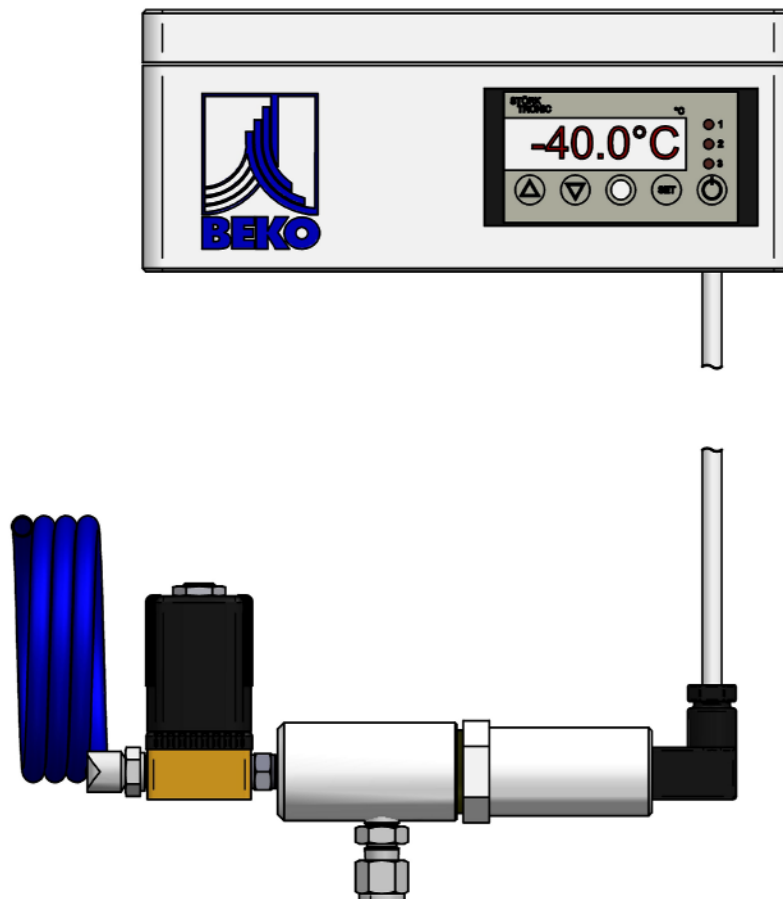


## Instructions for installation and operation

### Load-dependent control

### **DRYPOINT® AC HP**



Dear Customer,

Thank you for deciding in favour of the load-dependent control for DRYPOINT® AC HP. Before installing the load-dependent control and putting it into service, please read these instructions for installation and operation and observe the information and rules set out here. The perfect functioning of the load-dependent control can only be guaranteed if the applicable rules and regulations are complied with correctly.



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### 1 General information



Before reading these operating instructions, just check that you have got hold of the right instructions for the device.

Read the instructions for installation and operation carefully before making any changes related to the control. The operating instructions must always be readily accessible at the place of operation of the device.



To ensure safe operation, the device may only be operated and maintained in accordance with the requirements set out in the operating instructions. In addition, the use of the device must comply with the national and operational legal and safety regulations for the relevant application as well as with the accident prevention regulations. This applies analogously to accessories.

Non-observance of the instructions for installation and operation represents a hazard to persons and equipment.



Functional tests, adjustments, installation and maintenance work may only be performed by authorized technical personnel<sup>1</sup>.

Device calibration must, as a rule, only be carried out at BEKO's manufacturing facility.



If the load-dependent control is used for purposes other than the intended application or in the case of non-observance of these instructions, warranty and liability claims shall be excluded.

If you need further clarification or if you have any questions concerning these instructions, please get in touch with BEKO TECHNOLOGIES GMBH.



This symbol represents actions that can be carried out by the operator provided he is authorized and technically suitably qualified.

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<sup>1</sup> "Authorized technical personnel" are persons authorized by the manufacturer and possessing experience, technical qualification, knowledge of the relevant rules and legal regulations, as well as the ability to carry out the required work and recognize and prevent possible dangers during machine transport, installation, operation and maintenance.

