



Translation of the original instruction handbook

Adhesive melter

**HB 6000 connect**

# **BÜHNEN**

KLEBESYSTEME

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## SAFETY GUIDELINES

### GENERAL

The information contained in this section applies not only to everyday machine operation, but also to any procedure carried out on it, whether for preventive maintenance or in the case of repairs and the replacement of worn out parts.

It is very important to observe the safety warnings in this manual at all times. Failure to do so may result in personal injury and/or damage to the machine or the rest of the installation.

Before beginning work on the machine, read this manual carefully, and in case of any doubt, contact our Technical Service Center. We are available for any clarification that you might need.

Keep manuals in perfect condition. They should always be accessible to the operating and maintenance personnel.

Also provide necessary safety material: appropriate clothing, footwear, gloves and safety glasses.

In all cases, observe local regulations regarding risk prevention and safety.

### SYMBOLS

The symbols used on both the melter/appliator equipment and in this manual always represent the type of risk we are exposed to. Failure to abide by a warning signal may result in personal injury and/or damage to the machine or the rest of the installation.



**Warning:**

Risk of electrical shock. Carelessness may produce injury or death.

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**Warning:**

Hot zone with high temperatures. Risk of burns. Use thermal protective equipment.

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**Warning:**

System under pressure. Risk of burns or particle projection. Use thermal protective equipment and glasses.



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**Warning:**

Important information for the correct use of the system. May include one or several of the previous hazards, and therefore must be kept in mind to avoid damage and injury.



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**MECHANICAL COMPONENTS**

The melter/applicator equipment installation uses moveable parts that may cause damage or injury. Use the equipment correctly, and do not remove the safety guards while the equipment is in operation; prevent the risk of possible entrapment due to moving mechanical parts.

Do not use the machine if the safety devices are not in place or appear to be inadequately installed.

For maintenance or repair operations, stop the movement of moveable parts by turning off the main switch.

**ELECTRICAL COMPONENTS**

The system operates with a one-phase current (230 V / 50 Hz) or a three-phase current (3 x 400 V + N / 50 Hz) at a certain rated power. Never handle the equipment with the power connected, as this may result in powerful electrical shocks.

The installation must be correctly grounded.

The installation's power cable conductors must match the required electric current and voltage.

Periodically inspect the cables to check for crushing, wear and tear, as well as to prevent tripping and falls as a result of their placement.

Although the system meets EMC requirements, it is inadvisable to use devices that transmit high levels of radiation, i.e., mobile phones or soldering equipment in their vicinity.

**HYDRAULIC COMPONENTS**

Take the usual precautionary measures for systems under pressure.

The melter/applicator equipment includes an automatic valve depressurization system. Before each operation, always make sure that the adhesive circuit is completely free of pressure. There is a high risk of hot particle projection, along with the corresponding danger of burns.

Use caution with the residual pressure that may remain in the hoses when the adhesive cools. When reheated, there is a risk of hot particle projection if the outputs are left open.

### **THERMAL COMPONENTS**

The entire system operates with temperatures reaching up to 200 °C (392 °F). The equipment must be operated using adequate protection (clothing, footwear, gloves and protective glasses) that completely cover exposed parts of the body.

Keep in mind that, due to the high temperatures reached, the heat does not dissipate immediately, even when the power (in this case, electric) source is disconnected. Therefore, use caution, even with the adhesive itself. It may remain very hot, even in a solid state.

In case of burns, immediately cool the affected area with clean, cold water. Seek medical attention as soon as possible from the company's medical service or the nearest hospital. Do not try to remove the adhesive material from the skin.

### **NOISE**

The noise level of the system is well below allowable levels (<70 dB(A)), and therefore does not present a specific risk to be taken into consideration.

### **MATERIALS**

'BÜHNEN' systems are designed for use with hot-melt adhesives. They should not be used with any other type of material, and especially not with solvents, which may cause personal injury or damage to internal system components.

Always use original 'BÜHNEN' components and replacement parts, which guarantee the correct system operation and service.

When using adhesive, follow the corresponding guidelines found in the Technical and Safety Sheets provided by the manufacturer. Pay special attention to the advised work temperatures in order to prevent adhesive burning and degradation.

Ventilate the work area adequately in order to remove the vapors produced. Avoid the prolonged inhalation of these vapors.

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## INTRODUCTION

In this manual you will find information about the installation, use and maintenance of the hot-melt adhesive melter/applicator in BÜHNEN's *HB 6000 connect* series.

The '*HB 6000 connect*' series includes the 5, 10, 20 and 35 liter range of hot-melt adhesive melters/applicators.

Most of the photographs and illustrations that appear in this manual refer to the '*HB 6050 connect*' melter/applicator. This model has been used as a reference for writing this manual as its main characteristics, with the exception of the tank capacity and the connection outputs are the same as those in the rest of the '*HB 6000 connect*' series.



## DESCRIPTION

The 'HB 6000 connect' are designed for use with 'BÜHNEN' hoses and applicators in hot-melt adhesive applications. Their different variations – line, coating or swirl-spray – cover a wide range of applications, being very versatile in all markets where they are used.

## MODES OF OPERATION

The 'HB 6000 connect' series hot-melt melters/applicators may be used in all of the following modes:

- **Work mode**  
The hot-melt melter/applicator keeps materials hot at the pre-selected temperature indicated on the display. The pump is kept activated, waiting for the consumption command when one or more application applicators are activated..
- **Standby mode**  
The hot-melt melter/applicator remains in a resting state, with the materials kept at (programmable) temperature values below the pre-selected value. The pump remains deactivated..
- **Alarm mode**  
The hot-melt melter/applicator detects a malfunction and warns the operator of this event. The pump remains deactivated.
- **OFF mode**  
The hot-melt melter/applicator remains off, without heating the materials and with the pump deactivated. The electrical and pneumatic supply remains activated between the network and the system, however.

## HOT-MELT MELTER/APPLICATOR IDENTIFICATION

When placing orders for replacement parts or requesting help from our service center, you should know the model and reference number of your hot-melt melter/applicator.

Those data, as well as further technical information can be found on the type plate at the side of the melter base.



**MAIN COMPONENTS**

- 1. Front control card
- 2. Access door to the electric/ pneumatic area
- 3. Tank access lid
- 4. Pump air pressure regulator
- 5. Air pressure gauge
- 6. Characteristics plate
- 7. Main switch
- 8. Hose output distributor (up to 6 hydraulic connections)
- 9. Hose-applicator electrical connections
- 10. Compressed air hook-up (Max. 6 bar)
- 11. Set of pump drain valve and filter.



**CONTROL PANEL COMPONENTS**

1. Touch screen.
2. Status central leds (GREEN, YELLOW, RED).
3. RED led 'pumping OFF'.
4. STOP RED Button 'Start/Stop Pump'.
5. Touch screen ON/OFF button.
6. GREEN led 'power ON'.



### **AUTOMATIC FEEDER MAIN COMPONENTS (OPTIONAL)**

#### **GENERAL**

1. Flexible Load Tube
2. Rotary fitting
3. Unload Filter
4. Load Sensor
5. Tank access lid
6. Output air supply to the suction area
7. Electric load valve
8. Input air supply (from the grid)
9. Junction box
10. Level sensor amplifier
11. Sensor and power supply connector
12. Pneumatic vibrator
13. Suction area
14. Air feeding tube



**HB 6000 CONNECT RANGE OPTION ACCESSORIES**

If some of the different machine configuration options have been chosen, it will be necessary the following accessories:

**Automatic feeder option**

The automatic adhesive feeder will be included and is the same for the 5, 10, 20 and 35l machines. Suction lance and hose have to be order separately.

**Warning light option**

The warning light must be requested separately. There is a choice of the low level and colourless (white) indicator light or the low level and temperature OK indicator light (green). They are both the same for all machines.

**VP option**

The VP proportional valve system must be requested separately. It is the same for all machines in all cases.

**OPTIONAL EQUIPMENT**

To increase the functionality of the melter machines, the following optional elements can be incorporated:

- **Low level of melted adhesive detection system.** This can be fitted to all the machines in float switch or capacitive sensor options.
- **Adaptation plate for previous models.** For adapting the previous HB 6040, HB 6080 and HB 6160 machines and HB 6050 connect, HB 6100 connect, HB 6200 connect and HB 6350.

## INSTALLATION



### Warning:

The melters/applicators are equipment with current technology and with certain foreseeable risks. Therefore, only allow qualified personnel with sufficient training and experience to use, install or repair this equipment.

### INTRODUCTION

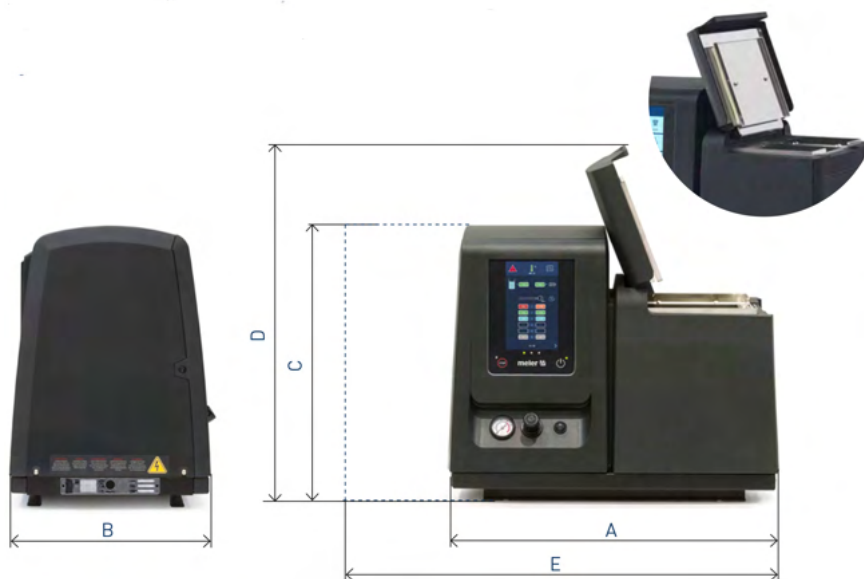
The 'HB 6000 connect' series melters/applicators are delivered with all the materials necessary for their installation. However, some components must be provided by the user himself, according to the location and connections in each particular installation:

- Anchoring screws for the melter/applicator equipment
- Power cord and plug for electrical power
- Pneumatic pipe and connection to the compressed air system
- Multicore cable for external electrical control
- Optionally, a gas ventilation system

### INSTALLATION REQUIREMENTS

Before installing 'HB 6000 connect' series melter/applicator equipment, we must make sure that the space assigned to it permits installing, connecting and using the entire system. Similarly, we must check to see that the electrical and pneumatic supplies meet the necessary requirements of the melter/ applicator equipment being installed.

### FREE SPACE



Item	Description	Dimension	
A	equipment length	HB 6050 connect	588 mm
		HB 6100 connect	671 mm
		HB 6200 connect	671 mm
		HB 6350 connect	742 mm
B	equipment width	HB 6050 connect	339 mm
		HB 6100 connect	339 mm
		HB 6200 connect	383 mm
		HB 6350 connect	435 mm
C	equipment height	HB 6050 connect	481 mm
		HB 6100 connect	481 mm
		HB 6200 connect	526 mm
		HB 6350 connect	673 mm
D	equipment height with lid open	HB 6050 connect	628 mm
		HB 6100 connect	760 mm
		HB 6200 connect	875 mm
		HB 6350 connect	1067 mm
E	equipment length with electrical cabinet open	HB 6050 connect	838 mm
		HB 6100 connect	921 mm
		HB 6200 connect	921 mm
		HB 6350 connect	992 mm

#### ELECTRICAL CONSUMPTION

In order to install a 'HB 6000 connect' series melter/applicator, we should take into consideration the total consumption of the installation, including the consumption of the installed hoses and applicators.

Before connecting, make sure that the voltage that is being connected to the melter/applicator is the correct one appearing on the equipment's characteristics plate.

Connect the machine and check to see if it is well grounded.

#### Warning

Risk of electrocution. Even when the equipment is turned off, voltage remains in the intake terminals, which may be dangerous during internal equipment manipulations.



Install a power switch for disconnecting the melter/applicator equipment from the electrical network. It must be protected against overload and short circuits by circuit breaker and install appropriate personal protection leads to mass by differential switch.

Consumption figures, according to melter/applicator and output configuration, are included in the table in the section 'Electrical power connection'.



**COMPRESSED AIR**

To install 'HB 6000 connect' series melters/applicators, it is necessary to have a dry, non-lubricated compressed air system with a maximum pressure of 6 bar.

The applicator's internal pneumatic equipment is able to work with a minimum of 0.5 bar, however, pressure lower than this will cause intermittent operational anomalies.

The air consumption is according to the number of stroke made by the pump cylinder, which in turn depends on the adhesive consumption during the application. It is therefore necessary to estimate this consumption in all cases.

Generally speaking, we can provide as a maximum consumption value 40-50 l/min for a pressure of 6 bar at maximum pump speed.

**OTHER FACTORS**

While installing 'HB 6000 connect' series melters/applicators, other practical considerations should be kept in mind:

Zum bequemen Befüllen der Anlage sollte die Einfüllöffnung stets leicht zugänglich sein.

- Keep the load opening accessible for comfortable melter/applicator filling.
- Position the melter/applicator equipment in such a way that you can easily see the front panel display where temperatures and possible alarm signals are shown.
- As much as possible, try to avoid unnecessarily long hoses that result in elevated electrical energy consumption levels and pressure drops.
- Do not install the melter/applicator equipment beside powerful heat or cooling sources that may have distortional effects upon its operation.
- Avoid melter/applicator vibrations.
- Make sure that the melter/applicator maintenance areas (filter, purging valve, tank interior, etc.) are easily accessible.

**UNPACKING**

Before proceeding with the installation of the melter/applicator, it should be removed from its location on a pallet and examined in order to detect any possible breakage or deterioration. Communicate any defect, even to the outer packing materials, to your 'BÜHNEN' Representative or to the Main Office.

## CONTENTS

The 'HB 6000 connect' series packing materials may contain accessories that form part of the same order. If this is not the case, the following are the standard components that accompany the melter/applicator:

- Instruction manual.
- Guarantee card.
- Hose couplings.
- Set connectors for Inputs / Outputs.

## MOUNTING THE EQUIPMENT

For mounting the 'HB 6000 connect' series set the base in the desired location using the indicated holes M8 screws.

The 'HB 6000 connect' series equipments have an optional adaptation plate for fixing *HB 6050 connect*, *HB 6100 connect*, *HB 6200 connect*, *HB 6350 connect* and previous HB 6040, HB 6080, HB 6160, HB 6320. To mount the base plate, place it on the machine bench and adjust its position. Mark and drill the four holes for the base plate's M8 fastening screws. The holes may be threaded or non-threaded, depending on the bench to which they are being attached.



## Warning

Make sure that the bench where the base plate is fastened is level, free from vibrations and is able to support the weight of the equipment in addition to the full tank load. Once the base plate is fastened in place on the bench, the melter/applicator should be mounted on top of it.



**ELECTRICAL POWER CONNECTION**

'HB 6000 connect' series melters/applicators are designed to be connected to the electrical power supply in three possible ways, depending on the power of different elements connected:

- 1 phase 230 VAC
- 3 phases 400 VAC with neutral

A good ground connection is required in all cases.

Consumption figures, according to melter/applicator and output configuration, are included in the table. Due to high power connected 'melter' recommends 3-phases 400 VAC with neutral connection.



**Warning:**

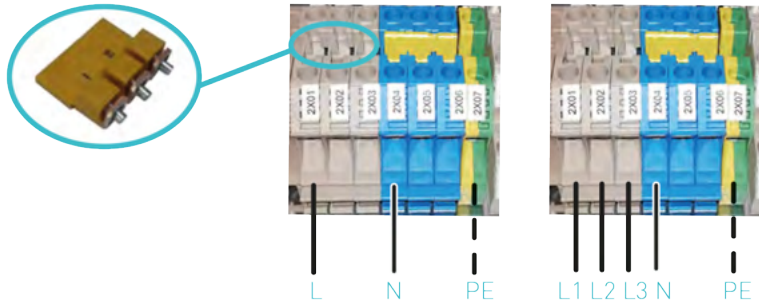
Risk of electrical shock. Carelessness may cause injury or death.



Open the electric cabinet door as far as possible. Thread the power cord (max. Ø18mm) through the electrical wall bushing (P) and fasten it to the inside anchor, making sure that the cord reaches the power card connector at the position where it will be installed.

Connect each wire in the power cord to its corresponding place on the power intake connector on the power card.

Consumption values concerning each equipment can be found in the characteristics plate.



Unit	No. Outputs	1 phase	3 phases
		230 VAC (!)	400 VAC (!)
HB 6050 connect	2	25.65 A	10.00 A
	4	27,00 A	15.65 A
	6	27,00 A	23.48 A
HB 6100 connect	2	--	14.35 A
	4	--	15.65 A
	6	--	23.48 A
HB 6200 connect	2	--	16.52 A

Unit	No. Outputs	1 phase	3 phases
	4	--	16.52 A
	6	--	23.48 A
HB6350 connect	2	--	18,70 A
	4	--	26,52 A
	6	--	27,00 A

Maximale Anschlussleistung für jedes Paar Schlauch-Auftragskopf:  
1.800 W

(<sup>1</sup>) **The maximum permissible current for a connection is 27 A per phase.** The table show the maximum current when using the maximum possible power. Calculate the power to be installed in each case to choose a suitable connection.



3/N ~ 400V 50/60Hz + PE (limited for *HB 6350 connect*)  
3 ~ 230V 50/60Hz + PE (terminal connection of mm<sup>2</sup>)

### **PNEUMATIC CONNECTION**

Before connecting the pneumatic power to the melter/applicator, make sure the pressure regulator is completely closed. To do this, turn the regulator located on the front of the equipment next to the pressure gauge counterclockwise as far as it will go.



Connect the plant air supply (max. 6 bar) to the melter/applicator intake using flexible tubing with an outside diameter of 8 mm. The equipment is provided with a quick coupling for this purpose.

Activate the air supply to pass and turn the pressure regulator clockwise. Adjusting to 1 bar of pressure is enough for checking the pump operation.



The pump will not operate and the pressure gauge will show 0 bar until the melter/applicator and the hoses-applicators connected to it reach the correct temperature.

Once the pump operation has been checked, you may adjust the pressure to the operational value you wish.

In the pressure gauge can be found pneumatic and hydraulic pressure values, the relation between both are 1:13.6.

### **HOSE AND APPLICATOR CONNECTION**

'HB 6000 connect' series melters/applicators use standard 'BÜHNEN' components.

Up to six hose-applicator outputs may be connected.



#### **Warning:**

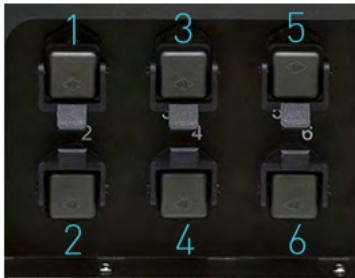
When connecting hose-applicator outputs, verify that the connected power is not above the maximum allowable power for each output..



'HB 6000 connect' series melters/applicators are equipped with a six outputs hydraulic distributors. Connect the hoses to the distributor in order, following the numbering in the diagram.

#### **Caution:**

- In order to identify each hose-applicator, electrically connect them to the connector with the same number as the output they use.
- It is preferable to use couplings at 45° or 90° angle to minimize the space the hoses occupy. Using straight couplings usually results in curves with very small radii that may damage the inside of the hose.
- Save the screw-on caps that are removed from the distributor in order to connect a hose. They may be necessary in the future if a hose is removed from its location.
- Perform the electrical hose and applicator connections with the equipment turned off. Failing to do so may result in electrical defects in the connection and the appearance of alarm messages on the melter/ applicator display.



### **PARAMETER PROGRAMMING**

Once the melter/applicator and its components are installed, you will need to program the operational parameters appropriate for the specific application that will be performed.

Among the various parameters, it is necessary to program the set point temperature values for each component connected and the value for overheating warnings. There are two other parameters (weekly start-up and shut-down programming and the standby temperature value) left to program in advanced systems, although the factory default values are perfectly valid for operational purposes.

Chapter "4. Melter operation" details the operating modes of the machine and its configuration.

**EXTERNAL I/O CONNECTIONS**

The input and output (Input/Output) signals enable the melter to communicate with the main machine simply and directly. Six I/O different signals can be used, depending on the options installed on the unit. Function of these signals can be selected by the user

The signals that can be used to communicate with the main machine are as follows:

Type <sup>(1)</sup>	Description	Terminal/ Connector
Input	<b>External ON/OFF</b> A closed contact switches the unit on; an open contact turns it off.	Terminal XD11.1/XD11.2 XD12.1/XD12.2 ----- Connector on HMI card <sup>(5)</sup> DI3
	<b>Standby ON/OFF</b> A closed contact activates the 'Standby' function; an open contact deactivates it and the unit returns to the status indicated by the unit's other signals.	
	<b>Pumpvng external ON/OFF</b> A closed contact activates pumping (if the required conditions are met); an open contact deactivates it..	
	<b>Activity (Auto Standby - OFF)</b> Contact for the activity control signal, to switch the unit to Standby and off mode <sup>(2)</sup> .	
	<b>ON/OFF communications</b> A closed contact activates the communications (Modbus/Profibus); an open contact deactivates them. Signals must be enabled in the unit <sup>(3)</sup> .	
	<b>Inhibition of zones</b> Zone inhibition control inputs. The unit has 8 contacts to inhibit 8 groups of programmable zones(4). When the contact is closed, the respective group is inhibited (off); when the contact is open, the inhibition of that group is disabled (activated).	Temperature Control Board X21 (signals 1 to 4) X9 (signals 5 to 8)

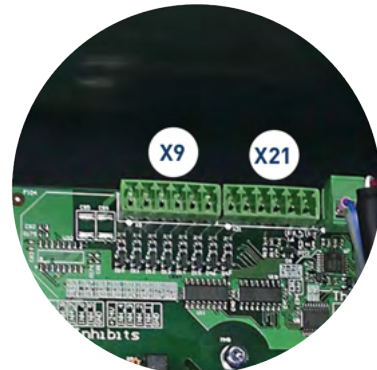
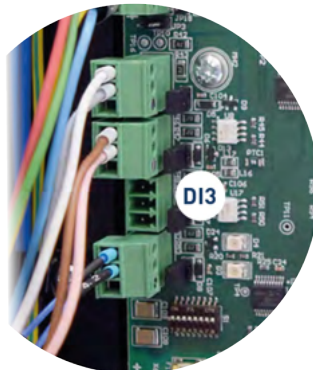
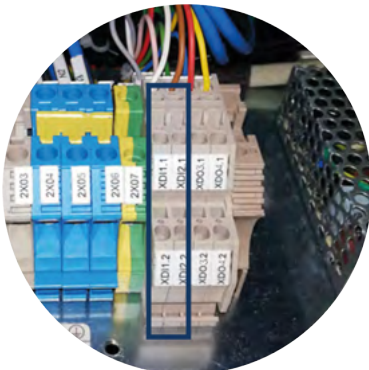
(1) See point '4 Use / Settings Menu / Configuration of input and output signals'  
Some inputs will not be shown on the menu, depending on which options are installed in the unit.

(2) See point '4 Use / Heating Menu / Auto Standby - OFF'.

(3) See point '4 Use / Settings Menu / Additional Settings'.

(4) See point '4 Use / Heating Menu / Inhibitions'

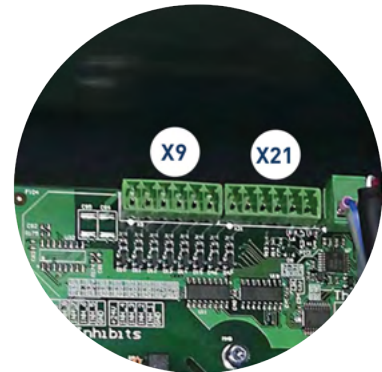
(5) Connectors available according to options installed on the equipment.



Type <sup>(1)</sup>	Description	Terminal/ Connector
Output	<p><b>Temperature OK</b>                      During the heating phase: contact that indicates that all of the system's temperatures have reached a level that is 3°C below its set point value (and the delay time has elapsed).                      During normal operation: indicates that the actual temperature value is neither below nor above the programmed alarm values..</p>	<p>Terminal                      XDO3.1/XDO3.2                      XDO4.1/XDO4.2                      -----                      Connector on                      HMI card <sup>(2)</sup>                      DO2</p>
	<p><b>Low level</b>                      Contact that indicates that the level of adhesive in the tank has reached the lower limit.</p>	
	<p><b>Error</b>                      Contact that indicates that the unit is in error mode.</p>	
	<p><b>Pumping activated</b>                      Contact that indicates that the unit's pump is in operation.</p>	
	<p><b>Level NOT OK (Warning light)</b>                      Contact that activates the warning light of low adhesive level in the tank.</p>	

(1) See point '4 Use / Settings Menu / Configuration of input and output signals'. Some outputs will not be shown on the menu, depending on which options are installed in the unit.

(2) Connectors available according to options installed on the equipment..



**Attention:**

The 'Temperature OK' output is not a contact relay and, as such, it cannot support voltages of 230 V.



**CONNECTING EXTERNAL INPUTS AND OUTPUTS**

**Warning**

Risk of electric shock. Carelessness may cause injuries or death.



1. Disconnect the unit's power.
2. Open the front door of the electric cabinet by giving the fastening screw a 1/4 turn.



3. Run the signal cable (max. Ø14 mm) through the bushing at the rear of the unit (P) and attach it to the interior fitting, making sure the cable reaches the corresponding terminals/connectors.

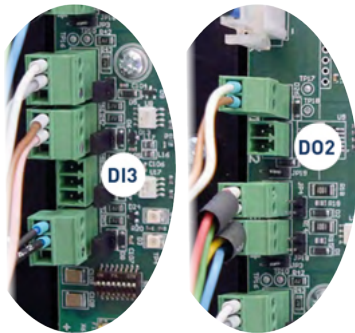


4. Connect the two cable wires to the corresponding terminal/connector. The polarity of the connection must be correct:

Terminal	Polarity	Connector	Polarity
XDI 1.1	+24 VDC 200mA	DI3 1	+24 VDC 200mA
XDI 1.1	IN	DI3 2	IN
XDI 2.1	+24 VDC 200mA	DO2 1	+24 VDC 2A
XDI 2.2	IN	DO2 2	GND
XDO 3.1	+24 VDC 100mA		
XDO 3.2	GND		
XDO 4.1	+24 VDC 100mA		
XDO 4.2	GND		







5. Make sure that the cables are properly secured by the terminal's screws.
6. Check that the cable is correctly connected and that its passage through the electric cabinet presents no risk of jamming, being cut or any other accidental damage.
7. To assign the function to be performed by the connected signal, see point '4 Use / Settings Menu / Configuration of input and output signals'.

**CONNECTING ZONE INHIBITION**



**Warning:**

Risk of electric shock. Carelessness may cause injury or death.

