



Service Manual

Proportioning Unit

“**G PRO - 50H**”

Issue 1.2

13/07/2026

Ref. NR-00154-ENG



Before installing the unit and starting it up, carefully read all the technical and safety documentation included in this manual. Pay special attention to the information to know and understand the operation and the conditions of use of the unit. All of the information is aimed at enhancing User Safety and avoiding possible breakdowns derived from the incorrect use of the unit.



WARRANTY

HI-TECH SPRAY EQUIPMENT, S. A. (hereinafter "HI-TECH") grants this Limited Guarantee to the original buyer (hereinafter the "Client") for the unit and the original accessories given with the unit (hereinafter the "Product") against any fault in the design, materials or manufacture of the Product at the time of the first purchase by the user and for a duration of two (2) years thereafter, except in the case of hoses and TSU's, which shall have a warranty period of one (1) year. Additionally, for any other product manufactured by external suppliers, the warranty period shall be as specified by the manufacturer.

If during the guarantee period and under normal conditions of use, the Product should fail to work correctly due to defects of design, material or manufacture, the authorised distributor of the country where the HI-TECH Product or technical assistance service has been purchased shall repair or replace the Product in accordance with what is established in the following:

CONDITIONS

- a) The validity of this guarantee will be subject to the presentation of the original invoice issued by the HI-TECH authorised distributor for the sale of the Product along with the Product handed over for repair or replacement, which must show the date of purchase and the serial number. HI-TECH reserves the right to refuse to give the guarantee service when the indicated data fail to appear on the invoice or have been modified after the purchase of the Product.
- b) The repaired or replaced Product will continue to maintain the original guarantee for the time remaining until the end of the guarantee or for three (3) months from the repair date, if the remaining period of the original guarantee were shorter.
- c) This guarantee will not be applied to the faults in the Product caused by its faulty installation, the natural wear and tear of the components, any use other than that considered normal for this Product or which should fail to strictly comply with the instructions of use provided by HI-TECH; due to accident, carelessness, adjustments, alterations or modifications of the Product not authorised by HI-TECH or due to the use of accessories, heating devices, pumping equipment and/or dispensers that have not been approved or manufactured by HI-TECH.
- d) The guarantee applicable to the components and accessories forming part of the Product and which have not been made by HI-TECH will be limited to the guarantee offered by the original manufacturer thereof.

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All information provided on components which have not been manufactured by HI-TECH and which is based on reports received from the original manufacturer, though considered precise and reliable, is provided without any guarantee or responsibility of any explicit or implicit kind.

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The restrictions on the guarantee suppose no limitation on the legal rights of the consumer established in applicable national legislation, nor do they affect any rights derived from the bargain and sale agreement between the consumer and supplier.

All information provided in this manual has been included in the confidence that it is true, although it does not constitute any responsibility or implicit or explicit guarantee. HI-TECH reserves the right at any time and without prior warning to make all improvements and modifications necessary to this manual, in order to rectify any possible typographical errors, increase the information contained or insert the changes caused to the characteristics and performance of the unit.

SAFETY AND HANDLING

The equipment described in this manual has been designed and manufactured in compliance with the following European Directives, following as application guide the harmonized standards detailed and in conformity with the relevant UK Statutory Instruments (and their amendments):

2006/42/EC Machinery Directive

2014/35/EU Low Voltage Directive

2014/30/EU EMC Directive

2011/65/EU RoHS Directive with amendment 2015/863

2012/19/EU Directive on waste electrical and electronic equipment

Standards used:

EN ISO 12100:2010

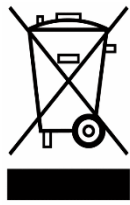
EN 60204-1:2018

EN IEC 61000-6-4:2019

EN IEC 61000-6-2:2019

EN IEC 63000:2018





Electrical products cannot be thrown out with the rubbish. They must be taken to a dedicated collection point for an environmentally sound disposal in accordance with local regulations. You must contact your local collective or retailer for information about recycling. Before leaving WEEE at appropriate collection facilities, batteries must be removed and disposed of separately for proper recycling. The packaging materials are recyclable.

Dispose of packaging materials in an environmentally sound manner and place them at the disposal of recycling sectors.

TRANSPORT AND STORAGE

Proper precautions must be taken so that the equipment can withstand the effects of transport and storage temperatures between -25°C and +55°C or up to +70°C for short periods that do not exceed 24 hours. Also, appropriate means to prevent damage from moisture, vibrations or shocks must be foreseen.

This chapter contains information on the safety, handling and use of the **G PRO-50H** series metering unit.



Before installing the unit and starting it up, carefully read all the technical and safety documentation included in this manual. Pay special attention to the information to know and understand the operation and the conditions of use of the unit. All of the information is aimed at enhancing User Safety and avoiding possible breakdowns derived from the incorrect use of the unit.

!WARNING! Establishes information to alert on a situation that might cause serious injuries if the instructions are not followed.

!PRECAUTION! Establishes information that indicates how to avoid damage to the unit or how to avoid a situation that could cause minor injuries.

NOTE: is relevant information on a procedure being carried out.

Careful study of this manual will enable the operator to know the characteristics of the unit and the operating procedures. By following the instructions and recommendations contained herein, you will reduce the potential risk of accidents in the installation, use or maintenance of the unit; you will provide a better opportunity for incident-free operation for a longer time, greater output and the possibility of detecting and resolving problems fast and simply.

Keep this Service Manual for future consultation of useful information at all times. If you lose this manual, ask for a new copy from your **HI-TECH** local distributor or directly contact **HI-TECH SPRAY EQUIPMENT**.



!WARNING! *The design of the G PRO-50H dosing units does not allow it to be used in potentially explosive atmospheres or to exceed the pressure and temperature limits described in the technical specifications of this manual.*

When working with the unit, it is recommended that the operator wear suitable clothing and elements of personal protection, including, without limitation, gloves, protective goggles, safety footwear and face masks. Use breathing equipment when working with the machine in enclosed spaces or in areas with insufficient ventilation. The introduction and follow-up of safety measures must not be limited to those described in this manual. Before starting up the machine, a comprehensive analysis must be made of the risks derived from the products to be dispensed, the type of application and the working environment



To prevent all possible bodily harm caused by incorrect handling of the raw materials and solvents used in the process, carefully read the safety information provided by your supplier.

Deal with the waste caused according to current regulations.



Disconnect the unit from the power supply before carrying out any operation inside the electrical console.

The electrical maintenance of the machine must only be performed by a qualified electrician.



To avoid damage caused by the impact of pressurized fluids, do not open any connection or perform maintenance work on components subject to pressure until the pressure has been completely eliminated.



Use suitable protection when operating, maintaining or remaining in the operating area of the unit. This includes, but is not limited to, the use of masks, protective goggles, gloves, shoes and safety clothing.

The unit includes components that reach temperatures that are liable to cause burns. The hot parts of the unit must not be handled until they have cooled.



To prevent serious harm by crushing or loss of limbs, do not work with the unit without the safety guards installed on all moving parts. Make sure that all of the safety protections are correctly reinstalled after all repair or maintenance work is completed.



CHARACTERISTICS

The **G PRO-50H** metering unit has been designed and built for the application of Polyureas, chemical systems for polyurethane foaming and some two-component epoxy systems.

Principal Heating System

Consists of two independent heaters without seals. Each heater has six 1500 W heating elements, that give the unit a total power of 9000 W, and the necessary control and safety components for precise operation of the system. Its singular configuration allows a temperature differential (ΔT) of 50°C (122° F) and application temperatures of up to 90°C (194° F) under normal conditions of ambient temperature.

Hose Heating System

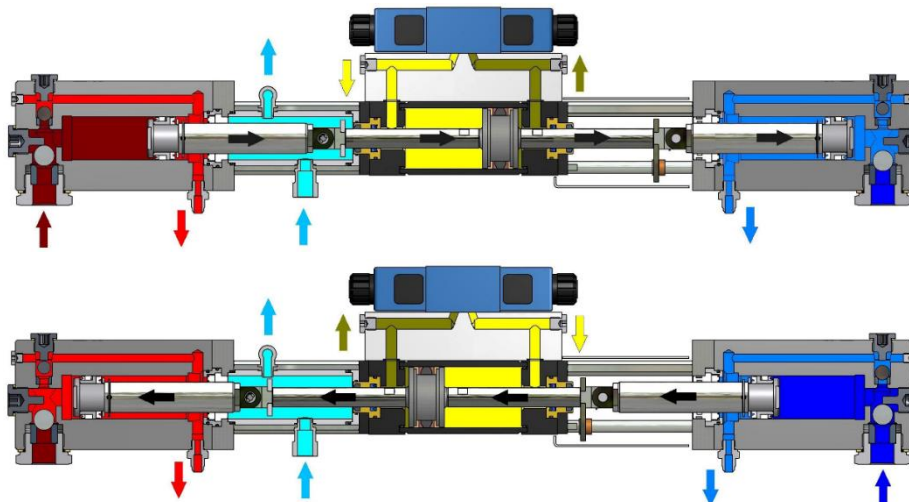
Designed with a 4000 W isolation transformer that enables effective heating up to a total hose length of 93 m (305 ft). The system includes an innovative hose heating concept in which the copper heating element is spread evenly around the circumference of the hose, providing a uniform heating watt density and precise control of the product application temperature. This hose heating element design is extremely resistant to fatigue failure.

100% circumferential coverage produces the most homogenous distribution of heat available.



Double Acting Opposed Piston Metering Pumps

A pump line driven by a double rod hydraulic cylinder. The in line pump system with opposed piston pumps provides a constant volume and guarantees uniform pressures in both directions of pump movement. Different sized pumps allow for various volumetric ratios to be achieved (1:4 to 4:1) between the chemical components used in the process.





TECHNICAL SPECIFICATIONS "G PRO-50H"

Electrical

Main voltage: _____ 400 V / 200 V

Frequency: _____ 50/60 Hz

Electrical consumption: _____ 56 A @ 3PE~400V / 100 A @ 3PE~200V

Pre Heater power: _____ (2 x 9 kW) 18 kW

Hose Transformer Power (*): _____ 4 kW

Electrical Motor Power: _____ 5,5 kW

Total Active Power: _____ 27,5 kW



Inside the console, there is a terminal strip for connecting the main power (wire not supplied) to the unit. The electrical connection of the unit must only be carried out by a qualified electrician.

Mechanical

Maximum working pressure: _____ 240 bar (24 MPa)

Max. Production ratio 1:1: _____ 22 kg/min @ 110 bar (11 MPa)

_____ 17 kg/min @ 160 bar (16 MPa)

_____ 12 kg/min @ 240 bar (24 MPa)

Minimum production: _____ 1 kg/min

Maximum hose length: _____ 93 m

Recommended compressor: _____ 3 HP III phase

Acoustic

A-weighted sound pressure level: _____ 78,4 dB (A)

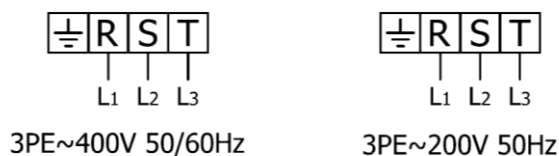
A-weighted sound power level: _____ 93,5 dB (A)

Values obtained according to UNE-EN ISO 3746:1995 standard.