Qualified and authorized operators are persons instructed by the manufacturer with regard to handling the pressure dewpoint control and possessing experience, technical qualification, and knowledge of the relevant rules and legal regulations.

## 2 Safety information

### 2.1 General safety rules



#### **DANGER!**

##### **Compressed gas!**

In the event of contact with quickly or abruptly released compressed gas or bursting plant components there is a danger of serious personal injury or death.



It is the operator's duty to ensure that the connected pressure generator / compressor is provided with means against exceeding the maximum operating pressure and temperature limits on the adsorption dryer.

Before incorporating the load-dependent control into the compressed gas network make sure that the network is depressurized!

Installation work of whatever type may only be carried out when the dryer is depressurized. Only use valves, fittings and connection elements approved for this particular application. It is absolutely essential to observe the specifications of the relevant manufacturer.

Depressurize the plant prior to any maintenance or repair work!

Before putting the device into operation for the first time check all the connections and tighten up where necessary.

The maximum allowable operating pressure is stated on the type plate and in the technical data (see chapter "Technical data").

Abrupt loading due to built-up pressure can cause damage and the discharge of compressed air.

Open valves slowly to avoid sudden pressure release.

Do not exceed the maximum allowable operating pressure (see type plate).

Maintenance, inspection and installation work may only be performed by authorized and qualified technical personnel. Before starting any work on the adsorption dryer, technical personnel must carefully study the operating instructions. Responsibility for observing these instructions rests with the plant operator. The qualification and know-how of technical personnel are governed by the relevant guidelines.

Never perform any constructional modifications on the plant!

Only use original replacement parts and accessories!

Applicable are the general safety regulations and the accident prevention regulations!



#### **DANGER!**

##### **Mains voltage!**

Operation and maintenance of machines and devices supplied with electricity may only be performed by suitably qualified and authorized personnel. Before carrying out any type of maintenance work, the following rules need to be observed:

Ensure that no parts of the control are still energized (live) and that the control cannot be connected to the mains network while maintenance work is being carried out.



#### **WARNING!**

##### **Unauthorized interference!**

Any modification of the control or functional parameters not previously checked and authorized by the manufacturer, creates a potential source of danger and leads to the complete loss of warranty and liability on the part of the manufacturer.



Do not use water for extinguishing a fire (neither aimed directly at the control nor in the vicinity of the control).

### 2.2 Special rules for pressurized plant & systems in compliance with Pressure Equipment Directive 97/23/EC

The correct use of the compressed air plant is a fundamental requirement for safe operation. The operator must therefore proceed as follows:

- The control may only be employed within the pressure and temperature range limits stated by the manufacturer on the type plate.
- Welding work on the housing and bottom of the devices is not permitted.
- The load-dependent control must not be installed in inadequately ventilated rooms nor close to heat sources or inflammable materials.
- To avoid fractures due to material fatigue the load-dependent control should not be exposed to vibrations during operation.
- The maximum operating pressure stated on the manufacturer's type plate must not be exceeded. It is the operator's duty to install suitable safety and control systems.
- The documentation for the load-dependent control (manual, operating instructions, manufacturer's declaration, etc.) must be safely kept for future reference.
- There must be no objects placed on or attached to the load-dependent control or connecting pipework.



#### **DANGER!**

#### **High pressure!**

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death.

Never perform any constructional modifications on the plant!

Only use original replacement parts and accessories!



#### **WARNING!**

#### **Unauthorized interference!**

Unauthorized interference can endanger persons and equipment and lead to malfunctions.

Unauthorized interference, modifications or inappropriate use of the pressure equipment is prohibited. The equipment operator must comply with the local and national regulations concerning pressure equipment valid in the country of installation.

### 2.3 Special safety rules



#### **IMPORTANT!**

Compressed air!

Exceeding the maximum pressure can damage the plant.



Observe the type plate specifications for maximum pressure!

#### **IMPORTANT!**

Danger to functional safety!



Faulty installation can be a danger to functional safety and have a negative impact on maintenance work.

Do not exceed the allowable flow rate and the allowable working pressure!

Ensure that the system does not drop below the working pressure!

#### **NOTE!**



Maintenance work!

