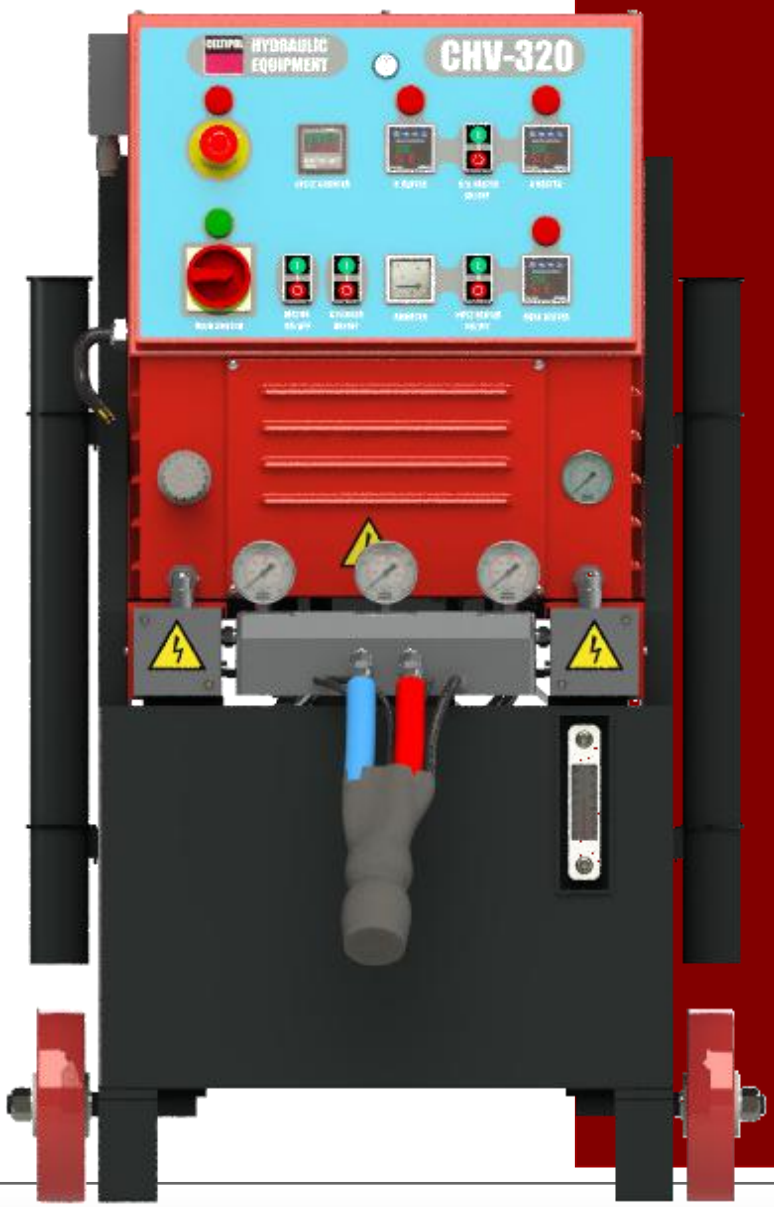
TECHNICAL MANUAL 2023



CHV-320

HYDRAULIC SYSTEM FOR SPRAYING POLYURETHANE, POLYUREAS AND BI-COMPONENTS

CELTIPOL

TABLE OF CONTENTS:

1. GENERAL CONDITIONS.

Before installing and starting up the Machine, read all the technical and safety documentation included in this manual carefully. It is important to pay particular attention to the information included here in order to become acquainted with handing and operating conditions of the Unit. All information is focused on bolstering User Safety and avoiding any possible breakdown arising from the incorrect use of the Unit.

Careful reading of this Technical Manual will give you a better knowledge of the system and procedures. Following the instructions and recommendations included here will reduce the potential risk of accident during installation, use or maintenance of the Machine, and will make it possible to have an incident-free operation for a longer period of time, better performance and the possibility to detect and solve problems in a swift and simple manner.

Keep this Technical Manual. You will be able to make consultations in the future, with access to useful information at all times. In the event of misplacing the manual, please request a copy from Celtipol.

The design of the Machine does not allow for it to be used in potentially explosive environments. Nor should the pressure and temperature limits stipulated in the technical specifications in this manual be surpassed.

2. SAFETY CONDITIONS

The first consideration to take into account is that during the design and project stage of the CHV-320 machine, the regulations in force regarding machine Safety and Prevention of Risk in the Work Place have been scrupulously respected. Therefore, we can firmly state that the machine is intrinsically safe.

Nevertheless, in common with any machine or tool, incorrect use of the same may cause more or less hazardous situations. These recommendations have been drafted to avoid such situations to ensure safe use and handling of the system.

Leading on from the above, clearly, all personnel that have anything to do with the spraying and handling operations of the machine must have an in-depth knowledge of these recommendations as well as all other recommendations that may be provided by the manufacturers of chemical products.

Throughout these operations, the intention is to provide a non-exhaustive list of the possible risks that may arise from spraying operations. For this reason, and depending on each particular application, it must be the user of the system who should carefully study the risks arising from the same, in line with the Regulation in force on the Prevention of Risks in the Work Place.

Another aspect for consideration is the prevention of possible risks arising from the use of different chemical products, some of which may be hazardous if used incorrectly. Special attention should be paid to any fumes issued during use of polyurethane foam and polyurea systems since isocyanate compounds are used in spraying operations.

In short, to ensure that the handling and use of the spraying equipment is as safe as possible, the user must strictly follow the following aspects indicated in this manual.

3. APPLICATION SAFETY.

• It is advisable for personnel with a history of respiratory complaints to avoid exposure to all isocyanates.
• Chemical products must be handled safely in accordance with manufacturer's recommendations. The manufacturer should provide information on the toxicity of the products used as well as actions to take in the event of accident (wounds, irritation, etc.).
• It should be taken into account that solvents that may be used in cleaning operations may also entail additional risk during handling.
• Do not apply until adequate ventilation is ensured, either naturally or forced, if required. Suppliers of chemical products must be applied to in order to determine the values at which the concentrations of fumes may be hazardous.
• The appropriate procedures and systems must be applied to detect hazardous concentrations of fumes.
• In the event of not being able to ensure appropriate ventilation, both the personnel applying substances and those working in the area influenced by fumes must, without fail, use certified breathing apparatus.
At all times, users must use the appropriate personal protection equipment (gloves, breathing masks, goggles, protective clothing, etc.).
• Users must be completely familiar with the chemical products and with the use of the equipment.





- In order to prevent any possible bodily harm caused by incorrect handling of raw materials and solvents used in the process, please read carefully the safety information provided by the supplier.
- Treat waste according to the regulations in force.
- Electrical maintenance of the machine must only be conducted by a qualified electrician.
- In order to avoid damage caused by the impact of pressurized fluids, do not open any connection or carry out any maintenance work on components under pressure until the pressure has been completely eliminated.
- Use appropriate protection for operating, maintenance work or whenever present in the working area of the Machine. This includes but is not limited to the use of a face mask, goggles, gloves, footwear and safety clothing.
- Certain components of the Machine reach temperatures that can cause burns. Do not handle or touch the hot parts in the Machine until they have cooled down.
- In order to prevent any serious harm due to crushing or amputations, do not work with the Machine without safety protection from duly installed moving parts. Make sure that all safety protection is correctly fitted when completing repairs or maintenance work.

4. SAFE HANDLING OF CHEMICAL PRODUCTS.

Products such as polyisocianates, organic solvents and diamines should be stored in a place exclusively for and adapted to such a purpose, with restricted access. Maximum temperatures must be strictly adhered to, both in the application and in storage of chemical products, at all times following the manufacturer's recommendations.

• Also, chemical products are to be stored at all times in suitable containers, following the manufacturer's recommendations.

• Containers must not be opened until immediately before being used in order to avoid contamination by damp. Any leftover product after being applied should be put back into the original container and be stored in a dry, ventilated place.

• During cleaning tasks of spilt components, it will be essential to use eye protection, gloves and wearing breathing apparatus. Spilt isocyanate can be collected with any absorbent inert product, such as sawdust. In any case, it is important to avoid skin contact. The absorbent product is to be immediately collected and dumped into an open container through the upper part.

• Throughout the entire operation explained above, the area must be correctly ventilated.

Safety personnel equipment:

Celtipol recommends the following personnel safety equipment for operations with foaming (see table):

- **Protective mask for airways.**
- **Goggles to protect the eyes.**
- **Headset to protect against noise.**
- **Gloves to protect hands.**
- **Protective clothing for the body.**

5. EQUIPMENT TECHNICAL SHEET.

Technical characteristics:

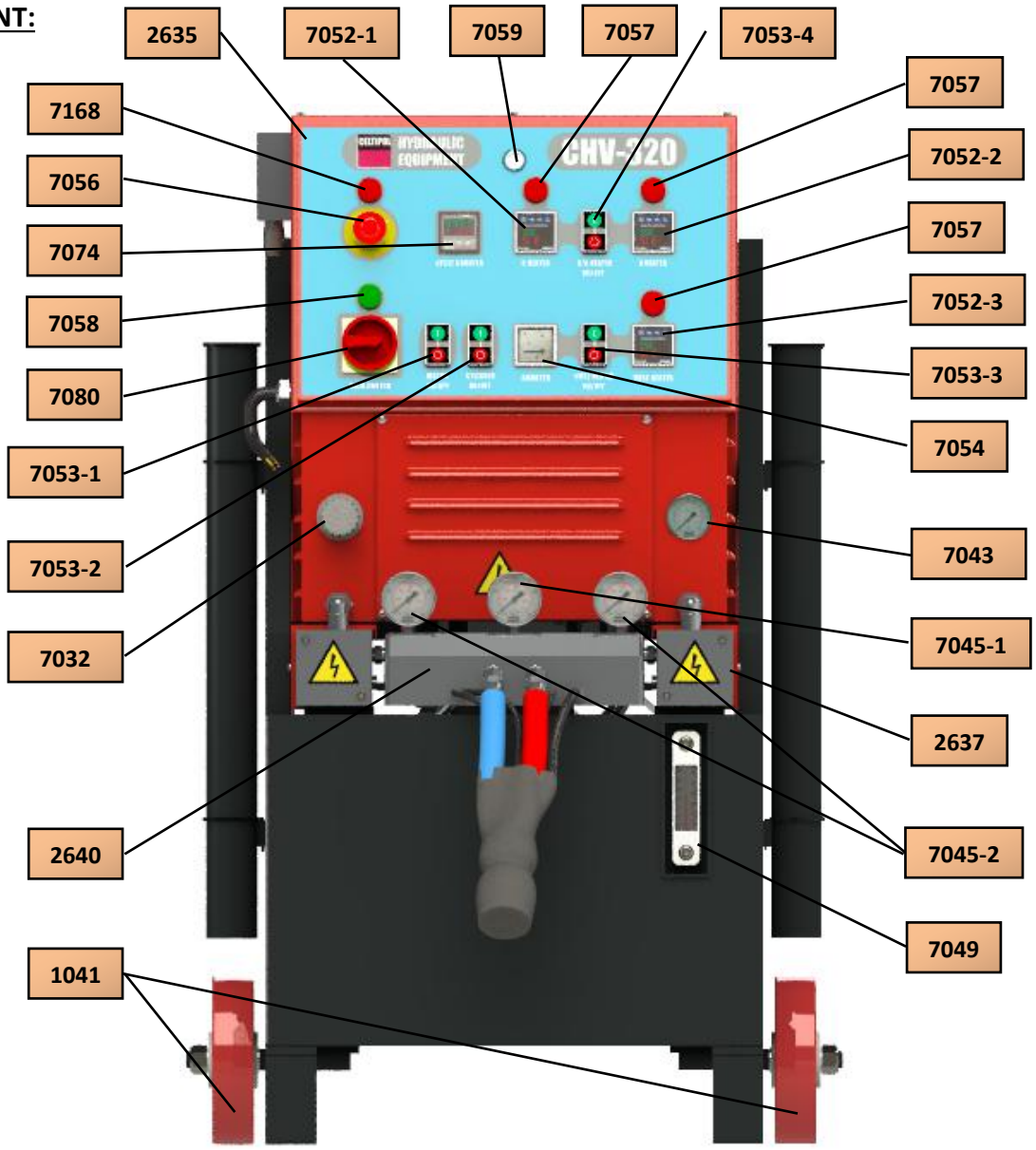
- ....Power supply:.....Three-phase 380 V, 60Hz
- ....Preheater power:.....12,000w
- ....Transformer power:.....5,000w
- ....Electric engine power:.....5.3 H.P. - 4 Kw
- ....Installed power:..... 21,000w
- ....Maximum consumption:..... 32 A
- ....Work pressure:..... 190 bar
- ....Admissible hose length:.....80 m
- ....Maximum production:..... 9 kg/min. – 8,2 l/min.
- ....Weight of the machine with no oil:..... 165 kg
- ....Oil tank capacity:.....80 l
- ....Dimensions (width x depth x height):..... 765 x 1.005 x 1.230 mm

Systems:

- Self-lubrication.
- In an emergency situation, it can operate with transfer pump.
- Air distributor with two outlets.
- Air pressure regulator.
- Digital automatic controller for temperatures in preheaters and hoses.
- Automatic blocking systems activated by excess pressure or temperature.
- Consumption ammeter for the hose.
- Cycle counter with programmed blocking preselect.
- Protection filters for incoming products.

