



Ultrapure HL-ALG Oilfreepac HL-OFP 0100 - 1000

Serial-No. : / 001

Date :

Introduction

As the user / operator, you should make yourself familiar with this operation manual in terms of the safety, construction, function, maintenance and servicing of the cold regenerated adsorption dryer Ultrapure HL-ALG / Oilfreepac HL-OFP 0100 - 1000.

A basic prerequisite for safe working with and error-free operation of the unit is a knowledge of the basic special safety features.

This operation manual includes the required safety information to operate this unit safely.

This operation manual and especially the safety information, are to be followed by all persons working with the unit. It is imperative that this operation manual is always made freely available to machine operators and are to be kept at the place where the unit is installed.

Explanation of the used Symbols



Hint

Provides hints on operation and usage of the equipment.



Important

Provides hints on preventing equipment damage.



Caution

Denotes direct and immediate risk of death or personal injury if the provided information is not followed. Failure to comply can lead to serious health problems including life-threatening injuries.



Dangers due to electrical energy

Denotes a risk of electric shock if the provided information is not followed. Failure to comply may result in electric shock and could lead to death or personal injury.



Danger by pressurized parts of the unit

Reminds the operator to depressurize the unit before performing service work. Failure to comply may result in personal injury or equipment damage.



Noise during pressure release

Wear ear protectors for your own safety!



Fine dust

Wear a dust mask for your own safety!



Environment protection

Reminds the operator to wear ear protectors due to high noise levels. Failure to comply can lead to hearing damage.



Shutdown / Depressurizing of the unit (see chapter 7.2 / 7.3)



Start-up (see chapter 7)



Use suitable gloves



Waste must be disposed of in accordance with local regulations



Afterfilter (particle filter)



Perfekter (coalescence filter)

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1 The Manufacturer

The manufacturer of the unit is:

Donaldson Filtration Deutschland GmbH
Industrial Filtration Solutions
Büssingstr. 1
D-42781 Haan

www.donaldson.com

If required, additional copies of the Operation Manual may be requested using the above contact information.

If writing or telephoning, please give us the following data:

Dryer Type : _____

Serial Number *) : _____

Year of Construction *) : _____

*)The serial number and year of construction can be found at the type plate of your unit.

The manufacturer reserves the right to make changes and improvements without prior notice!

2 Recommendations to the Work Protection

The manufacturer explicitly excludes all responsibility or liability for damage and / or injury caused by failure to follow these special points requiring attention, or others, or by failing to pay the necessary attention when operating and handling these adsorption dryers, even if this is not explicitly stated in individual cases.

In order to ensure proper operation of the unit, please pay attention to all safety information and general information given in this operation manual.

All safety information is always intended to ensure your personal safety!

All relevant regulations for industrial safety, general safety rules and information included in the operation manual, apply to the operation of the adsorption dryer.

The adsorption dryer was designed and constructed acc. to the generally recognised regulations concerning technical matters and safety work.

Design / Development, production, installation and after-sales service for the unit are subject to a certified quality assurance system as per DIN EN ISO 9001.

2.1 General Safety Information



Operate the unit properly!

The unit may only be used for its intended purpose. The adsorption dryer is built exclusively for the drying of compressed air or nitrogen. Any other use of the unit, or one deviating from this one stated, shall be considered inappropriate.

The manufacturer shall not be liable, where this is permitted under law, for any damage incurred as a result of misuse.

The medium to be dried must not contain any corroding components which could cause corrosion in the material of the pressure unit in an unacceptable way. Corrosion during intended usage of C-steel components is considered by providing an additional wall thickness of 1 mm or an adequate seal respectively.

The manufacturer guarantees for the use of suitable materials. If the requester specifies materials for the components of the unit, the guarantee of the suitability of the materials will rest upon the requester.

Pressure and temperature of the medium must correspond to the specification on the type plate and the operation manual!

The pressure unit is not designed for loadings by traffic, wind and earthquakes. In the case of the appearance of these loadings, the pressure unit must be protected by suitable measures against these loadings.

Keep the Operation Manual at the installation site!

Ensure that the operation manual is always at hand with the unit making sure that it is available for the operating staff.

Use the appropriate tools!

When servicing the unit, use tools that are appropriate and are in good condition.
If special tools are required, approval must be given by the manufacturer beforehand.



Do not make any constructional changes to the unit!

Constructional changes to the unit may only be carried out by the manufacturer or after consultation of the manufacturer.

All work on the pressure vessels and pipelines, such as welding, constructional changes, installation work, etc. without consultation of the manufacturer and, if necessary, after consultation of the notified body, is forbidden and results in invalidity of the declaration of conformity. Failing to observe this prohibition can place you and your fellow-workers in danger.



Do not put any protective devices to the unit out of operation!

Protective devices against exceeding the maximum allowable operating conditions such as pressure and temperature are not part of the standard scope of supply. Never disable the optional protective devices of the unit. Never attempt to by-pass the protective devices.

Non-functional protective devices imply the greatest possible danger for you and your fellow-workers and can cause malfunctions in the unit.



Protection against exceeding the pressure / exceeding the temperature!

It must be ensured that the pressure of the components of the unit should under no circumstances be able to exceed the maximum operating pressures.

As a standard it is the responsibility of the operator to secure protection against exceeding the pressure. It must be ensured that the pressure generating compressor and, should the occasion arise, the compressed air network downstream of the adsorption dryer are protected accordingly.

The safety device must have a blow-off capacity that corresponds to the maximum possible mass flow of the upstream pressure generator. It must be designed in accordance with one of the following standards: DIN EN ISO 4126-1, DIN EN 4126-2, or AD 2000-A2. The unit must be protected against exceeding the maximum operating pressure as stated on the dryer type plate.

Regardless of their design, the inlets of valve connections must be designed so that the cross-sectional area of the connecting pipe or the butt weld end is at least equal to that of the valve inlet.

Regardless of their design, the outlets of valve connections must be designed in such a way that the cross-sectional area of the connecting pipe at the valve outlet is at least equal to that of the valve outlet, except for valves whose outlet ends are provided with internal threads.

It must be ensured that the temperature cannot rise above the maximum permissible operating temperature. The operator must take suitable measures to ensure that the operating temperature does not exceed the maximum permissible temperature or fall below the minimum permissible temperature.



Pressure vessels – periodic approvals / alternation of stress!

Because of the cycle times of the pressure unit, the alternation of loads per year is dependent on the type. The design takes a lifetime of 10 years into consideration.

Examination of all pressurised vessel walls (inner examination). Shorter test and examination intervals are valid when national regulations require shorter intervals.



Fire risk!

Safety devices against exceeding the pressure due to external fire are not part of the standard scope of the unit.

If there are potential fire risks at the place of installation of the unit the operator must ensure relevant protective measures against exceeding the maximum allowable operating parameters

2.2 Safety information for Transport and Installation



Dangers during transport!

The unit should be lifted at the appropriate points with the proper equipment.

The unit must not be transported by the pipelines, because it could cause pipelines to leak and lead to serious malfunctioning of the unit.



Avoid stress by external strength and torques!

Ensure that no additional forces or stress is transmitted to the adsorption dryer via the connected pipelines, which could exceed the maximum capacity of the system.

If necessary, the operator has to guarantee this with suitable measures.

Ensure that any vibration from other units or machinery is not transmitted to the adsorption dryer.

If necessary, limit these influences with the appropriate measures.

2.3 Safety Measures during Operation

Safe working conditions and proper operation of the unit can be achieved with knowledge of and adherence to the national working, operating and safety regulations. Furthermore, any internal plant regulations must be followed.

Check the unit for external damage at regular intervals.

Malfunctions or faults, which can compromise personal safety, must be resolved immediately. Follow the troubleshooting section (chapter 10) in the event of malfunction.
Contact the manufacturer if the problem cannot be corrected.

Only allow properly trained personnel to operate the controller or the unit.



Never release the pressure manually during operation!

Never open the ball valves at the lower pipeline of the unit manually during operation. Failure to comply will result in severe personal injury.



Noise during pressure release!

Wear ear protectors for safety precautions! Failure to comply could result in hearing damage.

2.4 Dangers due to Electrical Energy



Electrical components must be serviced by a trained electrician acc. to the DIN VDE stipulations (or comparable national stipulations) and the regulations of the relevant power supply company on site.

If it is necessary to service electrical components, a second person must switch off the main breaker and the working area must be made safe by isolating the area and posting warning signs. Only insulated tools should be used to service the electrical components.

The electrical parts of the unit must be checked regularly. Only use original fuses for the rated current and voltage!

2.5 Dangers due to Desiccant

The adsorbents are in the adsorbers.

The type of adsorbent used depends on the type of processing unit.
Only adsorbents from the manufacturer may be used.

Adsorbents are chemicals and thus, are subject to standard safety precautions (EN safety data sheet). The type of adsorbent used is not subject to any marking requirements as per the Hazardous Substances Ordinance.

Store the desiccant in a place accessible to authorized personnel only.



Warning! Risk of injury through eye contact!

- If the adsorbent gets into contact with the eyes, flush the eyes with clean water. Seek medical attention immediately.



Warning! Risk of injury if swallowed!

- If the adsorbent is swallowed, seek medical attention immediately!

There are no restrictions on the type of extinguishing agent to be used in the event of a fire. Nonetheless, the adsorbent strongly reacts with water or foam.

If pouring the desiccant, minimize the amount of dust in the surrounding area.



A dust mask must be worn if a MAK value of 6 mg/m³ (fine dust) is exceeded.

2.6 Safety Measures during Maintenance, Servicing and Repair Work

All personnel within the user's company involved with installation, start-up, operation, servicing, repair work of the unit must read and understand the Operation Manual beforehand, with special reference to the safety information. Contact the manufacturer with any questions.

The manufacturer is not liable for damage caused by inappropriate installation and start-up of the unit. The user bears all the risk in such a case.

The responsibility for maintenance and servicing work must be clearly established. Operating personnel must be informed before the start of maintenance and service.

Preventive maintenance should be performed at the recommended intervals by the manufacturer's after-sales service.

All the maintenance and service must be carried out on the unit per the operation manual instructions.

Warning! Remove power during servicing!



The unit must be powered down and must not have voltage or pressure during some types of maintenance or servicing work. Failure to comply will compromise personal safety.

- Shut down the unit properly.
- Depressurize the unit.
- Switch off the main breaker and lock it.
- Post a warning sign to prevent the unit from being switched on again.

Warning! Safety Insulation Removal!



If removing the existing contact safety insulation, care should be taken to sufficiently cool down the unit. Replace the insulation before restarting the unit.

Replace the consumable parts according to the intervals stated in the “Instrument and spare parts list” res. the chapter 11.2 “Service Sets”.

Only use original spare parts and accessory parts 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.

Warning! Parts Replacement!



Replace damaged parts with new ones. Pressure units must be taken out of operation if its parts are badly damaged.

For safety reasons, the manufacturer recommends the after sales service to remove spare or damaged parts from a unit.

After maintenance has been performed, a leakage test must be carried out.



When replacing larger sections, carefully fasten the section to the lifting gear making sure it is secure. Only use suitable lifting gear and load-bearing members that are in perfect condition and have adequate load-bearing capacity!

If carrying out installation work above head height, use suitable and safe working platforms or other means to stand higher. Use safety lines to protect against falling when carrying out maintenance work at heights above 1.80 meters.

2.7 Environmental Protection



Dispose of used items and materials properly.

Sort materials for disposal into categories to ease recycling.

It is absolutely essential that the desiccant is disposed of in the correct manner. Disposal will be arranged by the manufacturer's after-sales service.

2.8 Requirements for the Operator

The operator should ensure that the unit operated by trained personnel familiar with safety stipulations and the handling of the unit. In detail, these are as follows:

Safety

- Accident prevention regulations
- Safety information (both general and specific to the unit)
- Safety devices of the unit
- Emergency procedures

Operation of the unit

- Unit start-up
- Troubleshooting
- Unit shutdown

2.9 Requirements for Operating Staff

All persons who are entrusted with the operation of the unit are required to.

- follow the basic regulations for safety at work and accident prevention.
- have read and understood the operation manual.
- follow the instructions provided in this manual.

2.10 Warranty and Liability

Claims for warranty and liability concerning personal injury or material damage become void if caused by one or more of the following reasons:

- Inappropriate use or application of the unit.
- Incorrect installation, start-up, operation and maintenance of the unit.
- Operation of a noticeably defective unit
- Failure to follow operation manual procedures regarding concerning transport, storage, installation start-up and maintenance of the unit.
- Implementing constructional modifications to the unit.
- Inadequate monitoring of parts on the unit that are subject to wear.
- Improper repairs
- Use of non-original parts

Please also note the general warranty conditions for the manufacturer's products.

3 Fundamental Function

The cold regenerated adsorption dryers are available in 2 different versions:

1. HL - ALG

The HL-ALG is a breathing air unit based on the HL-MSD adsorption dryer. The adsorption dryer has been extended to include a treatment stage containing special adsorbents. The breathing air unit contains two pre-filters and an after-filter.

2. HL - OFP

The HL-OFP is a treatment system based on the HL-MSD adsorption dryer. The adsorption dryer has been extended to include a treatment stage containing special activated carbon. The treatment system includes two pre-filters and after-filter.

Prefilter with condensate drain

Pre-filtration of the medium to be dried is done by the high-performance sub-micro-filter. Oil, water and dirt particles are trapped in the micro-fibre mat which retains up to 99.99998% of dirt particles larger than 0.01 μm .

The micro-fibre mat is surrounded by a coalescence filter sheath and the flow is from the inside to the outside. Liquid aerosols and mists are aggregate into bigger droplets in this coalescence filter and fall to the lower part of the filter casing, where they are removed from the system via a condensate discharge line.

The residual oil content after this filter stage is less than 0.01 mg/m^3 for a maximum input concentration of 3 mg/m^3 .

Afterfilter

After-filtration of the medium to be dried is also done by a high-performance sub-micro-filter.

Particles are trapped in the micro-fibre fleece which retains up to 99.99998% of dirt particles larger than 0.01 μm .

4 Technical Data

Standard Conditions	
Pressure dewpoint	-40°C (bei 7 bar) -70°C...-40°C (Depending on dimensions and operating conditions)
Operating pressure	7 bar
Operating temperature	max. 50°C
Inlet moisture	100% saturated
Purity of compressed air	
Purity classes for compressed air acc. ISO 8573-1:2010	1-2 : 1-2 : 1
Purity of breathing air HL-ALG (Residual impurity content at the outlet under standard conditions)	
Particle	Class 1-2 : ISO 8573-1
Oil (liquid phase)	< 0,01 mg/m ³ (Class1 , ISO 8573-1)
Oil vapor and Hydrocarbons	< 0,003 mg/m ³ (Class 1 , ISO 8573-1)
Water vapor	DTP -40°C (=0,11 g/m ³) (Class 2, ISO 5573-1)
CO ₂	< 500 ppm
CO	< 5 ppm
SO ₂	< 1 ppm
NO _x	< 2 ppm
Limits	
Medium	Compressed Air / Nitrogen
Operating pressure	4 – 16 bar
Operating temperature	5 – 50 °C
Ambient temperature	5 – 50 °C
Installation	Indoor installation

Power supply	
To be provided by the customer	230 V / 50-60 Hz (±10%) (optional) 115 V / 50-60 Hz (±10%) (optional) 24 V DC (±10%)
Power cable	AC: 3 x 0.75 mm ² DC: 2 x 0.75 mm ²
Current consumption / internal fuse	max. 40 W / 2 A, delayed, 250 V, Ceramic fuse
Nominal voltage of solenoid valves (depending on version)	230 V AC 115 V AC 24 V DC
Nominal current of solenoid valves	8 A (resistive load)
Nominal voltage of alarm relay contact	125 V
Nominal current of alarm relay contact	1 A (resistive load)
Safety Class	IP54
Overvoltage Category	2
Adsorber vessel	
Design Data	Design Pressure: 16 bar Design Temperature: -10°C / +60°C
Design, Manufacture and Testing	Acc. AD2000 / PED 2014/29/EU
Material of Pressure Vessel	Carbon Steel
Material of Gas Distributor	Stainless Steel

5 Before Installation

5.1 Transport and Installation

Here you will find information on:

- how to transport and set up the unit correctly and safely.

The adsorption dryers HL-ALG / HL-OFP 0100 – 1000 are packaged in foil and supplied on wooden beams.

Please make a note of the symbols on the packing.

5.1.1 Safety hints concerning transport.



Take special care in transporting or loading and unloading the unit. Never use force!

Ensure that the maximum safe loading limits of the load-bearing members are never exceeded at the place of installation.

If using a fork-lift truck for transport, ensure that the unit is only lifted by the carrying frame for the unit or under the wooden pallet.

Beware of unequally distributed loads! This can cause severe injuries when transporting with lifting gear!



Ensure that the angle from the horizontal to the position of the ropes is never less than 45°. Otherwise, it could cause leaks in the piping of the unit and even lead to serious malfunctioning of the dryer.

Under no circumstances should the dryer be transported by the piping, as this could cause it. leaks in the piping of the unit and even lead to serious malfunctioning of the dryer.



6 Installation



The operator of the unit is responsible for the correct installation and layout of the piping leading to and from the unit.



The manufacturer is not responsible for the installation of protection devices to protect against power surges, short-circuits, and overloads.

6.1 General Hints

- If the unit is to be integrated into an existing pipeline, take into consideration that the existing piping sections may still be contaminated after the installation prior to initial start-up and commissioning. If necessary, these piping chapters and components must be cleaned or replaced.
- Never remove individual filters or blanking plates from the system without replacing them first, prior to start-up. Otherwise, this could lead to limited functionality of the unit.
- High performance dryer should be set up vertically correctly oriented for air flow.
- Ensure that the dryer is not set up, so the direction of airflow is reversed (Exception: intermittent operation).
- The dryer must not be started against large volumes of atmospheric pressure or vacuum (see also chapter 4).
This can be prevented by using an automatic starting device (optional).
- In the same way, avoid parallel switching of multiple dryers without separate volume flow limiters.
- If the compressor is not operated continuously, it is possible to couple the compressor controller and the dryer controller (option: Intermittent Operation, chapter 6.5).
In all cases, ensure that the current regeneration cycle is completed after switching off the compressor.

6.2 Installation Hints

- During installation, ensure that the housing cabinet plates can be removed for service and maintenance work.
- The unit can be supplied with compressed air from all usual market compressors. However, ensure that the inlet conditions of the compressed air are guaranteed at the inlet of the unit. The inlet of the compressor may not be located at a point where there are excessive contaminants and pollutants (in direct proximity of machine exhaust gases or other sources of contamination).

Removing the packing materials

Remove the packing materials with care!

Immediately report of any damaged machine parts or missing parts because of transport to the manufacturer and the transporting company.

Document any unit damage and inform the manufacturer in detail.

Location site

- If the ambient temperature at the installation site falls below +2 °C, the unit must be equipped with auxiliary heating to protect against frost (optional).
- Ensure that the installation site is clean and provides accessibility from all sides of the unit. Take special care that there is a sufficient room to swap over the unit or perform maintenance on it.
- Ensure that the load-bearing weight of the floor is flat, level and can support the weight of the unit.
- Ensure that any vibration or pulsations from other units or machinery is not transmitted to the dryer.
- Ensure that the electrical outlet and/ or the circuit breaker are accessible.

Bypass line (optional)

A bypass line should be installed around the unit so the compressed air can still be supplied to the network if maintenance work is being performed on the unit.

6.3 Connection to the Compressed Air Network

Properly connect the unit to the moist air inlet and to the dry air outlet. Check that all screw connections have been installed properly.

Compressed air quality

The maximum permissible residual oil content in the compressed air before entering the dryer is 3 mg/m³. An additional pre-filter should be installed if higher residual oil contents are encountered.

If oil-free compressed air is required, an oil vapour adsorber should be installed after the dryer.

If sterile compressed air is required, a high-performance sterile filter should be installed after the dryer.

6.4 Electrical Connection



Any work on electrical power supply must be performed by a trained electrician according to DIN VDE stipulations and the regulations of the relevant power supply company.

The connection to the electrical controller must be installed with the supplied power cord, which has an earthed plug, or with an external wiring.

The unit has to be provided with an electrical power supply of 230/ 115 V AC res. 24 V DC and protected with a 1.6 A fuse.

If an external power cord is used, a circuit breaker (external switch) must be installed near the unit. An external power cord of 3x 0.75mm² (AC) or 2x 0.75mm² (DC) should be used.

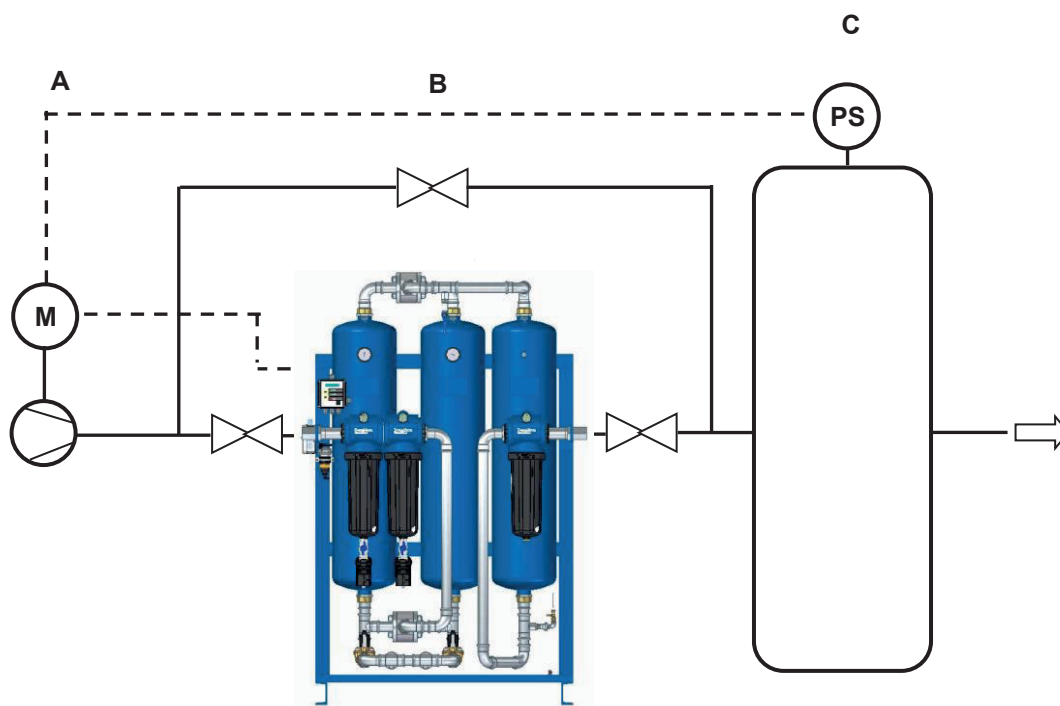
Important!

The ends of the cable connected to the controller must be installed with wire nuts.

All electrical connections must be checked before initial start-up and commissioning. Electrical connections should only be performed by qualified electricians.

6.5 Intermittent Operation

If the high-performance dryer is operating in the „intermittent operation“ mode, the installation must be performed as per fig. “intermittent operation” in the following sequence: compressor (A) – dryer (B) – reservoir tank (C).



Ensure that the dryer can be backflushed!

