Instructions manual

ADHESIVE MELTER MACRO SYSTEM

meler

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Published by:

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TABLE OF CONTENTS

1. SAFETY GUIDELINES

General

The information contained in this section applies not only to every-day 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 and within reach of personnel that use the machine and perform maintenance on it.

Also provide necessary safety material: appropriate clothing, foot-wear, gloves and safety glasses.

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

Symbols

The symbols used on both the melter/applicator 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.

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

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

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.

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 (3x400 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 vecinity.

Hydraulic components

As this is a pressurized system, precautions related to this type of equipment must be observed.

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 230 °C (446 °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, and therefore does not present a specific risk to be taken into consideration.

Materials

'*meler*' 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 '*meler*' 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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2. INTRODUCTION

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

The '*macro system*' series includes the 50 and 100 liter range of hot-melt adhesive melters/applicators.

Most of the photographs and illustrations that appear in this manual refer to the 50-liter '*macro system'* 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 '*macro system*' series.

Description

The '*macro system*' are designed for use with '*meler*' hoses and guns 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.

Intended use

The hot-melt melters/applicators in the '*macro system*' series are designed to be used in the following conditions:

- Hot-melt adhesive fusion and pumping at temperatures up to 200°C (230°C in option)
- Use of hot-melt melters/applicators with '*meler*' accessories
- Installation of hot-melt melters/applicators according to the security regulations currently in force and the instructions provided in this manual (anchoring, electrical connection, hydraulic connection, etc)
- Use of hot-melt melters/applicators in non-explosive, non-chemically aggressive environments
- Use of hot-melt melters/applicators following the safety instructions indicated in this manual, as well as on the labels accompanying the equipment, using adequate means of protection during each mode of operation.

Limited use

The '*macro system*' series hot-melt melters/applicators must be used for their intended uses and never in the following conditions:

- Use with adhesives or any other material that might cause safety or health risks when heated.
- Use of hot-melt melters/applicators in environments where cleaning is necessary using water jets.
- Use of hot-melt melters/applicators to heat or melt food products.
- Use or operation without adequate safety protection.

Modes of operation

The '*macro system*' series hot-melt melters/applicators may be used in all of the following modes:

Work mode_ The melting equipment keeps the hot elements at the temperature indicated on the display, which has been preselected to the desired value. The pump-motor set remains active, on standby to receive the consumption request by the opening of one or more applicator guns.

manual control_The pump motor is started by means of the switch in 'MANUAL' position. The rotational speed of the motor is selected by turning the 'R.P.M.' control.

automatic internal set point control_Switches are in 'AUTO' and 'REF INT' position. The pump motor is started by means of an external signal contact. The rotational speed of the motor is selected by turning the 'R.P.M.' control.

automatic external set point control_Switches are in 'AUTO' and 'REF EXT' position. The pump motor is started by means of an external signal contact. The rotational speed of the motor is selected by means of a 0-10V external control signal.

Standby mode_ The melting equipment remains on standby status, with the temperatures of the elements at a value (which may be programmed) that is below the preselected value. The pump-motor remains deactivated.

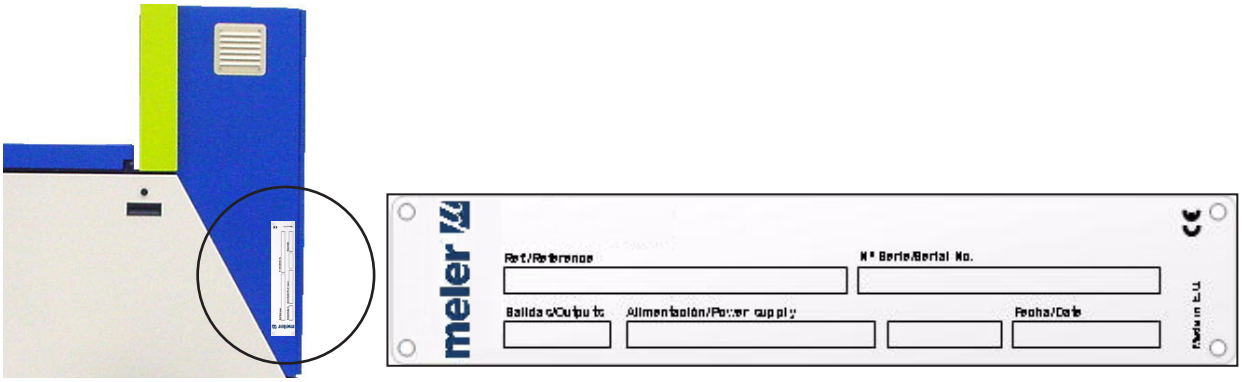
Alarm mode_ The melting equipment detects a malfunction and warns the operator about the event. The pump-motor remains deactivated.

Stop mode_ The melting equipment remains off, no elements are heated and the pump-motor assembly is deactivated. However, the electrical and pneumatic power from the grid, if any, are still supplied to the equipment.

Hot-melt melter/applicator identification

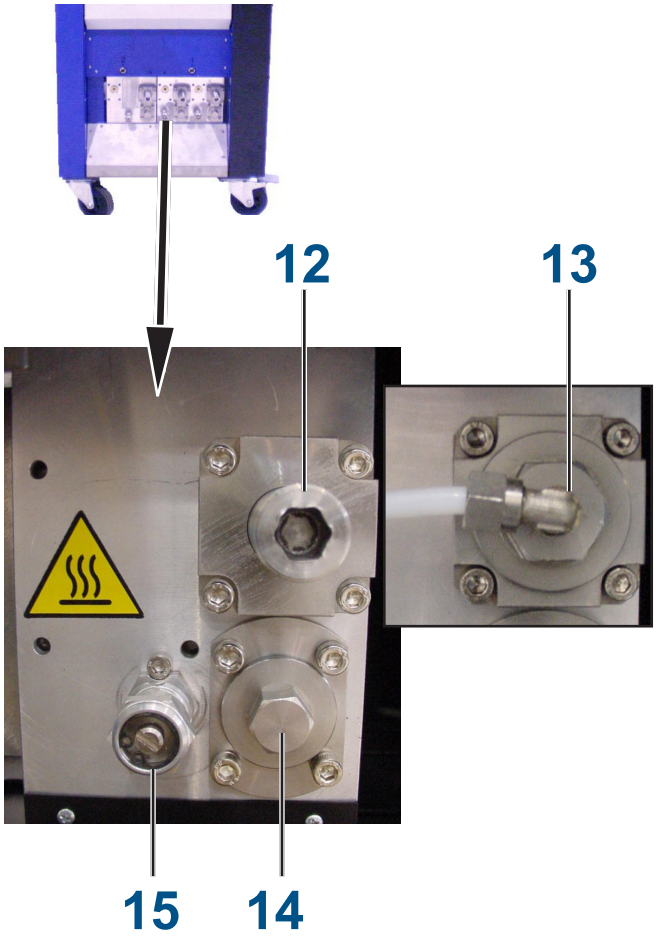
When placing orders for replacement parts or requesting help from our service center, you should know the model and reference number of your hot-melt melter/applicator.

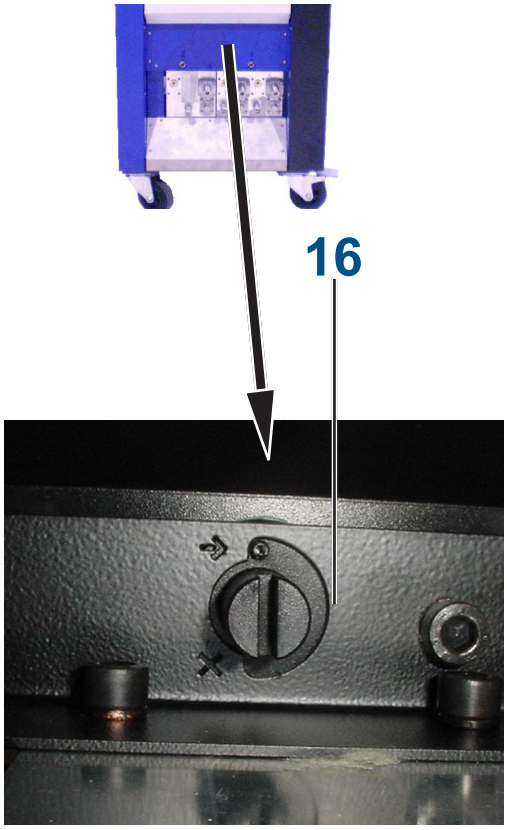
This and other technical information will be found on the identification plate located on the side of the lower part of the hot-melt melter/applicator.



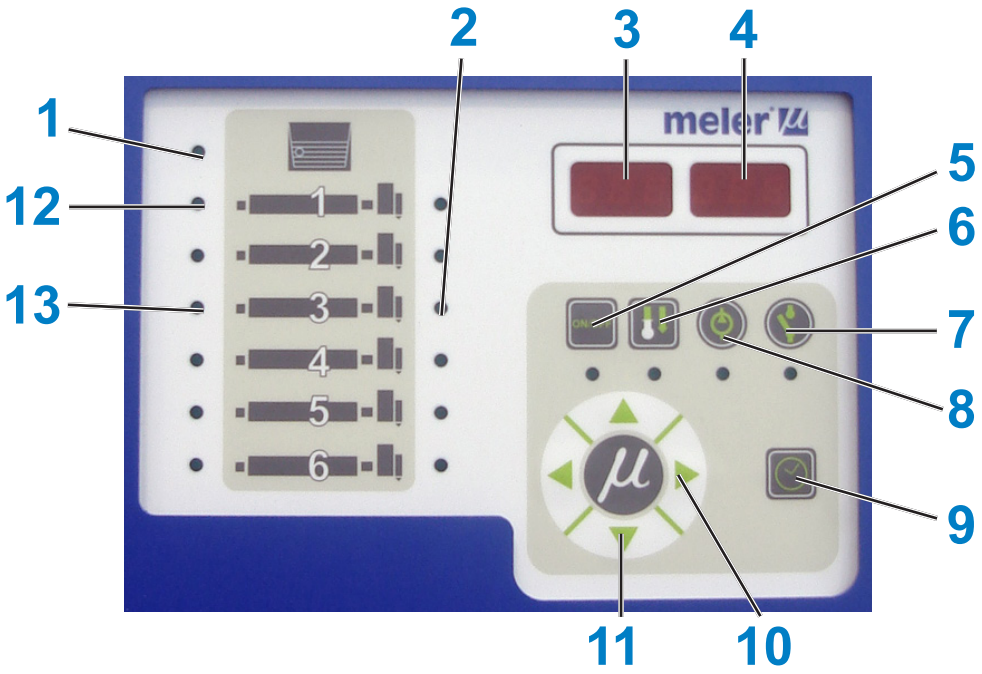
Main components

1. Front control card
2. Access door to the electronic section and connections.
3. Tank access cover
4. By-pass valve pressure regulator with pressure gauge (optional system)
5. Electrical main supply input
6. Motor control panel
7. Unit transport wheels
8. Hose output distributor (up to 2 hydraulic connections per motor-single pump or 4 per motor-double pump assembly). Right side or rear placed
9. Hose-gun electrical connections. Right side or rear placed
10. Main switch
11. Optional air drying system for PUR adhesives

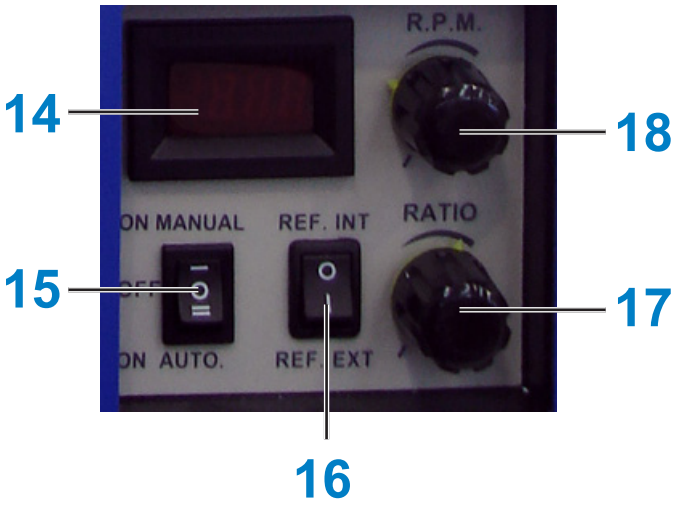




12. Mechanical by-pass valve pressure control
13. Pneumatic by-pass valve pressure control
14. Pump filter (in case of PUR adhesive the equipment has not filters)
15. Purge valve
16. Tank-distributor shut off valve



1. Tank indicator LED
2. Gun indicator LED
3. Temperature set point
4. Actual Temperature
5. ON/OFF switch
6. Standby function
7. Temperature OK LED
8. Pump operation LED
9. Time scheduling
10. Left/right button - channel selection
11. Up/down button - temperature modification
12. Manifold indicator LED
13. Hose indicator LED



For each motor-pump assembly installed:

14. Pump speed display
15. ‘MANUAL / 0 / AUTO’ mode switch
16. INTernal / EXTernal set point switch
17. Maximum ‘RATIO’ speed control
18. Motor ‘R.P.M.’ speed regulation

Optional Equipment

In order to provide the melting equipment with more functions, the following optional elements may be added:

- Air drying system for use with PUR adhesives.
- Low melted adhesive level detection system.
- Automatic tank filling system.
- Light tower system

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3. 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

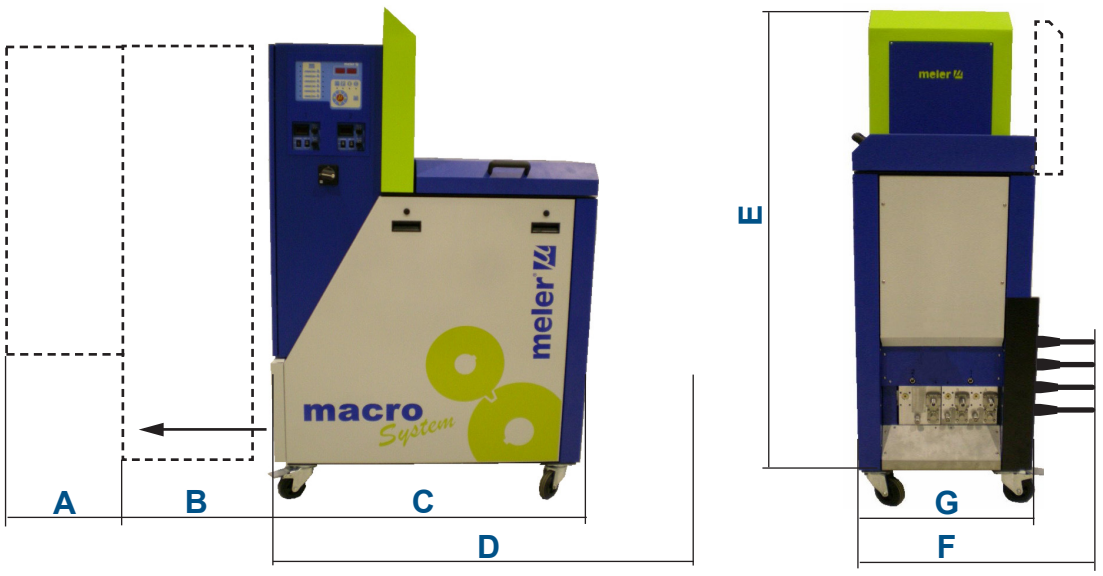
The '*macro system*' series melters/applicators are delivered with all the materials necessary for their installation. However, some components must be provided by the user himself, according to the location and connections in each particular installation:

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

Installation requirements

Before installing '*macro system*' 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	
		50 L	100 L
A	DOOR OPENED	430 mm	795 mm
B	ELECTRICAL CABINET DISPLACEMENT	410 mm	
C	UNIT LENGTH	1080 mm	
D	UNIT LENGTH WITH FREE SPACE TO RIGHT SIDE DEVICES ACCESS	2080 mm	
E	UNIT HEIGHT	1600 mm	
F	UNIT WIDTH WITH FREE SPACE TO REAR SIDE DEVICES ACCESS	1510 mm	1875 mm
G	UNIT WIDTH	510 mm	875 mm

Electrical Consumption

In order to install a '*macro system*' series melter/applicator, we should take into consideration the total consumption of the installation, including the consumption of the installed hoses and guns.