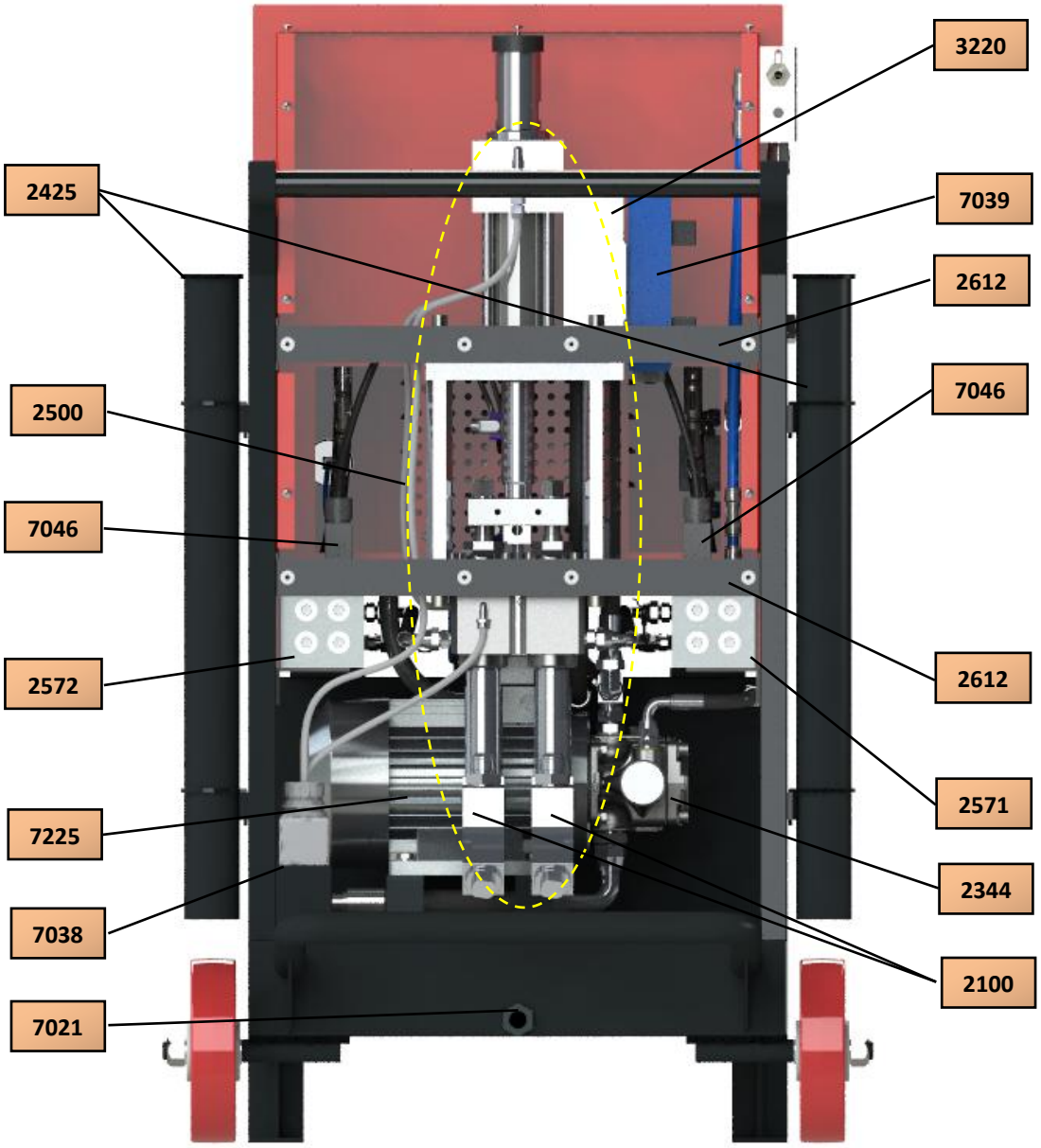
6. OVERVIEW

FRONT:



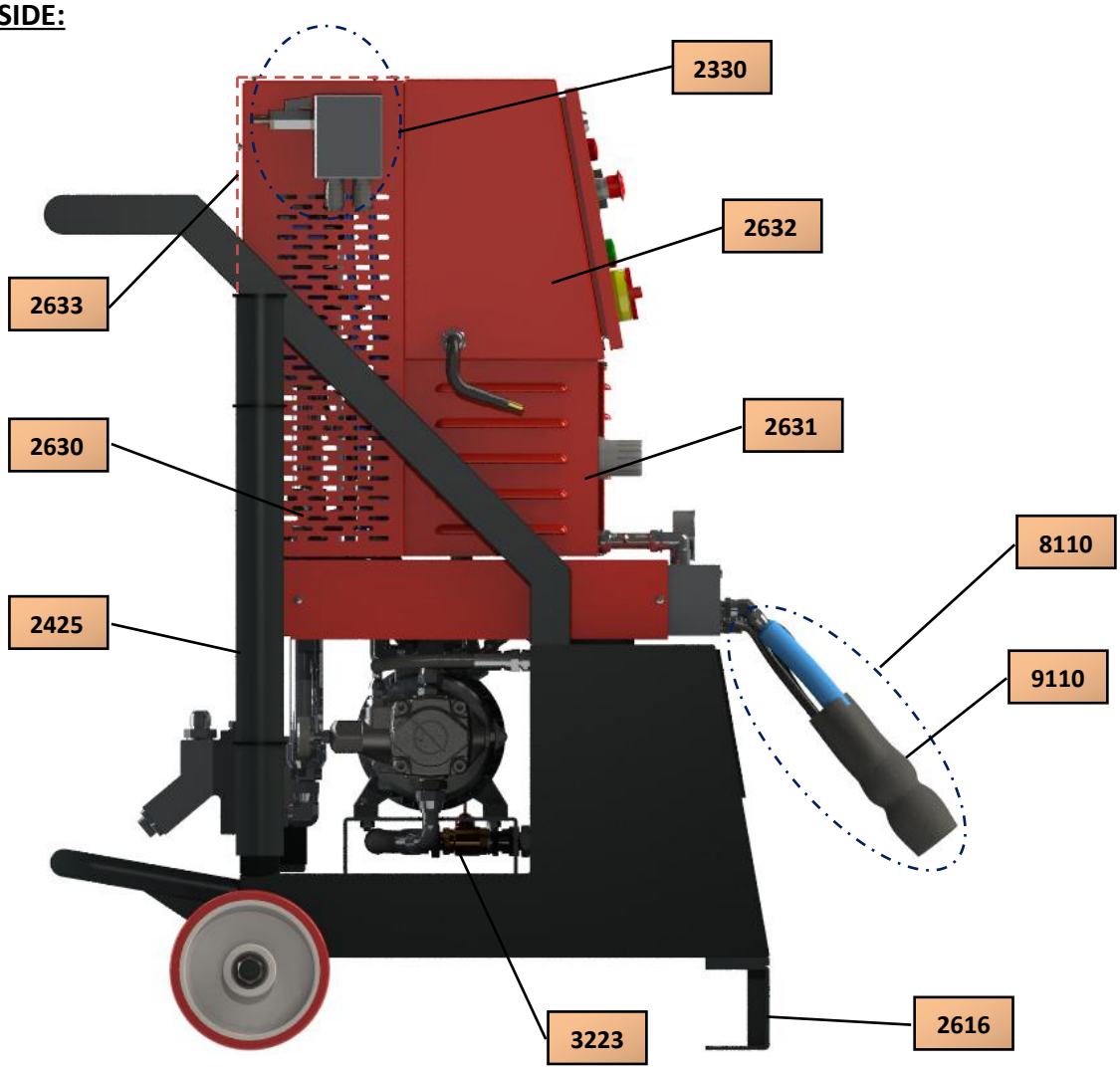
1041.....Main wheels.
2635.....Cover of the control cabinet.
2637..... Isocyanate heater protection plate.
2638..... Poliol heater protection plate.
2640..... Hose outlet unit.
7032.....1/2" Air pressure regulator.
7043..... Air pressure gage .
7045-1..... Hydraulic high pressure gage.
7045-2.....Products High pressure gage.
7049..... Thermometer and hydraulic level.
7052-1.....Temperature controller POLY.
7052-2..... Temperature controller ISO.
7052-3.....Temperature controller HOSE.
7053-1.....Hydraulic central start-up pushbutton.
7053-2..... Hidraulic cylinder start-up pushbutton.
7053-3..... Hose start-up pushbutton.
7053-4..... Heater start-up pushbutton.
7054.....Ammeter.
7056..... Emergency stop.
7057.....Red signal light.
7058..... Green signal light.
7059.....Control cabinet lock.
7074..... Cycle counter.
7080.....Main switch.
7168.....RESET button with red signal light.

REAR:



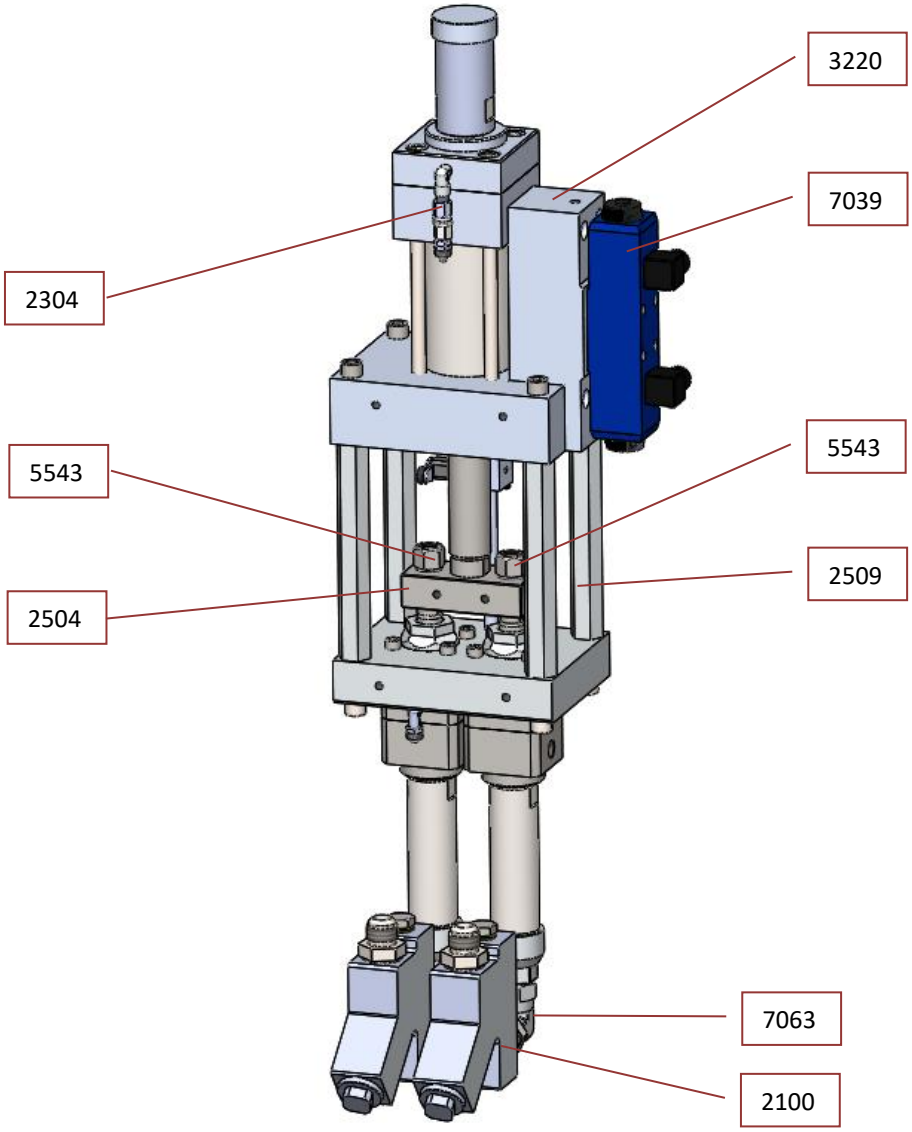
2100.....Liquid filters unit.
2344.....Hydraulic pressure pump.
2425.....Transfer pump brackets.
2500.....Pumping unit.
3220..... Solenoid valve base plate.
2571..... Heater block POLI.
2572..... Heater block ISO.
2612..... Pump holder.
7021..... 1/2" Plug.
7038.....Lubrication tank.
7039.....Solenoid valve.
7046.....Pressure switch.
7225..... Electric engine.

RIGHT SIDE:

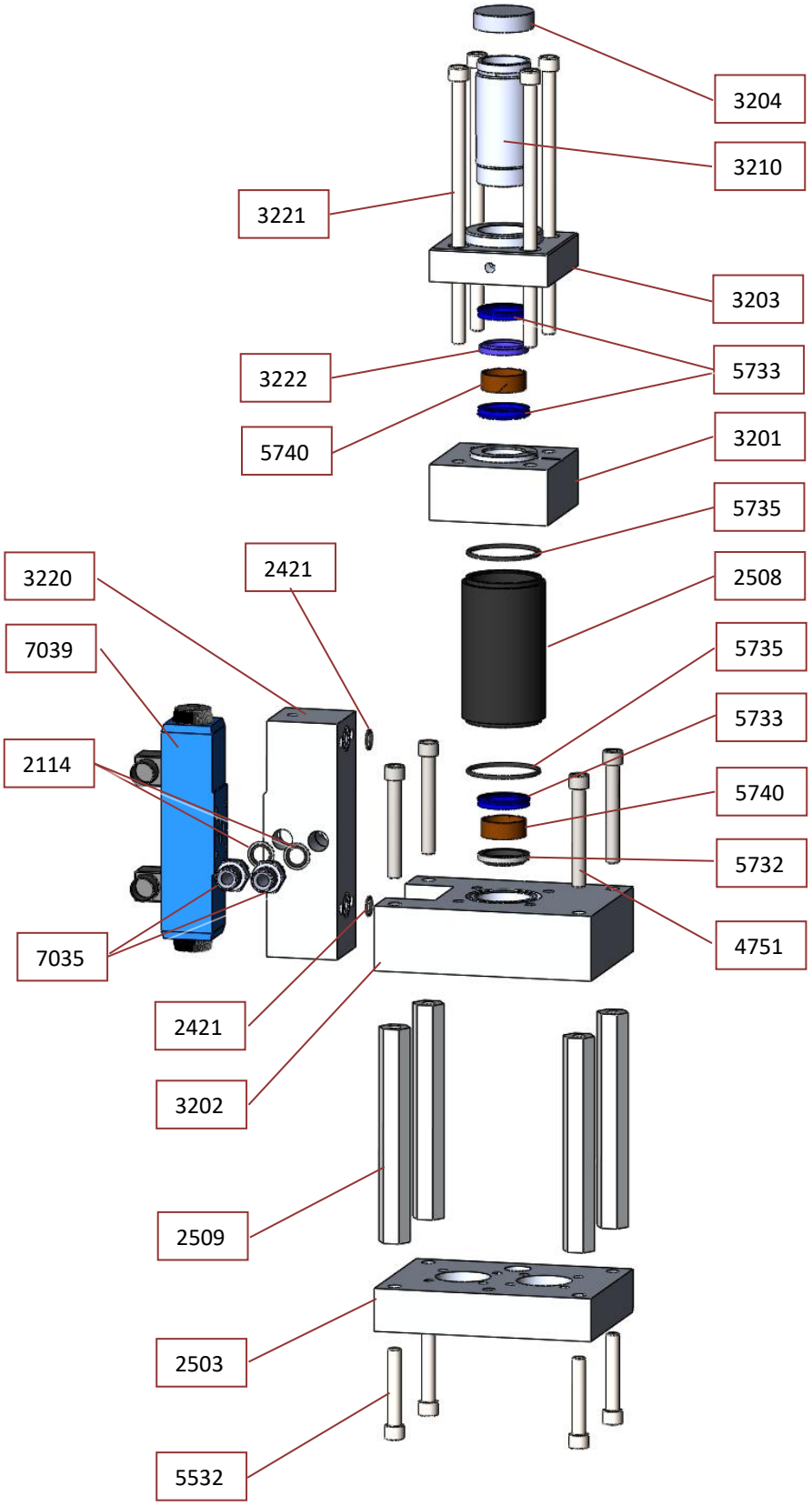


2330..... Air distributor.
2425..... Brackets for transfer pumps.
2616..... Machine stand.
2630..... Machine casing.
2631..... Transformer housing.
2632.....Electrical cabinet
2633.....Back cover.
3223.....Ball valve 3/4”
8110.....Machine connection stretch.
9110..... Blach heat shrink tubing

7. 2500 PUMPING UNIT.