7 Start-up

In this chapter we will explain to you:

- Initial start-up
- shutdown
- how to release the pressure from the unit

7.1 Initial Start-up

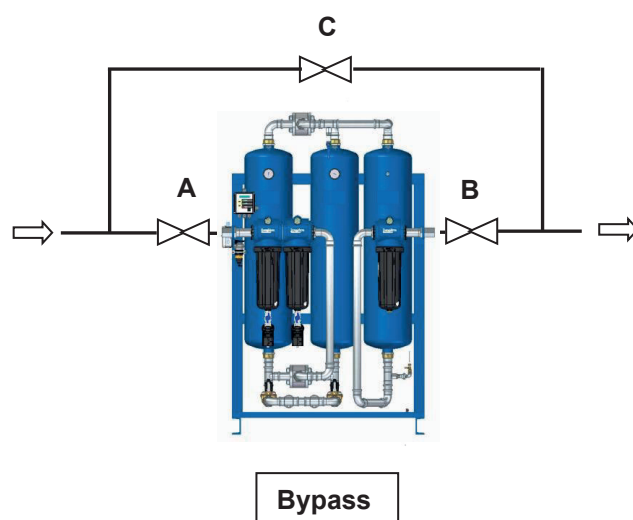
Before the initial start-up and commissioning of the unit, the pressure vessel must be provided with the necessary safety devices, such as suitable safety devices to prevent an excessive build-up of pressure, safety valves, etc.

These items are not part of the scope of supply of the manufacturer.

It is recommended that the initial start-up be performed by the manufacturer after-sales service.

Taking in account the information in chapter 5.1, follow the initial start-up procedure below:

- 1 Verify that valves A and B (bypass line optional) are closed and that the electrical controller is switched off.



- 2 Slowly build up the pressure in the dryer by gradually opening valve A.
- 3 Monitor the pressure on the pressure gauge. Both adsorbers must be at operating pressure.
- 4 Apply power to the electrical controller.
- 5 The controller starts with the pressure build-up phase in both adsorbers. Then, the regeneration phase begins in one of the adsorbers and the adsorption phase in the other adsorber.
- 6 Note that moisture from the ambient air can get into the desiccant from transport or storage of the dryer. Therefore, the dryer must be regenerated for at least three hours before the initial start-up (before butterfly valve B is opened to the compressed air network).

- 7 Slowly open valve B to integrate the dryer into the compressed air network.
- 8 Close valve C if open.

The following mechanical dangers can occur during unit during operation:



Violent depressurisation of pressure components via the silencer.



Loud discharge noises when depressurizing the components. Wear ear protectors for personal safety!

7.2 Shutdown

The following procedure shuts down dryers in in continuous operation:

1. Close the cut-off device after the dryer (valve B, see fig. on page 22).
2. Leave the controller in operation until both adsorbers have regenerated fully.
3. Terminate the operation of the controller by cutting off the control box from the mains power supply.



Under no circumstance, should compressed air continue to flow through the dryer after shutdown. Failure to comply may cause the desiccant to overload, and therefore, cannot be regenerated again within the dryer unit.

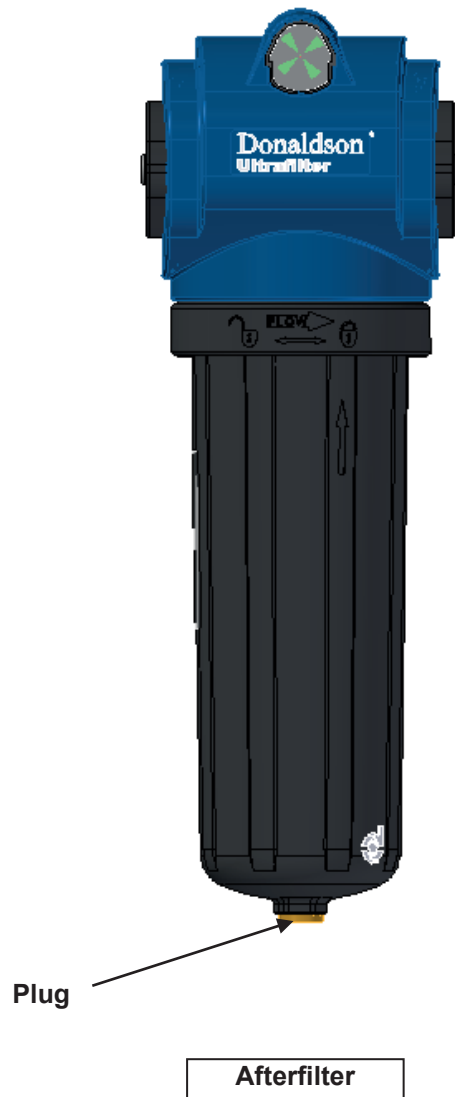
Please note that dryers operated in situations where there is an intermittent demand for compressed air must have a controller installed to regulate the intermittent operation.

7.3 Depressurising the Unit

1. Shut down the unit properly (see chapter 7.2).
2. Close cut-off devices A and B (see fig. „By-pass line“ on page 22).
3. Depressurize the unit by slowly opening the manual discharge valve at the afterfilter.



Loud discharge noises during depressurization! Wear ear protectors for your own safety!



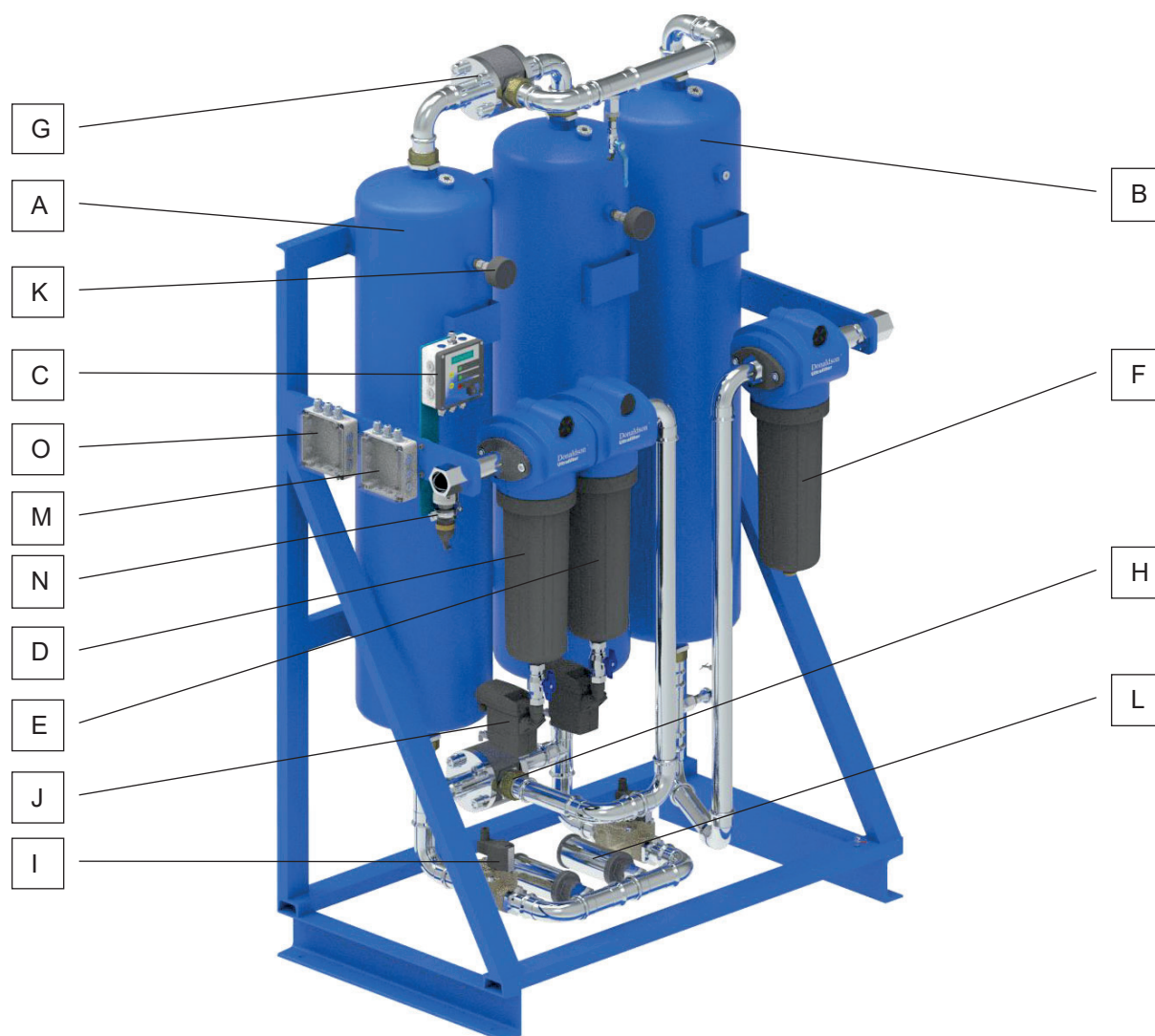
8 Unit Description

In this chapter we will explain you:

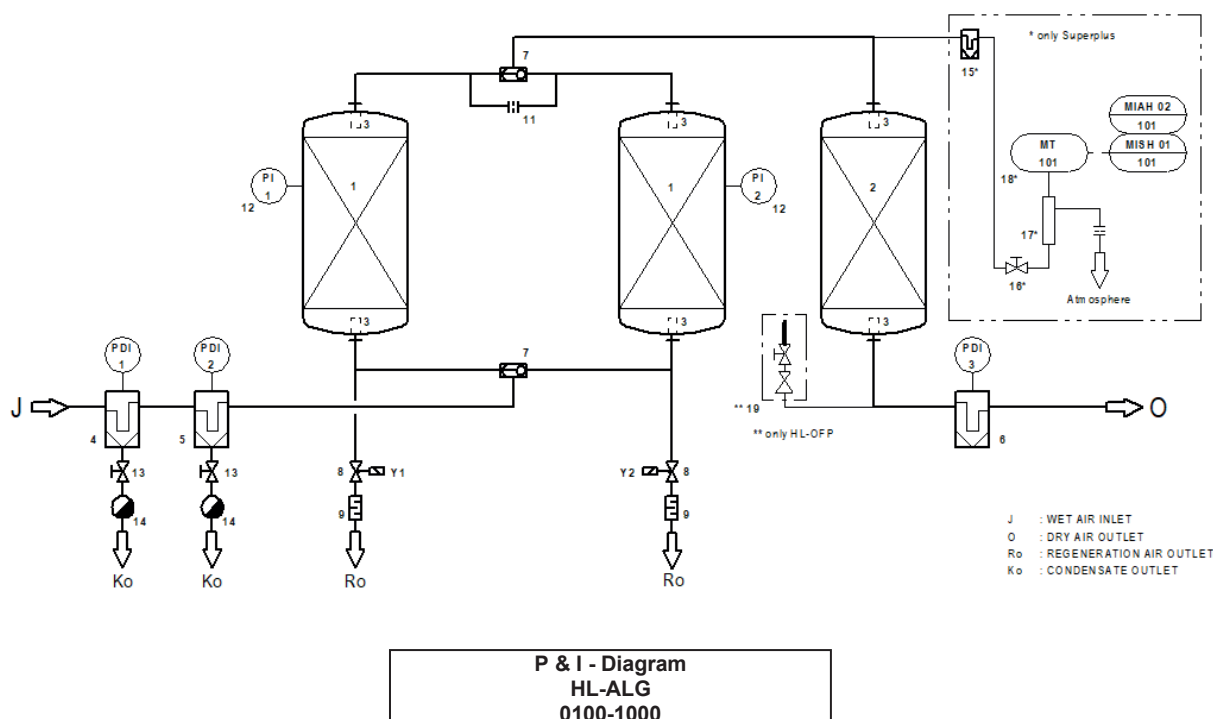
- Parts of the unit
- Function of the unit

8.1 Parts of Unit HL-ALG

A	:	Adsorber MS/SP	I	:	Solenoid valve
B	:	Adsorber AK/OX	J	:	Condensate drain
C	:	Controller	K	:	Pressure gauge
D	:	1. Prefilter	L	:	Silencer
E	:	2. Prefilter	M	:	add. control board
F	:	Afterfilter	N	:	Option dewpoint control
G	:	Upper shuttle valve	O	:	Option add. 4-20mA output signal
H	:	Lower shuttle valve			



8.2 Funktion HL-ALG



The HL-ALG breathing air unit is used to prepare compressed air for breathing air in accordance with the quality standards of all relevant international standards (incl. EN 12021 (DIN 3188); ANSI/CGA G.7.1; Z 180.1 M85; BS 4275; AS 2299-1979; NZS 5813). It can be used behind oil-lubricated or oil-free compressors.

It is used in critical applications where ambient air or compressed air without proper treatment poses a potential hazard to the user.

The breathing air device produces particle-, oil-, water- and steam-free compressed air and removes carbon dioxide (CO₂) and carbon monoxide (CO). The breathing air unit can be used as a central reprocessing station or in the decentralised area.

Adsorption

An adsorption dryer with reciprocal adsorption and regeneration phases is integrated into the HL-ALG. In each of the two absorbers, the medium is dried alternately in one adsorber, while the other adsorber is regenerated. This process ensures continuous operation.

The medium to be dried enters the pre-filter combination (4,5) at the wet air inlet (J). Here, condensate, oil aerosols and dirt particles are separated at high-performance microfilters.

The medium flows through the lower change-over valve (7) and the lower flow manifold (3) from bottom to top through one of the two SP adsorbers (1). The pressure dew point after the dryer stage is -40°C with a residual water content of 0.11 mg/m³ and CO₂ is adsorbed up to a residual content of well below 500 ppm.

At the upper part of the absorber, the dried medium passes through the upper flow manifold (3) and the upper change-over valve (7) into the downstream AK/OX adsorber.

In the two consecutive stages in the AK/OX adsorber, oil vapors and hydrocarbons are first removed by means of activated carbon (residual oil content below 0.003 mg/m³) and then the CO is removed in a catalyst stage up to a residual content of less than 5 ppm. The cleaned air then flows through the post-filter (6). Here, fine dust and any desiccant (activated carbon) abrasion that may have occurred are separated and the dried and cleaned medium enters the pipeline network at the dry air outlet (O).

Regeneration (Dryer stage)

The regeneration of the moisture-laden desiccant is carried out with a partial flow of the dried medium. At the beginning of the regeneration, the 2/2-way solenoid valve (8) at the regeneration air outlet is opened. This relaxes the adsorber to atmospheric pressure. The compressed air is released from the system via the silencers (9).

A partial flow of the dried medium flows from the adsorbent to the atmosphere via the regeneration air orifice (11) located in the upper change valve (7), from top to bottom through the adsorber to be regenerated and through the silencers (9). The amount of regeneration air required is limited by the orifice (11).

Pressure build-up (Dryer stage)

At the end of the regeneration phase, the 2/2-way solenoid valve (8) at the regeneration air outlet is closed. The pressure builds up in the regenerating adsorber via the regeneration air orifice (11). The regenerated adsorber is in "stand-by" mode until the changeover process is initiated.

Changeover process of the unit (Dryer stage)

Depending on the selection of the operating mode via the text display of the electronic control, the switching process is time-controlled or load-dependent (see chapter 8.6)

Intermittent operation

In the case of discontinuous (intermittent) operation of the compressor, it is possible to couple the control of the dryer with the control of the compressor. This ensures that the system only uses compressed air for regeneration as long as the compressor is running.

The dryer remains in stand-by after the pressure build-up has been completed if no compressed air is consumed.

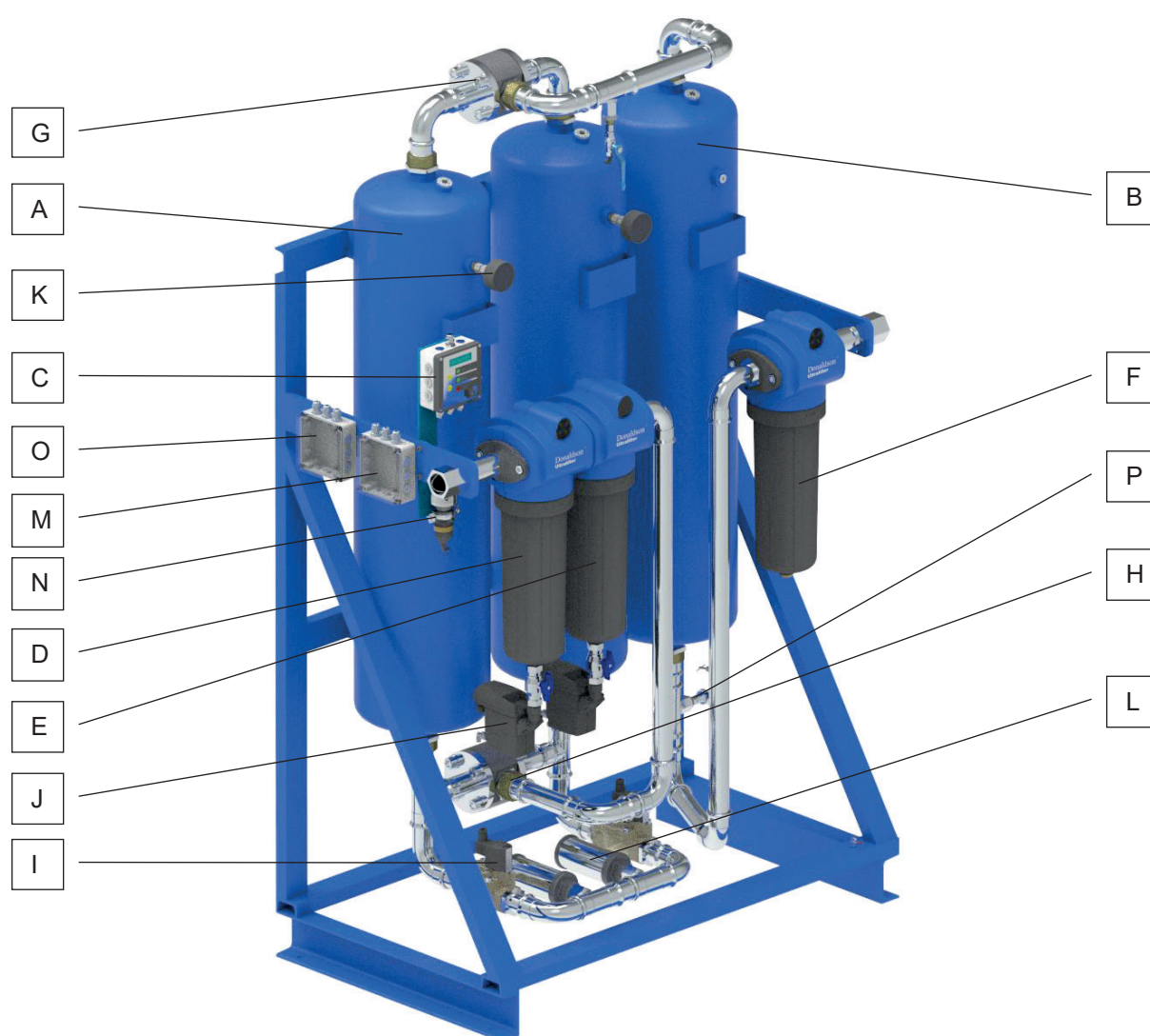
The coupling of the dryer control with the compressor control is carried out by connecting the potential-free closing contact on the compressor to the terminal block X12 (digital input) of the control board. The contact must be closed when the compressor is not running.

The "Stand-By" status is shown on the standard control with an LED, in the dew point control in the display as plain text.

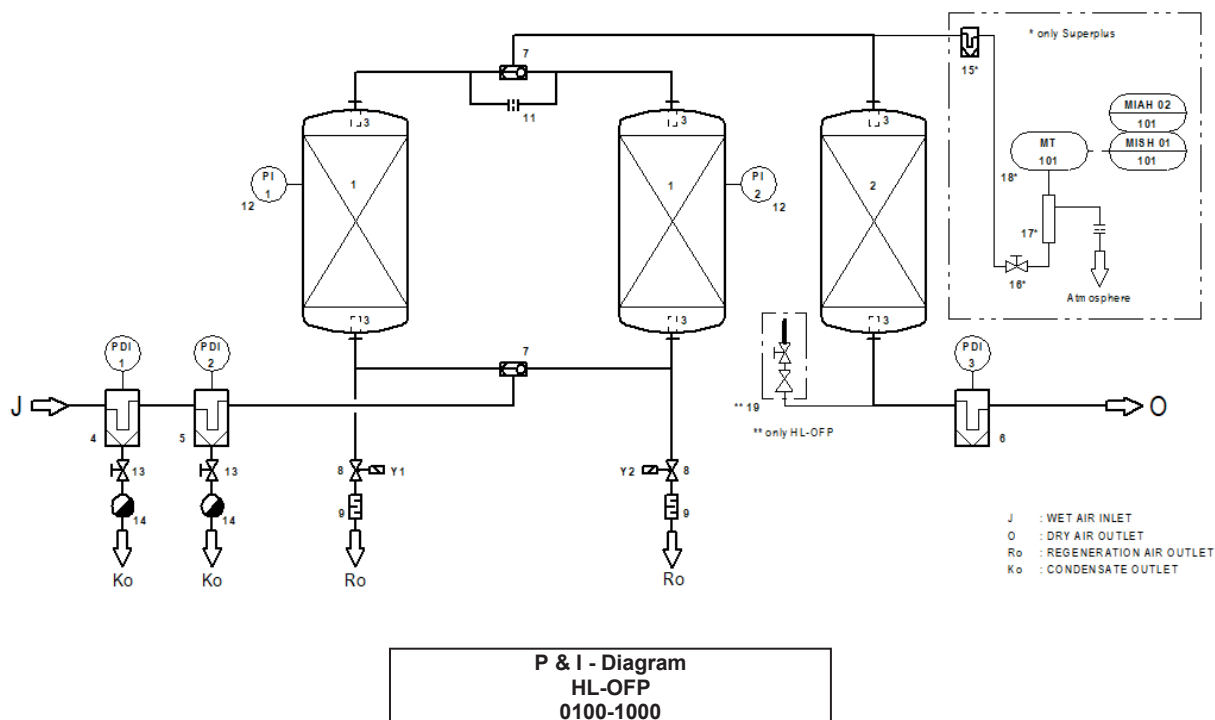
This mode of operation can only be used if the dryer is installed directly downstream of the compressor and a storage tank is downstream of the dryer!

8.3 Parts of Unit HL-OFP

A	:	Adsorber MS	I	:	Solenoid valve
B	:	Adsorber AK	J	:	Condensate drain
C	:	Controller	K	:	Pressure gauge
D	:	1. Prefilter	L	:	Silencer
E	:	2. Prefilter	M	:	add. control board
F	:	Afterfilter	N	:	Option dewpoint control
G	:	Upper shuttle valve	O	:	Option add. 4-20mA output signal
H	:	Lower shuttle valve	P	:	Oil test indicator



8.4 Funktion HL-OFP



Adsorption

An adsorption dryer with alternating adsorption and regeneration phases is integrated in the HL-OFP. In each of the two absorbers, the medium is dried alternately in one adsorber, while the other adsorber is regenerated. This process ensures continuous operation.

The medium to be dried enters the pre-filter combination (4,5) at the wet air inlet (J). Here, condensate, oil aerosols and dirt particles are separated at high-performance microfilters. The medium flows through the lower change valve (7) and the lower flow manifold (3) from bottom to top through one of the two adsorbers (1). The moisture is removed from the compressed air up to the desired point.

At the upper part of the absorber, the dried medium passes through the upper flow distributor (3) and the upper change-over valve (7) into the downstream AK adsorber. In this stage, oil vapours and hydrocarbons are extracted by means of activated carbon (residual oil content less than 0.003 mg/m³)

The cleaned air then flows through the post-filter (6). Here, fine dust and any desiccant (activated carbon) abrasion that may have occurred are separated and the dried and cleaned medium enters the pipeline network at the dry air outlet (O).

Regeneration (dryer stage)

The regeneration of the moisture-laden desiccant is carried out with a partial flow of the dried medium. At the beginning of the regeneration, the 2/2-way solenoid valve (8) at the regeneration air outlet is opened. This relaxes the adsorber to atmospheric pressure. The compressed air is released from the system via the silencers (9).

A partial flow of the dried medium flows from the adsorber to the atmosphere via the regeneration air orifice (11) located in the upper change valve, from top to bottom through the adsorber to be regenerated and through the silencers (9). The amount of regeneration air required is limited by the orifice (11).