Approximate weight (hydraulic tank empty): _____ 242 kg

Approximate weight (hydraulic tank full): _____ 270 kg

Dimensions: _____ H: 1295 mm / W: 745 mm / L: 650 mm



GENERAL DESCRIPTION

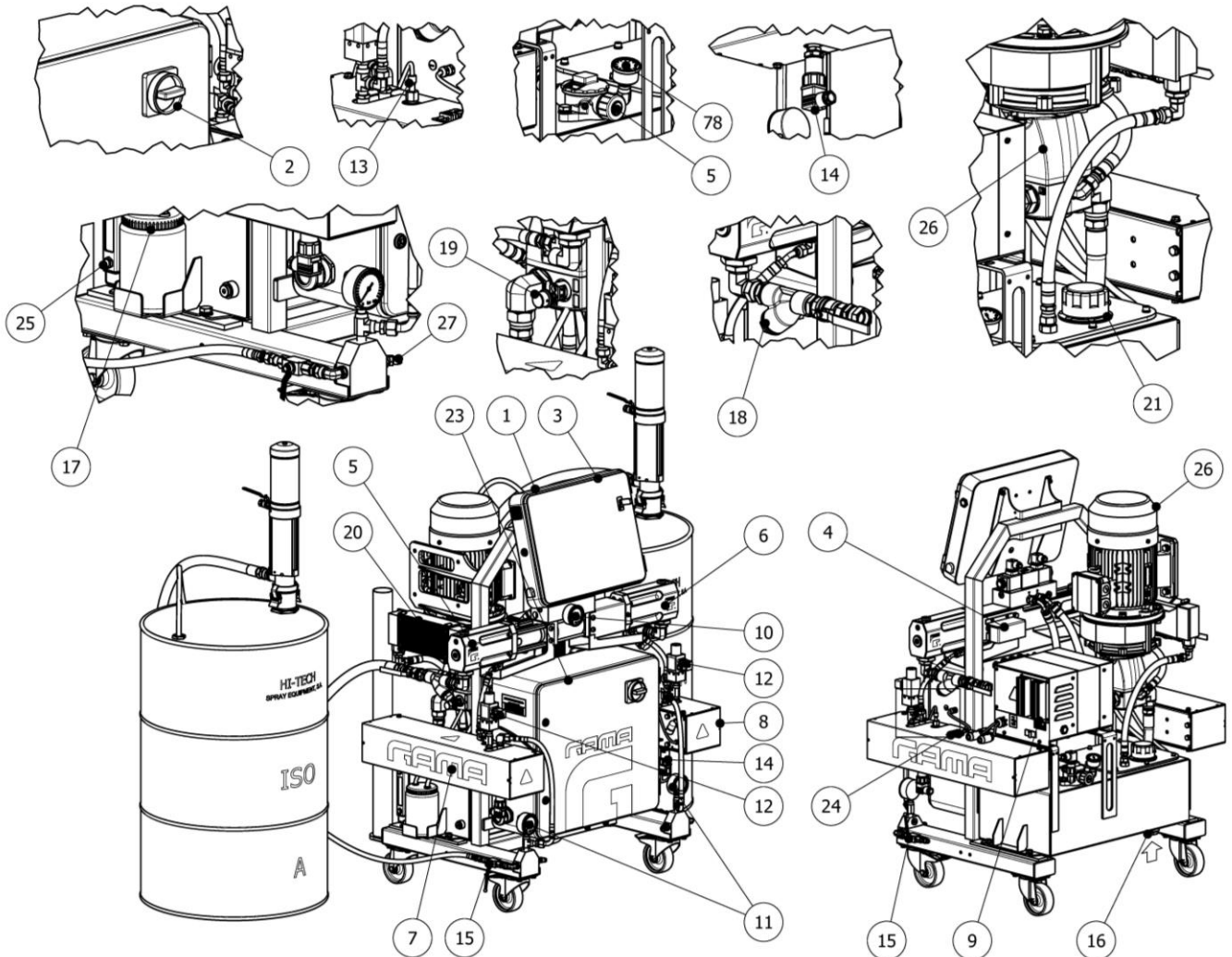


Figure 1. General Description.

1. Console Control

Ventilated module incorporating a keypad with circuitry.

2. Power Switch

Connects and disconnects the power supply to the electrical cabinet. It must be connected (**ON** position) to be able to perform any operation with the equipment. When in **ON** position, the displays will light up.

3. Board with Keypad and Circuit

Controls and regulates the operation of the unit.



4. Reverse Switch

They activate the change of direction of the product pump delivery direction.

5. Isocyanate Dosing Pump

Provides isocyanate to the system.

6. Polyol Dosing Pump

Provides Polyol to the system.

7. Isocyanate Heater

Heat the isocyanate to the pre-set temperature.

8. Polyol Heater

Heat the Polyol to the pre-set temperature.

9. Transformer Heating Hoses

It supplies the voltage required for heating the hoses.

10. Hydraulic Pressure Gauge

Indicates the pressure of the hydraulic circuit.

11. Pressure Gauge of each Product

Indicates the pressure in the product circuits.

12. Safety Pressure Switch for each Product

Deactivates the hydraulic solenoid valve in case of excess pressure in the corresponding product circuit.

13. TCS of each Product

Provides independent temperature information on each Product (Temperature Control Sensor).

14. Pressure Transducer of each Product

Read the output pressure in each product circuit.

15. Recirculation Valve for each Product

Opens or closes the independent passage of each product for recirculation from the heater outlet.

16. Oil Tank Drain Plug

By removing the plug, the oil tank can be emptied.

17. Lube Reservoir

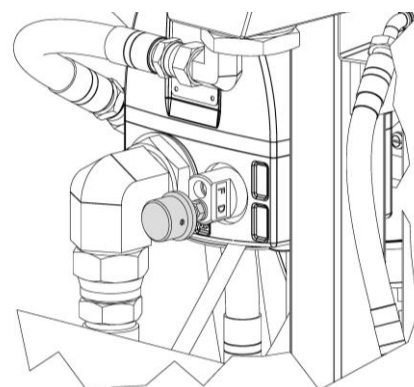
Specific lubricant tank for the closed lubrication circuit of the isocyanate pump shaft.

18. Return Filter Obstruction Indicator

Hydraulic oil circuit return filter sealing level indicator.

19. Hydraulic Pressure Regulator

Allows you to increase or decrease the pressure of the hydraulic system. To increase the pressure, turn clockwise and to decrease the pressure turn counter clockwise. To be able to regulate the pressure of the hydraulic system, the hydraulic pump must be activated.



Regulate the hydraulic system so that the output pressure of the unit never exceeds the pressure of work of the installed product hoses



20. Radiator Hydraulic oil

Hydraulic oil circuit cooling unit.

21. Filler Cap

Hydraulic oil tank filler neck.

22. Motor

Power supply unit for the hydraulic pump.

23. Electrical Cabinet

It contains all the electrical components that control and regulate the correct operation of the unit.

24. Connector TCS Hoses

Connector for the Isocyanate (and optionally Polyol) temperature measuring device at the end of the product hose.

25. Oil Sight Glass Tank

Hydraulic oil level and temperature sighting device in the tank.

26. Hydraulic Pump

Variable flow hydraulic oil pressure supply unit.

27. Product Output

Location of the threaded connections to join the product hoses.

28. Inlet Product Filters

Devices located at the inlet of each product that limit the entry of impurities according to the mesh size.

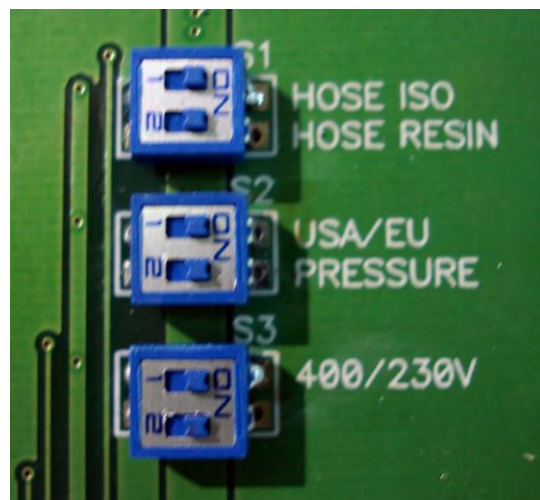
29. Hydraulic Return Filter

It filters the impurities generated in the hydraulic circuit. By means of the sight glass (18) it is possible to control its sealing level clogging condition.

30. DIP S1 Selector TPC Probes

This sets the hose heating control mode to be selected, depending on whether the system includes a single Temperature Control Sensor (TCS) for automatic temperature control or no TCS for manual temperature control.

Please be aware that after manipulating the DIP selector you should switch off the unit so the change. (in detected buy the board).





31. DIP S2 Selector Control Units

This sets the pressure and temperature units that will be shown on the control panel displays to Metric or English. Set to EU for the pressure to be shown in **bar** and the temperature to be shown in degrees Celsius. Set to USA for the pressure to be shown in **psi** and the temperature to be shown in degrees Fahrenheit. ***Please be aware that after manipulating the DIP selector you should switch off the unit so the change. (in detected buy the board).***

32. DIP S3 selector – Input Voltage selector

It allows selecting the input voltage. Moving the 1 switch to ON for 230V with neutral and to OFF for 400V without neutral. Selection is factory set and cannot be modified without HI-TECH technical service authorization. ***Please be aware that after manipulating the DIP selector you should switch off the unit so the change (in detected buy the board).***



CONTROL PANEL



Figure 2. Control Panel

The Control Panel allows the optimum working conditions to be selected and set, depending on the characteristics and requirements of the products to be dispensed. Using the MODE key, the different control parameters may be entered. The parameter display will flash for a few seconds to allow the change of this value by pressing the UP / DOWN keys. Once the change is made, press the MODE key once more for the new value to be entered into memory and to select the next parameter for setting.

The modification mode will be interrupted automatically after 3 seconds without activity on the keyboard.

The parameters that may be selected and displayed are the following:

- Hose temperature in automatic control mode (maximum 80° C / 176 F)
- Hose heating power (maximum 50 Amps)
- Isocyanate heater temperature (maximum 90°C / 194 F)
- Polyol heater temperature (maximum 90°C / 194 F)
- Total number of cycles to be made
- Number of cycles made



1. Main Power Switch

Turns the electric supply to the control panel on and off. It must be turned ON for any operation to be performed with the unit. When turned ON, the green pilot at the top of the switch will come on.

2. Hoses

The display shows the temperature of the Isocyanate hose (ISO) and the temperature of the Polyol hose (RESIN).



The hose heating control may be automatic (optional) if using a Temperature Control Sensor (TCS) or manual. The control mode must be established with the two DIP selectors on the printed circuit board (S1).

If the TCS is located in the ISO hose (the recommended placement), then set the Isocyanate DIP selector to ON and the Polyol DIP selector to OFF. In this setup, the Isocyanate temperature will show on the indicator and the Polyol indicator will be blank. If the hose heat system does not include a TCS or the sensor is inoperative, then set both DIP selectors to OFF. In this setup, both temperature indicators will be blank. In the units equipped with two hose transformer power, locate the DIP "Hose ISO" and the DIP "Hose RESIN" to ON position if the hoses have TCS for the temperature control system, or OFF position if the hoses not have TCS.

Please be aware that after manipulating the DIP selector you should switch off the unit so the change. (in detected buy the board).

ISO on / RESIN off
w/TCS



ISO off / RESIN off
manual control



Dual Hose Heat
(optional)



To select the temperature when the unit is working in automatic control mode, press the MODE key until the temperature flashes, select the required temperature by pressing the UP/DOWN keys and press the MODE key once more to enter the selected value into memory. Repeat the process to select the Amps. When the unit is in automatic mode, the value of the power must be set between 45 and 50 Amps.

Hose temperature settings that are higher than the temperature settings of the heaters cannot be programmed.