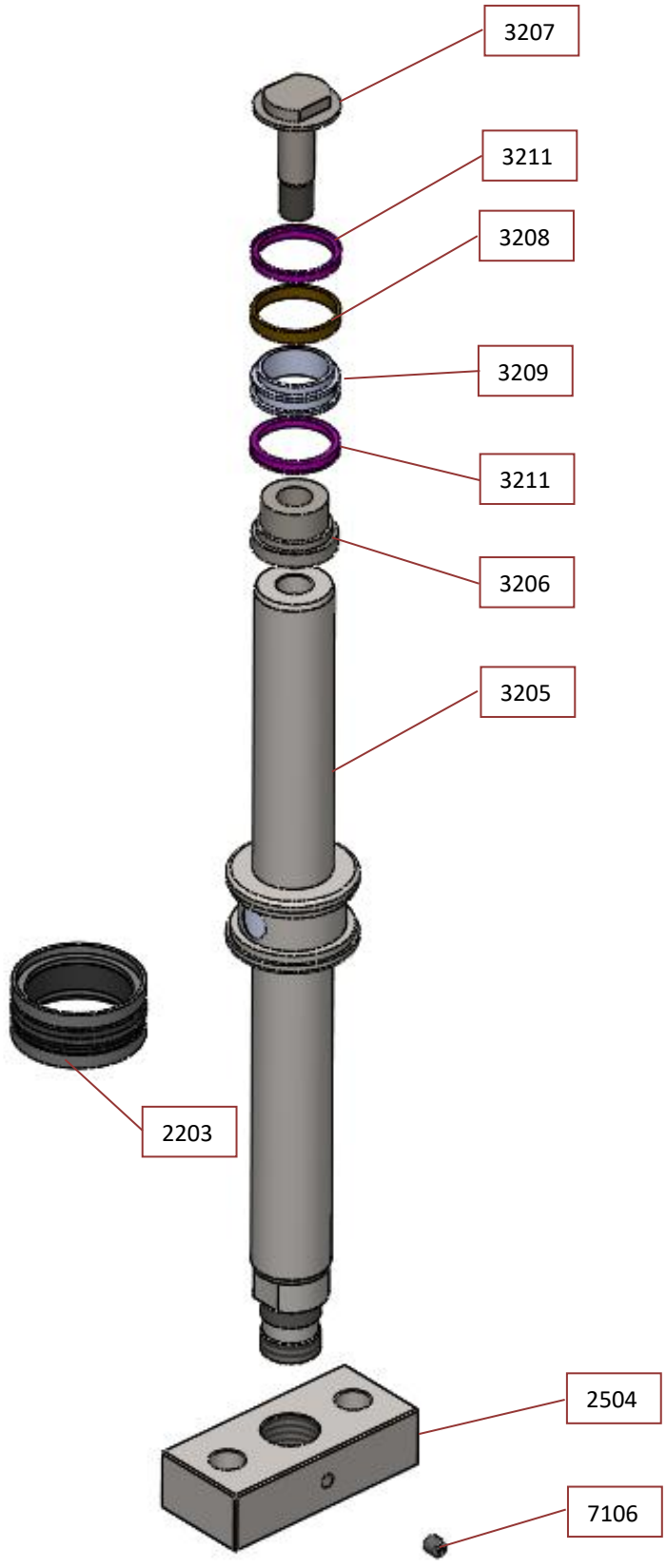


2100..... Liquid filters.
2304.....Non-return valve.
2504..... Piston rod yoke.
2509..... Hexagonal pillar.
3220..... Solenoid valve base plate.
5543.....M16 Self-locking nut.
7039.....Solenoid valve
7063.....90º Elbow G3/4" M-F



Ref.	DESCRIPCIÓN
2114	Sealing washer 1/2”
2421	O-ring Øin. 14x3
2503	Base pumping unit
2508	Cylinder body
2509	Hexagonal pillar (x4)
3201	Upper cylinder head
3202	Lower cylinder head
3203	Pump supplement
3204	Cover
3210	Lubrication pump liner
3220	Solenoid valve base plate
3221	Screw 12.9 M12x240 (x4)
3222	Wiper seal
4751	Screw M12 x 90 (x4)
5532	Screw M12 x 70 (x4)
5732	Wiper seal
5733	Rod seal
5735	O-ring Øin. 60x3,5
5740	Guide
7035	Joint 1/2” M-M Gas
7039	Solenoid valve

SPARE PARTS KIT (2210)	
3222	Wiper seal
5732	Wiper seal
5733	Rod seal (x3)
5735	O-ring Øin. 60X3.5 (x2)
5740	Guide (x2)

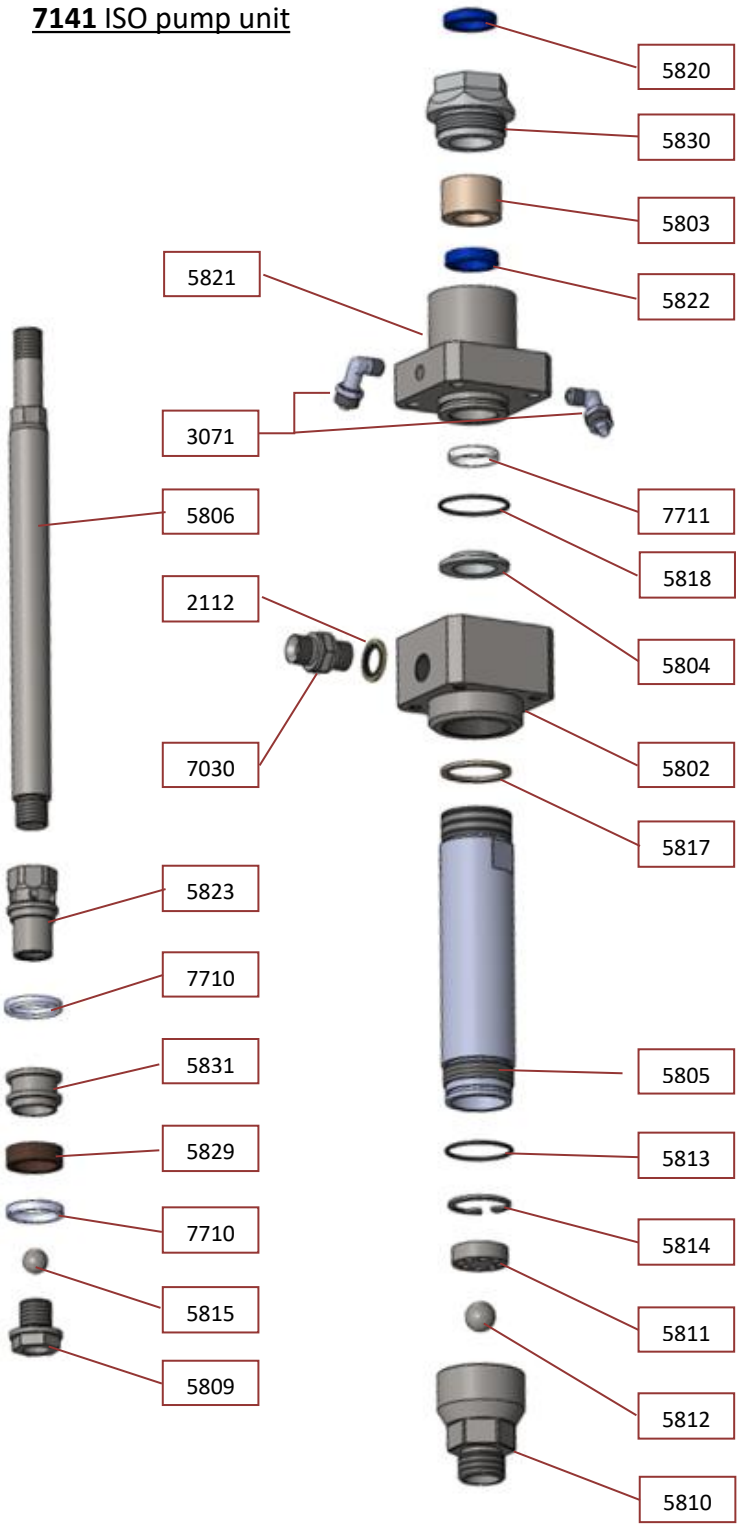


Ref.	DESCRIPTION
2203	Piston seal kit
2504	Piston rod yoke
3205	Piston-rod set
3206	Lubr. pump gasket support
3207	Tip piston lubrication pump
3208	Lubrication pump guide
3209	Lubr. pump guide housing
3211	Joint lubrication pump
7106	Inner screw M8

SPARE PARTS KIT (2203)	
	Piston seal
	Piston guide 60 (x2)

SPARE PARTS KIT (2211)	
3208	Lubrication pump guide
3211	Joint lubrication pump (x2)

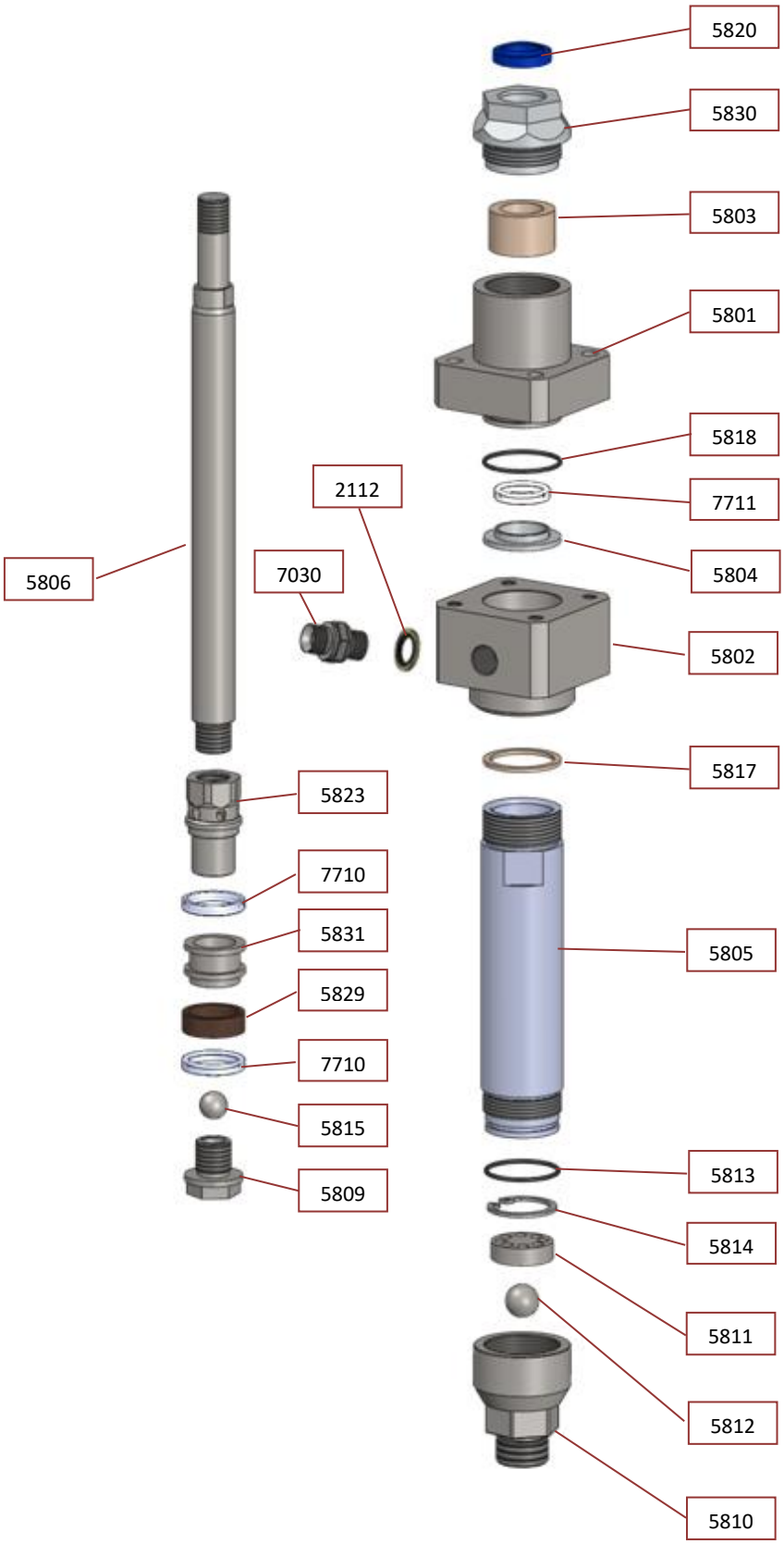
7141 ISO pump unit



Ref.	DESCRIPTION
2112	Watertight washer 3/8”
3071	Lubrication elbow 1/8”
5802	Upper base
5803	Nylon guide
5804	Seal stop ring
5805	Cylinder body
5806	Piston rod
5809	Piston head
5810	Lower base
5811	Sphere stop
5812	Sphere Ø17
5813	O-ring Øin. 35x2
5814	Safety ring
5815	Sphere Ø15
5817	Nylon cylinder joint stop
5818	O-ring Øin. 34x2
5820	Wiper seal
5821	ISO packer bracket
5822	Rod seal
5823	Double collar piston
5829	Piston guide
5830	Seal and housing wiper seal
5831	Guide and buffer seal housing
7030	Joint G3/8” M-M
7710	Varisel buffer seal
7711	Varisel buffer seal

SPARE PARTS KIT (2206)	
5803	Nylon guide
5813	O-ring Øin. 35x2
5818	O-ring Øin. 34x2
5820	Wiper seal
5822	Rod seal
5829	Piston guide
7710	Varisel buffer seal (x2)
7711	Varisel buffer seal

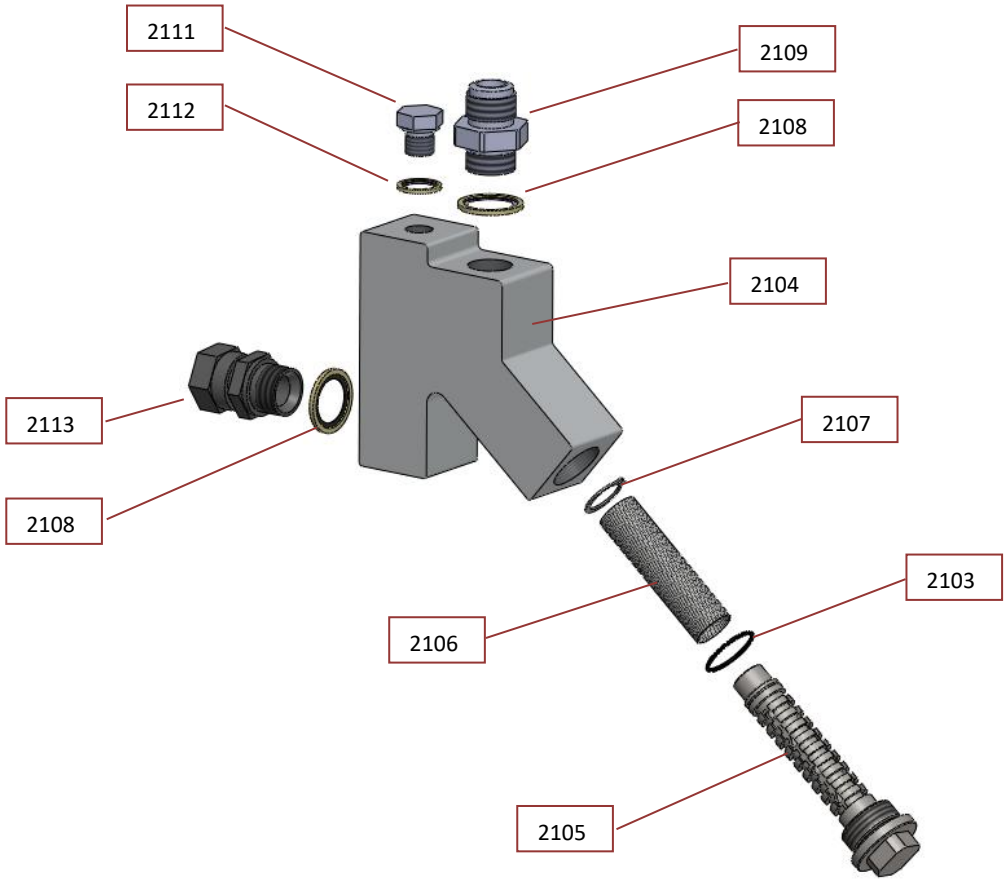
7142 POLI pump unit



Ref.	DESCRIPTION
2112	Watertight washer 3/8”
5801	POLI packer bracket
5802	Upper base
5803	Nylon guide
5804	Seal stop ring
5805	Cylinder body
5806	Piston rod
5809	Piston head
5810	Lower base
5811	Sphere stop
5812	Sphere Ø17
5813	O-ring Øin. 35x2
5814	Safety ring
5815	Sphere Ø15
5817	Nylon cylinder joint stop
5818	O-ring Øin. 34x2
5820	Wiper seal
5823	Double collar piston
5829	Piston guide
5830	Seal and housing Wiper seal
5831	Guide and buffer seal housing
7030	Joint G3/8” M-M
7710	Varisel buffer seal
7711	Varisel buffer seal