Pressure build-up (dryer stage)

At the end of the regeneration phase, the 2/2-way solenoid valve (8) at the regeneration air outlet is closed. The pressure builds up in the regenerating adsorber via the regeneration air orifice (11). The regenerated adsorber is in "stand-by" mode until the changeover process is initiated.

Changeover process of the system (dryer stage)

Depending on the selection of the operating mode via the text display of the electronic control, the switching process is time-controlled or load-dependent (see chapter 8.6)

In the case of discontinuous (intermittent) operation of the compressor, it is possible to couple the control of the dryer with the control of the compressor. This ensures that the regeneration of the dryer is not interrupted.

The dryer remains in stand-by after the pressure build-up has been completed if no compressed air is consumed.

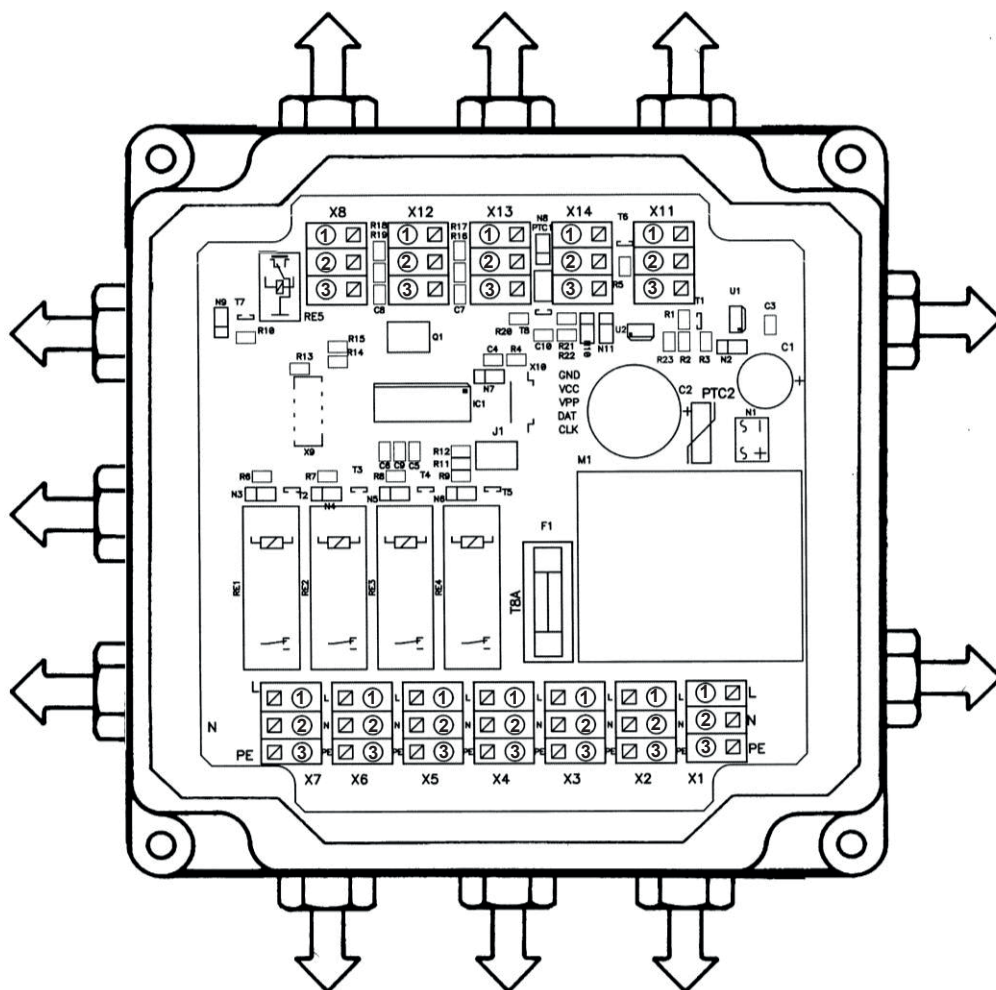
The coupling of the dryer control with the compressor control is done by connecting the potential-free closing contact on the compressor to the terminal blocks X12 (digital input) of the control board. The contact must be closed when the compressor is not running.

The "stand-by" status is shown on the standard control with an LED, on the dew point control in the display as plain text.

This mode of operation can only be used if the dryer is installed directly downstream of the compressor and a storage tank is installed downstream of the dryer, which must be dimensioned in such a way that the regeneration of the adsorption dryer can be completed without the compressor starting again.

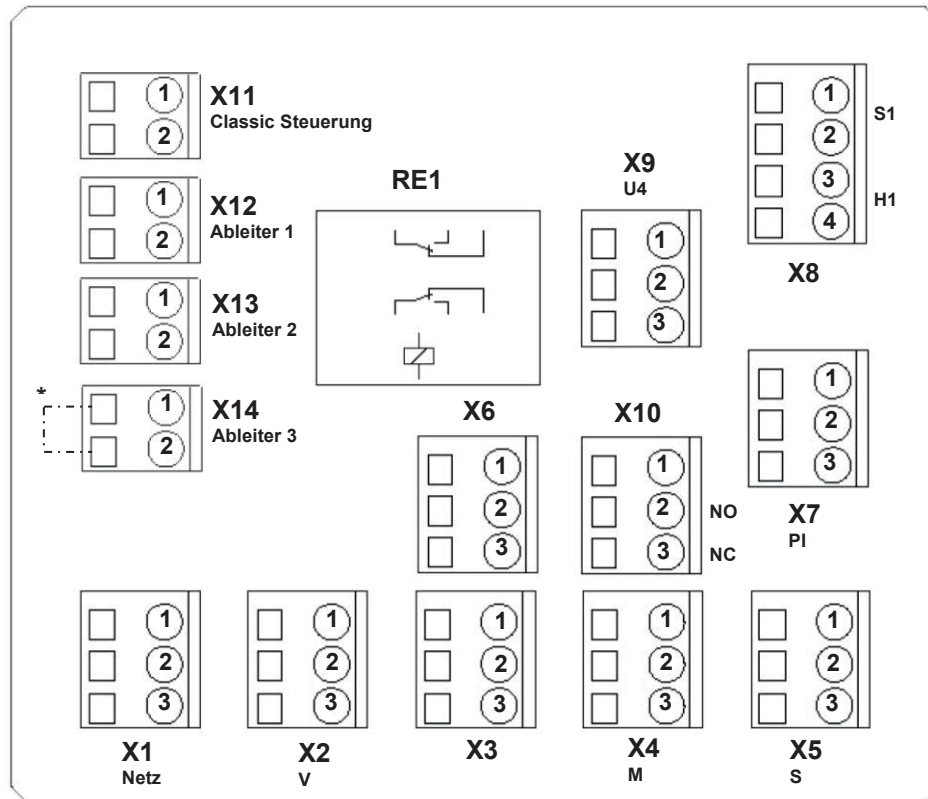
8.5 Connections Board

8.5.1 Basic controller board



Connection	Terminal	Terminal contact		
		1	2	3
Power supply inlet: 230 VAC / 115 VAC / 24 VDC	X1	L1 (+)	N (-)	PE
Power supply outlet: add. control board	X2	L1 (+)	N (-)	PE
Power supply outlet: Regeneration valve vessel 1	X3	L1 (+)	N (-)	PE
Power supply outlet: Regeneration valve vessel 1	X4	L1 (+)	N (-)	PE
Not existent	X5	L1 (+)	N (-)	PE
Not existent	X6	L1 (+)	N (-)	PE
Not existent	X7	L1 (+)	N (-)	PE
Alarm-outlet (change-over contact, potential free)	X8	NC	Common	NO
Drain: Power supply 12 V DC/ Alarm 1 input	X11	(-) GND	Alarm drain	(+) 12 V
Intermittent operation	X12		(-) GND	Intermit.
Not used	X13			
Inlet: Dewpoint transmitter	X14		(-) Dewpoint	(+) 12 V

8.5.2 Add. Control board



Anschluss	Klemmleiste	Klemme			
		1	2	3	4
Power supply inlet: 230 VAC / 115 VAC / 24 VDC	X1	L1 (+)	N (-)	PE	
Power supply outlet Drain 1	X2	L1 (+)	N (-)	PE	
Power supply outlet Drain 2	X3	L1 (+)	N (-)	PE	
Not used	X4	L1 (+)	N (-)	PE	
Not used	X5	L1 (+)	N (-)	PE	
Not used	X6	x		x	
Not used	X7	x	x	PE	
Not used	X8	x	x		
Not used				x	x
Not used	X9	L1 (+)	N (-)	PE	
Not used	X10	Common	NO	NC	
Alarm Outlet Drain	X11	(-) GND	Alarm Ableiter		
Inlet Alarm Drain 1	X12	Pin 3	GND		
Inlet Alarm Drain 2	X13	Pin 3	GND		
Not used	X14	Pin 3	GND		

8.6 Function of the Electronic Control

Standard Control

The standard electronic controller for the standard series offers a display with LEDs to indicate current operating conditions of the dryer. The controller offers a potential free collective alarm, which operates alternately as either a normally open or normally closed contact.

Furthermore, the controller offers "Intermittend Operation", which allows connection to the compressor (see chapter 8.6.6). This function offers considerable energy savings since the adsorption-dryer only operates when the compressor runs.

Load Dependent Control (Dewpoint Controller)

The electronic controller offers different options for programming and configuration. The dryer can be customized to optimize cycle-times and reduces air loss for regeneration.

Central controller parameter can be configured directly at the control.
Thus, it is guaranteed that the unit can be adapted optimally to the individual requirements.

Via a potential-free contact, a collective-failure signal can be linked for example to a central control station. Furthermore, the controller provides an input, that exchanges signals with the compressor. This function offers substantial saving potential, since the adsorption dryer works only at intermittent operation if the compressor runs.

The controller is also capable of supporting a dewpoint-dependent capacity control. This function offers operating cost savings when the dryer is under partial-load conditions.

The dewpoint-transmitter, which effectively monitors dewpoint changes, decreases energy costs by extending adsorption time while maintaining a consistent dewpoint. The controller display shows current operating conditions as well as service – and alarm-messages in text.

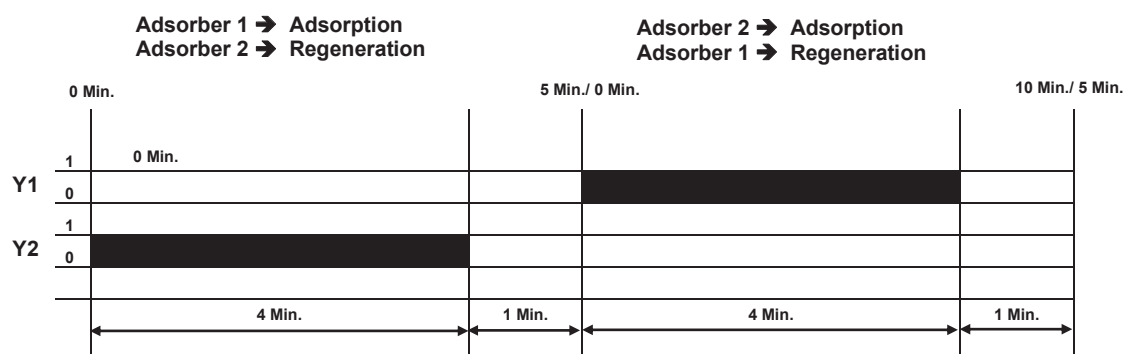
The electronic controller is at modular design.

The basic circuit board is installed in all models. An upgrade from a Standard-controller to the dewpoint controller can take place if desired.

In order to use the increased energy saving potentials still better, also each controller of the previous version can be updated to the newest controller version, since the newest controller version possesses the same dimensions as the previous version.

8.6.1 Time Control

In "Time Control Mode" the duration of the adsorption cycle of an adsorber is fixed to 5 minutes. This adsorption time is derived from 4 minutes of regeneration time and 1 minute of pressurization time.



8.6.2 Dewpoint Controller (only load dependent controller)

In load-dependent mode, the dewpoint controller controls the adsorption-cycle of the heatless-adsorption dryers based on actual operating-conditions. The extended adsorption cycle does not change the amount of time required to regenerate the desiccant, but it increases the "stand-by duration," in which the system does not require purged air.

The operation mode ("time control" or "dewpoint control") can be selected on the text display of the controller.

As part of the criteria for extending the adsorption-cycle, the pressure dewpoint is measured at the dry-air-outlet of the adsorption dryer. A dewpoint transmitter determines the pressure dewpoint. The load-dependent control is managed through the "work-window" in the control-program. This work-window is defined by two temperature set points.

The standard setting values for switching-over point A is - 48°C and for switching-over point B is - 43°C. **Note:** Switch-over point B is set automatically by the control. These values will be used if there are no special customer requests.

If the mode "dewpoint control" is set, the adsorption-dryer adsorbs moisture in one of the two adsorbers as long as the pressure dewpoint has reached the dry-air-outlet value that was set for switch-over point B.

Once reaching the switch-over point B value of -43°C, the controller operates in time-controlled mode until the switch-over point A value of -48°C is reached. The controller operates in the load-dependent cycle again until the pressure dewpoint at the dry-air-outlet is once again, at the set value for switch-over point B.

During the standby-phase (in load-dependent extended cycle), the regenerated adsorber remains under operating pressure allowing an immediate switch over to the regenerated side. The current standby time is indicated on the display.

8.6.3 Alarm Conditions

Upon an alarm-situation, the controller automatically changes to "safety mode" as indicated on the display (only dewpoint controller). By pressing the mode button once, the error can be displayed. If several errors appear, it can be displayed by pressing the mode button again. If an alarm is triggered, it will switch the alarm-outlet terminal X8. The outlet switches a potential-free contact. A red LED located in the housing cover (Standard and dewpoint controller) will light up.

8.6.4 Alarm Inputs

The controller provides 2 alarm inputs. The condensate drain alarm is connected at terminal contact X11 – 2 and an optional differential pressure alarm is connected at terminal contacts X13 -2 and X13 – 3 (not used for the units HL ALD MSD). Both alarm-inputs are "normally open" contacts meaning if no alarm-input is used, a wire jumper must be installed there. "Normally open" contacts are used in order to protect against broken wires.

8.6.5 Software-generated Alarm (only dewpoint controller)

There are miscellaneous safety-functions in the controller function. Under certain conditions, the alarm will be triggered by the following conditions:

- Dewpoint transmitter open
- Dewpoint transmitter short
- Dewpoint pre-alarm
- Dewpoint alarm

8.6.6 Intermittent Operation

If a potential-free contact of the compressor is connected at terminals X12 - 2 and X12 - 3 (opens upon compressor operation), then intermittent operation becomes active (see also chapters **Fehler! Verweisquelle konnte nicht gefunden werden.** "Intermittent Operation"). At the beginning of the pressurizing-phase, the compressor run-time will be added up. At the end the adsorption-phase, that value will be compared to the set value (ex: 1 minute). If the time falls short of the set value, the controller closes the regeneration valves and switches to STAND BY mode. When the compressor starts again, the program will automatically continue.

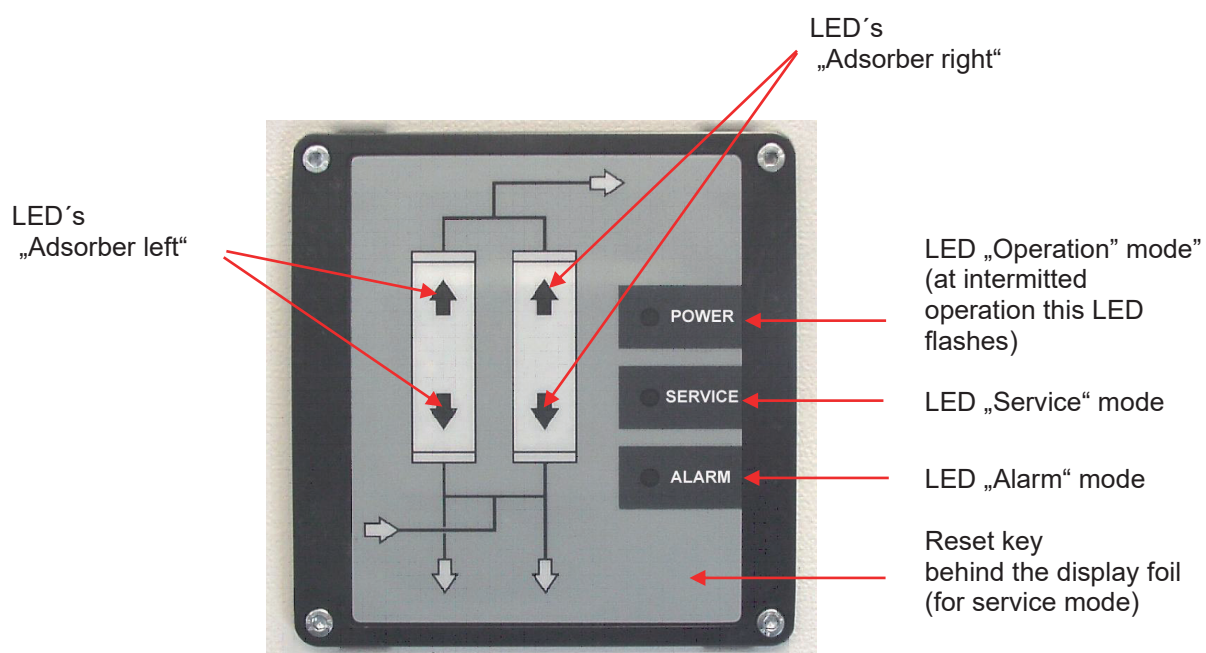
8.6.7 In Case of a Blackout

In case of a power failure, the controller will store its current position in the cycle. After switching on the power supply again, the controller will re-pressurize the system and resume operation at the point where the power failure occurred.

9 Operation

9.1 The Display (Standard-Version)

After start-up of the unit, the current operating-conditions will be indicated by LED's on the display. The controller operates automatically, no more user steps are required.



9.1.1 Service Messages (Standard Version)

There are 2 different service indications, in the operating mode by means of the service LED and in the service mode by means of adsorber LED's.

The indication of the messages is done with 3 different symbols:

Indication of the service LED in operating mode (flashing):

Service A = short-long / Service B = short-long-long / Service C = short-long-long-long.

Indication of the Service-LED in service mode:

3s permanent shining or 3x short flashing.

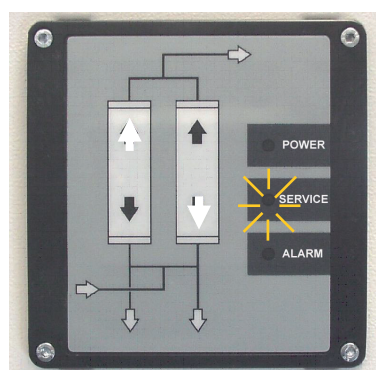
Indication of the adsorber LED's in service mode (flashing), the service message is activated, that means, the time for necessary service is reached.

Indication of the adsorber LED's in service mode (permanent shining), the service message is not activated, that means, the time for the necessary service is not reached. In operation mode this LED's indicate the current operating condition.

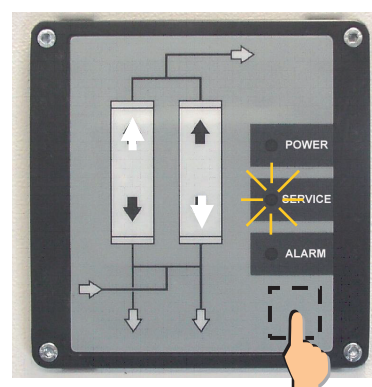


Service message in operating mode:

The service LED flashes, the corresponding adsorber LED's shine permanent and indicate the current operating condition.



Switching over to the service mode

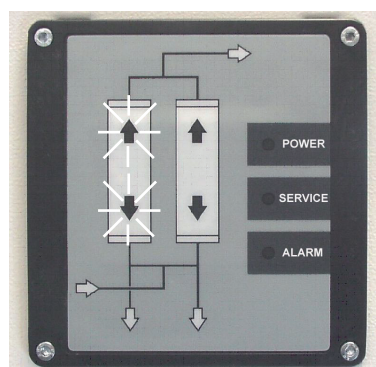


Press key for **3s**, the service LED shines permanent and is terminated after 3s.