If only one temperature control system is working (ISO or POL), the limiting temperature value will be the highest set in the heaters.

If both temperature control systems are working (ISO and POL), the limiting value will be related to each of their corresponding heaters.

Temperature settings are restricted to 80°C maximum for hoses and 90°C maximum for heaters.

For the data input, the order will be as follows:

- Temperature set-point for A(ISO) heater and B or R (POL).
- Temperature set-point for A(ISO) hose and B or R (POL).
- Amps set-point for A (ISO) and B or R (POL).
- Ratio adjustment.
- Cycles pre-selection.
- Date input

If the TCS stops working, the temperature display will show the symbol (---) and the heating will be automatically turned off.

At start-up, the hose heat set point is not maintained in memory and must be reset after each activation of the CONTROL POWER key.

To select the hose power when the unit is working in manual heating control mode, press the MODE key until the amperage flashes, press the UP / DOWN keys to enter the number of amps required and press the MODE key once more to enter the value into memory.

Refer to the table shown below to select the power that is required to reach the application temperature:

30 A	38° C	100° F
35 A	48° C	118° F
40 A	60° C	140° F
45 A	75° C	167° F
50 A	80° C	176° F

Select the required amps for a quick pre-heating.



N.B.:

The circuit breaker software of the transformer has a safety system to prevent the hoses from being exposed to high temperatures during long periods of time.

If you have selected a potential over 35 amperes, after 20 minutes, the potential will automatically regulate to 35 amperes.

This potential cannot be set above 35 amperes until the heater is disconnected from the hoses and reconnected.

The settings programmed by the machine operator will be stored for the next time the heating is switched on.

3. Heaters

The display shows the temperature in the Isocyanate heater (ISO) and the temperature in the Polyol heater (RESIN). To enter new temperature values, press the MODE key until the respective temperature flashes; select the required temperature by pressing the UP/DOWN keys and press the MODE key to enter the value into memory.

The pushbuttons turn on or off the heater of each product. Each pushbutton has a led that lights steady when the heater is on; if the led flashes, it indicates that the heater is at the preset temperature.

If the temperature control probe stops working, the temperature display will show the symbol (---) and the heater will automatically be turned off.

AT start-up, the heater set point is not maintained in memory and must be reset after each activation of the CONTROL POWER key.

4. Mode Key

Allows access to change the different control parameters.

5. Up / Down Keys

Allows the value of each of the parameters to be increased or decreased.

6. Pressure

Indicator displays the Isocyanate pressure (ISO) and the Polyol (RESIN)

Using the DIP S2 selector labeled USA and EU, the units of pressure and temperature can be set. Set the switch 1 of DIP S2 selector to EU (ON) for the pressure to be displayed in **bar** and the temperature in degrees Celsius; set the switch 1 of DIP S2 selector to USA (OFF) for the pressure to be displayed in **psi** and the temperature in degrees Fahrenheit. ***Please be aware that after manipulating the DIP selector you should switch off the unit so the change. (in detected buy the board).***



7. Counter

Indicator displays the cycles used and the cycles remaining from the preset. The cycle counter is incremental and may be reset by simultaneously pressing the UP / DOWN keys.



The system allows pre-selecting the required number of working cycles so that the unit will automatically stop when it reaches this number. To enter the number of cycles to reach automatic shutdown, press the MODE key until the cycle meter flashes, select the number of cycles with the UP / DOWN keys and press the MODE key to enter the value into memory.

When the unit starts, the cycles used will be deducted from the pre-selected cycles until the total number of cycles requested is completed. Once completed, the display will show zero and the unit will automatically stop.

The cycle meter display will alternate every two or three seconds to show the cycles used (totalizer) and the cycles remaining (pre-set). The cycles remaining will be shown by the

Minus sign (-XXXXX). The counter display will also show any alarm warnings resulting from faults.

8. Power Control Key

Pushbutton turns on and off the control voltage to the electrical circuit of the heaters and hoses. When the key is on, the led in its center will come on. It may be turned off at will by pressing the key once more, or automatically if an alarm is caused due to excessive temperature in the heaters (alarms 6 and 7) or due to excessive current in the heating system of the hoses (alarm 9).

9. Motor Key

Pushbutton turns on and off the hydraulic motor. When the key is active, the led in its centre will come on. This may be turned off at will by pressing the key once more, or automatically in the event of overload in the hydraulic motor (alarm 8).

10. Ratio Key

Controls that the pressure difference between the two components will not be higher than the programmed (between a 5 and a 25%), if the difference is greater than, the alarm number 10 will be activated. The system to monitor the pressure differential is activated five seconds after pressing the NORMAL key and allows the differential to be exceeded for two seconds before the alarm is set off. The ratio control parameters are factory set. When the key is active, the led in its center will come on.

11. Normal Key

Activates the normal operation of the machine. When the key is active, the led in its center will come on.

12. Retract Key

Sets the piston rod of the Isocyanate metering pump to the retract position and prevents the crystallization of Isocyanate on the piston rod. Press the RETRACT key every time the unit is stopped by the operator. When the key is active, the led in its center will come on.



13. Direction Indicator Pilot Lights

Indicates the direction of movement of the metering pumps. If excessive pressure is caused in the system, the pilot lights will be turned off and alarms 3 and 4 will be set off. The functions of the NORMAL and RETRACT keys will remain active

14. USB Port

Optional connector to insert device of massive storage for capture of data.



ALARMS

When the unit has faults caused by conditions affecting its correct operation, an audible alarm will sound and a fault number will show on the COUNTER display. The system does not allow an alarm to be reset until the fault causing the alarm has been corrected. After resetting, the MODE key must be pressed.

The procedures recommended to determine the possible causes activating the alarms are indicated in the following:

1. Maneuvering Voltage under 170 V

- Check the electrical supply connections.
- Check the transformer thermal limit switch.

2. Maneuvering Voltage over 270 V

- Check the electrical supply connections.

3. Excessive ISO Pressure (deactivates the directional valve and the heating system)

- Check the product pressure.
- Check the number 10 led of the printed circuit: it must be lit.
- Check the over pressure safety switch.

4. Excessive POL Pressure (deactivates the directional valve and the heating system)

- Check the product pressure.
- Check the number 11 led of the printed circuit: it must be lit.
- Check the over pressure safety switch.

5, 18 Excessive ISO temperature (deactivates the POWER CONTROL)

- Check the heater heating system.
- Check the connections of the safety thermostat and allow it to cool so that it makes an automatic reset.
- Check the number 12 led of the printed circuit: it must be lit.

6, 19 Excessive POL temperature (deactivates the POWER CONTROL)

- Check the heater heating system.
- Check the connections of the safety thermostat and allow it to cool so that it makes an automatic reset.
- Check the number 13 led of the printed circuit: it must be lit.

7. Fault key (it only turns on when the machine is connected to the mains)

- Check the keyboard.



8. Motor fault (the motor stops)

- Check the amperage draw on the hydraulic motor.
- Check the electrical connection of the hydraulic motor.
- Check the number 15 led of the printed circuit: it must be turned off.

9. Fault in Hose Heating System (deactivates the POWER CONTROL)

- Replace the faulty triac.

10. Fault Ratio Off Tolerance (deactivates the directional valve)

- Check the product pressures.
- Replace the pressure transducer if there is no reading.
- Press the ratio key to cancel the function.

000000 Cycle Pre-selection made (deactivates the directional valve)

- Press the MODE key to reset the counter
- Set the cycle selector to zero.



Disconnect the unit from the main power supply before working on the inside of the electrical console. The electrical maintenance of the machine must only be performed by a qualified electrician.



METHOD OF THREADED UNION OF THE HOSES

Follow the torques for threaded joints listed in **Table 1** according to thread sizes of hose fittings to ensure their proper assembly.

There is also an alternative procedure to obtain an equivalent torque without using special tools: joint both ends of the hoses to be connected, tighten a swivel nut by hand (without using spanner) until there is resistance on the nut. Fit two spanners (1) on the fixed ends of the hoses and turn the swivel nut with a third spanner (2) as many flats from wrench resistance (FFWR) as indicated in **Table 1**.

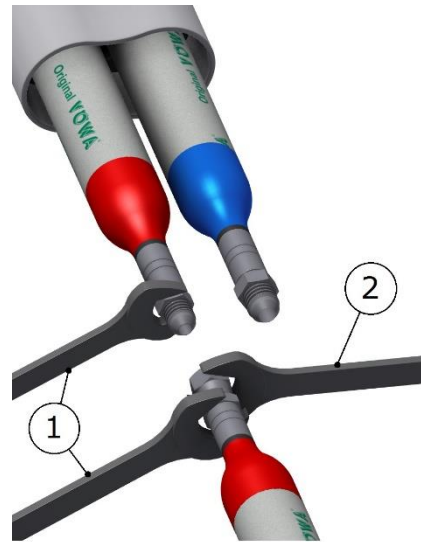
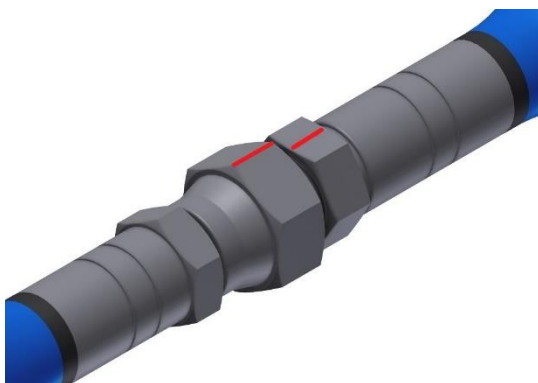


Table 1. Tightening Threaded Joints		
THREAD SIZE	TORQUE Nm	FFWR
1/2"-20	23	2 (o 120º)
9/16"-18	30	1-1/2 (o 90º)

NOTE: 1 FFWR corresponds to one complete shear of a flat marked with red between swivel and fitting or else 60º.





INSTALLATION

!CAUTION! Use appropriate protection and follow the recommendations contained in the safety information provided by the product suppliers when installing or working with the Unit.

HI-TECH provides a series of tools and accessories necessary for assembling the machine. The kit is made up of the following elements:

REFERENCE	DESCRIPTION	QTY.
BI-00009	Tube of grease Lubriplate 1.75 oz./ 49 gr	1x
NR-00153	Parts Identification Manual	1x
NR-00154	Service Manual	1x
NR-00065	Monobloc Pumps Parts Manual	1x
HT-00001	Magnet holder tools	1x
HT-00003	Pin extractor	1x
EL-00051-11	ISO TCS Assy with POL hose extension (For units with TCS)	1x ①
EM-00012	Hose TCS packaging	1x ①
HT-00045	Allen key 1/8"	1x
EL-00100-06	Blue Terminal for Cable 16 mm ² L=12mm	2x ①
TN-00242	Threaded Rod 1/4"-20 UNC x 14" nylon	2x ①
OPTIONALS		
EL-00052-11	ISO – POL TCS Assy (For units with 2 Transformers)	1x ②
EM-00012	Hose TCS packaging	1x ②
EL-00100-06	Blue Terminal for Cable 16 mm ² L=12mm	4x ②
TN-00242	Threaded Rod 1/4"-20 UNC x 14" nylon	4x ②
NR-00093	Recirculation kit Parts Manual	1x

① For Units with 1 transformer & TCS (standard version)

② For Units with 2 transformers & individual TCS each hose of product (optional versions).



Inside the console there is a terminal strip for connecting the principal electrical wire (not supplied) to the unit. The electrical connection of the unit must only be carried out by a qualified electrician.