Any maintenance work on the load-dependent control may only be carried out when the dryer is switched off, depressurized and de-energized (off circuit).

## 3 Area of application and correct use of the load-dependent control

The load-dependent control is designed to reduce the consumption of regeneration air in adsorption dryers. Any other use is regarded as incorrect.

The manufacturer shall not be liable for the consequences of incorrect use; the operator alone shall be responsible for any possible resulting dangers.

For correct application and use of the load-dependent control, in compliance with specifications, it is absolutely essential that the installation instructions be observed precisely, in particular with regard to:

- Place of installation, installation conditions
- Power supply and voltage frequency
- Pressure, temperature and humidity of the inlet air
- Ambient temperature

The device is delivered as inspected and accepted at works. The operator only needs to connect it to the supply networks and interconnect the components, as described in the following chapters.

### WARNING!

#### Use for guarding against dangerous conditions!



The load-dependent control must not be used as a sole means to guard against dangerous conditions on machines and equipment. Machines and equipment must be designed in such a way that faulty conditions cannot lead to a hazardous situation for the operating personnel.

### WARNING!

#### Incorrect use!



The load-dependent control corresponds to the state of the art and is safe to operate. However, incorrect use and operation by untrained personnel may pose a residual danger.



The load-dependent control may only be used by qualified and authorized technical personnel, and only in accordance with the technical data.

## 4 Technical data

Name	<b>PDP CONTROL DRYPOINT® AC HP</b>
Manufacturer	BEKO TECHNOLOGIES GMBH Germany, 41468 Neuss, Im Taubental 7
Type	PDP-ST710
Medium	Compressed air
Connection	6 mm Hy-Lok
Max. allowable operating pressure	16 bar (g)
Compressed air working pressure	9 bar (g)
Max. flow rate at inlet (ISO 1217)	10 ltrs/min
Min./max. allowable operating temperature	+5 °C / 55 °C
Min./max. ambient temperature	+5°C / +50°C
Mains voltage	230 VAC 50 Hz

### 5 Transport and installation site

#### IMPORTANT!

Danger due to incorrect transport!



The load-dependent control may only be transported and installed by qualified and authorized technical personnel.

The applicable national regulations and guidelines must be adhered to. Otherwise there is a risk of personal injury.

#### WICHTIG!

Danger due to damaged components!



A damaged load-dependent control must on no account be put into operation. Damaged components can impair the functional safety and cause further damage.

The function and lifetime of the load-dependent control is influenced by the conditions at the place of installation. The place of installation must meet the following requirements:

1. Weather-protected installation inside a building.
2. The ambient temperature must not lie below or above the temperature data stated on the type plate.

### 6 Function of the load-dependent control

Cold-regenerated adsorption dryers are designed to function just as reliably in summer and during the hottest time of the day, even with maximum compressed air temperatures and maximum flow rates.

However, under low-load conditions, e.g. with lower inlet temperatures or in partial-load operation, dryers with a timed standard control system consume the same amount of energy (in the form of regeneration air) as during maximum loading.