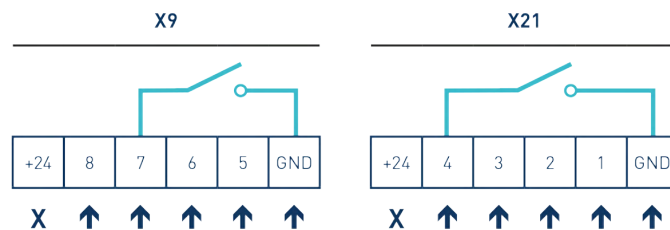


1. Disconnect the unit's power.
2. Open the front door of the electric cabinet by giving the fastening screw a 1/4 turn.



3. Run the signal cable (max. Ø14mm) through the bushing at the rear of the unit and attach it to the interior fitting, taking care to ensure that the cable reaches the connectors (X21 / X9) in the temperature control board.

4. Remove the connectors from the board and connect the cable wires to their corresponding terminals. To activate it, all disabling signals must be switched with the GND pin.



5. Reconnect the connectors to the board.
6. Check that the cable is correctly connected and that its passage through the electric cabinet presents no risk of jamming, being cut or any other accidental damage.
7. To configure the various inhibition groups and assign them the corresponding signal, see point '4 Use / Heating Menu / Inhibitions'.

## **AUTOMATIC FEEDER ASSEMBLY**

### **PNEUMATIC CONNECTION**

Before connecting the pneumatic power to the vacuum feeder, make sure the pressure regulator on the system and the main air supply is completely closed.

Connect the vacuum feeder through a flexible tube with outside diameter of 10 mm to the general air supply (6 bar max.) (1). The unit has a quick coupling for this connection.

The air outlet grid (2) is connected by a flexible hose outside diameter 10 mm to the Y quick connector (3) located in the area of the suction adhesive.

To be sure about the connection of the tubes in the inlet and the outlet, the valve is marked with the numbers 1 and 2 respectively. See the pictures.

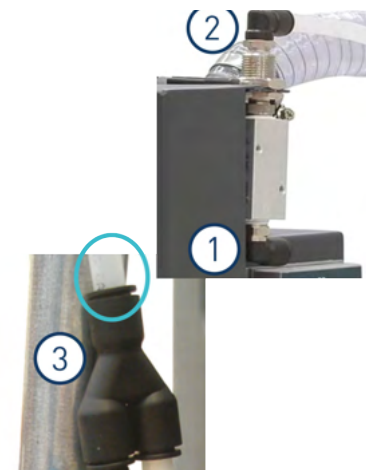
Once connected, open the air supply verify that you have maximum 6 bar pressure. Pressures higher than that causes an unnecessary expense and the possibility to produce turbulences in the hot melt tank with consequent malfunction of the unit.

### **SUCTION TUBE CONNECTION**

The suction tube should be connected to the swivel elbow of the vacuum feeder, inserting it into the inside of the metallic mouth down to its bottom.

Place the swivel elbow to the most convenient position for installation, depending on the location of the hot melt container. Therefore:

- Loose slightly the three fixing screws for the lid of the filter and set the swivel elbow.
- Place the swivel elbow to the desired position, twisting it in the required sense.
- Tight the three fixing screws to the position of the elbow and prevent their movement.





#### PLACING THE SUCTION TUBE

To transfer the adhesive from the adhesive container to the hot melt equipment, the suction tube should be inserted to the bottom of the container.

The four flaps that protects the entrance of the suction tube are designed to keep the suction mouth open and without obstructions. It maintains a free way for the suctioned adhesive.

The vibratory element (pneumatic) keeps the adhesive loose around the entrance to facilitate its suction.

The aspiration element uses compressed air. By the help of the venturi effect, a depression is created in it, that absorbs pearled and pallet adhesive and drives it to the shell of the hot-melt system.

The Venturi effect, applied to the vacuum feeder, consists in a decrease of the air pressure by an air flow inside the closed circuit while increasing the air speed when passing through the narrowing of the entry mouth.

As the entry of aspiration is connected to this point, the aspired adhesive stays in it and is transported to the hot-melt tank through the flexible communication hose.



#### ELECTRICAL CONNECTIONS

Connect the power and the signal cable to the corresponding socket on the back of the equipment.

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## OPERATION

In this section we will introduce the method for using the melter. Although its operation is very simple, it should not be used by untrained personnel.



### Warning

Improper use may cause damage to the machine or injury and even death to the person using it.

### GENERAL INFORMATION

There are three large groups of components with thermal control in a hot-melt installation:

- the fusion unit,
- the transport hoses and
- the applicators.

All of these are controlled from the front panel of the melter equipment.

The first large group is the tank (T) an distributor (D) group and they have separate programmable controls.

The second group is the hose group. They are identified on the front panel, depending on the equipment model, by number, from number 1.1 to number 6.1 . Each one has its own set point value.

The third group is the applicators group. It is identified on the front panel, depending on the equipment model, by number from number 1.2 to number 6.2 . Each one has its own set point value.

The hose and applicator numbers are automatically assigned to the hose/ applicator channel they are connected to on the rear part of the melter..



**FILLING THE TANK**

The tank can be equipped with a low level capacitive sensor that warns when the level of hot-melt adhesive drops below a third of the tank's capacity.

The unit will deactivate the external signal and, if it is connected, will activate its the corresponding warning device.

**Warning:**

Before refilling the tank, make sure that the adhesive is the same type as that already in the tank. Mixing different types of adhesives can cause damage to the melter equipment.



To fill the tank:

1. Open the tank lid
2. Use a shovel or a ladle to fill the tank with adhesive. Do not fill the tank above the loading opening level. The lid must be able to close normally.

**Warning:**

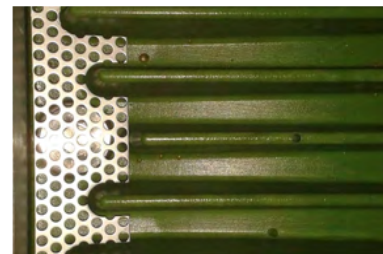
Risk of burns. Always refill using protective gloves and goggles.



3. Close the lid when you have finished refilling the tank.

Model	Capacity*	
HB 6050 connect	5,15 l	5,15 kg
HB 6100 connect	9,7 l	9,7 kg
HB 6200 connect	19,7 l	19,7 kg
HB 6350 connect	37,4 l	37,4 kg

Bei einer Dichte von 1g/cm<sup>3</sup>

**STARTING UP THE MELTER EQUIPMENT**

Before starting up the melter equipment, it is necessary to check to see if the unit has been correctly installed and all its input/output and accessory connections are correctly established.

It is also necessary to make sure that the equipment has been filled with adhesive and that the operational parameters have been programmed.

To start:

















1. Connect the melter's switch.  
When the switch is actuated, the GREEN POWER LED remains lit. The unit is powered but the screen stays off.
2. When you press the ON/OFF button, the screen lights up and the POWER LED stays lit. The main screen shows the unit's status.  
Once it has reached 3° below the programmed temperature (set point) of the all active elements, a programmable delay timer starts until, guaranteeing fusion, the pump receives permission to operate and the signal will be sent to the main machine by the external output 'Temperature OK'.

While the system counts down the delay time, the temperature OK symbol flashes until the programmed time value is reached. The screen displays the actual temperature values for each zone at all times.

If the temperatures of all the active zones exceed the set point temperature -3° in under 5 minutes, the unit will pass to 'Temperature OK' status without taking the 'Pumping Permission Delay' into account.

3. Use the machine's pressure gauge to make sure that the generated pressure is adequate. Values below 0.5 bar may cause erratic pump action.

Unit status	Symbol on the display	Central LED	Decription
Heating			The unit is heating the programmed zones.
Delay			The zones are at Temperature OK but the 'Pumping Permission Delay' is activated.
Standby			The tank or the distributor are in standby mode.
Inhibition			The tank or the distributor are inhibited.
Alarm: Warning			The unit has an operating error but can continue operating.
Alarm: Error			The unit has an operating error and cannot continue operating.
Temperature OK			The unit is ready to operate.

**MANUAL PUMPING PERMISSION**

When the unit reaches 'Temperature OK', the pump can be manually activated or stopped by pressing the 'STOP' key.

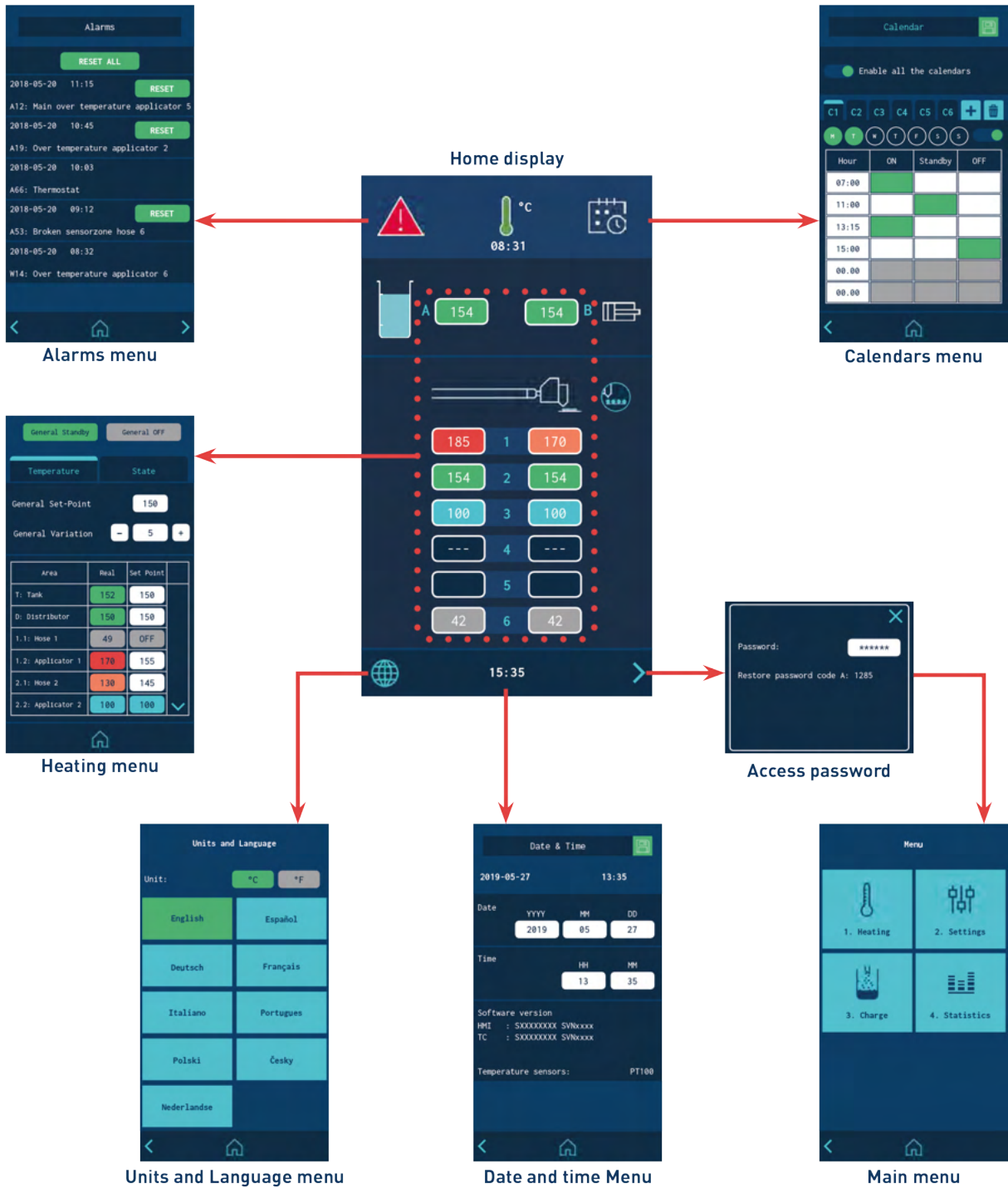
When the pump is deactivated, the red LED next to the key stays lit.

**MELTER EQUIPMENT DISPLAY**

The 7-inch touchscreen shows the main data and contains a user menu to customise how your unit is configured and operated.



The user menu has the following structure:



## GENERAL CHARACTERISTICS

In general, there are several icons and pieces of information that are repeated throughout the screen navigation, so they will be explained at the beginning and then not in the next screens.

## NAVIGATION ICONS

Right arrow icon (FORWARD), located in the lower right part of the screen. Appears when there is a possibility of navigation to a next screen. From the HOME screen it provides access to the MENU.



Left arrow icon (BACK), located in the lower left part of the screen. This icon appears on all the menu screens, allowing you to return to the previous

From any screen you can return to the main screen by clicking on the icon (HOME) located in the bottom centre of the screen.

## SAVE CHANGES

The 'SAVE CHANGES' icon, located in the upper right part of the screen, appears in the data entry and programming screens. If the data shown on the screen is stored, the icon appears with a blue background. If the data has not been stored, the icon is shown with a green background.

## Note:

In some options, the unit does not automatically store programming data. Whenever you modify or program any data that you wish to keep press "SAVE CHANGES"

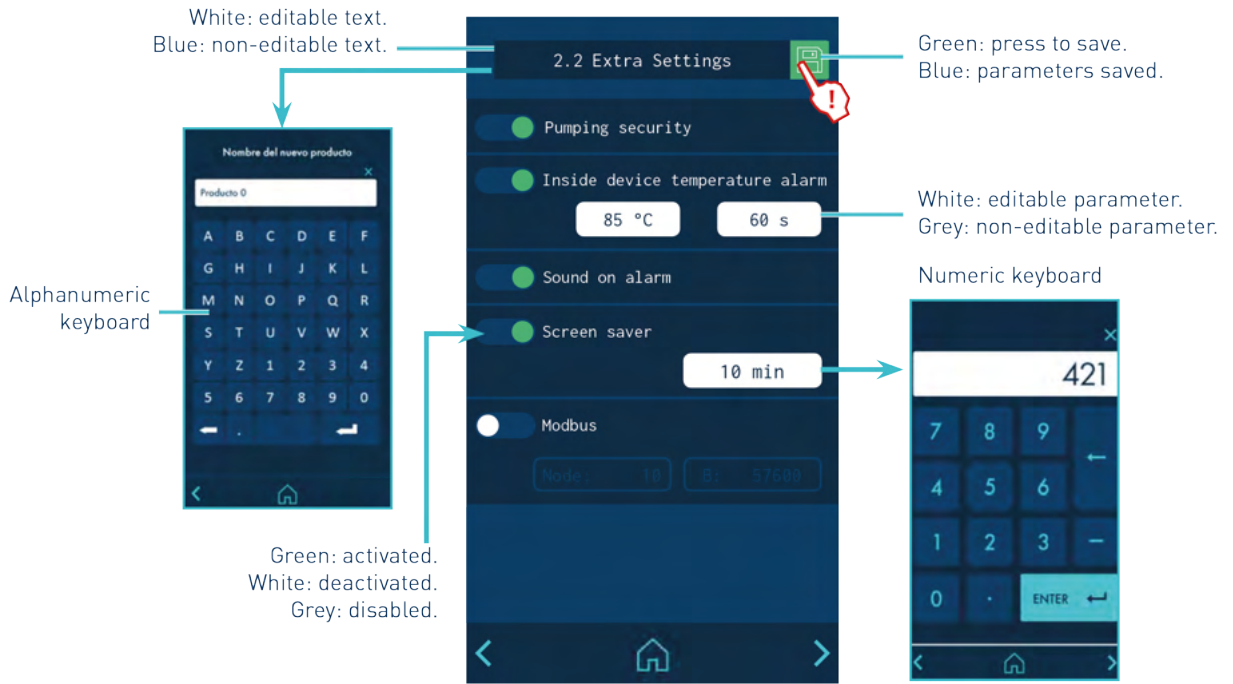


Press to save



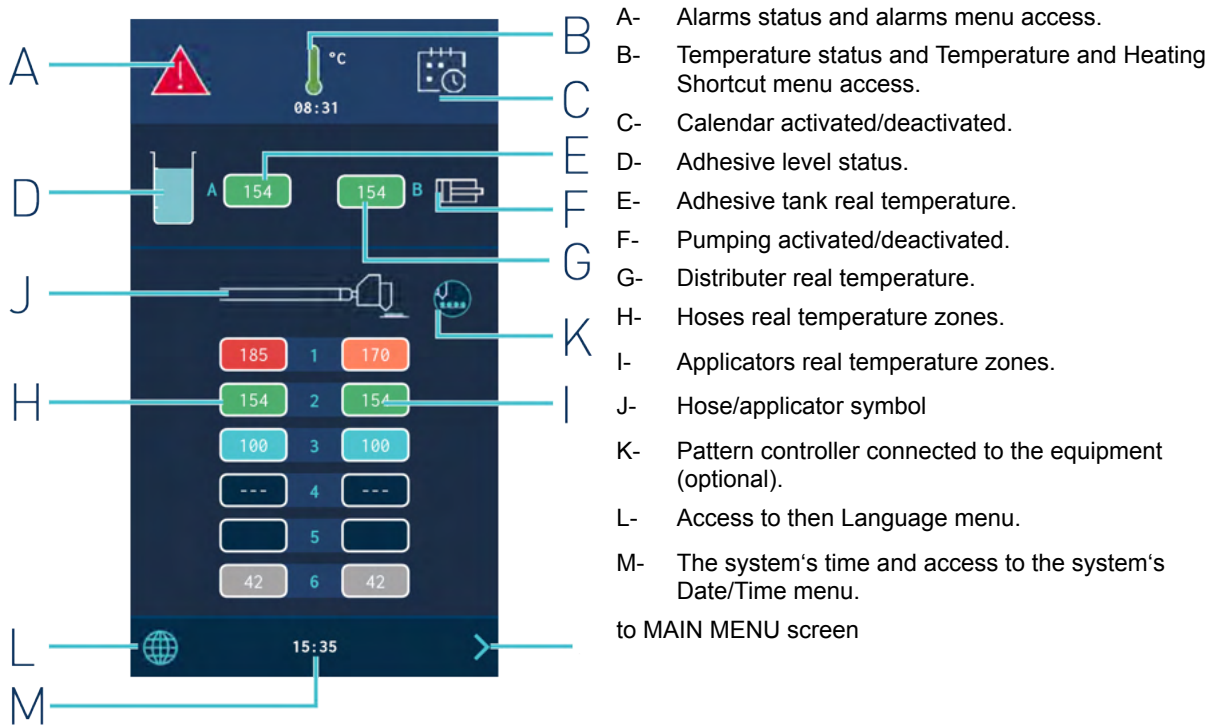
Parameters saved

### DESCRIPTION OF DISPLAY CONTENTS









### HOME DISPLAY

It is the main screen where the most representative values of the equipment are shown.



**GENERAL TEMPERATURE STATUS**

-  Temperature OK.
-  Unit heating up.
-  Unit heating up.  
'Pumping Permission Delay' countdown timer, once all the active heated components have reached their set point temperature  $\pm 3^\circ$ .
-  Unit in Standby mode.
-  Unit in Inhibition mode.
-  Unit in overheating or low temperature alarm.

Moreover, this icon shows whether the temperature is indicated in °C or °F. Access the Temperature and Heating Shortcut displays menu by pressing the icon.

### ALARMZUSTÄNDE



There are no errors.



The unit has an operating error but can continue operating.



The unit has an operating error and cannot continue operating.

Access the ALARMS menu by pressing the icon.

### CALENDAR STATUS



Calendar not activated.



Calendar activated.

Access the CALENDAR menu by pressing the icon.

**ADHESIVE LEVEL STATUS**



- WITHOUT automatic loading
- WITHOUT level sensor



- WITH automatic loading
- Adhesive level nearly empty



- WITHOUT automatic loading
- WITH level sensor
- Adhesive level nearly empty



- WITH automatic loading
- Adhesive level nearly empty, LOADING



- WITH automatic loading
- Adhesive level sufficient and LOADING (extra time)



- WITHOUT automatic loading
- WITH level sensor
- Adhesive level sufficient



- WITH automatic loading
- Adhesive level sufficient

**PUMPING STATUS**



Pumping not activated.



Pumping activated.

Access the PUMPING menu by pressing the icon.

**TEMPERATURE STATUS**

Zone heating.



There is no physical connection of components in that zone.



Temperature sensor error in that zone.



Zone in Temperature OK.



Zone in Standby mode.



Zone in Inhibition mode (OFF).



Zone in overheating or low temperature warning.  
**Note:** For a zone to be able to give a low temperature warning, it must have first reached its set point temperature.

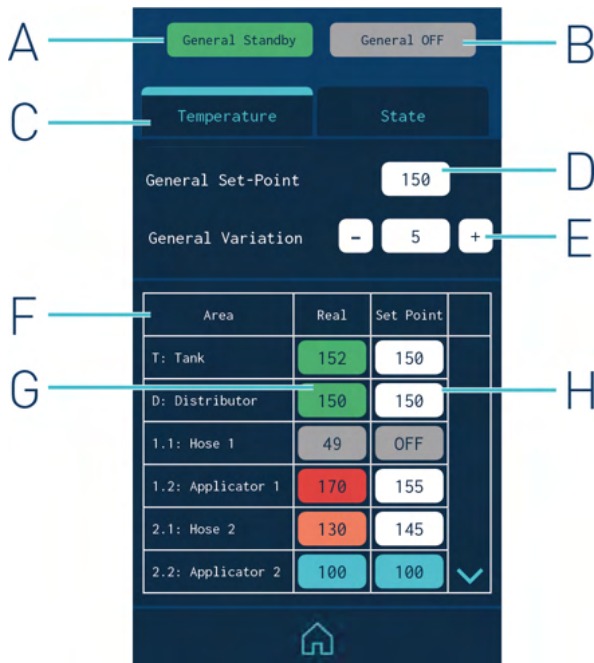


Zone in overheating or low temperature alarm.  
**Note:** For a zone to be able to give a low temperature warning, it must have first reached its set point temperature.

Access the SHORTCUTS menu by pressing the temperatures area.

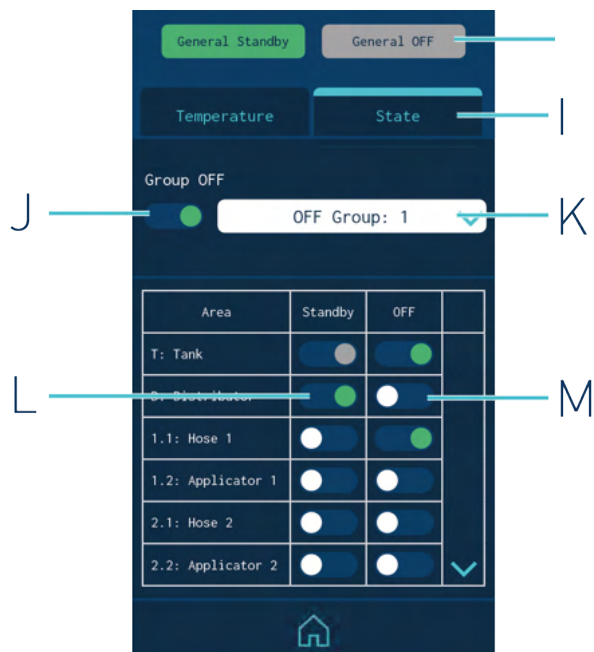
### TEMPERATURE AND HEATING SHORTCUT DISPLAYS

These screens give you access to the unit's quick settings.



- A- General standby of the unit (activate/deactivate).
- B- General inhibition of the unit (activate/deactivate).
- C- Programming of temperatures.
- D- General set point temperature (all zones).
- E- Temperature variation over the set point..
- F- Temperature zones (14 zones).
- G- Actual temperature.
- H- Set point or control temperature.

- Unit ON: Setpoint temperature.
- Unit or Component on Standby: Standby Temperature.
- Component Disabled: OFF



Green: activated. Grey: deactivated

- I- Programming of zone statuses.
- J- Inhibition/activation by groups of zones.
- K- Group selection.
- L- Activation of Standby in each zone.
- M- Activation of Inhibition in each zone.





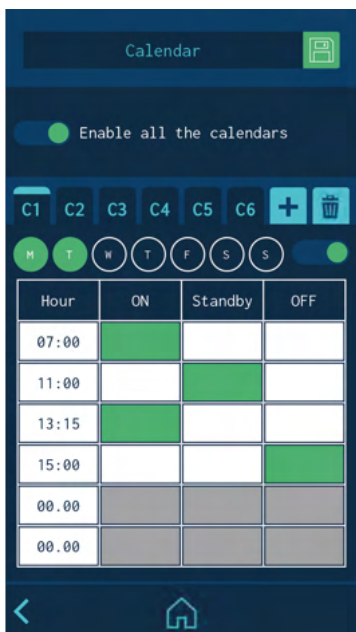
**PROGRAMMING OF TEMPERATURES**

1. Enter a temperature in 'General set point' to simultaneously program all the zones with that temperature value.
2. To make quick adjustments, enter a variation value in 'General variation' and add (+) or subtract (-) it from the 'General set point' value. The value is simultaneously added or subtracted in all zones.
3. To program each zone individually, click on the 'Set point' value and enter the new desired temperature value.



**PROGRAMMING OF STATUSES**

1. Press 'General Standby' to activate (green) or deactivate (grey) the Standby mode in all zones.
2. With the 'General Standby' mode activated (Equipment in Standby) it is not possible to activate each Zone individually.
3. Press 'General Off' to activate (green) or deactivate (grey) the Inhibition in all zones. With the 'General Off' mode activated (Equipment OFF) it is not possible to activate each Zone individually.
4. To inhibit a group of zones, select the group and activate the inhibition (green). To define the different groups, see the 'Inhibitions' point.
5. Press 'Standby' in each zone to individually activate (green) or deactivate (white) the Standby mode.
6. Press 'OFF' in each zone to individually activate (green) or deactivate (white) the inhibition.



**MENU CALENDAR**

This menu allows you to program a calendar with the unit's status changes. Once it is activated, the unit changes from one status to another automatically.

When the unit is switched on, it does so in the mode that has been programmed in the calendar, if the calendar is activated.

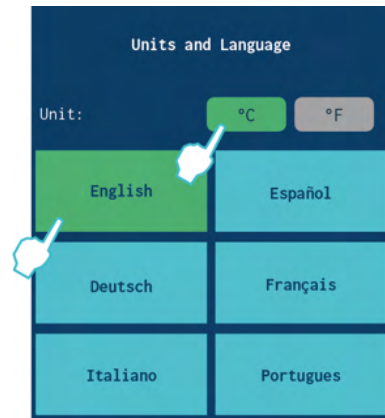
You can create up to six calendars (C1, C2, etc.) and up to six status changes per day, indicating whether the unit will be in ON, Standby or Inhibition (Off).

From the 'Select all calendars' option, you can simultaneously activate or deactivate all the calendars you have created.

You can add different days of the week to each calendar. Keep in mind that a single day cannot be programmed in two active calendars. Therefore, if a day of the week is programmed in an active calendar, it can only appear in other calendars if they are disabled.

### UNITS AND LANGUAGE MENU

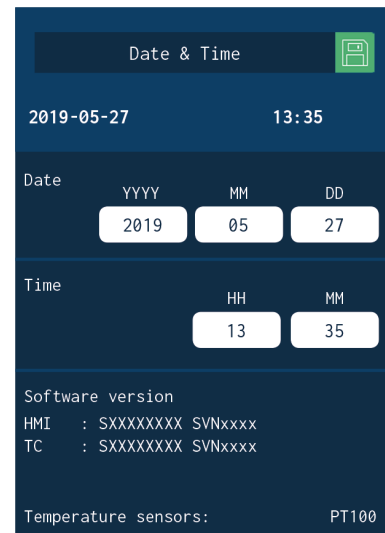
- Units: To select whether the temperatures are displayed in °C/°F.
- Language configuration: Press the desired language.