SPARE PARTS KIT (2207)	
5803	Nylon guide
5813	O-ring Øin. 35x2
5818	O-ring Øin. 34x2
5820	Wiper seal
5829	Piston guide
7710	Varisel buffer seal (x2)
7711	Varisel buffer seal

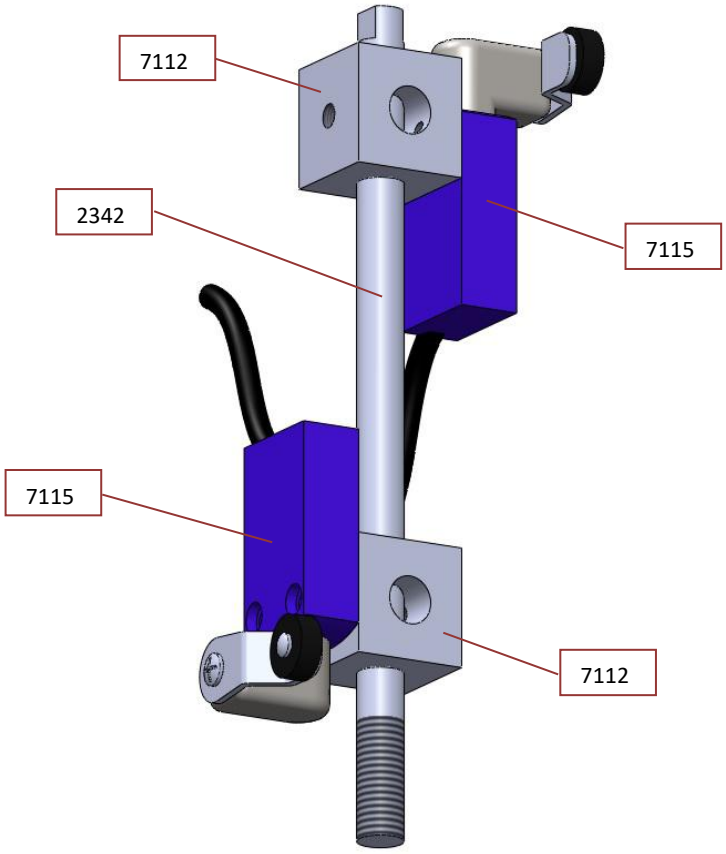
8. 2100 LIQUID FILTERS UNIT



Ref.	DESCRIPTION
2103	O-ring Øin. 30x2
2104	Filter body
2105	Filter holder
2106	Filter
2107	Safety ring
2108	Watertight washer 3/4”
2109	M3/4 Joint - M1”1/16
2111	Plug 3/8”
2112	Watertight washer 3/8’’
2113	Joint M 3/4” - F 3/4”

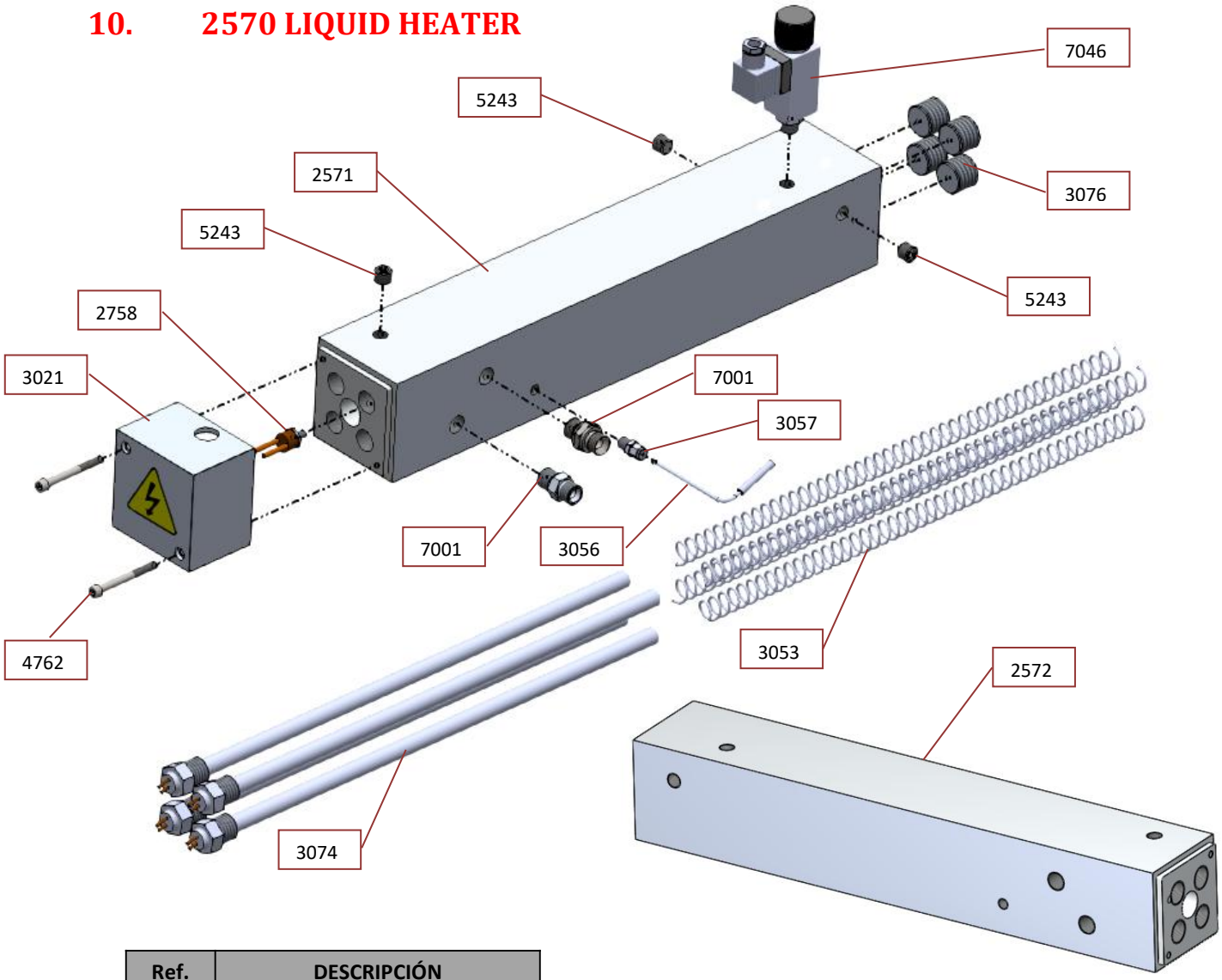
SPARE PARTS KIT (2208)	
2103	O-ring Øint 30x2
2106	Filter

9. ENDS OF STROKE.



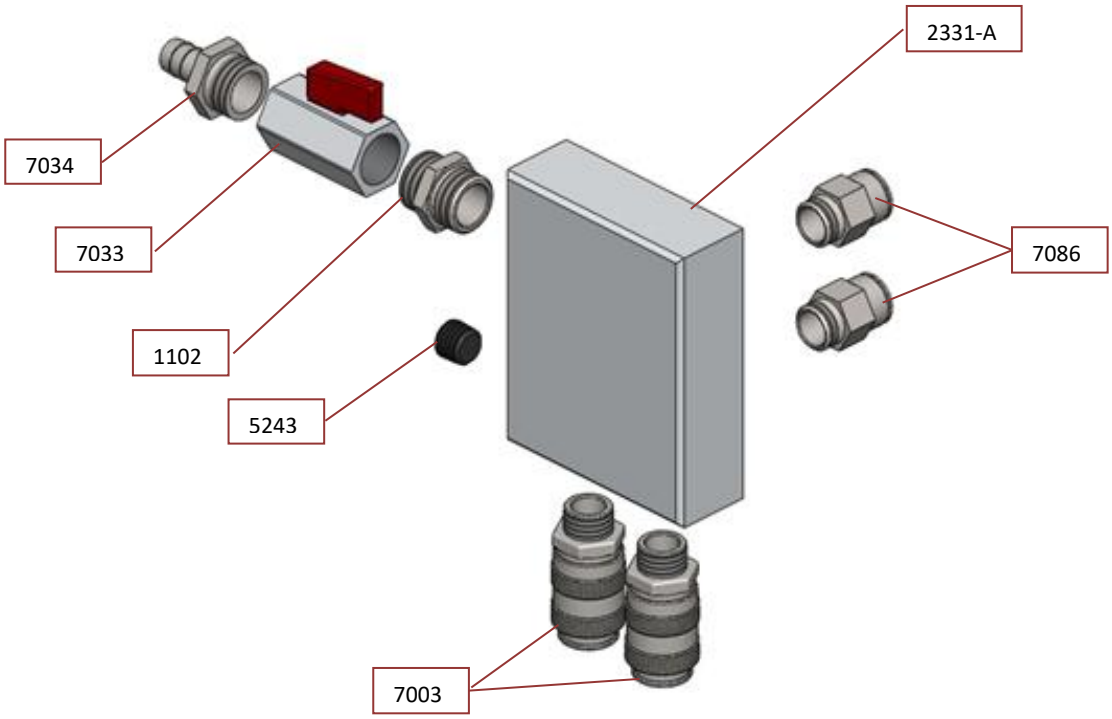
Ref.	DESCRIPTION
2342	Vertical bracket
7112	End of stroke bracket
7115	Limit switch

10. 2570 LIQUID HEATER



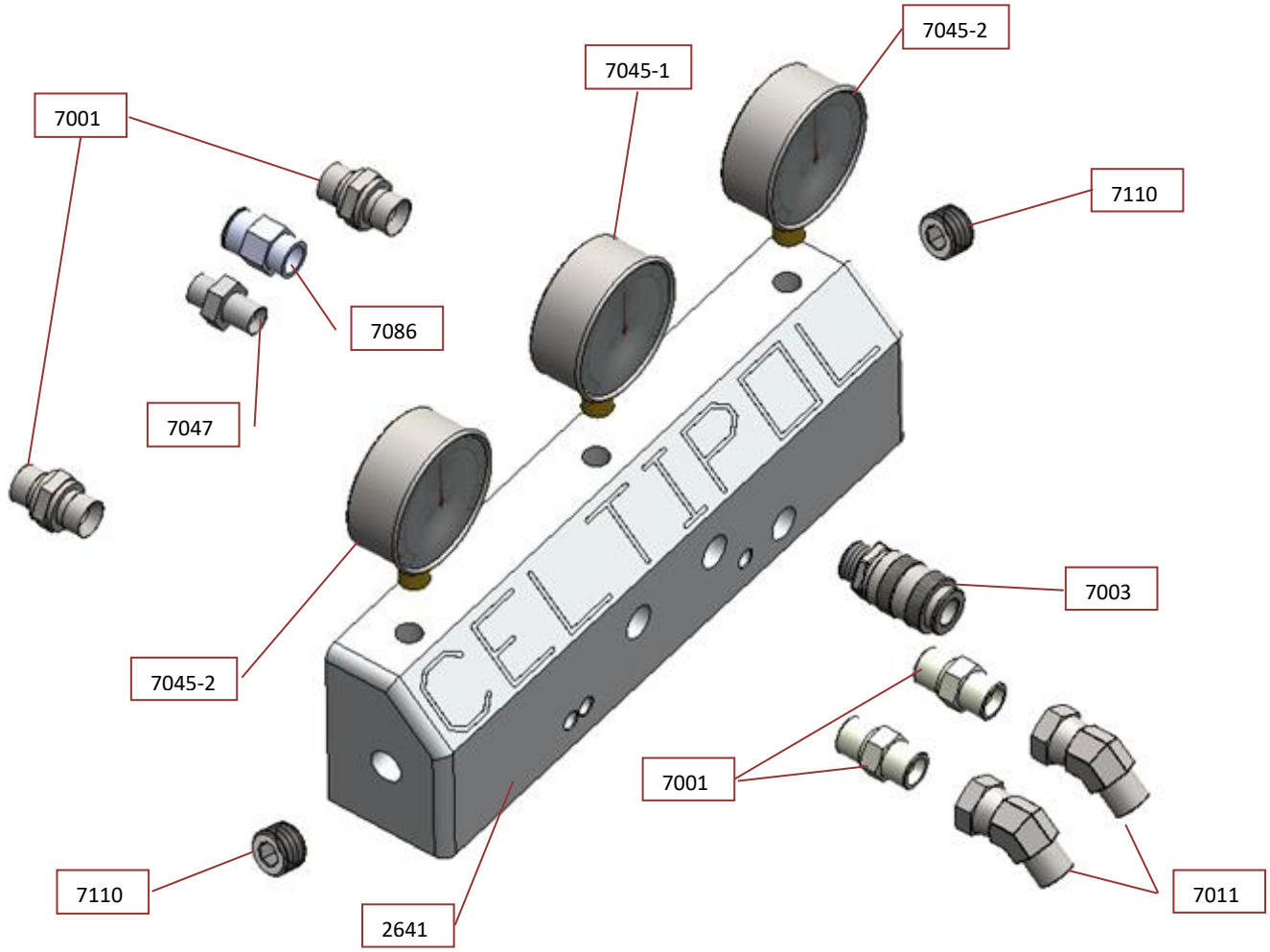
Ref.	DESCRIPCIÓN
2571	Left heater block (POLI)
2572	Right heater block (ISO)
2758	Thermostat
3021	Heater cover
3053	Spring Øin. 14x2
3056	Thermocouple probe
3057	Probe connector
3074	1500W-380v Ø14 resistance
3076	Inner Plug NPT 3/4”
4762	Screw M6 x 60
5243	Plug NPT 1/4”
7001	M 3/8”NPT Joint – M 3/8”G
7046	Pressure switch

11. 2330 AIR DISTRIBUTOR.