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.

Compressed air

As an option, a pneumatically activated by-pass valve or an air drying system may be installed. If these are added to the system, a dry, unlubricated compressed air network must be available, with a maximum pressure of 6 bar.

The by-pass valve consumes next to no air, given that this is a pressurized closed circuit. In the case of the air drier, this depends on the frequency of application, and therefore consumption must be estimated for each case. Generally speaking, we can give a maximum consumption value of 4.5 l/min for a pressure of 0.5 bar with a standard cycle setting (10 min standby / 10 s application).

Other factors

While installing '*macro system*' series melters/applicators, other practical considerations should be kept in mind:

- 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 '*meler*' Representative or to the Main Office.

Contents

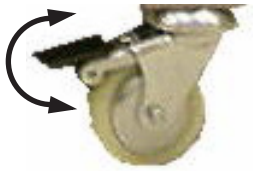
The '*macro system*' series packing materials may contain accessories that form part of the same order. If this is not the case, the following are the standard components that accompany the melter/applicator:

- Instruction manual
- Guarantee card
- Hose couplings
- Electrical wall bushing Pg (on the unit)
- Connector for external I/O (included on the power card)

Mounting the equipment

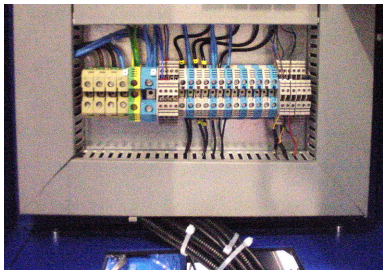
The '*macro system*' series melting equipment are equipped with wheels for their easy transport and positioning near the main machine.

The four wheels turn 360°, and two are equipped with brakes. To move the unit, unlock the two wheels by lifting the lever.



Slide the unit to its final position. Lock the wheels once again, lowering the levers.

Electrical power connection



'*macro system*' series melters/applicators are designed to be connected to the electrical power supply in two possible ways, depending on their power consumption:

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

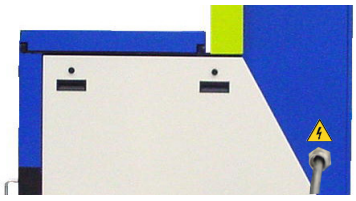
A good ground connection is required in all cases.

Consumption figures, according to melter/applicator and output configuration, are included in the table.

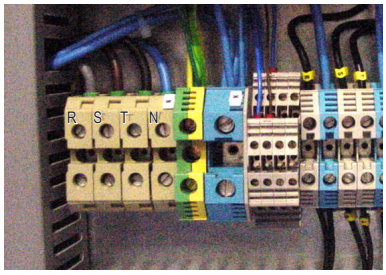
UNIT	No. OUTPUTS	1 PHASE	3 PHASES
			400 VAC Y
		1 SINGLE PUMP	1 SINGLE PUMP
macro50	2	46.7 A	21.3 A
macro100	2	74.2 A	29.1 A

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

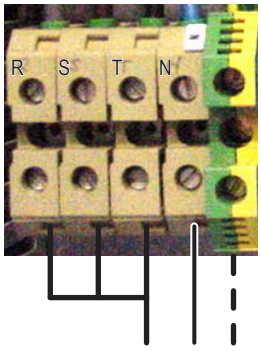
Install the electrical wall bushing Pg 21 in the area reserved for them, fastening them to the plate with the appropriate nut.



Open the electric cabinet door as far as possible. Thread the power cord (Ø14-18 mm) through the electrical wall bushing Pg 21 and fasten it to the inside anchor, making sure that the cord reaches the power terminals block inside the cabinet.

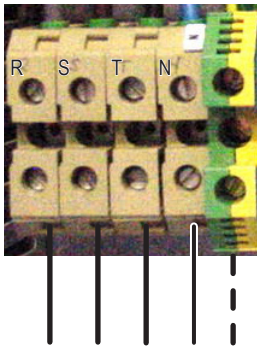


Connect each wire in the power cord to its corresponding place on the power terminals block, as shown in the figures.



L N PE

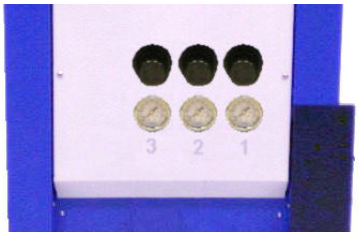
230V 1~ 50 Hz + N + PE



L1 L2 L3 N PE

400V 3~ 50 Hz + N + PE

Pneumatic connection



If a pneumatically controlled by-pass pressure control valve is installed, the equipment must have a compressed air supply.

Before connecting the pneumatic power to the melter/applicator, make sure the pressure regulator is completely closed.To do this, turn the regulator handle located on the equipment base 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 6 mm. The equipment is provided with a quick coupling for this purpose.

Activate the air supply to pass and turn the pressure regulator clockwise. The ratio between the pneumatic pressure and the hydraulic pressure on the circuit is 1 to 15 bar.

Warning: A 6 bar on the grid, the maximum pressure on the hydraulic circuit reaches 90 bar. There is a risk of burns or particle projection. Use thermal protective gear and goggles.

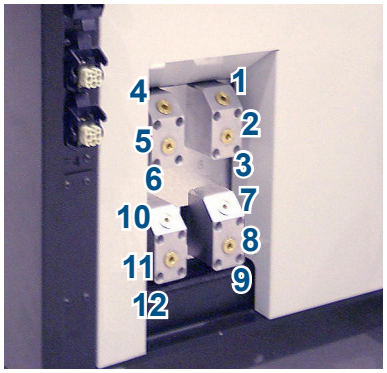
Hose and gun connection

'*macro system*' series melters/applicators use standard '*meler*' components. The entire range of 'MD/MDR', 'MS/MSR', 'ND' and 'NDS' hoses and guns may be connected to this equipment.

Up to four hose-gun outputs may be connected to 50 and 100L '*macro system*' melters/applicators, depending on the number of pumps installed.

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

The 'macro system' series melting equipment is equipped with a hydraulic distributor for each pump, with 2 possible outputs, depending on the connections that will be used. Connect the hoses to the distributor according to the needs of the installation and the ease of connection.



Caution:

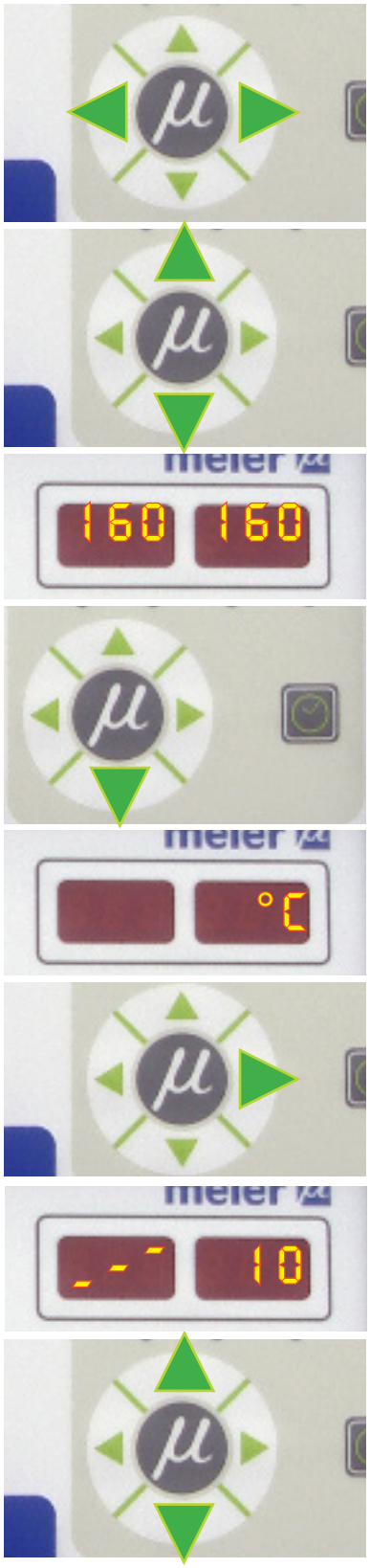
- In order to identify each hose-gun, electrically connect them to the connector with the same number as the output they use.
- It is preferable to use couplings at a 45° or 90° angle to minimize the space the hoses occupy. Using straight couplings usually results in curves with very small radii that 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 gun 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.

'*macro system*' series melters/applicators simplify this task as much as possible, allowing the operator to modify only those parameters that are necessarily variable for each application.

The value displayed corresponds to the increase in real



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.

Programming working temperatures

The melters/applicators leave the factory with the following set point temperatures:

- 160 °C (320 °F) for the tank and the distributor
- 150 °C (302 °F) for hoses
- 160 °C (320 °F) for guns

The general process for modifying set up temperature values for any component is described below.

1. Select the component for which you wish to modify the value with the left-right arrow.

   The corresponding LED will blink quickly.

2. Using the up-down arrow, select the desired value for the set point temperature.

3. After ten seconds, the LED will stop blinking and the display will change by default to the set point temperature, saving the changed data.

This simple process must be repeated for each one of the components installed on the melter/applicator.

Selecting the overheating value

1. Press the buttons with the clock symbol and the down arrow at the same time to enter the special menu.

   The choice of display units (ºC or ºF) will appear on the display.

2. Using the right arrow, we advance to the next screen where the overheating symbol appears. ▬▬▬

3. Select the desired value with the up-down arrow.

temperature over the set point temperature permitted without activating the alarm message.

4. Use the right arrow to advance to the next screen.

5. Exit the special menu using the left arrow and the tank temperatures will once again be displayed.

   All the special menu values will be saved.

Keeping a component on display

By default, the main display shows the tank temperatures. However, it is possible to display indefinitely the temperatures of any component for analysis or tracking.

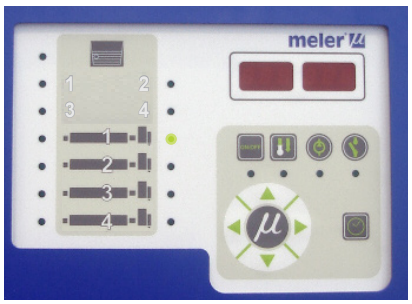
1. Select the component you wish to see permanently with the left-right arrow.

   The corresponding LED will blink rapidly.

2. Hold the arrow button down for two seconds, selecting the desired component.

3. The display will now remain on the selected component, without changing.

4. Simple press any left-right arrow button again to restore the default display (tank).



External I/O connections

The melter/applicator's input and output signals (I/O) allow it to communicate with the main machine simply and directly.

There are four signals that may be used to communicate with the main machine:

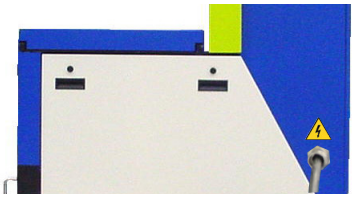
- **Temperatures ok**_an output from a non-voltage contact that communicated to the main machine (or to a warning light beacon) that all the system temperatures have reached 3° below their set point value (and the delay time have finished) during start-up, or that their real value is not 20°C below their set point value during operation.
- **External Standby**_control input from the standby mode, via a non-voltage contact. The standby function is connected with a closed contact; an open contact disconnects it.
- **Low level**_an output from a non-voltage contact that communicates to the main machine (or to a warning light beacon) that the adhesive fluid level in the tank has reached

the minimum level established (optional)

- **Output inhibitor**_inhibitor tracking inputs for each hose-gun output via a non-voltage contact. With a closed contact, the output remains activated; with an open contact, it is deactivated.
- **Motor start up**_for each pump installed, the motor start up may be controlled by closing an external non-voltage contact.
- **Motor speed set point**_for each pump installed, the rotational speed of the motor (and therefore, the pump) may be controlled by means of a 0 to 10V DC external signal.

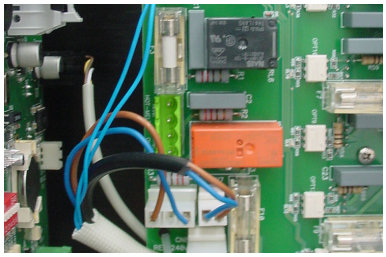
Warning: Risk of electric shock. Carelessness may cause injuries or death.

Temperature ok

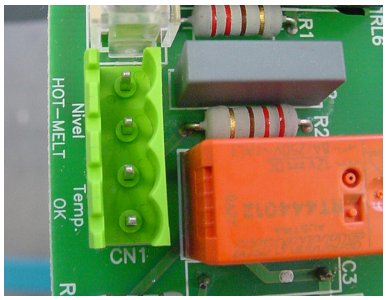


1. If only this signal will be connected, use a 0.5 mm^2 two-wire cable.

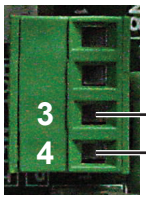
   Install an electrical wall bushing Pg9 on the equipment base plate next to the electrical supply input.



2. Open the door to the electrical cabinet as far as possible. Thread the power cord (Ø4-8 mm) through the electrical wall bushing Pg9 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.



3. Remove the connector from the card and connect the two cable wires to their corresponding connector terminals:



4. Reconnect the card connector

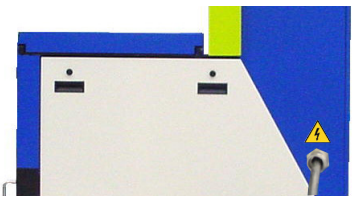
5. Make sure that the cable is well connected and that its path through the electrical cabinet presents no risks of snagging, being cut or any other accidental deterioration.

Warning: It must be connected to 24 AC or DC voltage. If you connect this signal to 230V load current cannot be less than 50mA.

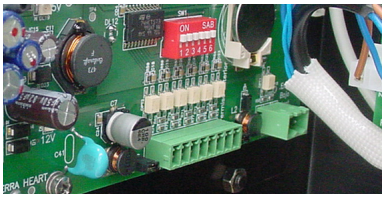
External Standby

1. If this is the only signal being connected, use 0.5 mm² two-wire cable.

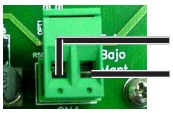
   Install an electrical wall bushing Pg9 on the equipment base plate next to the electrical supply input.

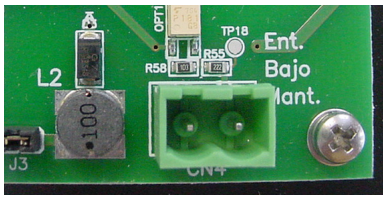


2. Open the electrical cabinet door as far as possible. Thread the power cord (Ø4-8 mm) through the wall bushing Pg9 and fasten it to the inside anchor, making sure that the cord reaches the power card connector at the position where it will be installed.



3. Remove the connector from the card and connect the two cable wires to their corresponding connector terminals:





4. Reconnect the card connector

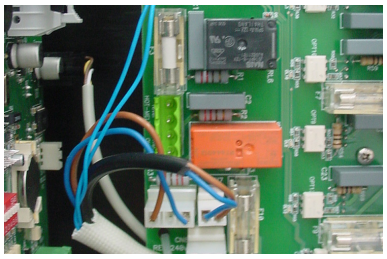
5. Make sure that the cable is well connected and that its path through the electrical cabinet presents no risks of snagging, being cut or any other accidental deterioration.

Low level (optional)

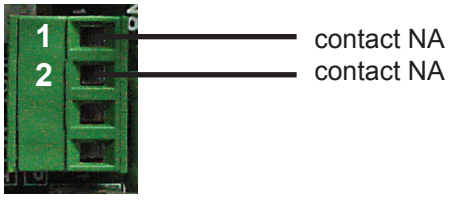
1. If this is the only signal being connected, use 0.5 mm² two-wire cable.