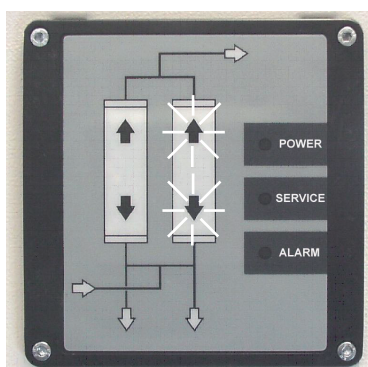
Hint: in the service mode the operating condition will **not** be indicated via the adsorber LED's

Service messages in service mode:

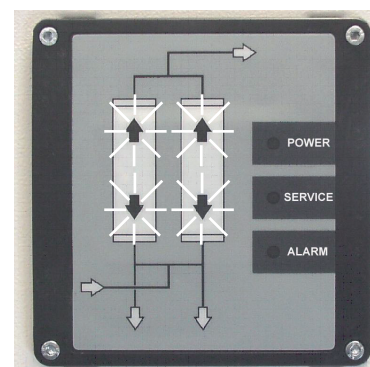
Service A (activated)



Service B (activated)

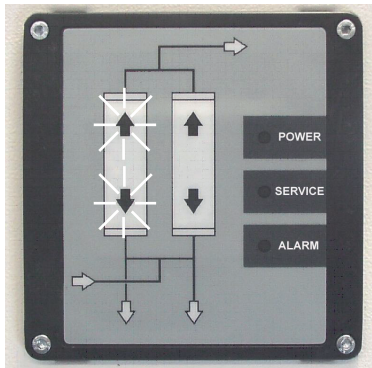


Service C (activated)

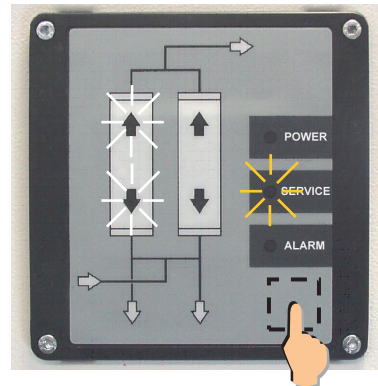


9.1.2 Reset of the Service Messages (Standard-Version)

**Example:
Service A (activated)**

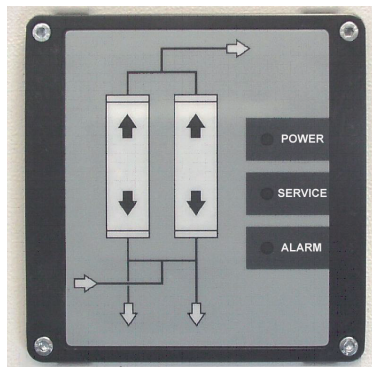


Reset



Press key for **3s**,
the service LED flashes 3x after
releasing the key

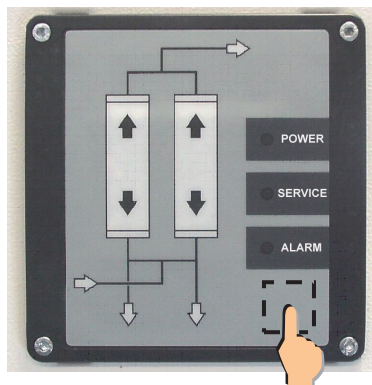
**Left adsorber LED's are
terminated**



No further key
actuation

**The service mode will
be left automatically
after 5s**

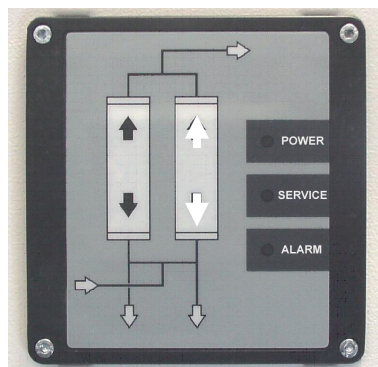
Scrolling in the service messages

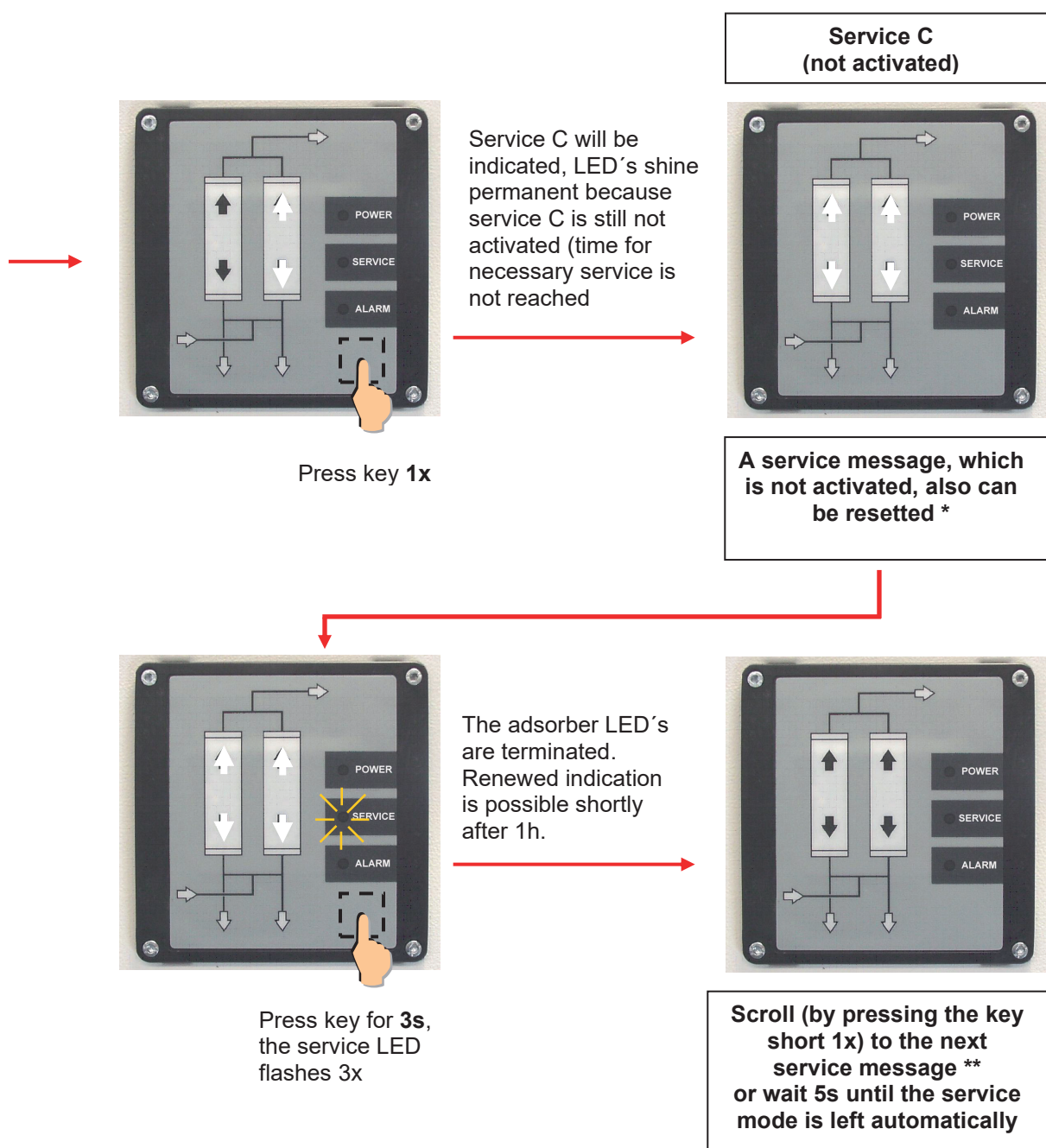


Press key **1x**

Service B will be
indicated, LED's shine
permanent, because
Service B is still not
activated (time for
necessary service is
not reached.

**Service B
(not activated)**





*** The aim of this function:**

Possibly together with service A also a service B or C is accomplished, although this would be not yet necessary. Then also the appropriate not yet active service messages must be resetted, in order to reposition the operating hours to "0".

**** Hint:**

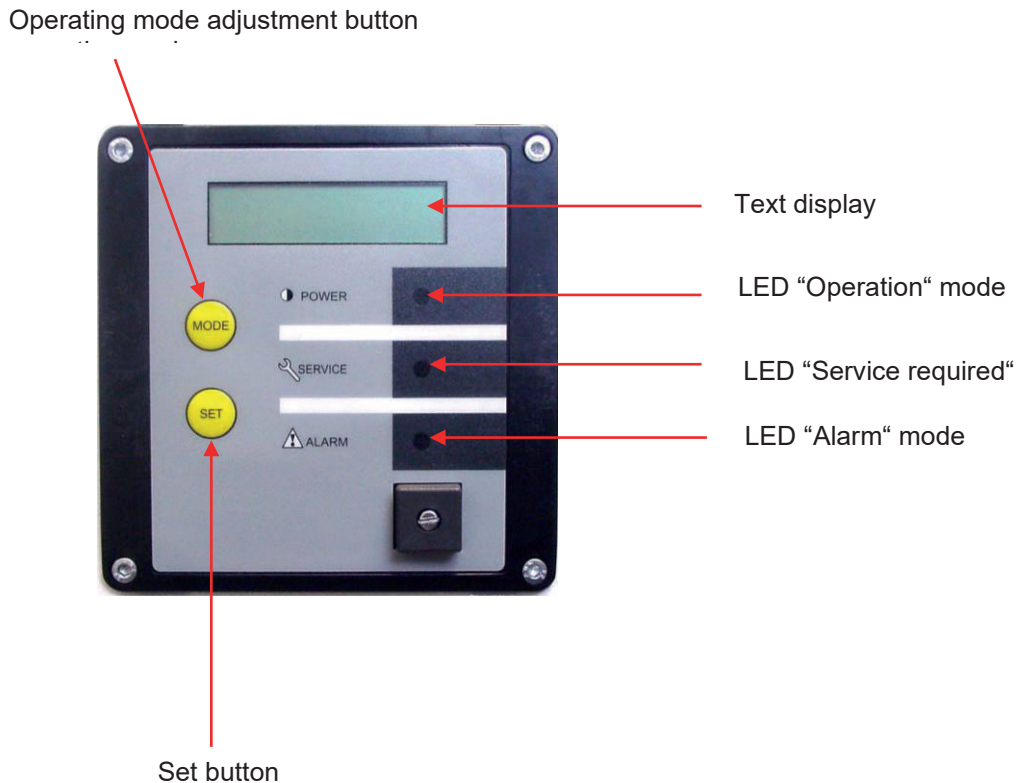
With first startup as well as after acknowledgement or resetting an active/ not active service in the service mode the adsorber LED's shine again permanently after 1h, which means, renewed acknowledging is possible only by leaving the service mode and renewed calling.

Hint:

Due to possible overlaps of the ends of the time intervals between service "A", "B" and "C" it can be, that, e.g. resetting of service "A" leads automatically also to resetting the service "B" or something else.

9.2 The Text Display (dewpoint controller)

After start-up and pressurization of the unit, the current operating conditions appear as text on the display.



9.2.1 Function of the Buttons

The "mode" - button scrolls down the main menu in a loop. After the last content is displayed, the first content is shown again.

By pressing the mode button and set button simultaneously for at least 3 seconds, the service level is activated, which accesses service messages, language selection, and other parameter settings.

Changing the Language Setting:

- Simultaneously press the "mode-button" and the "set - button" for at least 3 seconds.
- "Service mode 1.0" (revision level) appears in the display.
- Continue to press the mode-button until "country" appears in the display.
- Press the "set-button" for a minimum of 3 seconds.
- "Great Britain" text will blink on the display.
- By pressing the mode button, the country can be changed.
- Press the set-button for a minimum of 3 seconds to store the setting.
- If the button is not pressed within 10 seconds, a time-out will occur without storing the data.
- The selected country is shown on the display.

To exit the "second level"("service-level"), simultaneously press the "mode"-button and "set"-button for a minimum of 3 seconds.

The service-level automatically exits if no changes take place within 5 minutes (no button activity).

9.2.2 Display Contents

Current status of the settings and alarm or service messages are shown in the display.

Table 1 shows the different text messages. The menu consists of 2 levels:

- "First Level:" Display shows current operating conditions. Content can be scrolled down by pressing the mode button.

"Second Level" (service-level): Display is accessed by pressing the mode-button and the set-button simultaneously for a minimum of 3 seconds. Content can be scrolled down by pressing the mode button. Changes can be made as described in chapter 9.2.1.

Important: When restarting the unit (or after a power failure), the unit will always start re-pressurization.

Table 1: First level (without set-button)

Display Contents				
	Upper line	Lower line at dewpoint control	lower line at time control	Remark
Current operation	Dewp. Control ↑(↓)	Dewpoint= xx °C	-----	Automatically as main display (after 10 min.)
	Adsorption Right	Dewpoint= xx °C	xx:xx/Rest xx:xx	Alternating right/left
	Adsorption Left	Dewpoint= xx °C	xx:xx/Rest xx:xx	Alternating right/left
	Regen. Right	xx:xx/Rest xx:xx	xx:xx/Rest xx:xx	Alternating right/left
	Regen. Left	xx:xx/Rest xx:xx	xx:xx/Rest xx:xx	Alternating right/left
Statistic	Operating time	xxxxxx hrs.	xxxxxx hrs.	
	Stand-By	xxx:xx:xx hrs.	xxx:xx:xx hrs.	
	Oper. Time Ads.	xxxxxx hrs.	xxxxxx hrs.	Operation time of the desiccant
(from 06.2015)	Cycles total	xxxxxx	xxxxxx	6-digit number of cycles
(from 06.2015)	Cycles Ads.	xxxxxx	xxxxxx	6-digit number of cycles (will be resetted to "0" at service C).

	Upper line	Lower line at dewpoint control	lower line at time control	Remark
Action	Off-Line			Dryer runs in „off-line“. Display only if this function is caused (intermittent operation).
Service messages	Service A	replace !	replace !	Maximum life of consumable parts reached (indicated alternately at main display)
	Service C	replace !	replace !	Maximum life of desiccant reached (indicated alternately at main display)
	Transmitter	calibrate !		Annual calibration of dewpoint transmitter required
Alarm messages	Safety Mode			Safety operation (fix-operation) Displayed if alarm is triggered
	Dewpoint Alarm			Dewpoint alarm is triggered (failure)
	Short	Transmitter		Short of dewpoint-transmitter (failure)
	Open	Transmitter		Open wire on transmitter (failure)
	Failure			Electrical malfunction.

Table 2: Second Level (with set button)

Display contents				
	Upper line	Lower line at dewpoint control	Lower line at time control	Remark
Service Mode				Press the set-button (change happens if set-button is pressed >3s).
	Service Mode x.x			Number represents software version.
	Country	Great Britain		Country-Selection DE/ GB /NL/FR/IT/ES/P T/PL/DK/FI/ SE/NO/TR/CZ.
	Pressure	xx bar		1-16 bar adjustable.
	Temperature	xx °C		25-55°C in 5° degree adjustable increments.
	Switchover Dewp.	-48 °C		Switch over temperature Adjustable from 0 to -100°C (Preset -48°C).
	Dewpoint alarm	0 °C		Adjustable from +20 to -80°C or switch „Off“ Preset 0°C.
	Mode	Dewp. Control Dewpoint in Safe	Time Control	Selection dewpoint control or time control. Only at dewpoint alarm.
	Service A	Change ?	Change ?	Acknowledgement Service A (will be confirmed with “Change successful !”).
	Service A	done ?	done ?	
	Service C	Change ?	Change ?	Acknowledgement Service C (will be confirmed with “Change successful !”).
	Service C	done ?	done ?	

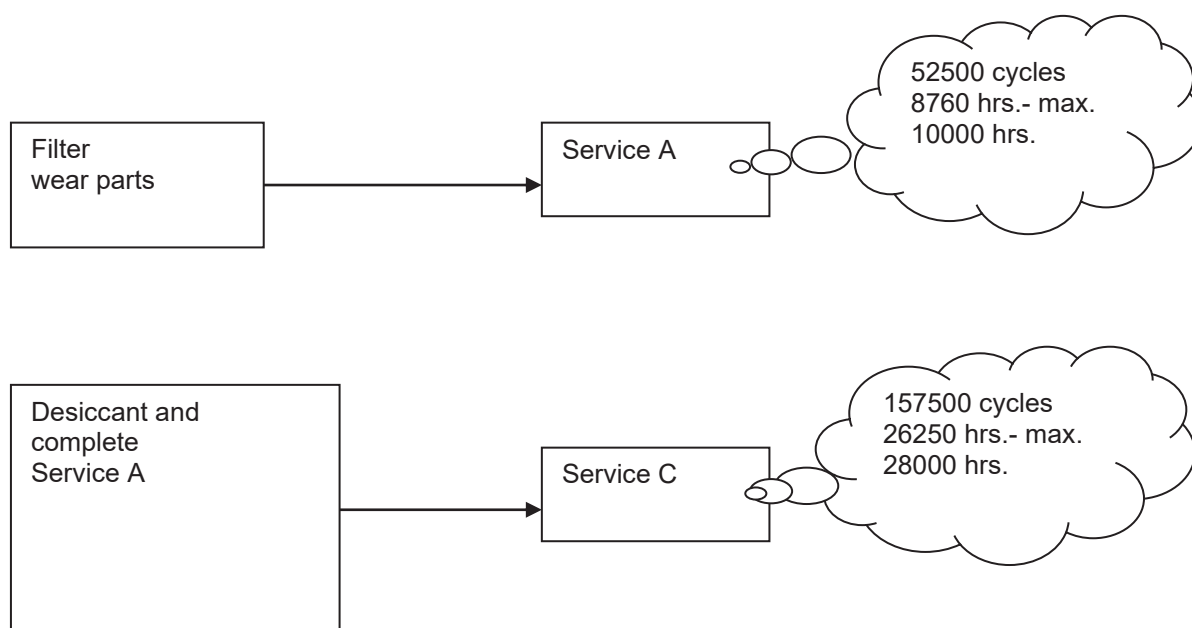
9.2.3 Service Intervals

Service A (annual maintenance interval) : Indication after 52500 cycles or 8760 hrs.

Service C: (triennial maintenance interval) : Indication after 157500 cycles or 28000 hrs.

9.2.4 Graphic Representation of the Service

To explain the service A to C more clearly, should be represented their formation and its contexts in a chart.



10 Malfunctions

In this chapter we will explain to you:

- which faults can occur
- the causes of problems
- which measures must be taken to correct problems. You can get an overview of this topic in the corresponding overview list (see chapter 10.2).

List all fault messages, operating states and parameters settings at the time of the malfunction.

In some troubleshooting instances, it is necessary to power down the unit. In such a case, please follow the below steps.

- Shut-down the unit.
Carry on the shut-down procedure described in chapter 7.2).
Put up a warning notice forbidding the start-up of the unit!
- Depressurize the unit as needed (see chapter 7.3).
- Restore the unit back to its original state after service.

Important: Corrective action may only be taken by assigned and trained personnel!

10.1 Possible Causes of Faults

Before identifying the cause of the malfunction, ensure the following areas are checked and in proper condition:

- Is there external unit damage or missing parts?
- Any power to the unit? Does the power being used correspond to the type listed on the type plate?
- Is the power supplied to all electrical components and modules within the unit?
- Are pneumatically-operated components supplied with the compressed air for control purposes? Does compressed air for control purposes meet the minimum pressure stated on the type plate?
- Was the start-up process carried out properly (see chapter 7.1 „Initial Startup“)?
- Are all external shut-off valves in their correct positions (see chapter 7.1 „Initial Start-up“)?
- Do the input parameters (max. throughput, min. operating pressure, max. inlet temperature) correspond to the data used for the design calculation ?

10.2 Troubleshooting

Troubleshooting tables are provided on the following pages.

Troubleshooting		
Symptom	Possible cause	Solution
Controller is inoperable: LEDs on display do not light up Alarm at the alarm output (connector block X11) is activated (if installed)	No power supply	Make sure, that the power supply, which is mentioned on the type plate, is available
	Fuse F1 is defective (see page 31)	Cut off the power supply to the controller. Check controller and replace fuse if necessary
	Controller defective	Check controller and replace it if necessary
		Contact after-sales service.
High differential pressure at dryer	Filter elements are dirty	Check differential pressure at filter casing (Econometer), replace filter elements if necessary
	Gas distributors in the vessels are blocked	Contact after-sales service
Shuttle valves (9) do not switch over (see P&I-diagrams on page Fehler! Textmarke nicht definiert.)	Solenoid valve (5) has not opened	Check solenoid valve and replace if necessary Shut down the unit (see chapter 7.2) and depressurize it (see chapter 7.3)
	Shuttle valve (9) is defective	Check shuttle valve, replace any defective parts if necessary Shut down the unit (see chapter 7.2) and depressurize it (see chapter 7.3)
	Controller defective	Check controller and replace it if necessary

Troubleshooting		
Symptom	Possible cause	Solution
Pressure gauge banks pressure during regeneration	Silencer is blocked	Dismantle and clean silencer, and replace if necessary Shut down the unit (see chapter 7.2) and depressurize it (see chapter 7.3)
	Gas distributor in adsorber is blocked	Contact after-sales service
Pressure gauge shows excessively low pressure during adsorption and the unit ventilates during the pressure build-up phase	Solenoid valve (5) is leaking or has not closed	Check solenoid valve and replace if necessary
	Shuttle valve (9) is leaking or has not switched over	Check shuttle valve and replace any defective parts if necessary Shut down the unit (see chapter 7.2) and depressurise it (see chapter 7.3)
Dewpoint is too high	Input conditions are not being maintained	Check the throughput, pressure and temperature of the medium, and reset the values if necessary
	Amount of air for regeneration is inadequate	Check solenoid valve for pressurizing Check regeneration air orifice Check sleeve gate for pressurizing
	Condensate is inside the dryer	Check prefilter and condensate discharge line, replace filter element or condensate discharge line if necessary Shut down the unit (see chapter 7.2) and depressurize it (see chapter 7.3)

11 Maintenance and Servicing

11.1 Maintenance Intervals

Filter elements

In order to ensure proper unit operation, the filter elements should be changed when prompted by the message on the display or after a maximum of 8760 operating or 1 year.

Desiccant

Oil in a liquid form can destroy the desiccant and restrict unit functioning. It is therefore necessary to ensure that the filter elements are replaced regularly.

Failure to ignore improper operating conditions (high inlet temperature or low operating pressure) can lead to desiccant overload causing unit malfunction.

In order to ensure proper unit operation, the desiccant should be changed when prompted by the message on the display or after a maximum of 26250 operating hours or 3 years.

Service-Inspection Checklist:

- 1) Visually check the adsorption dryers and filters
- 2) Checking of the pre-and afterfilter elements and the exchange of the filter elements
- 3) Test and clean the condensate drains.
- 4) Check all valves, clean and lubricate as needed!
- 5) Check the silencer and exchange as needed
- 6) Check all electrical components and indicator lamps!
- 7) Check adsorbent and exchange according to service schedule!
- 8) Test leakage under pressure!
- 9) Test and run adjacent controller.
- 10) Check the switch over of the adsorption dryer
- 11) Start the dryer
- 12) Check compressed air quality
- 13) Record data and inspection information in a service report

The manufacturer recommends the following maintenance schedule within the stated intervals.

Type	Size Remark	3 months	12 months	3 years
HL – ALG / HL-OFP	0100 - 1000			
Service inspection	Check/ Clean: - Condensate Drain - Silencer - Solenoid valve Check: - Adsorber, desiccant	X		
Service Kit A			X	
Recalibration dewpoint transmitter	Dewpoint controller		X	
Carepac (Service C)				X
Replacement Filling AK / OX (ALG)*			X	
Replacement Filling AK (OFP)*			X	

*

***Manufacturer's recommendation:**

Annual change of replacement fillings together with the service kit (depending on the application)

- AK / OX (HL-ALG)
- AK (HL-OFP)

11.2 Service-Sets

Article-No. Service Kit (Service A) Carepac (Service C)			
Typ	Service A HL - ALG / HL-OFP	Service C HL-ALG	Service C HL-OFP
0100	On Inquiry	On Inquiry	On Inquiry
0150	On Inquiry	On Inquiry	On Inquiry
0175	On Inquiry	On Inquiry	On Inquiry
0225	On Inquiry	On Inquiry	On Inquiry
0300	On Inquiry	On Inquiry	On Inquiry
0375	On Inquiry	On Inquiry	On Inquiry
0550	On Inquiry	On Inquiry	On Inquiry
0650	On Inquiry	On Inquiry	On Inquiry
0850	On Inquiry	On Inquiry	On Inquiry
1000	On Inquiry	On Inquiry	On Inquiry

Content Service Kits HL – ALD-MSD		
Type	Service Kit A	Carepac C
0100 - 1000	Filter elements / O-Rings Set of wear parts solenoid valves Set of wear parts condensate drain Silencers	Filter elements / O-Rings Adsorbens / Gas Distributor Set of wear parts solenoid valves Set of wear parts condensate drain Silencers Set of wear parts shuttle valves Body disk lower shuttle valve Orifice body disk upper shuttle valve* (Regeneration air orifice @ 7 bar)

11.3 Regeneration Air Orifice

The regeneration air orifice contained in the upper shuttle valve is supplied with the hole for standard conditions at 7 bar.

Please use the following table to determine the regeneration air orifice for a different operating pressure. This can be adjusted after delivery or during servicing.