### DATE AND TIME CONFIGURATION

This screen lets you see and modify the system's date and time.

It also shows the version of the unit's software, and the type of temperature sensors installed.





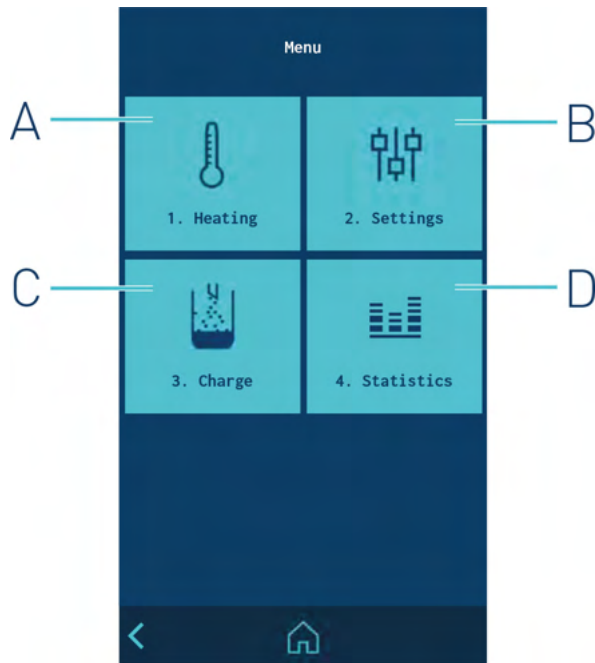
### ALARMS AND WARNINGS

It displays the alarms and warnings in chronological order. It shows 5 alarms on each screen, with a total of 3 screens.

When an alarm/warning needs to be reset for the unit to return to operation, a button appears for you to press and confirm that the problem has been resolved.

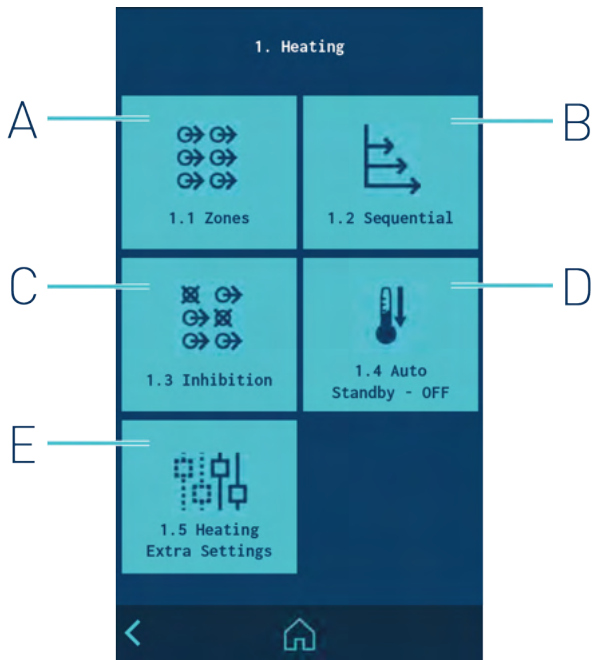
The 'Delete logs' button appears on the screen to delete all the alarm/warning logs.

### MAIN MENU



- A- Heating options configuration.
- B- General settings of the unit.
- C- Automatic loading configuration.
- D- Access to statistics.

### '1. HEATING' MENU



- A- Heating zones configuration.
- B- Heating sequence by zones configuration.
- C- Programming of Inhibitions.
- D- Standby modes configuration.
- E- Access to extra options.

#### 1.1 HEATING ZONES

This menu lets you do the following for each zone:

- Change the name to identify it more easily.
- Edit the set point temperature.
- Edit the standby value. The value indicates the temperature reduction with respect to its set point.
- Apply PID values. By default the unit comes configured with a Standard PID.  
You can select from four PID options: Standard, Moderate, Quick or Manual.



#### Warning:

The PID values are directly involved in the heating process. Do not modify these values if you do not have the required technical knowledge or without the advice of BÜHNEN's After Sales Service.



## 1.2 SEQUENTIAL HEATING



This lets you start heating the zones one after the other. This prevents a zone from being active for a long time until the slowest zone heats up.

This function allows you to create three heating groups: A, B and C. Press 'Define groups' to go to a screen where zones can be added to the groups:

- **Group A:** this always includes the Tank, which is the slowest and serves as a reference for the remainder of the zones. Other zones can be added so they begin to heat up with the Tank.
- **Group B:** other zones can be added and some degrees of temperature defined before the tank reaches its set point and a wait time.
- **Group C:** the zones that are not in group A or B can be added here.

If a component in group B or C is deselected, it goes back to group A. By

default, all the zones belong to group A.

Example:

- » Tank set point temperature: 150°C
- » Programming of Group B: -20°C / 5 minutes.  
Group B begins to heat up 5 minutes after the tank reaches 130°C.

### 1.3 INHIBITIONS

This menu allows you to create seven groups of zones and program the mode in which the Inhibition (Off) can be activated or disabled.

The following is indicated for each group:

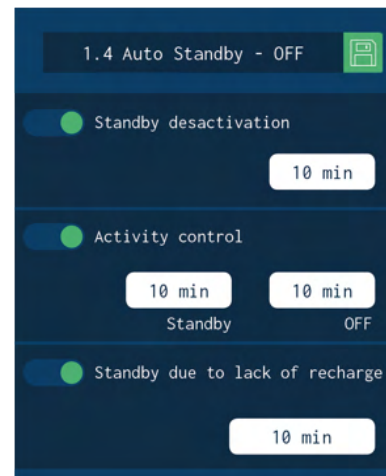
- **Name of the group.** The name can be changed to identify it more easily.
- **Manual inhibition of the group (Manual Off).** Whether it is possible to manually activate or deactivate the inhibition in that group from the 'SHORTCUTS' menu.  
Manual inhibition takes priority over external inhibition.
- **Automatic inhibition with external signal (External Off).** Whether it is possible to externally activate or deactivate the inhibition in that group. You must indicate which of the seven possible external signals will perform this function.  
One signal can never be enabled in two different groups.
- **Selected zones.** A zone may be selected in more than one group or may not be in any group.

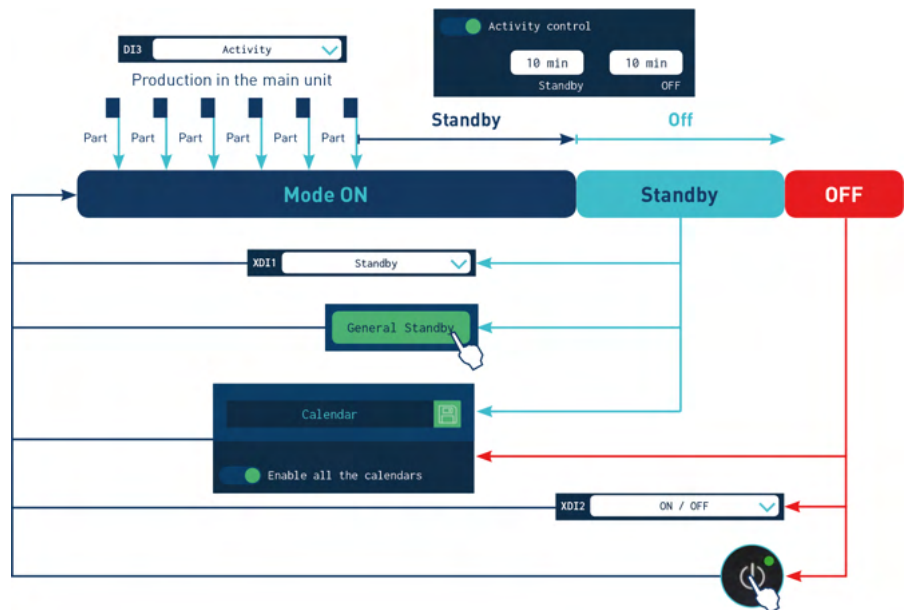


### 1.4 AUTO STANDBY - OFF

This function can program the following work parameters:

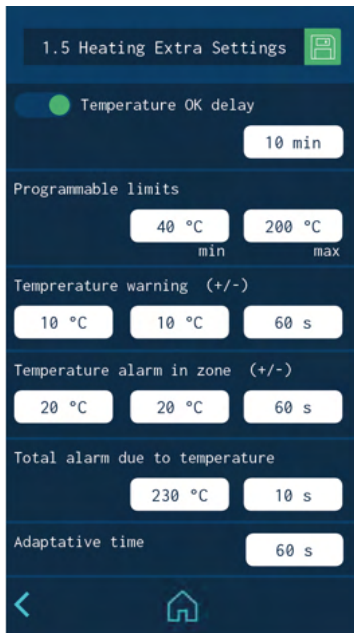
- **Standby Deactivation:** automatically deactivates the 'General Standby' mode activated manually. Once the minutes programmed in the unit have passed, the heating process will start again.  
If the 'Calendar' is active, the unit will follow the programmed calendar.
- **Activity control: This lets you configure the times for changing to Standby mode and to Inhibition (OFF) when the activity signal ceases.**  
The activity of the line is monitored from a digital input. When it detects that there is no activity, the unit changes to Standby mode after the programmed time has passed, and changes to Inhibition mode when the second time has passed.





- **Standby due to no reload:** the unit automatically goes into Standby when it detects a lack of adhesive and has not detected a reload after the programmed time has passed..

**1.5 EXTRA TEMPERATURE SETTINGS**
















- **Pumping permission delay:** This is the time that the unit must wait to activate pumping after all the active zones have reached a temperature above [Set point temp. -3°].
- **Programmable limits:** Two limits can be set to prevent set point temperatures from being programmed above or below those values.
- **Temperature warning:** A temperate ( $\pm^{\circ}\text{C}/^{\circ}\text{F}$ ) and a time are defined to indicate when the overheating or low temperature warning is activated in each zone.
- **Temperature alarm:** A temperature ( $\pm^{\circ}\text{C}/^{\circ}\text{F}$ ) and a time are defined to indicate when the overheating or low temperature alarm is activated in each zone. If either of those values are reached ( $\pm$ ) and maintained for the set time, the unit disconnects the heating in the zone causing the error. If the error persists 3 minutes later, the remainder of the zones are automatically disconnected. If the affected zones are the tank or the distributor, the unit also stops the pumping.
- **Total temperature alarm:** A temperature ( $\pm^{\circ}\text{C}/^{\circ}\text{F}$ ) and a time are defined to indicate when the overheating alarm is activated. If any zone reaches this temperature and maintains it for the set time, the unit disconnects the heating of all zones and stops the pumping.



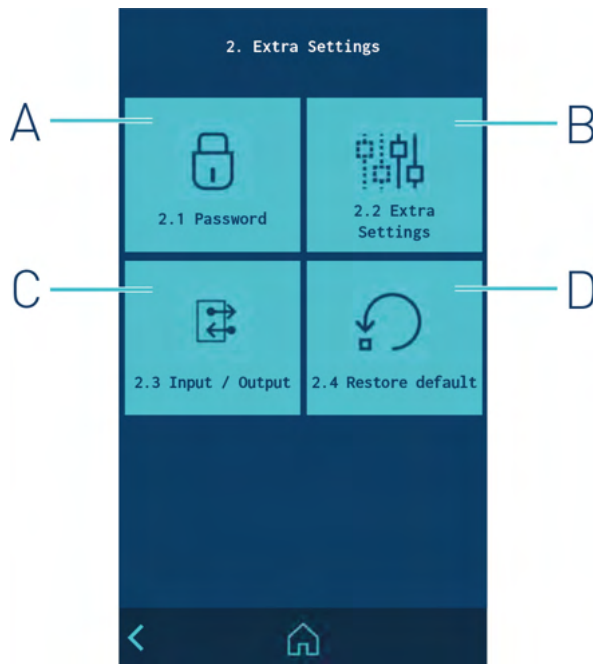
- **Adaptive time:** Automatic interval setting for warning and alarm temperatures, when the user reprogrammes the setpoint values.

(\*) Example values

Status	Actual temp.*	Set point temp.*	Heating	Pumping	Temp. OK	Alarm activated	Pumping activated
			ON	ON	ON	OFF	ON/OFF
			ON	ON	ON	ON	ON/OFF
							
			OFF Unit	OFF if... Error in tank Error in distributor	OFF	ON	ON/OFF
			OFF Zone in error	ON if... Error in the remaining zones			
			OFF All Zones	OFF	OFF	ON	OFF



### '2. GENERAL SETTINGS' MENU



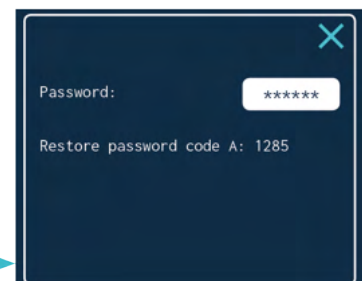
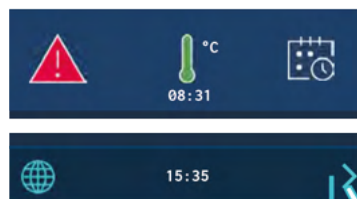
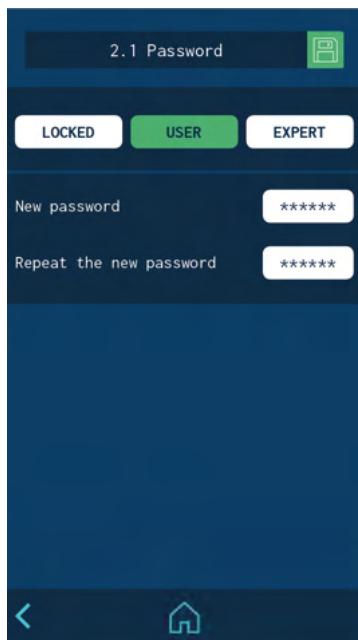
- A- Password management.
- B- Extra settings.
- C- Configuration of input and output signals.
- D- System restore

#### 2.1 PASSWORD MANAGEMENT

The unit has three access levels: LOCKED; USER and EXPERT.

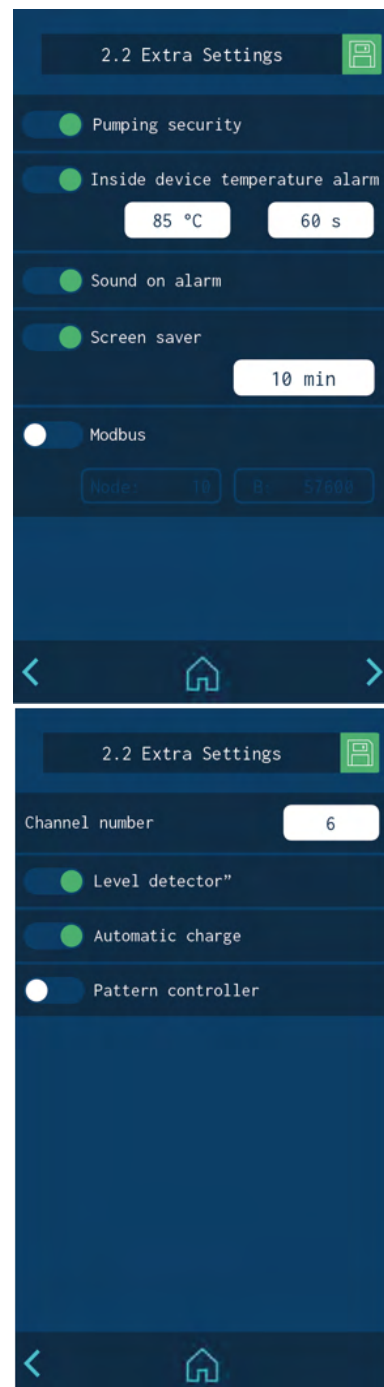
- **LOCKED:** Only the HOME screen can be displayed. You cannot edit any value or access any menu.
- **USER:** you can view the HOME screen, access the SHORT-CUTS menu, view statistics and view alarms and calendars.
- **EXPERT:** All menus are available.

When the unit is protected in LOCKED or USER mode, the remainder of the options can be accessed by pressing any unauthorised menu. The program will then ask for the corresponding password. The program will then ask for the corresponding password.



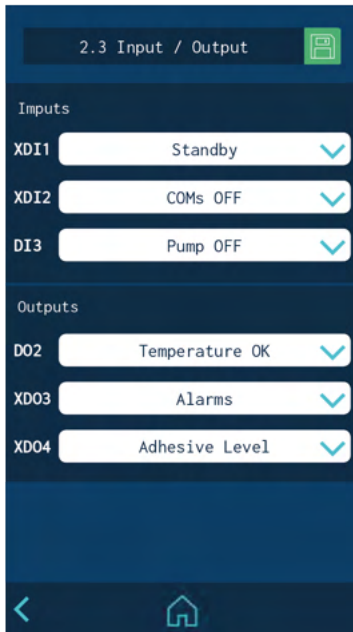
## 2.2 EXTRA SETTINGS

- **Pumping security:** When this option is activated, if you want to enable the pumping permission you have to manually press the STOP button once the unit is in 'Temperature OK'.
- **Cabinet temperature alarm:** A value (+°C/°F) and a time are defined to indicate when the alarm is activated due to overheating inside the unit's electrical cabinet. If it reaches this temperature and maintains it for the set time, the unit disconnects the heating of all zones and stops the pumping.
- **Activate or deactivate the alarm sound:** To stop the sound, press the ALARM icon on the HOME screen.
- **Activate or deactivate the screensaver:** The screen switches off after the set time has passed. If you press the screen when it is off, it turns on and the HOME menu appears.
- **Activate or deactivate the Modbus communication.**
- **Number of channels.** Configures the number of electrical outputs enabled in the melter.
- **Level sensor.** Indicates whether or not the unit has a minimum adhesive level sensor. See the point 'Menu 3. Feeding' for programming the various operating parameters.
- **Automatic feeder.** Indicates whether or not the unit has an automatic adhesive feeder. See the point 'Menu 3. Feeding' for programming the various operating parameters.
- **Firing controller.** Indicates whether or not the unit has firing controller functions.



### 2.3 CONFIGURATION OF INPUT AND OUTPUT SIGNALS

This allows you to configure the unit's digital input and output signals.



The inputs can be:

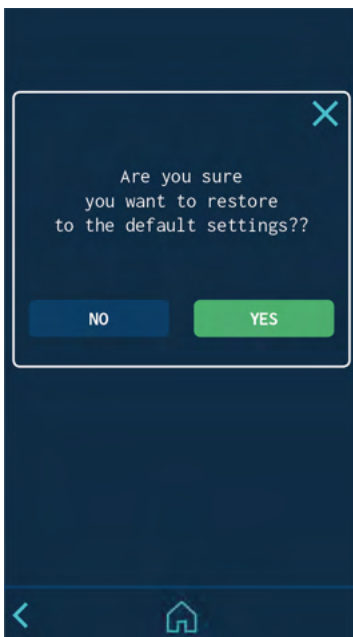
- **ON/OFF:** Switches the unit fully off or on.
- **Standby:** Activates or deactivates the Standby mode.
- **Activity:** Enables the activity control to measure the times for switching automatically to Standby and OFF.
- **Pumping:** Activates or deactivates the pumping.
- **COMM:** Activates or deactivates the communications.

The outputs can be:

- **Level:** Indicates a low level of adhesive in the tank.
- **Pumping:** Indicates that pumping is activated.
- **Temperature OK:** Indicates that the melter status is OK for pumping.
- **Error:** Indicates that there is an active Alarm.
- **Level NOT OK (warning light):** It activates the warning light of low adhesive level in the tank.

### 2.4 RESTORE DEFAULT VALUES

Allows you to delete all the changes made to the system and leave the unit with the factory-set default parameters. After pressing, the following confirmation message will appear.



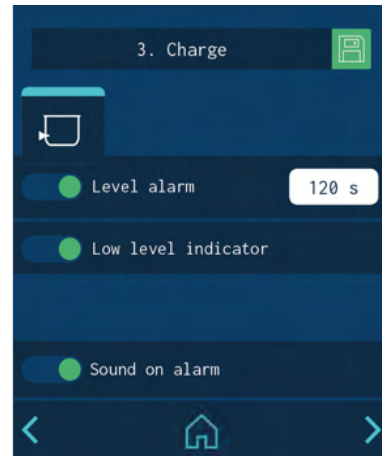
When you press 'YES', the device restarts with the default configuration.

### '3. LOAD' MENU

These screens allows control of several tasks regarding the adhesive feeding.

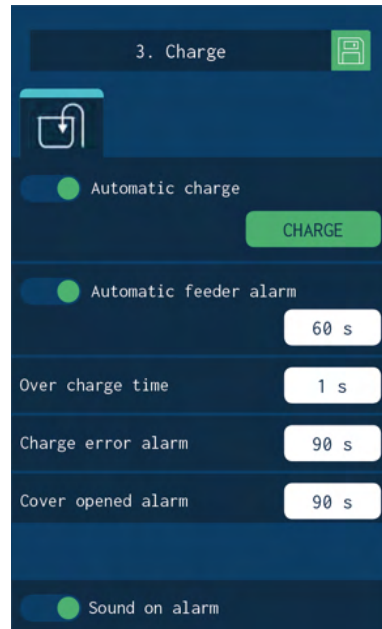
#### Screen 1: Minimum adhesive level sensor

- **Level alarm:** Time after which the unit stops and activates a low-level alarm.
- **Minimum level sensor:** Activates or deactivates the sensor function.
- **Sound with alarm:** Allows you to configure the sensor alarm to emit a sound.



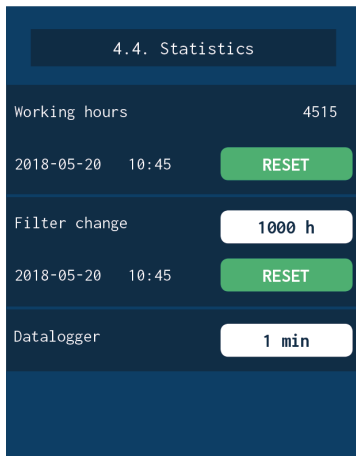
#### Screen 2: Automatic adhesive feeder

- **Automatic feeder.** Activates or deactivates automatic feeding. When you press 'CHARGE', This lets you activate manual loading. When pressed, it loads, and when released, the loading stops.
- **Overfill time:** This lets you configure for how much time the adhesive will continue to be loaded once the lower level sensor has activated (tank sufficiently full, but not completely full).
- **Loading error alarm:** This defines the maximum amount of time for filling the tank. If this time is exceeded, the unit displays an alarm.
- **Open tank lid alarm:** An alarm sounds when the tank lid is open and it stops loading immediately.
- **Buzzer:** This lets you set whether or not loading alarms emit a sound.

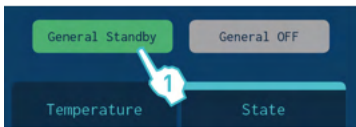


#### '4. STATISTICS' MENU

This screen displays:



- **Hours of operation:** This counts all of the hours during which the unit is in Temperature OK. To reset the counter to zero, you must press reset.
- **Filter change.** To program a countdown in hours. When it gets to '0', the unit gives a warning to change the adhesive particles filter. Once the filter has been changed, press reset to return the counter to the set value.
- **Data logger.** Time interval for logging the unit's programming and operating data. You can back up this data using the application for PCs.

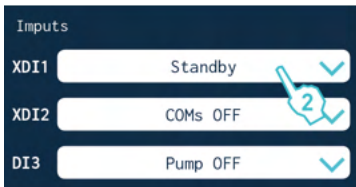


#### STANDBY FUNCTIONS

Using the standby function during periods of melter/applicator inactivity helps save energy and allows the heated elements to return quickly to their set point temperatures once you return to the operational mode.



When the function is activated, the target temperature of the heated zones is reduced to the programmed value for each zone (see 'Heating menu / Heating zones').

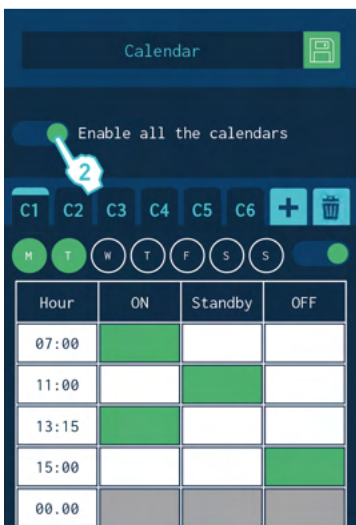


For example, if the target temperature of the tank is 160°C and the Under Maintenance parameter is set to -30°C, when the Under Maintenance function key is pressed, the tank's set point temperature will change to 130°C.

The priority protocol is as follows:

1. Under Maintenance external signal.
2. 'Under Maintenance' function key. or calendar programming.
3. individual Under Maintenance function key.

Therefore, while the Under Maintenance external signal remains active, none of the other three systems can deactivate the function.



The following criteria are suggested for standby function use:

- If the period of inactivity is less than 2 hours, allow the melter applicator equipment to heat as normal.

- If the period of inactivity is more than 2 hours and less than 4 hours, use the standby function.
- - If the period of inactivity is over 4 hours, use one of the following two options: turn off the equipment if you do not plan on using it for the rest of the day or keep the standby function on if you plan on using the equipment during that same day..

**TURNING OFF THE MELTER EQUIPMENT**

If you need to disconnect the melter equipment:

1. Turn off the machine switch.  
The depressurization valve frees pressure from the hydraulic circuit, returning the adhesive to the tank.
2. Disconnect the pneumatic power to the applicators and the electrical power to the control unit programmer, if there is one..

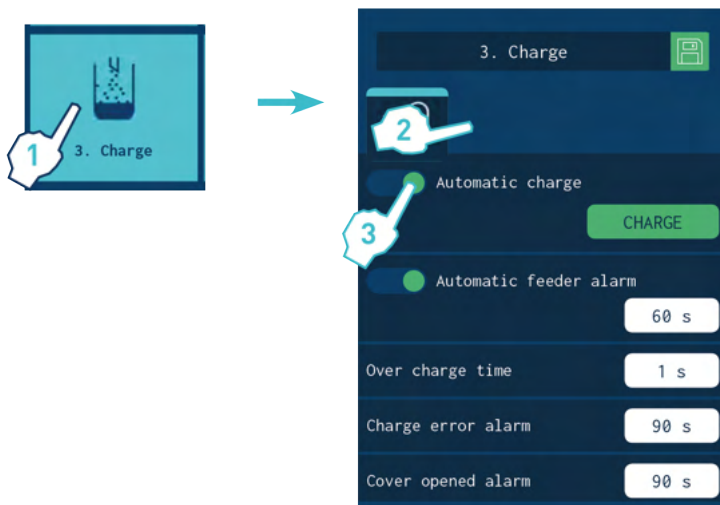


**USE OF THE AUTOMATIC FEEDER**

This section presents how to use the automatic feeder. Even if its operation is very simple, it should not be used by non-trained personnel.