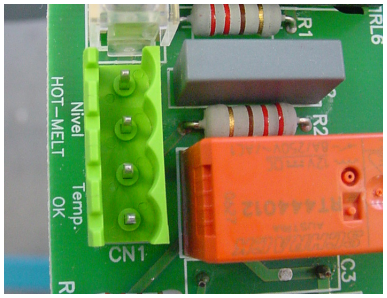
   Install an electrical wall bushing Pg9 on the equipment base plate next to the electrical supply input.

2. Open the electrical cabinet door as far as possible. Thread the power cord (Ø4-8 mm) through the wall bushing Pg9 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.



3. Remove the connector from the card and connect the two cable wires to their corresponding connector terminals:

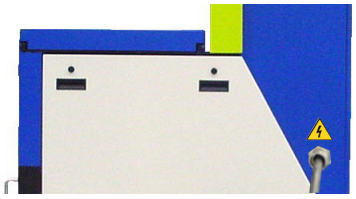




4. Reconnect the card connector

5. Make sure that the cable is well connected and that its path through the electrical cabinet presents no risks of snagging, being cut or any other accidental deterioration.

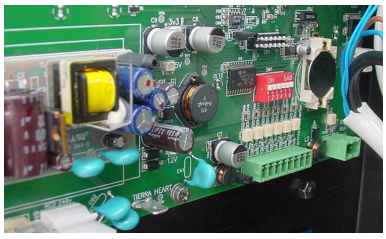
Warning: It must be connected to 24 AC or DC voltage. If you connect this signal to 230V load current cannot be less than 50mA.



Output inhibitor

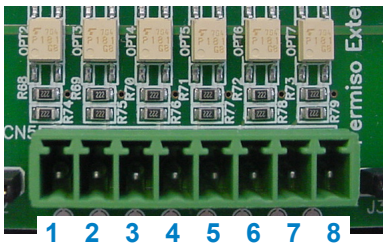
1. If this is the only signal being connected, use a seven-wire cable no smaller than 0.22 mm^2.

   Install an electrical wall bushing Pg9 on the equipment base plate next to the electrical supply input.



2. Open the door to the electrical cabinet as far as possible. Thread the power cord (Ø4-8 mm) through the electrical wall bushing Pg9 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.

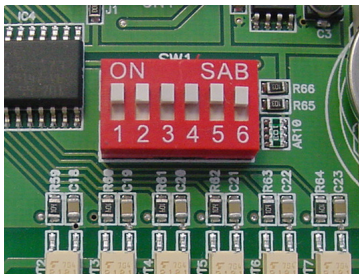
3. Remove the connector from the card and connect the two cable wires to their corresponding connector terminals:



   1 common + voltage output
   2 input for inhibitor output 1
   3 input for inhibitor output 2
   4 input for inhibitor output 3
   5 input for inhibitor output 4
   6 input for inhibitor output 5
   7 input for inhibitor output 6
   8 without connection

4. Reconnect the card connector

5. Make sure that the cable is well connected and that its path through the electrical cabinet presents no risks of snagging, being cut or any other accidental deterioration.



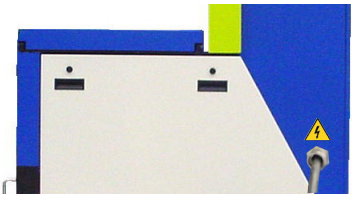
It is possible to select the channels that you want to control from the outside using the small switches located above the connecter. Switches 1 through 6 control each of the channels, so that the switch in the ‘ON’ position means heating from the equipment, without any external control.

When the switch is in the ‘OFF’ position, the corresponding channel does not heat unless activated from the outside, through a non-voltage contact between pin 1 (the common pin) and the pin that corresponds to the channel.

Starting up the motor

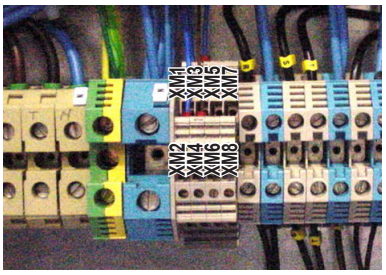
1. If only this signal is going to be wired, use a two-wire 0.5 mm2 section cable.

   Install a Pg9 electrical wall bushing in the plate at the base of the equipment, next to the electrical power intake.



2. Open the door to the electrical cabinet as far as possible. Run the signal cable (Ø4-8 mm) through the Pg9 bushing and attach it to the inside anchor, making sure that the cable reaches the terminals on the inside, next to the motor variator.

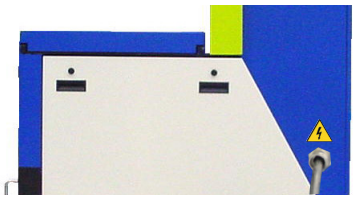
3. Connect the two wires from the start-up signal to the terminal XM1/2, on the bottom (this signal could be up to four connections, depending on motor-pump assembly installed -1/2, 5/6, 9/10 and 13/14-). This is a double terminal, which makes it necessary to connect each wire in one of the two holes in the terminal. Since this contact is not under voltage, there is no connection polarity.



4. Make sure that the cables are firmly attached by the terminal screws.

5. For the signal to work, the switch on the control panel must be in the ‘AUTO’ position.

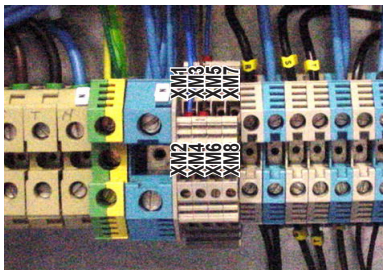
Motor speed set point reference



1. If only this signal is going to be wired, use a two-wire 0.5 mm2 section cable.

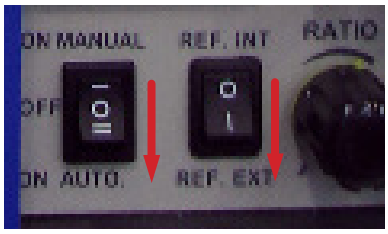
   Install a Pg9 electrical wall bushing in the plate at the base of the equipment, next to the electrical power intake.

2. Open the door to the electrical cabinet as far as possible. Run the signal cable (Ø4-8 mm) through the Pg9 bushing and attach it to the inside anchor, making sure that the cable reaches the terminals on the inside, next to the motor variator.



3. Connect the two wires from the speed set point reference signal to the terminal XM3/4, on the bottom (this signal could be up to four connections, depending on motor-pump assembly installed -3/4, 7/8, 11/12 and 15/16-). This is a double terminal, which makes it necessary to connect each wire in one of the two holes in the terminal. The positive signal wire must be connected to point XM3, while the negative wire must be connected to point XM4.

4. Make sure that the cables are firmly attached by the terminal screws.



5. For the signal to work, the switches on the control panel must be in the ‘AUTO’ and ‘EXT’ positions.

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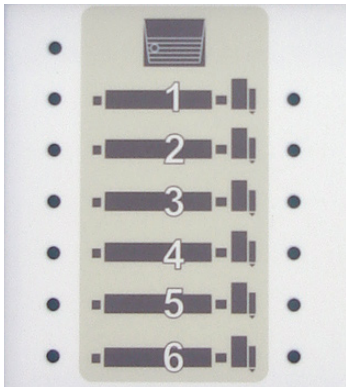
4. MELTER OPERATION

In this section we will introduce the method for using the melter/ applicator. 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.

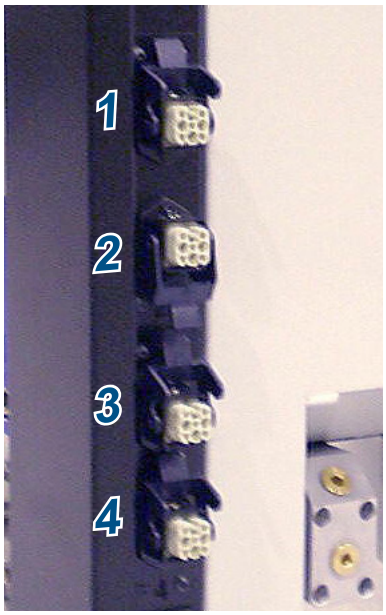
General information

There are three large groups of components with thermal control in a hot-melt installation: the fusion unit, the transport hoses and the melter/applicator guns. All of these are controlled from the front panel of the melter/applicator equipment.



The first large group is the premelter-tank-distributor assembly. The premelter is the first heated zone for the adhesive before it is melted. It has its own temperature control but it forms a single unit with the tank, with separate controls, even though their set point value is the same. The tank receives the melted adhesive from the premelter and distributes it to the pumps. It has its own control and is identified on the front panel by the corresponding picture. Distributors are connected to channels number 1 to 4 with independent set point values and temperature controls.

The second group is the hose group. These are identified on the front panel from No. 1 to No. 4 and by a picture of the corresponding hose. Each has its own set point value.



The third group is the gun group. These are identified on the front panel from No. 1 to No. 4 and by a picture of the corresponding gun. Each has its own set point value.

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

Filling the tank

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

The unit will activate the external signal and, if it is connected, 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/applicator 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 glasses.

3. Close the lid when you have finished refilling the tank. Different adhesive types can damage the melting equipment.

MODEL	CAPACITY	
macro50	50 L	50 kg
macro100	100 L	100 kg

For a density of 1g/cc

Starting up the melter/applicator equipment

Before starting up the melter/applicator 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.

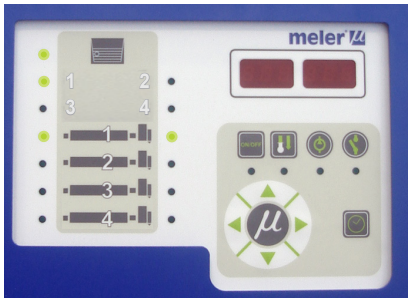
To start:

1. Connect the melter/applicator's switch.

If the control card was turned off the last time the machine was disconnected, it will remain turned off when the machine is started up again (time display).

If the control card was on the last time that the machine was disconnected, it will turn on when the machine is started up again.

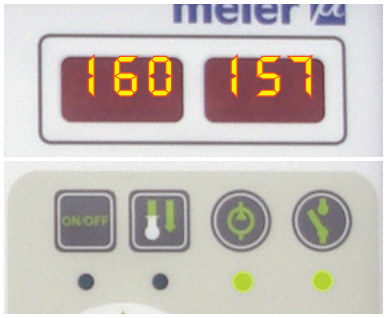
2. Press the ON/OFF button on the control card to turn it on, if it is not already activated.



By default, the set point and real temperature values shown are those corresponding to the tank.

The tank (and distributors, hoses and guns connected) heating control LED (green) will light up and the tank will begin to heat.

Once it has reached 3° below the programmed temperature (set point) of the tank, a programmable delay timer starts until, guaranteeing fusion, the pump receives permission to operate and the signal will be sent to the main machine, indicated by the two corresponding (green) LEDs.



While the system is running the delay timer both LEDs remains blinking until the programmed time value has been reached. If then, any other element has not reached 3° below its temperature setting point, the LEDs turn off.

If the system is shut down, for any possible mode, when it is turning on the delay timer only starts again if the tank temperature is 20° below setting point.

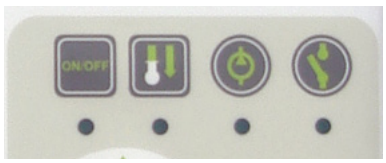
3. Make sure that the control switches for each of the motors installed is in the correct position (see Chapter '*2. Introduction. Operating modes*').

Melter/applicator equipment displays

'*macro system*' series melters/applicators have two displays built into their control panel, with three sets of 7 segments each for displaying the temperature values (set point and real temperature), programmable parameters and alarms.

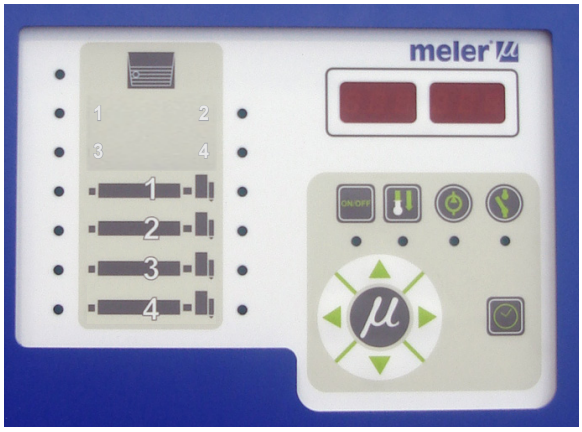
They are equipped with LED indicators to display the heating of each component, as well as the pump activations and the main machine connection signal.

LED display	Component heating	Component status
constantly lit	constant	low temperature
blinking slowly	as needed (according to PID parameters)	temperature near set point
blinking rapidly	programming or display	change in set point values
off	not heating	temperature reached



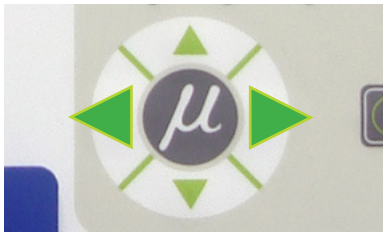
They are also equipped with LEDs indicating equipment connection/disconnection and standby function connection/ disconnection:

Led display	On/off	Standby
constantly lit	turned off unit	function activated
blinking slowly	deactivation programmed for the current day	activation programmed for the current day
blinking rapidly	activation/deactivation programming mode	activation/deactivation programming mode
off	unit in operation	function deactivated
simultaneous intermittence from both leds	timing in progress, once the tank has reached its set point temperature	



Displaying the temperature for each component

The temperature may be displayed for each component (premelter, tank, distributor and each hose and gun) by selecting the component with the cursor.



Press the left-right arrow until the desired component is displayed.

After 10 seconds, the display will return to the default component (the tank).

If you wish to keep the component displayed permanently, press and hold the left-right arrow for 2 seconds while selecting the chosen element.

For units that have one pump installed, the display sequence is the following:

premelter<—tank<—distributor1<—...<—distributor4<—hose1<—gun1<—hose4<—gun4

premelter—>tank—>distributor1—>...—>distributor4—>hose1—>gun1—>hose4—>gun4

To remove a component from permanent display, simply press either of the left-right arrows.

Alarm displays

'*macro*' series melter/applicator equipment tell the user when a malfunction has occurred in the unit, sending warning messages that may be seen on the control panel display.

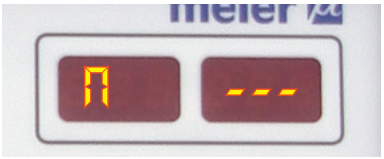
When an alarm appears, the control unit takes a series of steps to protect the unit. Simply correct that malfunction and the control unit will reactivate the equipment functions.

Standby function does not generate any alarm.

code	source	actions		
		heating	pump	main machine signal
Err 0	tank broken sensor	only tank off	off	off
Err 1	distributor1 broken sensor	only distributor1 off	off	off
Err 2	distributor2 broken sensor	only distributor2 off	off	off
Err 3	distributor3 broken sensor	only distributor3 off	off	off
Err 4	distributor4 broken sensor	only distributor4 off	off	off
Err 5	hose1 broken sensor	only hose1 off	off	off
Err 6	gun1 broken sensor	only gun1 off	off	off
Err 7	hose2 broken sensor	only hose2 off	off	off
Err 8	gun2 broken sensor	only gun2 off	off	off
Err 9	hose3 broken sensor	only hose3 off	off	off
Err 10	gun3 broken sensor	only gun3 off	off	off
Err 11	hose4 broken sensor	only hose4 off	off	off
Err 12	gun4 broken sensor	only gun4 off	off	off
Err 13	premelter broken sensor	only premelter off	off	off
Err 100	tank overheating	all components off	off	off
Err 101	distributor1 overheating	all components off	off	off
Err 102	distributor2 overheating	all components off	off	off
Err 103	distributor3 overheating	all components off	off	off
Err 104	distributor4 overheating	all components off	off	off
Err 105	hose1 overheating	all components off	off	off
Err 106	gun1 overheating	all components off	off	off
Err 107	hose2 overheating	all components off	off	off
Err 108	gun2 overheating	all components off	off	off
Err 109	hose3 overheating	all components off	off	off
Err 110	gun3 overheating	all components off	off	off
Err 111	hose4 overheating	all components off	off	off
Err 112	gun4 overheating	all components off	off	off
Err 113	premelter overheating	all components off	off	off

If a temperature sensor is broken, the system heats all the elements except the one where the failure is located.