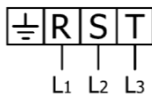
NOTE: To ensure correct operation of the Unit the electrical power supply must be able to meet the specifications given on pages 7 of this manual and on the machine nameplate.

Follow the recommended procedure, in the order given, to install the Unit:

- a) Insert the main power cable through the cable gland at the bottom of the electrical console and make the connection as shown in the diagram.

Use the proper size of cable according to the voltage, current and maximum power required by the Unit.

The sizing of the cable is calculated for a length of 25m, for longer lengths you must recalculate the appropriate section.



3PE~400V 50/60Hz

56,0 A @ 3PE~400V

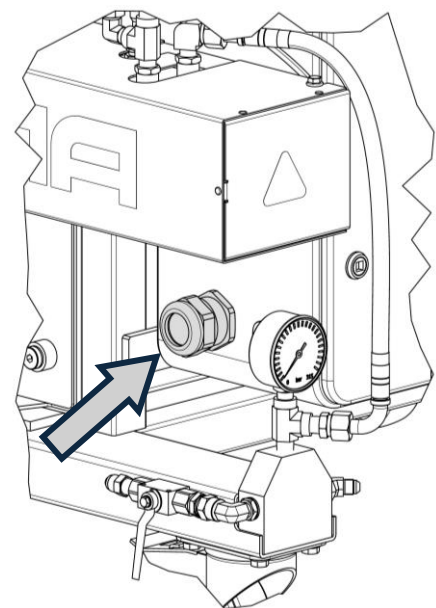
Sección Cable 10 mm²



3PE~200V 50Hz

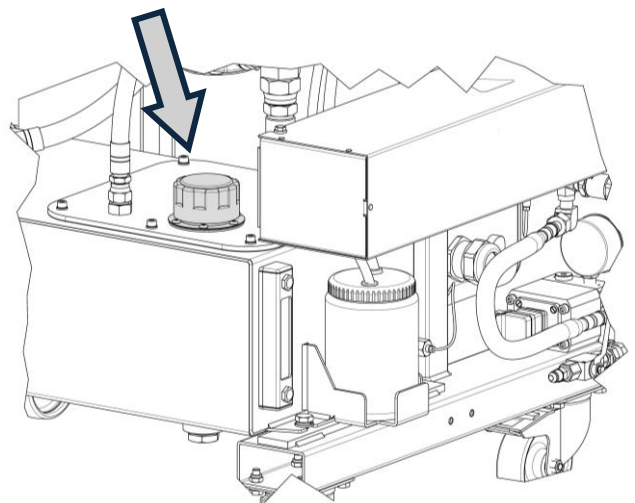
100 A @ 3PE~200V

Sección Cable 16 mm²



Make sure that the power cable is not connected to the main power supply before connecting it to the terminal located on the console.

- b) Fill 27 liters of hydraulic oil into the unit's reservoir. The oil must comply with the characteristics and specifications of DIN 51524 sections 1 and 2 (e.g. ISO VG 46).





NOTE: Do not fill the tank to its maximum capacity (34 Lts.); verify that the amount of oil introduced does not exceed 80% of the maximum capacity (27 Lts. Approx.). Use the oil thermometer sight glass as a visual reference since the maximum temperature limit (80°C) coincides with the recommended capacity.

- c) Check the level of the oil in the case of the hydraulic pump: remove the plug from the top of the pump case and check that the oil level reaches to the top of the case. Add oil if necessary and refit the plug
- d) Fill the lubrication reservoir of the Isocyanate pump with DOTP. It is not necessary to pre-prime the system.
- e) Connect the product hoses to the respective heater outlets (Isocyanate hose to the Isocyanate heater and Polyol hose to the Polyol heater).

NOTE: The hoses of the products have been differentiated with red color (Isocyanate) and blue color (Polyol), allowing a quick identification of them. To avoid connection errors, the coupling fittings of the Isocyanate and Polyol hoses are of different sizes, which makes it impossible to interchange connections.

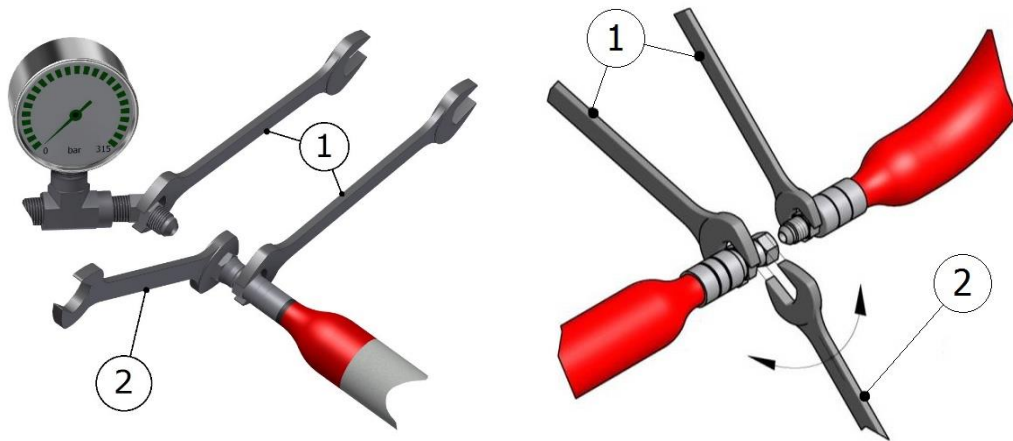


Figure 3. Method of threaded Union for Hoses

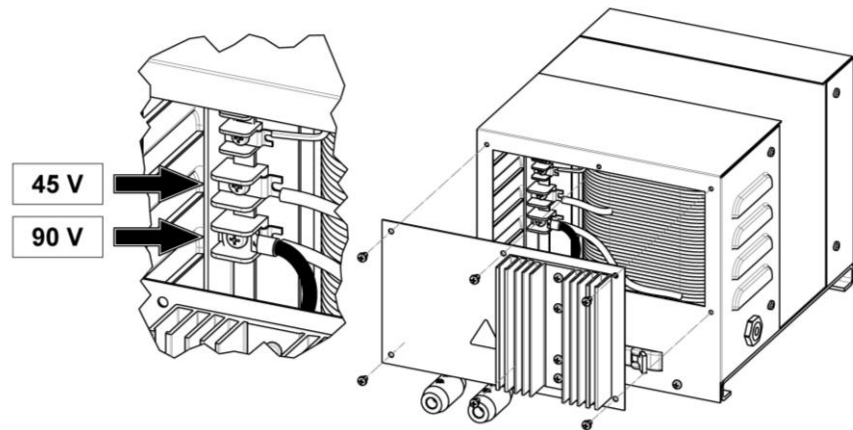
!WARNING! To join the hoses to each other, to the heaters or to the gun, use two wrenches to hold the parts to be joined (1) and with a third wrench tighten or loosen (as appropriate) the union nut (2) as shown in the illustrations. The tightening torque for these joints should be as indicated in the procedure on pag.20.



The hoses are vacuum dried and supplied interconnected and end capped to protect against moisture absorption. Do not separate or open them until they are installed in the Unit.

The hose connection system includes special terminals (fast lock) to facilitate the electrical connection to the transformer and between the different sections installed in the unit.

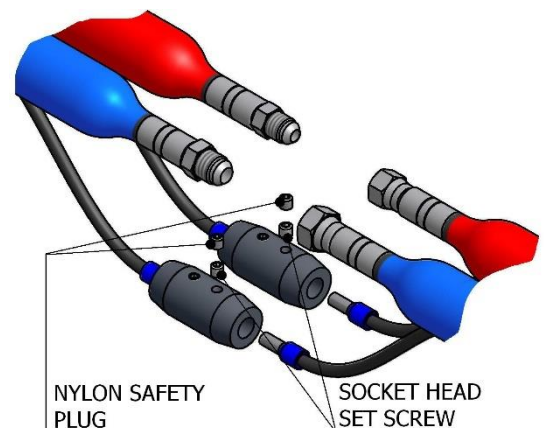
The transformer offers the option of connecting to a 45 V output voltage valid for a total hose length of up to 48 meters (158 ft), or an output voltage of 90 V, for hose lengths exceeding 48 meters (158 ft) to 93 meters (305 ft). Connect the black wire to one output voltage or other depending on the total hose length installed. Before starting up the



5 kVA			
	MIN.	MAX.	PRODUCT TYPE
45 V	18 m	< 48 m	FOAM/POLIUREA
90 V	> 48 m	< 93 m	FOAM/POLIUREA

unit, make sure that the connection made in the factory adapts to the total length of hose installed. If you add or eliminate sections of hose, make sure the output voltage of the transformer to which it is connected is suitable for the resulting total length. Otherwise, change the connection.

- f) Connect the electrical cables of the heating system of the product hoses to the fast lock connector body of the transformer output as follows:
 - a. Unscrew the Nylon Safety Plug from the "fast lock" connector body.
 - b. Unscrew partially the Socket Head Set Screw from electrical wires.
 - c. Insert the heated hose electrical wire with terminals into the "fast lock" connector body.
 - d. Tighten the Socket Head Set Screw of the terminals and place the Nylon Safety Plugs.

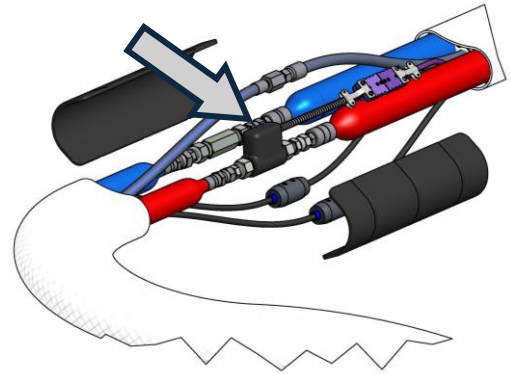


NB: A good practice is to add some dielectric grease to the ID of the connector.

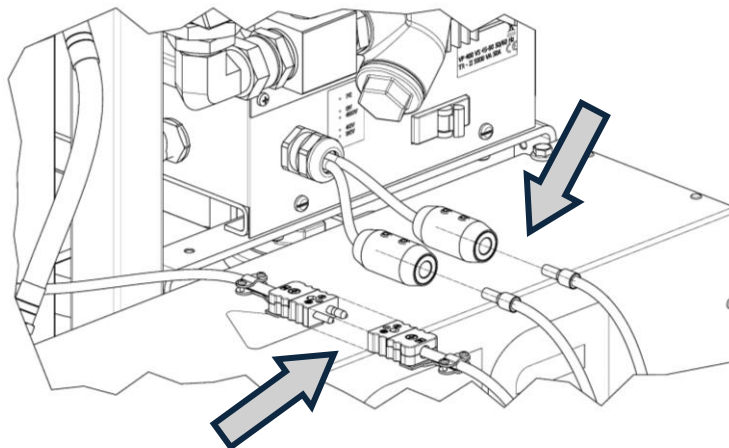
Repeat the same steps to connect the "fast lock" that you will find in the intermediate connections of the hoses.

- g) Connect the rest of the product hoses until the desired total length is reached. Remember that the hoses are identified with red color (Isocyanate) and blue color (Polyol).

NOTE: Make sure that the mechanical connection and the electrical connection of the hoses are correctly made to avoid possible product leakage and to prevent failures in the heating system.



- h) Install the TCS temperature control probe between the last section of the product hose and the end section connected to the gun. Carefully stretch the probe cable by inserting it into the isocyanate hose on the section coming from the machine.
- i) Connect the female electrical connector of the probe to the male connector of the hose. Make as many connections as you have 15 m hose lengths.
- j) To compensate for the increase in length caused by the probe in the ISO hose, place the corresponding extension in the POL hose.
- k) Make the connection between the female connector of the TCS probe cable of the first hose section and the male connector coming from the machine.



