time-dependent standard control consume the same energy in the form of regeneration air as is the case at maximum load. This renders operation uneconomic under certain conditions. The "dew point-dependent control" option reduces the consumption of regeneration air by up to 80% or more, depending on the load situation.</p> <p>Savings are implemented through full utilisation of the possible loading, and thus of the regeneration air. Subsequent to normal loading time, the pressure dew point at the dryer outlet is monitored using a sensor. The outlet pressure dew point gives information on the loading degree of the desiccant. As long as the pressure dew point is better than a set limit value, loading of the desiccant is continued. Only when the limit value is exceeded does switching to the second desiccant bed take place. To ensure trouble-free operation, the maximum loading time per container is limited to 30 minutes.</p> |
| <b>Heating pressure governor</b>            | At compressed-air inlet temperatures below +30°C, we recommend the heating of the pressure governor stage 1. Through the expansion at the pressure governor, the regeneration air is strongly cooled down. At lower compressed-air temperatures, icing may then occur at the pressure governor. To avoid this, a heating system is installed at the pressure governor and the regeneration air line is insulated correspondingly.  |

### 11 Operation

#### 11.1 Initial start-up



**Danger!**

**High pressure!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

Sudden impact through pressure build-up can cause damage and escape of compressed air!

Check all pipe and cable connections before starting-up the device for the first time and retighten them, where necessary.

Do not exceed the maximum permissible operating overpressure (see type plate).

Avoid a sudden pressure build-up by operating the valves slowly.



**Caution!**

**Operational reliability at risk!**

**Overloading the dryer can compromise the operational reliability!**

Adhere to the permissible temperature range!

Do not exceed the permissible volume flow!



Prior to the initial start-up, it must be ensured that the line network is free from impurities. Malfunctions which are a result of improper installation are excluded from the warranty granted by BEKO TECHNOLOGIES GMBH.

Check all pipe joints for tightness.

Check the setting of the pressure retention valve at the dryer outlet. The pressure retention valve should be set to slightly below the minimum operating pressure.

Switch on the dryer via the electric main switch.

The pressure reducers are pre-adjusted to 9 ... 12 bar (see "Description of the unit" section). Verify this setting.

To remove the residual humidity from the strongly hygroscopic adsorbent, the dryer should operate for approximately four hours when the shut-off valve (behind the dryer outlet) is closed. At pressure dew points below -40°C, this process could take a longer period of time.

**Slowly** open the shut-off valve behind the outlet of the dryer and pressurise the entire compressed-air system.

The DRYPOINT® AC HP 100 high-pressure adsorption dryer is now ready to operate. Operation is fully automatic.



## 11.2 Operation during compressor synchronisation



**Caution!**

**Operational reliability at risk!**

**Incorrect installation can compromise the operational reliability and affect service measures.**

The DRYPOINT® AC HP functions with continuous voltage supply which is separate and independent of the potential-free contact of the compressor.

When the compressor supplies air, the potential-free contact at the compressor closes and the dryer operates.

Subsequent to having reached the adjusted system pressure, the compressor switches off and the potential-free contact of the compressor opens.

This interrupts the cycle of the dryer. The dryer is in the stand-by mode. However, the switch of the dryer is still switched to "ON". The control lamp is on.

When the compressor supplies again, the dryer will continue the cycle where it was stopped.

### 11.3 Short-term removal from service



A short-term removal from service should always be implemented together with the compressor.

### 11.4 Removal from service for maintenance or repair



**Danger!**

**High pressure!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

De-pressurise the plant prior to any maintenance or repair works!



**Danger!**

**Supply voltage!**

**Contact with non-insulated parts carrying supply voltage involves the risk of an electric shock resulting in injury and death.**

De-energise all connector cables prior to repair or maintenance!

Repair and maintenance works must only be carried out by correspondingly qualified personnel and in accordance with the provisions in force!

The general safety regulations in accordance with the accident prevention regulations and the VDE shall apply!

Switch off the high-pressure dryer.

Open the bypass line (not included in the scope of delivery)

Close the high-pressure shut-off valves upstream and downstream of the dryer.