How to find the correct orifice bobbin

1. Choose the right name and size of your dryer
For example: HL-ALD 0650
2. Determine the operating pressure
For example: 8,5 bar[g]
3. Find the orifice diameter in the table
For example: in this case 6.0 mm (line ALD 0650, column 8 bar[g])
4. Choose the right article-no.
For example: 1C963709-O60

Type / Size	Minimum operating pressure												Article-No.
ALD	4	5	6	7	8	9	10	11	12	13	14 - 16	[bar g]	
0100	3.0	3.0	2.5	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0	[mm]	1C963707-Oxx
0150	3.5	3.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.0	[mm]	1C963707-Oxx
0175	4.0	3.5	3.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	2.5	[mm]	1C963708-Oxx
0225	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0	3.0	3.0	2.5	[mm]	1C963708-Oxx
0300	5.0	4.5	4.5	4.0	4.0	3.5	3.5	3.5	3.5	3.0	3.0	[mm]	1C963708-Oxx
0375	5.5	5.0	5.0	4.5	4.5	4.0	4.0	4.0	3.5	3.5	3.5	[mm]	1C963708-Oxx
0550	7.0	7.0	6.0	6.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	[mm]	1C963709-Oxx
0650	7.5	7.0	7.0	6.0	6.0	6.0	5.0	5.0	4.5	4.5	4.5	[mm]	1C963709-Oxx
0850	8.5	8.5	7.0	7.0	7.0	6.0	6.0	5.5	5.5	5.0	5.0	[mm]	1C963709-Oxx
1000	9.0	9.0	8.0	8.0	7.0	7.0	6.5	6.5	6.5	5.5	5.5	[mm]	1C963709-Oxx

Type / Size	Minimum operating pressure												Article-No.
MSD ALG OFP	4	5	6	7	8	9	10	11	12	13	14-16	[bar g]	
0100	3.5	3.0	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.0	2.0	[mm]	1C963707-Oxx
0150	4.0	4.0	3.5	3.5	3.0	3.0	3.0	3.0	2.5	2.5	2.5	[mm]	1C963707-Oxx
0175	4.5	4.0	4.0	3.5	3.5	3.5	3.0	3.0	3.0	3.0	2.5	[mm]	1C963708-Oxx
0225	5.0	4.5	4.5	4.0	4.0	3.5	3.5	3.5	3.5	3.0	3.0	[mm]	1C963708-Oxx
0300	6.0	6.0	5.0	5.0	5.0	4.0	4.0	4.0	3.5	3.5	3.5	[mm]	1C963708-Oxx
0375	6.5	6.5	5.5	5.5	5.5	4.5	4.5	4.5	4.0	4.0	4.0	[mm]	1C963708-Oxx
0550	8.0	7.0	7.0	7.0	6.0	6.0	6.0	5.0	5.0	5.0	4.5	[mm]	1C963709-Oxx
0650	8.5	8.5	7.5	7.5	6.5	6.5	6.5	5.5	5.5	5.0	5.0	[mm]	1C963709-Oxx
0850	10.0	10.0	8.5	8.5	8.5	7.0	7.0	7.0	6.0	6.0	6.0	[mm]	1C963709-Oxx
1000	10.5	10.5	9.0	9.0	8.0	8.0	7.0	7.0	7.0	7.0	6.0	[mm]	1C963709-Oxx

Examples:

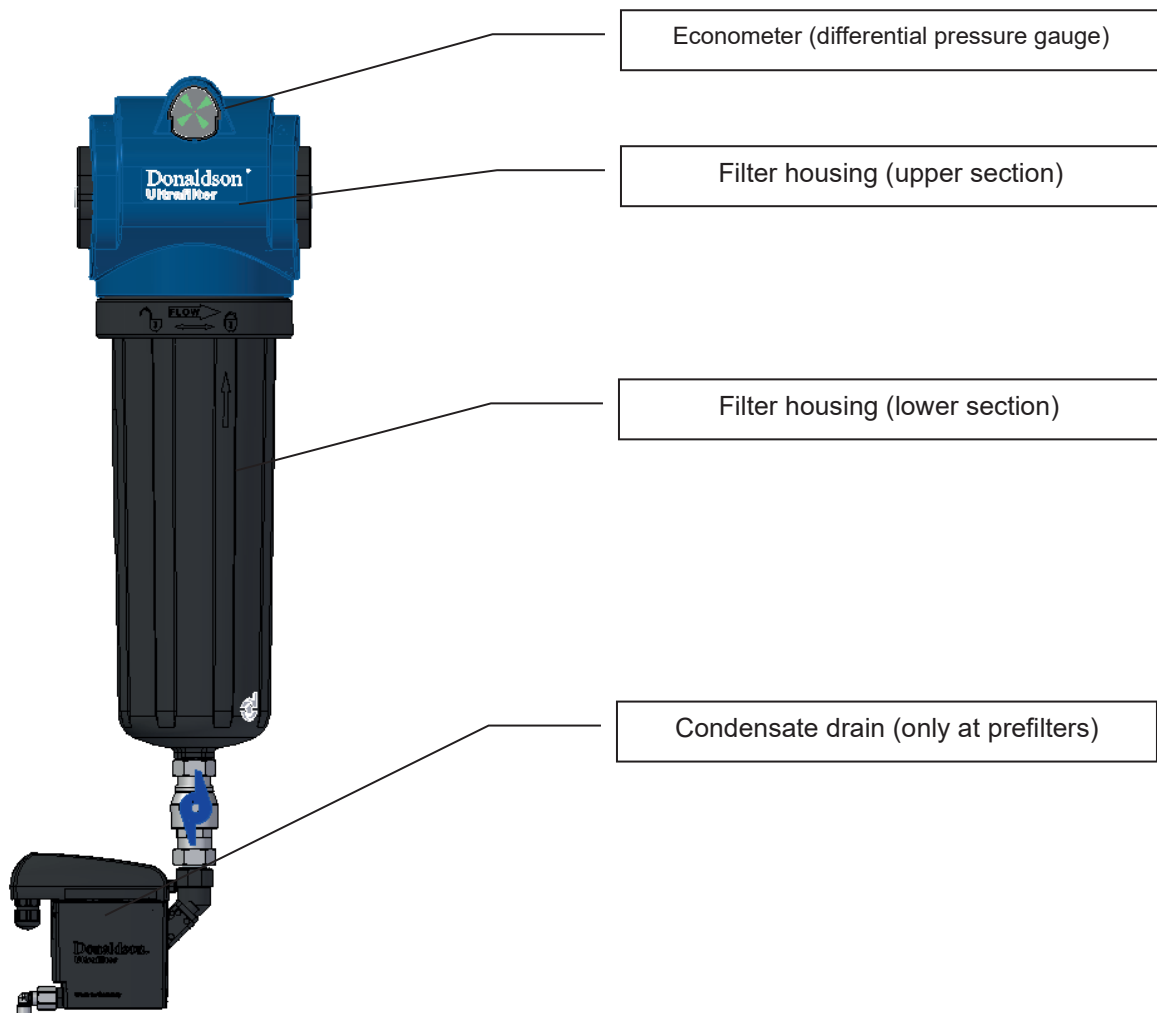
HL-ALD 0300 / 12,0 bar[g] : 1C963708-O30
 HL-ALD 0100 / 15,0 bar[g] : 1C963707-O20
 HL-MSD 0850 / 4,5 bar[g] : 1C963709-O100
 HL-ALG 1000 / 5,5 bar[g] : 1C963709-O105

11.4 Maintenance Filter

Check loss of pressure

Interval: monthly

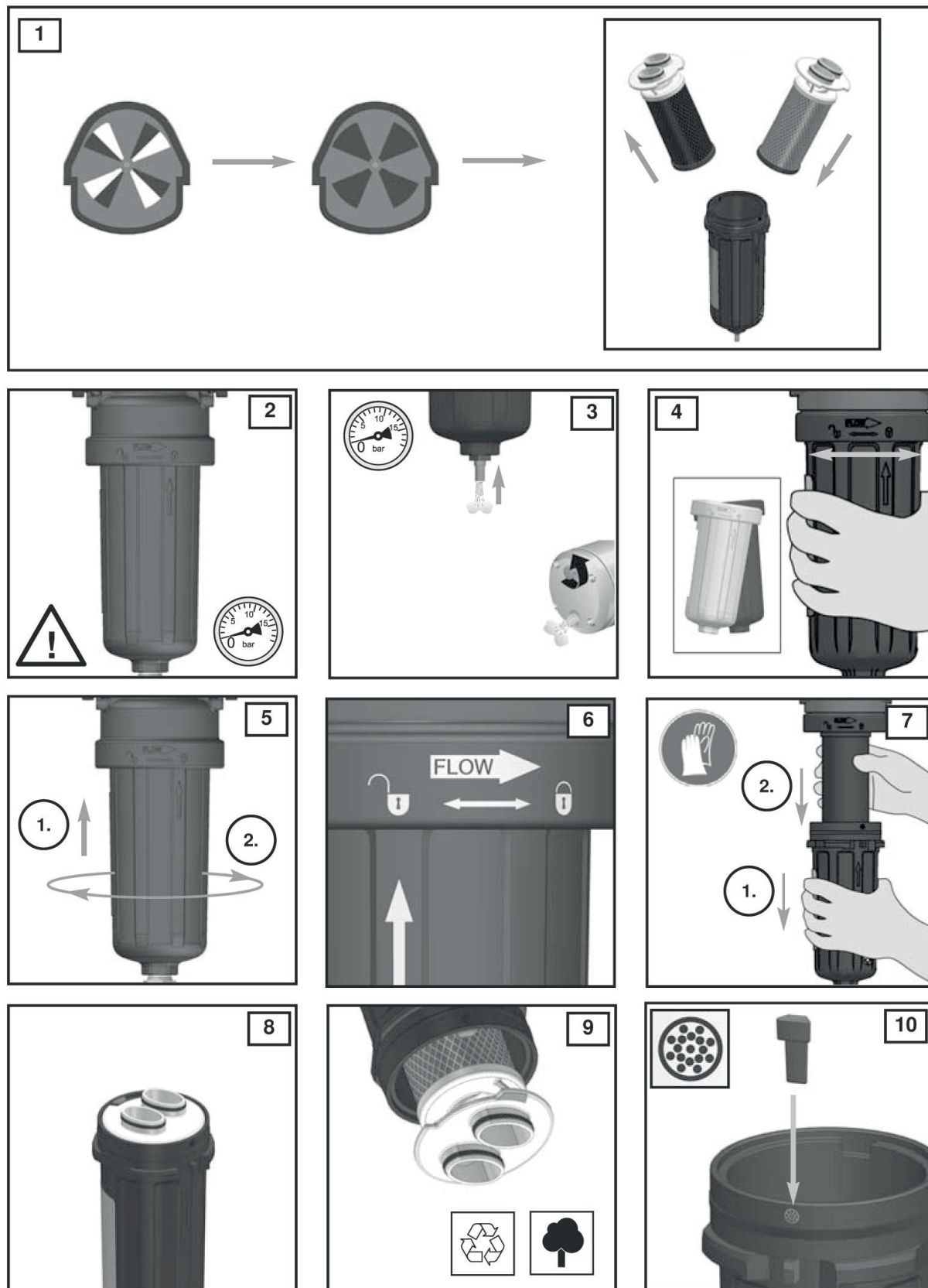
Check for filter pressure loss at the Econometer!
(differential pressure indicator) during unit operation.



Pre-filter with condensate drain

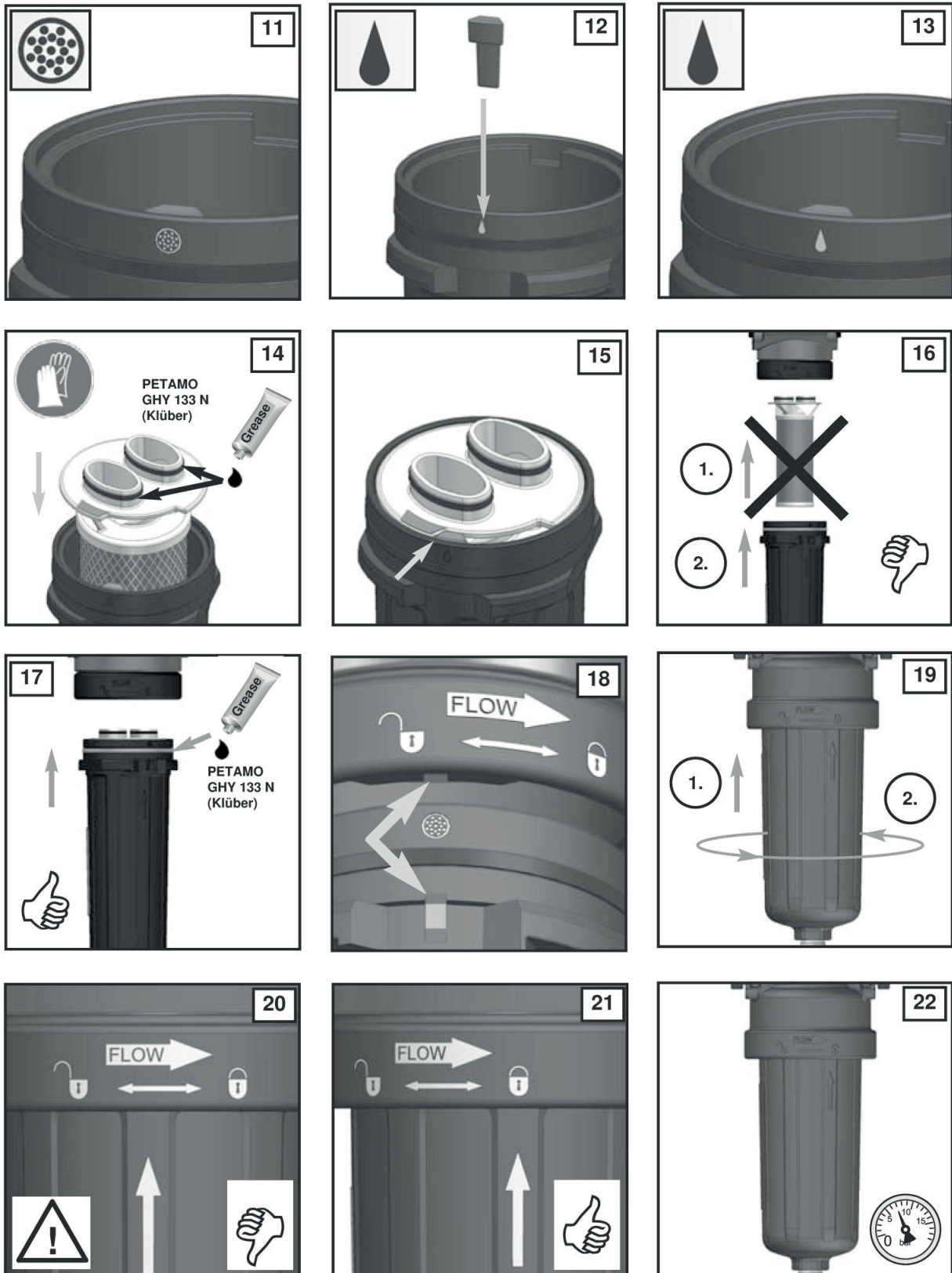
Replacing filter elements

Interval: every 8760 hrs



Pictures 10 + 11: Afterfilter.
 Pictures 12 + 13: Prefilter.

These steps are only necessary, if the manufacturer-installed clip is damaged or lost.



11.5 Maintenance Condensate Drain



Danger!

Compressed air!

Risk of serious injury or death through contact with quickly or suddenly escaping compressed air or through bursting plant components or plant components which are not secured.

Measures:

- Do not exceed the maximum operating pressure (see type plate).
- Only carry out service measures when the system is pressureless.
- Use pressure-resistant installation material only.
- The feed pipe must be tubed firmly. Discharge pipe: short, fixed pressure hose onto pressure-resistant pipe.
- Make sure that persons or objects cannot be hit by condensate or escaping compressed air.



Danger!

Supply voltage!

There is the risk of an electric shock involving injury or death when coming into contact with non-insulated components carrying supply voltage.

Measures:

- During electric installations, all regulations in force need to be adhered to (e.g. VDE 0100 / IEC 60364).
- When the control unit is open, service and installation works must only be undertaken when the system is deactivated.
- The removed control unit has no IP degree of protection.
- All types of electrical works must be carried out by authorised and qualified personnel only.



Caution!

Malfunction during operation!

Through incorrect installation and poor maintenance, malfunction may occur at the D05.

Condensate which is not discharged may cause damage to plants and in production processes.

Measures:

- Condensate drainage which is reliable in performance directly optimises the compressed-air quality.
- To prevent damage and breakdowns, it is imperative to observe the following:
 - Exact compliance with the specifications of use and with the performance parameters of the D05, in connection with the case of application (see "Proper use" section)
 - Exact compliance with the installation- and operation instructions in this manual
 - Regular maintenance and control of the D05 in accordance with the instructions in this operating manual



Note:

It is imperative to observe all hazard statements and warnings listed here.

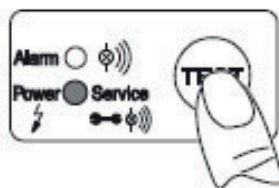
Please also observe all regulations and notes regarding industrial safety and fire prevention at the place of installation.

As a matter of principle, only use suitable and appropriate tools and materials in a proper condition.

Do not use aggressive cleaners and improper devices such as high-pressure cleaners.

Please note that condensates may contain aggressive or harmful components. Therefore, skin contact should be avoided.

Condensate is subject to mandatory waste disposal. As such, it must be collected in suitable containers, and disposed of or processed properly.

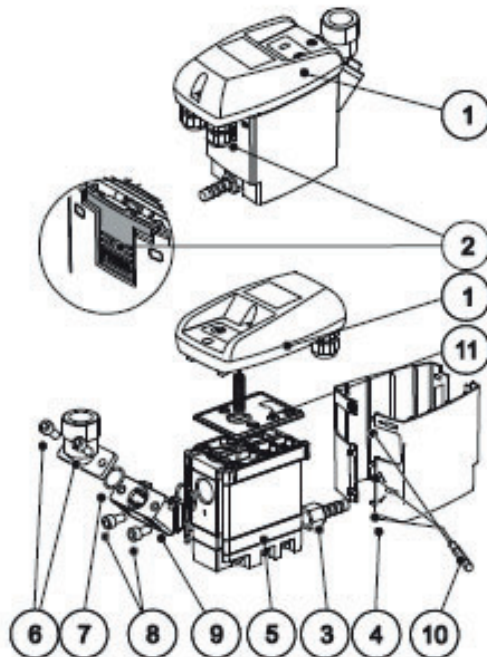


Maintenance recommendation:

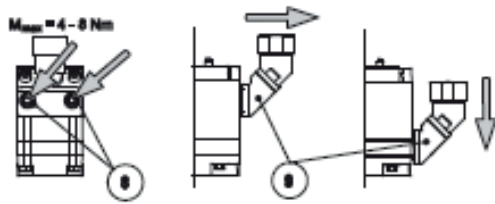
After 2 x 8,760 operating hours or one million switching cycles, a maintenance message is released.

The green power LED flashes. Afterwards, or at the latest after two years (2 x 8,760 operating hours), the service unit (5) needs to be replaced.

1. Prior to the replacement of the service unit, a reset needs to be carried out. The control unit is released by actuating the arresting hook. When removed, the TEST button below the LED must be pressed and held for at least five seconds.

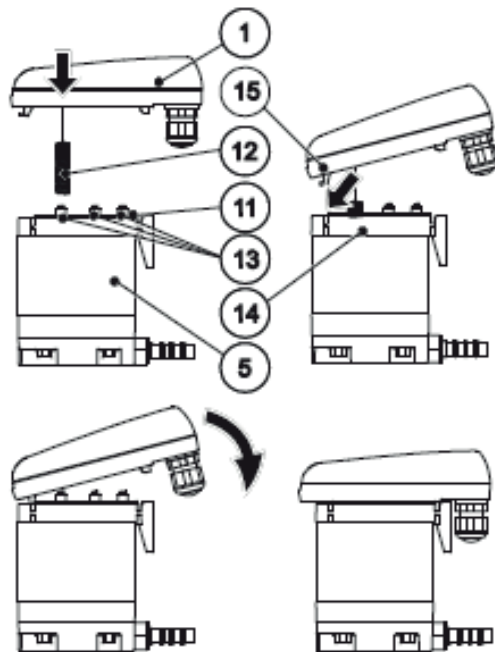


2. Remove the control unit (1) by pressing the arresting hook (2)
3. Unfasten the D05 from the outlet (3).
4. Remove the design shell (4) (if there is one) using a screwdriver (10).
5. Detach the service unit (5) from the tubing at the inlet by removing the union nut.
6. or remove the screws (6) from the angle nozzle (7).



7. or remove the screws (8) at the intermediate adapter (9) and remove the latter from the service unit by pulling it downwards.
8. Check whether or not the new service unit (5) goes with the control unit (1).
(model designation and colour of the arresting hook (2)).

9. Installation of the new service unit (5) in reverse order.



Installation of the control unit on the service unit:

1. Check whether or not the service unit (5) goes with the control unit (1) (model designation and colour of the arresting hook).
2. Check whether or not the sealing mat (11) and the contact springs (13) are clean, dry, and free from impurities.
3. Introduce the sensor (12) into the sensor tube plate (14).
4. Hang the hook (15) of the control unit (1) in the sensor tube plate (14).
5. Press the control unit (1) against the service unit (5) and snap into place.

Start-up subsequent to maintenance measures:

Always carry out prior to the start-up:

- Leak test of the screwed connector
- Check of the electrical connections
- Check of the correct engagement of the control unit

11.5.1 Troubleshooting / Fault elimination

Symptoms	Possible reasons	Measures
 LED does not light up	Supply voltage incorrect Circuit board defective	Check voltage on the type plate Check the connections and the supply voltage Check the circuit boards for possible damage
 LED lights continuously orange	Failure during the start of the programme Circuit board defective	Separate the device from the supply voltage and reactivate after > 5 s Check the circuit boards for possible damage
 Test button pressed, but no condensate discharge	Feed pipe and/or discharge pipe blocked or obstructed Wear and tear Circuit board defective Service unit defective Minimum pressure not reached Maximum pressure exceeded	Check feed and discharge pipe Check whether or not the valve opens audibly (press the test button several times for > 2 seconds) Check the circuit board for possible damage Check the operating pressure
 Condensate discharge only when the test button is pressed	Feed pipe without sufficient slope Cross section not large enough Condensate accumulation too high (surge) Service unit extremely dirty	Install feed pipe with a slope Replace the service unit
 Device blows off continuously	Service unit defective or dirty	Replace the service unit

11.6 Maintenance – 2/2-Way Solenoid Valve

Preventive maintenance and cleaning of the 2/2 Way Solenoid Valve are recommended in accordance with operating-conditions and with noticeable change of the switch-times or switch-sounds. According to environment conditions, the solenoid and the electric connection on the solid seat and certain insulation should be checked at regular intervals for rips and contamination.

The operator is responsible for scheduling preventive maintenance based on the operating condition of the valve. Service may be enforced only from trained personnel and with suitable tools. Spare parts are available in the form of service kits. The order-numbers are to be found in the parts lists in the appendix.

Sediments, filth, aged or worn-out parts can lead to malfunctions.



Service may be carried out only with depressurized piping-system and disconnected solenoids. Dismantling the valve from the pipeline is not necessary.

Mounting

Inspect solenoid valve for signs of external damage. Clean pipework before mounting valve. Remove dust caps from the connections before mounting it in the pipe system. Use recommended PTFE tape to seal the G connection thread. Avoid distorting the body of the valve in misaligned pipework or by using inappropriate tools or sealing material.

Do not use the solenoid as a lever!

The valve may be mounted in any position. However, there is less risk of wear and dirt contamination of the solenoid if it is positioned upright.

Electrical Connection

Connect solenoid in accordance with electrical regulations. Then close the terminal compartment carefully to restore protection. Make sure the cable entry is sealed properly and the seal between solenoid and power lead socket is properly seated. IP65 protection is achieved if the procedure is performed properly. Tighten the central screw of the power lead socket to a maximum torque of 60 Ncm.

The housing must not show signs of distortion.

Ensure correct polarity of terminals marked + and -.

Unmarked supply wires can be connected either way around.

Caution! It is vital to connect the ground wire to the appropriately marked terminal provided!



It is advisable to carry out an operating test before pressurizing. The clicking (impact) of the plunger must be heard during switching. Ensure the power is switched off before connecting the valve!

Operating AC solenoids without the plunger and plunger tube will cause them to burn out!

NC Function

Normally closed:

The compression spring in the plunger closes the pilot seat. A closing spring forces the diaphragm onto the main seat of the valve. The process fluid flows through the bleed orifice in the diaphragm into the actuator compartment above and increases the closing force.

Open position:

When the power is switched on, the magnetic force pulls the plunger against the pole face of the tube. Though the now open pilot seat, the pressure in the actuator compartment is released through the valve outlet.

As more fluid flows out of the actuator compartment through the pilot seat, additional fluid is replenished from the bleed orifice in the diaphragm. As a result, the differential pressure lifts the diaphragm and the main seat of the valve is opened.

Troubleshooting

No working: The control voltage measured immediately before the solenoid must be > 90% of its nominal value. If it is lower than this value or a long cable is used, a heavier conductor must be chosen to keep the voltage drop minimal.

Fuse loose or blown:	Check fuse.
Solenoid faulty, no continuity:	Replace solenoid
Operating pressure excessive:	Check and reduce maximum
Diaphragm cracked:	Replace diaphragm
Valve dirty:	Clean control passages
Plunger jammed:	Clean plunger and its tube

Valve seat leaking: Clean valve and replace diaphragm if seat very dirty.