Secure the probe connection with a plastic cable tie by inserting it through the holes of both connectors.



- l) Once the connections have been completed, place the rubber protections for the joints fixing them with three plastic flanges. Subsequently cover the joints with the ends of the hose sleeves.



NOTE: Once the TCS temperature control probe is in place, special care must be taken not to hit or bend the hoses excessively. **DO NOT COIL THE HOSES SO THAT THE RADIUS IS LESS THAN ONE METER.**

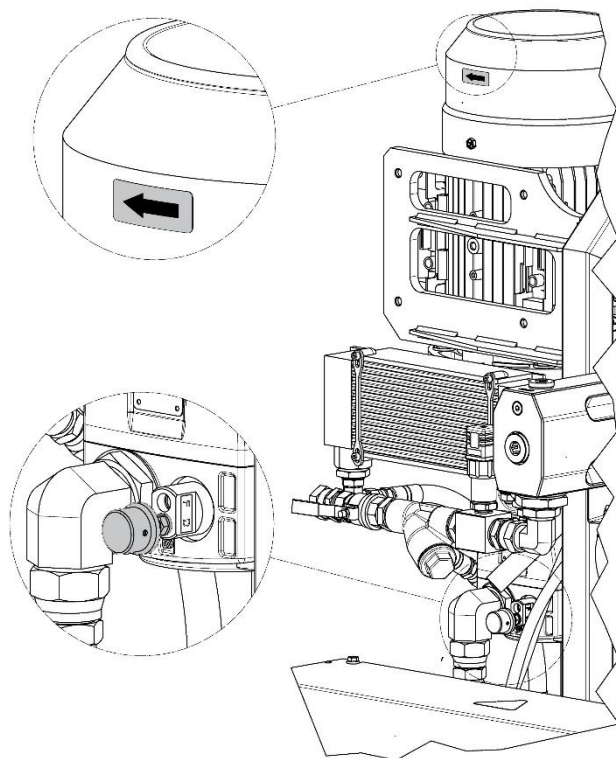
m) Connect the air hoses and gun mic connectors (if applicable).

n) Connect the hoses to the coupling block fittings of the gun making sure that the manual valves are closed.

Once the operations described above have been carried out, the direction of rotation of the motor must be observed. To check that it rotates in the correct direction perform the following steps:

- Turn the hydraulic pressure regulator counterclockwise all the way.
- Turn the main switch to ON position. The displays on the Main board will light up.
- Press the POWER CONTROL key.

Go to the side of the machine to be able to see the motor fan. Press the MOTOR key to start the motor and press it again to stop it. Check that the blades of the fan are turning clockwise, otherwise turn the general switch OFF and disconnect the machine from the source of electrical supply.





- d) Open the console of the control panel and change the position of two of the three wires of the electrical connection of the unit. Check the turning direction once more.

Proceed to install the transfer pumps paying special attention to connect each pump to **"its"** respective product, as changing the pumps would cause a reaction in the products inside them and make them useless. Identifying each pump with a tape of the same color as that of the hoses (blue for the Polyol pump and red for the Isocyanate pump) might be a good method for avoiding errors in connection.

Do the following steps to install the pumps:

- a) Make sure that the inlet valves of the products to the unit are closed.
- b) Connect one end of the Polyol hose ($\frac{3}{4}$ " thread) to the Polyol valve and the other end to the transfer pump of the same product.
- c) Connect one end of the Isocyanate hose ($\frac{1}{2}$ " thread) to the Isocyanate valve and the other end to the transfer pump of the same product.
- d) Connect the air hose to the transfer pumps.
- e) Install the unit ground connection. The movement of the product inside the hose can cause static electricity and produce electrical discharges.

Before using the unit, the residual air and oil from factory testing must be eliminated.

To purge the whole circuit, proceed as follows:

- f) Pressurize the transfer pumps and open the inlet ball valves. Make sure there are no leaks.
- g) Turn the hydraulic pressure regulator counter clockwise.
- h) Turn the general switch ON. The top pilot light will come on.
- i) Press the POWER CONTROL key.
- j) Hold the coupling block with the outlet of each product in separate vessels and open the manual valves of each product.
- k) Press the MOTOR key.
- l) Press the NORMAL key. The led will light
- m) If necessary, increase the hydraulic pressure by turning the regulator clockwise until the product pumps begin to move slowly.
- n) Allow the materials to come out of the coupling block until the residual oil and the air bubbling has disappeared completely.
- o) Close the manual valves of each product and clean the coupling block of the remains of product.
- p) Slowly increase the hydraulic pressure to check for product leaks in the hose joints. Retighten if necessary and tape the connectors to protect them from possible damage.
- q) Press the NORMAL key. The led will go out.
- r) Place the gun in the coupling block.

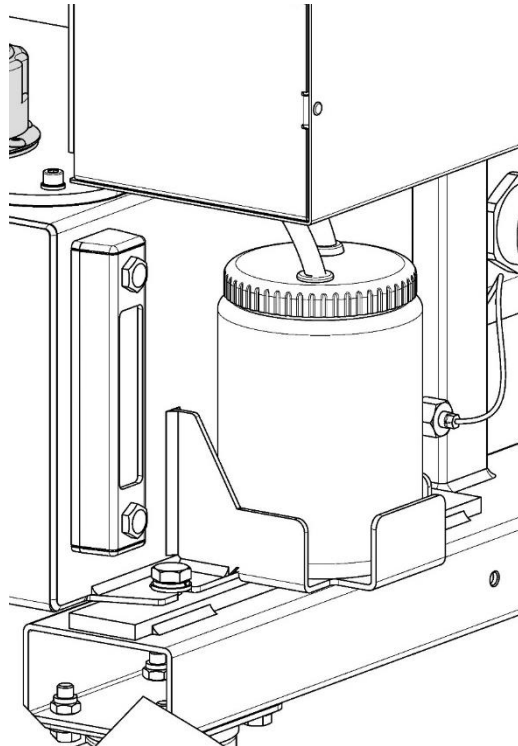


STARTUP METHOD

Follow the recommended procedure, in the order given, for starting the machine when starting work:

!CAUTION! *The start-up method described below should be initiated when all necessary pre-settings have been made correctly.*

- a) Check the condition of the DOTP plasticizing oil in the lubrication reservoir of the Isocyanate pump. Change the oil if you observe changes in color or signs of solidification.
- b) Check the hydraulic oil level (see **Installation** chapter on **pag.21**). Add oil if the level is low.
- c) Make sure that the chemicals to be processed are at the minimum temperature required to be supplied to the unit through the transfer pumps. Ask your product supplier for information on what the minimum supply temperature should be.
- d) Check the product inlet filters. Clean them if necessary.
- e) Pressurize the two transfer pumps and open the product inlet valves to the unit.
- f) Turn the main switch to the ON position. The displays on the Main board will light up.
- g) Press the POWER CONTROL key. The led will light.
- h) Press the ISO key under the HOSES display. The led will light in the center of the key. In machines fitted with two transformers, the ISO and RESIN keys must be pressed. The two leds will light.
- i) Press the ISO and RESIN keys under the HEATERS display when the products in the hoses reach the working temperature. The two leds will light.



!PRECAUTION! To avoid excess pressure in the heating hoses, wait until the product contained in the hoses reaches the required temperature before starting the hydraulic system.

- j) Press the MOTOR key. The led will light.
- k) Press the NORMAL key. The led will light. One of the direction indicator lights will come on and the dosing pumps will begin to move.
- l) Using the hydraulic pressure regulator, adjust the required pressure and check the pressure of each dosing pump on their respective gages on the machine outlet.



Regulate the hydraulic system so that the outlet pressure of the unit never exceeds the working pressure of the installed product hoses.

The pressures must be practically the same and remain constant. The directional indicator lights must remain with one on and the other out. The lit lamp indicates the direction of movement of the pumps.

If the pressure fluctuates on either stroke, consult the fault section before continuing.

- m) Connect the air supply to the gun; open the manual valves of each product; make a test projection and check the pressures on the product gages. If the projection test is correct and the pressures remain equal, proceed with the application.



SHUTDOWN PROCEDURES

Follow the recommended procedure in the indicated order for machine shut down when work is stopped for the day.

- a) Press the RETRACT key. The led will light.
- b) Use the gun to project into a waste container until the Isocyanate metering pump is in the retract position and the pressure begins to fall.

PRECAUTION! To avoid possible seal weep age and the early failure of the pump seals, the pressure must not be reduced to zero. It is recommended to keep the system with a minimum pressure of 30 bar (400 psi) to extend the life of the seals.

- c) Press the MOTOR key. The led will go out.
- d) Press the ISO and RESIN keys under the heater temperature display. The two leds will go out.
- e) Press the ISO key under the HOSES display. The led will go out. In machines fitted with two transformers, the ISO and RESIN keys must be pressed. The two leds will go out.
- f) Press the POWER CONTROL key. The led will go out.
- g) Turn the general switch OFF. The top pilot light will go out.
- h) Close the inlet ball valves.
- i) Close the supply to the transfer pumps.
- j) Disconnect the air supply to the transfer pumps
- k) Close the manual valves of the coupling block and remove the gun to perform the corresponding maintenance.



CLEANING

!PRECAUTION! The Unit includes components that reach temperatures that can cause burns. Do not handle or touch hot parts of the Unit until they have cooled down.

To avoid possible contamination, the Unit's circuits (pumps, heaters, and hoses) should be pre-cleaned whenever applications requiring component replacement are to be performed.

Follow the recommended procedure, in the order given, for cleaning when system components need to be changed:

- a) Place two drums of DOTP cleaning agent near the machine.
- b) Make sure that the manual valves of the coupling block are closed. Disassemble the gun and leave the coupling block attached to the hoses.
- c) Remove the transfer pumps from the product drums and insert them into the DOTP cleaning agent drums.
- d) Place a container under the coupling block to collect the products contained inside the machine.
- e) Open the manual valves on the coupling block and press the MOTOR and NORMAL keys to start up the metering pumps.
- f) Allow the products to come out until you see that only DOTP cleaning agent comes out free of impurities.
- g) Close the valves on the coupling block and deactivate the MOTOR and NORMAL keys.
- h) Place the transfer pumps in the drums of the new products.
- i) Place a vessel under the coupling block to collect the DOTP cleaning agent.
- j) Open the valves on the coupling block and press the MOTOR and NORMAL keys to start up the dosing pumps.
- k) Allow the DOTP cleaning agent to come out until you see that only the new products come out.
- l) When the products come out without the contamination produced by the DOTP cleaning agent, terminate the cleaning process and proceed normally.



TEMPORALY SHUTDOWN OF THE UNIT

!PRECAUTION! The Unit includes components that reach temperatures that can cause burns. Do not handle or touch hot parts of the Unit until they have cooled down.

When the machine is to be shut down for more than FOUR weeks, it is necessary to replace the products contained in the machine with DOTP plasticizing oil.

Follow the recommended procedure, in the order indicated, to replace the products with DOTP oil:

- a) Place two drums of DOTP cleaning agent close to the machine.
- b) Dismantle the gun and leave the coupling block connected to the hoses.
- c) Remove the transfer pumps of the product drums and place them in the drums of the DOTP cleaning agent.
- d) Place a vessel under the coupling block to gather up the products contained inside the machine.
- e) Open the manual valves on the coupling block and press the MOTOR and NORMAL keys to start up the dosing pumps.
- f) Allow the products to come out until you see that only DOTP cleaning agent comes out free of impurities.
- g) Deactivate the MOTOR and NORMAL keys, close the valves on the coupling block, turn the general switch OFF, disconnect the supply system of the transfer pumps and the process is finished. The metering pumps, the heaters and the hoses must be full of DOTP plasticizing oil. Never leave the machine or the hoses empty of product or DOTP plasticizing oil..