Slowly decompress the dryer via the manual drains until both container manometers no longer indicate overpressure.

## 11.5 Restart



**Danger!**

**High pressure!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

Sudden impact through pressure build-up can cause damage and escape of compressed air!

Avoid a sudden pressure build-up by operating the valves slowly.

Do not exceed the max. permissible operating overpressure.

The max. permissible operating overpressure is specified on the type plate and in the technical data (see "Technical data" section).



**Caution!**

**Operational reliability at risk!**

**Overloading the dryer can compromise the operational reliability.**

Adhere to the permissible temperature range!

Do not exceed the permissible volume flow!

When the DRYPOINT® AC HP 100 is restarted after a longer rest period, please proceed as if you were starting up the device for the first time.

Check, above all after service measures or repair, whether or not the dryer is tubed completely and electrically connected. If this is not the case, carry out installation properly.

Check whether or not the compressor is switched off. If this is not the case, switch it off.

Check whether or not the high-pressure dryer is switched off via the electric main switch. If this is not the case, switch it off.

Check whether or not the high-pressure dryer is pressureless. If this is not the case, de-pressurise the dryer with the manual drains.

Check whether or not the high-pressure shut-off valves upstream of the dryer inlet and downstream of the dryer outlet are closed. If this is not the case, close both shut-off valves.

Start the compressor.

When the compressor has reached the cut-out pressure, slowly open the shut-off valve upstream of the dryer inlet. The dryer is set under operating pressure.

Check all pipe joints for tightness.

Switch on the dryer via the electric main switch.

**Slowly** open the shut-off valve behind the outlet of the dryer and pressurise the entire compressed-air system.

Close the shut-off valve in the bypass line.