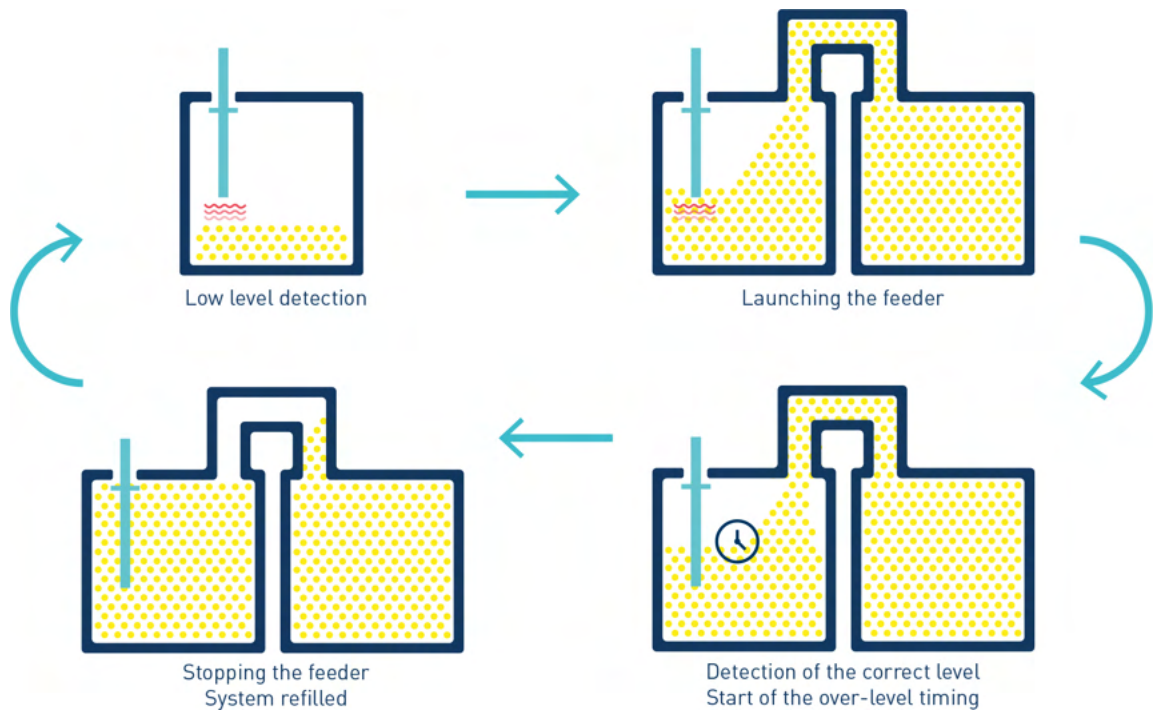
**START UP AND AUTOMATIC PROCESS**

The operation of the vacuum feeder is absolutely automatic and only needs to switch it on in the program menu, to begin the automatic feeding when the low level sensor requests it.



The automatic loading process is developed according to the following pattern:





#### SENSITIVITY ADJUSTMENT

The adjustable sensitivity of the sensor is factory pre-set and therefore it is NOT necessary to change. In most cases the factory setting is perfectly valid to use the automatic feeder.

#### POSITIONING OF THE LEVEL SENSOR

The sensor is supplied factory set so that, when the pellet level is around 10 mm below the sensor, it detects a full tank (green LED).

Depending on the type of pellet used, it may be necessary to make a final adjustment when starting up the system:

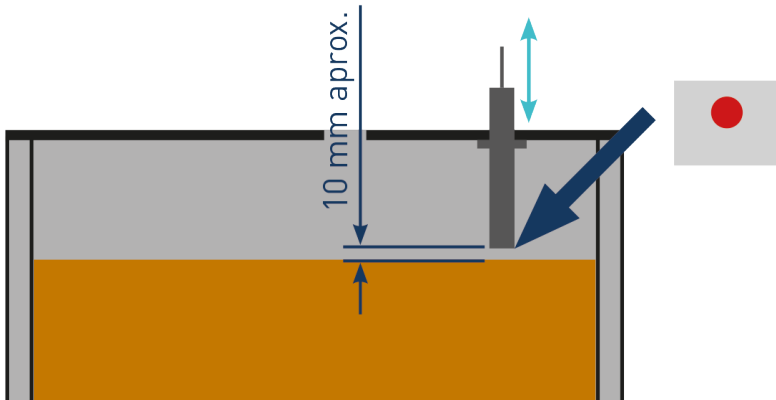
**Important:** Use the working adhesive at the operating temperature.



#### Warning

Hot zone with high temperatures. Risk of burns. Use thermal protective equipment.

1. With the unit at the operating temperature and the sensor clean, fill the tank with the pellets that you are going to work with, up to what is considered the 'tank full' level.
2. Move the capacitive sensor up/down in relation to the tank lid, right until the colour of the LED changes from green to red. The LED should remain red.



3. We recommend checking that it is properly set by running a few automatic reloading cycles.

**Note:**

If the sensor sensitivity setting needs to be corrected, contact BÜHNEN's after sales service or the area representative.





## MAINTENANCE



### Warning

The melter equipment is equipped with current technology, but has certain foreseeable risks. Therefore, only allow qualified personnel with enough training and experience to operate install or repair this equipment.

The following table briefly summarizes the indications for adequate melter equipment maintenance. Always read the corresponding section carefully.

Operation	Frequency	Refer to chapter
External cleaning	Daily	<i>Equipment cleaning</i>
System depressurization	Before performing maintenance tasks and repairing the hydraulic system	<i>System depressurisation</i>
Remove electrical cabinet	<ul style="list-style-type: none"> <li>• Before performing pneumatic unit or pump shaft maintenance</li> </ul>	<i>Access to pneumatic unit</i>
Filter cleaning or changing	<ul style="list-style-type: none"> <li>• As needed (once a year minimum)</li> <li>• With each adhesive change</li> </ul>	<i>Filter maintenance</i>
Emptying and cleaning the tank	<ul style="list-style-type: none"> <li>• When burnt adhesive is present</li> <li>• With each adhesive change</li> </ul>	<i>Cleaning the tank</i>
Check thermostag operating	<ul style="list-style-type: none"> <li>• Check in continuous work</li> </ul>	<i>Safet thermostat</i>
Equipment change	<ul style="list-style-type: none"> <li>• Equipment change ore repair</li> </ul>	<i>Remove the equipment from its base</i>

### ***EQUIPMENT CLEANING***

To continue to take advantage of the melter's benefits and to ensure the perfect mobility of its components, it is necessary to keep all its parts clean, especially the ventilation grate on the upper part of the machine.



### Warning

Risk of electric shock. Carelessness may result in injury or death.

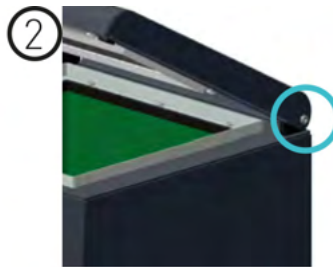
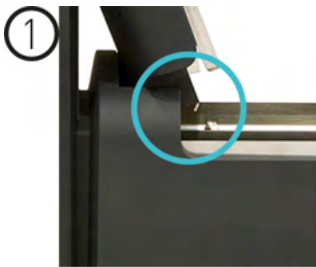
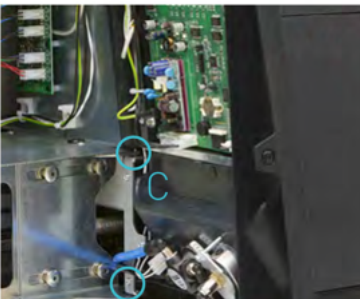
Clean the exterior using a cloth moistened with water. Do not use flammable liquids or solvents.

To carry out external cleaning:

- Use cleaning products compatible with polyamide materials.
- Apply the cleaning product with a soft cloth.
- Do not use sharp tools or scrapers with sharp edges.

**Removing and changing exterior panels:**

1. Turn off the melter.
2. Disconnect the compressed air from the machine intake.
3. To remove the casing from the machine, first you have to separate the electrical cabinet from the tank. To do this, slacken the 1/4 turn screw as indicated (A) and slide it along the guides.
4. To remove the electrical cabinet door, open the door by turning the 1/4 turn screw as indicated (B), lift the door, turn it and remove the screws (C).
5. To remove the electrical cabinet casing, slacken the screws (D) that hold it to the base of the machine and the screws (E) that hold it to the structure of the electrical cabinet.
6. To remove the tank casing, remove screws F and G that hold this casing to the base of the equipment. The lid and the casing are removed from the tank at the same time.
7. The tank lid of *HB 6050 connect* and *HB 6100 connect* is removed once the tank casing has been dismantled. It is simply a matter of sliding the shafts at the ends along the grooves in the casing. (See diagram 1).



8. The tank lid of *HB 6200 connect* and *HB 6350 connect* is removed loosening the side lid screws (see diagram 2).



**SYSTEM DEPRESSURISATION**

'*HB 6000 connect*' series melters are equipped with a safety valve that allows you to depressurize the system whenever the equipment is pneumatically or electrically disconnected.

Before disconnecting any hydraulic component or opening any distributor output, it is necessary to follow these steps:





1. Turn off the machine switch on the door of the electrical cabinet next to the pressure regulator.  
The depressurization valve releases the pressure from the hydraulic circuit, returning the adhesive to the tank.
2. Purge all applicators that have been used either manually or with the corresponding program command



#### **ACCESS TO PNEUMATIC UNIT**

To access the unit for more exhaustive machine maintenance, it will be necessary to remove the electrical cabinet from its place so it can be handled more comfortably and accessibly. To do this, slacken the 1/4 turn screw that keeps the electrical cabinet in position (screw A) and slide it along the guides.



To carry out this operation it is not necessary to open the electrical cabinet door..

#### **FILTER MAINTENANCE**

'HB 6000 connect' series melter equipment is equipped with a 50 mesh pump filter. The filter prevents impurities and burnt adhesive remains from being pushed out from the tank by the pump.



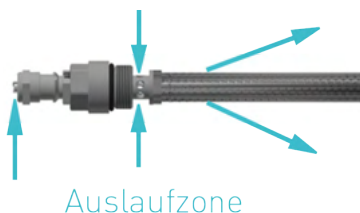
#### **Warning**

It is a good idea to also use a filter in the tank intake valve. This filter performs a first-step filtration, preventing impurities resulting from burning in the tank and other impurities that may enter from the outside from passing through.

The adhesive flows from the inside to the outside of the filter, with impurities being trapped inside it.

The drain valve is included in the filter cap.

When the filter is removed from its housing, all the impurities remain trapped inside, and the inside of the distributor stays perfectly clean. The filter may be cleaned or replaced directly with a new one.



No rule exists for determining when to change the filter. Several factors influence this decision::

- the type and purity of the adhesives used.
- the adhesive work temperatures.
- adhesive consumption relating to the time it normally remains

into the tank.

- changes in the type of adhesive used.

In any case, we recommend checking and cleaning the filter at least every 1000 hours of operation (melter equipment turned on).

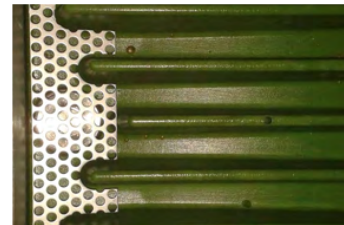
### Warning

Always use protective gloves and goggles. Risk of burns.



To change the filter, it should be borne in mind that the filter and purge valve are the same assembly:

1. Depressurise the system.
2. To remove the whole filter, unscrew the assembly's hexagonal plug using a 22mm socket driver and remove it..
3. Depending on the amount of dirt inside the cartridge, clean it or throw it away, following the applicable waste regulations.
4. Replace the joints if they are damaged.
5. Screw the assembly up again, clockwise.
6. Put the assembly back inside the distributor and tighten the screws.
7. Continue to work as normal.



### CLEANING THE TANK

The hot-melt tank must be cleaned on occasion to maintain its fusion and anti-adherence properties. The tank is covered on the inside with PTFE and inclined enough to aid unloading the hot-melt and to avoid it from being retained inside when consequential burning occurs.

Furthermore, when adhesives are mixed, reactions may occur between them, causing a degeneration and thus problems in unloading in the direction of the pump.

Therefore, it is recommended to clean the deposit every time that:

- a change is made to a different type of hot-melt.
- too much burnt material is generated in its interior..

**CHANGING ADHESIVE TYPE**

1. Use up as much of the adhesive as possible.  
If it is necessary to unload the adhesive without having used it up as much as possible, follow the instructions in the section 'Emptying the tank'.
2. Clean the remains of hot-melt adhesive on the inside of the tank..

**Warning**

Use appropriate protective equipment for high temperatures.

---

3. Add the appropriate type and quantity of the new adhesive, wait for it to melt and pump at least one full tank through the system (hoses and applicators).

**CLEANING BURNT ADHESIVE****Warning**

Use appropriate protective equipment for high temperatures.

---

**Warning**

Whenever you handle the filter or any other element subject to pressure, you must always perform a system depressurization first (see the corresponding section)

---



1. Empty the tank directly (see the section 'Emptying the tank') to prevent the burnt material from passing through the pump circuit.
2. Clean the adhesive remains and burnt material inside the tank. Do not use sharp objects that might damage the inside coating. Wir empfehlen die Verwendung eines Holzspatels.
3. Add the appropriate type and quantity of adhesive and wait for it to melt.
4. Remove the filter cartridge and clean it, if necessary (see the section 'Filter maintenance').
5. Reassemble the filter without the cartridge.
6. Pump a minimum of one tank through the distributor output marked number 1.
7. Remove the filter and attach it to the corresponding cartridge. Reinstall it in the distributor.
8. Refill the tank with adhesive, wait for it to melt and continue working as usual.

**EMPTYING THE TANK**

During normal maintenance activities, it is recommended, and sometimes necessary to empty the tank directly, without passing the adhesive through the pump system.

In the case of the 'HB 6050 connect', the tank does not have a pouring chute so, to empty out the adhesive you need to wait until it has cooled and separate it from the walls of the tank, making it easier to remove.

For the other models, empty the tank following these indications:

1. Keep the tank at working temperature.
2. Remove the tank cover and then its casing.
3. Lower the emptying chute attached to the tank and put a suitable container in position.
4. Unscrew the plug and allow the adhesive to flow freely into the container.
5. Once it is completely empty, clean the exit hole and chute of remains of adhesive.
6. Put the plug back in position.
7. Raise the emptying chute and put the cover of the casing back in position.

**Warning:**

Use appropriate protective equipment for high temperatures.

**SAFETY THERMOSTAT**

If there is an error in the resettable thermostat. Dismantle the tank casing with the cover and slide the electrical cabinet along. When you can see the thermostat, press the button indicated to reset it.



**REMOVE THE EQUIPMENT FROM ITS BASE**

For more thorough equipment maintenance, it is necessary to remove it from its present location to be able to perform operations more comfortably and with greater accessibility.

To do this, the equipment should be removed from its base following these indications:



1. Turn off the machine switch on the door of the electrical cabinet next to the pressure regulator.
2. Depressurise the system.
3. Disconnect the hoses connected to the distributor outputs both electrically and hydraulically.
4. Disconnect the input power supply and ground connection.
5. Raise the machine to extract it from the base.



## AUTOMATIC FEEDER MAINTENANCE

### Warning

The vacuum feeder is a device with updated technologies but with certain risks. Therefore, you should allow only the right people, with sufficiently enough training and experience, handling, installation or repair of these devices.



The following table summarizes briefly the indications for proper maintenance of the vacuum feeder. Read carefully, in each case, the corresponding section.

If the device does not work or works incorrectly contact the Technical Services 'BÜHNEN' or Area Representative.

Operation	Frequency	Refer to chapter
External cleaning	Daily	<i>Cleaning of the unit</i>
Pneumatic system	<ul style="list-style-type: none"> <li>• Daily: pressure control</li> <li>• Weekly: Überprüfen Leck</li> </ul>	<i>Pneumatic circuit</i>
Load sensor	<ul style="list-style-type: none"> <li>• Daily: load control</li> <li>• Weekly: cleaning</li> </ul>	<i>Control of load sensor</i>
Suction tube	Weekly	<i>Inspection aspiration tube</i>
Air exhaust filter	Weekly	<i>Filter maintenance</i>
Pneumaatic vibrator	Weekly	<i>Control of pneumatic vibrato</i>

### CLEANING OF THE UNIT

To maintain the performance of the vacuum feeder in perfect functioning, all of its components must be maintained clean and especially the exits in the air suction tube.

Eliminate waste that can clog the air outlets.

Keep clean and without obstructions the tube for the adhesive.

Clean items with a soft tissue and aspire the dust that can be accumulated.

### PNEUMATIC SYSTEM

Control regularly the pressure feeding circuit. Very low pressures do not allow proper loading of the adhesive. Very high pressures can produce splash of molten adhesive in the tank of the melting unit and even cooling of the hot melt.

Monitor periodically if there is any leak in the pneumatic circuit. In addition to being a useless expense resulting in loss of pressure and thus malfunction of the feeding system.





### **CONTROL OF THE LOAD SENSOR**



It is necessary to control if the load sensor is working properly and that it allows you to maintain the desired levels.

A low load will cause a decline in the level and the possibility of not having the amount of necessary hot-melt adhesive. By contrast, an overload can cause the overfilling of the tank with subsequent sealing of the loading mouth.

The load sensor should remain clean of charred adhesive that may affect the proper level detection.

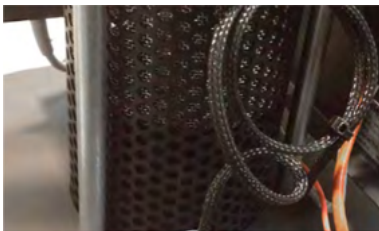
### **INSPECTION OF THE ASPIRATION TUBE**



Monitor that the aspiration tube is not obtured with sticked glue pallets or perls. This tube should be perfectly free of any glue plugs that impedes the smooth transfer of the adhesive from container to the tank of the melting unit.

The tube is mostly transparent to facilitate visual inspection of the same.

### **FILTER MAINTENANCE**

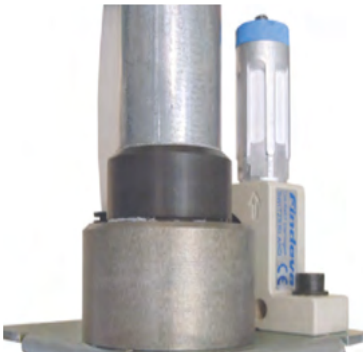


Periodically review the state of the filter located inside the discharge zone. Blow compressed air impurities that may have acceded to.

This filter avoids dust particles or glue pallets itself being spilled outside with the exhaust air. If it arrived to be plugged the system might not work properly.

To clean, unscrew the three screws of the rotary elbow lid and extract the filter.

### **CONTROL OF PNEUMATIC VIBRATOR**



Reviewing the correct operation of the pneumatic vibrator located in the suction mouth. Ensures that it vibrates and its vibration is adequate.

Clean up the exhaust silencer of impurities and adhesive dust.

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## TECHNICAL DATA

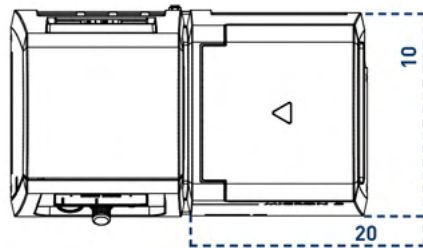
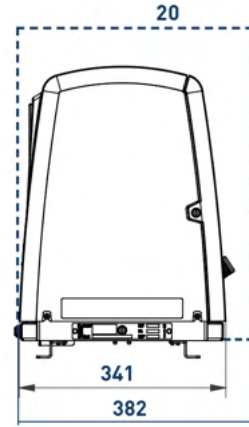
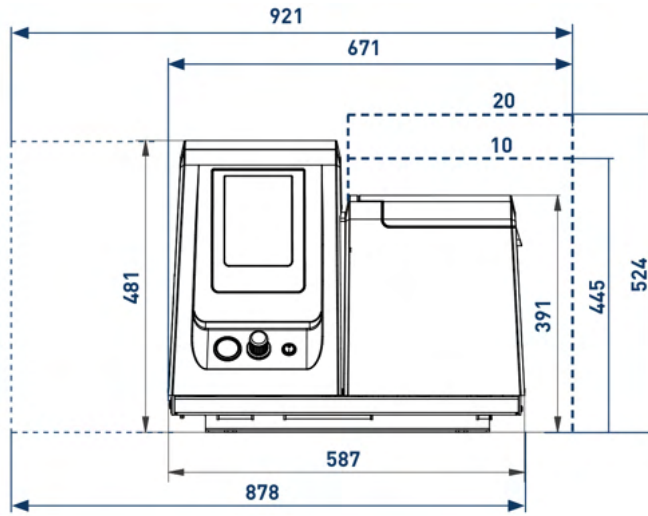
### GENERAL

	HB 6050 connect	HB 6100 connect
Tank capacity	5,15 liters	9,7 liters
Pumping rate	29,3 kg/h (*) 7 cm <sup>3</sup> /stroke pump 66,0 kg/h (*) 19 cm <sup>3</sup> /stroke pump	29,3 kg/h (*) 7 cm <sup>3</sup> /stroke pump 66,0 kg/h (*) 19 cm <sup>3</sup> /stroke pump
Melting rate	9,0 kg/h (*)	13,5 kg/h (*)
Number of outputs	6 (thread 9/16)	6 (thread 9/16)
Temperature range (optional)	0 to 200 °C (32 to 392°F) 230 °C (450°F)	0 to 200 °C (32 to 392°F) 230 °C (450°F)
Temperature control	RTD ±0,5 °C (±1°F) Pt-100, Ni-120 or NTC-R	RTD±0,5 °C (±1°F) Pt-100, Ni-120 or NTC-R
Max. working pressure (at 6 bar)	81,6 bar (1183 psi)	81,6 bar (1183 psi)
Max. installation power (at 400 V)	5.900 W (2 outputs) 9.500 W (4 outputs) 13.100 W (6 outputs)	6.900 W (2 outputs) 10.500 W (4 outputs) 14.100 W (6 outputs)
External functions		
Inputs	Unit On-Off / Standby On-Off / Activity Control / Pumping On-Off / Communications On-Off / Electrical Outputs Inhibition.	Unit On-Off / Standby On-Off / Activity Control / Pumping On-Off / Communications On-Off / Electrical Outputs Inhibition.
Outputs	Low adhesive level / Pumping On / Temperature OK / Error / Level Not OK (Warning light).	Low adhesive level / Pumping On / Temperature OK / Error / Level Not OK (Warning light).
Electrical requirements	230V 1~ 50/60 Hz + N + PE 400V 3~ 50/60 Hz + N + PE	400V 3~ 50/60 Hz + N + PE
Protection class	IP30	IP30
Ambient temperature	0 to 40 °C	0 to 40 °C
Dimensions (L x W x H)	587 x 341 x 481 587 x 341 x 628 (with lid open)	671 x 341 x 481 671 x 341 x 760 (with lid open)
Weight	37,5 kg (empty)	45,7 kg (empty)
(*) Under standard conditions		

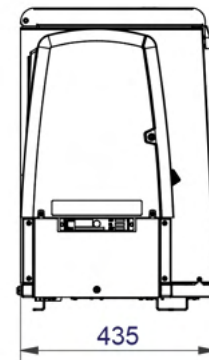
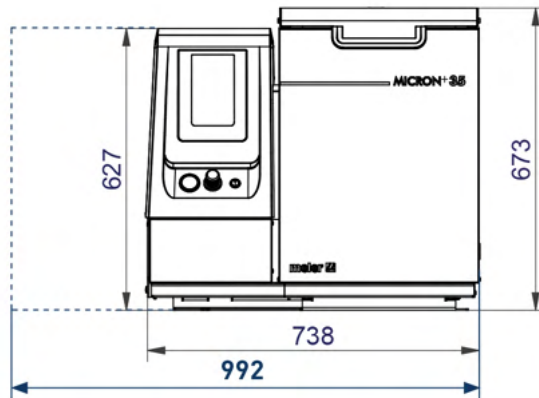
	<b>HB 6200 connect</b>	<b>HB 6350 connect</b>
Tank capacity	19,7 Liter	37,4 Liter
Pumping rate	29,3 kg/h (*) Pumpe 7 cm <sup>3</sup> /Stroke pump 66,0 kg/h (*) Pumpe 19 cm <sup>3</sup> /Stroke pump	29,3 kg/h (*) Pumpe 7 cm <sup>3</sup> /Stroke pump 66,0 kg/h (*) Pumpe 19 cm <sup>3</sup> /Stroke pump
Melting rate	19 kg/h (*)	30 kg/h (*)
Number of outputs	6 (thread 9/16)	6 (thread 9/16)
Temperature range (optional)	0 to 200 °C (32 to 392°F) 230 °C (450°F)	0 to 200 °C (32 to 392°F) 230 °C (450°F)
Temperature control	RTD ±0,5 °C (±1°F) Pt-100, Ni-120 or NTC-R	RTD ±0,5 °C (±1°F) Pt-100, Ni-120 or NTC-R
Max. working pressure (at 6 bar)	81,6 bar (1183 psi)	81,6 bar (1183 psi)
Max. installation power (at 400 V)	7.400 W (2 outputs) 11.000 W (4 outputs) 14.600 W (6 outputs)	8.900 W (2 outputs) 12.500 W (4 outputs) 16.100 W (6 outputs)
External functions Inputs	Unit On-Off / Standby On-Off / Activity Control / Pumping On-Off / Communications On-Off / Electrical Outputs Inhibition.	Unit On-Off / Standby On-Off / Activity Control / Pumping On-Off / Communications On-Off / Electrical Outputs Inhibition.
Outputs	Low adhesive level / Pumping On / Temperature OK / Error / Level Not OK (Warning light).	Low adhesive level / Pumping On / Temperature OK / Error / Level Not OK (Warning light).
Electrical requirements	400V 3~ 50/60 Hz + N + PE	400V 3~ 50/60 Hz + N + PE
Protection class	IP30	IP30
Ambient temperature	0 to 40 °C	0 to 40 °C
Dimensions (L x W x H)	671 x 382 x 524 671 x 382 x 875 (with lid open)	738 x 435 x 673 738 x 435 x 1067 (with lid open)
Weight	60,2 kg (empty)	90,1 kg (empty)

(\*) Under standard conditions

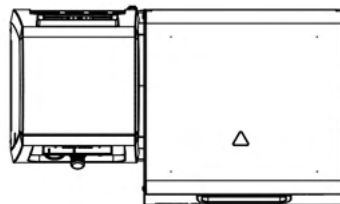
**DIMENSIONS**



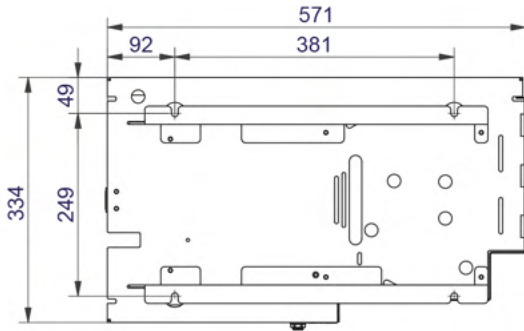
HB 6050 connect  
HB 6100 connect  
HB 6200 connect



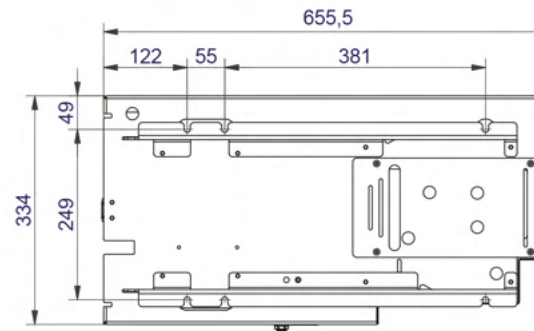
HB 6350 connect



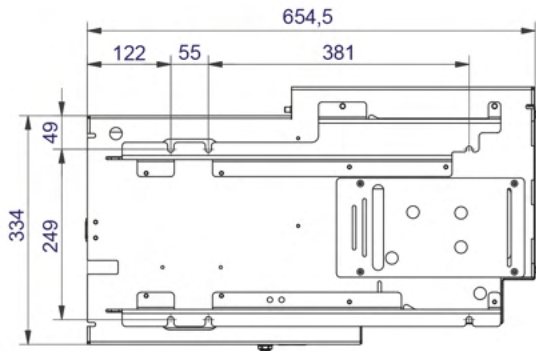
Fixation HB 6050 connect



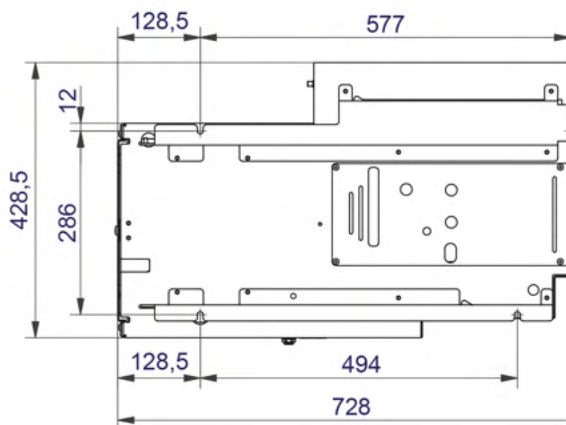
Fixation HB 6100 connect



Fixation HB 6200 connect



Fixation HB 6350 connect



**Note:** the indicated holes are for M8 screws.

## ACCESSORIES

### LOW LEVEL DETECTION SYSTEM

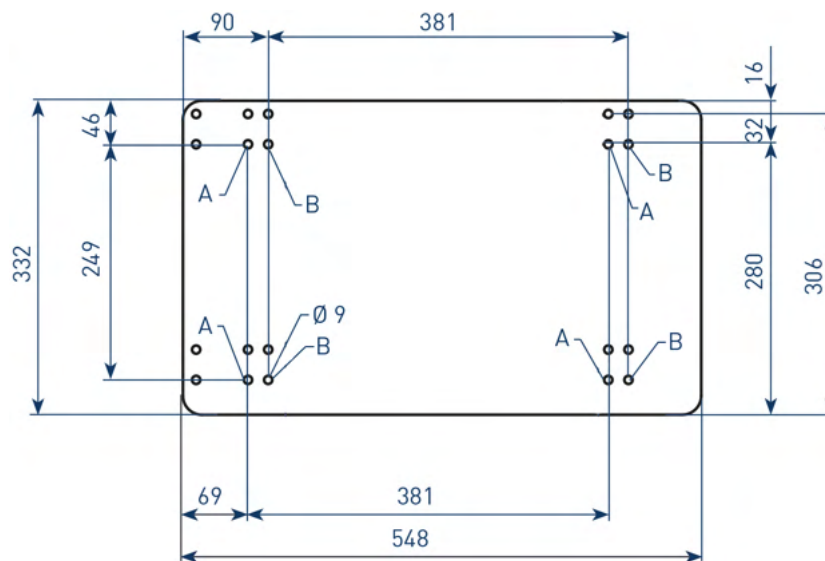
System for warning and/or monitoring the level of melted adhesive, with a float detector or capacitive sensor.