Replacing solenoid

Switch off power supply. Unscrew central screw of power lead socket and remove socket. Release Click-on® spring clip and pull solenoid off. Replace O-ring on plunger tube if hard. Slip the new solenoid onto the tube so that the spring clip slides in the slot. Press clip until it engages for firmly into the seating. Turn solenoid to required position and fit the power lead socket with seal. Tighten central screw of the power-led socket to a maximum of 60 Ncm.

Replacing diaphragm

Depressurize valve and switch off the power supply. Disengage Click-on® spring clip and pull solenoid off. Unscrew valve cover screws and remove cover. Remove compression spring and diaphragm. Mount new diaphragm on valve body as shown in diagram. Replace valve cover and tighten its screws diagonally.

Screw tightening torque:	M4	= 2,0 Nm±10%
	M5	= 3,6 Nm±10%
	M6	= 6,0 Nm±10%
	M8	= 16,0 Nm±10%
	M10	= 31,0 Nm±10%

Replacing plunger for NC function

Depressurise the valve and switch off the power supply. Disengage Click-on® spring clip and pull solenoid off. Replace O-ring on plunger tube if hard. Unscrew 22 mm screw piece. Remove plunger tube with screw piece and Click-on® clip. Remove O-ring from the groove. Replace compression spring and plunger. Push new O-ring into the collar of the plunger tube and fit tube as shown in the diagram. The O-ring is forced into the sealing position by screwing in the screw piece. Tighten the screw piece to a torque of 20 Nm $\pm$ 10%.

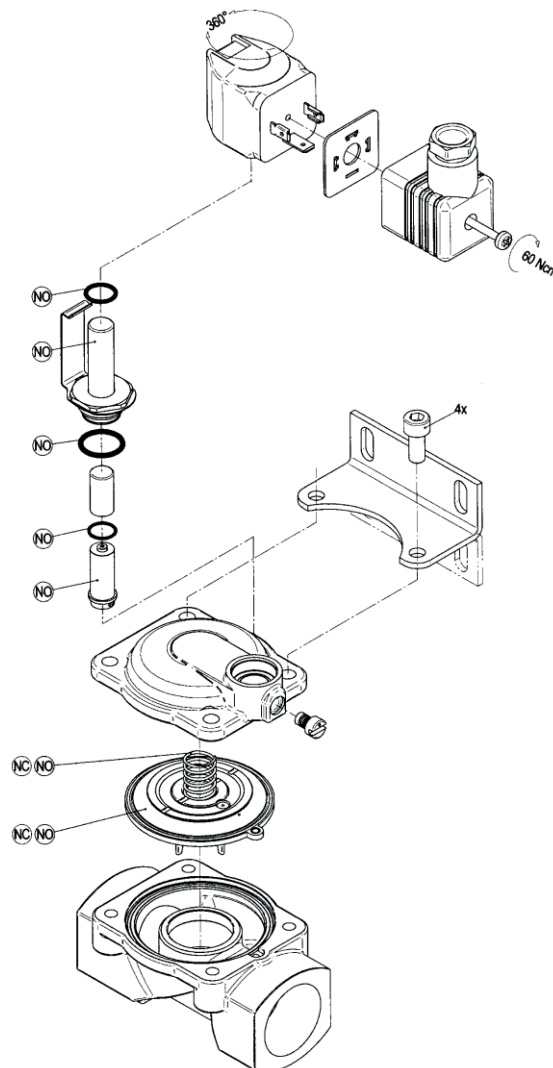
Replacing manual override

Depressurize valve and switch off power supply. Disengage Click-on® spring clip and pull the solenoid off. Replace O-ring on plunger tube if hard. Unscrew 22 mm screw piece. Remove plunger tube with screw piece and Click-on® clip. Remove O-ring from the groove.

Replace manual override. Push new O-ring into the collar of the plunger tube and fit tube as shown in the diagram. The collar of the plunger tube must engage in the groove of the manual override. The O-ring is forced into the sealing position by screwing in the screw piece. Tighten the screw piece to a torque of 20 Nm $\pm$ 10%.

Fig. „Spare Parts“

„NC“ and „NO“marked parts are available as “wear and tear-parts set” (see spare part list at appendix).



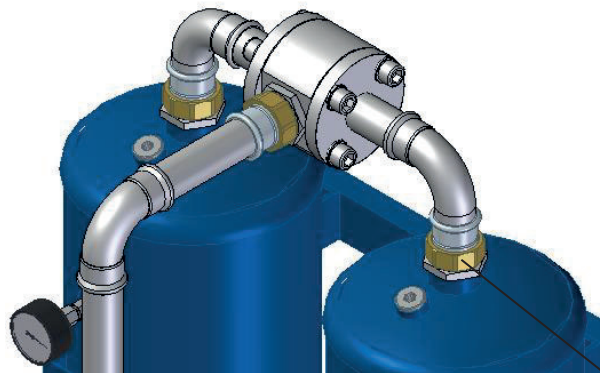
11.7 Maintenance – Shuttle Valves



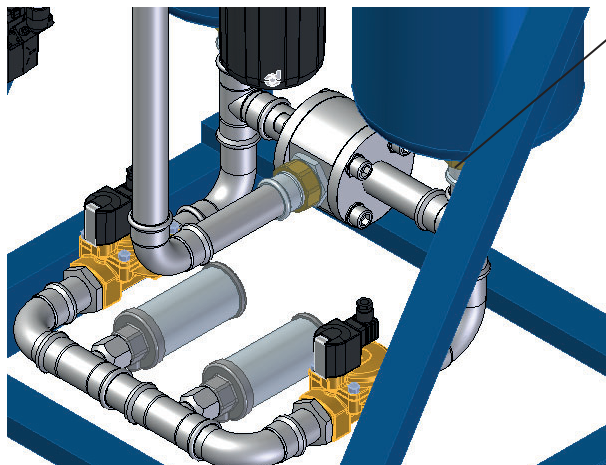
Caution!

Maintenance work on the shuttle valves may only be performed by qualified and especially trained personnel.

1. Shutdown the unit.
2. Depressurize the unit.
3. Dismantle the entire upper section of the lower piping of the adsorption dryer from the tank or the piping. Unscrew the connecting nut on the threaded connections (1).



1



4. Dismantle the shuttle valve as follows:

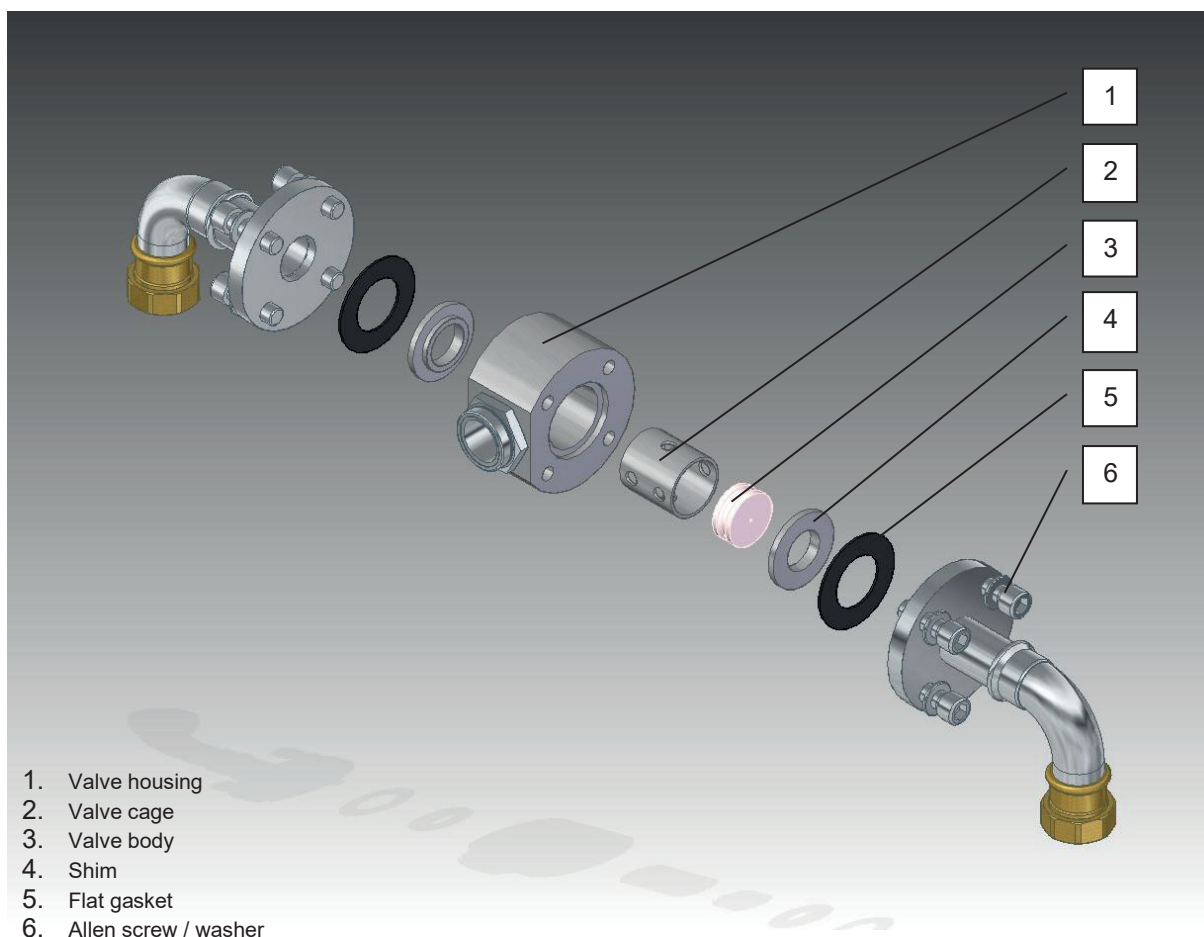
- Remove the allen screws (6)
- Remove the shuttle valve housing (1)
- Remove the shims (4)
- Replace the valve cage (2) and valve body (3)
- Reassembly the parts in reverse order
- Ensure the correct seating of the valve cage (2) and shim (4)
- Use new flat gaskets (5) for sealing



Please note that the valve body for the upper shuttle valve has a bore. Otherwise, no regeneration and no pressure build-up takes place. The valve body for the lower shuttle valve must not have a hole.



Please note the following when tightening the allen screws
max. torque (M12:40Nm / M16: 95Nm)



1. Valve housing
2. Valve cage
3. Valve body
4. Shim
5. Flat gasket
6. Allen screw / washer

5. Mount the complete upper and lower pipe back on the adsorption dryer .
Connect the three union nuts of the threaded connections on the tank or the pipe
6. Use new flat gasket for sealing glands.
7. Return the system under pressure.

8. Start the operation of the system again

11.8 Exchange of Desiccant / Adsorbents

Exchange of adsorbents

Caution! Exchanging adsorbents may only be performed by qualified trained personnel.

Interval: 26250 operating hrs or 3 years



Warning!
Risk of injury through eye contact!

- If the adsorbent gets into contact with the eyes, flush them with copious amounts clean water. Medical attention should be sought in all cases.

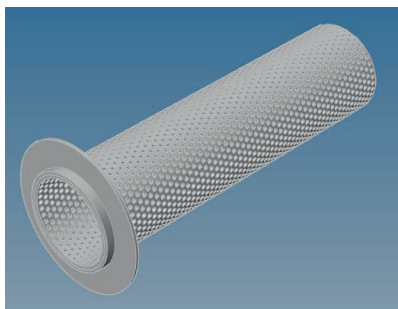


Warning!
Risk of injury if swallowed!

- Medical attention should be sought immediately.

When emptying and refilling the adsorber, always use a dust-mask (recommended dust protection-stage P2 respectively FFP2).

1. Shut down the unit.
2. Depressurize the unit.
3. Dismantle the complete upper section of the lower pipe of the adsorption dryer, respectively the 3rd vessel. Unscrew the ring nut on the screwed connections at the adsorber and the shuttle valve housings. At the activated carbon adsorber, only the ring nuts of the screwed connections at the vessel must be loosened.
4. Provide a sufficient number of vessels (plastic-sacks or pails) in order to catch the entire amount of adsorbent from the vessels.
5. Gas distributors are located under a flat seals at each end of the vessel to contain the adsorbent in the. Carefully pull out the lower gas distributor and catch the adsorbent in the container.



Tip: A vacuum cleaner may also be used to remove adsorbents from the adsorber.

6. After emptying the vessel, re-insert the gas distributor into the lower connection of the vessel. Ensure that the gas distributor is secured between the two flat-seals.
7. Install the lower pipe.
8. Remove the gas distributor from the upper connection of the vessel.
9. Refill the vessel with new adsorbent. While refilling, strike the vessel with a rubber hammer to compress the adsorbent.
10. Re-insert the gas distributor into the upper connection of the vessel. Ensure that the gas distributor is secured between the two flat-seals.
11. Install the upper pipe.

Pressurize the system and check all installed connections for leakage.

12 Options and Accessories

Available accessories:

- Power supply : 24VDC or 115V / 50-60Hz
- Additional dewpoint signal : 4-20 mA for Superplus type
- Orifice : acc. Operation pressure
- Tropical temperatures : Ambient: up to +40°C / Inlet: up to +50°C
- Pressure dew point: : MSD: $(-70^{\circ}\text{C} \leq \text{PDP} \leq -40^{\circ}\text{C})$
- Wooden Packaging : Vertical / Horizontal (seaworthy/airfreight)

Information on options and accessories for the dryer can be found in chapter 13.7.

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 appropriate safety requirements.

13 Appendix

13.1 Technical Data

13.2 P & I – Diagram

13.3 Dimension Sheet

13.4 Overview Drawing

13.5 Instrument and Spare Parts List

13.6 Electrical Documentation

13.7 Manufacturer and Accessory Documentation

14.1 Technische Daten**14.1 Datos técnicos****14.1 Données techniques****14.1 Tekniske data****14.1 Tekniska data****14.1 Technical Data****14.1 Dados técnicos****14.1 Technische gegevens****14.1 Dati tecnici****14.1 Tekniske data**

PRODUCT DESCRIPTION

TECHNICAL DATA

Adsorber Vessel

Pressure Vessel Material	Carbon steel
Design Data	Design pressure: 16 bar g Design temperature: -10°C / +60°C
Design, Manufacturing and Testing	Acc. to AD2000 / PED 2014/29/EU
Flow Distributor Material	Stainless steel

Piping

Design Data	Flange pressure rating: PN16 Design pressure: 16 bar g Design temperature: 60°C
Piping Material	Carbon steel, galvanized
Design, Manufacturing and Testing	Acc. to PED 2014/68/EU

Filters

Design Data	Design pressure: 16 bar g Design temperature: 65°C
Filter Housing Material	Aluminium
Design, Manufacturing and Testing	Acc. to PED 2014/68/EU

Electrical Controller

Design	Circuit board controller with LED indicators (Standard) or LCD text display (Superplus)
Power Supply	230 V AC 50-60 Hz (Standard), 24 V DC (optional), 115 V AC 50-60Hz (optional)
Protection Class	IP 54, acc. to IEC/EN 60529
Potential-Free Alarm Contact	Included
Remote On/Off Contact	Included

PRODUCT DESCRIPTION

TECHNICAL DATA

Nominal Standard Conditions

Pressure Dewpoint	-40°C (at 7 bar g), -70°C...-40°C (depending on sizing and operating conditions)
Operating Inlet Pressure	7 bar g
Operating Inlet Temperature	35°C
Inlet Humidity	100% saturated

Compressed Air Purity

Achievable Compressed Air Purity Classes acc. to ISO 8573-1:2010	HL - ALG: 1-2 : 1-2 : 1
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Breathing Air Purity (residual content of impurity at standard condition at the entry)

Particles	Class 1-2 : ISO 8573-1
Oil (liquid phase)	< 0,01 mg/m ³ (class 1, ISO 8573-1)
Oil vapour and hydrocarbon	< 0,01 mg/m ³ (class 1, ISO 8573-1)
Water vapour	PDP-40°C (= 0,11 g/m ³) (class 2, ISO 8573-1)
CO ₂	< 500 ppm
CO	< 5 ppm
SO ₂	< 1 ppm
NO _x	< 2 ppm

Operating Limits

Media	Compressed Air / Nitrogen
Operating Pressure	4 - 16 bar g
Operating Temperature	5 - 50°C
Ambient Temperature	5 - 50°C
Installation	Indoor

PRODUCT DESCRIPTION

Technical Data					
HL-ALG	Nominal Volume Flow (1 bar g, 20°C) m³/h ¹⁾	Purge Air Consumption, average m³/h (1 bar g, 20°C)	Volume Flow Outlet, min. m³/h (1 bar g, 20°C)	Differential Pressure, initial mbar	Prefilter UltraPleat M + S Afterfilter UltraPleat S
0100	100	20	75.4	115	0210
0150	150	30	113.1	340	0210
0175	175	35	132.0	305	0210
0225	225	45	170.0	190	0450
0300	300	60	226.2	230	0450
0375	375	75	282.8	370	0450
0550	550	110	414.7	315	0750
0650	650	130	490.1	380	0750
0850	850	170	640.9	385	1100
1000	1000	200	754.0	455	1100

¹⁾ Nominal flow at 7 bar g, 35°C; ²⁾ at nominal flow

SIZING

Type	Pressure Dewpoint (PDP)	Residual water content	Inlet Temp.	Operating Pressure (bar g)												
				4	5	6	7	8	9	10	11	12	13	14	15	16
ALG	≤ -40°C* PDP ≥ -70°C*	0.11 g/m³ 0.0027 g/m³	25°C	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55
			30°C	0.69	0.83	0.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06	2.20	2.34
			35°C	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
			40°C	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70
			45°C	0.44	0.53	0.61	0.70	0.79	0.88	0.96	1.05	1.14	1.23	1.31	1.40	1.49
			50°C	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00	1.06
* on request				Correction factors (f)												

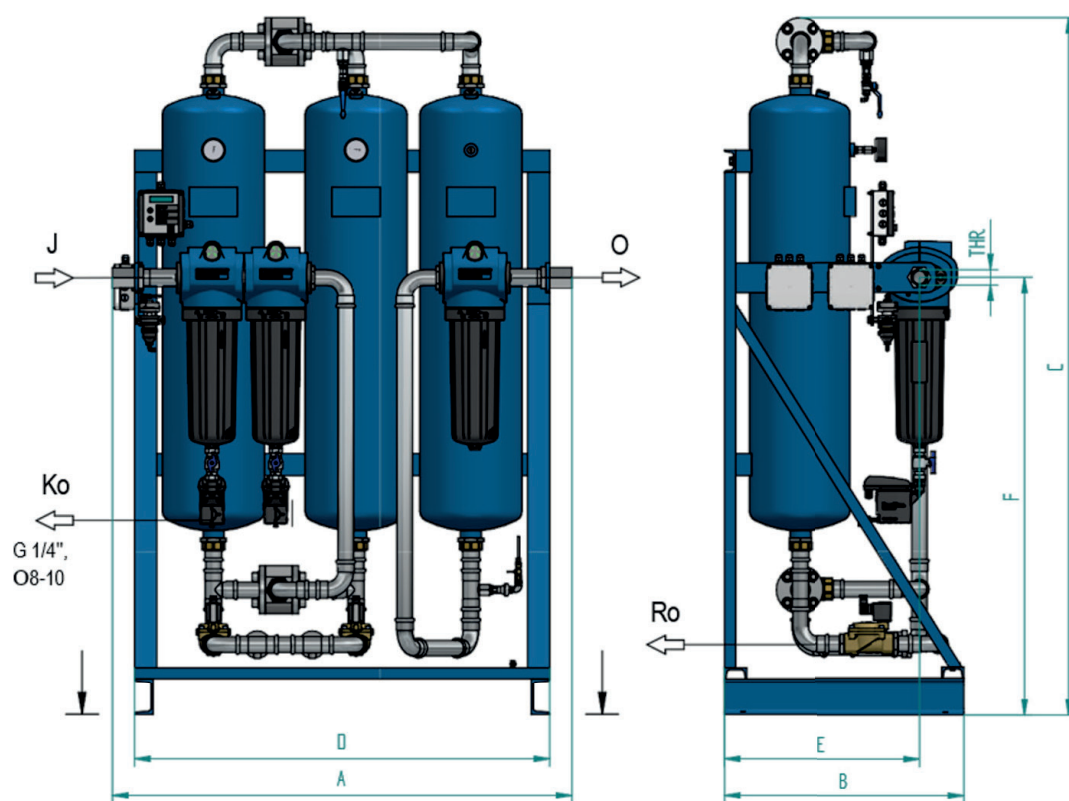
Example:

$V_{nom} = 200 \text{ m}^3/\text{h}$, inlet temperature = 30°C, operating pressure = 10 bar (g), PDP = -40°C

$$V_{corr} = \frac{V_{nom}}{f} = \frac{200 \text{ m}^3/\text{h}}{1.51} = 132.5 \text{ m}^3/\text{h}$$

Calculated dryer size:
ALG, Type 0150

DIMENSIONS / WEIGHT



HL-ALG	A mm	B mm	C mm	D mm	E mm	F mm	THR BSP	Weight kg
0100	955	450	1610	850	370	900	1"	205
0150	1005	450	2040	900	370	1100	1"	245
0175	1230	650	1900	1120	530	1185	1"	325
0225	1240	650	1900	1120	530	1185	1 1/2"	325
0300	1240	650	1890	1120	530	1185	1 1/2"	385
0375	1240	650	2220	1120	520	1300	1 1/2"	495
0550	1630	750	2220	1490	635	1370	2"	530
0650	1630	750	2220	1190	635	1370	2"	630
0850	1810	850	2320	1670	730	1500	2"	750
1000	1810	850	2330	1670	730	1500	2"	860

PRODUCT DESCRIPTION

TECHNICAL DATA

Adsorber Vessel

Pressure Vessel Material	Carbon steel
Design Data	Design pressure: 16 bar g Design temperature: -10°C / +60°C
Design, Manufacturing and Testing	Acc. to AD2000 / PED 2014/29/EU
Flow Distributor Material	Stainless steel

Piping

Design Data	Flange pressure rating: PN16 Design pressure: 16 bar g Design temperature: 60°C
Piping Material	Carbon steel, galvanized
Design, Manufacturing and Testing	Acc. to PED 2014/68/EU

Filters

Design Data	Design pressure: 16 bar g Design temperature: 65°C
Filter Housing Material	Aluminium
Design, Manufacturing and Testing	Acc. to PED 2014/68/EU

Electrical Controller

Design	Circuit board controller with LED indicators (Standard) or LCD text display (Superplus)
Power Supply	230 V AC 50-60 Hz (Standard), 24 V DC (optional), 115 V AC 50-60Hz (optional)
Protection Class	IP 54, acc. to IEC/EN 60529
Potential-Free Alarm Contact	Included
Remote On/Off Contact	Included

PRODUCT DESCRIPTION

TECHNICAL DATA

Nominal Standard Conditions

Pressure Dewpoint	-40°C (at 7 bar g), -70°C...-40°C (depending on sizing and operating conditions)
Operating Inlet Pressure	7 bar g
Operating Inlet Temperature	35°C
Inlet Humidity	100% saturated

Compressed Air Purity

Achievable Compressed Air Purity Classes acc. to ISO 8573-1:2010	HL- OFP: 1-2 : 1-2 : 1
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Operating Limits

Media	Compressed Air / Nitrogen
Operating Pressure	4 – 16 bar g
Operating Temperature	5 – 50°C
Ambient Temperature	5 – 50°C
Installation	Indoor