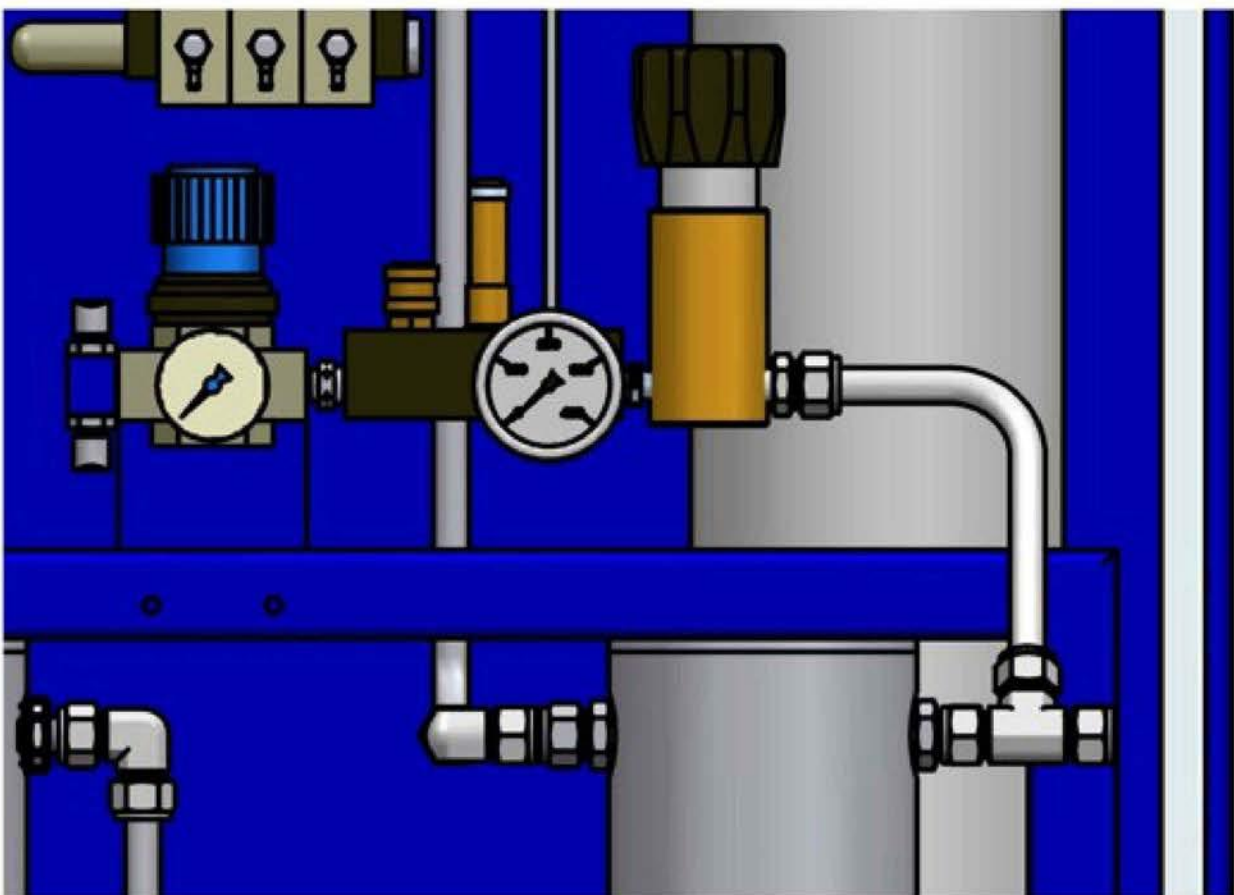
## Operation

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### 11.6 Measurement of the pressure dew point in the low-pressure range (optional)

To measure the pressure dew point in the low-pressure range (9...12 bar), a safety quick-release coupling is optionally installed.

Connect your pressure dew point measuring device to the G ¼" nozzle in the 9...12 bar range between the pressure reducers 1<sup>st</sup> and 2<sup>nd</sup> stage.



## 11.7 Maintenance



**Note!**

**Possible faults regarding the function and safety!**

**Poor maintenance can compromise the functional performance and safety.**

Undertake the service measures listed below at regular intervals!

It is imperative to observe the safety instructions for maintenance, inspection and installation works!



**Note!**

**In the event of malfunctions which are not listed here or which cannot be eliminated, please contact BEKO TECHNOLOGIES GMBH.**

**Daily:**

Discharge the condensate at the manual drains of the inlet filters at least once a day.

Carry out a visual check.

Watch for abnormalities and possible faults during running operation.

**Weekly:**

Check the function of the pressure reducers using the manometers.

Check the glands of the needle valves.

Check the back pressure of the silencers.

**Annually:**

Adsorbent

Verify the desiccant. For this purpose, proceed as described under "Replacement of the adsorbent"; do not replace it but take a sample. In the event of contamination through oil (brownish discolouration), replace the adsorbent.

The activity of the adsorbent is fully maintained over a very long period of time (> 8,000 operating hours) if the compressed air is properly processed before entering the dryer. Oil which is entrained in the compressed air has a particularly negative effect. It may clog the pores of the adsorbent and impede reactivation during the regeneration phase. At an enhanced oil concentration in the compressed air, a second pre-filter and automatic condensate drains are strongly recommended.

Safety valve

Check the function of the safety valve by adjusting the pressure of the control air to 16 bar by means of the pressure governor 1<sup>st</sup> stage and verify whether or not the safety valve relieves pressure at 16 bar.

Check valve block

Verify the wearing parts of the check valve block and replace them, if necessary.

Replace the following wearing parts:

Element of the inlet filter CLEARPOINT fine filter (for option fine filter)

Element of the inlet filter CLEARPOINT super-fine filter

Element of the outlet filter CLEARPOINT fine filter

Silencer element

## Operation

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### 11.8 Checking the back pressure of the silencer



**Danger!**

**Compressed air!**

**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

De-pressurise the plant prior to any maintenance or repair works!

Lowering of the partial pressure between adsorption and regeneration influences the achievable pressure dew point. In the event that the desired pressure dew point is no longer reached, contaminated silencers could be the reason. Therefore, it is important to make sure that the silencers for the regeneration air do not build up back pressure as a result of contamination. Regular checks are required.

A manometer is installed for each container at the check valve block.

The manometer at the container which is actively drying air indicates the system pressure.

At the manometer at the container in which the adsorbent is regenerated, the back pressure of the silencer can be read.