NOTE: Never use fluids that are not recommended or approved by Hi-Tech Spray Equipment, Inc. or recommended or approved fluids that are contaminated with water or ISO/POL. If you are unsure of the quality of the fluid you are using, we recommend that you check the machine 2-3 times every 2 weeks after filling it by recirculating through the heated hoses (see page 40) with new plasticizer, unless you are sure that the fluid coming out is completely pure and clean.

TROUBLESHOOTING

The **G PRO-50H** model unit has been designed and built to withstand severe operating conditions with a high degree of reliability, provided it is used and maintained properly. This chapter contains information on possible incidents that may cause problems that prevent further operation of the Unit. The information provided should be used as a guide to help you detect and resolve the vast majority of problems before seeking assistance from your authorized HI-TECH dealer or service center. In any case, please feel free to contact HI-TECH Spray Equipment, S.A. technical assistance service where a team of qualified technicians will assist and advise you whenever you need it.

Repairs carried out by unqualified personnel or the use of non-original spare parts may cause damage to the equipment and may result in hazardous situations for the operator.



To prevent possible personal injury caused by improper handling of the raw materials and solvents used in the process, please read carefully the safety information provided by your supplier.

Treat the originated waste according to current regulations.



Disconnect the Unit from the mains power supply before performing any operation inside the electrical console.

Electrical maintenance of the machine should only be performed by a qualified electrician.



To avoid damage caused by the impact of pressurized fluids, do not open any connections or perform maintenance work on pressurized components until the pressures have been completely eliminated.

Use appropriate protection when operating, maintaining or being present in the Unit's operating area. This includes, but is not limited to, the use of face mask, goggles, gloves, safety shoes and clothing.



The Unit includes components that reach temperatures that can cause burns. Do not handle or touch hot parts of the Unit until they have cooled down.

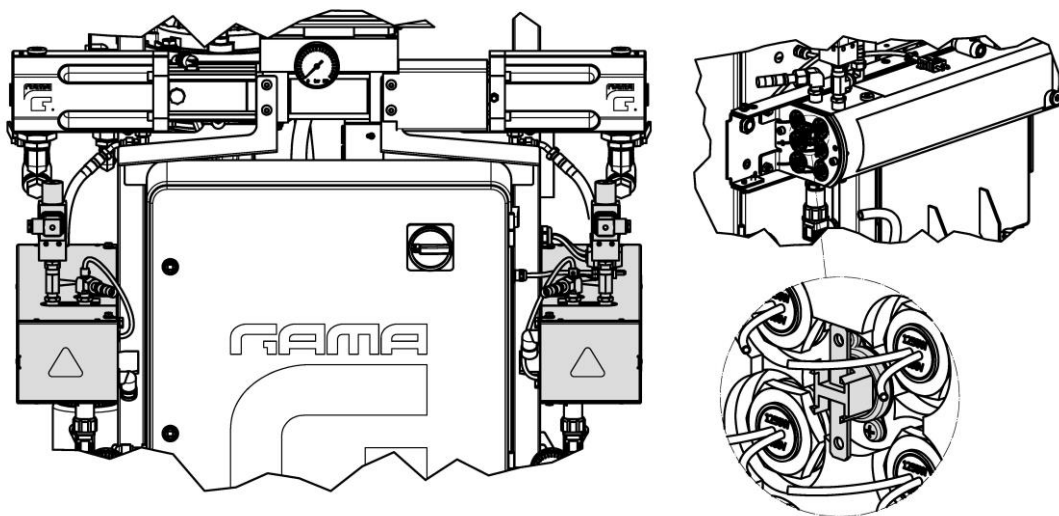


To prevent serious crushing or amputation injuries, do not operate the unit without the safety guards on the moving parts properly installed. Make sure that all safety guards are properly mounted when repair or maintenance work is completed.



Heaters

!WARNING! Before resolving any kind of defect, make sure all of the pushbuttons are off, that the general switch is in shutdown position and that the unit is disconnected from the power supply. Never handle the inside of the control panel with the unit connected to the power supply. The heaters are components that reach high temperatures; wait until they have cooled before handling.



NOTE: The thermostat is a safety component that is in contact with the heater. If the temperature registered exceeds 120° C (248° F) the thermostat will cut off the power supply by deactivating K1. The thermostat will not reset until the temperature registered in the heater is below 120° C (248° F).

If the temperature in the Isocyanate heater or the Polyol heater is over 120° C (248° F), an alarm will be activated and the corresponding number will be shown on the control panel (5 for Isocyanate and 6 for Polyol).

Follow the recommended procedure in the order indicated, to try to solve the problem and avoid costly repairs. Make sure all the automatic switches and control elements are in the correct working position before determining the existence of a fault.

PROBLEMS

The heater fails to heat, the pushbutton led is lit.

The heater display shows the symbol (---)

SOLUTIONS

1-2-3

4



SOLUTIONS

1. Static Relay

This determines that the static relay is not working when all of the previous checks have been correct

2. Heating Resistances

Each heater has six 1500 W elements connected in parallel, which give the system a total power of 9000 W. If under normal conditions of ambient temperature, it is not possible to reach the temperature required in two or three minutes, it is possible that one or several heating elements are not working.

To check the state of the resistors proceed as indicated below:

With the main switch disconnected verify with a tester that the reading of the total value of the heater resistance is the one indicated in the table according to the power, voltage and number of elements installed by each heater, a higher value would indicate that one or more resistors are defective.

Disconnect them and check that the individual value of each resistor is as indicated in the table according to the power and voltage installed.

Table 2. Elements Values List

(W)	(V)	x1 (Ω)	x2 (Ω)	x4 (Ω)	x6 (Ω)
450	230	117 $\pm$ 2	58 $\pm$ 2	29 $\pm$ 2	19 $\pm$ 2
900	230	58 $\pm$ 2	29 $\pm$ 2	14 $\pm$ 2	9 $\pm$ 2
900	400	177 $\pm$ 2	88 $\pm$ 2	44 $\pm$ 2	29 $\pm$ 2
1250	230	42 $\pm$ 2	21 $\pm$ 2	10 $\pm$ 2	7 $\pm$ 2
1250	400	128 $\pm$ 2	64 $\pm$ 2	32 $\pm$ 2	21 $\pm$ 2
1250	440	154 $\pm$ 2	77 $\pm$ 2	38 $\pm$ 2	25 $\pm$ 2
1500	230	35 $\pm$ 2	17 $\pm$ 2	8 $\pm$ 2	5 $\pm$ 2
1500	400	106 $\pm$ 2	53 $\pm$ 2	26 $\pm$ 2	17 $\pm$ 2
1500	440	129 $\pm$ 2	64 $\pm$ 2	32 $\pm$ 2	21 $\pm$ 2
1800	230	29 $\pm$ 2	14 $\pm$ 2	7 $\pm$ 2	4 $\pm$ 2
1800	400	88 $\pm$ 2	44 $\pm$ 2	22 $\pm$ 2	14 $\pm$ 2
1800	440	107 $\pm$ 2	53 $\pm$ 2	26 $\pm$ 2	17 $\pm$ 2
2000	230	26 $\pm$ 2	13 $\pm$ 2	6 $\pm$ 2	4 $\pm$ 2
2000	400	80 $\pm$ 2	40 $\pm$ 2	20 $\pm$ 2	13 $\pm$ 2
2000	440	96 $\pm$ 2	48 $\pm$ 2	24 $\pm$ 2	16 $\pm$ 2



Under extreme environmental conditions, the heater might be affected and fail to reach the required temperature. In this case, put the unit in a more favorable place, or use an auxiliary heating system.

3. Automatic Switch

This protects the elements against any possible change in voltage. With the general switch turned off, open the control panel and make sure the switch is activated (see electrical diagram), otherwise activate it.

4. Temperature

The control panel automatically detects any fault in the operation of the temperature. If the fault occurs, replace the probe, paying special attention not to damage it when assembling. The probe must be in firm physical contact with the element.



Hose Heating

!WARNING! Before troubleshooting, make sure that all pushbuttons are turned off, the main switch is in the off position and the Unit is disconnected from the power supply. Never tamper with the inside of the control panel when the Unit is connected to the mains. The hoses can reach high temperatures, wait until they have cooled down before handling them.

If a fault occurs in the heating system of the hoses, an alarm will be activated and the number 9 will be shown on the control panel.

Follow the recommended procedure in the order indicated, to try to solve the problem and avoid costly repairs. Make sure all the automatic switches and control elements are in the correct working position before determining the existence of a fault.

PROBLEMS

SOLUTIONS

The hose is hot, but fails to reach the selected temperature.	1-2-7
The hose is not hot; the pushbutton led is lit.	2-3-4-5
Only the sections of the hose closest to the unit are heated.	5
The hose display shows the symbol (---).	6
The automatic switch is triggered.	3

SOLUTIONS

1. Hose Length

The **G PRO-50H** has been designed to work with a maximum hose length of 93 meters (310 ft). A longer length will render the heating capacity less effective. Under extreme ambient conditions, the hose heating system may be affected and fail to reach the required temperature.

2. Hose Transformer

The transformer offers the option of connecting to a 45 V output voltage valid for the connection of hoses sections with a total length of up to 45 meters (160 ft), or an output voltage of 90 V, for connecting hose lengths of over 45 meters (160 ft); connect to one or the other position depending on the total hose length installed in the machine. If the connection is performed incorrectly, the hoses will not reach the required temperature.

3. Automatic Switch

This protects the secondary circuit of the transformer. The switch is located on the front of the transformer; make sure it is activated, otherwise activate it. Replace it with one of equal amperage if the switch fails to work correctly.



PRECAUTION! *The replacement of the automatic switch with another of different characteristics may cause damage to the equipment and put the operator at risk.*

4. Triac

This determines that the triac is faulty when all of the previous checks have been correct. Replace the triac if it fails to work correctly.

5. Hose Heating Components

With the general switch turned off, make sure the hose connections and the electrical connections between the hoses and the unit are correct and tight. If the connections are correct and the hoses do not heat up, check section by section to locate the connection that is at fault.

Proceed as follows:

- a) Disconnect the unit from the power supply by deactivating the general switch and start to check the hose section closest to the gun. Remove the "Fast Lock" connector, and make a "bridge" on the connection immediately before.
- b) Restore the power supply, press the POWER CONTROL key and the ISO and RESIN keys under the HOSES display. If the heating works, the problem will be in the last section of hose. Replace it. If not, do the following.
- c) Disconnect the unit from the power supply, remove the "Fast Lock" connector from the last section of hose and make a "bridge" on the connection immediately before.
- d) Restore the power supply, press the POWER CONTROL key and the ISO and RESIN keys under the HOSES display. If the heating works, the problem will be in the last but one section of hose. Replace it. If not, repeats steps c) and d) until you find the point of the fault.

6. TCS Temperature Control

The control panel automatically detects any fault in the operation of the temperature sensor. To determine if the mistake is caused by the proper probe or by a defective electrical connection, realize the following cross-check: dismantling the electrical connector of the probe TCS of the last stretch of hose and without dismantling any other connection connect it straight to the electrical capture of the exit of the machine, if the control is restored check the electrical connections of the probe existing TCS in the intermediate stretches of the hoses, in the opposite case replace the probe TCS.