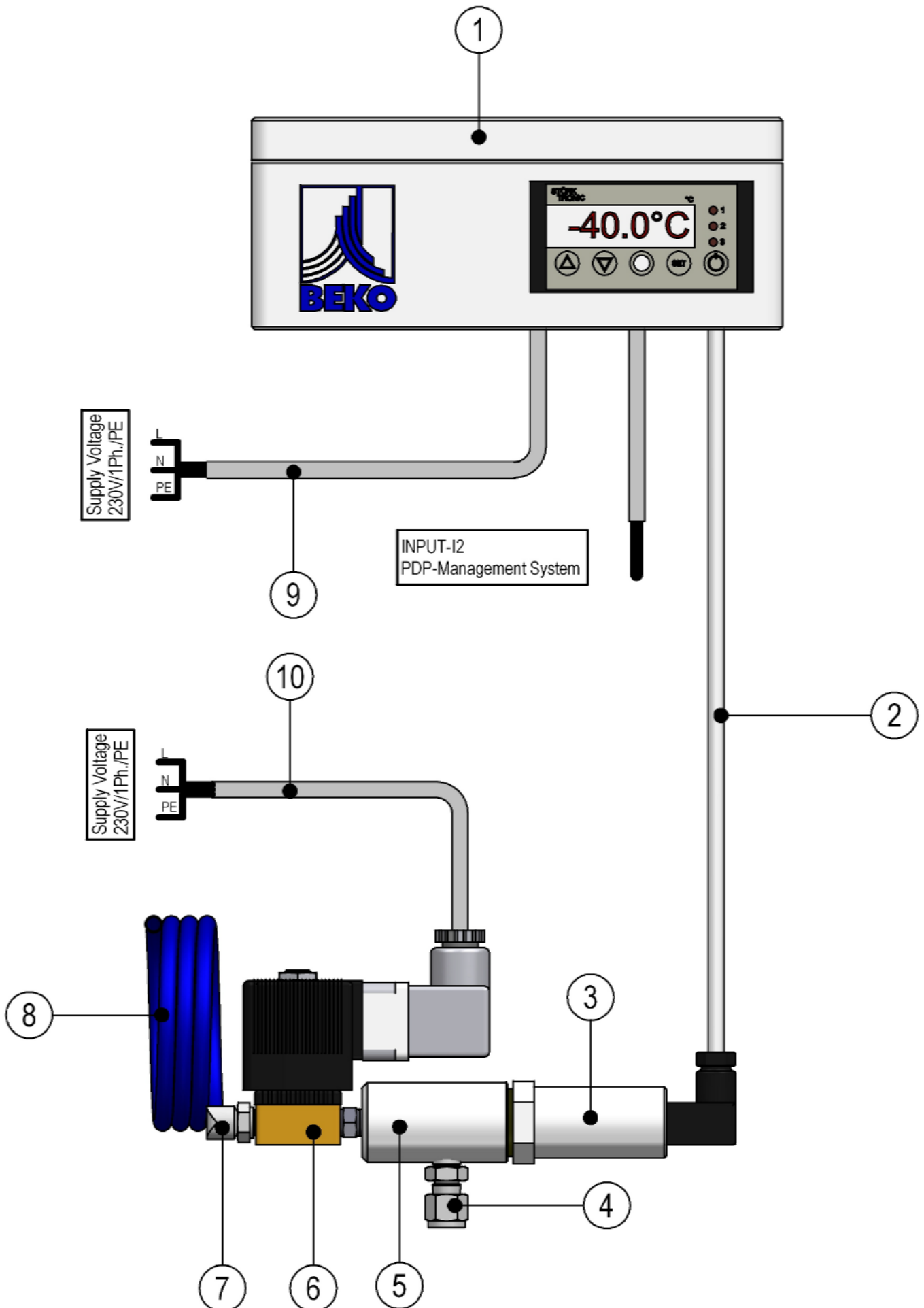
This makes the operation extremely uneconomic. The "load-dependent control" option reduces the consumption of regeneration air by 80 % or more, depending on the given load situation.

This saving is realized by fully utilizing the available loading capacity and thus reducing the regeneration air requirement. At the end of the normal loading period, a sensor monitors the pressure dewpoint at the dryer outlet. The outlet pressure dewpoint is an indication of the degree of loading of the desiccant. As long as the pressure dewpoint is better than the set limit value, the loading of the desiccant continues. When the pressure dewpoint drops below the limit value, the system will switch over to the second desiccant bed. To ensure troublefree operation, the maximum loading period per tower is restricted to 30 minutes.

### 7 Description of components

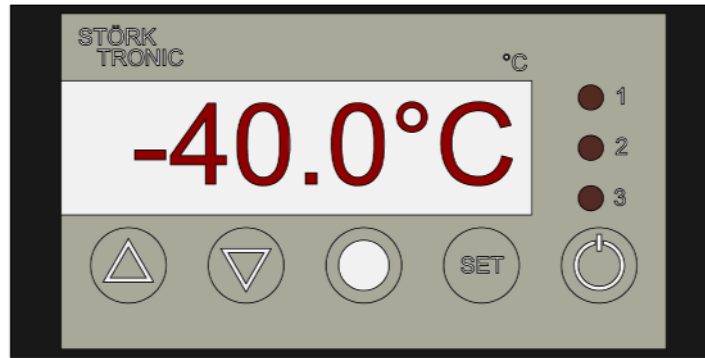
- 1 Control unit with display
- 2 Connecting cable to PDP sensor
- 3 PDP sensor
- 4 Connection for measuring air inlet (threaded lock nut)
- 5 Measuring chamber
- 6 Solenoid valve for shutting off purge air
- 7 Hose connector
- 8 Spiral hose for purge air outlet
- 9 Power supply cable for load-dependent control
- 10 Power supply cable for solenoid valve