In case of overheating the system cuts off inmediately the damaged element. After three minutes if the failure continues all the system will be shut down. After repairing the failure the system starts heating normally.

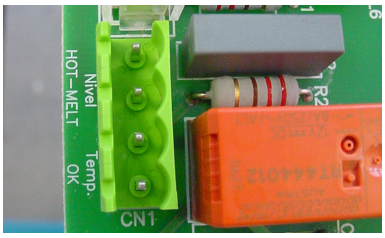


Hot-melt display level (optional)

When the level of hot-melt drops below 1/3 of the tank capacity, the level detector sends a signal to the melter/applicator control unit, which takes the following actions:

1. On-screen display (if the function is activated).

2. It closes a non-voltage output contact where the user will install the required device (horn, light or PLC input).



Simply refill the tank and wait for the adhesive to melt enough that the sensor sends the message that the correct level has been reached.

Operating speed display and adjustment

The speed at which the pump turns (in revolutions per minute) is shown on the control display for each motor in the unit. These revolutions may be adjusted using the potentiometer labeled ‘R.P.M.’ Turning clockwise increases the revolutions, while turning counterclockwise reduces the revolutions. La velocidad de giro de la bomba debe ser ajustada a las necesidades de la aplicación.

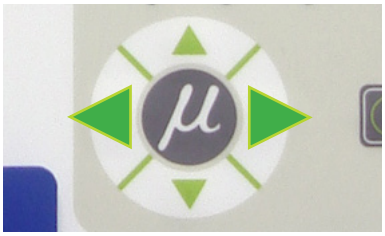
Warning: Even though the control allows you to select rotational speeds between 0 and 100 rpm, it is not recommended to work at speeds below than 10 rpm (the flow might not be constant, depending on the motor load) or above 80 rpm (with the pump operating at maximum revolutions).

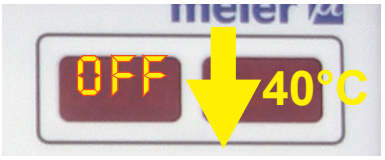
Under the rotational speed adjustment potentiometer, we find the maximum speed control, labeled as ‘RATIO.’ This potentiometer allows us to adjust the full scale of the speed adjustment as a percentage, so that the maximum adjusted speed is 100 rpm (100%) or lower. This regulation affects both the manual speed adjustment and the external set point value for automatic adjustments.

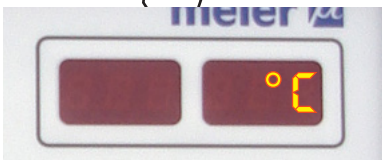
Temperature adjustment

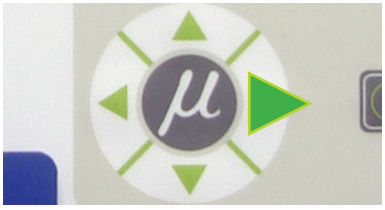
The melters/applicators leave the factory with the following set point temperature values:

- 160 °C (320 °F) for the tank and distributor
- 150 °C (320 °F) for the hoses
- 160 °C (320 °F) for the guns
- Disconnected (OFF) for the hoses and guns.
- °C displayed
- Overheating value: 20°C
- Standby value: 40%
- Delay time: 10 min
- Timetable programs: ON









The general process for adjusting the temperatures of each components is described below.

1. Select the component whose value you wish to modify using the left-right arrow. The tank and the distributor have the same set point value.

   The corresponding LED will blink rapidly.

2. Select the desired set point temperature value with the up-down arrow. Below 40°C the set point value displays '*OFF*' canceling the heating of that element.

3. After ten seconds, the LED will stop blinking and the display will show the tank's set point temperature value by default, saving the modified data.

This simple procedure should be repeated for each of the components whose set point temperature value you wish to modify.

Programming the applicator parameters

1. Simultaneously press the buttons with the clock symbol and the down arrow to enter the special menu.

   The choice of temperature display units (°C or °F) will appear on the display.

2. Select the desired value using the up-down arrow.

3. Use the right arrow to move to the next display where the overheating symbol appears. ▁▁▁

4. Select the desired value (between 10 and 25) using the up-down arrow.

   The value shown corresponds to the increase in real temperature allowed over the set point temperature without activating the alarm message.

5. Use the right arrow to go to the next display where the standby function symbol appears. ‾_‾_

6. Use the up-down arrow to select the desired value (between 25 and 55).

   The value shown corresponds to the percent decrease in the real temperature compared to the set point temperature that will occur when this function is activated.

7. Use the right arrow to go to the next display where delay time value appears.

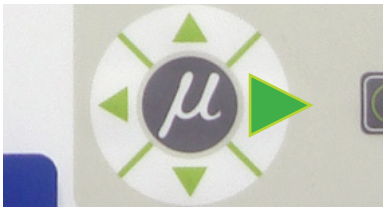
8. Use the up-down arrow to select the desired value (between 0 and 60 min).

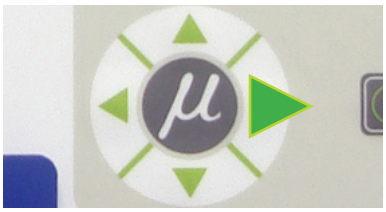
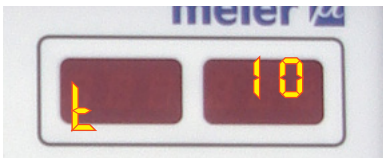
9. Use the right arrow to advance to the next screen, where the level detector activation/deactivation is found.

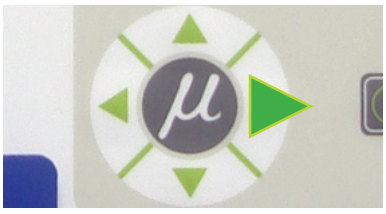
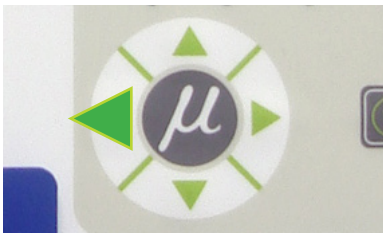
10. Use the up-down arrow to select the desired value (ON/OFF). When OFF is selected, neither the on-screen display nor the external signal activation will be operational. If ON is selected, when the level of hot-melt is low the alarm (n - - -) will be displayed on the screen and the external signal contact will be activated.

11. Use the right arrow to return to the initial parameter.

12. For any parameter, the left arrow may be used to exit the special menu and display the tank temperatures once again.




To record any parameter, you must always move to the next parameter, using the right arrow.

Setting the clock

'*macro system*' series melters/applicators are equipped with a weekly programmable system controlling equipment connection and disconnection and activating and deactivating the standby function.

Before programming these functions, it is necessary to introduce into the control unit data corresponding to the day and hour used to execute these programs.

Programming the current day and hour

1. Press the button with the clock symbol.

   A ‘0’ will appear on the display, indicating the program for current day and hour information.

2. Press the button with the clock symbol once again.

   On the left display, you will see the time with a dot, indicating that this is the value that may be modified, while the minutes appear on the second display.

3. Use the up-down arrow to select the desired value.

4. Press the button with the clock symbol once again.

   Now the dot will appear on the right display.

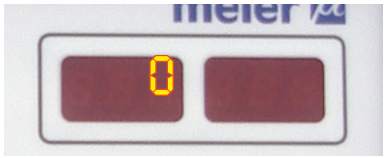
5. Use the up-down arrow to select the desired value.

6. Press the button with the clock symbol once again.

   A number appears, indicating the day of the week (1- Monday / 7- Sunday).

7. Use the up-down arrow to select the desired value.

8. Press the button with the clock symbol once again.



   The ‘0’ program appears once again.

9. Pressing either the left or the right arrow button will exit this program and return to the tank temperature display.

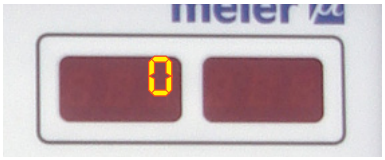
Programming equipment activation/deactivation

You may program an activation and a deactivation time for every day of the week, from Monday (1) to Sunday (7).

Time is expressed in 15 minute increments, so we cycle from 10.0 (10 hours and 0 minutes) to 10.1 (10 hours and 15 minutes) to 10.2 (10 hours and 30 minutes) to 10.3 (10 hours and 45 minutes).

1. Press the button with the clock symbol

   A ‘0’ will appear on the display, indicating the program for current day and hour information.



2. Use the up-down arrow to select the value for the desired day of the week, from Monday (1) to Sunday (7).

3. Press the button with the clock symbol once again.

   Two times will appear, one in each display. The display on the left shows the start time, while the display on the right shows the finish time.

4. The blinking dot next to the start time indicates that this is the value that may be modified. Use the up-down arrow to select the desired value.

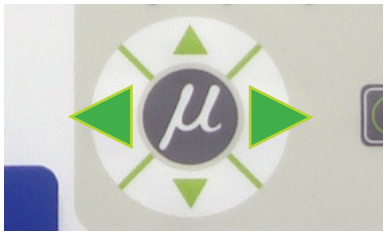
5. Press the button with the clock symbol once again.

   The dot changes to the finish time.

6. Use the up-down arrow to select the desired value.

7. Press the button with the clock symbol once again.

   The selected program will appear once again. Use the up-down arrow to select other programs.



8. Pressing either the left or the right arrow button will exit this program and return to the tank temperature display.

The green LED next to the 'ON/OFF' button will remain blinking as long as there is an equipment disconnection time programmed for the current day.

Disabling the equipment activation/deactivation program

It is possible to disable the equipment activation/deactivation programming without canceling the daily programming. This way the programmed data is saved, but the programming will have no effect on the equipment.

1. Press the button with the clock symbol.

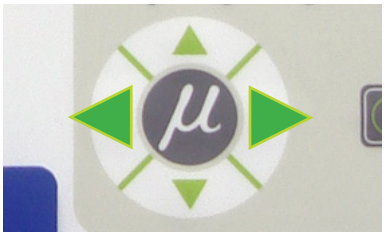
   A '0' will appear on the display, indicating the program for current day and hour information.

2. Use the up-down arrow to go past the selection for the last day of the week (7).

   The message 'ON/OFF' will appear on the display, depending on the current status.

3. Press the button with the clock symbol once again.

   The status will alternate each time you press the button.



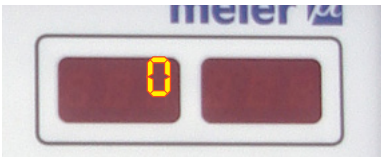
4. Pressing either the left or the right arrow button will exit this program and return to the tank temperature display.

Programming the equipment's standby function activation/ deactivation

You may program an activation and a deactivation time for every day of the week, from Monday (1) to Sunday (7). Time is expressed in 15 minute increments, so we cycle from 10.0 (10 hours and 0 minutes) to 10.1 (10 hours and 15 minutes) to 10.2 (10 hours and 30 minutes) to 10.3 (10 hours and 45 minutes).

1. Press the button with the clock symbol.

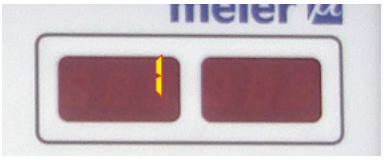
A ‘0’ will appear on the display, indicating the program for current day and hour information.



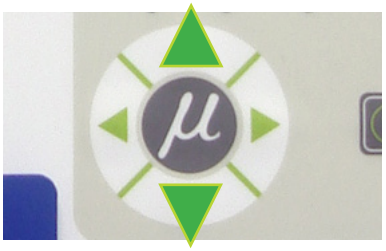
2. Press the standby function button.

A ‘1’ will appear, indicating the first day in the standby function programming.

[Since the current time and date are values common to both programs, the value ‘0’ does not appear in this menu].



3. Use the up-down arrow to select the desired value for the day of the week, Monday (1) to Sunday (7).



4. Press the button with the clock symbol once again.

Two times will appear, one in each display. The left display shows the start time, while the right display shows the finish time.

5. The blinking dot next to the start time indicates that this is the time that may be modified.

Use the up-down arrow to select the desired value.

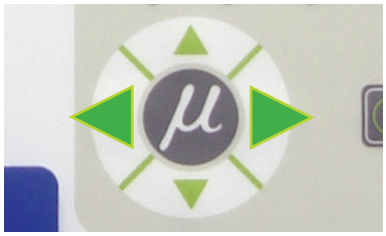
6.Press the button with the clock symbol once again.

The dot changes to the finish time.

7. Use the up-down arrow to select the desired value.

8. Press the button with the clock symbol once again.

   The selected program appears once again. You may use the up-down arrow to select other programs.



9. Pressing either the left or the right arrow button will exit this program and return to the tank temperature display.

The green LED next to the ‘standby’ button will remain blinking as long as there is an equipment standby function activation time programmed for the current day.

Disabling the equipment standby function programming

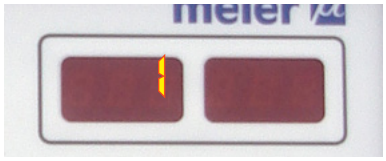
It is possible to disable the equipment standby function programming without canceling the daily programming. This way the programmed data is saved, but the programming will have no effect on the equipment.

1. Press the button with the clock symbol.

   A ‘0’ will appear on the display, indicating the program for current day and hour information.

2. Press the standby function button.

   A ‘1’ will appear, indicating the first day in the standby function programming.

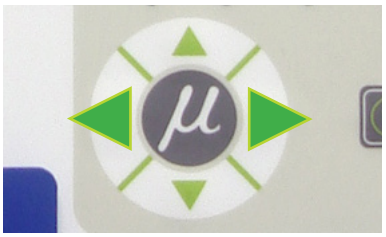


3. Use the up-down arrow to go past the selection for the last day of the week (7).

   The message ‘ON/OFF’ will appear on the display, depending on the current status.

4. Press the button with the clock symbol once again.

The status will alternate each time you press the button.



5. Pressing either the left or the right arrow button will exit this program and return to the tank temperature display.

Special function buttons

The simplicity of programming '*macro system*' series melters/applicators reduces the use of the special function buttons to only the standby function.

This manual function allows you to alternate between the operational mode and the standby mode. 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 standby function is activated, the set point temperature for all the heated components is lowered to a certain value, according to the programmed parameter (see '*Programming melter/applicator equipment parameters*'). For example, if the tank set point temperature is 160 °C and the standby temperature is programmed as 30 (30%), when you press the standby function button, the tank set point temperature will drop to 112 °C (70% of 160 °C).

The three means for activating the standby function available with 'macro' melters/applicators have the following priority protocols:

1. Manual standby function button
2. Standby function external signal
3. Standby function activation/deactivation programming

Therefore, if the function is activated by any of the three means, it may always be deactivated using the manual button. On the other hand, if it was activated using the manual button, it may not be deactivated by either of the other two means. The weekly programming may not deactivate a standby function that has been activated by either of other two means.

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.

Pump speed control

Manual mode

The manual operating mode provides total user control over start-up/stop and the pump rotational speed adjustment.