### ADAPTION PLATE FOR PREVIOUS MODELS

If you want to replace a HB 6040, HB 6080, or HB 6160 range by new range *HB 6050 connect*, *HB 6100 connect*, or *HB 6200 connect*, you can directly change between them if the standard holes was used to fix the equipment. In this case, the equipment will be outdated a few centimeters relative to the position of the previous equipment and mooring table.

To correct this small gap there is an optional adaptation plate to attach the new units of the range in the above position. This plate is the same for all units, using the holes indicated depending on the unit (see dimensions below).

For the *HB 6350 connect* units the adaptation plate does not exist.



A: *HB 6060 connect* unit set up and replacement of other units.

B: *HB 6100 connect*, *HB 6200 connect* unit set up and replacement of other units.

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## **ELECTRICAL DRAWINGS**

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## PNEUMATIC DIAGRAM

### COMPONENTS LIST

#### 7 cc/stroke pump

- 1	Inlet filter (filtering disk)
- 2	Solenoid valve 3/2 manual override (230V 50 Hz 1.5VA)
- 3	Pressure regulator 1 - 8 bar
- 4	Pressure gauge 0 - 10 bar
- 5	Pneumatic valve 5/2
- 6	Differential valve
- 7	Pneumatic cylinder double acting double chamber Ø 50 x 50 (Zykluspumpe 7 cc)
- 8	Exhaust port filter
- 9	Pressure discharge valve

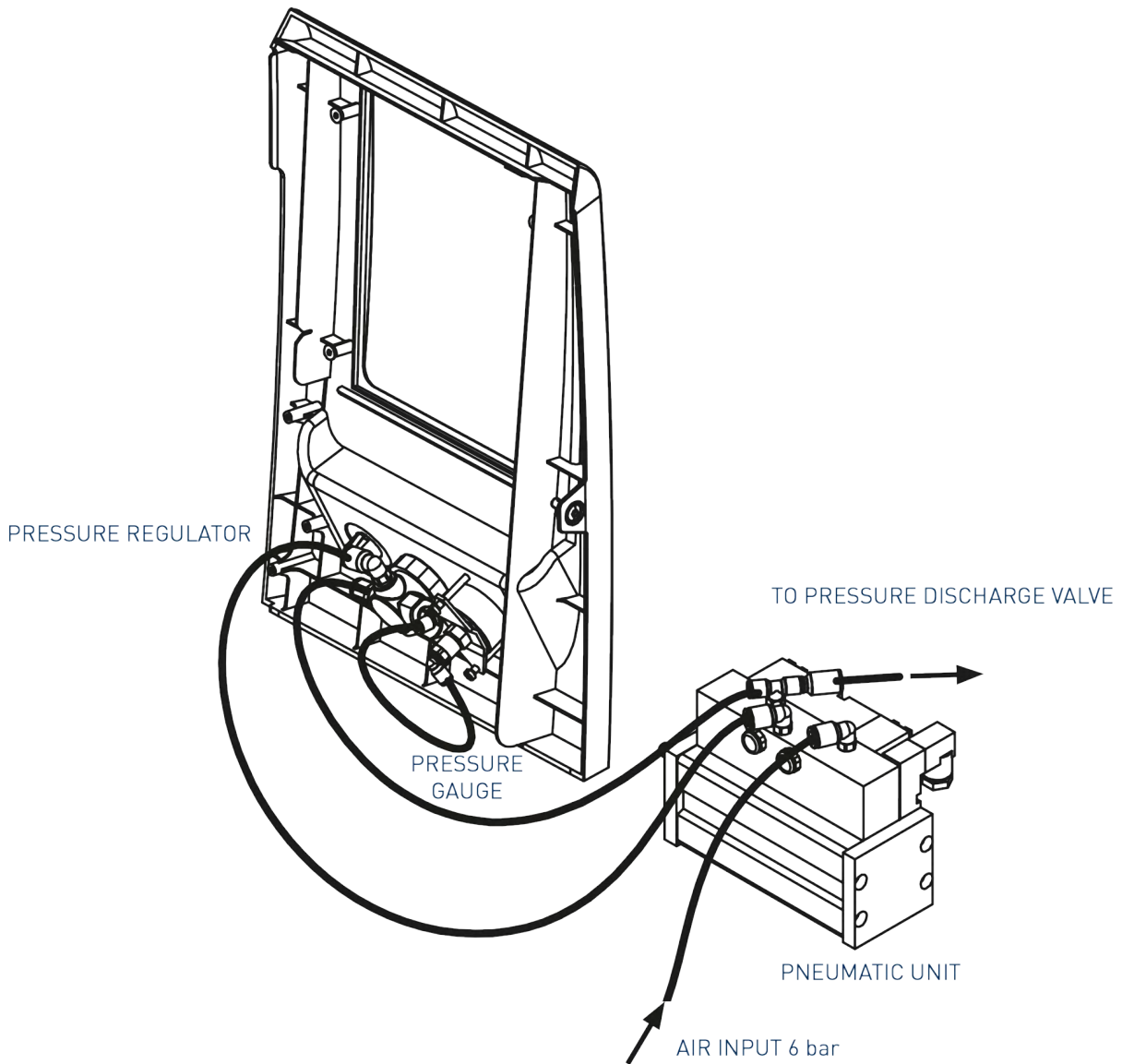
#### 19 cc/stroke pump

- 1	Inlet filter (filtering disk)
- 2	Pneumatic valve 3/2 (Ø 80 x 50 cylinder)
- 3	Pressure regulator 1 - 8 bar
- 4	Pressure gauge 0 - 10 bar
- 5	Pneumatic valve 5/2
- 6	Differential valve
- 7	Pneumatic cylinder double acting double chamber Ø 80 x 50 (stroke pump 19 cc)
- 8	Exhaust port filter
- 9	Pressure discharge valve

#### with electro-pneumatic pressure regulator VP200:

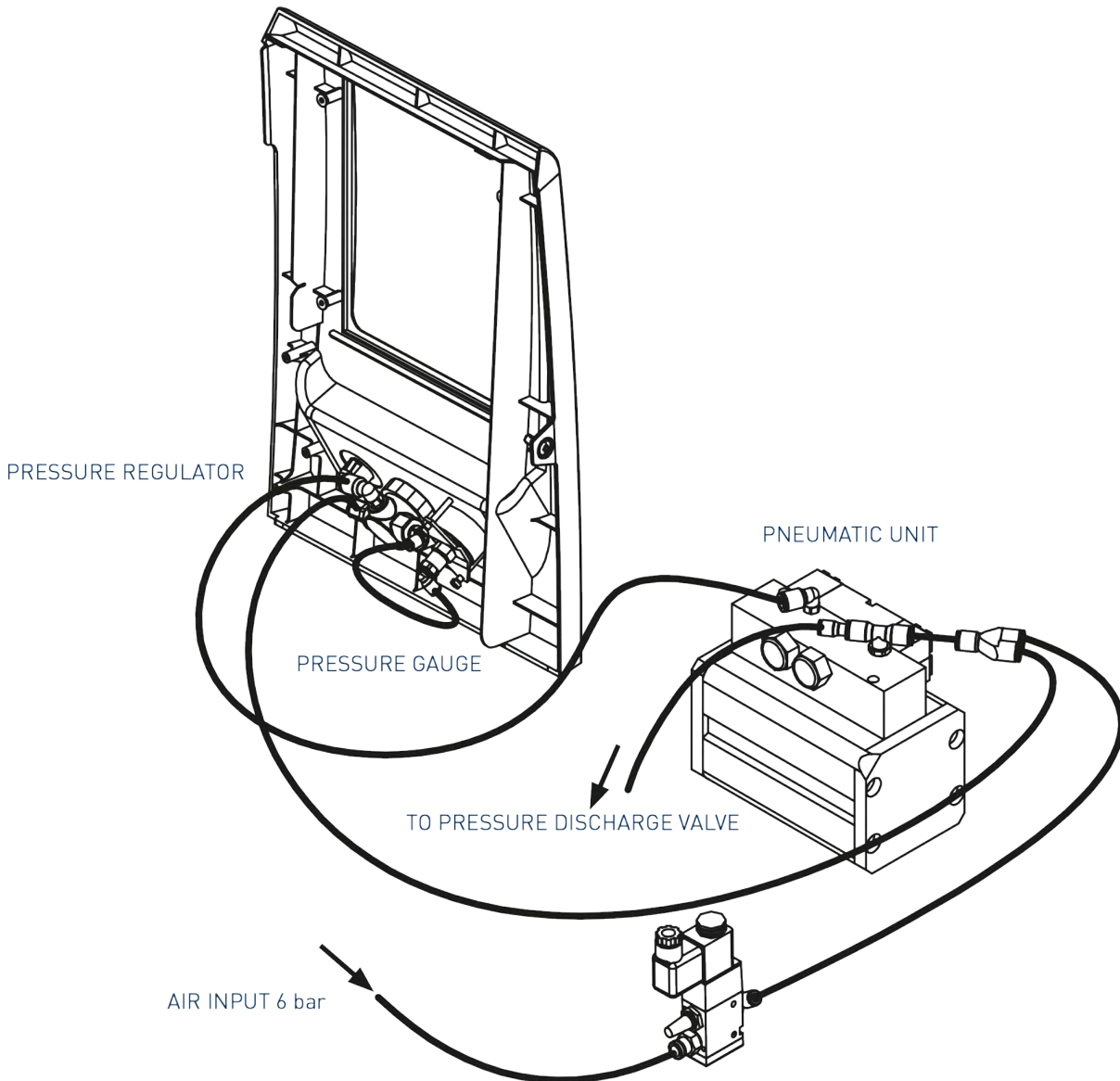
- 10	Air filter 5 $\mu$
- 11	Pressure regulator (proportional valve)

**PNEUMATIC CONNECTION FOR 7 CC/STROKE PUMP**

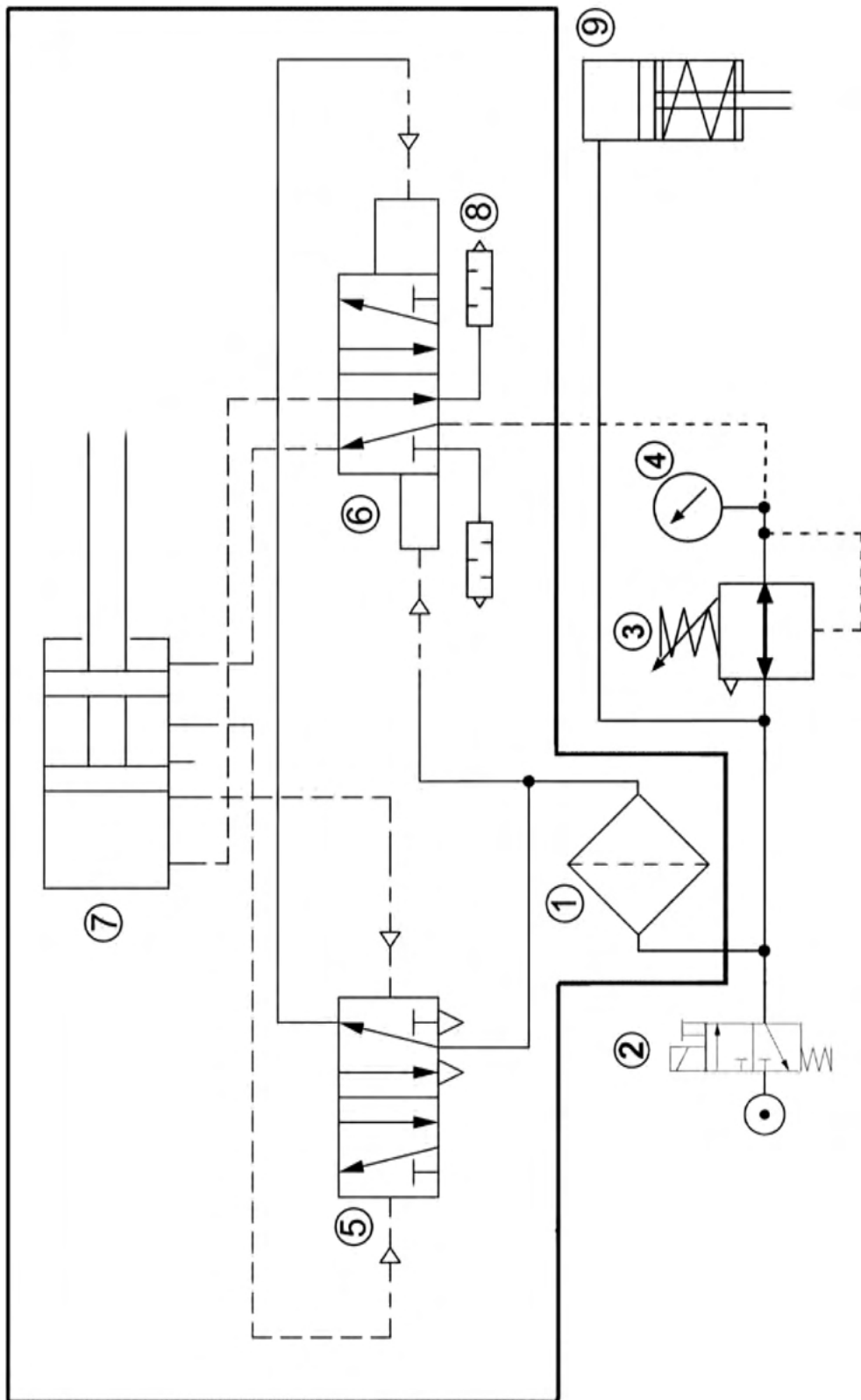




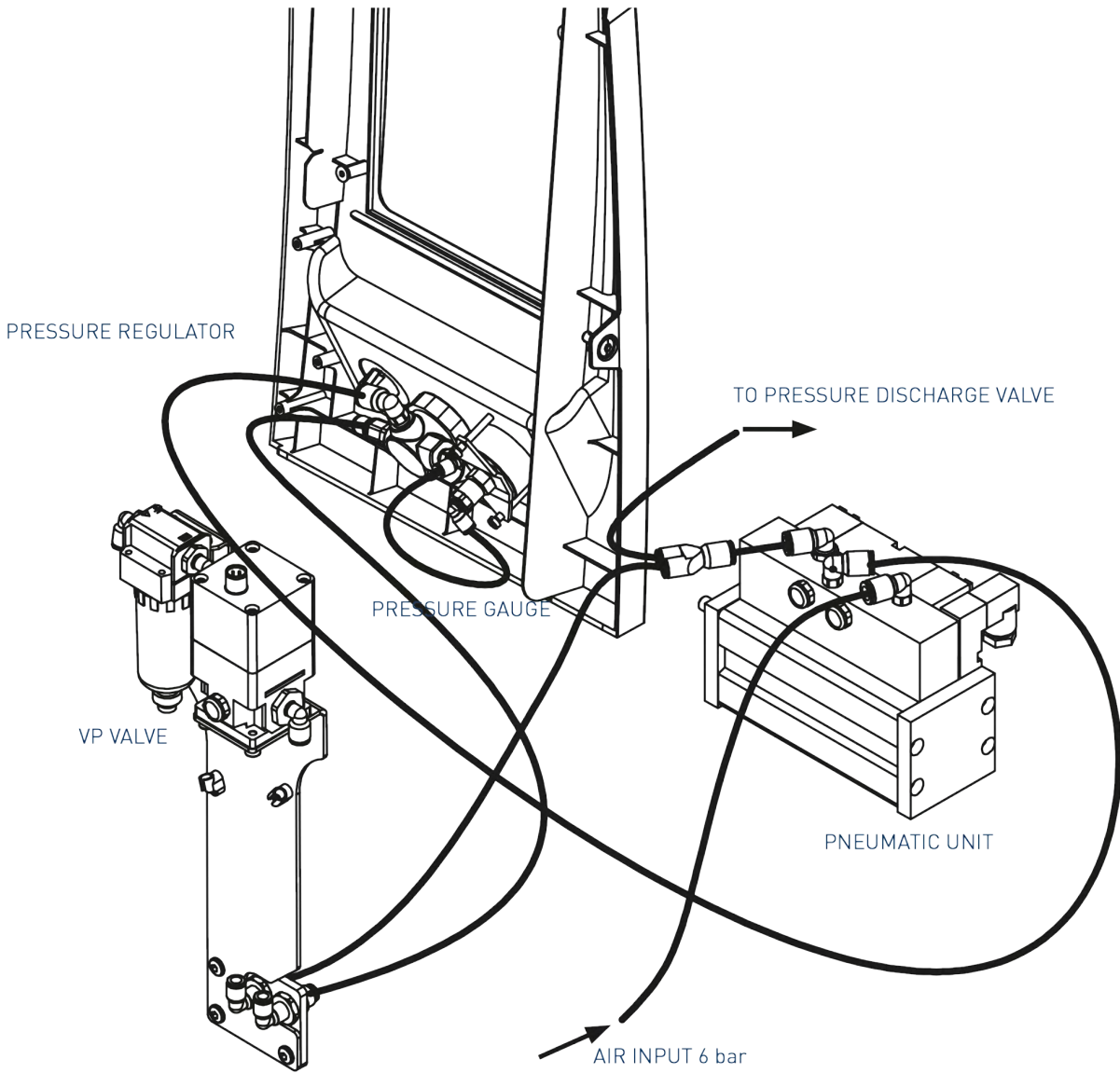
**PNEUMATIC DIAGRAM FOR 19 CC/STROKE PUMP**