PRODUCT DESCRIPTION

Technical Data					
HL-OFP	Nominal Volume Flow (1 bar g, 20°C) m³/h ¹⁾	Purge Air Consumption, average m³/h (1 bar g, 20°C)	Volume Flow Outlet, min. m³/h (1 bar g, 20°C)	Differential Pressure, initial mbar	Pre- and afterfilter UltraPleat S
0100	100	20	75.4	115	0210
0150	150	30	113.1	340	0210
0175	175	35	132.0	305	0210
0225	225	45	170.0	190	0450
0300	300	60	226.2	230	0450
0375	375	75	282.8	370	0450
0550	550	110	414.7	315	0750
0650	650	130	490.1	380	0750
0850	850	170	640.9	385	1100
1000	1000	200	754.0	455	1100

¹⁾ Nominal flow at 7 bar g, 35°C; ²⁾ at nominal flow

SIZING

Type	Pressure Dewpoint (PDP)	Residual water content	Inlet Temp.	Operating Pressure (bar g)												
				4	5	6	7	8	9	10	11	12	13	14	15	16
OFP	≤ -40°C* PDP ≥ -70°C*	0.11 g/m³ 0.0027 g/m³	25°C	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55
			30°C	0.69	0.83	0.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06	2.20	2.34
			35°C	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
			40°C	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70
			45°C	0.44	0.53	0.61	0.70	0.79	0.88	0.96	1.05	1.14	1.23	1.31	1.40	1.49
			50°C	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00	1.06
* on request				Correction factors (f)												

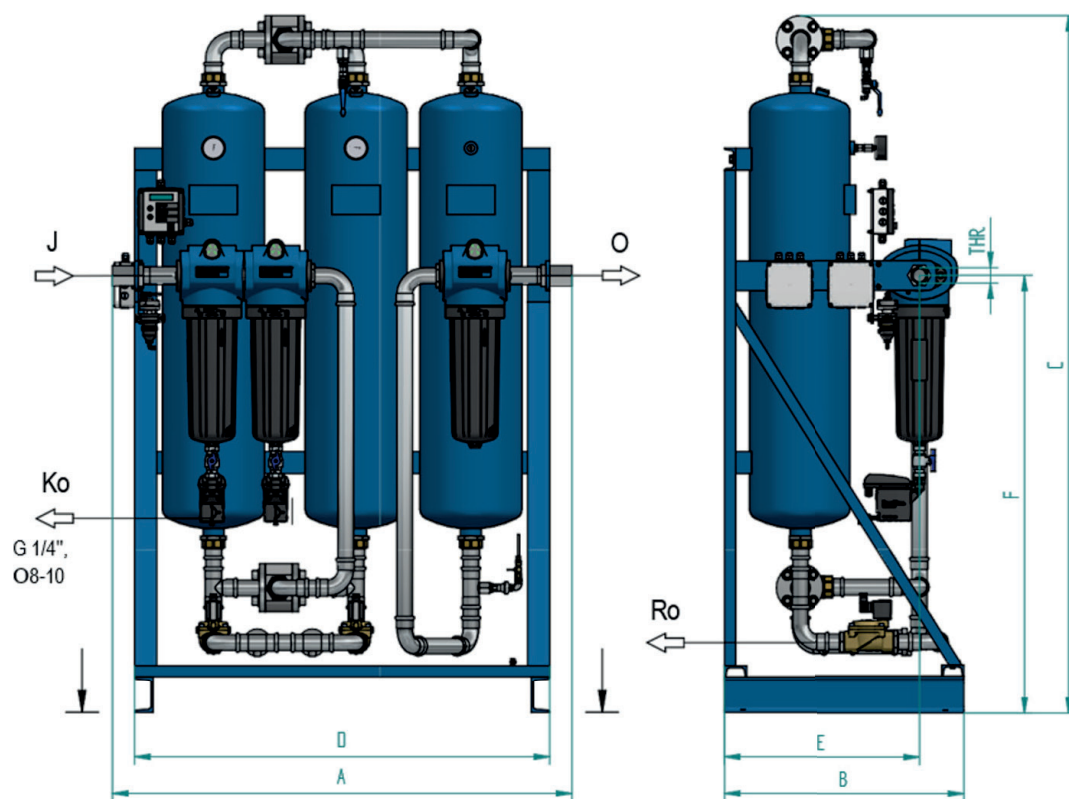
Example:

$V_{nom} = 200 \text{ m}^3/\text{h}$, inlet temperature = 30°C, operating pressure = 10 bar (g), PDP = -40°C

$$V_{corr} = \frac{V_{nom}}{f} = \frac{200 \text{ m}^3/\text{h}}{1.51} = 132.5 \text{ m}^3/\text{h}$$

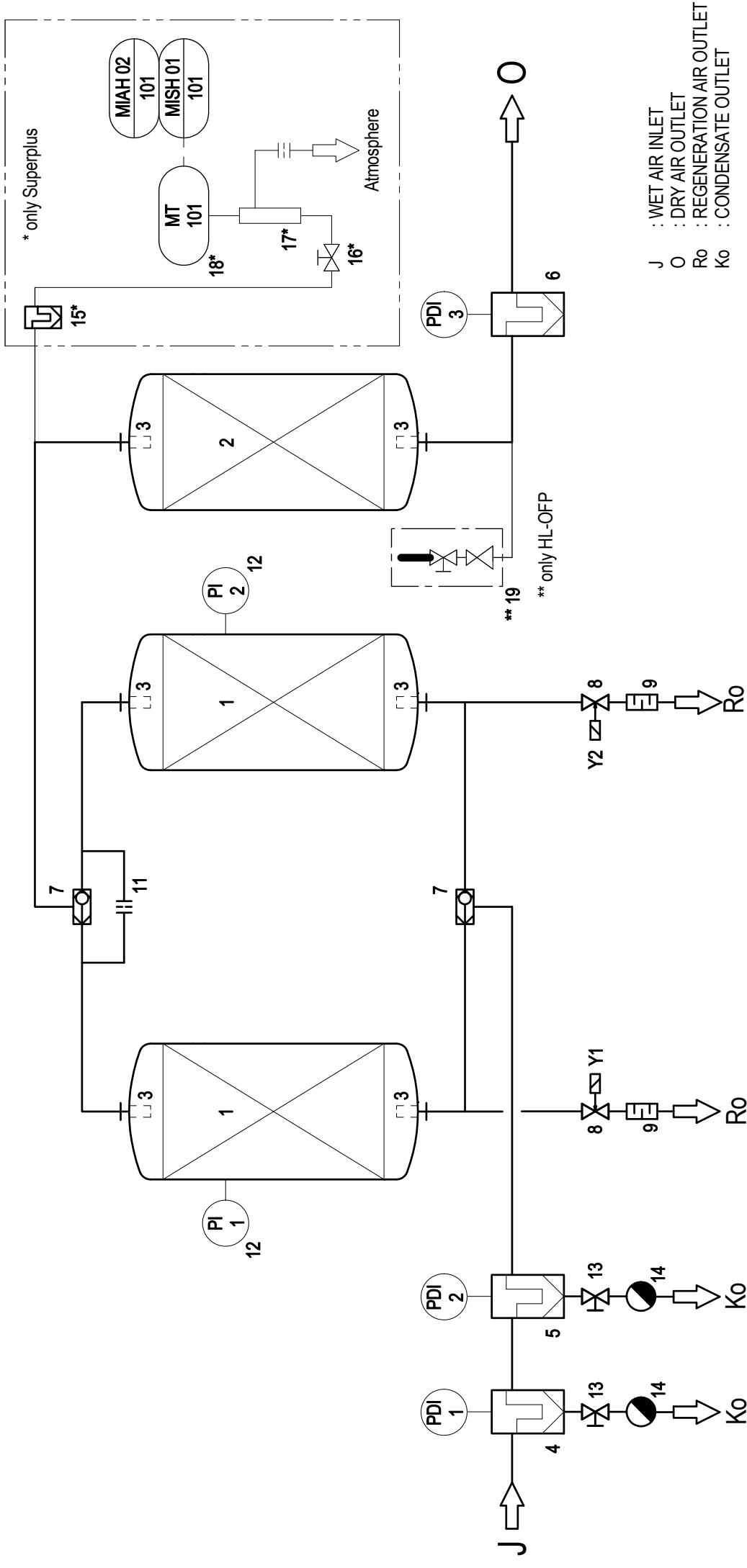
Calculated dryer size:
OFP, Type 0150

DIMENSIONS / WEIGHT



HL-OFP	A mm	B mm	C mm	D mm	E mm	F mm	THR BSP	Weight kg
0100	955	450	1610	850	370	900	1"	205
0150	1005	450	2040	900	370	1100	1"	245
0175	1230	650	1900	1120	530	1185	1"	325
0225	1240	650	1900	1120	530	1185	1 1/2"	325
0300	1240	650	1890	1120	530	1185	1 1/2"	385
0375	1240	650	2220	1120	520	1300	1 1/2"	495
0550	1630	750	2220	1490	635	1370	2"	530
0650	1630	750	2220	1190	635	1370	2"	630
0850	1810	850	2320	1670	730	1500	2"	750
1000	1810	850	2330	1670	730	1500	2"	860

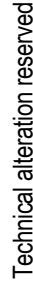
14.2 R & I - Fließbild**14.2 P & I - Diagrama de
flujo****14.2 P & I - Schéma
fonctionnel****14.2 P & I - Skjematisk dia-
gram****14.2 P & I - Schematiskt
diagram****14.2 P & I - Diagram****14.2 P & I - Fluxograma
tipo****14.2 P & I - Schematisch
diagram****14.2 P & I - Schema del flus-
so****14.2 P & I - Skematisk dia-
gram**



MATERIAL	RELEASE NO.	TITLE P & I – DIAGRAM		
	DATE 08.01.2024	Ultrapore HL-ALG 0100-1000		
	EXP DATE 08.01.2024	Oilfreepac HL-OFF 0100-1000		
	DWN D. KOVARIK	NUMBER 3EA AX0698901		
REFERENCE	DATE 08.01.2024	SCALE NONE	SHEET OF	REVISION
	CHK H. SCHNABEL	C/C	SE/CADD	O
	DATE 08.01.2024	SECTIONAL SIZE X	OUTLINE SIZE NO	
	APVD H. SCHNABEL			
PREVIOUS DRAWING NO. 6MPI1-000131	DESIGN CONTROL C073 DWG LOCATION C000			
	VERSION C			
	COPYRIGHT © DONALDSON COMPANY, INC.			
	A3			
TOLERANCES UNLESS OTHERWISE SPECIFIED	FIRST ANGLE PROJECTION			
	DO NOT SCALE			
	GENERAL TOLERANCES			
	DIN EN ISO 13920			
SURFACE FINISH	DIN ISO 2768-m-K			
	SURFACE FINISH			
	DIN ISO 1302			
	DIN ISO 1302			

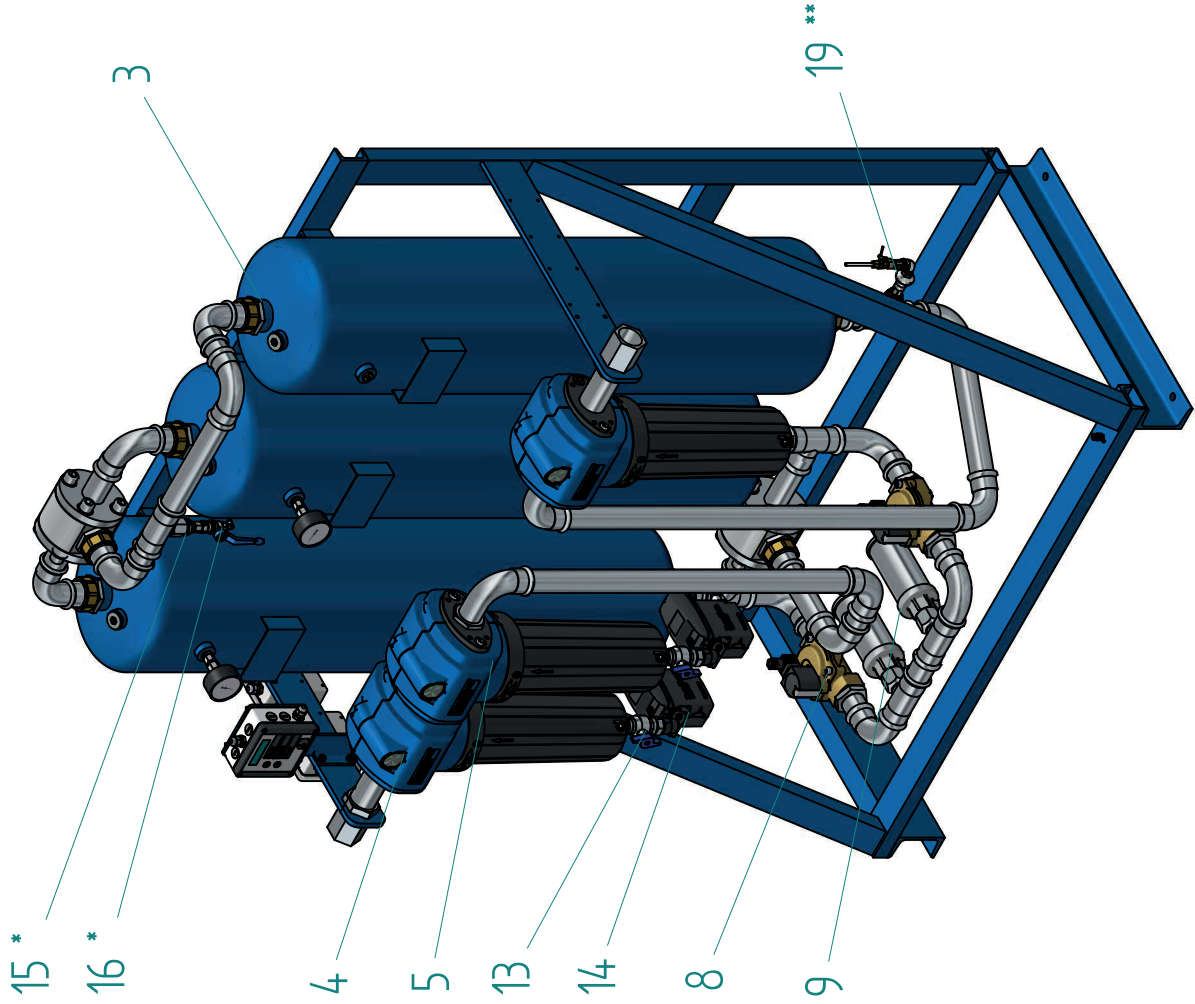
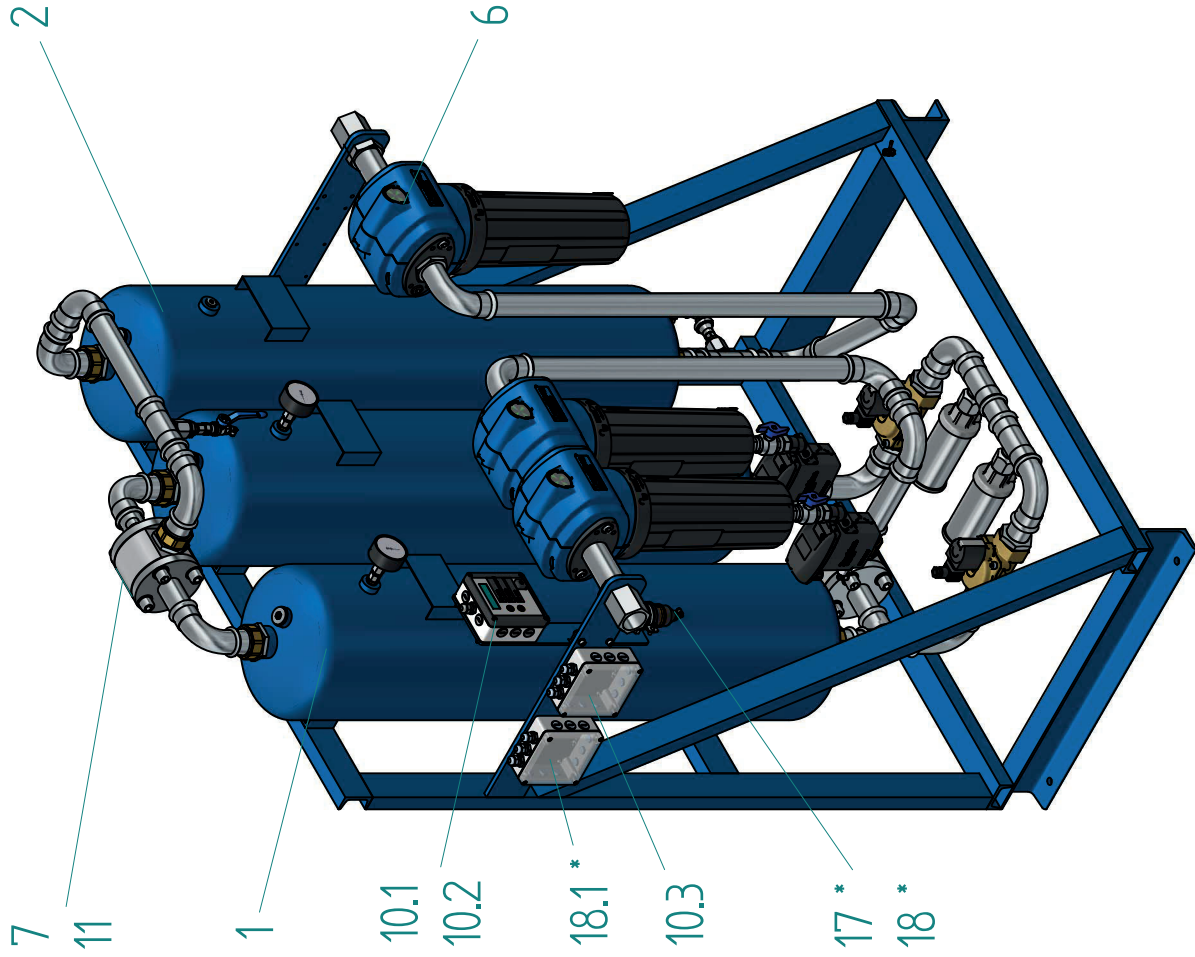
14.3 Maßblatt**14.3 Hoja de medidas****14.3 Fiche des dimensions****14.3 Måleark****14.3 Dimensionsblad****14.3 Dimensions Sheet****14.3 Folha de medidas****14.3 Matenblad****14.3 Foglio delle misure****14.3 Måleark**

ENT



14.4 Übersichtszeichnung**14.4 Plano general****14.4 Dessin d'ensemble****14.4 Oversiktstegning****14.4 Översiktsritning****14.4 General Arrangement****14.4 Esquema geral****14.4 Overzichtstekening****14.4 Disegno sinottico****14.4 Oversigtstegning**

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** only HL-OFF

Technical alteration reserved

MATERIAL	RELEASE NO.	GA-Drawing / Overview			TITLE	ultrapure HL-ALG 0100-1000 Oilfreepac HL-OFP 0100-1000												
	DATE	28.05.2024																
	EXP DATE	28.05.2024																
	DWN D.	DRAHOTA																
REFERENCE	DATE	28.05.2024			NUMBER	1FA AX0760101												
	CHK	H. SCHNABEL																
	DATE	28.05.2024																
	APVD	H. SCHNABEL																
PREVIOUS DRAWING NO.	6MPI-001-303	APVD H. SCHNABEL			SCALE	NONE	SHEET	OF	REVISION									
	TOLERANCES	DATE 28.05.2024			G/C				0									
	UNLESS				SECTIONAL SIZE		X	OUTLINE SIZE	NO									
	OTHERWISE																	
SCALE	SURFACE DIN ISO 1302	FIRST ANGLE PROJECTION			DWG. LOCATION: C-000					COPYRIGHT © 0073	COMPANY: INC.	L	A2					
DONALDSON Deutschland GmbH Hepp, Germany														C A F				VERSION: C

**14.5 Service-Sets/ Geräte- /
Ersatzteilliste****14.5 Service-Sets/ Lista de
recambios e instru-
mentos****14.5 Service-Sets/ Nomen-
clature des équip-
ments****14.5 Service-Sets/ Utstýrsli-
ste****14.5 Service-Sets/ Instru-
ment-& reservdelsli-
sta****14.5 Service-Sets/ Instru-
ment and Spare Parts
List****14.5 Service-Sets/ Lista de
aparelhos****14.5 Service-Sets/ Lijst van
apparaten****14.5 Service-Sets/ Lista deg-
li equipaggiamenti****14.5 Service-Sets/ Instru-
ment- og reservedelsli-
ste**

Ersatzteilliste / Spare Parts List
Ultrasure HL-ALG 0100 - 1000 , 230 V
ab 11.2024 / from 11.2024

Pos. Item	Menge Quantity	Benennung Description	Größe Size										Wechselintervall Exchange Interval	
			0100	0150	0175	0225	0300	0375	0550	0650	0850	1000	1 Jahr / year	3 Jahr / year
1	2	Adsorberbehälter MS / SP	---	---	---	---	---	---	---	---	---	---		
1.1		Adsorber vessel MS / SP	2x 1C927520	3x 1C927520	5x 1C927520	5x 1C927520	8x 1C927520	10x 1C927520	1x 1C927526	1x 1C927526	1x 1C927526	2x 1C927526		
		Ersatzfüllung Trockner Ultrascorp 4	1x 1C927522	1x 1C927522	1x 1C927522	1x 1C927522	1x 1C927541	1x 1C927538	3x 1C927531	4x 1C927520	10x 1C927520	4x 1C927520		
1.2		Ersatzfüllung Trockner Ultrascorp SP	1x 1C927530	1x 1C927530	2x 1C927530	2x 1C927530	3x 1C927530	4x 1C927530	5x 1C927530	6x 1C927530	8x 1C927530	10x 1C927530		X
		Replacement Ultrascorp SP	1x 1C927529	1x 1C927529										
2	1	Adsorberbehälter AK / OX	---	---	---	---	---	---	---	---	---	---		
2.1		Adsorber vessel AK / OX	1x 1C927531	2x 1C927531	3x 1C927531	3x 1C927531	2x 1C927533	2x 1C927533	3x 1C927533	4x 1C927533	5x 1C927533	7x 1C927533		
		Replacement Ultrascorp OX	1x 1C927541				1x 1C927541	7x 1C927538	1x 1C927531	1x 1C927539	5x 1C927539	1x 1C927541	X	
2.2		Ersatzfüllung Trockner Ultrascorp AK 48	1x 1C927677	2x 1C927677	3x 1C927677	3x 1C927677	5x 1C927677	6x 1C927677	8x 1C927677	9x 1C927677	12x 1C927677	3x 1C927674		
		Replacement filling Ultrascorp AK48												
3	6	Gasverteiler	1C963727-AS	1C963727-AS	1C963728-AS	1C963728-AS	1C963728-AS	1C963728-AS	1C963729-AS	1C963729-AS	1C963729-AS	1C963729-AS		X
4	1	Flow distributor												
4.1	1	1. Prefilter												
		Filterelement "1"	1C486131	1C486131	1C486131	1C486151	1C486151	1C486151	1C486161	1C4860171	1C4860181	1C486181	X	
4.2	1	Filter cartridge												
		O-ring	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
4.3	1	O-Ring												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
5	1	Econometer												
5.1	1	2. Vorfilter												
		2. Prefilter												
5.2	1	Filterelement "S"												
		Filter cartridge	1C486130	1C486130	1C486130	1C486150	1C486150	1C486150	1C486160	1C4860170	1C4860180	1C486180	X	
4.3	1	O-ring												
		Econometer	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
6	1	Econometer												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
6.1	1	Nachfilter												
		Afterfilter	---	---	---	---	---	---	---	---	---	---		
6.2	1	Filterelement "S"												
		Filter cartridge	1C486130	1C486130	1C486130	1C486150	1C486150	1C486150	1C486160	1C4860170	1C4860180	1C486180	X	
6.3	1	O-ring												
		Econometer	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
7	2	Econometer												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
7.1	2	Wechselventil												
		Shuttle valve	---	---	---	---	---	---	---	---	---	---		
7.2	1	Ventilkäfig (oben + unten)												
		Valve cage (upper + lower)	1C900824-AS	1C900824-AS	1C900834-AS	1C900834-AS	1C900834-AS	1C900834-AS	1C900844-AS	1C900824-AS	1C900824-AS	1C900824-AS	X	
7.2	1	Ventilkörper (nur unteres Wechselventil)												
		Valve body (only lower shuttle valve)	1C963707-AS-00	1C963707-AS-00	1C963707-AS-00	1C963708-AS-00	1C963708-AS-00	1C963708-AS-00	1C961709-AS-00	1C961709-AS-00	1C961709-AS-00	1C961709-AS-00	X	

Ersatzteilliste / Spare Parts List
Ultrapure HL-ALG 0100 - 1000 , 230 V
ab 11.2024 / from 11.2024

Pos. Item	Menge Quantity	Benennung Description	Größe Size										Wechselintervall Exchange interval	
			0100	0150	0175	0225	0300	0375	0550	0650	0850	1000	1 Jahr / year	3 Jahr / year
8	2	2/2-Wege Magnetventil 2/2-way solenoid valve	1C907365-AS	1C907365-AS	1C907370-AS	1C907370-AS	1C907370-AS	1C907370-AS	1C907375-AS	1C907375-AS	1C907375-AS	1C907375-AS		
8.1	2	Verschleisssteilsatz Magnetventil Servicekit solenoid valve	1C907369-AS	1C907369-AS	1C907374-AS	1C907374-AS	1C907374-AS	1C907374-AS	1C907379-AS	1C907379-AS	1C907379-AS	1C907379-AS	X	
9	2	Schalldämpfer Silencer	AX0704301	AX0704301	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	X	
10	1	Steuerung Control	---	---	---	---	---	---	---	---	---	---		
10.1	1	Ersatz Steuerung Trockner Standard Replacement control dryer Standard	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429		
10.2	1	Ersatz Steuerung Trockner Superplus Replacement control dryer Superplus	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430		
10.3	1	Ersatz Steuerung Zusatzplatine Replacement control additional control board	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427		
11	1	Regenerationsluftdüse (nur oberes Wechselventil) Regeneration air orifice (only upper shuttle valve)	---	---	---	---	---	---	---	---	---	---		
11.1	1	Regenerationsluftdüse (7 bar Betriebsdruck) Regeneration air orifice (7 bar working pressure)	1C963707-030-00	1C963707-035-00	1C963708-035-00	1C963708-040-00	1C963708-050-00	1C963708-055-00	1C961709-070-00	1C961709-075-00	1C961709-085-00	1C961709-090-00		X
12	2	Manometer Pressure gauge	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS		
13	2	Kugelhahn Ball valve	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS		
14	2	Kondensatableiter Condensate drain	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510		
14.1	2	Verschleisssteilsatz Kondensatableiter Servicekit condensate drain	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	X	
15 *	1	Inline Filter	---	---	---	---	---	---	---	---	---	---		
15.1 *	1	Filterelement Filter cartridge	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	X	
16 *	1	Kugelhahn Ball valve	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS		
17 *	1	Messkammer Measuring chamber	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS		
18 *	1	Taupunkttransmitter Dewpoint transmitter	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS		

* OPTION SUPERPLUS ULTRACONOMY

Schutzvermerk nach DIN 34 / Protected acc. to DIN 34 !