7. Hose Heating Temperature Adjustment

The hose heating system maintains the temperature of the products exiting the heaters, which is why the value set for the temperature of the hoses must be the same as that selected on the heater display.

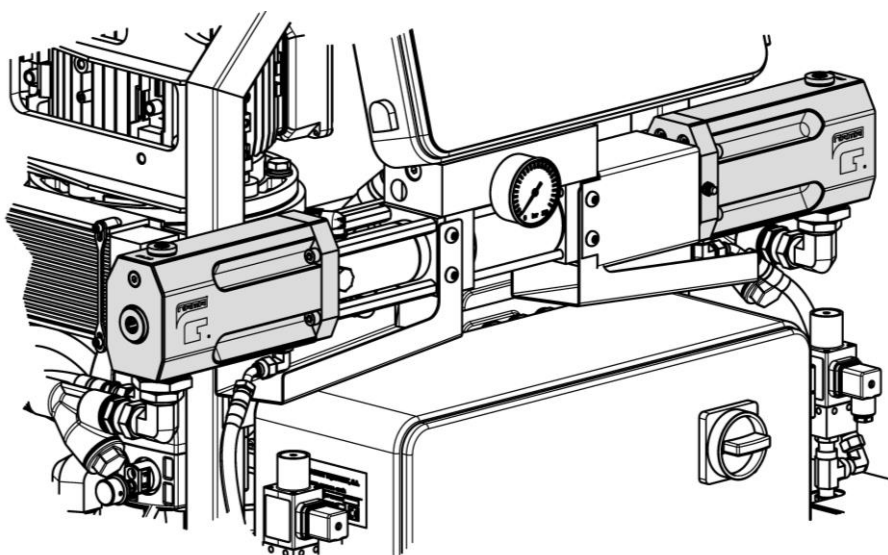
Metering Pumps

!WARNING! Before troubleshooting, make sure that all pushbuttons are turned off, the main switch is in the off position and the Unit is disconnected from the power supply. Never tamper with the inside of the control panel when the Unit is connected to the mains. The dosing pumps are pressurized components, do not open any connections or carry out any repair or maintenance work on pressurized components until all pressures have been completely eliminated.

If excessive pressure is caused in the Isocyanate circuit or the Polyol circuit, an alarm will be activated that will be shown on the control panel (3 for the Isocyanate and 4 for the Polyol).

Follow the recommended procedure in the order indicated, to try to solve the problem and avoid costly repairs. Make

sure all the automatic switches and control elements are in the correct working position before determining the existence of a fault.



PROBLEMS

SOLUTIONS

The pumps fail to maintain the pressure when the unit is shut down.	1
There are pressure differences between the metering pumps.	1-2-3
There is cavitation in the metering pump.	1-2-3
The metering pumps do not change direction.	4
The metering pumps fail to move and the direction indicator lights are out.	4-5
The movement of the metering pumps is erratic.	4



SOLUTIONS

1. Loss in the Valve Ball

Observe the pressure gages to identify which pump fails to maintain the pressure and check the direction indicator light to determine in which direction the pump fails to maintain the pressure. If the lit lamp is the left hand one and the pressure is lost in the Polyol pump, check the discharge valve ball of the Polyol pump; or check the inlet valve ball of the Isocyanate pump, if the pressure loss is caused in the Isocyanate pump. If the lit lamp is the right hand one and the pressure is lost from the Polyol pump, check the inlet valve ball of the Polyol pump; or check the discharge valve ball of the Isocyanate pump, if the pressure is lost from the Isocyanate pump.

Proceed as follows to check the valve balls:

- a) Disconnect the machine from the power supply and close both inlet ball valves and the supply system to the transfer pumps.
- b) Depressurize the metering pump and remove the corresponding valve ball.
- c) The loss from the valve ball is usually caused by foreign particles that prevent the perfect coupling of the ball with the ball seat. Clean the ball and the seat and make sure there are no faults from knocks, marks or scratches to the seat or the ball. If cleaning fails to resolve the problem or any fault is observed, replace the seat and the ball.

2. Pressure Imbalance

Pressures are decompensated when there is an obstruction in the hose or in the gun that prevents one of the components from leaving freely through the gun chamber when it is projected, or when a problem in the pumping system prevents one of the components reaching the gun in the required amount.

It is relatively easy to identify which component is problematic if we bear in mind that the chemical components used in the polyurethane foaming are of a different colour. By observing the color of the material that leaves the gun, we can determine which component is missing.

To determine whether the decompensation is caused as a result of an obstruction or as a consequence of a problem in the pumping system, project with the gun, observe the pressure indicated on the corresponding pressure gage to the missing component and compare it with the pressure indicated by the gage to the other component: if the pressure of the missing component is higher, the decompensation is the result of an obstruction, if the pressure is lower, the decompensation is the consequence of a problem in the pumping system.



3. Cavitation

Cavitation occurs when the metering pump requires a larger volume of material than that supplied by the feeding system, causing the formation of a vacuum in the inlet of the metering pump. The causes of cavitation are the following:

- a) The transfer pump fails to supply the necessary volume. The problem might be in the pump not meeting the required specifications, in the lack of air supply to the pump or that the pump is faulty. A pump is recommended with a ratio of 2:1 for transferring the Isocyanate and a supply hose with an interior diameter of at least 20 mm ($\frac{3}{4}$ in).
- b) High viscosity. The polyurethane foaming systems normally require a minimum transfer temperature of 12° C (55 F); at lower temperatures, the product increases its viscosity, making the pumping more difficult. When the ambient conditions prevent the products from being maintained at a minimum temperature of 12° C (55 F) auxiliary heating elements must be used to condition the products as the minimum temperature required for the transfer.
- c) The product inlet filter is obstructed (see Maintenance).
- d) The inlet valve ball has leaks as a result of wear or possible faults in the ball or the closing surface of the seat, which means that part of the material supplied returns to the supply tank and that the metering pump supplies a smaller volume of material in the discharge cycle, causing an incorrect ratio.

4. Fault in the Reversing Switch

The metering pump system has a plate that activates the reversing switches to carry out the change of direction. The most common cause of the fault is the deformation of the plate or the entry of a foreign body preventing the plate from making contact with the micros.

Failure to move the directional valve will cause the activation plate to overrun the micro and not perform the directional change.

- a) Determine the direction in which the plate must move; this depends on which micro has been passed.
- b) Locate the slide for the manual activation of the directional valve in the hydraulic distributor: this is located on the same side of the machine towards which the activation plate must work.
- c) Turn the general switch ON, press the POWER CONTROL key and the MOTOR key. With the manual valves of the coupling block open, point the gun at a waste container.
- d) Press the manual slide of the directional valve and hold it until the activation plate is centred between the two run end micros.



- e) If when pressing the slide, it moves freely, the excess run is due to an electrical problem. Press the MOTOR key and the NORMAL key; press the run end micros and check whether the reels are changed and the direction indicator lights: if the reels are not changed or the direction indicator lights fail to come on, there is an electrical problem in the run end micro or in the reels of the directional valve.

5. Over Pressure Safety Switch

Each metering pump is protected by a safety pressure switch factory set to limit the pressure depending on the size of the pumps installed in the unit. For **1.2** and **0.8** size pumps, the limit pressure set in the factory is 270 bar (3900 psi). When the limit pressure is reached, the pressure switch interrupts the electrical supply to the directional valve, stopping the pumps. When the pumps stop, the direction indicator lights will go out and an alarm will be activated that will be shown on the control panel (3 if the excess pressure is caused in the Isocyanate circuit or 4 if it is caused in the Polyol circuit).

When the pressure reaches lower values than the established limit, the metering pumps will restart. However, the causes of the excess pressure must be determined and corrected.



Hydraulic Unit

!WARNING! Before resolving any kind of defect, make sure all of the pushbuttons are off, that the general switch is in shutdown position and that the unit is disconnected from the power supply. Never handle the inside of the control panel with the unit connected to the power supply. The hydraulic unit is a component that works under pressure; do not open any connection or carry out maintenance work on components subject to pressure until all of the pressures have been completely eliminated.

Follow the recommended procedure in the order indicated, to try to solve the problem and avoid costly repairs. Make sure all the automatic switches and control elements are in the correct working position before determining the existence of a fault.

PROBLEMS

SOLUTIONS

The electric motor does not start or stops while it is working.	1
The hydraulic pump fails to develop pressure.	2
Little or no pressure with screeching.	2-3

SOLUTIONS

1. Automatic Switch

The electric motor is protected by an overload safety switch that triggers when the motor draws excessive current. Disconnect the machine from the power supply, allow the motor to cool, open the control panel and reset the automatic switch for the motor. It is important to determine the reason why the motor has been subject to an overload. Reset one time only or the electric motor may be damaged due to overheating.

2. Little or No Pressure

The most likely causes of low or no pressure is usually a deficient supply of the hydraulic fluid to the pump. This can be caused by incorrect priming, a lack of hydraulic fluid or dirt in the return filter. Check the indicated points to guarantee correct operation.

3. Noise

A noise similar to screeching is a symptom of cavitation. The noise is normal if it occurs when starting and lasts for approximately thirty seconds.

If the noise continues, stop the machine to protect the hydraulic pump and make sure that the connectors are tight and that the pump has been correctly primed.

Another possible cause of noises in the pump is excessive temperature in the hydraulic oil. Make sure the oil supply is correct, and, if necessary, improve the ventilation to allow better dissipation of the heat in the hydraulic tank.



MAINTENANCE

To achieve maximum output from the **G PRO-50H** unit, certain daily or regular maintenance operations are needed.



To prevent possible bodily harm caused by incorrect handling of the raw materials and solvents used in the process, carefully read the safety information provided by your supplier.



Deal with the waste created according to current regulations.

Disconnect the unit from the power supply before carrying out any operation inside the electrical console.



The electrical maintenance of the machine must only be performed by a qualified electrician.

To avoid damage caused by the impact of pressurized fluids, do not open any connection or perform maintenance work on components subject to pressure until the pressures have been completely eliminated.



Use suitable protection when operating, maintaining or remaining in the operating area of the unit. This includes, but is not limited to, the use of face masks, protective goggles, gloves, shoes and safety clothing.

The unit includes components that reach temperature that are liable to cause burns. The hot parts of the unit must not be handled until they have cooled.



To prevent serious harm by crushing or loss of limbs, do not work with the unit without the safety duly installed on all moving parts. Make sure that all of the safety protections are correctly fitted after all repair or maintenance work.



Heaters

!WARNING! Before performing any maintenance work, make sure all of the pushbuttons are off, that the general switch is in shutdown position and that the unit is disconnected from the power supply source. Never handle the inside of the control panel with the unit connected to the power supply. The heater is a component that reaches high temperatures; wait until it has cooled before handling.

1. Heating Elements

To replace a faulty element, proceed as follows:

- a) Depressurize the unit, disconnect it from the power supply and remove the cover on the heater.
- b) Disconnect the element from the terminal block and with an appropriate spanner, loosen the element and remove it from its housing. Inspect the element; it must be smooth and shiny in appearance. If it is blackened or has material adhered, replace it.
- c) Check the new element with a tester: the reading of the cold resistance value must be as shown in **Table 2** on **pag.35**.
- d) Apply Teflon or sealing paste to the thread and assemble the element into its housing.
- e) Reconnect the wires to the terminal block; make sure the connection is in parallel and fit the heater cover.
- f) Before operating the unit, replace the protective casing around the heater.

NOTE: If the element that must be replaced is the one in contact with the temperature probe, first remove the probe.

2. Temperature

The temperature probe is fixed to the connector with a ferule and a torque nut. Once inserted in its housing, the ferule forms to the probe and does not allow it to be relocated or moved. The location of the probe is very important and must be done correctly before fitting the torque nut.