**PNEUMATIC DIAGRAM FOR 19 CC/STROKE PUMP**

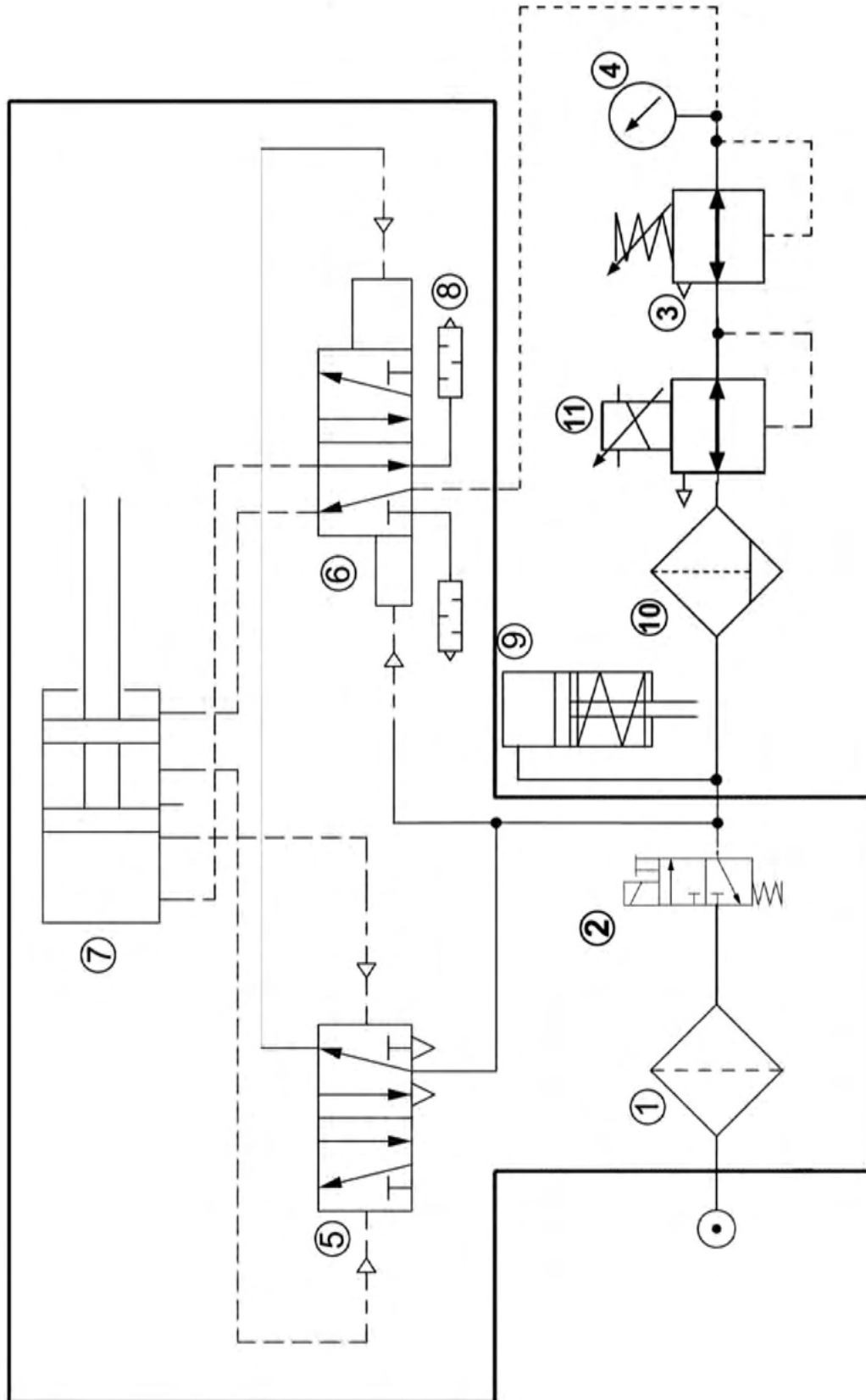


**ELECTRO-PNEUMATIC CONNECTION WITH PRESSURE REGULATOR VP. 7 CC/STROKE PUMP**

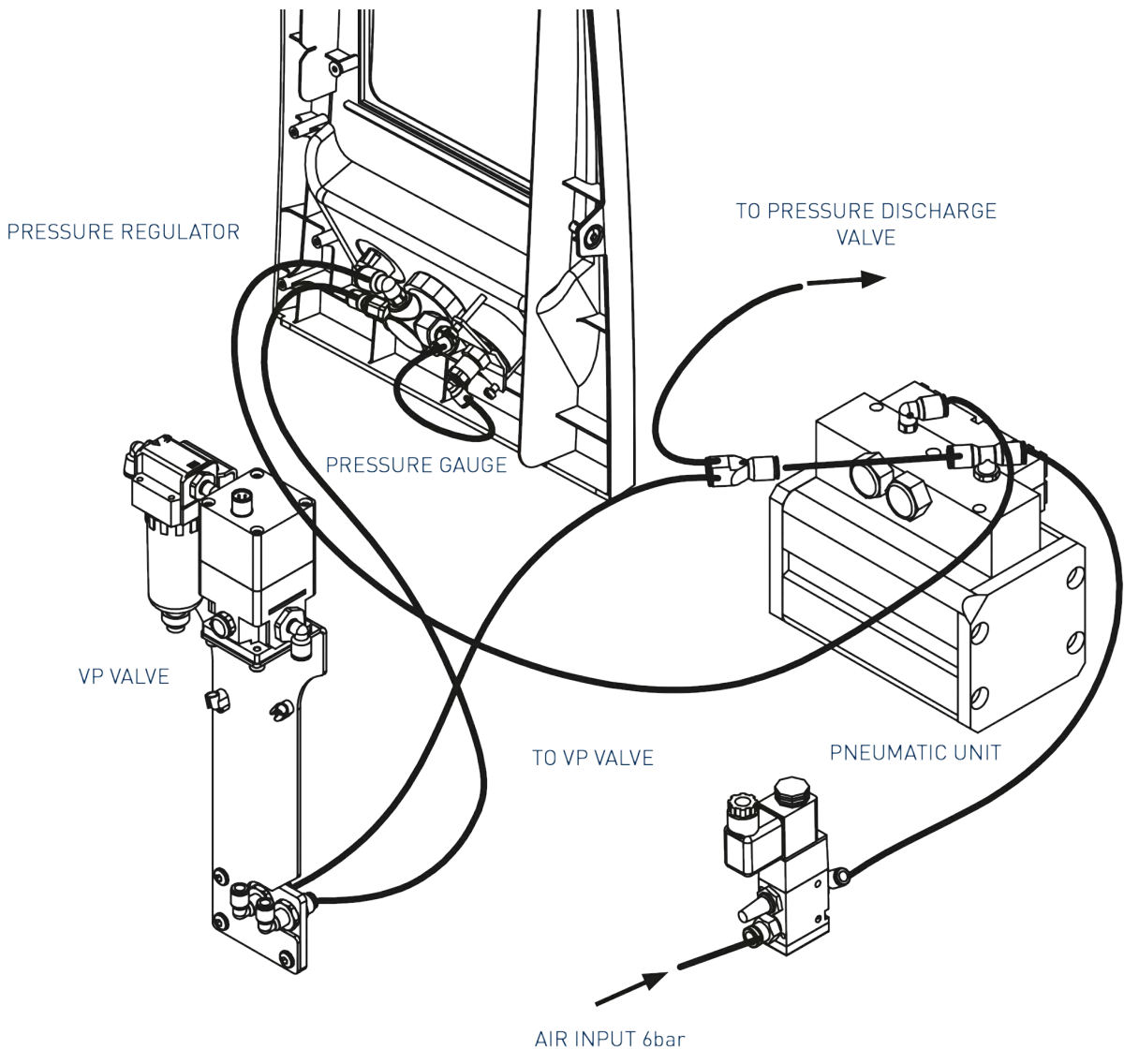




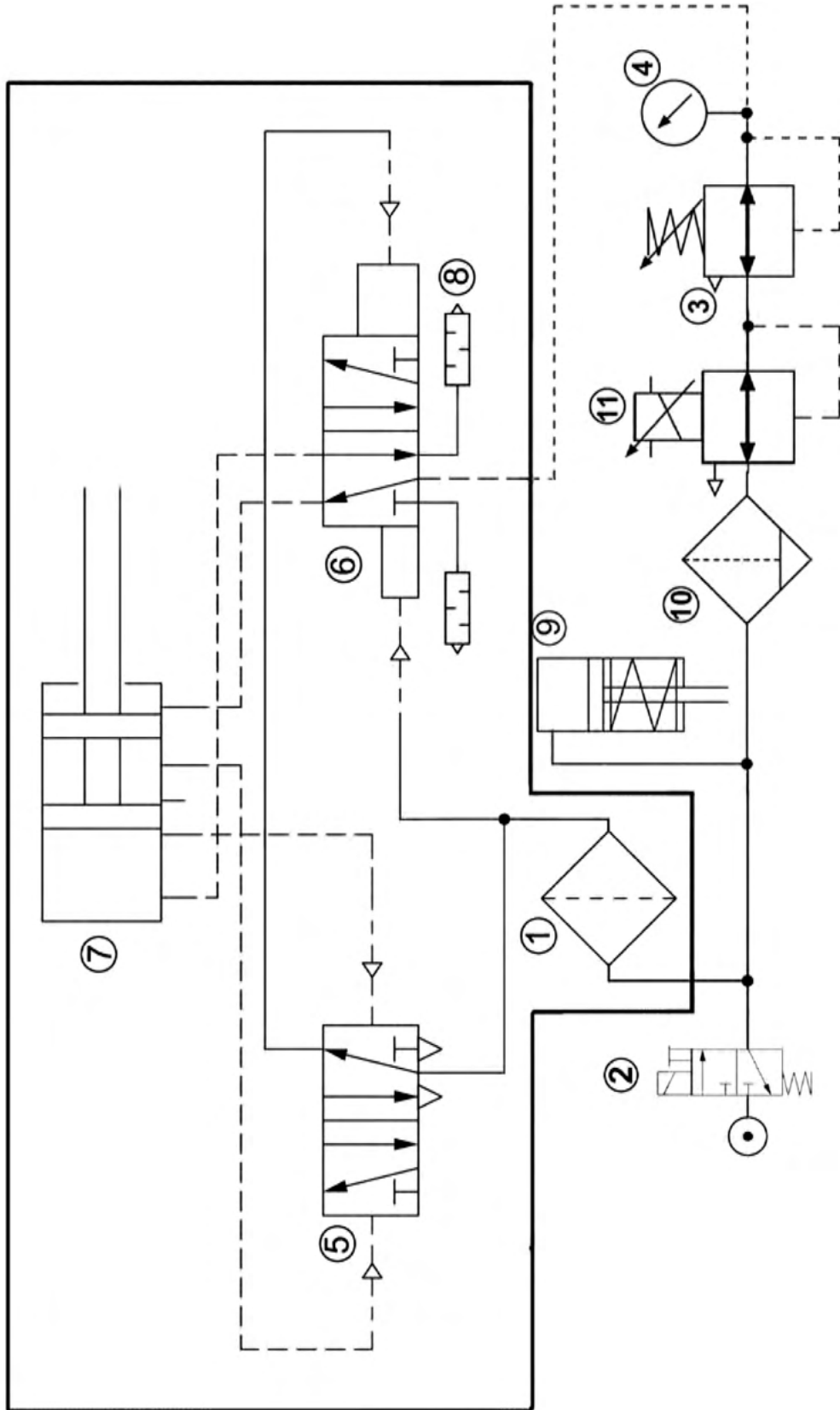
**ELECTRO-PNEUMATIC DIAGRAM WITH PRESSURE REGULATOR VP, 7 CC/STROKE PUMP**



**ELECTRO-PNEUMATIC CONNECTION WITH PRESSURE REGULATOR VP, 19 CC/STROKE PUMP**



**ELECTRO-PNEUMATIC DIAGRAM WITH PRESSURE REGULATOR VP, 19 CC/STROKE PUMP**



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## SPARE PARTS LIST

The list of the most common spare parts for „HB 6000 connect“ series machines appears in this section, providing a quick and reliable guide to choosing them.

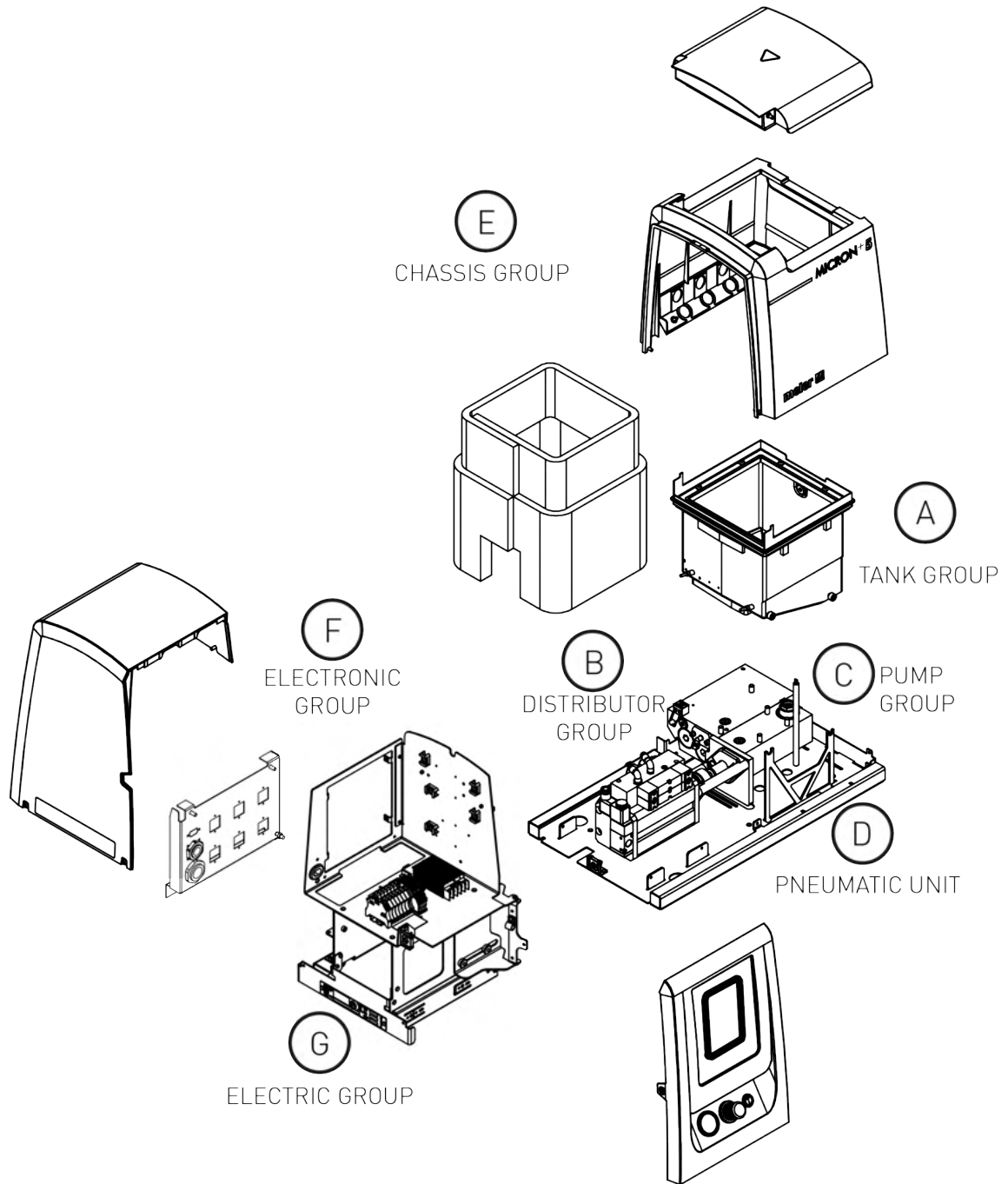
The spare parts are grouped together naturally, in the same way as they are located in the melters.

As a visual aid, drawings of the parts are included and are numbered to help identify them in the list. For further information about the content of the spare parts, click on the number of the spare part.

The lists provide the reference and name of the spare part, indicating, when necessary, whether the reference corresponds to the 5-, 10-, 20- or 35-litre model.

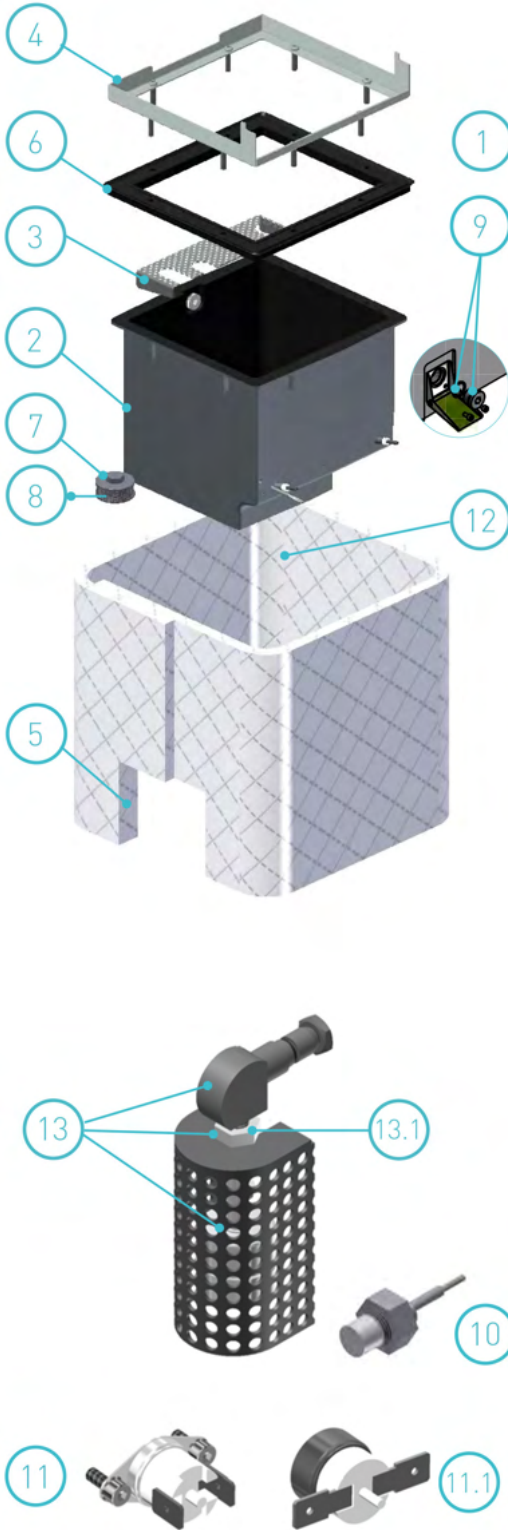


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H, I, J - Spare parts for automatic feeder

### A TANK ASSEMBLY

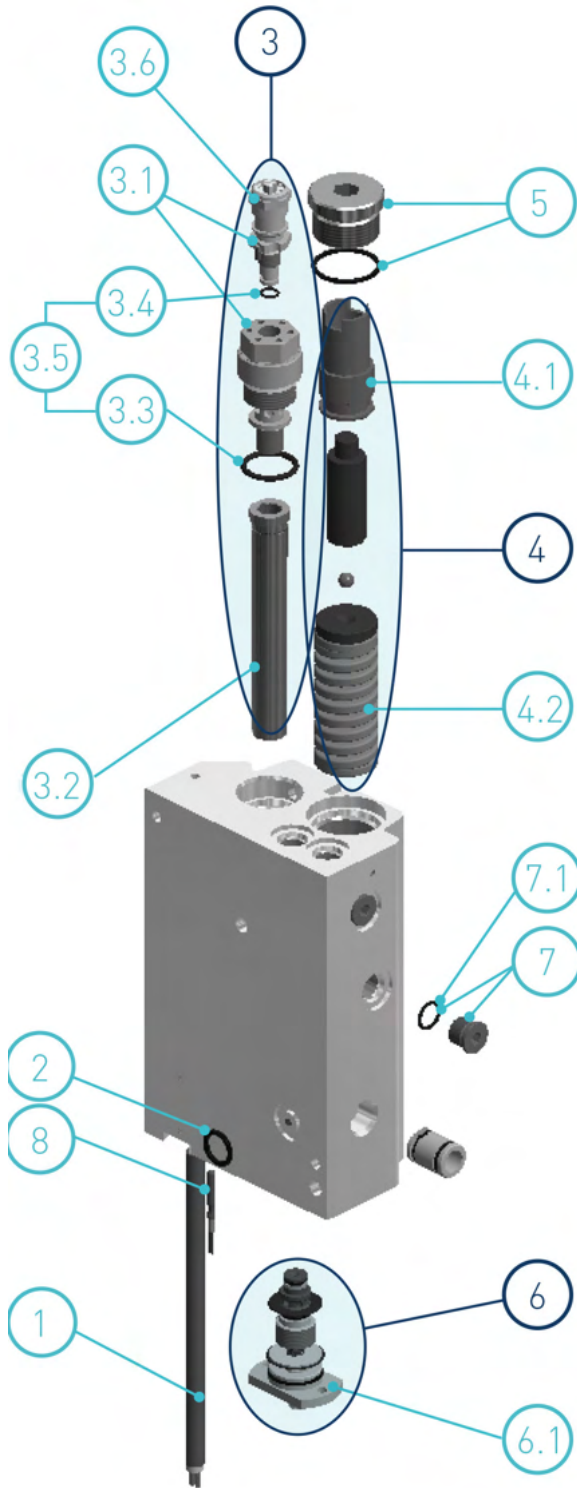


No.	Ref no.	Description
1	M150113470	Complete tank assembly 5 l 230 V
1	M150113480	Complete tank assembly 10 l 230 V
1	M150113490	Complete tank assembly 20 l 230 V
1	M150114890	Complete tank assembly 35 l 230 V
2	M150113500	PTFE coated tank 5 l 230 V
2	M150113510	PTFE coated tank 10 l 230 V
2	M150113520	PTFE coated tank 20 l 230 V
2	M150114900	PTFE coated tank 35 l 230 V
3	M150113370	Tank grid 5 - 10 l-Behälter
3	M150114880	Tank grid 20 l-Behälter
3	M150028830	Tank grid 35 l-Behälter
4	M150113380	Inlet tank 5 l
4	M150113390	Inlet tank 10 l
4	M150113400	Inlet tank 20 l
4	M150121360	Inlet tank 35 l
5	M150113410	Tank insulation mantle 5 l
5	M150113420	Tank insulation mantle 10 l
5	M150113430	Tank insulation mantle 20 l
5	M150114920	Tank insulation mantle 35 l
6	M150113440	Insulation mantle inlet tank 5 l
6	M150113450	Insulation mantle inlet tank 10 l
6	M150113460	Insulation mantle inlet tank 20 l
6	M150121370	Insulation mantle inlet tank 35 l
7	M10100070	Flat tank filter
7	M10100085	Flat tank filter, extra-thick
8	M10100071	Tank flat filter mesh
8	M10100086	Tank flat filter mesh, extra-thick
9	M150113270	Drain plug with o-ring
10	M150110140	Capacitive sensor (*)
11	M150114500	Safety thermostat, up to 200° C
11.1	M150114510	Safety thermostat, up to 230 °C (*)
12	M150130370	Sensor PT100
12	M150130360	Sensor Ni120
12	M150123150	Sensor NTC-R
13	M150122430	Level detector assembly (*)
13.1	M150123620	Low level detector (*)

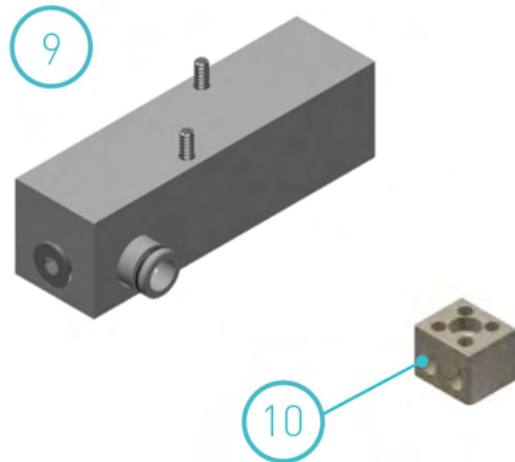
(\*) optional



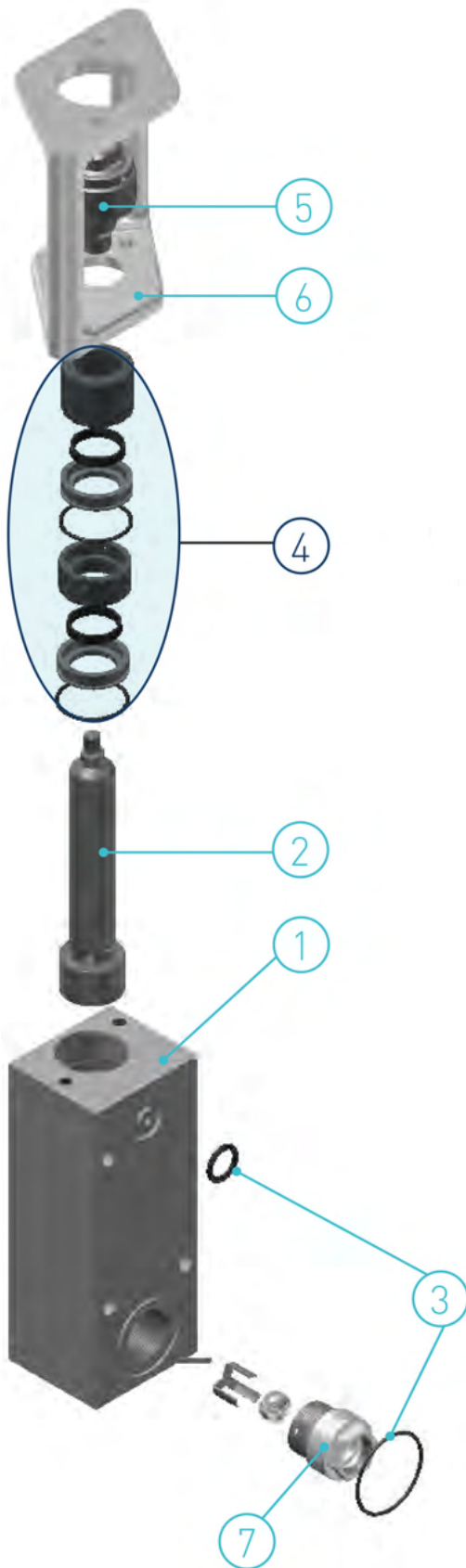
### B DISTRIBUTOR UNIT



No.	Ref no.	Description
1	M150026350	Heating element 300 W
2	M10120032	Tank-distributor seating o-ring
3	M150121390	Distributor filter assembly
3.1	M150121380	Filter head with purger
3.2	M150029250	Filter mesh 50
3.3	M150029260	O-ring 23 x 3
3.4	M150026340	Oring 7 x 1,5
3.5	M150121350	O-rings filter assembly kit
3.6	M150026330	Complete purger
4	M150021820	Compensation valve assembly
4.1	M150021830	Compensation valve piston/plunger assembly
4.2	M10100096	Compensation valve spring
5	M150022110	Compensation valve plug with O-ring
6	M150024750	Depressurisation valve assembly
6.1	M150024760	Pressure discharge valve o-rings
7	M10100082	Pump plug with o-ring
7.1	M10100083	Pump o-ring
8	M150130370	Sensor Pt100
8	M150130360	Sensor Ni120
8	M150123150	Sensor NTC-R
9	M150114940	Distributor-pump union 35 l
10	M10030007	Current connection strip



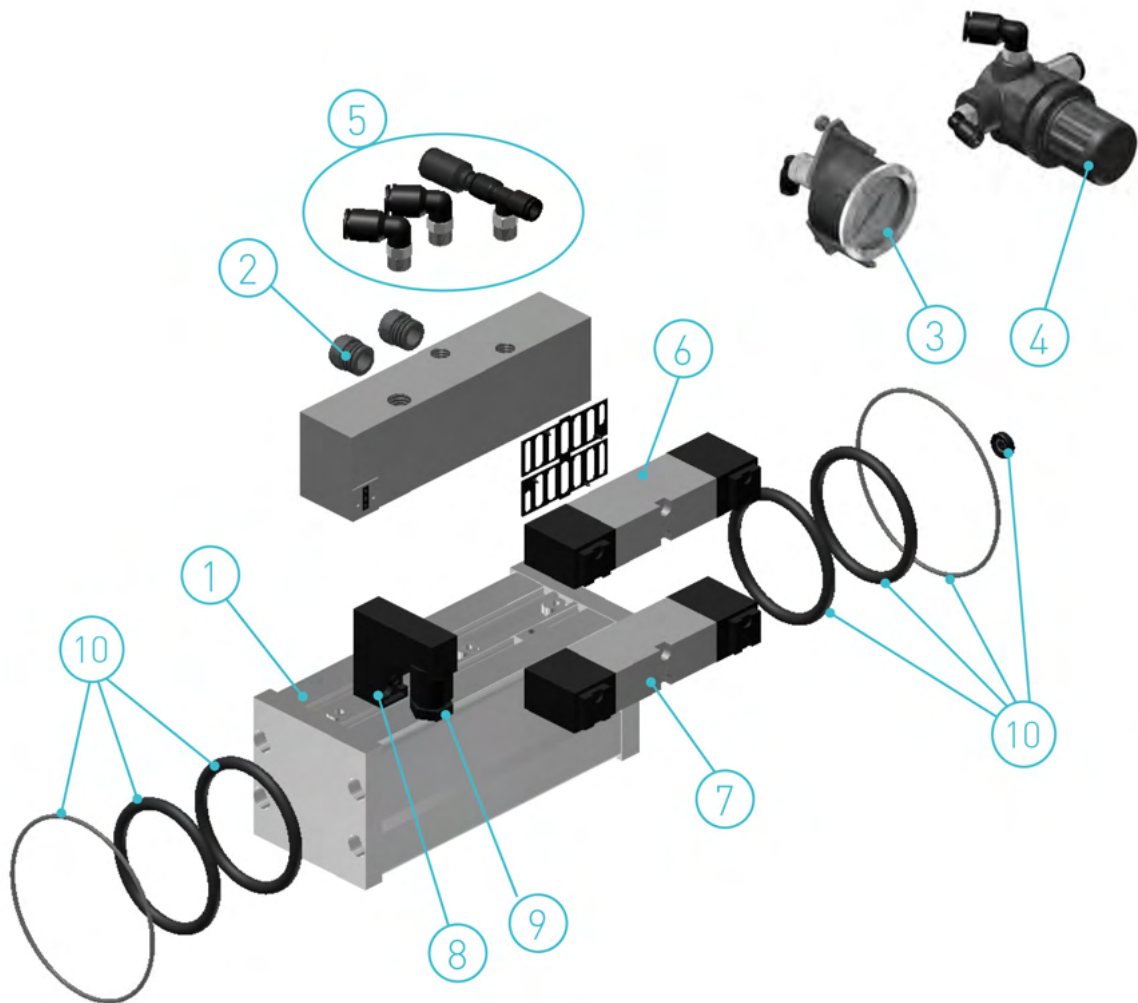
**C PUMP ASSEMBLY**



No.	Ref no.	Description
1	M150113550	7cc pump body with braces and fittings
1	M150113560	19cc pump body with braces and fittings
2	M10100011	Pump shaft 7cc
2	M150023080	Pump shaft 19cc
3	M150113570	Tank-pump-distributor seating O-ring kit
4	M150113530	7cc pump guide bushing kit
4	M150113540	19cc pump guide bushing kit
5	M150020590	Short ball and socket joint for pump shaft activator
6	M150113580	Pump holding support 7cc
6	M150113590	Pump holding support 19cc
7	M150024970	Inlet valve fitting pump 7cc
7	M150024980	Inlet valve fitting pump 19cc

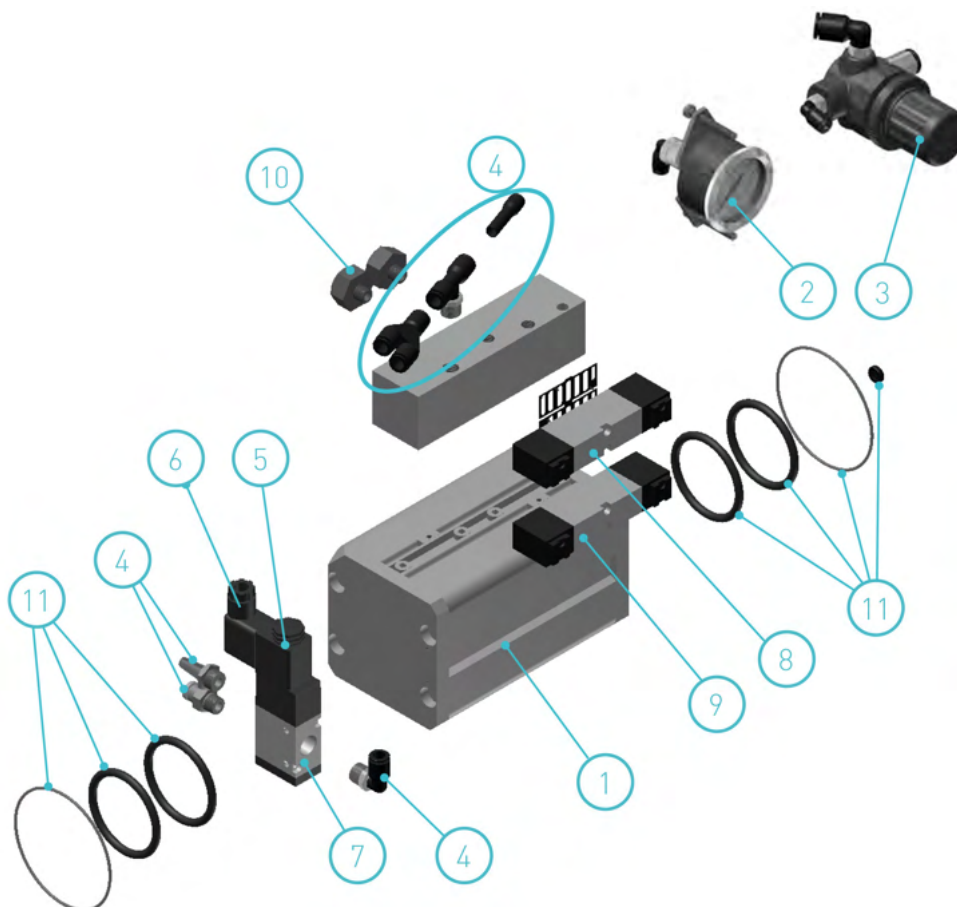
**D PNEUMATIC UNIT ASSEMBLY 7 CC**

No.	Ref no.	Description
1	M150123120	Pneumatic unit assembly with filter 7cc 24VDC
2	M150113640	1/4' flat silencer
3	M150114480	Pressure gauge
4	M10110031	Pressure regulator
5	M150113690	Connector kit for 7cc pump unit without VP
6	M150020490	Differential valve with o-ring
7	M150020500	Control valve with o-ring
8	M150123650	Inlet solenoid valve (24V DC)
9	M150020630	Connector 2 P+T 15 x 15
10	M150020580	O-ring kit of pneumatic cylinder 7cc