The permissible back pressure is 0.5 bar.

If the permissible back pressure is reached or exceeded, replace the silencer element.

To do so, remove the dryer from service in accordance with the instructions.



Example:

Regeneration takes place in the left container, the back pressure of the silencer can be read.

The air is dried in the right container, the system pressure is indicated.

### 11.9 Replacement of the adsorbent



**Caution!**  
**Desiccant produces dust and wear debris!**  
**Danger through released particles of different sizes.**



Use eye protection!



Use protective gloves!



Wear light breathing protection at strong dust formation!



**Danger!**  
**High pressure!**  
**Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components.**

De-pressurise the plant prior to any maintenance or repair works!  
 Comply with the instructions in the "Removal from service for maintenance or repair" section.  
 Prior to the restart, a leak test must be carried out. Implementation only by correspondingly qualified skilled personnel, considering the safety regulations.  
 The advice regarding the start-up needs to be taken into account (see the Chapter entitled "Operation").

The applied desiccants are not subject to any compulsory labelling in accordance with the Ordinance on Hazardous Substances. However, the usual precautions regarding the handling of chemicals shall be taken.

In the event of fire, there are no restrictions regarding the applicable fire-extinguishing agents. The reaction with water and foam must be considered as heavy.

Spilled desiccant should be removed, avoiding dust to the largest possible extent.

**As a matter of principle, replace the adsorbent in both containers simultaneously.**

#### 11.10 Waste code

Molecular sieve  
 Waste code 06 13 99  
 (Directive 94/3/EC)

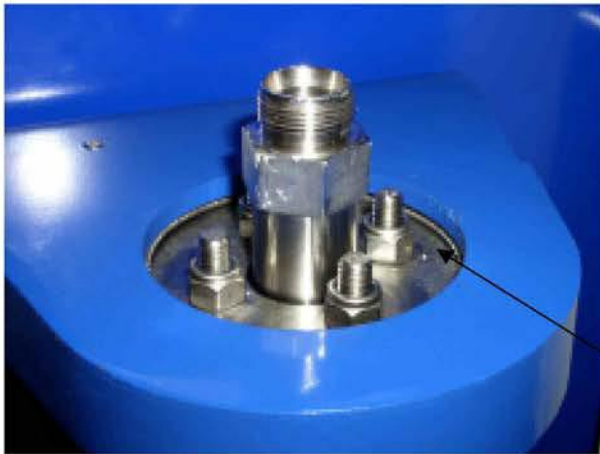
Water-resistant pearls  
 Waste code 06 08 99  
 (Directive 94/3/EC)

## Operation

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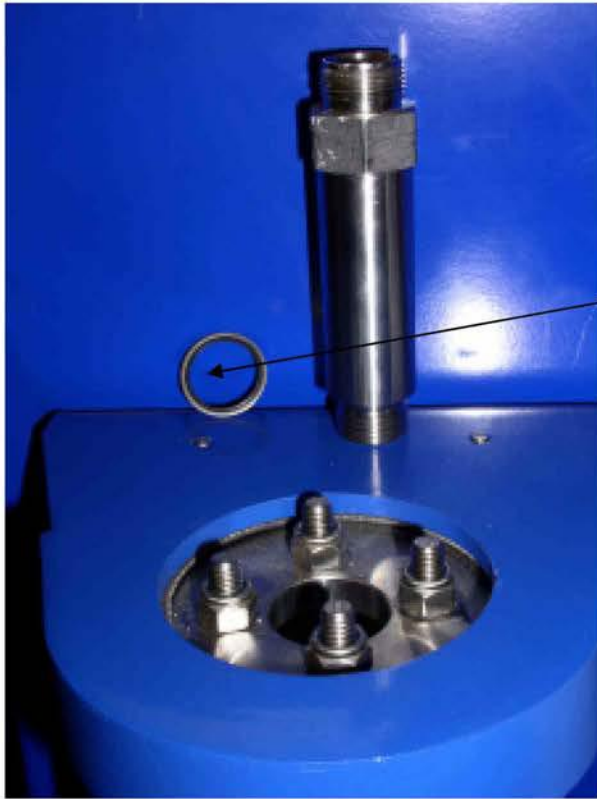
Dismantle the pipe above the adsorption containers.