To operate in this mode, follow these steps:

1. Set the ‘ON-OFF’ switch to the ‘MANUAL’ position.

If there has been a previous speed adjustment made, this value will appear on the display and the pump will start to turn at the speed indicated. If this is not the case:

2. Turn the ‘R.P.M.’ control clockwise and the pump will begin to turn at the revolutions indicated on the display.

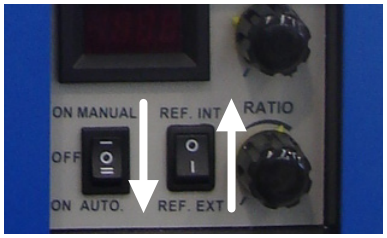
3. Set the rotational speed to the value needed for the application.

The full scale for this control is the maximum number of revolutions permitted, 100, although it is recommended to work at speeds that are neither below 10 rpm nor above 80 rpm.

This full scale may be varied using the control labeled ‘RATIO,’ which reduces this value percentage wise. Therefore, with the ‘RATIO’ control at the middle position, the maximum value that can be reached using the ‘R.P.M.’ control is only 50 rpm.

Automatic mode with an internal set point signal

This operating mode permits the user to control the pump rotational speed, but leaving the start-up/stop dependent on an external signal (a contact that is not under voltage), normally from the main machine.



To operate in this mode, follow these steps:

1. Set the ‘REF’ switch to the ‘INT’ position.

2. Set the ‘ON-OFF’ switch to the ‘AUTO’ position.

The system will wait for the start-up signal from the main machine. When this is received, if there has been a previous speed adjustment made, this value will appear on the display and the pump will start to turn at the speed indicated. If this is not the case:

3. Turn the ‘R.P.M.’ control clockwise and the pump will begin to turn at the revolutions indicated on the display.

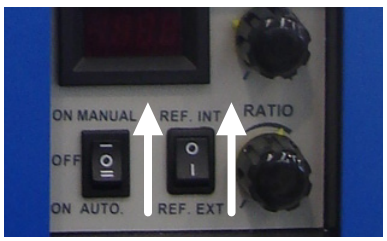
4. Set the rotational speed to the value needed for the application.

The full scale for this control is the maximum number of revolutions permitted, 100, although it is recommended to work at speeds that are neither below 10 rpm nor above 80 rpm.

This full scale may be varied using the control labeled ‘RATIO,’ which reduces this value percentage wise. Therefore, with the ‘RATIO’ control at the middle position, the maximum value that can be reached using the ‘R.P.M.’ control is only 50 rpm.

Automatic mode with an external set point signal

This operating mode allows the main machine to have total control over the pump start-up/stop (through a contact that is not under voltage) and the pump rotational speed control (by means of a 0-10V DC external signal under voltage).



To operate in this mode, follow these steps:

1. Set the ‘REF’ switch to the ‘EXT’ position.

2. Set the ‘ON-OFF’ switch to the ‘AUTO’ position.

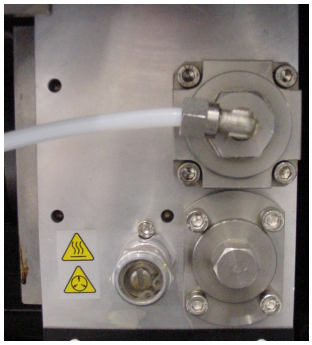
The system will wait for the start-up signal from the main machine. When this is received, if there a previous voltage signal has been received, the corresponding speed value will appear on the display and the pump will start to turn at the speed indicated. If this is not the case:

3. Start the main machine so that it sends the appropriate voltage signal.

4. Set the signal to the value needed for the application.

A 10 V DC signal for the speed set point corresponds to the maximum number of revolutions permitted, 100, although it is recommended to work at speeds that are neither below 10 rpm nor above 80 rpm.

The correspondence between the voltage and the rotational speed may be varied using the control labeled ‘RATIO,’ which reduces this value percentage wise. Therefore, with the ‘RATIO’ control at the middle position, the maximum value that can be reached at 10V DC is only 50 rpm.



By-pass valve regulation

The pumping system using a geared pump provides a constant flow of adhesive, according to the pump’s rotational speed.

In this type of system, the pressure generated by the pump is the result of the retentions found on the circuit (the length and diameter of the hose, elbows in the connectors, the diameters of the nozzle outputs, etc.) and the adhesive itself (its viscosity).

For safety reasons, this pressure must be discharged when the circuit exceeds the operating value (normally with a closed circuit and the pump activated), which makes the use of a discharge valve or a by-pass valve necessary.

This valve may be a manual adjustment valve, using a threaded screw, or upon request, with pneumatic control, using a pressure regulator and a pressure gauge. In the latter case, the adhesive circuit pressure has a 15:1 ratio to the pressure displayed on the pressure gauge.

Manual valve control

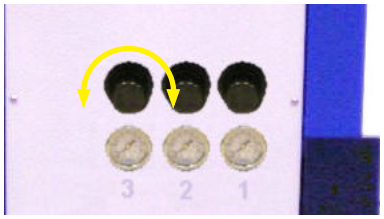
To adjust the pressure with this valve model (in an approximate manner), follow these steps:

1. Screw the spindle in clockwise, as far as possible. In this position, the maximum pressure is 90 kg/cm2.

2. Gradually loosen by turning counterclockwise until reaching the desired pressure. Each millimeter that the spindle sticks out represents a reduction of approximately 9 kg/cm2.

Pneumatic valve control

To adjust the pressure with this valve model, follow these steps:



1. Unlock the pressure regulator control by pulling on it gently.

2. Turn it clockwise to increase the pressure. This will be seen reflected on the pressure gauge located next to it.

Warning: Do not exceed 6 bar of pressure. This corresponds to 90 kg/cm2 on the hydraulic circuit.

Turning off the melting equipment

If it is necessary to disconnect the melting equipment:

1. Switch each motor control installed on the unit to the 'OFF' position.

2. Disconnect the equipment switch located at the front of the unit.

3. Reduce the by-pass valve pressure to 0, if it is pneumatically controlled.

4. Disconnect the pneumatic power supply from the guns and the electrical power supply from the control programmer, if there is one.

Using the air drying system

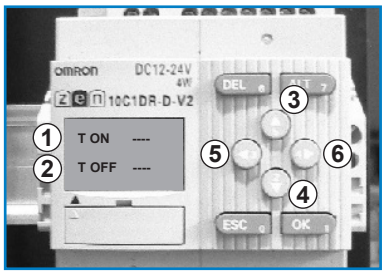
Polyurethane-based reactive adhesives, known as P.U.R. (reactive polyurethanes), require a completely dry environment before they can be applied, since when they come in contact with atmospheric humidity, they reticulate, hardening quickly.

As an option, '*macro system*' series melting equipment ensures a dry environment thanks to the addition of an air-drying system to these models, which provides a level of dehumidification above 99.98%. This guarantees that the adhesive is preserved without premature reticulations inside the applicator unit.

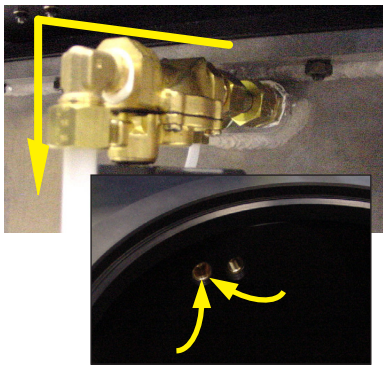
The metering unit consists of a pressure regulator, a by-pass electrovalve with its corresponding pipe to the inside of the unit tank and a timer that controls the electrovalve. The system connections may be seen in Chapter '*7. Electrical diagrams*'.

Injection cycle

The injection cycle is done by the programmable relay with two different timers: for the injection time and the pause time between two injections. Set values from factory are 10 s for injection time and 5 min for the pause time.



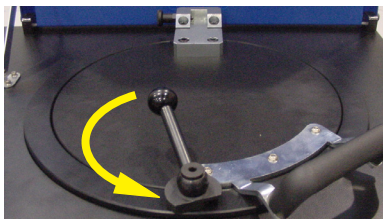
1. Shows the time in seconds for the set injection time.
2. Shows the time in seconds for the pause time.
3. Line down selection key.
4. Line up selection key.
5. Decreases the time value selected in ‘T ON’ or ‘T OFF’.
6. Increases the time value selected in ‘T ON’ or ‘T OFF’.



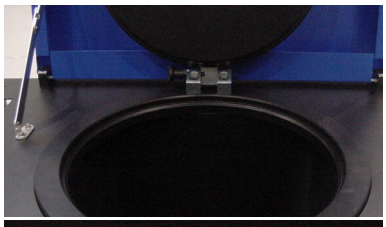
When the adhesive block has been charged and both lids are completely closed, intake and exhaust solenoid valves are opened so a flow of air is coming in and out during the time selected in ‘T ON’. After that exhaust valve is closed while intake valve remains opened for the same time (T ON). Then both valves remain closed while the timer counts set value of ‘T OFF’ and starts a new cycle time of injection. The system stops if you open the lid or switch off the power supply.3 or 4) increase or decrease the corresponding value.

Opening the airtight cover

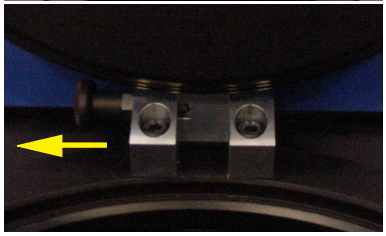
If you need to open the airtight cover, for example to refill the tank, the system acts as follows:



1. When the system detects the cover has been opened, by means of the cover detector, it automatically release the pressure of the tank to assure a safety handle of the airtight cover.

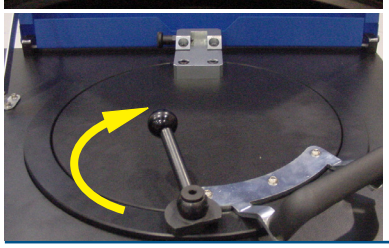


De-pressurization is done through an exhaust valve, connected directly to the outer ambient.



The airtight cover can be opened safely.

2. Turn the handle anti-clockwise sense.



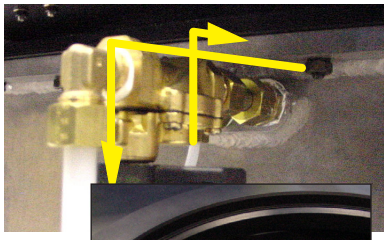
3. Lift the cover and put it on its maximum position. A blocking fastener fix it to remain opened.

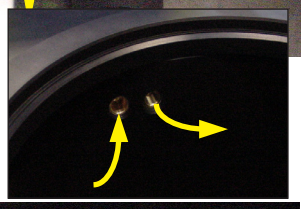
To close the airtight cover:

4. Unlock the fixing mechanism, holding the cover with the other hand.

5. Turn the handle in clockwise sense to fix it.

6. Close the upper cover.



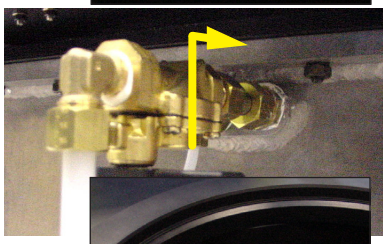


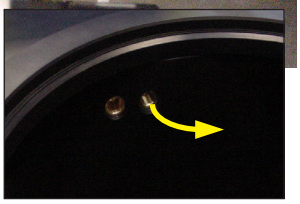
When the system detects the cover closed acts as follows:

1. With the exhaust valve opened, it is injected dry air for 0.5 min. This restores the air into the tank.

2. The exhaust valve is closed and continue the injection of air for 0.5 min. This refills the tank with dry air to the pressure regulated.

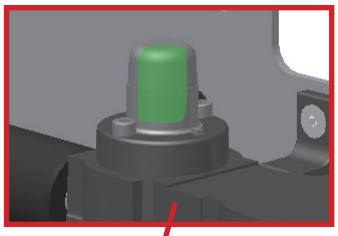
3. The injection valve is closed and starts the automatic cycle.

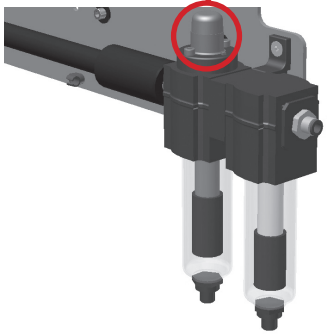




Injection pressure can be regulated by the pressure regulator placed inside the unit on the electrical cabinet panel. A pressure limit valve assures the system will work below 0.6 kg/cm^2.

To maintain the air drying system in perfect condition, we recommend periodically observing the green indicator for filter saturation control. If this indicator turns red, it is necessary to replace the filter cartridges. See the corresponding chapter for replacement parts.





5. MAINTENANCE

Warning: The melter/applicator 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/applicator equipment maintenance. Always read the corresponding section carefully.

If the equipment does not work or works incorrectly, called to your '*meler*' Representative or to the Main Office.

Operation	Frecuency	Refer to
External cleaning	Daily	*Equipment cleaning*
System depressurization	Before performing maintenance tasks and repairing the hydraulic system	*Depressurizing the system*
Emptying and cleaning the tank	- When burnt adhesive is present - With each adhesive change	*Tank cleaning*
Check for pump leaks	Depending on the hours of operation and the temperature and speed parameters (min. once per month)	*Pump maintenance*
Check the lubrication (motor and gear)	Depending on the temperature and conditions of use (max. 8000 hours)	*Motor-gear maintenance*
Air dryer filters (PUR option)	- Purge water condensation (weekly) - Clean the filter (at least twice a year)	*Air filter maintenance*

Equipment cleaning

To continue to take advantage of the melter/applicator'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.

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. Disconnect the melter/applicator equipment.
2. Disconnect the compressed air from the equipment intake.
3. Tilt the panel and pull it up by means of two handles placed below fixing screws.
4. To replace the panels, follow steps 1 through 3 in the reverse order.

System depressurization

Melting equipment belonging to the 'macro system' series include a safety valve (a by-pass valve) that limits the maximum pressure within the system, especially during continuous pumping periods with closed applicator guns.

However, even with the motor turned off, residual pressure may exist in the circuit. This must be kept in mind when performing any operation on the hydraulic circuit.

Before disconnecting any hydraulic element or opening any distributor outlet, it is necessary to perform the following steps:

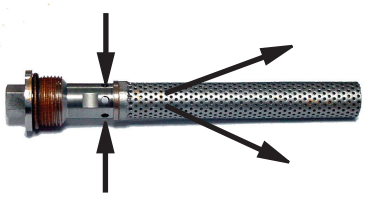
1. Disconnect the equipment switch located on the front.
2. Operate the purge valve housed in each distributor to free any residual pressure from the circuit.
3. Manually purge (or use the corresponding control command) all the guns that have been used.

Filter maintenance

Pump filter

'*macro system*' series melter/applicator equipment is equipped with a 100 mesh pump filter. The filter prevents impurities and burnt adhesive remains from being pushed out from the tank by the pump.

In case of using PUR adhesive, the equipment has not any filter.



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

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.

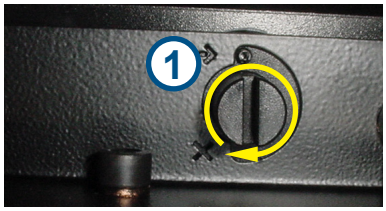
No rule exists for determining when to change the filter. Several factors influence this decision:

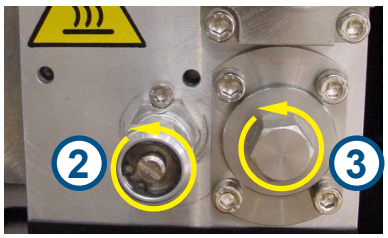
- the type and purity of the adhesives used
- the adhesive work temperatures
- adhesive consumption in relation to the time it spends in the tank
- changes in the type of adhesive used

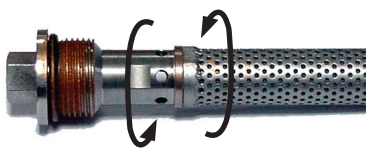
In any case, we recommend checking and cleaning the filter at least every 1000 hours of operation (melter/applicator equipment turned on).