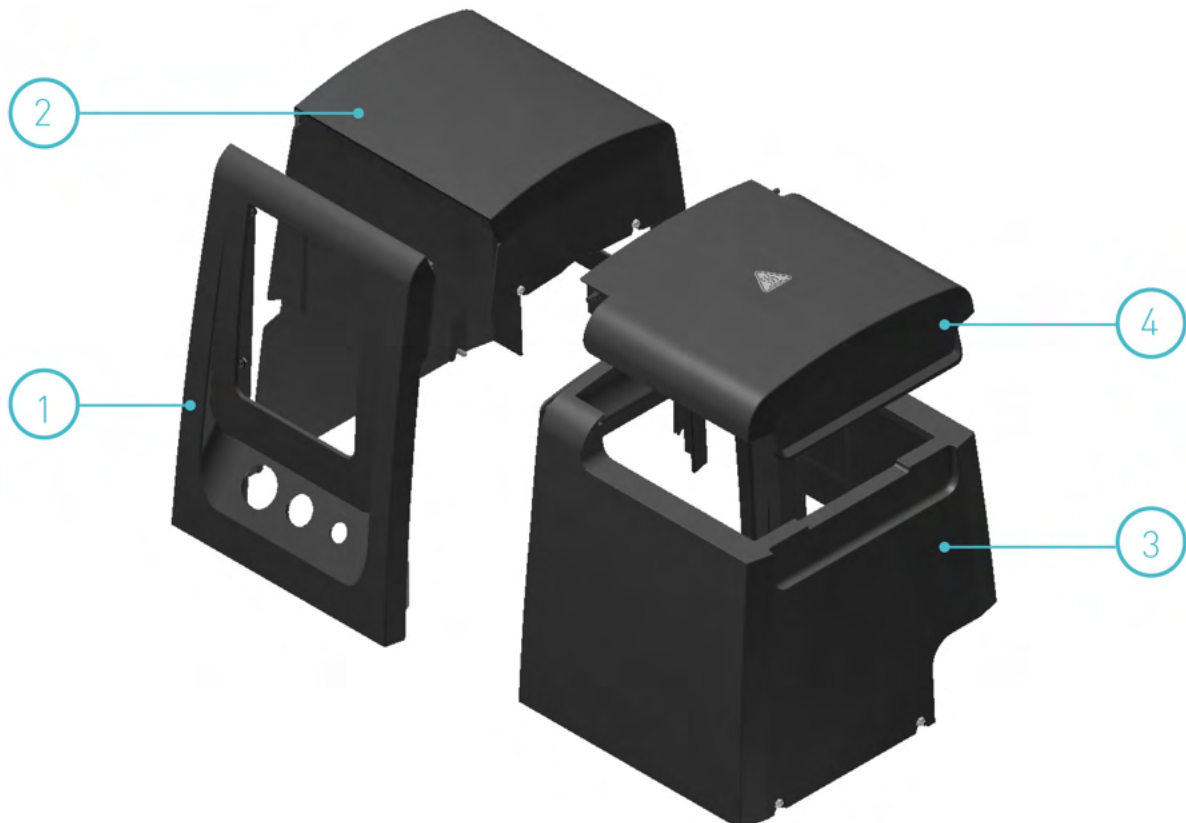
**D PNEUMATIC UNIT ASSEMBLY 19 CC**

No.	Ref no.	Description
1	M150113620	Pneumatic unit assembly 19cc with filter
2	M150114480	Pressure gauge
3	M10110031	Pressure regulator
4	M150113850	Connector kit for 19cc pump unit without VP
5	M150123660	Solenoid coil (220V AC) 19cc
6	M150060040	Solenoid valve connector DIN 43650B
7	M150123670	Intake solenoid valve (220V AC)
8	M150020490	Differential valve with o-ring
9	M150020500	Control valve with o-ring
10	M150023330	Exhaust silencer
11	M150023300	O-ring kit of pneumatic cylinder 19cc



**E CHASSIS ASSEMBLY**

No.	Ref no.	Description
1	M150113280	Electrical cabinet door casing HB 6000 connect
2	M150113290	Electrical cabinet casing assembly without warning light
2	M150113360	Electrical cabinet casing assembly with warning light
3	M150122930	Tank housing assembly HB 6050 connect
3	M150122940	Tank housing assembly HB 6100 connect
3	M150122950	Tank housing assembly HB 6200 connect
3	M150122960	Tank housing assembly HB 6350 connect
4	M150113330	Tank cover assembly HB 6050 connect
4	M150113340	Tank cover assembly HB 6100 connect
4	M150113350	Tank cover assembly HB 6200 connect
4	M150114960	Tank cover assembly HB 6350 connect



**F ELECTRONIC ASSEMBLY**

No.	Ref no.	Description
1	M150122970	HMI control board HB 6000 connect
2	M150122980	Temperature control board 2 outputs
2	M150122990	Temperature control board 6 outputs
3	M150114760	Capacitive sensor and amplifier kit (*)
4	MR0001938	Solid state relay 40 A

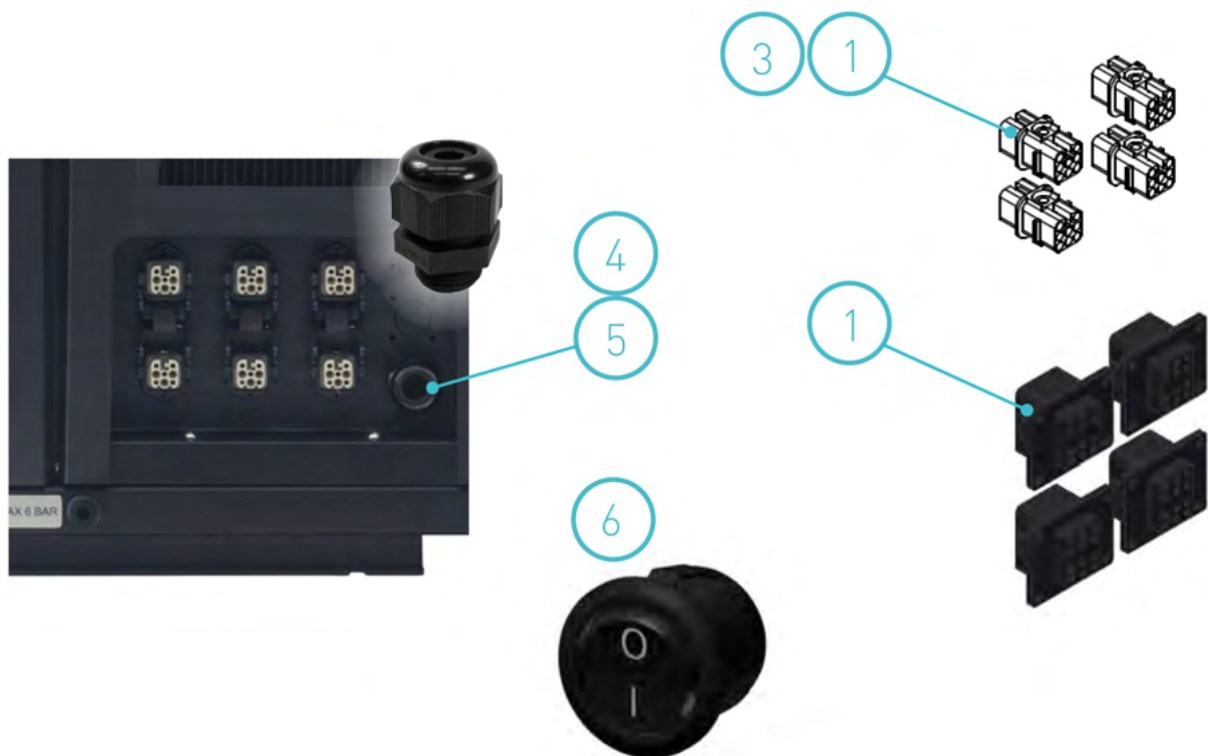
(\*) optional





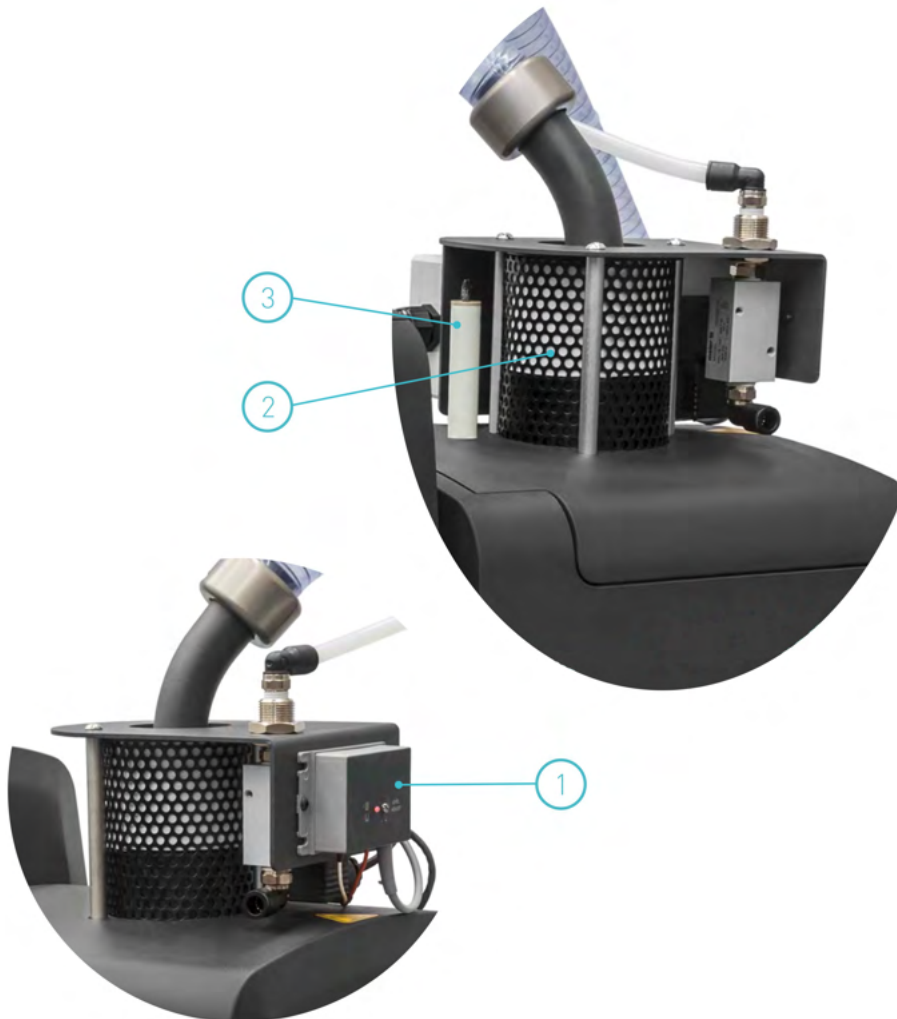
**G ELECTRIC ASSEMBLY**

No.	Ref no.	Description
1	M16010003	Female connector 8 pin PT-100 (base housing)
2	M150020720	Female connector 12 pin Ni-120 (base housing)
3	M150130450	Female connector 8 pin NTC (base housing)
4	M150123000	Cable gland Pg 21 black
5	M150119190	Cable gland Pg16 black
6	M150114470	Main switch



### H AUTOMATIC FEEDER, FILTER - SENSOR ASSEMBLY

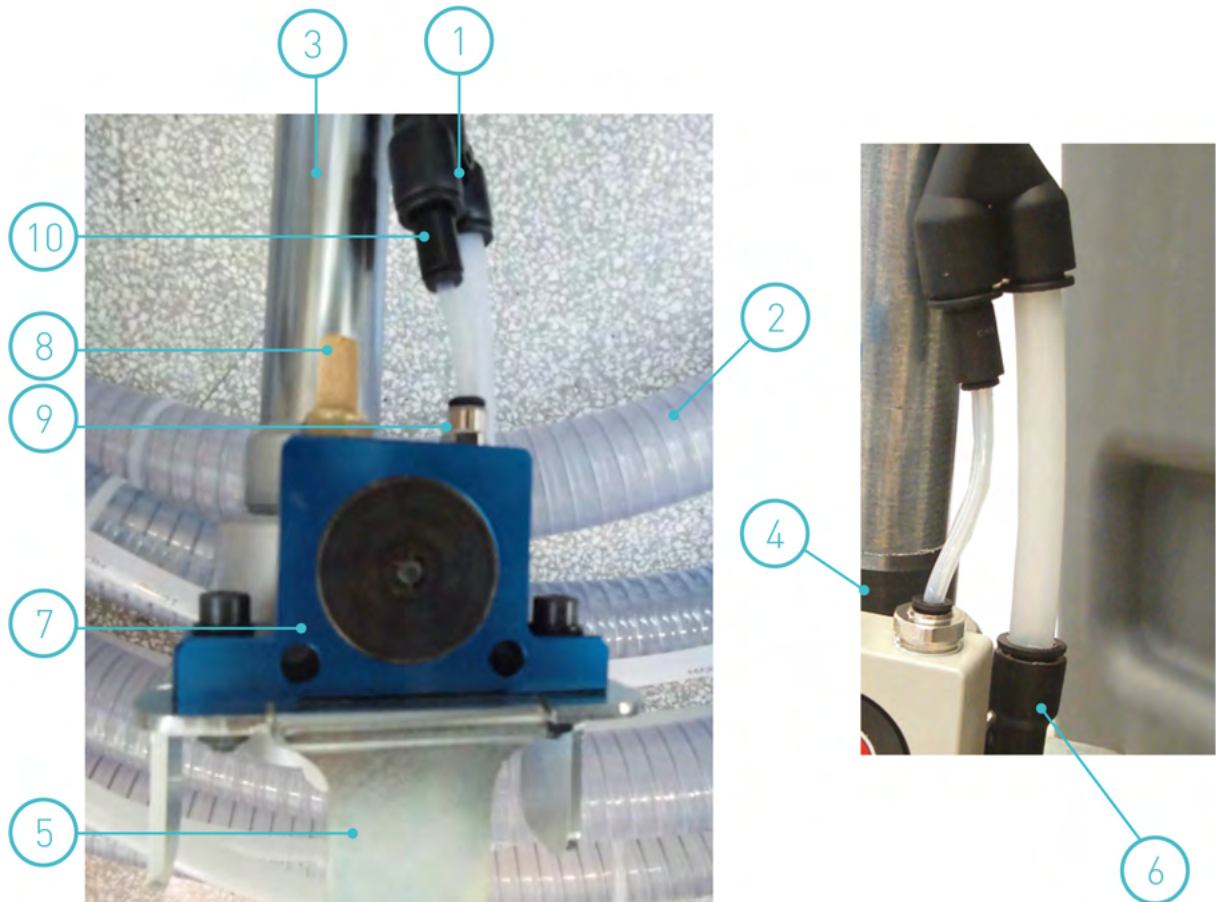
No.	Ref no.	Description
1	M150025800	Capacitive level sensor (amplifier and probe)
2	M150025770	Grid filter 20 mesh
3	M150025870	Capacitive level sensor o-rings





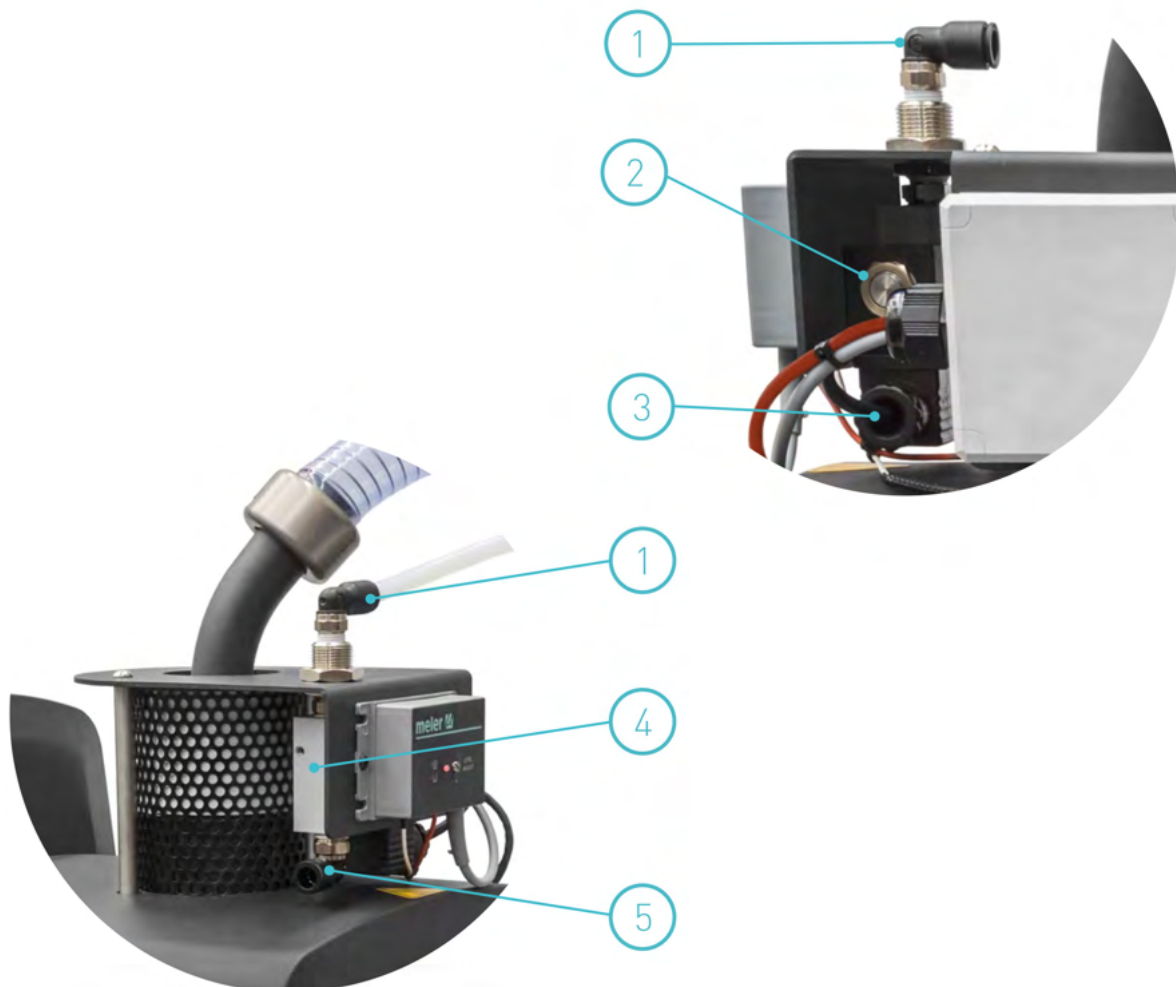
**I AUTOMATIC FEEDER, SUCTION TUBE**

No.	Ref no.	Description
1	M1500252650	Fitting Y Ø10 quick plug
2	M150025660	Hose vacuum feeder Ø30 (meter)
3	M150025670	Metal suction tube
4	M150025680	Venturi suction tube
5	M150025690	Support for suction tube
6	M150025700	Fitting 90° 3/8 Ø10 quick plug
7	M150025710	Pneumatic vibrator vacuum feeder
8	M21300000	Silencer
9	M150110180	Straight fitting 1/8 Ø4 quick plug
10	M150025740	Reduction Ø10 - Ø4 quick plug
	M150025810	Complete suction tube vacuum feeder



**J AUTOMATIC FEEDER, VALVE ASSEMBLY**

No.	Ref no.	Description
1	M150025750	Fitting 90° 1/4 Ø10
2	M150060080	Coil for solenoid valve 24 V DC (10 W)
3	M150060050	Solenoid valve connector
4	M150060070	Complete solenoid valve 2/2 24 V DC 5 W
5	M150025790	Fitting 90° 3/8 Ø10 quick plug



## DECLARATION OF CONFORMITY



### EU-Declaration of Conformity according to the Machinery 2006/42/EC

We as manufacturer,

**BÜHNEN GmbH & Co. KG**  
**Hinterm Sielhof 25**  
**28277 Bremen – Germany**

declare in sole responsibility that the product:

**Hot melt adhesive application system type**  
**Tradename: HB 6000**  
**Year of construction: 2021**

to which this declaration refers, is in conformity with the provisions of the following EC/EU directives:

**2011/65/EU - RoHS Directive 2011/65/EU**  
**2014/30/EU - Electromagnetic Compatibility (EMC)**  
**2006/42/EC – Machinery**

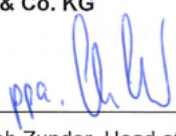
The following harmonized standards or normative documents have been applied according to EU Machinery 2006/42/EC:

**EN 50581:2012**  
**EN 60204-1:2019-06**  
**DIN EN IEC 61000-6-1:2019-11**  
**DIN EN IEC 61000-6-2:2019-11**  
**DIN EN IEC 61000-6-4:2020-09**  
**EN ISO 13732-1:2008**  
**DIN EN ISO 13849-1:2016-06**  
**EN ISO 14120:2015**

The person authorised to compile the technical documentation:

**Nils Erdmann; Bühnen GmbH & Co. KG**

Bremen, September 2021

  
Christoph Zunder, Head of Product Management

Bremen, September 2021

  
Bert Gausepohl, General Manager

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TRANSLATION OF THE ORIGINAL INSTRUCTION HANDBOOK

HEATABLE HOSE

TYPE NS, KS, HP

**CONTENT**

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## INSTRUCTION HANDBOOK HEATABLE HOSE

This document describes dealing with heatable hoses

- Type NS (for applicator heads)
- Type KS (for applicator heads) and
- Type HP (for manual applicator devices)

### **SPECIFIC SECURITY ADVICE**

#### **POSSIBLE DANGERS**



#### **Danger of burns!**

due to hot metal parts, hot melt material, and hot melt material vapors.

Therefore, always wear heat protection gloves.

#### **INTENDED USE**

Heatable hoses are used as flexible connections between machines or machine parts. They are used to transport melted hot melt material, such as from a tank system to the manual application unit.



#### **Attention!**

Heatable hoses Types HP and KS mini are only approved for operation with BÜHNEN applicator heads and manual application devices.

Disconnection and connection to the applicator head/manual application device for Type HP may only be carried out by trained electricians. Switch the tank unit off beforehand!

#### **NOTES ON SAFE OPERATION**



#### **Danger of burns!**

- The maximum permissible working temperature ( $T_{max}$ , see type plate) may not be exceeded. Too high temperatures will cause the pressure load capacity to sink. This could destroy the hose.

- Release the system pressure before dismantling the heatable hose.



#### **Danger!**

**Before every maintenance or repair work on the heatable hose, remove the mains plug from the tank system.**

Danger of burning caused by hot melt adhesive!