Rev. 0 / 01.11.2024

Ersatzteilliste / Spare Parts List
Oilfreepac HL-OFP 0100 - 1000 , 230 V
ab 11.2024 / from 11.2024

Pos. Item	Menge Quantity	Benennung Description	Größe Size										Wechselintervall Exchange Interval	
			0100	0150	0175	0225	0300	0375	0550	0650	0850	1000	1 Jahr / year	3 Jahr / year
1	2	Adsorberbehälter MS	---	---	---	---	---	---	---	---	---	---		
1.1		Adsorber vessel / Dryer												
		Ersatzfüllung Ultrasorp 4	3x 1C927520	5x 1C927520	7x 1C927520	7x 1C927520	1x 1C927526	3x 1C927520	1x 1C927520	5x 1C927520	1x 1C927526	2x 1C927636		X
2	1	Replacement filling Ultrasorp 4	1x 1C927522	1x 1C927522	1x 1C927522	1x 1C927522		1x 1C927526	1x 1C927635	1x 1C927636	1x 1C927636			
		Adsorberbehälter AK	---	---	---	---	---	---	---	---	---	---		
2.1		Adsorber vessel AK												
		Ersatzfüllung Ultrasorp AK 48	2x 1C927677	3x 1C927677	4x 1C927677	4x 1C927677	1x 1C927674	1x 1C927674	2x 1C927674	2x 1C927674	3x 1C927674	4x 1C927674		
3	6	Replacement filling Ultrasorp AK48						3x 1C927677	1x 1C927677	2x 1C927677	2x 1C927677	2x 1C927677	X	
		Gasverteiler	1C963727-AS	1C963727-AS	1C963728-AS	1C963728-AS	1C963728-AS	1C963728-AS	1C963729-AS	1C963729-AS	1C963729-AS	1C963729-AS		X
4	1	Flow distributor												
		1. Prefilter												
4.1	1	Filterelement "IM"												
		Filter cartridge	1C486131	1C486131	1C486131	1C486151	1C486151	1C486151	1C486161	1C4860171	1C4860181	1C486181	X	
4.2	1	O-Ring												
		O-Ring	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
4.3	1	Econometer												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
5	1	2. Vorfilter												
		Filterelement "S"												
5.1	1	Filter cartridge												
		O-ring	1C486130	1C486130	1C486130	1C486150	1C486150	1C486150	1C486160	1C4860170	1C4860180	1C486180	X	
5.2	1	O-Ring												
		O-Ring	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
4.3	1	Econometer												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
6	1	Nachfilter												
		Afterfilter	---	---	---	---	---	---	---	---	---	---		
6.1	1	Filterelement "S"												
		Filter cartridge	1C486130	1C486130	1C486130	1C486150	1C486150	1C486150	1C486160	1C4860170	1C4860180	1C486180	X	
6.2	1	O-Ring												
		O-Ring	1C371252-AS	1C371252-AS	1C371252-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	1C371268-AS	X	
6.3	1	Econometer												
		Econometer	1C485502	1C485502	1C485502	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503	1C485503		
7	2	Wechselventil												
		Shuttle valve	---	---	---	---	---	---	---	---	---	---		
7.1	2	Ventilkäfig (oben + unten)												
		Valve cage (upper + lower)	1C900824-AS	1C900824-AS	1C900834-AS	1C900834-AS	1C900834-AS	1C900834-AS	1C900844-AS	1C900824-AS	1C900824-AS	1C900824-AS	X	
7.2	1	Ventilkörper (nur unteres Wechselventil)												
		Valve body (only lower shuttle valve)	1C963707-AS-00	1C963707-AS-00	1C963707-AS-00	1C963708-AS-00	1C963708-AS-00	1C963708-AS-00	1C961709-AS-00	1C961709-AS-00	1C961709-AS-00	1C961709-AS-00		X

Ersatzteilliste / Spare Parts List
Oilfreepac HL-OFP 0100 - 1000 , 230 V
ab 11.2024 / from 11.2024

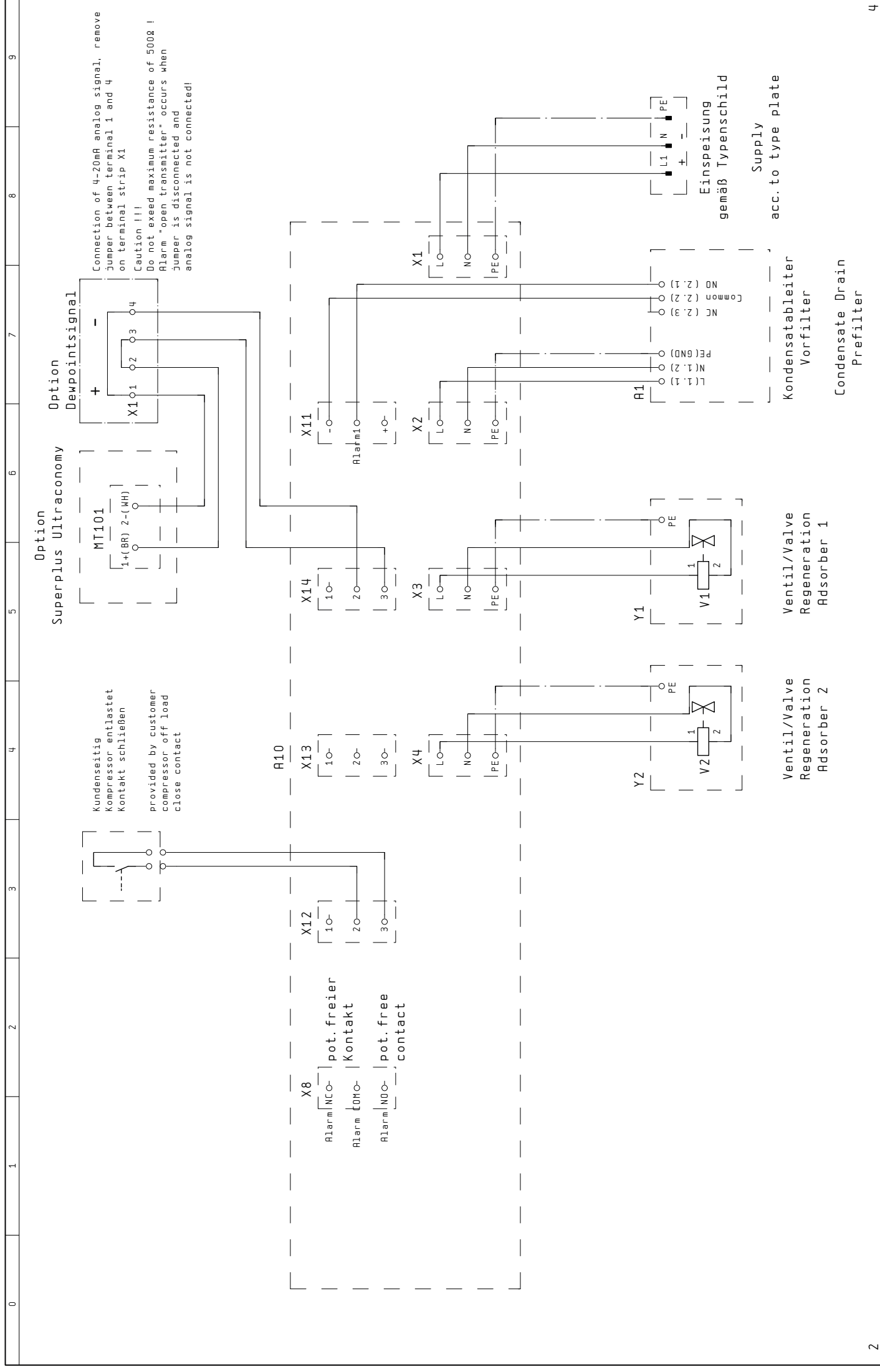
Pos. Item	Menge Quantity	Benennung Description	Größe Size										Wechselintervall Exchange interval	
			0100	0150	0175	0225	0300	0375	0550	0650	0850	1000	1 Jahr / year	3 Jahr / year
			1C907365-AS	1C907365-AS	1C907370-AS	1C907370-AS	1C907370-AS	1C907370-AS	1C907375-AS	1C907375-AS	1C907375-AS	1C907375-AS		
8	2	2/2-Wege Magnetventil 2/2-way solenoid valve	1C907369-AS	1C907369-AS	1C907374-AS	1C907374-AS	1C907374-AS	1C907374-AS	1C907379-AS	1C907379-AS	1C907379-AS	1C907379-AS		
8.1	2	Verschleisssteilsatz Magnetventil Servicekit solenoid valve	AX0704301	AX0704301	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	AX0704501	X	
9	2	Schalldämpfer Silencer											X	
10	1	Steuerung Control												
10.1	1	Ersatz Steuerung Trockner Standard Replacement controller dryer Standard	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429	1C931429		
10.2	1	Ersatz Steuerung Trockner Superplus Replacement controller dryer Superplus	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430	1C931430		
10.3	1	Ersatz Steuerung Zusatzplatine Replacement controller additional control board	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427	1C931427		
11	1	Regenerationsluftdüse (nur oberes Wechselfventil) Regeneration air orifice (only upper shuttle valve)												
11.1	1	Regenerationsluftdüse (7 bar Betriebsdruck) Regeneration air orifice (7 bar working pressure)	1C963707-030-00	1C963707-035-00	1C963708-035-00	1C963708-040-00	1C963708-050-00	1C963708-055-00	1C961709-070-00	1C961709-075-00	1C961709-085-00	1C961709-090-00		X
12	2	Manometer Pressure gauge	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS	1C911040-AS		
13	2	Kugelhahn Ball valve	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS	1C909701-AS		
14	2	Kondensatableiter Condensate drain	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510	1C334510		
14.1	2	Verschleisssteilsatz Kondensatableiter Servicekit condensate drain	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	1C334481	X	
15 *	1	Inline Filter												
15.1 *	1	Filterelement Filter cartridge	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	1C900902-AS	X	
16 *	1	Kugelhahn Ball valve	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS	1C909604-AS		
17 *	1	Messkammer Measuring chamber	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS	1C525218-AS		
18 *	1	Taupunkttransmitter Dewpoint transmitter	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS	1C525532-AS		
18.1 *	1	Option 4-20mA analoges Ausgangssignal Option 4-20mA analogue output signal	1C525281	1C525281	1C525281	1C525281	1C525281	1C525281	1C525281	1C525281	1C525281	1C525281		
19	1	Ölprüfindicator Oil check indicator	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS	1C300019-KIT-AS		
19.1	1	Indikator Prüfröhrchen Indicator cartridge	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS	1C300020-AS		

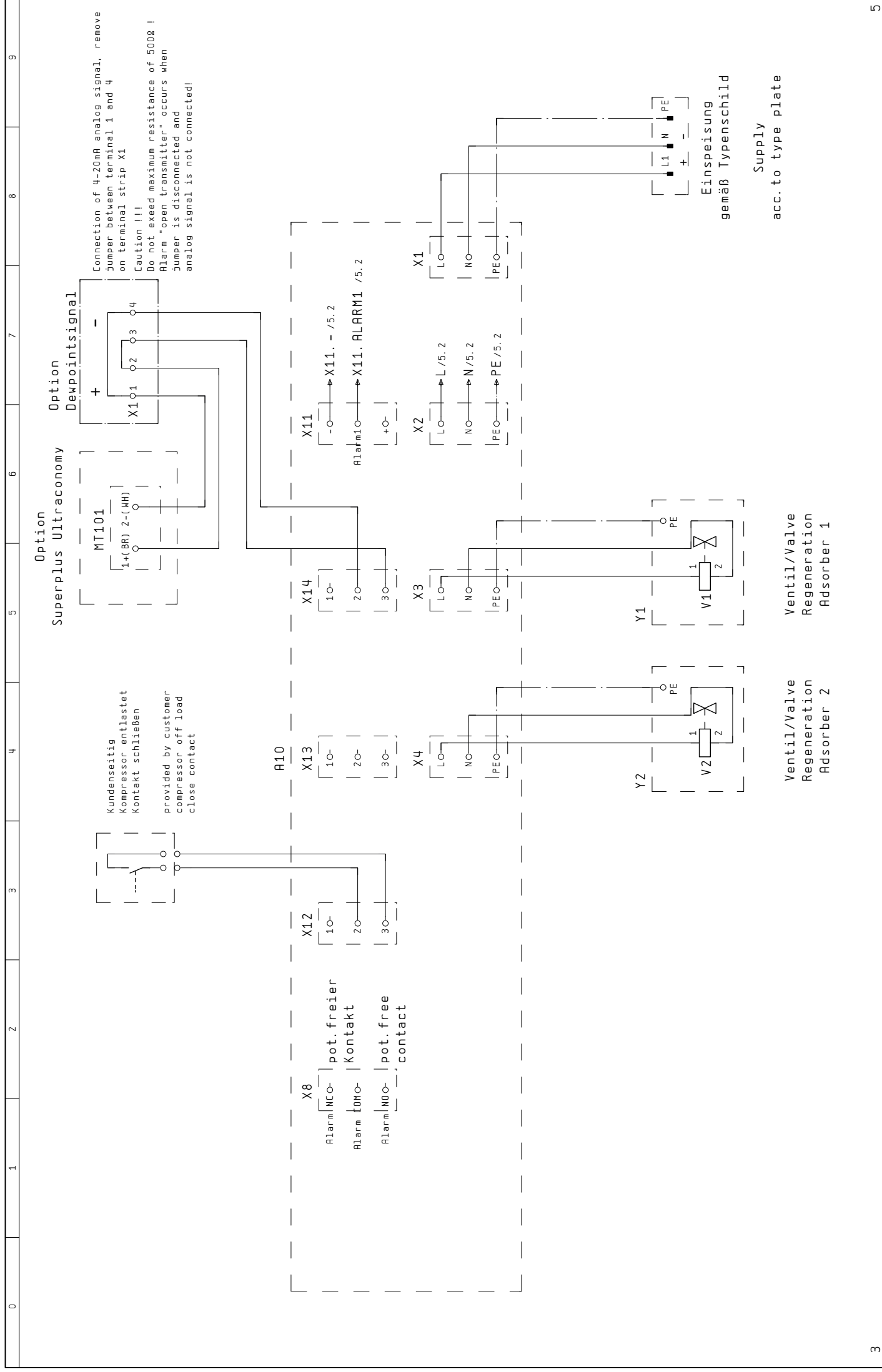
* OPTION SUPERPLUS UL TRACONOMY

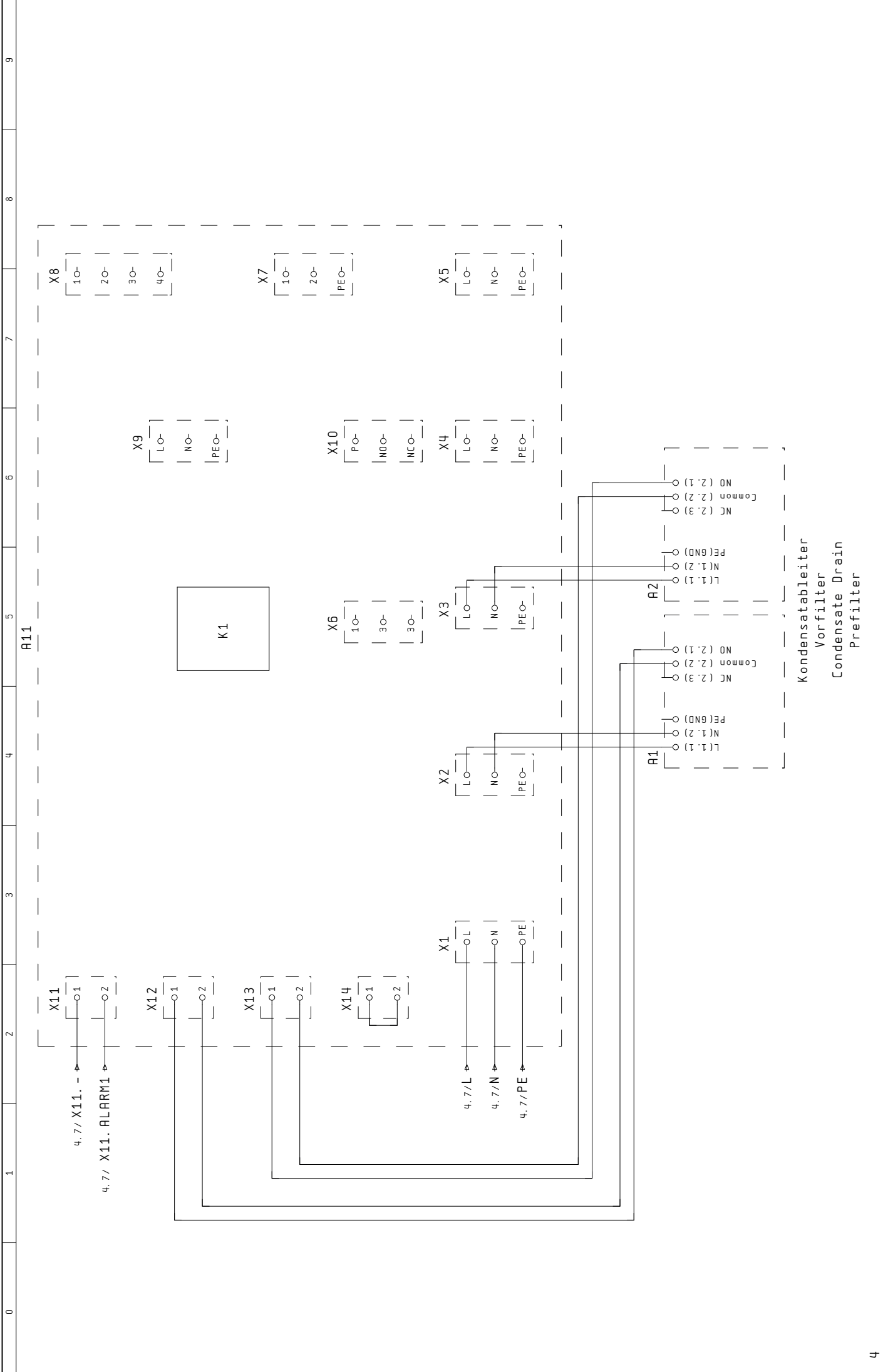
Schutzvermerk nach DIN 34 / Protected acc. to DIN 34 !

Rev. 0 / 01.11.2024

14.6 Elektrodokumentation**14.6 Documentación
eléctrica****14.6 Documentation sur la
partie électrique****14.6 Elektrisk
dokumentasjon****14.6 Elektrisk
dokumentation****14.6 Electrical
Documentation****14.6 Documentação
eléctrica****14.6 Elektrische
documentatie****14.6 Documentazione
elettrica****14.6 El-dokumentation**







EU-Declaration of Conformity

Acc. to Pressure Equipment Directive 2014/68/EU

We hereby declare that the products indicated hereafter, comply with the stipulations of the relevant guidelines and technical standards. This declaration only refers to products in the condition in which they have been placed into circulation. Parts which have not been installed by the manufacturer and / or modifications which have been implemented subsequently remain unconsidered.

Product description and function:

Heatless dryer for treatment, drying of compressed air and activated carbon for the removal of oil vapors and hydrocarbons

Product designation / series:

Oilfreepac HL-OFP

Type:

0100, 0150, 0175, 0225, 0300
0375, 0550, 0650, 0850, 1000

Voltage versions:

230 V / 50-60 Hz
115 V / 50-60 Hz
24 VDC

Maximum working pressure:

16 bar

Conformity method applied:

0100 - 0175	Art.4 , Par. 3
0225 - 1000	Category I / Module H

Serial number:

/ 001

Notified body:

TÜV SÜD Industrie Service GmbH
Westendstr. 199
80686 München
Germany

Certificate no.:

DGR-0036-QS-1434-24

CE-Labeling:

0100 - 0175	CE
0225 - 1000	CE 0036

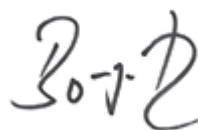
Applied guidelines, regulations and standards

Pressure Equipment Directive 2014/68/EU

AD 2000

Machinery Directive 2006/42/ECDIN EN ISO 12100:2011-03
DIN EN ISO 12100 Corrigendum 1:2013-08
DIN EN 60204-1:2019-06
DIN EN 61010-1:2020-03**EMC Directive 2014/30/EU**DIN EN IEC 61326-1:2022-11
DIN EN IEC 61000-6-2:2019-11
DIN EN IEC 61000-6-4:2020-09

Haan, _____
Place, Date of issue



Wolfgang Bongartz
Global Product Manager
Industrial Gases