Ref.	DESCRIPTION
1102	Air joint M1/2” - M1/2”
2331-A	Air distribution block
5243	Plug 1 x 4” NPT
7003	Swift air connector female 3/8”
7033	Stopcock 1/2”
7034	Hose connector 1/2”
7086	M3/8” swift coupling Ø12

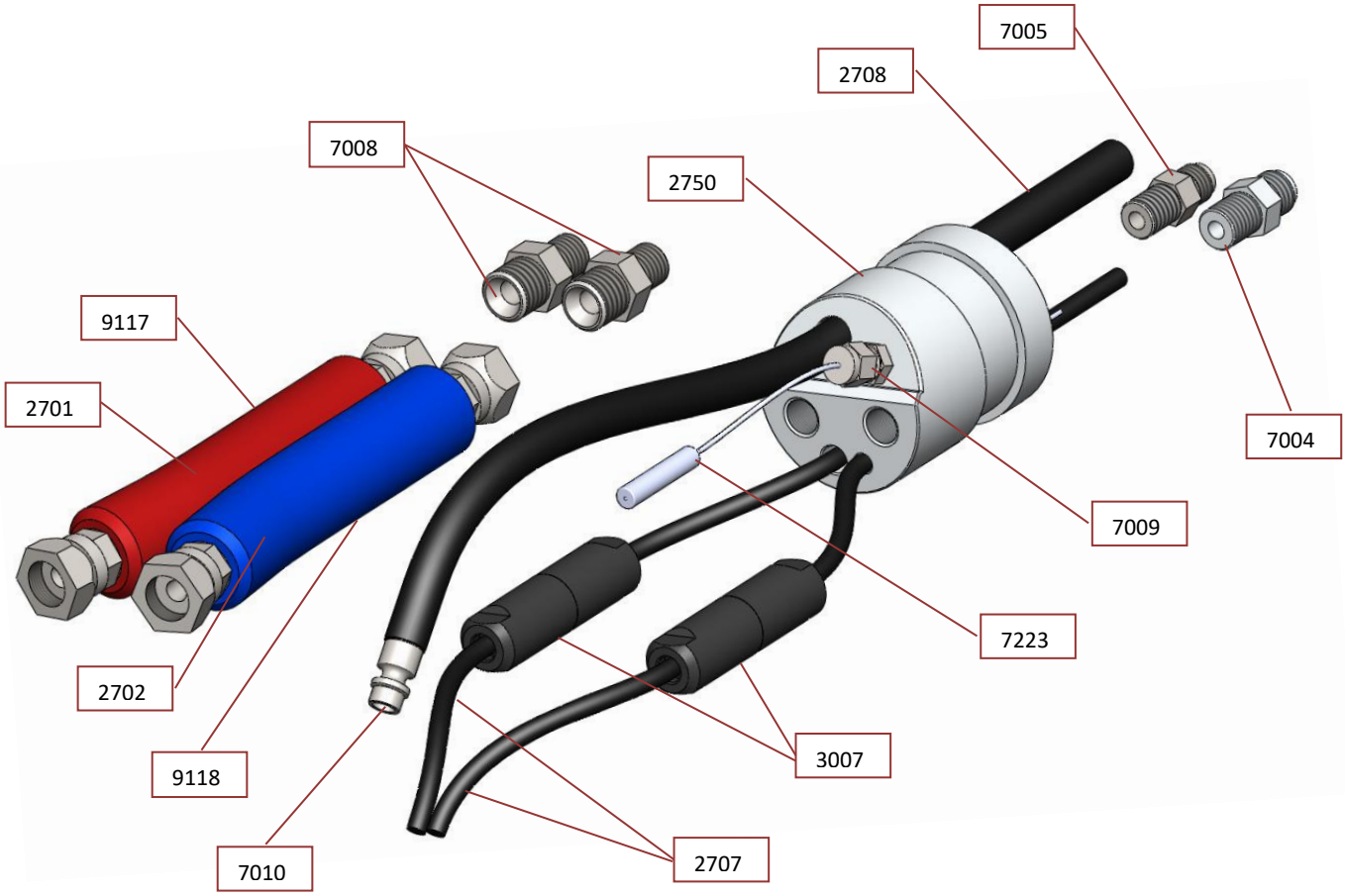
12. 2640 HOSE OUTLET UNIT



Ref.	DESCRIPTION
2641	Hose outlet block
7001	Joint 3/8” NPT- G3/8” M
7003	Swift air connector female 3/8”
7011	45° joint G3/8” F – G3/8” M
7045-1	Hydraulic high pressure gages
7045-2	High pressure gage product
7047	Joint G1/4”M - NPT1/4” M
7086	M3/8” swift coupling Ø12
7110	Plug NPT1/4”

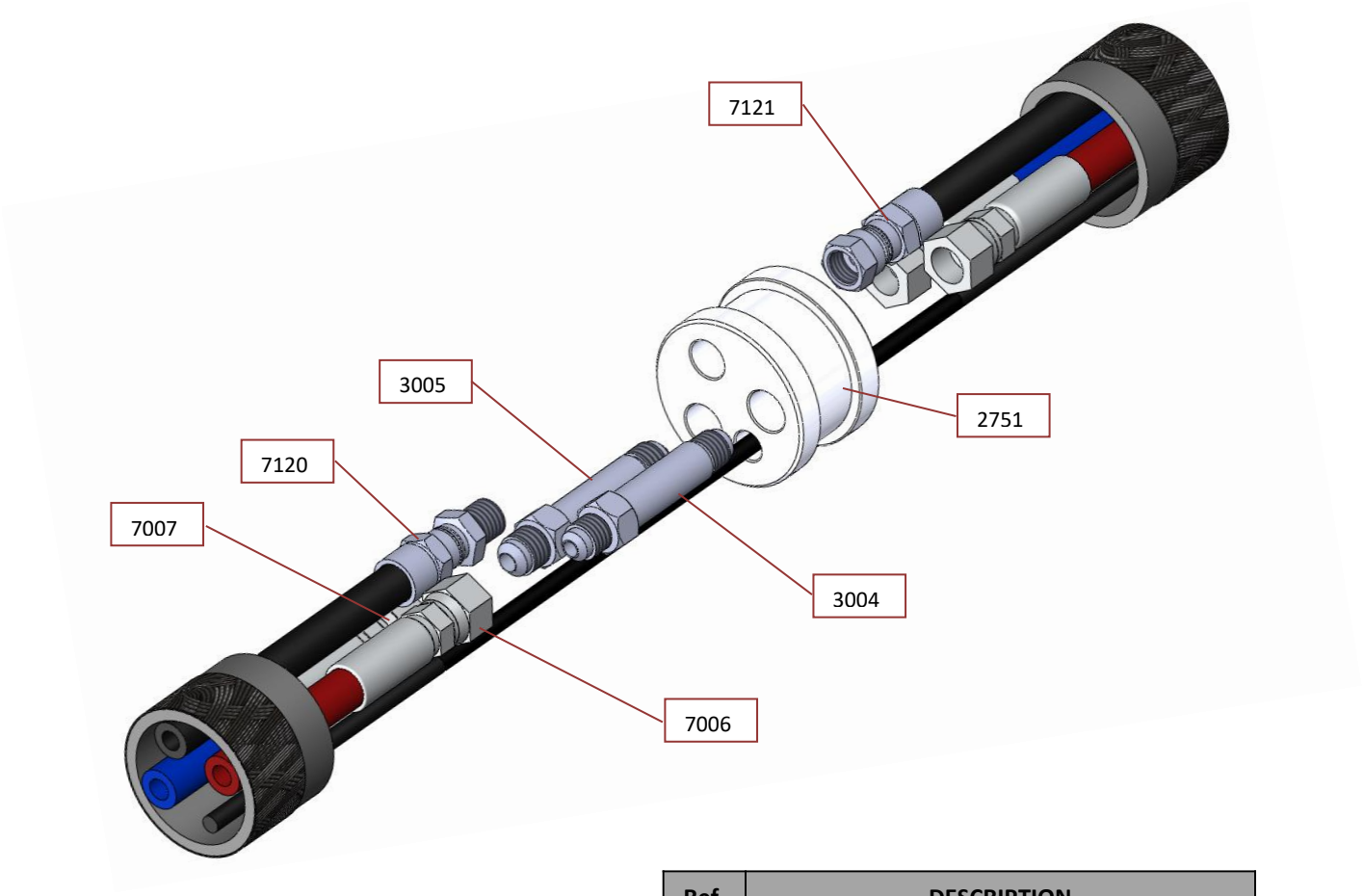
13. HOSE

8110 MACHINE CONNECTION STRETCH



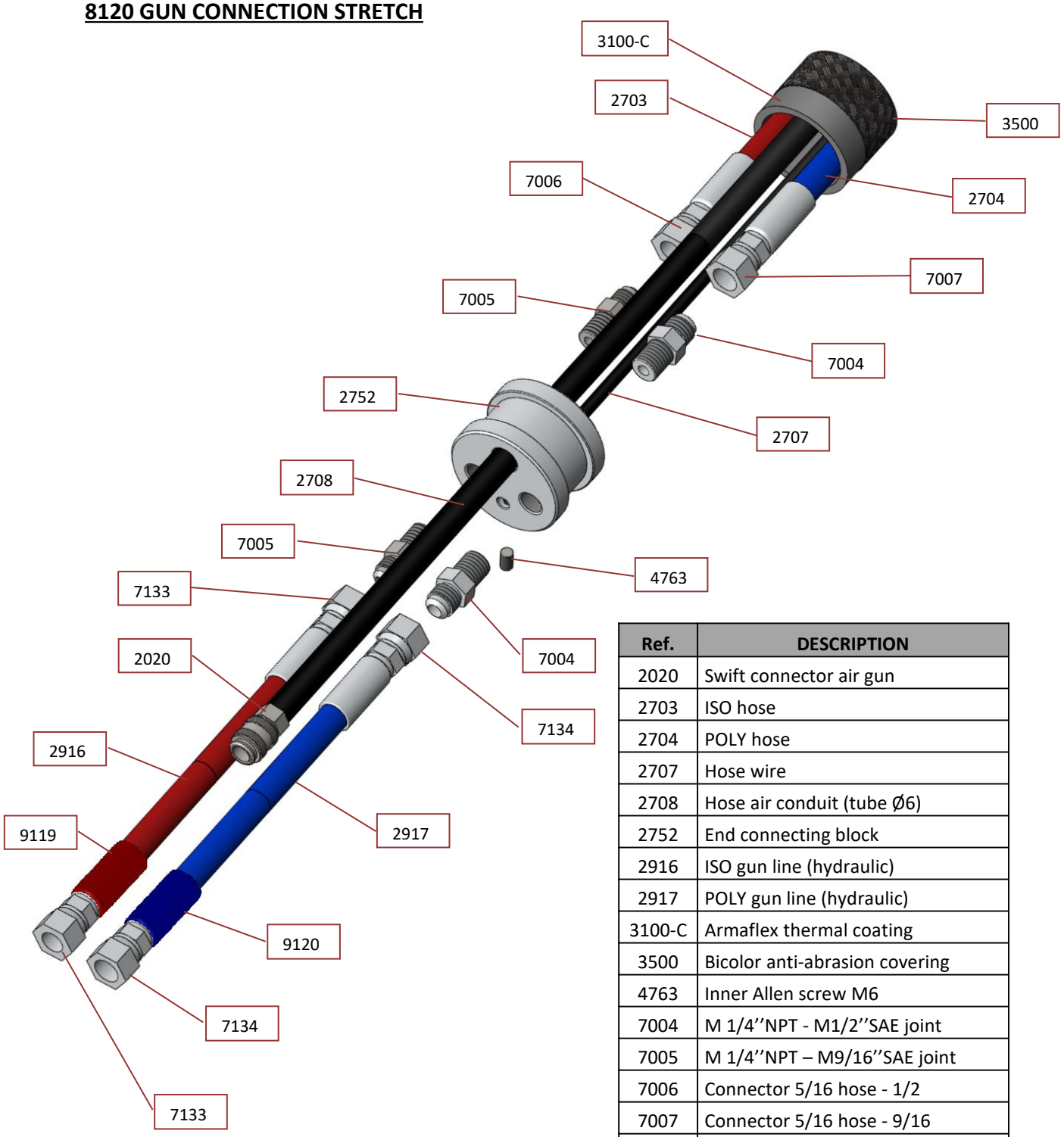
Ref.	DESCRIPTION
2701	ISO line
2702	POLI line
2707	Hose wire
2708	Hose air conduit
2750	Anterior connecting block
3007	Electrical connectors
7004	Joint NPT1/4”M - SAE 1/2” M
7005	Joint NPT1/4” M - SAE 9/16” M
7008	Joint NPT 1/4” M- G 3/8” M
7009	Probe connector unit
7010	Swift air connector male
7223	Hose temperature probe
9117	Red heat shrink tubing (ISO)
9118	Blue heat shrink tubing (POLY)

8130 HOSE FITTING



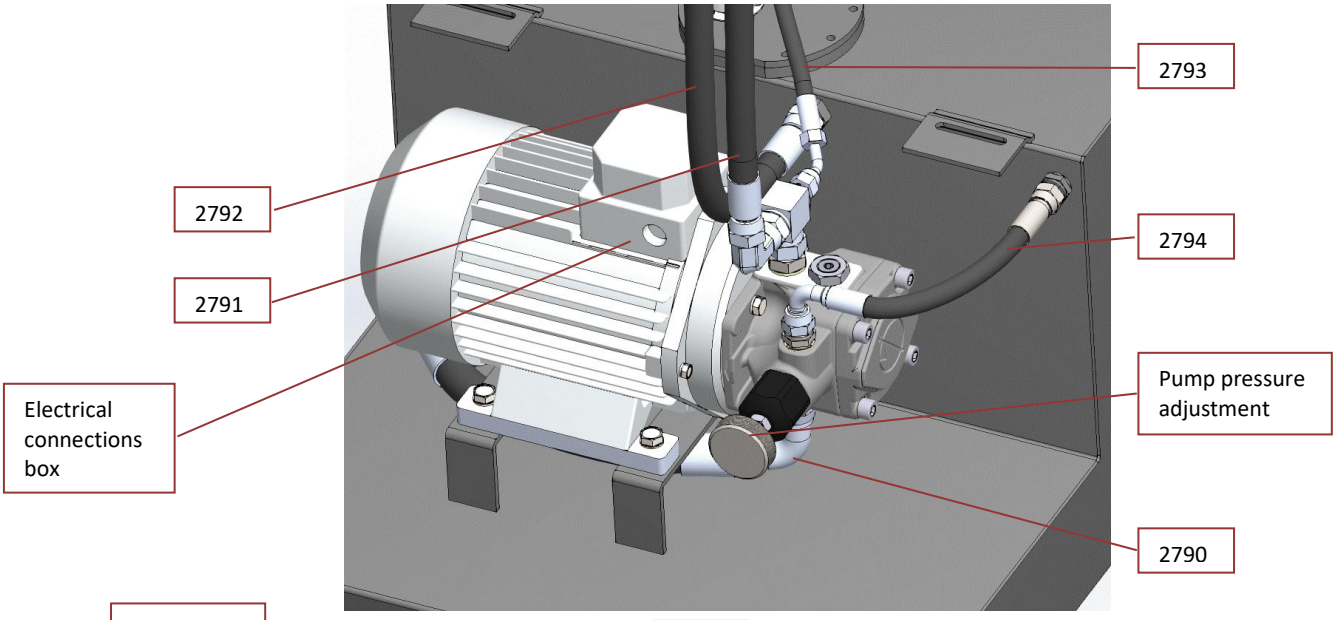
Ref.	DESCRIPTION
2751	Insulator separator
3004	ISO hose fitting
3005	POLI hose fitting
7006	Connector 5/16 hose - 1/2
7007	Connector 5/16 hose - 9/16
7120	Male air connector
7121	Female air connector