Dismantle the nozzle







Remove the gasket.



Introduce the sieve key  
(special tool, not included in  
the scope of delivery) into  
the aperture.

## Operation



Dismantle the sieve insert.



Introduce the suction hose of an industrial suction device into the adsorption container and empty it completely.



Fill the adsorption container with adsorbent.  
Type and amount is according to the data sheet.

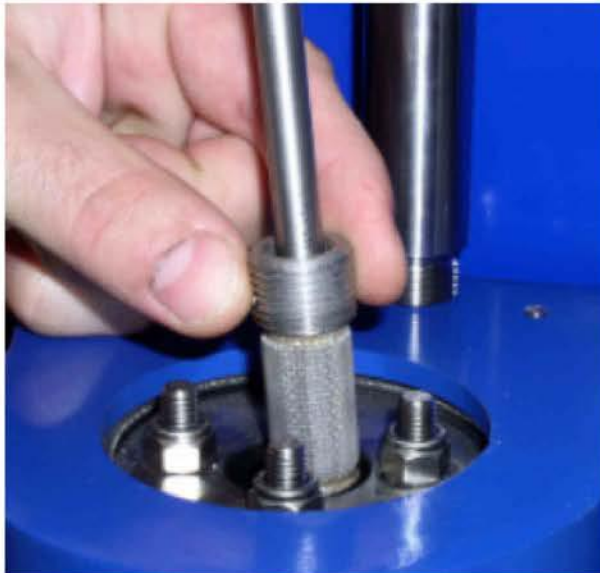
Use a commercially available funnel for filling.



**Note!**

**Adhere to the sequence regarding the filling:**

- 1. Water-resistant pearls (lower zone)**
- 2. Molecular sieve (upper zone)**



Screw in the sieve insert again using the sieve key.

## Operation

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Screw in the sieve insert to such an extent that the screw-in depth into the internal thread is approximately 13 mm.



Place the gasket.



Mount the nozzle.



Tighten the sieve insert against the nozzle using the sieve key.



Install the pipe above the adsorption containers.

### 12 Troubleshooting



**Caution!**

In the event of malfunctions which are not listed here or which cannot be eliminated, please contact BEKO TECHNOLOGIES GMBH.

#### 12.1 Pressure dew point is not reached

|  |   |
|--|---|
| Inlet volume flow too high                                     | Reduce inlet volume flow  |
| Operating pressure too low                                     | Increase operating pressure   |
| Not enough regeneration air                                    | Check function of the V4 outlet valve<br>Check setting of the X1 pressure reducer |
| Inlet filter elements exhausted / pressure difference too high | Replace inlet filter elements   |
| Condensate accumulation at the inlet filters too high          | Drain condensate more frequently  |
| Desiccant exhausted  | Replace desiccant   |
| Back pressure silencers too high                               | Replace silencers   |

#### 12.2 No switching between the containers

|  |   |
|--|---|
| No pressure build-up / pressure reduction        | Check the electric function of the Y4 coil; replace coil or the entire solenoid valve, if necessary.      |
|  | Check the function of the pneumatic Y4 drive, replace drive, if necessary.                                |
|  | Check the function of the V4 blow-off valve, replace it, if necessary.                                    |
| Valve V1/V2 in the control block does not switch | Check the electric function of coils Y1 and Y2; replace coils or the entire solenoid valve, if necessary. |
|  | Check the function of the pneumatic drive Y1/Y2, replace drive, if necessary.                             |

**12.3 Regeneration pressure too high**

|                            |   |
|----------------------------|---|
| Silencer clogged           | Clean silencer element, replace if necessary. |
| Pressure reducer defective | Check pressure reducer, replace if necessary. |

### 13 Technical documentations

P&I diagram

Schematic circuit diagram 24Vdc

Schematic circuit diagram 230Vac



**14 Notes**



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Original operating instructions in German.  
Subject to technical changes / errors excepted.  
DRYPOINT AC HP\_100\_manual\_de\_2010\_07.doc