## 8 Description of setup



## Description of setup

### 8.1 Setting options



#### **BUTTON UP**

Press this button to increase the parameter or parameter value or scroll through the parameter list.



#### **BUTTON DOWN**

Press this button to reduce the parameter or parameter value or scroll through the parameter list. In the event of an alarm, the button can be pressed to switch off the buzzer function.



#### **FUNCTION BUTTON 2 – Standard setting for setpoint changeover**

ON and OFF of control, setpoint changeover and/or coupling with an output relay. After power supply disruption, the mode will remain stored.



#### **SET BUTTON**

Keep this button pressed to display the setpoint.  
The button is also used for parameter setting.



#### **FUNCTION BUTTON 1 – Standard setting for standby**

ON and OFF of control, setpoint changeover and/or coupling with an output relay. After power supply disruption, the mode will remain stored.

### 8.2 Fixed settings (SET)

The alarm values for relay K4 (see electrical schematic) are preset, fixed settings when the unit is delivered. They can only be changed by your BEKO service.

Examples of some fixed settings (SET):

Desired pressure dewpoint	Upper alarm setting
-20°C	-10°C
-40°C	-30°C
-70°C	-60°C

## 9 Installation



To ensure safe operation, the device may only be operated in accordance with the requirements set out in the operating instructions. In addition, the use of the device must comply with the legal and safety regulations for the relevant application. This applies analogously to accessories.



### **DANGER!**

#### **High pressure!**

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death.



Depressurize the plant prior to any installation, maintenance or repair work!

It is the operator's duty to ensure that the connected pressure generator / compressor is provided with means against exceeding the maximum operating pressure on the high-pressure dryer.

The location of the pressure relief valves employed must be such that hazard to persons is excluded. Observe any additional information by the manufacturer.

The maximum allowable operating pressure is stated on the type plate and in the technical data (see chapter "Technical data").

Before incorporating the load-dependent control into the compressed air network make sure that the network is depressurized! Installation work of whatever type may only be carried out when the dryer is switched off, depressurized and de-energized (off circuit).

Only use valves, fittings and connection elements approved for this particular high-pressure application. It is absolutely essential to observe the specifications of the relevant manufacturer.



### **DANGER!**

#### **Overpressure!**

Observe the type plate data with respect to maximum pressure!



Before installing the device ensure that the compressed air pipe is pressureless!



### **IMPORTANT!**

Danger to functional safety!

Faulty installation can be a danger to functional safety and have a negative impact on maintenance work.

Do not exceed the allowable flow rate and the allowable working pressure!

Ensure that the system does not drop below the working pressure!



### **WARNING!**

Non-permissible state of the device!

The device must not remain unpressurized for more than one hour.

Otherwise the measuring system absolutely needs to be disconnected from the mains supply!

### 9.1 Electrical installation / Connection to the mains network



### **DANGER!**

#### **Mains voltage!**

In the event of contact with live, uninsulated parts there is a danger of an electric shock resulting in injury or death.

The connection to the mains network and the corresponding protective devices must comply with the legal regulations valid at the place of installation of the load-dependent control; connection and installation must be performed by a suitably qualified person.

The device has a varying-voltage input and is suitable for the following operating voltages:

115 – 230V AC, 50/60Hz

Before making the connection, check carefully that the voltage and frequency of the mains network correspond to the values stated on the type plate of the load-dependent control.

## Installation



### DANGER!

#### Mains voltage and missing earthing (grounding)!

Without an earthing system (PE), there is a danger that, in the event of a malfunction, accessible components could carry mains voltage. Touching of any such parts will result in an electric shock and possible injury or death.