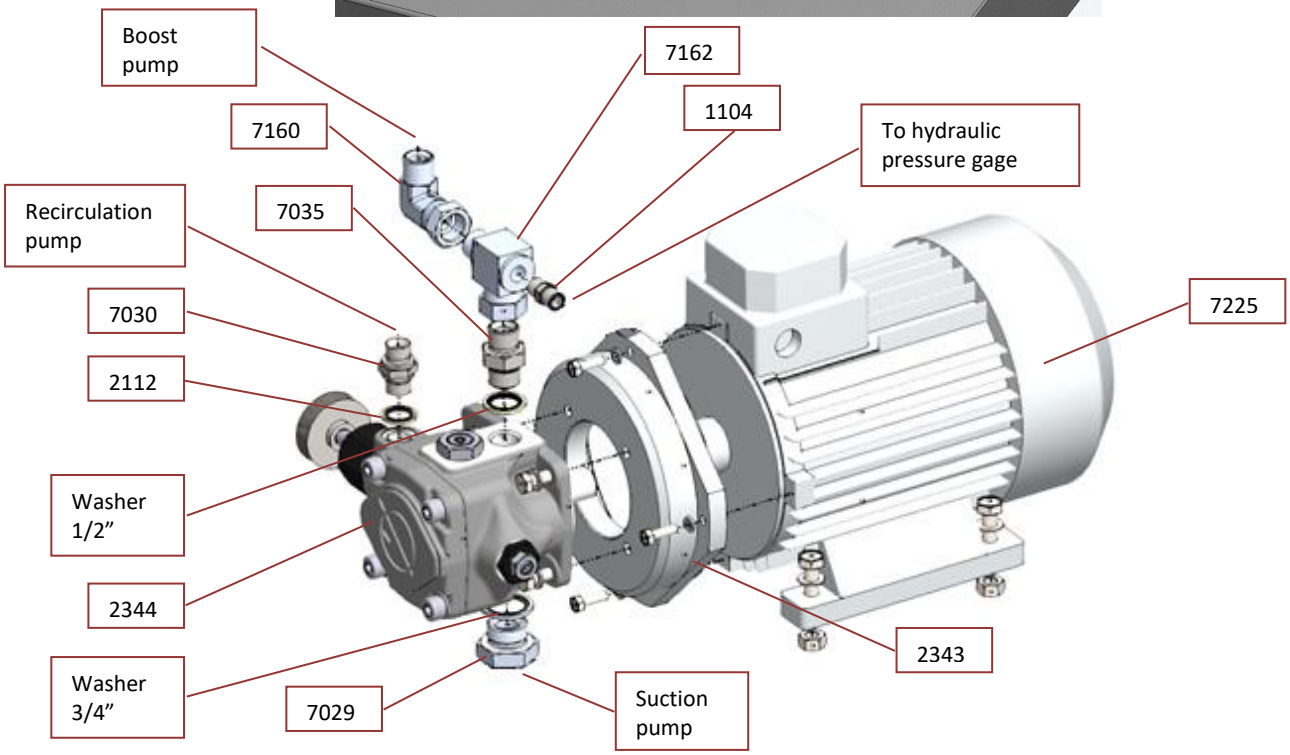
8120 GUN CONNECTION STRETCH



Ref.	DESCRIPTION
2020	Swift connector air gun
2703	ISO hose
2704	POLY hose
2707	Hose wire
2708	Hose air conduit (tube Ø6)
2752	End connecting block
2916	ISO gun line (hydraulic)
2917	POLY gun line (hydraulic)
3100-C	Armaflex thermal coating
3500	Bicolor anti-abrasion covering
4763	Inner Allen screw M6
7004	M 1/4''NPT - M1/2''SAE joint
7005	M 1/4''NPT – M9/16''SAE joint
7006	Connector 5/16 hose - 1/2
7007	Connector 5/16 hose - 9/16
7133	Connector 1/4 hose - 1/2
7134	Connector 1/4 hose - 9/16
9119	Red heat shrink tubing (ISO)
9120	Blue heat shrink tubing (POLY)

14. HIDRAULIC PUMP





Ref.	Description	Ref.	Description	Ref.	Description
1104	Joint M- M 1/4” NPT	2791	Bost pump sleeve	7030	Joint M-M 1/8” Gas
2112	Watertight washer 3/8’’	2792	Recirculation pump sleeve	7035	Joint G1/2” M-M
2343	Motor-pump adapter	2793	Hydraulic pr. gage sleeve	7160	Short elbow 90º G1/2” M-F
2344	Hydraulic pressure pump	2794	Recirculation pump sleeve	7162	T G1/2”F-G1/2”M–NPT1/4”F
2790	Suction pump sleeve	7029	Joint G 3/4” M-M	7225	Electric motor

15. START-UP SEQUENCE.

1. Install the machine completely fixed and stable.
2. Electrical connection of the unit. Ensure that the electrical connection is correct and that the line is suitably shielded (magnetothermal and differential shielding). Check the correct connection of the phases. If the phases are wrongly connected, the phase sequence monitoring relay (9012) prevents the machine from starting.
3. Connect the machine to earth using the terminal fitted for the purpose (only necessary in the event of the external power supply hose has no earth conductor).
4. Unroll the hoses.
5. Ensure that the emergency pushbutton is activated.
6. Connect product tanks to the machine by transfer pumps (they can be directly connected to the machine in the event of emergency). [1]
7. Connection of compressed air (external supply) to the distributor.
8. Open the main air valve located in the air distributor.
9. Adjust the pressure regulator to between 6 and 8 bars.
10. Unscrew the loose nut on each stopcock on the gun and insert the end of each hose into their respective tanks (this task of recirculating liquids must be carried out before using the machine for bleeding the air in the same). [2]
11. Put the general switch in the ON position.
12. Connect the cylinder start button to fill the pumps with liquid.
13. Select the required temperature using the thermostat for each product and connect the same with the start-up pushbutton.[3-4]
14. Select the required temperature on the hose using the thermostat[5].
15. As explained in point 10, these functions are performed without the gun for bleeding air (leave the cylinder activated for a few minutes for effective bleeding).
16. Stop the machine to be able to perform the following procedures.
17. Reconnect both loose nuts on each product to the gun.
18. Open the air stopcock on the gun.
19. Open the air stopcock on both products on the gun.
20. The system is now ready to start the application[7].
21. Use the appropriate means of personal protection[8].

1 Do not start up the system without material in the pumps or tanks.

2 Do not unscrew the loose nut on the gun with the machine in

3 Do not connect the heaters without products.

4 The operational temperature will vary depending on climatic conditions or the reaction of the different brands of the products.

5 Where necessary to alter the length of the hose, it will be necessary to first alter the output voltage of the transformer (Consult the Technical Assistance service).

6 Do not open the taps on the products without first opening the air stopcock (on the gun).

7 Do not place any part of the body in the direction of the projection nor project towards other people.

8 It is advisable to use protective goggles, air mask, protective clothing and other safety equipment. Manufacturers' recommendations and the instructions for the products used should be followed.

16. SELECTING WORK TEMPERATURE.

Using the temperature controllers on each product and on the hose (EMKO ESM 4420), the ideal temperature can be selected depending on the products to be used and the projection work to be carried out. (The controllers are factory set with the factory temperature selected according to customer requirements).

In order to select the required temperature, follow these steps:

1. Press PSET on the controller appearing on the PSET function screen.
2. With the keys ⇦ ⇨ the temperature range is increased or decreased.
3. Once the ideal temperature has been set, press ASET to keep the selected value, resetting the controllers screen to its initial status.

17. SELECTING WORK CYCLE.

Celtipol machines can be fitted, if required by the customer, with a cycle counter with preselect and with the possibility of blocking when the machine reaches the end of the cycles indicated.

This cycle counter can perform two functions:

1. Only count cycles when the machine is not stopped.
2. Count cycles and blocking the machine when following the programmed cycles.

In order to select the required cycles, proceed as follows (on PIXYS counters):

a. When pressing the SET button, SETPOINT 1/2 is displayed.

b. Pressing or selecting the required SET.

c. When SET pressed, a blinking figure is displayed.

d. When pressed or , modifies the SETPOINT figure that appears blinking.

18. DAILY STOP SEQUENCE.

1. Close the stopcock taps on both products on the gun.
2. Activate the gun trigger two or three times to clean[9].
3. Deactivate heating in the hose with the stop pushbutton[10].
4. Deactivate heaters with the stop pushbutton.
5. Deactivate the cylinder with the stop pushbutton.
6. Open the stopcock taps on the products in the gut and pull the trigger several times until the pressure in the products decreases below 30 bars (see output pressure gages) and check that the pump Piston rods are at their lowest position and fully insert them inside the body of the pump in order to guarantee autolubrication.
7. Deactivate the pump with the stop pushbutton.
8. Disconnect the main switch.
9. Close the stopcock taps for products on the gun and pull the trigger 2 or 3 times.
10. Close the air stopcock on the gun.
11. Dismantle the side and front housings of the gun for cleaning. Lubricate with Celtipol grease[11].
12. Close the main compressed air valve on the machine.
13. Electrical disconnection of the machine.

9 Observe if there are any losses in the injectors by repeatedly activating the trigger .

10 The hoses with hot products should not be bled.under no circumstance.

11 Never dismantle the side blocks on the gun with the product taps open since the gun may fill up with foam and be a risk for the user.

19. EXTENDED STOP SEQUENCE (OVER ONE MONTH).

- Ensure that the stopcock taps on the products on the gun are fully closed.
- Connect the transfer pumps to two separate containers, with an approximate amount of 10 litres of solvent in each.
- Spray material on the side blocks, opening the stopcock taps in the products on the gun. The jet should be aimed at an appropriate container until clean solvent comes out of the side blocks.
- Connect the transfer pumps to two separate containers, with an approximate amount of 10 litres of D.O.P. plasticizer.
- Re-add the spray until all the solvent has been bled from the system and only the plasticizer comes out of the side blocks[12].
- Apply a thick layer of Celtipol grease to each side of the front housing of the gun.
- Once again, place the side blocks on the front housing of the gun[13].
- Remove the adapters from the transfer pumps from the product tanks. Clean the plug adapters with solvent and then cover with Celtipol grease.
- Clean the large needles in the plug on the material tanks with solvent, cover with Celtipol grease; reinstall the plugs/caps on the drums when received from the material supplier.

12 Do not bleed the D.O.P. plasticizing fluid from the accumulated system.

13 Grease should appear on the tip of the mixing chamber. Excess grease should be spread over the rest of the gun to help to eliminate any excess accumulated spray.

20. SYSTEM MAINTENANCE.

- ✓ Lubricate the Piston rods when stopping the machine with D.O.P. (Daily) 17•
- ✓ Clean and refill the gun with white lithium grease or petroleum jelly (daily).
- ✓ Clean filters on the product input with ethyl-glycol (weekly).
- ✓ Regularly refill the lubricating bowl in the filter-regulator-lubricator unit with liquid petroleum jelly.
- ✓ Regularly empty the bleed water from the compressed air input regulator.
- ✓ Regularly check the emergency button trigger.
- ✓ Regularly check the safety elements for over-temperature.
- ✓ Regularly check the status of the machine's internal lines, both for air and products.
- ✓ Regularly check the status of the hoses (for abrasions or cuts).

21. GENERAL BREAKDOWNS.

Another way of avoiding incorrect handling of the equipment and to avoid any possible situation of risk is to know how to detect the source of the more frequent breakdowns, as well as to know how to solve them. To achieve this, essentially, the operator/user should be acquainted with:

- ➢ The normal working order of the equipment, with its corresponding sequences of start-up and stop.
- ➢ The flow diagram of the materials going through the equipment.
- ➢ The appearance of the product perfectly applied and its possible variables.

Since the ultimate aim of the equipment is the correct application and finish of the foam, it should be the final appearance of this that we should, in the first place, examine to locate any possible breakdown or anomalies in the application process and, in this way, identify the material that is missing (isocyanate or Poliol).

Therefore, the most appropriate procedure to locate breakdowns is as follows:

1. Identify the product missing.
2. Check the pressure gage corresponding to the material that is missing in such a manner that if the reading is higher than normal, there is an obstruction problem between the pressure gage and the point in the chamber where the gun makes the mix. Conversely, if the reading is lower than normal, there is an obstruction problem between the pressure gage and the transfer pumps[14].
3. In the event that the hydraulic pressure in the material that is deficient is higher than normal, we should start to check for possible causes for the obstruction from the furthest point away from the unit (gun) and move upstream following this sequence:

I. **Gun:** [14]
   - ✓ Ensure that the product tap is fully open.
   - ✓ Check the cleanliness of the front hole on the mixing chamber.
   - ✓ Check for the extent of cleanliness in the filter grille.
   - ✓ Check the cleanliness of the side hole on the mixing chamber.

II. **Hose:**
   - ✓ Ensure that the hoses are not blocked.

4. In the event that the hydraulic pressure in the material that is deficient is lower than normal, we should start to check for possible causes for the obstruction in the furthest point away from the machine (product feed) and move downstream, starting with the products tanks:

   - ✓ Check for product in the tanks.
   - ✓ Check the temperature of the material, since an excessively cold material, especially in the bottom of the tank, will increase the viscosity of the material and will block the transfer pumps. Conversely, excessive temperature in the material, on the polio side, will cause irregular properties in the material.
   - ✓ Check the status of the dosing pumps, paying special attention to determine if the flash appears in the ascending or descending run. If the flash appears on the descending run, check the seating of the lower ball. If the flash appears on the ascending run, check the seating of the upper ball.

In any case, repair works should be carried out as soon as possible. The unit should be open and in contact with the air as brief a time as possible in order to avoid other problems such as incoming humidity in the system or crystallization of the isocyanate.

In the event of the unit being exposed to the atmosphere, it will be vital to make it work for enough time to shift the material that there was in the unit when opened[15].

14 We should only concern ourselves with the hydraulic pressure on the side where the material is lacking. Furthermore, we should bear in mind that the pressures recorded on both pressure gages do not necessarily have to coincide due to the different products used, different viscosities, etc.

15 Prior to any kind of handling or repair of the gun, discharge all the pressures in the fluid and air.

22. LOCATING INCIDENTS.

The CHV-320 machine has been designed and built to withstand severe work conditions with a high degree of reliability, on the condition that it is used and maintained in the appropriate manner. See below for information on possible incidents that may cause problems preventing continuing to operate with the Machine. The information provided should be use as a guide to be able to detect and solve most of the problems before resorting to the Celtipol technical assistance service. In any case, feel free to contact the technical assistance service where a team of qualified technicians will attend to you and will assess you wherever you may require.

Repairs conducted by non-qualified personnel or the use of spare parts that are not the originals may be hazardous for the operator.