### **TYPE NS30**

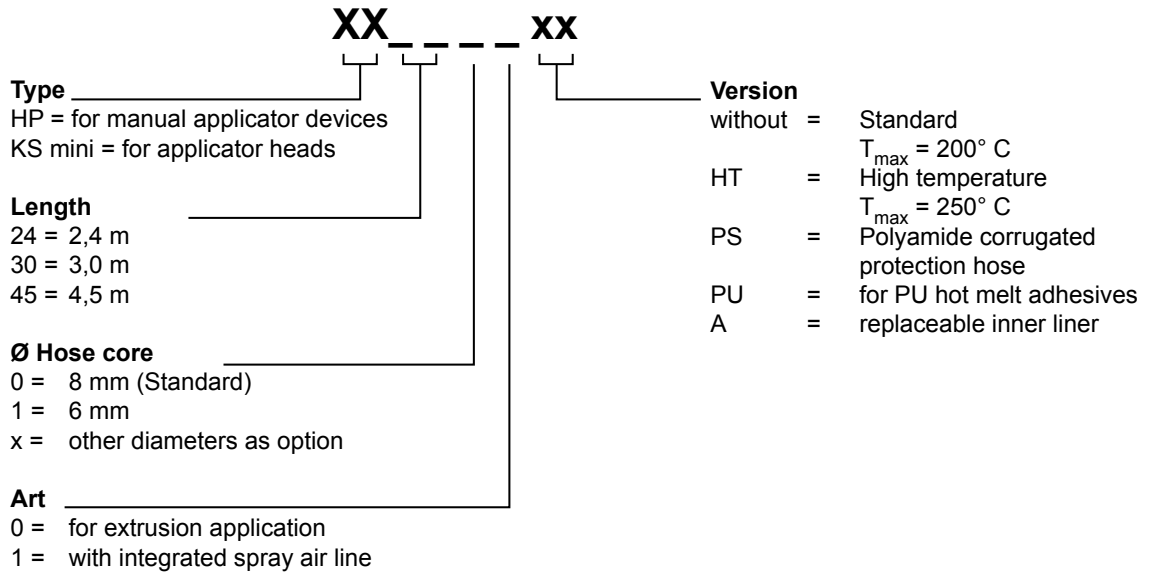
<b>Item no.</b>	<b>Designation</b>
NKT0081	Hose NS30 0.6 m NW08
NKT0082	Hose NS30 1.2 m NW08
NKT0083	Hose NS30 1.8 m NW08
NKT0084	Hose NS30 2.4 m NW08
NKT0085	Hose NS30 3.0 m NW08
NKT0086	Hose NS30 3.6 m NW08
NKT0415	Hose NS30 4.0 m NW08
NKT0357	Hose NS30 4.2 m NW08
NKT0087	Hose NS30 4.8 m NW08
NKT0405	Hose NS30 6.0 m NW08
NKT0088	Hose NS30 7.2 m NW08
NKT0328	Hose NS30 8.0 m NW08
NKT0089	Hose NS30 10.0 m NW08
NKT0090	Hose NS30-SW 0.6 m NW08 surge water protected
NKT0091	Hose NS30-SW 1.2 m NW08 surge water protected
NKT0092	Hose NS30-SW 1.8 m NW08 surge water protected
NKT0093	Hose NS30-SW 2.4 m NW08 surge water protected
NKT0094	Hose NS30-SW 3.0 m NW08 surge water protected
NKT0095	Hose NS30-SW 3.6 m NW08 surge water protected
NKT0096	Hose NS30-SW 4.8 m NW08 surge water protected

**Optional:**

- A = replaceable inner liner  
(recommended for use with PUR or POR)
- VA-FLEX = VA casing  
(under extreme loading on external casing)
- S = external casing in signal colour (orange)



**TYP KS MINI, HP**



## TECHNICAL DATA

### SERIES NS30

Version	High-Flex
Supply voltage	230V AC/50...60 Hz
Max. operating temperature (Tmax)	200° C
Temperature sensor	Ni120
Pressure resistance (at 200° C)	160 bar
Standard nominal diameter	NW08
Cap external diameter	40 mm

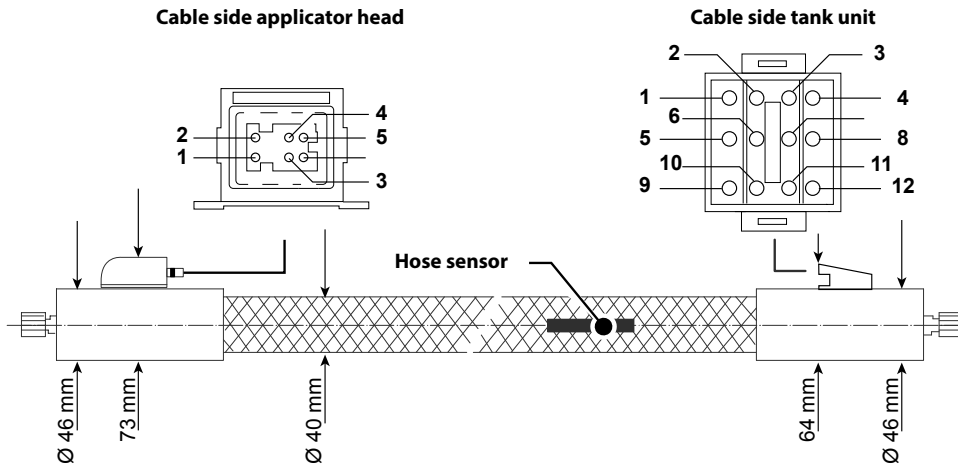
### TYPE KS MINI, HP

Design	Standard	High temperature (HT)
Supply voltage	230V AC/50...60 Hz	
Heating capacity (P)	up to 3 m hose length: 130 W/m as of 3 m hose length: 100 W/m	
Max. operating temperature (Tmax)	200° C	250° C
Temperature sensor	PT100	
Pressure load capacity (Pmax) for 8 mm hose core	The stated values have been established by measurement in stretched condition without movement. The values will change for mechanical loads. Especially short, frequently very high pressure peaks have a negative impact.	
Bursting pressure at 24°C	900 bar	900 bar
Max. hot melt material pressure: up to 24° C	200 bar	250 bar
at 100° C	180 bar	225 bar
at 200° C	160 bar	200 bar
at 250° C	-	188 bar
Max. spray air pressure (P <sub>max</sub> ) (Only with spray manual application device)	5 bar	
Fitting	galvanized steel, 9/16-18 UNF thread, size 19 for nominal diameters 08 and 10	

## PIN ASSIGNMENT

### TYPE NS30

Plug type: 12-pole rectangle, pins (to tank unit)  
6-pole rectangle, socket (to applicator head)



#### To applicator head (6-pole rectangle)

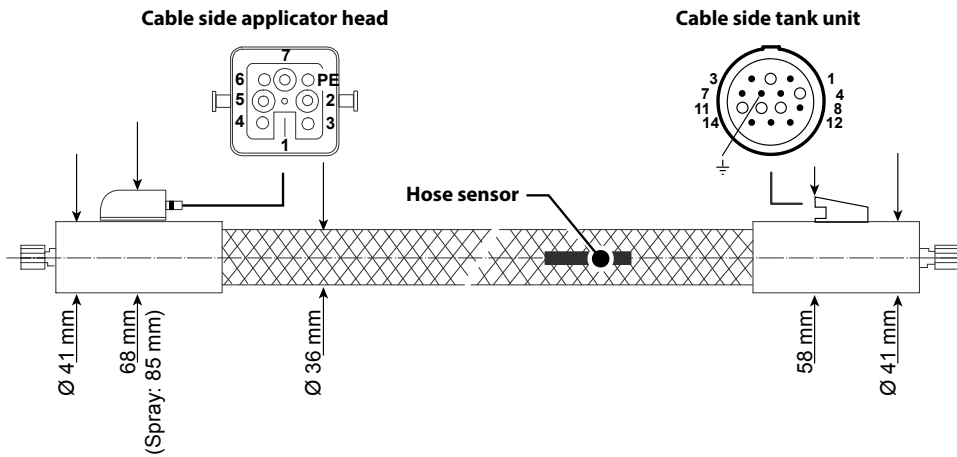
Pin	Colour	Function
1	white	Heater applicator head (L)
2	green	Heater applicator head (N)
3	orange	Applicator head sensor
4	free	
5	brown	Applicator head sensor
⊥	green/yellow	Protective earth

#### To tank unit (12-pole rectangle)

Pin	Colour	Function
1	white	Heater applicator head (L)
2	green	Heater applicator head (N)
3	orange	Connecting line to sensor applicator head, jumper to Pin 12
4	blue	Heater hose
5	brown	Sensor hose (out) Brown & red are connected in the plug together with the jumper to Pin 9
6	blue	Heater hose
7	green/yellow	Protective earth
8	red	Sensor hose (return), jumper to Pin 11
9	brown	Jumper to Pin 5
11	red	Jumper to Pin 8
12	orange	Jumper to Pin 3

**TYPE KS MINI**

Plug type: AMP, 14-pole, pins (to tank unit)  
Harting, 8-pole, lining, (to applicator head)



**To applicator head (8-pole)**

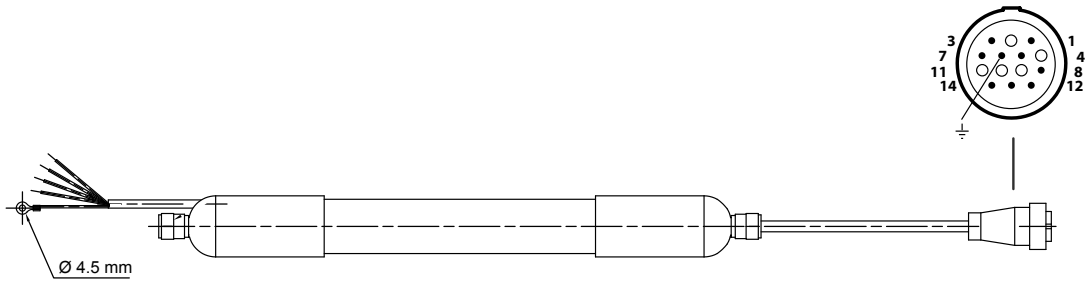
Pin	Colour	Function
1	free	
2	brown	Heater applicator head (L)
3	blue	Heater applicator head (N)
4	orange	Valve control
5	orange	Valve control
6	grey	Applicator head sensor
7	grey	Applicator head sensor
8	green/yellow	Protective earth

**To tank unit (14-pole AMP)**

Pin	Colour	Function
1	brown	Heater applicator head (L)
2	free	
3	blue	Heater applicator head (N)
4	grey	Applicator head sensor
5	green/yellow	Protective earth
6	grey	Applicator head sensor
7	orange	Valve control
8	free	
9	orange	Valve control
10	free	
11	white	Sensor hose
12	red	Sensor hose
13	yellow	Heater hose (L)
14	violet	Heater hose (N)

**TYPE HP**

Plug type: AMP, 14-pole, pins (to tank unit)

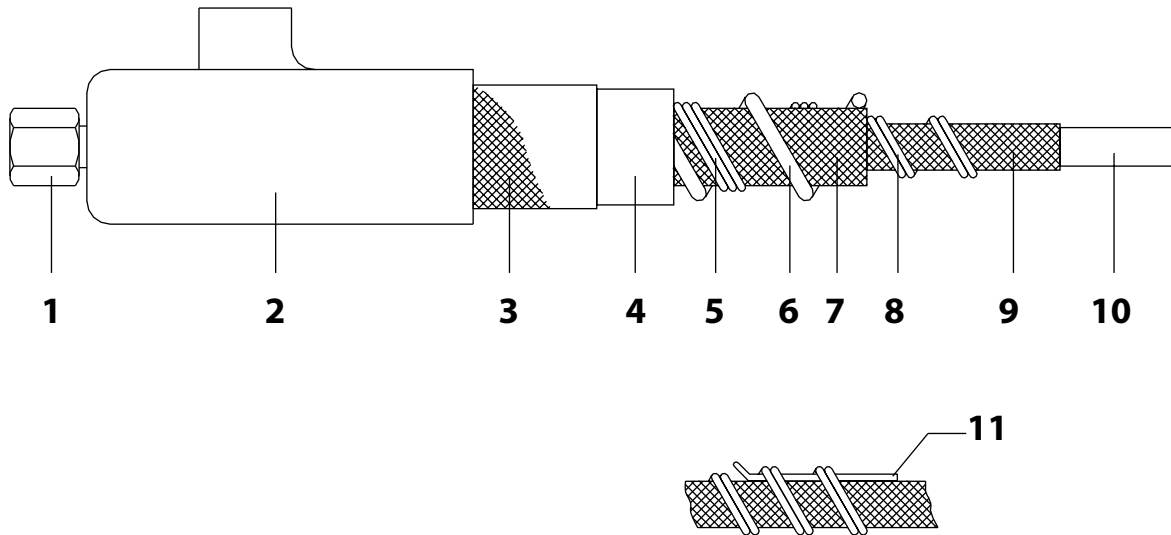


**To tank unit (14-pole AMP)**

Pin	Colour	Function
1	brown	Heater applicator head (L)
2	free	
3	blue	Heater applicator head (N)
4	grey	Applicator head sensor
5	green/yellow	Protective earth
6	grey	Applicator head sensor
7	orange	Valve control
8	free	
9	orange	Valve control
10	free	
11	white	Sensor hose
12	red	Sensor hose
13	yellow	Heater hose (L)
14	violet	Heater hose (N)

## CONSTRUCTION AND FUNCTION

### CONSTRUCTION



Cons. No.	Designation
1	Fitting
2	End cap
3	Braid or corrugated hose
4	Silicon foam
5	Control cores
6	PTFE hot air line (only in KS-S version)
7	Insulation
8	Heating
9	Stainless steel wire braid
10	PTFE inner liner
11	Pt 100/Ni120 temperature sensor

### FUNKTION

The basis of the heatable hose is formed by the inner liner (10) through which the melt flows. It is made in high-quality PTFE with a smooth surface.

Since the inner liner (10) does not have very much pressure resistance, it is enclosed in a stainless steel braid (9). The connecting fittings (1) in galvanised steel are pressed together with the overall setup plan.

The heating conductors (8) consist of high-quality heating conductor alloys that are covered by a protective conductor braid. Fiberglass braid (7) that covers the heating conductors is used as heat insulation.

The PTFE insulated brush shunts (5) are coiled around this construction in a spiral shape.

A heat stabilizing silicone foam (4) with fine-pored cell structure covers the entire construction that is protected by a polyamide protective braid (3). The connection sides of the hose are provided with stable temperature end caps made of silicone.

A temperature sensor (Pt100) is installed between the heater and stainless steel fiber that reports the current hose temperature to the control electronics.

Heatable hoses in the spray version also include a PTFE hose (6) for spray air.

#### TEMPERATURE STABILITY

The polyamide protective braiding is stable up to 160° C. Local overtemperatures can occur by bundling several heatable hoses or by touching hot machine parts.



#### Attention!

The maximum permissible temperature (given as  $T_{max}$  on the type plate) may not be exceeded.

The too high temperatures causes the pressure load capacity of the heated hose to sink, which can cause the hose to be damaged or destroyed.

#### CHEMICAL RESISTANCE OF ADHESIVE HOSE

PTFE is resistant to almost all media.

Water will diffuse through the walls in minor amounts.



#### Attention!

When using hot melt materials containing fluorinated hydrocarbons, oils, alkali metals, or halogens, have the respective manufacturer advise you about PTFE compatibility.

Unsuitable hot melt materials can damage the adhesive hose.

## **INSTALLATION**



### **Attention!**

The heatable hose may only be installed by competent personnel.

See the operating instructions of the tank system for more details.

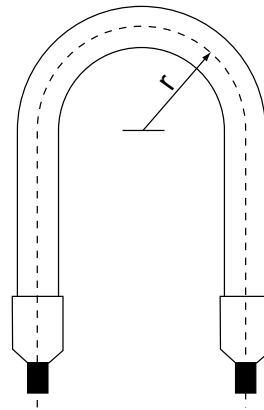
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### **CONNECTION / REMOVAL**

Assembling the heatable hoses to the tank system is described in detail in the operating instructions of the tank system.

### **GUIDANCE NOTES**

#### **Bending radius**



The minimum permissible bending radius for the heatable hose is  $r = 160$  mm, and 240 mm in the case of hoses with integrated spray air lines.

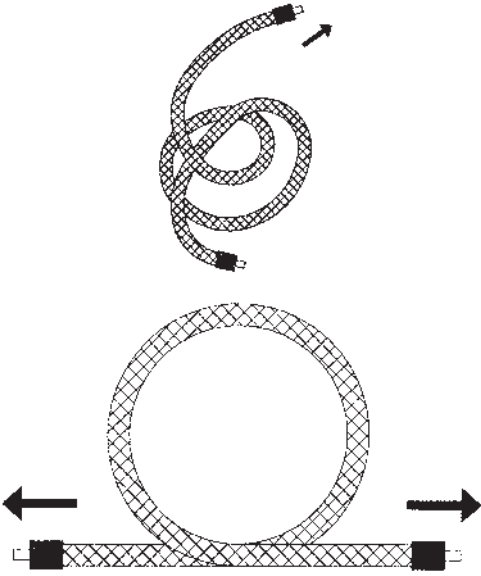
Please also observe the following notes

- Undercutting the minimum permissible bending radius, buckling, strong torsion loads (twisting) and S turns can cause the destruction of the hose.
- Movement and bending stresses may not occur directly at the connections.



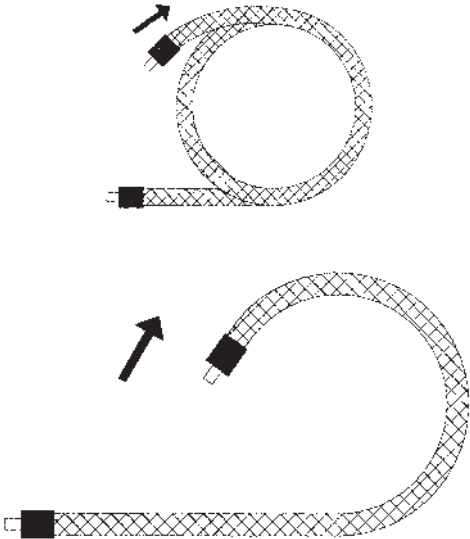
**FURTHER TIPS ON HOSE GUIDANCE**

**Wrong**

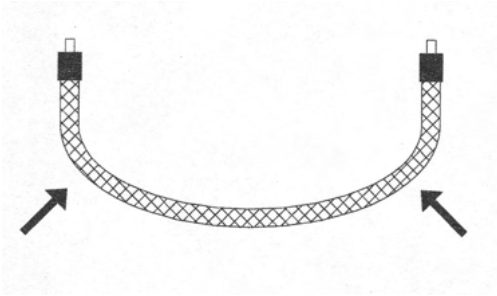


By pulling the ends of rolled up hoses, torsion stress occurs. The smallest permissible bending radius can be undercut!

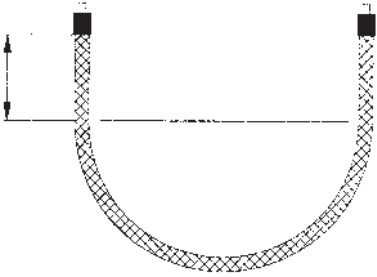
**Right**



Unwind the ring. (Do not pull off the hose)



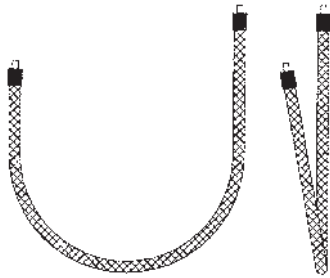
A too short hose will buckle at the connection ends



Plan to leave a straight piece (length approx. 5 x hose diameter) at the connection ends.

A greater bending radius will increase the service life of the hose.

**Wrong**

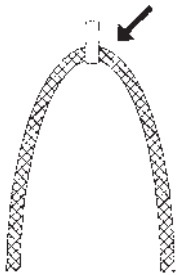


Torsion movement leads to destruction of the heatable hose. This occurs frequently due to incorrect installation, but above all due to twisting the hose during assembly.

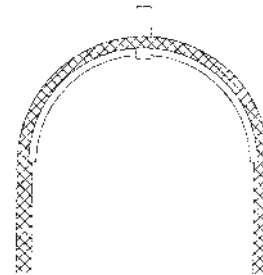
**Right**



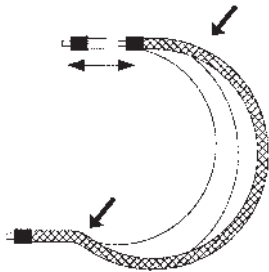
Let the hose axes run parallel during laying. Lay the hose in such a way that the direction of movement runs on a level with the hose axes.



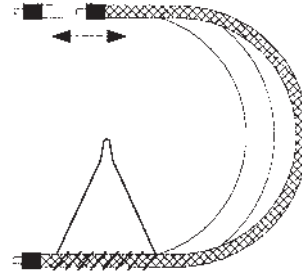
Guidance clips can cause buckling to the hose and bending stress.



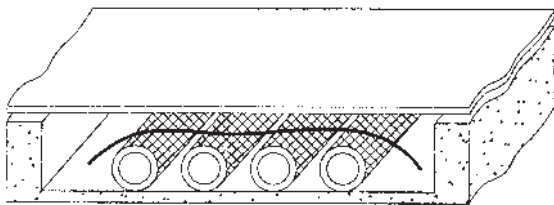
Remedy: Use a saddle or deflection pulley with corresponding diameter.



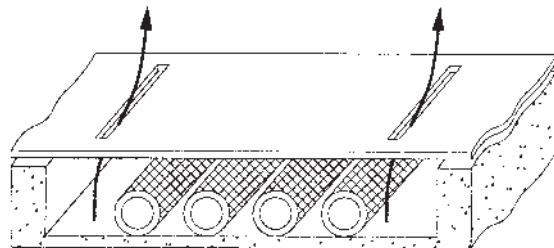
An unfavorable installation will let the hose sag.



Remedy: Spiral hose suspension



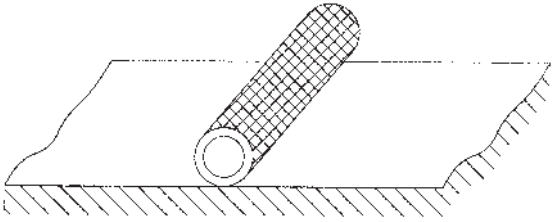
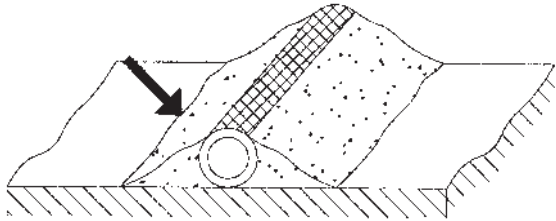
Heat accumulation can occur when laying the hoses in a closed canal or duct.



The hoses may not touch each other. Make sure you provide for adequate aeration.

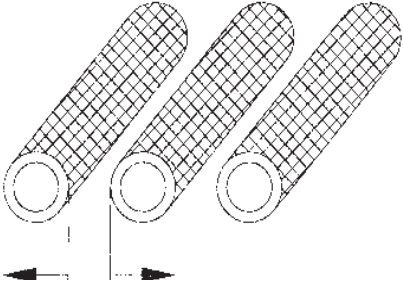
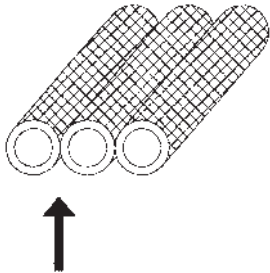
**Wrong**

**Right**



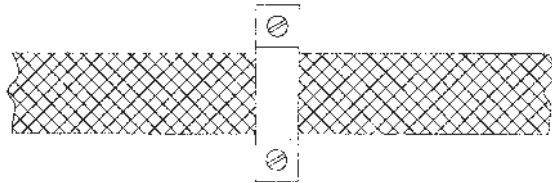
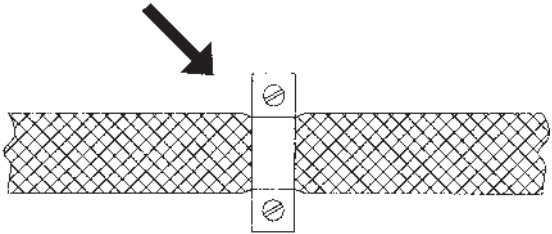
If the hoses are covered with powdery substances, local overheating will occur.

Clean the hoses at regular intervals.



Bundling or laying the hoses with contact will lead to overheating at these contact sites.

Lay these hoses far enough apart.



Squeezing the hoses caused by brackets can damage the hoses.

Select the bracket with the matching diameter. Tighten the bracket enough so that the hose is secured but not squeezed.

## MAINTENANCE

---



### Attention!

Maintenance works may only be implemented by competent personnel.

---

### MAINTENANCE INTERVALS

Interval	Activity
Daily	Check the hoses for leak tightness.
	Check all mechanical and electrical connections for tight fit.
	Remove hot melt material residues and other in-crustations.

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### HEATABLE HOSE SYSTEM WITH REPLACEABLE INNER LINER

The type KS heating hose system consists of a carrier hose and a replaceable inner liner. Due to the structure, the hose length is limited to max. 12 m.

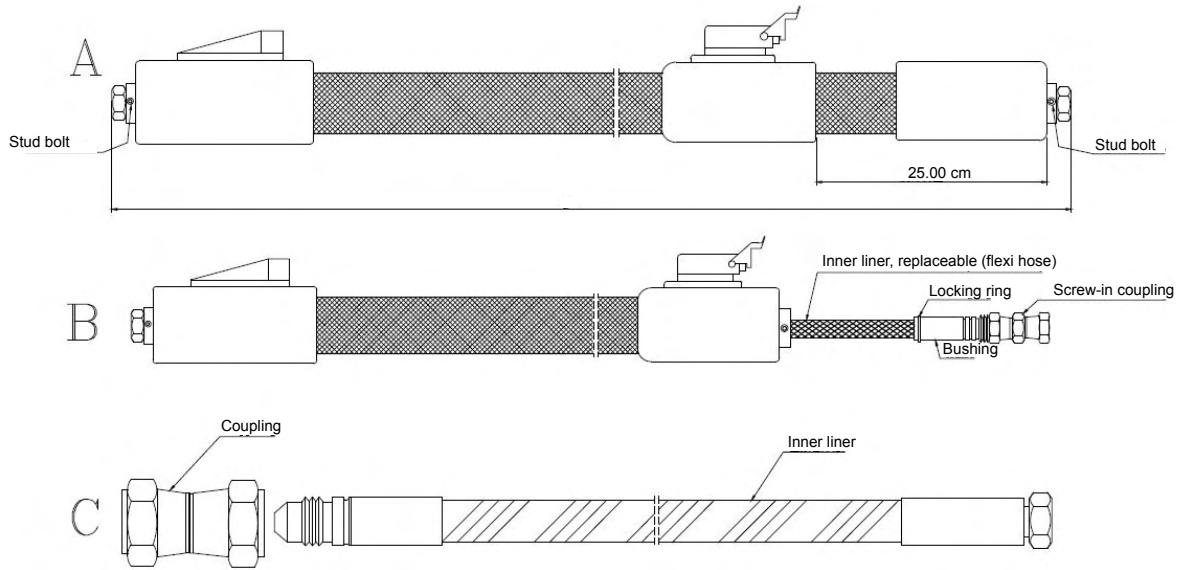
This system is particularly suitable for the processing of reactive adhesives. For impurities or clogging, only the inner liner needs to be replaced and the carrier hose (where the heater is situated) is retained. Replacement may only be carried out in a straight state.

The heating capacity is adjusted to the corresponding nominal diameter of the carrier hose and to the operating temperature. This heated hose system is designed for an operating temperature of max. 200°C. The pressure load refers to the inner liner and can be seen in the „Technical Data” on *page 7-1*.

Observe the „Installation” chapter on *page 3-1*.

### INSTRUCTIONS FOR EXCHANGING THE REPLACEABLE INNER LINER

- Release the set screw with Allen wrench (Ø 2.5 mm) on both sides of the hose.
- Unscrew the double nipple.
- Remove the inner liner from the carrier hose. To do so, pull out the inner liner on the side of the firmly pressed fitting.
- The installation of the new inner liner occurs in reverse order.



### CLEANING



#### **Attention!**

Do not use any aggressive solvent or combustible cleaning agents to clean the hoses. Such substances can cause damage to the hoses.

Using a suitable tool (e.g. cloth, soft brush, wood spatula), mechanically remove hot melt material residue and other pollution.

The heatable hose can also be cleaned by rinsing it with a suitable cleaning agent (see operating instructions of the basic unit).

### **REPAIRS**

Repairs other than those described in these operating instructions may only be implemented by competent persons commissioned by the manufacturer or otherwise competent persons under utilization of original BÜHNEN spare parts.

### **WARRANTY**

The unit was developed and manufactured according to the latest state of technology. The first purchaser receives warranty on function, material, and processing according to statutory regulations. Normal wear and tear is excepted.

The warranty is void if improper handling, use of violence, repairs by third parties and the installation of spare parts other than the original has been determined.

The warranty extends to servicing or replacing according to our choice. Warranty beyond our scope of delivery is excluded, as we do not have any influence on the competent and expert use of the unit.

Please observe our terms and conditions!

### **DISPOSAL**



Take the unit, packaging, and accessories to an environmentally friendly recycling center (in accordance with Directive 2002/96/EG of the European Parliament and the Council of January 27, 2003).

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## Conformity Declaration

We, the **Bühnen GmbH & Co. KG**  
**D-28277 Bremen**

declare on our sole responsibility that the product

**Heatable hose**

**Type AT, DY, FB, HP, KS, LS, MT and NS**

to which this declaration refers, complies with the following Standards or normative documents in its supplied condition:

**EN 60204-1: 2007-06**

**EN 60519-1: 2017-06**

**EN 60519-2: 2007-05**

**EN 61140: 2016-11**

**UNE-HD 60364-4-42: 2014-04**

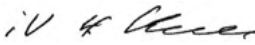
in accordance with the stipulations of guideline

**2011/65/EC**

**2014/30/EU**

**2014/35/EU**

Bremen, May 2019

  
Hermann Kruse  
Technical Manager &  
Documentation Representative



Bert Gausepohl  
General Manager