Warning: Always use protective gloves and glasses. Risk of burns.

To change the filter:





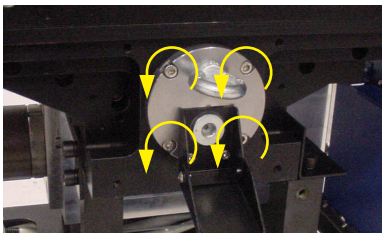


1. Close the by-pass valve from the tank to the distributor.
2. Depressurize the system using the purge valve.
3. Using a 15 mm wrench, unscrew the hexagonal filter cap and remove it.
4. Unscrew the filter cartridge in a clockwise direction.
5. Depending on the dirt inside the cartridge, clean it or dispose of it directly, abiding by any existing waste regulations.
6. Screw back the cartridge back onto the filter cap in a counterclockwise direction.
7. Replace the filter seal if damaged.
8. Place the assembly inside the distributor once more and tighten as much as possible.
9. Continue with normal operation.

Tank filter

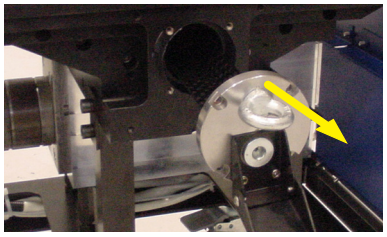
At the manifolds input there is a coarse filter inside the tank itself. This filter acts as a first step stoping dirty and parts from the outside.

This filter includes an output to empty the tank for cleaning it or changing the adhesive. Therefore to clean the filter the tank must to be empty previously.



To remove the filter:

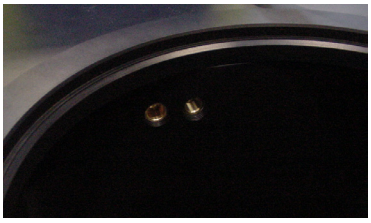
1. Remove four screws that fix the assembly.
2. Take out the filter using the holding ring at the end of the filter.
3. Clean the grid of dirty and burnt adhesive.
4. Replace the o-ring if it is damaged.
5. Put the assembly into the tank fixing it with the four screws.



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 guns).

Cleaning burnt adhesive

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.

Warning: Use appropriate protective equipment for high temperatures.

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.

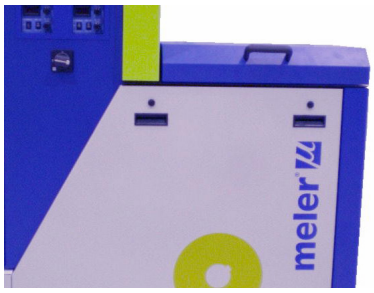
Warning: Whenever you handle the filter or any other element subject to pressure, you must always perform a system depressurization first (see the corresponding section)

Emptying the tank

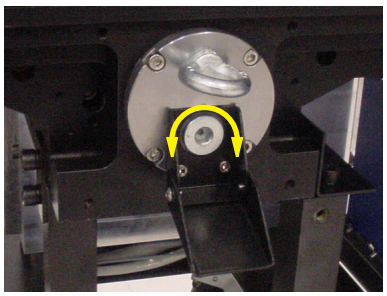
During normal maintenance activities, it is recommended, and sometimes necessary to empty the tank directly, without passing the adhesive through the pump system.

To do so, follow these instructions:

1. Maintain the tank at operating temperature.
2. Remove the side shroud cap.
3. Lower the discharge ramp located next to the tank and put an appropriate container in place.



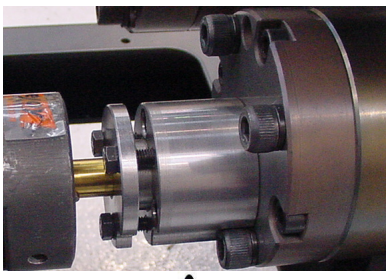
4. Unscrew the emptying plug and allow the adhesive to flow freely into the container.
5. Once completely empty, clean the any remaining adhesive from around the output hole and ramp.
6. Replace the plug.
7. Raise the discharge ramp and replace the side shroud cap.



Warning: Use appropriate protective equipment for high temperatures.

Pump maintenance

Inspecting for leaks



The pump is equipped with a gasket system on the shaft to prevent adhesive from leaking through it. On occasion, some adhesive may leak out, which makes it necessary to retighten the screws or change the gasket.

Warning: Changing the gasket with a hot pump.

Release the shaft coupling from the pump. Retighten or remove the screws that hold the gasket in place. Replace the gaskets and reassemble the parts.

Occasionally, as a result of the system's heating-cooling cycles, it may be necessary to retighten the screws.

Warning: Always wear protective gloves and goggles. Risk of burns.

Motor-gear maintenance

Cleaning the motor fan

Periodically inspect the condition of the motor fan and its vent screen.

If dust has accumulated, blow gently with air to clean it (remove the protective cover, if necessary).

Checking the lubricant

The gear reducers are delivered filled with synthetic grease for lubrication -free of outside contamination- 'for life'. Ambient temperature 0 ÷ 40 °C, with peaks of as low as -20 °C and up to +50 °C.
Use only those lubricants recommended by the manufacturer. The use of other types may cause premature wear or damage to the gear reducer.

Approximately 0.19 kg of lubricating grease fits in the gear reducer model used.

Recommended lubricants

MARCA	TIPO DE ACEITE
IP	Telesia Compound A
SHELL	Tivela Compound A
MOBIL	Glygoyle Grease 00

Air drier filter maintenance

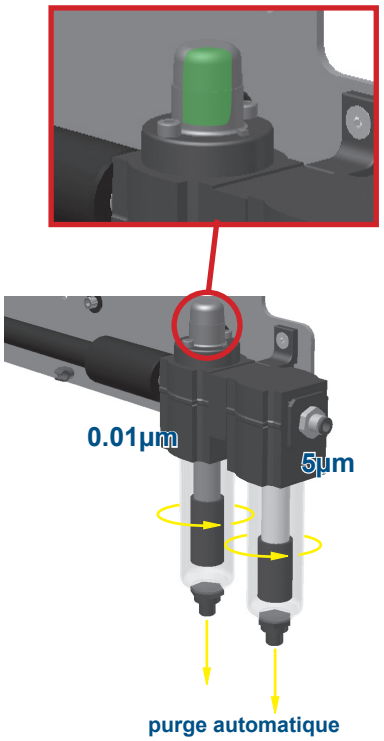
The filtering elements prior to the air drier device on the melting equipment are equipped with a filter saturation indicator, which indicates the best time to change the filter cartrtidge:

- *green color*: Low level of cartridge contamination.
- *red color:* The cartridge is contaminated. Replace immediately, otherwise equipment performance cannot be guaranteed.

We recommend installing new cartridges once a year, regardless of the indicator reading (differential pressure).

Follow these steps to change the cartridge:

- close the air valve.
- release the drainage hose from the reservoir, if connected.
- slowly turn the knurled screw clockwise. This will purge the air from the filter.
- push the reservoir towards the head of the filter.
- slowly turn the reservoir clockwise as far as possible (1/8 of a turn) and remove it, pulling down.
- remove the cartridge and replace it with a new one (do not touch the filter screen with your hands).
- mount the reservoir, following these instructions in reverse order.
- pressurize the filter, opening the by-pass valve slowly.



Warning: It is necessary to keep the power connected to the unit in order to keep the air drier system operational. The system may operate even with cold adhesive, in order to keep the internal environment moisture-free.

6. TECHNICAL CHARACTERISTICS

General

Tank capacity	50 liters	100 liters
Pumping rate		
single pump	6, 24, 48, 90 or 120 kg/h (*)	6, 24, 48, 90 or 120 kg/h (*)
double pump (per output)	3.6, 7.2, 14.4 or 28,8 kg/h (*)	3.6, 7.2, 14.4 or 28,8 kg/h (*)
Melting rate	50 kg/h (*)	100 kg/h (*)
Number of pumps	up to 4 single pumps up to 2 double pumps	up to 4 single pumps up to 2 double pumps
Number of outputs	2 or 4	2 or 4
Temperatures range	40 to 200°C (100 to 392°F)	40 to 200°C (100 to 392°F)
(optional)	40 to 230°C (100 to 450°F)	40 to 230°C (100 to 450°F)
Temperature control	RTD ±0.5°C (±1°F) Pt-100 o Ni-120	RTD ±0.5°C (±1°F) Pt-100 o Ni-120
Max. working pressure (at 6 bar in pneumatic option)	90 bar (1305 psi)	90 bar (1305 psi)
Max. power supply (at 230V)		
one single pump	10.750 W (2 outputs)	17.050 W (2 outputs)
two single pumps	14.800 W (4 outputs)	21.100 W (4 outputs)
one double pump	11.400 W (2 outputs)	17.700 W (2 outputs)
two double pumps	16.050 W (4 outputs)	22.350 W (4 outputs)
four single pumps	18.050 W (4 outputs)	24.350 W (4 outputs)
External functions	temperatures ok output low level signal (optional) standby input external outlet inhibitor motor start input motor speed control input	temperatures ok output low level signal (optional) standby input external outlet inhibitor motor start input motor speed control input
Electrical requeriments	230V 1~ 50 Hz + N + PE 400V 3~ 50 Hz + N + PE	230V 1~ 50 Hz + N + PE 400V 3~ 50 Hz + N + PE
Workplace temperature	0 to 40°C	0 to 40°C
Dimensions (LxWxH)	1080x510x1600	1080x875x1600

(*) Under standard conditions

Dimensions

macro50

macro100

Accessories

Level control system

To control the hot-melt level from the control card display screen or from the main machine, using the NO (normally open) contact, with no voltage.

Air drying system for PUR adhesives

Polyurethane-based reactive adhesives, known as P.U.R. (reactive polyurethanes), require a completely dry environment before they can be applied, since when they come in contact with atmospheric humidity, they reticulate, hardening quickly.

The ‘macro system’ melting equipment ensures a dry environment thanks to the addition of an air-drying system to these models, which provides a level of dehumidification above 99.98%. This guarantees that the adhesive is preserved without premature reticulations inside the applicator unit.

Automatic tank filling system

‘meler’ pellet loaders ensure a continuous level of adhesive inside the tanks of the melting units, eliminating the need for manual loading by the user.

Each time the tank sensor detects a low level of adhesive, it sends a signal to the suction system, which transfers a load of pellets to the melting tank from the adhesive container (or directly from the bag it comes in).

Light tower system

Three colors light tower system (red, amber and green) for alarm signals of ‘alarm’, ‘unit ready’ and ‘low level’.

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7. ELECTRICAL DRAWINGS

- macro50-Pt100 electrical drawings
- macro50-Ni120 electrical drawings
- macro100-Pt100 electrical drawings
- macro100-Ni120 electrical drawings

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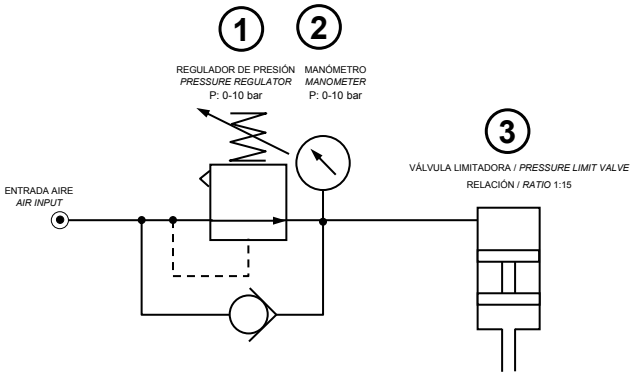
8. PNEUMATIC DIAGRAM

Components list

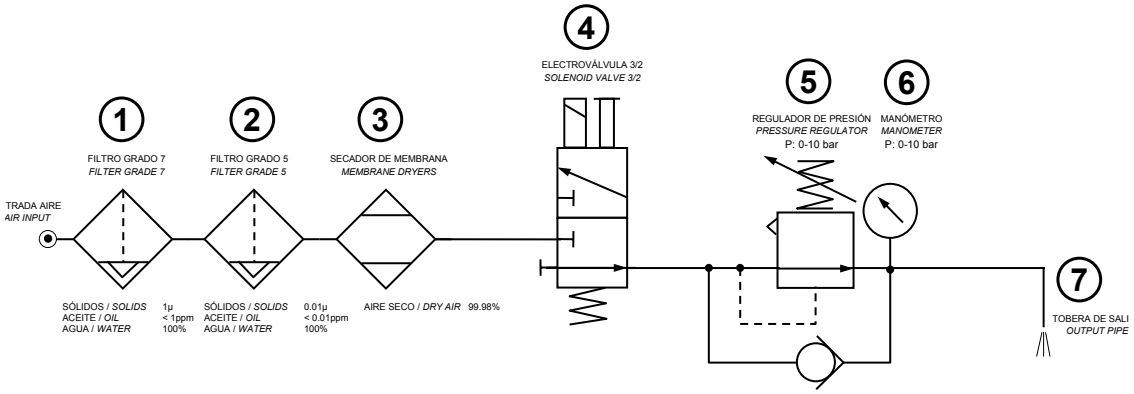
By-pass valve pneumatic control system

- 1 Pressure regulator 1-10 bar
- 2 Pressure gauge 0-10 bar
- 3 Pneumatic controlled limit valve



Air dryer system

- 1 Filter – 1st stage, grade 7
- 2 Filter – 2nd stage, grade 5
- 3 Air dryer
- 4 3/2 solenoid valve with manual control
- 5 Pressure regulator 1-10 bar
- 6 Pressure gauge 0-10 bar
- 7 Output nozzle



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9. SPARE PARTS LIST

The most common spare parts list of the *'macro'* series adhesive melters is shown in this chapter to give you a quick and sure guideline to choose them.

The spare parts are listed by groups in a natural order as they are located on the units.

As a visual help the manual includes drawings of the components with a drawing number to easy find them through the list.

The list gives you the part number and description, showing if it is necessary, if the part number belongs to a 50 or 100 liters unit.