Possible incidents:

1. Failure of the electrical supply:
   To switch on the machine, the main switch must be set to the ON position , lighting up the green LED light located above the switch. If this LED does not light up, this indicates that the electrical power does not exist or is faulty.

2. Incorrect connection of the phases:
   Check the correct phase connection. If the phases are incorrectly connected, the phase sequence monitoring relay (9012) prevents the machine from starting. Connect correctly and restart the machine.

3. Emergency stop is activated:
   With the emergency stop button activated (the electrical power in the control panel is interrupted, causing a stop during the operation of the machine or making it impossible to start operation.
   Activation is visualized by the red LED located above.

   To unblock the emergency stop, pull the emergency button in the opposite direction to the control panel.

4. Short-circuit electrical overload.
   The control panel has a magnetothermal switch which, in the event of an electrical overload or a short circuit, causes the electrical current to cut off, and must be activated manually once the fault has ceased.

5. Unbalanced pressures:

   Decompensation of pressures occurs when an obstruction in the hose or in the gun prevents one of the components to be freely released through the gun chamber when projected or when a problem in the pumping system prevents one of the components from being able to reach the gun in the required amount.
   (Identifying which component causes decompensation is relatively easy if we consider that the chemical components used in Polyurethane foaming systems are of a different color. By observing the color of the material coming out of the gun you will know which component is missing).

   To determine whether decompensation occurs as a result of an obstruction or as a result of a problem in the pumping system, project with the gun, observe the pressure indicated on the pressure on the pressure gage in the other component: if the pressure of the missing component is higher, decompensation is the result of an obstruction. If the pressure is lower, decompensation is the result of a problem in the pumping system.

6. Cavitation

   Cavitation occurs when the pumping system requires a greater volume of material than that supplied by the feeding system, leading to the formation of a vacuum in the dosing pump. The causes that can cause cavitation are as follows:

   a. The transfer pump fails to supply the required volume. The problem may be that the pump does not meet the required characteristics, the lack of air supply to the pump or that the pump is faulty. A 2:1 ratio pump is recommended for isocyanate transfer and a supply hose with a minimum internal diameter of 20mm.
   b. High viscosity. Polyurethane foaming systems normally require a minimum transfer temperature of 12ºC. With lower temperatures, the product increases its viscosity making pumping difficult. When environmental conditions do not allow the products to be kept at a minimum temperature of 12ºC, auxiliary heating elements must be used to adapt the products to the minimum temperature required for transfer.
   c. The product inlet filter is obstructed.
   d. There has been wear and tear on the gaskets or pump seals preventing the supply of the required product.

7. Failure in the ends of stroke in change of direction.

   The dosing pump system has two limit switches to change the direction of the pumping unit.

   If one of them fails, the pump unit will lock in position near where the end of stroke has failed.

   Check:

   a. That there are no foreign bodies preventing the contact of the plate with the end of stroke.
   b. Manually activate the directional valve to rule out any failure in the same.
   c. Electrical current in the ends of run.

8. Safety pressure switches:

   The hydraulic circuit of each product has a factory set safety pressure switch at a pressure limit depending on the size of the pumps installed in the machine. When the limit pressure is reached, the machine stops running and the red light above the temperature controllers lights up (this light comes on when there is an overpressure - it is displayed on the pressure gage - or an over-temperature - an alarm goes off on the temperature controller -).

   Until the pressure falls below the set limit, the machine cannot be restarted by resetting the push-buttons at the start of each function.

9. Temperature controllers

   Product and hose temperature control is established. The machine has a temperature probe installed in each of the heaters and a probe in the hose that, through their respective controllers on the control panel, can adjust the temperature according to customer requirements.

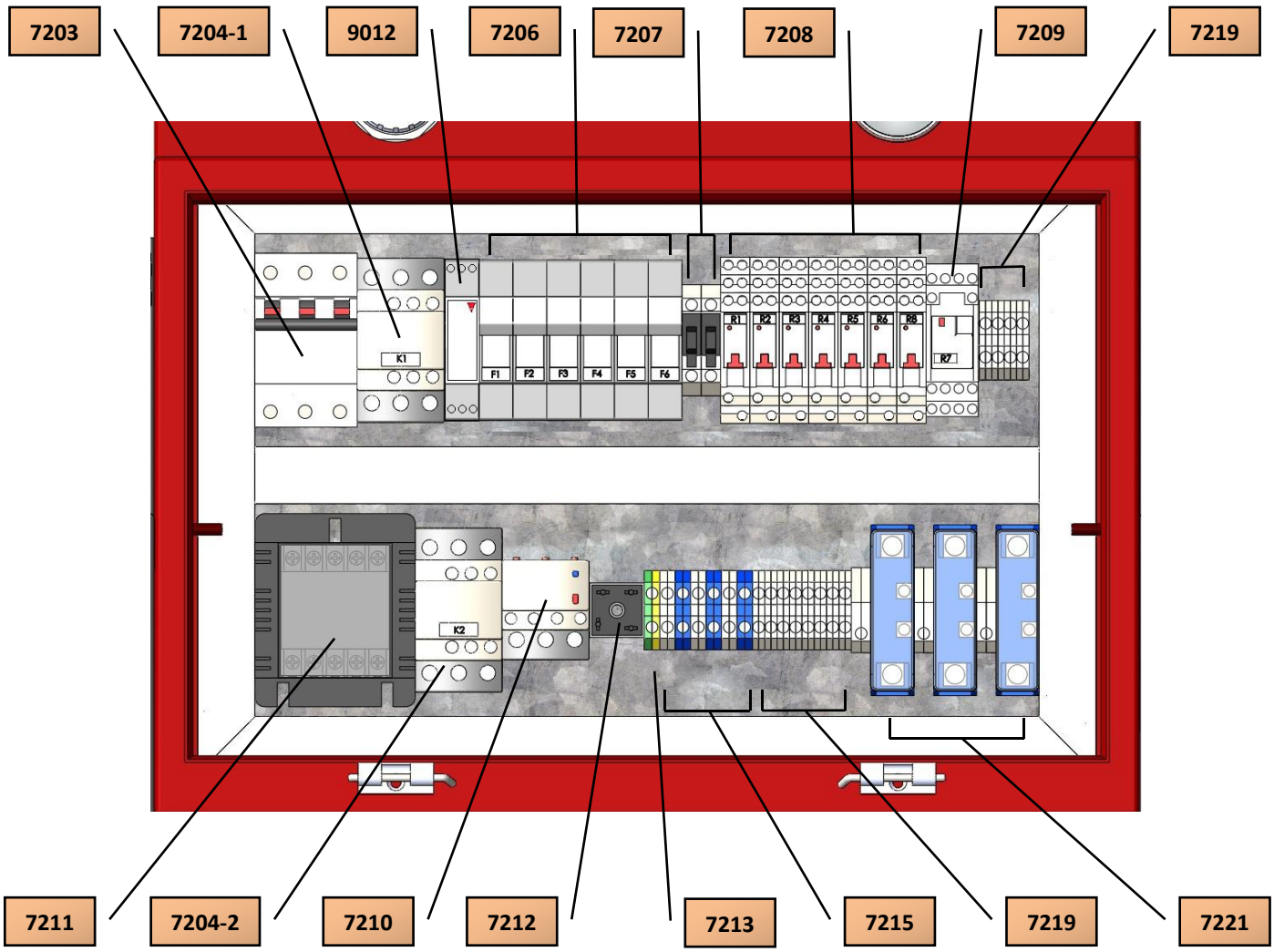
   In the temperature controllers, the safety temperature is adjusted which, if at any time this temperature is exceeded, the Machine stops operating and an alarm is set up in the temperature controller at the same time that the red pilot light located in the upper part of the controller where the alarm is created lights up.

23. FAULT DETECTION IN THE APPLICATION:

The simplest way to objectively detect if there are faults in the application is to observe the spraying, which is affected by the following parameters:

- Temperature: A material that is too hot will produce separation in the fan. A material that is too cold will produce a ripple effect.
- Pressure: Too high a pressure will result in excessive or disaggregated spraying. A pressure that is too low will produce a ripple effect.
- Contamination of the products in the mixing chamber.
- A foreign object in the mixing chamber will cause bad fanning.

24. ELECTRICAL CONTROLS PANEL.

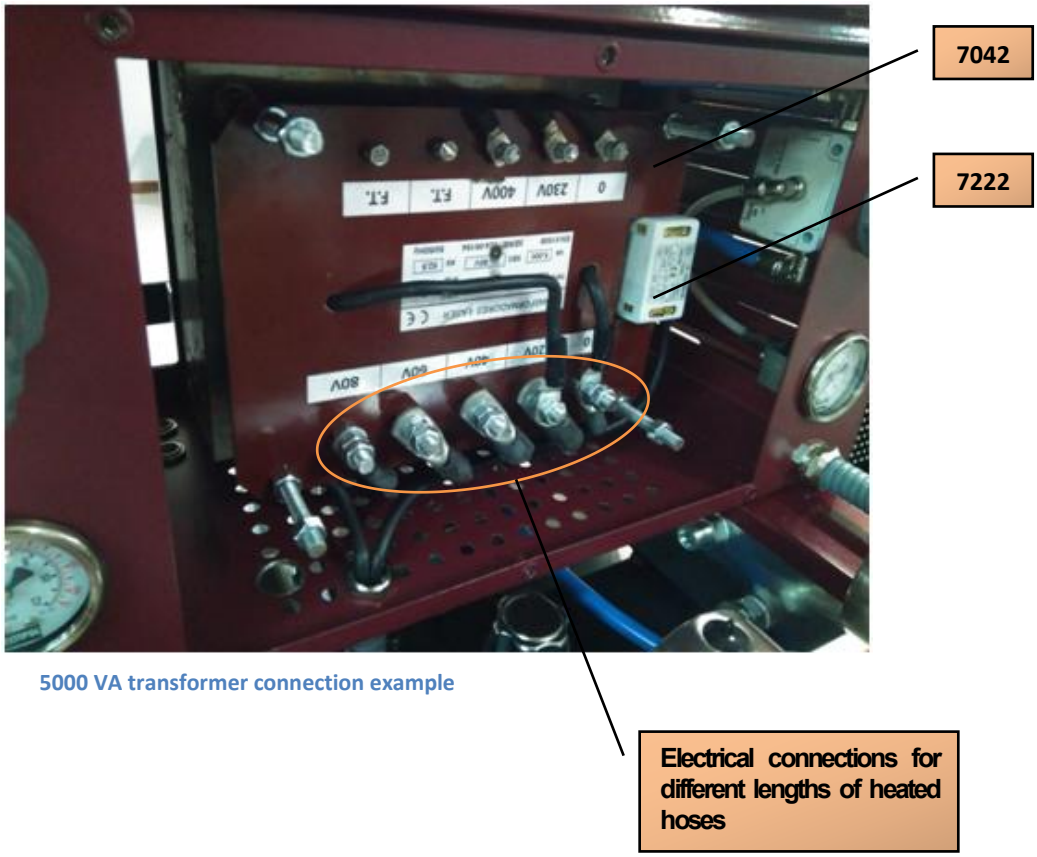


7203 ...General magnetothermal 3x32A
7204-1..... General contactor K1
7204-2.....Motor contactor K2
7206.....Fuses
Polyol.....(F1-F2)
Isocyanate (F3-F4)
Hose (F5-F6)
7207 Maneuvring fuses (F7-F8)
7208 Relays
ISO-POLY Maneuver R1
POLI Alarm R2
ISO Alarm R3
Hose maneuver R4
Hose Alarm R5
Cylinder R6-R8

7209 Solenoid valve relay R7
7210 Motor circuit breaker
7211 Control transformer
7212 Rectifier
7213 Earth terminal
7215 Heater connection terminals
7219 Maneuvring connection terminals
7221 Solid state relays
Polyol
Isocyanate
Hose:

9012 Three-Phase monitoring relay

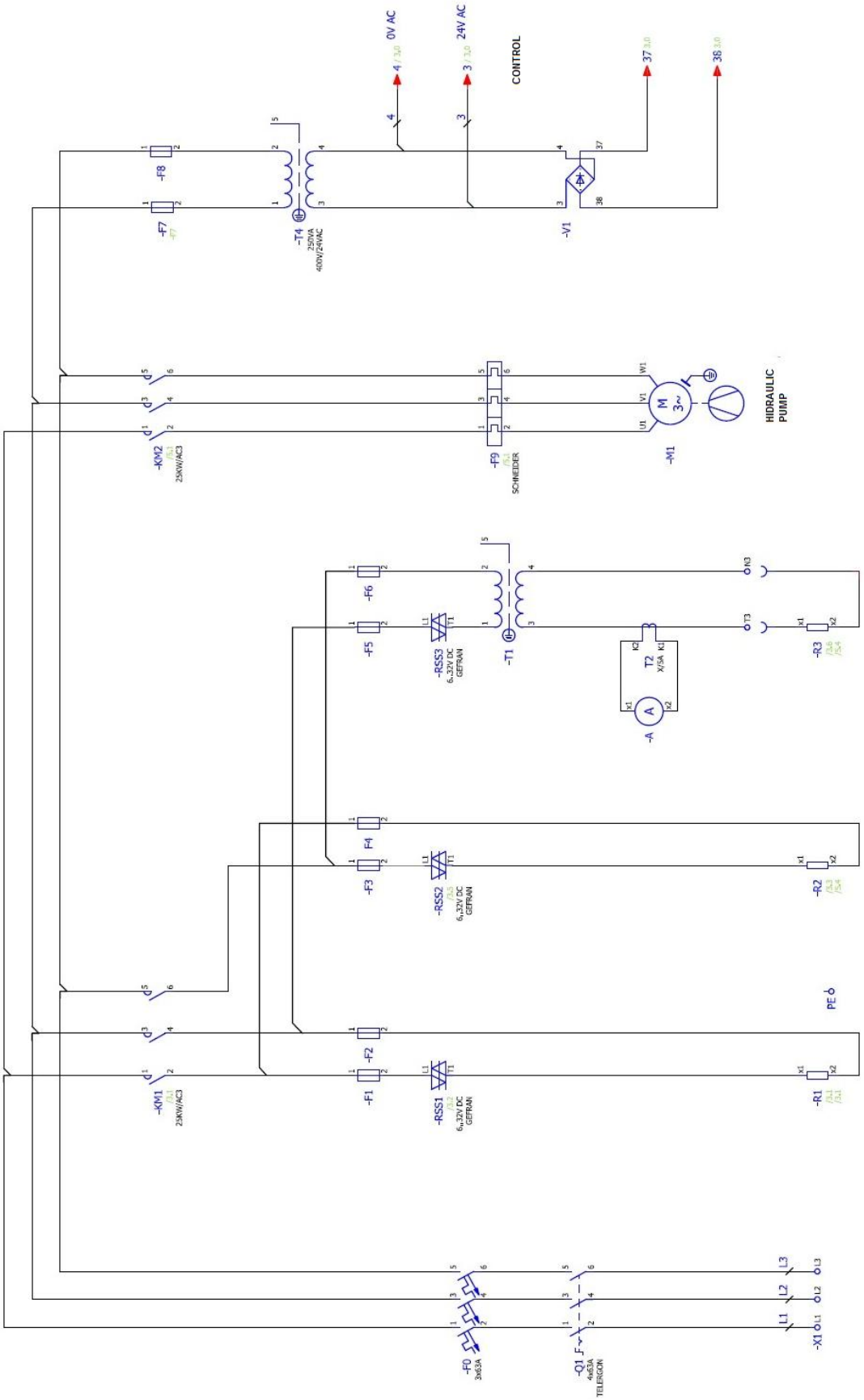
25. HOSE TRANSFORMER.