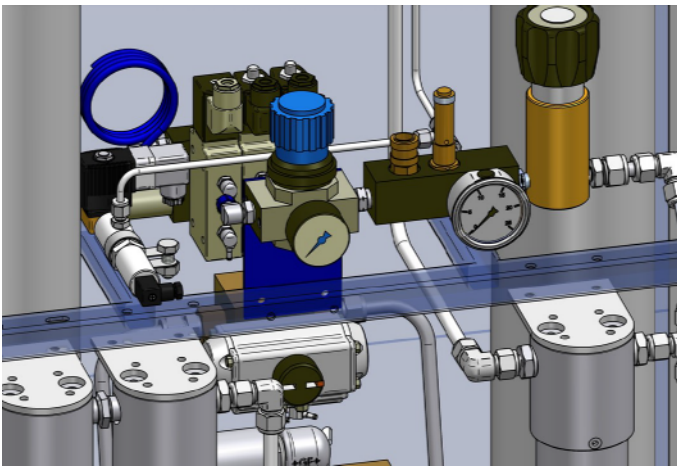
It is essential to ensure that the plant is earthed and that the protective earth conductor is correctly connected.

Do not use an adapter plug for the mains plug.

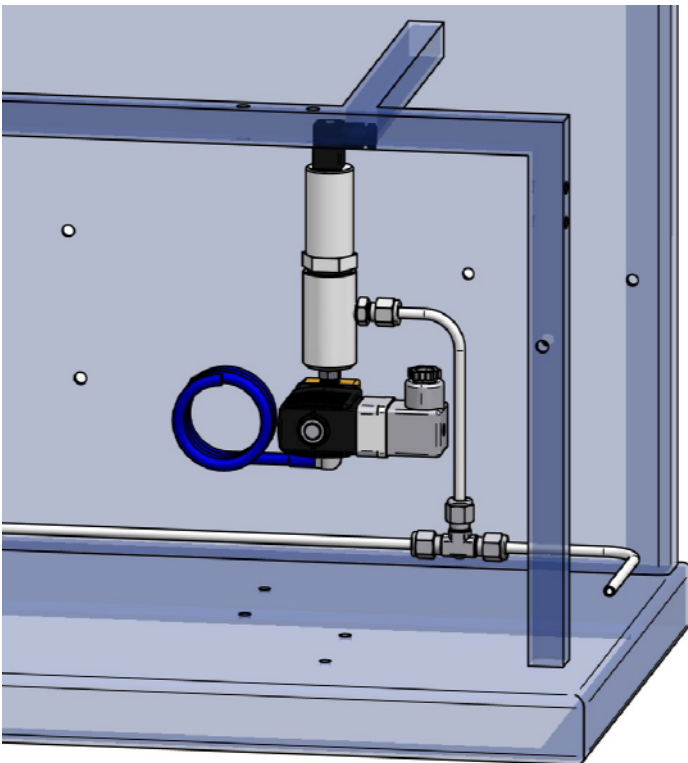
Where necessary, have the mains plug replaced by a suitably qualified person.



Prior to making the connection to the mains network, the housing of the electronic display and the measuring cell must be connected using the data cable supplied!



Installation arrangement of load-dependent control for AC xxx HP xxx



Installation arrangement of load-dependent control for AC xxx-N2 HP xxx

## 10 Putting into operation

### 10.1 Initial start-up



**DANGER!**

**High pressure!**

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death.



Abrupt loading due to built-up pressure can cause damage and the discharge of compressed air!

Before putting the system into operation for the first time check all the pipe and cable connections and tighten up where necessary!

Do not exceed the maximum allowable operating pressure (see "Technical data")!

Open valves slowly to avoid sudden pressure release!



**NOTE!**

**Impurities in the pipe network!**

Before the initial start-up, ensure that the pipe network is free from dirt and other impurities. Malfunctions resulting from incorrect installation are not covered under the warranty offered by BEKO TECHNOLOGIES GMBH.

### 10.2 Putting the system back into operation



**DANGER!**

**High pressure!**

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death!



Open valves slowly to avoid sudden pressure release!