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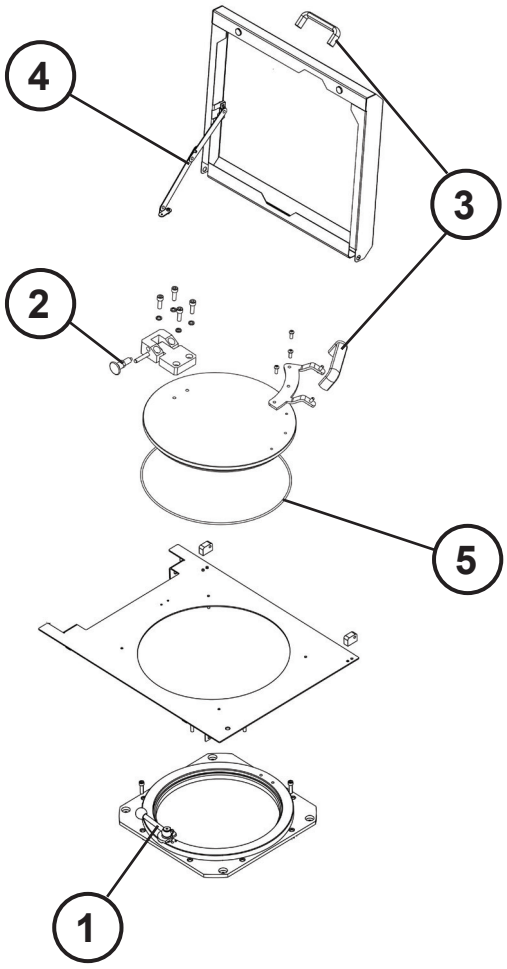
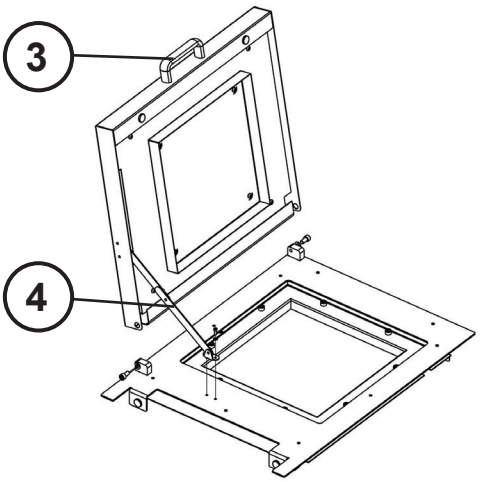
A. COVER ASSEMBLY

Nº	Ref.	Description
1	150028090	Fixing cam
2	150028100	Open cover blocking fastener
3	150028110	Fixing handle 117mm
4	150028120	Left hinge 150x150
5	150028310	macro50L PUR cover seal

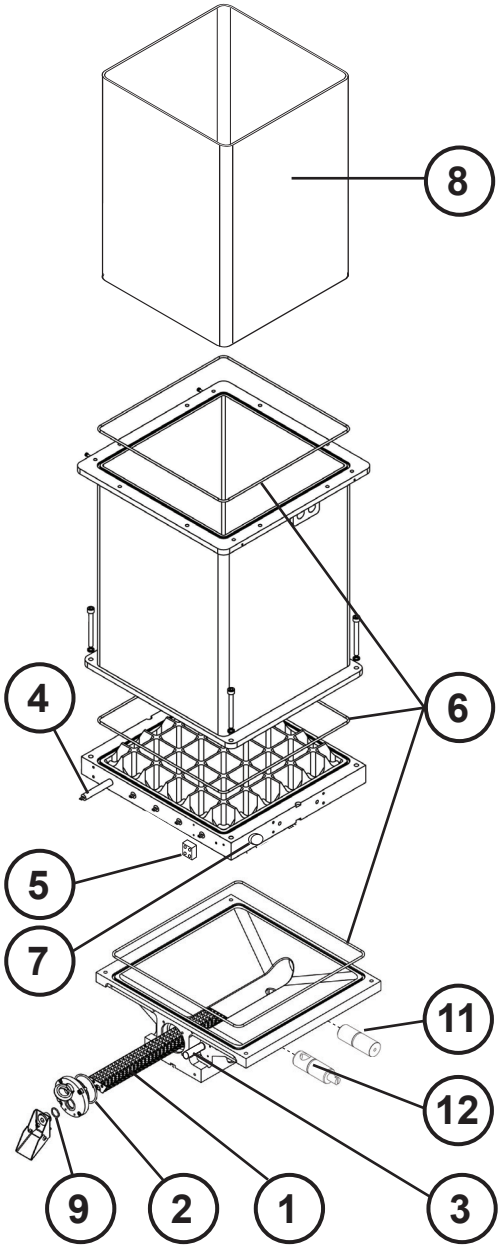
AIRTIGHT COVER



STANDARD COVER



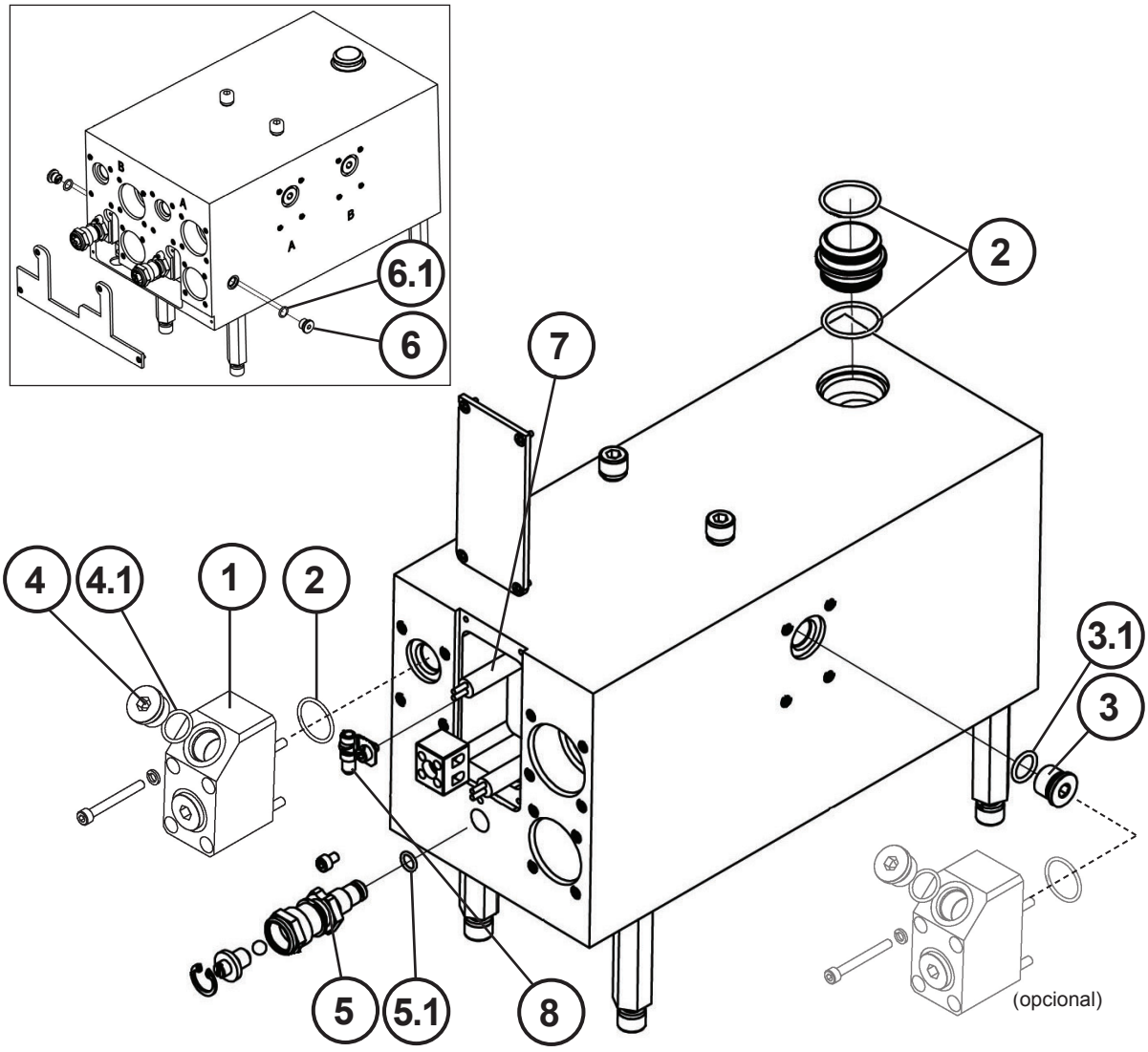
B. TANK GROUP



Nº	Ref.	Description
1	150027980	Hopper tank grid
2	150027990	O-ring 54x3
3	150028000	Heating element 12.5 X 250 300W
4	150028010	Heating element 12.5 X 350 900W
5	10030007	Ceramic terminals block
6	150028200	macro50l tank seal
6	150028210	macro100l tank seal
7	10030009	Safety thermostat 240°C
8	150028030	Tank insulation mantle macro50l
8	150028040	Tank Insulation mantle macro100l
9	150010130	O-ring Ø16X2
10	10020011	Tank RTD sensor Pt100
10	150117560	Tank RTD sensor Ni120
11	150028230	Tank isolation blind valve o-ring
12	150025460	Tank isolation valve o-ring

C. DISTRIBUTOR GROUP

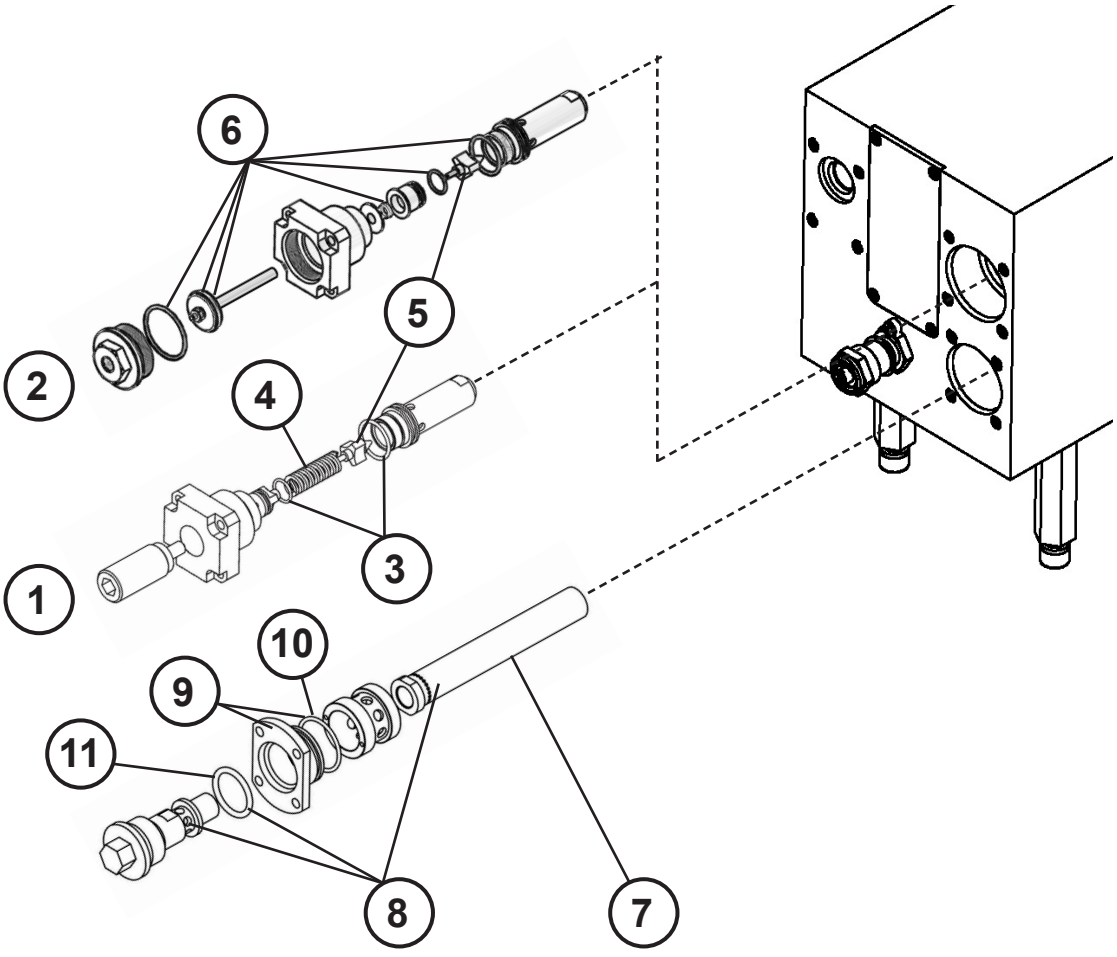
Nº	Ref.	Description
1	150027950	Complete two 3/4" hydraulic outputs block
2	150023950	O-ring 24x2
3	10100082	Pump plug with o-ring
3.1	10100083	Pump plug o-ring
4	150027960	Pump 3/4" plug with o-ring
4.1	150041920	Pump 3/4" plug o-ring
5	150026330	Complete purge valve
5.1	150026340	Purge valve o-ring
6	10120095	Plug c/w o-ring compensation valve
6.1	10120096	O-ring plug compensation valve
7	150027970	Haeting element 3/8" x 254 630W
8	10020011	Distributor RTD sensor Pt-100
8	150117560	Distributor RTD sensor Ni-120



D. FILTER AND PRESSURE VALVE GROUP

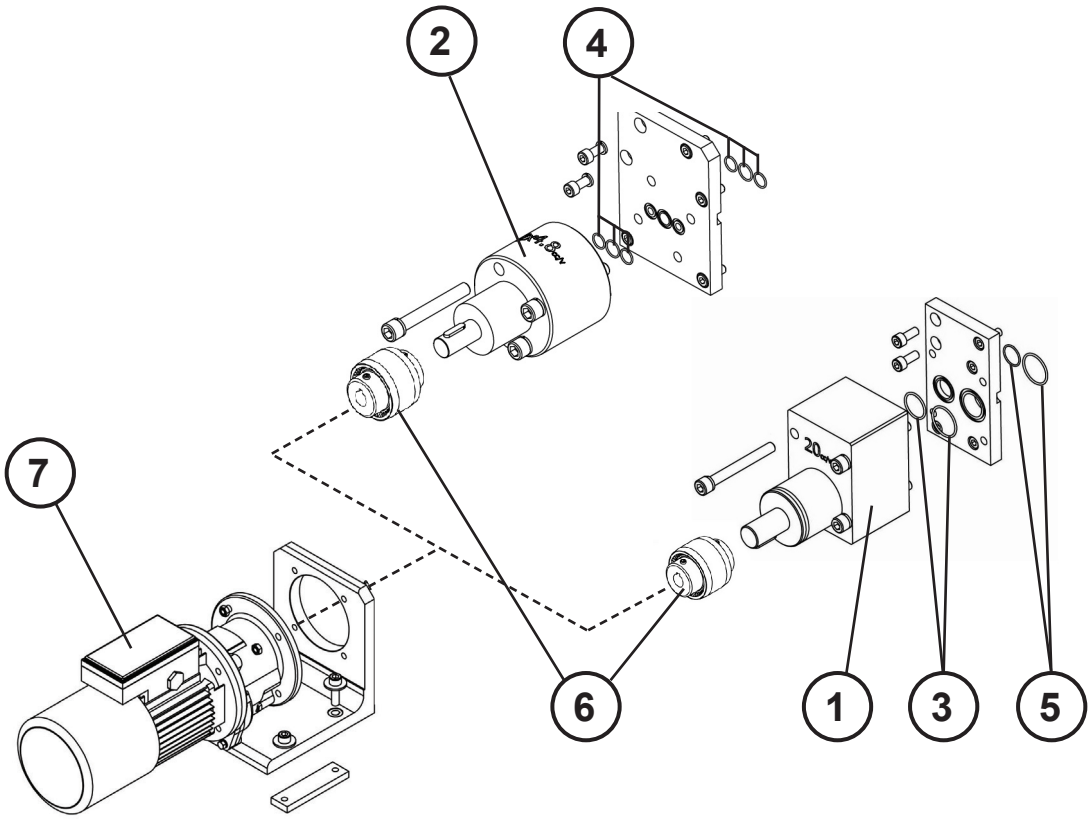
Nº	Ref.	Description
1	150026260	Mechanical pressure valve assembly
2	150026270	Pneumatic pressure valve assembly (*)
3	150026280	Mechanical pressure valve o-rings
4	150026290	Mechanical pressure valve spring
5	150026060	Pressure valve closure needle
6	150026300	Pneumatic pressure valve o-rings (*)
	10110030	'meler' pressure gauge
	10110031	Pressure regulator
7	150029250	Distributor filter cartridge
8	150029240	Distributor filter assembly
9	150025260	Distributor filter body with o-ring
10	150025270	Distributor filter body o-ring
11	150029260	Distributor filter o-ring