- a) Depressurise Depressurize the unit and disconnect it from the power supply. Check the torque of the body of the connector inserted in the heater to prevent leaks.
- b) Assemble the heating element.
- c) Insert the torque nut and the ferule in the probe and insert this in the connector body until it comes into positive physical contact with the heating element. Make sure the spring does not prevent the probe from making contact with the resistance
- d) Fix the probe in place and tighten the torque nut.



Hydraulic Unit

!WARNING! Before performing any maintenance work, make sure all of the pushbuttons are off, that the general switch is in shutdown position and that the unit is disconnected from the power supply. Never handle the inside of the control panel with the unit connected to the power supply. The hydraulic unit is a component that works under pressure; do not open any connection or carry out maintenance work on components subject to pressure until all of the pressures have been completely eliminated.

The hydraulic unit must be serviced each year as indicated below:

- a) Depressurize the unit and disconnect it from the power supply. Clean the hydraulic tank lid to prevent foreign bodies from falling into the tank when the lid is removed.
- b) Separate the lid and the motor-pump assembly from the hydraulic tank. Inspect the bottom of the tank for sediments. If there is sediment present, the tank must be emptied completely and the bottom must be cleaned, eliminating all the sediment and filling it once more with new hydraulic fluid.
- c) Clean the suction pipe and its connections.
- d) Replace the oil filter of the return line.
- e) Check that the hydraulic pump is full of fluid and check all hydraulic connections.
- f) Mount the lid and the motor-pump assembly.
- g) Proceed with the normal operation.



Metering pumps

!WARNING! Before resolving any kind of defect, make sure all of the pushbuttons are off, that the general switch is in shutdown position and that the unit is disconnected from the power supply source. Never handle the inside of the control panel with the unit connected to the power supply. The metering pumps are components that work under pressure; do not open any connection or perform repair or maintenance work on components subject to pressure until all pressures have been completely released.

When the pump is operating properly, it is not uncommon for a small amount of resin to seep past the seals and onto the visible part of the pump shaft. Periodically inspect the shaft and clean out debris when the metering pumps are stopped and the machine is turned off.

Dismantle and clean the metering pumps annually, even if there are no apparent signs of leakage. Take advantage of this circumstance to replace all the gaskets and bushings, since if you reassemble any element that apparently is not damaged, this can cause premature wear of the rest of the components (in the Component Manual NR-00065 of Gama, the gasket kits corresponding to each model and size of pump are available). The distributor bases of the pumps should also be inspected, checking that the ball valves do not show signs of wear, knocks or marks that affect the correct operation of the pump.

Inspect the lubrication reservoir of the Isocyanate pump daily and check the condition of the plasticizing DOTP oil it contains. Replace the oil when you observe changes in color or when it shows signs of solidification. If this persists, replace the seals of the isocyanate pump using the corresponding kit.

In cases where the machine is subjected to heavy workloads or special working conditions, disassemble, clean and replace the seals of the metering pumps every six months.

Inspect rods, plungers and inside of liners for marks or scratches that may cause leakage and premature damage to seals.

Only qualified personnel are authorized to replace the seals on metering pumps, as they have the knowledge and tools required for this purpose. These tools can be purchased upon request.

NOTE: Three special tools can be used to simplify the seal assembly. Tools A and B to insert the shaft seal into the seal housing and tool C for the packing retainer flange assembly insertion through the shaft (see Table 3 in pag.48).

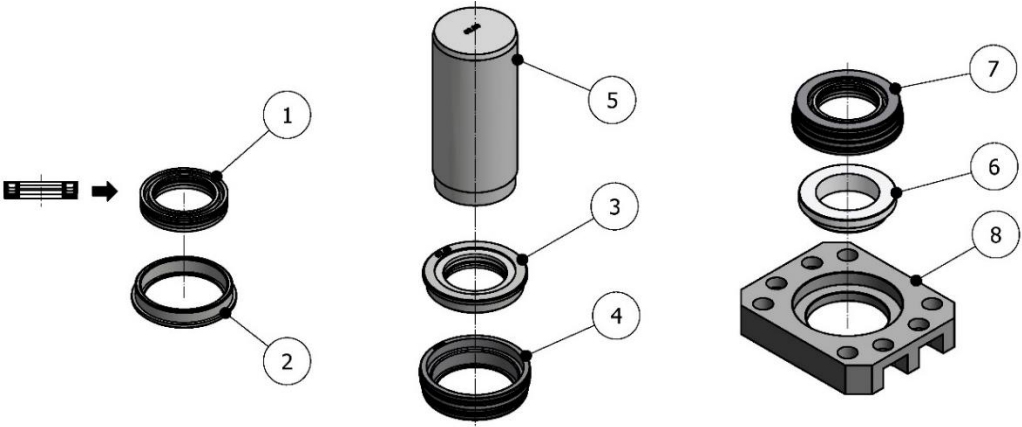
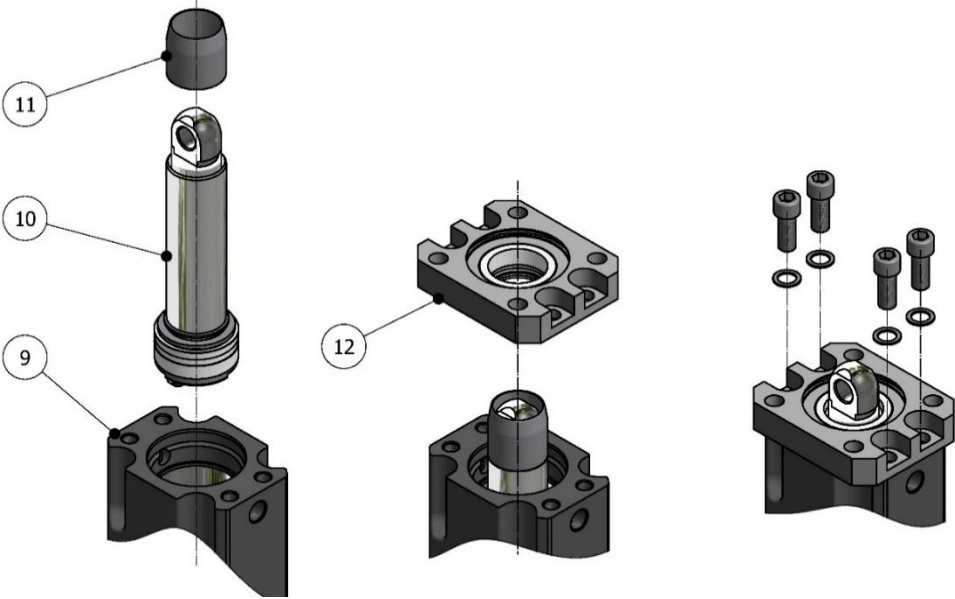


Table 3. Tools for Shaft Seal Assembly

	Tool (A)	Tool (B)	Tool (C)
Pump #0.80	HT-00124	HT-00125	HT-00036
Pump #1.20			HT-00035

Seals assembly

PISTON SEAL		
Insert the piston bearing, seal and washer into the piston shaft. Face the lips of the seal towards the end of the shaft. Face the grooves of the washer towards the seal.	Thread the plunger assembly onto the shaft as far as it will go (the pin holes in the shaft and plunger should line up).	Insert the spring pin so that it is recessed in the groove of the shaft. Insert the snap ring into the groove.

SHAFT SEAL		
		
Insert the Retainer (1) into Tool A (2). Make sure that the lips are facing upwards.	Place tool A with the seal (3) inside the seal housing (4). With tool B (5) push the seal until it stops against the seal housing (4).	Place the shaft bearing (6) and the seal housing along with its corresponding O-rings (7) on the packing retainer flange (8).
		
Insert the shaft assembly (10) into the pump body (9) and place the tool C (11) on the tip of the shaft.	Mount the packing retainer flange assembly with all components assembled (12) on the front face of the pump. The shaft bearing should be visible from the outside.	Remove tool C and fix the packing retainer flange with its corresponding screws.

Corresponding instructions are supplied with the specific tools.



Inlet supply filter

The filter bodies have a filter screen that prevents solid particles from entering the unit. Inspect the filters each day as part of the machine start-up, and clean them. Replace the filter screen if necessary.

Isocyanate is a product that crystallizes with ambient moisture or freezing. If the storage and transfer is correct and the operating procedures are respected, the risk of contamination of the Isocyanate filter will be minimized.

NOTE: Clean the Isocyanate inlet filter before the daily start-up; it should not be cleaned after the machine has been stopped for the day. Immediate use after cleaning the filter reduces the risk of moisture contamination or contamination through the reaction with the solvent used in the cleaning operation

To check the product inlet filters, proceed as follows:

- a) Disconnect the unit from the power supply and close the inlet ball valve from the filter you wish to check.
- b) Place a suitable vessel under the filter to collect the product coming out on removal. Carefully loosen the filter stopper to allow the product to be emptied into the vessel below. Completely unscrew the stopper.
- c) Remove the seal, the spring and the mesh and clean it all with the solvent used for cleaning the gun. Dry it all and check that the mesh is not obstructed. The holes in the mesh must be completely free. Replace the mesh if more than 10% of the surface is obstructed.
- d) Refit the mesh, the spring and the seal. Screw on the stopper.
- e) Open the product entry valve of the filter, make sure there are no leaks and proceed with the normal operation.

Isocyanate pump lubrication system

Each day, inspect the lube reservoir of the Isocyanate pump and check the condition of the DOTP. Replace the oil when it shows changes in colour or signs of solidification.

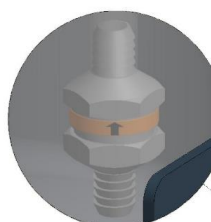
Oil solidification is the result of the absorption of moisture and the maintenance interval will depend on the working conditions. The closed circuit system reduces contamination.

Oil discoloration is due to the small film of Isocyanate that lies on the pump shaft during the pumping operation. If the gaskets and the seals are in a good condition, the plasticizer will not have to be changed so frequently.

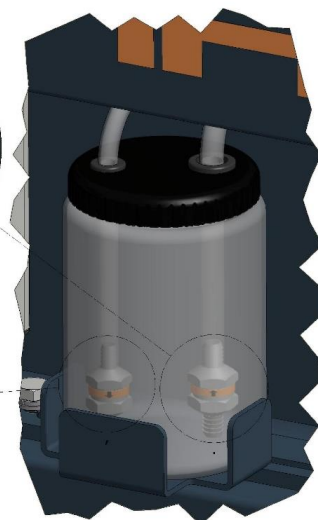
To replace the plasticizer, proceed as follows:

- a) Project the gun until the Isocyanate metering pump is placed on the right-hand side. Press the NORMAL key to interrupt the working cycle. The pushbutton led will go out.
- b) Press the MOTOR and POWER CONTROL keys and turn the general switch OFF. Disconnect the machine from the power supply.
- c) Remove the tank from the support, unscrew the lid, remove the non-return valve of the suction hose, empty the contaminated plasticizer in a suitable vessel and refit the non-return valve in the suction hose.
- d) Clean the tank, fill it with DOTP, screw on the lid and refit the tank in the support. The system is auto-suction and does not need priming.

SUCTION LINE



RETURN LINE



Pay attention to the mounting position of the backflow preventer, there is a mark indicating the flow direction, so if you disassemble the suction backflow preventer you must reassemble it with the arrow pointing upwards. For easy identification, the suction circuit is with tube Ø12 mm (backflow preventer upwards) and the return circuit is with tube Ø10 mm (backflow preventer downwards).



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