Do not exceed the maximum allowable operating pressure.

The maximum allowable operating pressure is stated on the type plate and in the technical data (see chapter „Technical data“).

If the DRYPOINT® AC HP dryer is to be put back into operation after a prolonged standstill period, proceed as for initial start-up.

Check, in particular after maintenance or repair, if all the piping to and from the dryer is in place and firmly fixed and if the dryer is electrically connected. If not, carry out the correct installation procedure.

Check if the compressor is switched off. If not, switch off the compressor.

Check if the high-pressure dryer is switched off at the electrical master switch. If not, switch it off.

Check if the high-pressure dryer is fully depressurized. If not, depressurize the dryer using the manual drains.

Check if the high-pressure shutoff valves upstream of the dryer inlet and downstream of the dryer outlet are closed. If not, close both shutoff valves.

Start the compressor.

When the compressor has reached the cut-out pressure, slowly open the shutoff valve upstream of the dryer inlet. The dryer is now pressurized to operating pressure.

Check all pipe connections for tightness.

Turn on the dryer at the electrical master switch.

Slowly open the shutoff valve downstream of the dryer outlet and admit pressure to the entire compressed air network.

Close the shutoff valve in the bypass line.

### 11 Maintenance



#### NOTE!

#### Possible problems concerning function and safety!

Lack of maintenance can impair the correct functioning and safety of the device.

Make sure that the maintenance tasks listed below are carried out regularly!

Always follow the safety rules and instructions for maintenance, inspection and installation work!

If the problem is not listed here or cannot be resolved, get in touch with BEKO TECHNOLOGIES GMBH.

#### 11.1 Shutdown for maintenance or repair



#### DANGER!

#### High pressure!

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death.



Depressurize the plant prior to any maintenance or repair work!



#### DANGER!

#### Mains voltage!

In the event of contact with live, uninsulated parts there is a danger of an electric shock resulting in injury or death.

The connection to the mains network and the corresponding protective devices must comply with the legal regulations valid at the place of installation of the load-dependent control; connection and installation must be performed by a suitably qualified person.



#### NOTE!

#### No repair or maintenance work while mains voltage is still being applied!

Before carrying out any repair or maintenance work, disconnect the device from the power supply and ensure that all the connecting cables are de-energized!

Maintenance or repair work may only be performed by suitably qualified personnel and in compliance with the valid regulations!

Applicable are the general safety regulations according to UVV, VDE as well as all the relevant safety regulations of the particular country where the device is being operated.

Switch off the high-pressure dryer.

Open the bypass line (not included in delivery).

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

Depressurize the dryer slowly through the manual drains until both tower gauges indicate atmospheric pressure.

## 11.2 Putting the dryer back into operation



### **DANGER!**

#### **High pressure!**

In the event of contact with quickly or abruptly released compressed air or bursting plant components there is a danger of serious personal injury or death!



Open valves slowly to avoid sudden pressure release!

Do not exceed the allowable operating pressure.

The maximum allowable operating pressure is stated on the type plate and in the technical data (see chapter „Technical data“).

If the DRYPOINT® AC HP dryer is to be put back into operation after a prolonged standstill period, follow the procedures for initial start-up.

Check, in particular after maintenance or repair, if all the piping to and from the dryer is in place and firmly fixed and if the dryer is electrically connected. If not, carry out the correct installation procedure.

Check if the compressor is switched off. If not, switch off the compressor.

Check if the high-pressure dryer is switched off at the electrical master switch. If not, switch it off.

Check if the high-pressure dryer is fully depressurized. If not, depressurize the dryer using the manual drains.

Check if the high-pressure shutoff valves upstream of the dryer inlet and downstream of the dryer outlet are closed. If not, close both shutoff valves.

Start the compressor.

When the compressor has reached the cut-out pressure, slowly open the shutoff valve upstream of the dryer inlet. The dryer is now being pressurized to operating pressure.

Check all pipe connections for tightness.

Turn on the dryer at the electrical master switch.

Slowly open the shutoff valve downstream of the dryer outlet and admit pressure to the entire compressed air network.

Close the shutoff valve in the bypass line.