(*) optional



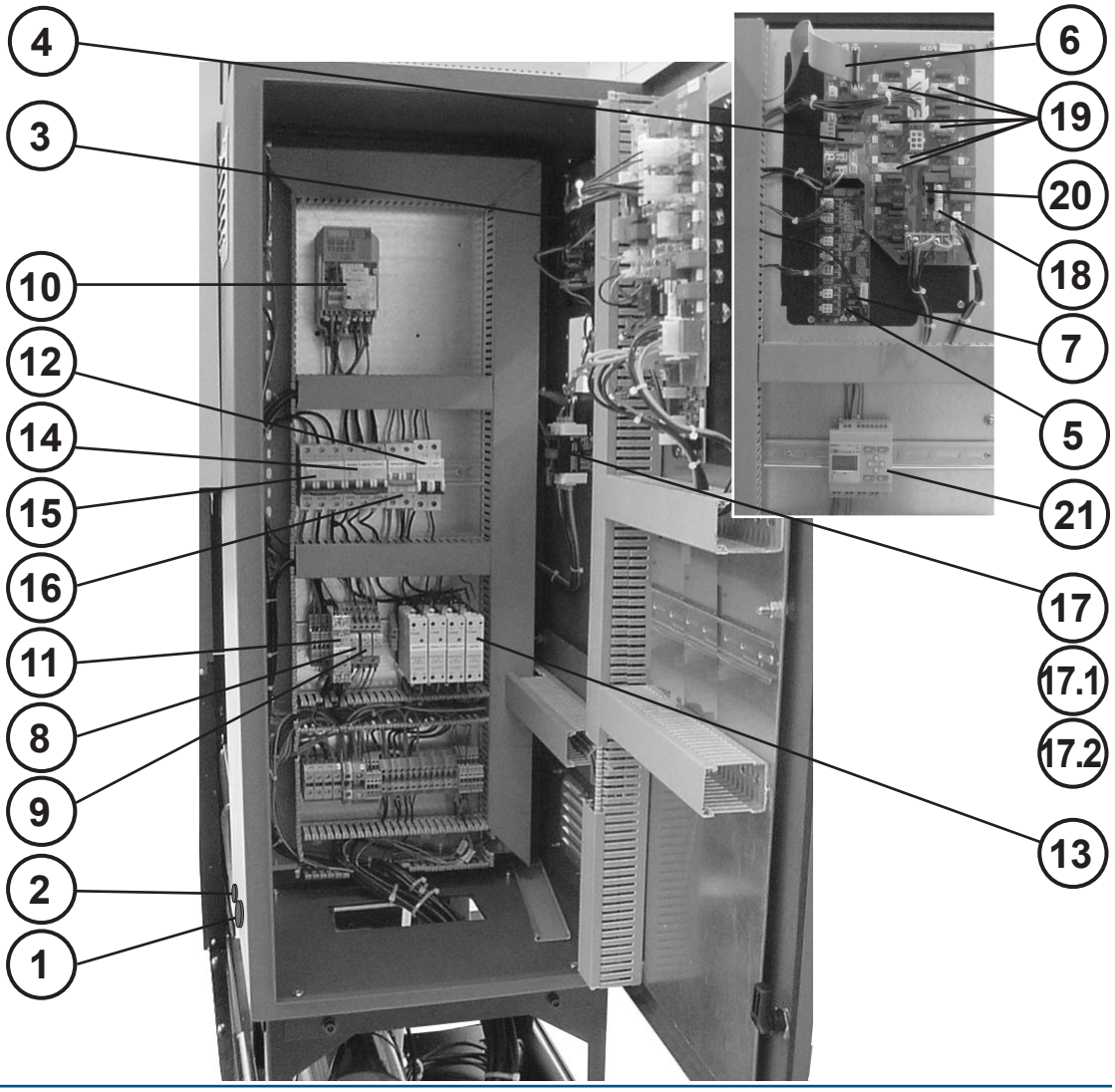
E. MOTOR-PUMP GROUP

Nº	Ref.	Description
1	150025960	Single gear pump 1 cc/rev
1	150025930	Single gear pump 4 cc/rev
1	150025970	Single gear pump 8 cc/rev
1	150026020	Single gear pump 15cc/rev
1	150026030	Single gear pump 20cc/rev
1	150110870	Single gear pump 30cc/rev
2	150025980	Double gear pump 0.6x2 cc/rev
2	150025990	Double gear pump 1.2x2 cc/rev
2	150026000	Double gear pump 2.4x2 cc/rev
2	150026010	Double gear pump 4.8x2 cc/rev
3	150026430	Single pump seat o-rings Ø79
3	150028050	Single pump seat o-rings (Plate seat 120x88)
4	150026450	Double pump-distributor plate seat o-rings (Plate seat Ø102)
5	150026440	Single pump-distributor plate seat o-rings
5	150028060	Double pump-distributor plate seat o-rings (Plate seat 120x88)
6	R0007217	Single pump motor coupling (1, 4, 8 cc/rev)
6	R0007574	Single pump motor coupling (15, 20, 30 cc/rev)
6	150011030	Double pump motor coupling (0.6x2, 1.2x2, 2.4x2, 4.8x2 cc/rev)
7	150028080	0,375kW geared motor with booster fan
7	150029700	0,55kW geared motor with booster fan
7	150111330	0,75kW geared motor with booster fan



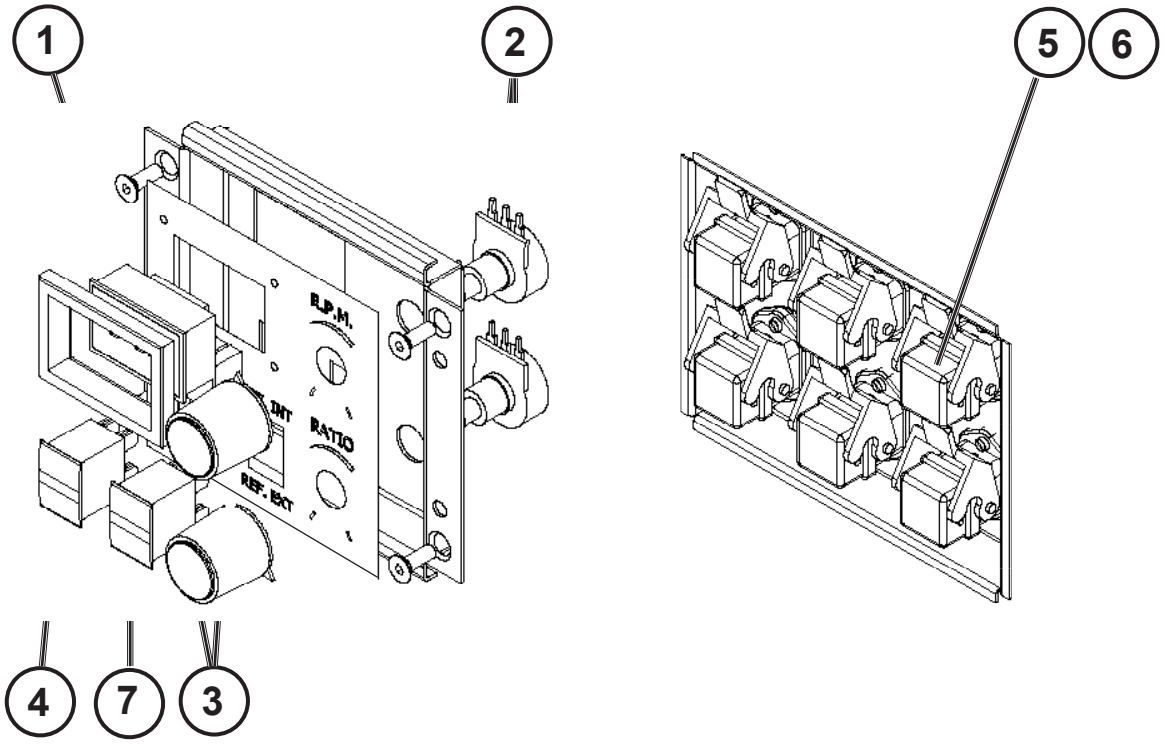
F. ELECTRICAL CABINET

Nº	Ref.	Description	Nº	Ref.	Description
1	150028140	PG 21 cable gland	14	10000440	Circuit-breaker, 16A 3-pole
2	10140040	PG 13.5 cable gland	15	150028170	Circuit-breaker, 25A 3-pole
3	150024720	Control board micron	15	150024440	Circuit-breaker, 63A 4-pole (100)
4	150024690	Power board micron 6 outlets	16	150021010	Circuit-breaker, 16A 2-pole (50)
5	150024710	Sensor board Pt100/Ni120 micron	17	150028180	3-pole main switch 25A (50)
6	150028150	Control to power board ribbon cable assembly	17.1	150028190	Main switch neutral module 25A (50)
7	150024740	Control to sensor board cable assembly	17.2	150028220	Main switch handle (50)
8	150090420	2-contact 220V AC relay	17	150024470	3-pole base block 63A (100)
9	150090430	2-contact 24V DC relay	17.1	150024460	Neutral pole 63-80A (100)
10	150090500	Motor inverter 230V AC 0,375kW	17.2	150024480	Main switch handle (100)
	150111320	Motor inverter 230V AC 1,1kW	18	150112570	Fuse 16A 10x38 ultra fast
	150090710	Motor inverter 230V AC 2,2kW	19	150112410	Fuse 6,3A 5x20 ultra fast
11	10110070	DC power supply 220V AC/24V DC 15W	20	150112560	Fuse 6.3A 6x32 ultra fast
12	150024090	Circuit-breaker, 10A 1-pole	21	150025600	Programmable relay
13	150028160	Solid state relay 30A			



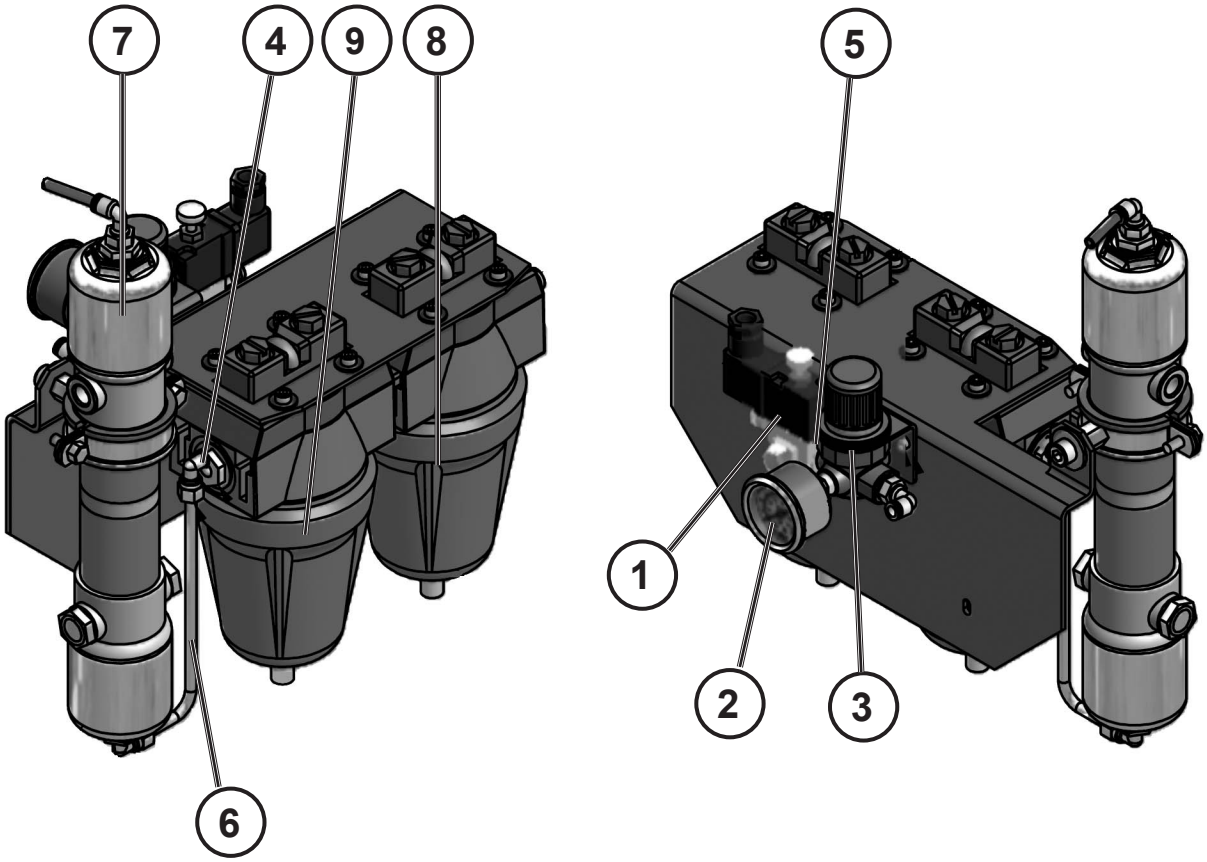
G. AUXILIARY ELECTRICAL COMPONENTS

Nº	Ref.	Description
1	150090450	Motor speed display
2	150090460	Potentiometer
3	150090470	Potentiometer handle
4	150090480	Three-position switch
5	16010003	8 pin female connector (base housing)
6	150020720	12 pin female connector (base housing)
7	150021600	Two-position switch



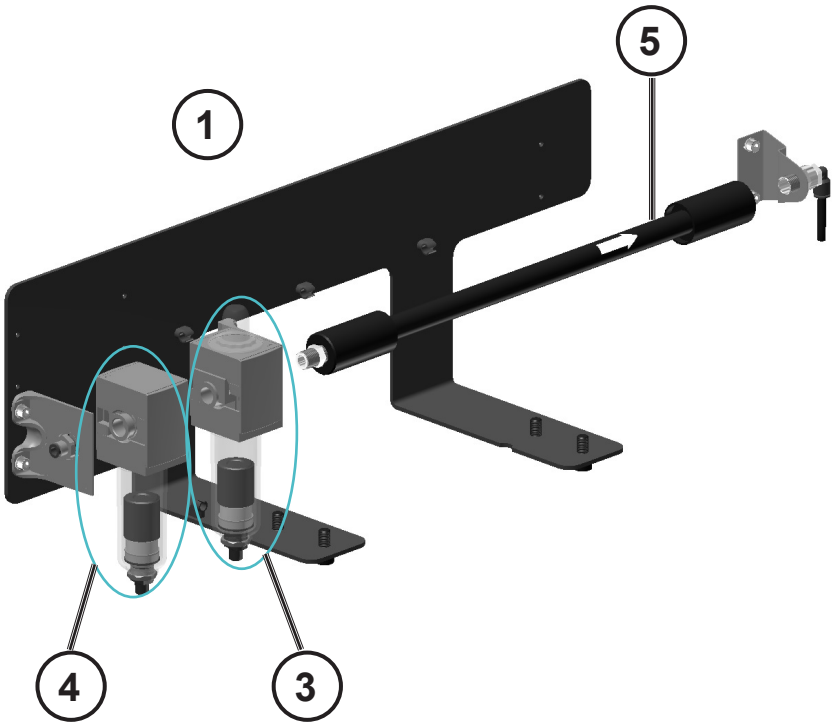
H. AIR DRYER GROUP (OPTIONAL)

Nº	Ref.	Description
1	21010010	Solenoid valve 24V DC
2	10110030	Manometer meler
3	10110031	Pressure regulator
4	10110064	Fitting 90° 1/8' Ø6
5	10110065	Male-male fitting 1/8'
6	10110066	Tube PTFE Ø4-Ø6
7	10140079	Air dryer cartridge
8	10140080	Filter cartridge 1ª stage
9	10140081	Filter cartridge 2ª stage
	10110067	Set air fitting Ø6



H. AIR DRYER GROUP (OPTIONAL)

Nº	Ref.	Description
1	150110430	Air dryer assembly with support
2	150110410	Air dryer NORGREN EXCELON PRO 92 SERIES
3	150110390	Air filter NORGREN F92C-NND-AT0
4	150110400	Air filter NORGREN F92G-NNN-AT1
5	150110060	Membrane dryer W07M



I. PRESSURE CONTROL SYSTEM FOR AIRTIGHT COVER

Nº	Ref.	Description
1	10110031	Pressure regulator
2	150028400	Solenoid valve 2/2 NA 24V DC 18W
3	150028380	Pneumatic pressure limit valve 0.5 bar 1/4’
4	150028420	Solenoid valve 3/2 1/8 24V DC 5.4W
5	150028410	Female-female non-return valve 3/8’ 0.05bar
-	150025830	Inductive detector M5 PNP