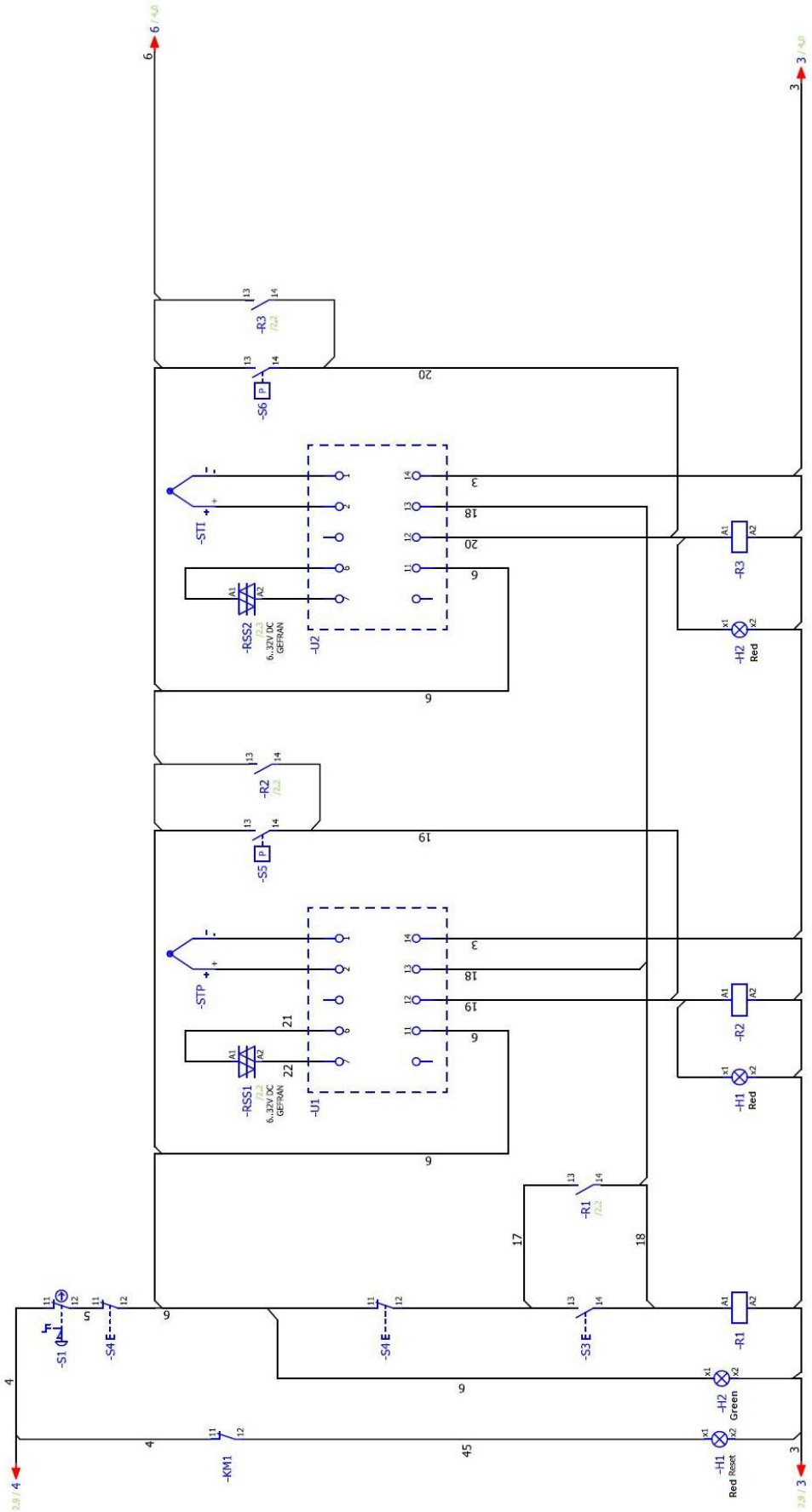


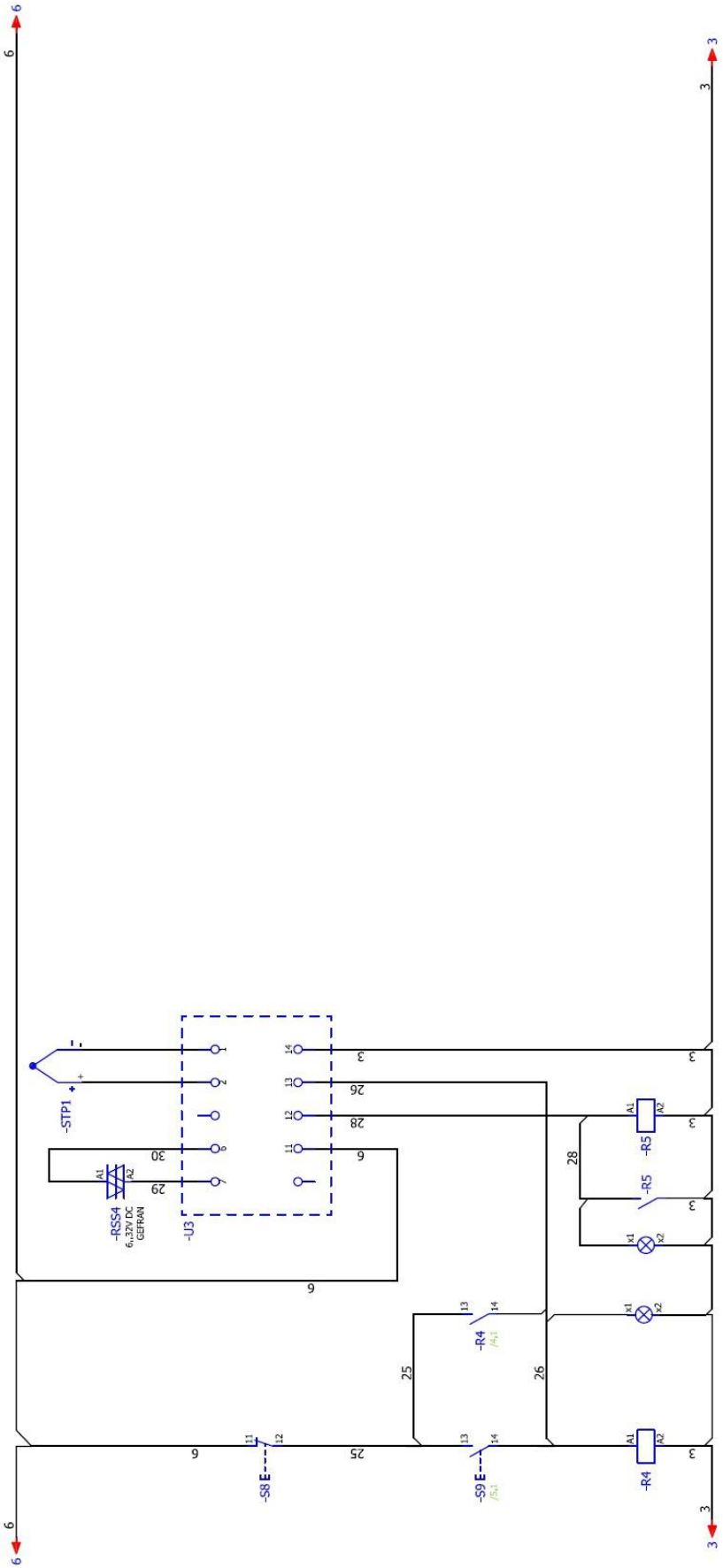
5000 VA transformer connection example

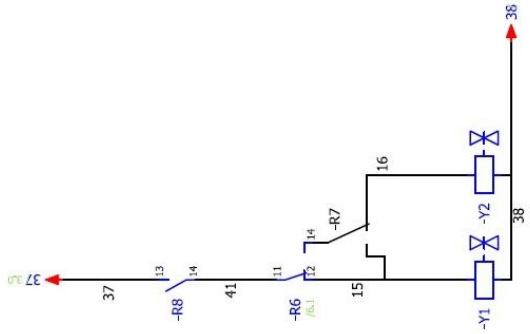
7222 Ammeter transformer.
7042 Hose transformer

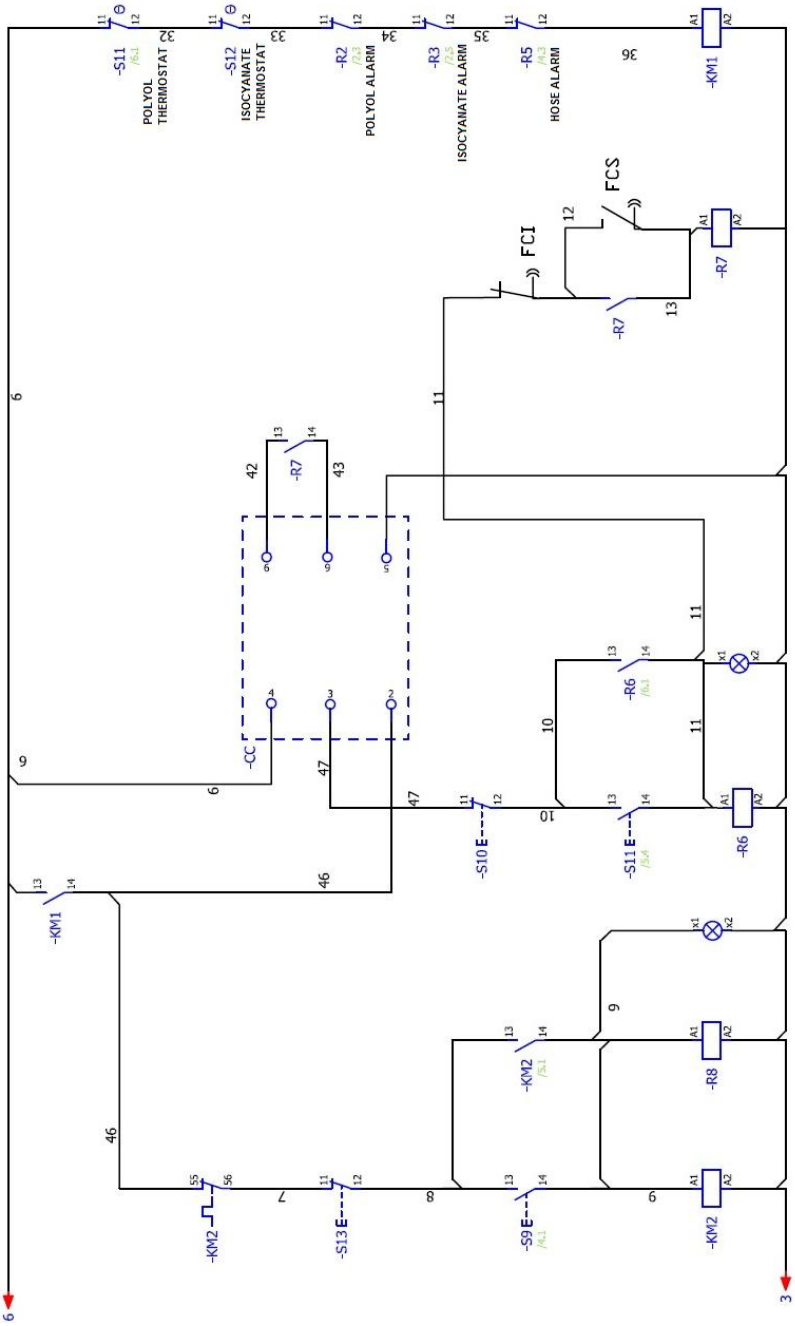
26. ELECTRICAL DIAGRAMS.




-R3
-S6
-STI
-RSS2
6,3V DC
GEFRAN
-U2
-H2
Red
-R2
-S5
-STP
-RSS1
6,3V DC
GEFRAN
-U1
-H1
Red
-R1
-S1
-S4 E
-S4 E
-S3 E
-R1
-H2
Green
-KM1
-H1
Red Reset

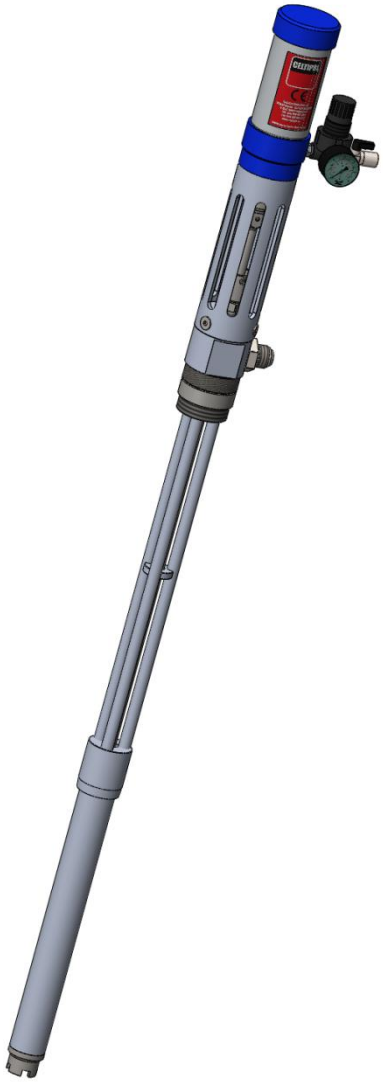

-STP1
-RSS4
6..32V DC
GEFRAN
-U3
-R5
-R4
-S8
-S9
30
29
28
26
25
9
6
3


36
16
-R7
-Y2
38
37
37
-R8
41
-R6
15
-Y1


-S11
POLYOL THERMOSTAT
-S12
ISOCYANATE THERMOSTAT
-R2
POLYOL ALARM
-R3
ISOCYANATE ALARM
-R5
HOSE ALARM
-KM1
FCS
FCI
-R7
-CC
-R6
-S10E
-S11E
-KM2
-S13E
-S9E
6
3

27. LIST OF COMPONENTS

28. TRANSFER PUMPS C-M 16



Technical characteristics of the equipment

- Air pressure:..... 7kg/cm²
- Air consumption:.....200l/min.
- Maximum product outlet pressure:.....20kg/cm²
- Pressure ratio:.....2,8 : 1
- Outflow:..... 30l/min.

Safety in the use of the equipment

- It is advisable for personnel with a history of respiratory complaints to avoid exposure to all isocyanates.
- Chemical products must be handled safely in accordance with manufacturer's recommendations. The manufacturer should provide information on the toxicity of the products used as well as actions to take in the event of accident (wounds, irritation, etc.).
- Products such as polyisocianates, organic solvents and diamines should be stored in a place exclusively for and adapted to such a purpose, with restricted access. Maximum temperatures must be strictly adhered to, both in the application and in storage of chemical products, at all times following the manufacturer's recommendations.
- Also, chemical products are to be stored at all times in suitable containers, following the manufacturer’s recommendations.
- Containers must not be opened until immediately before being used in order to avoid contamination by damp. Any leftover product after being applied should be put back into the original container and be stored in a dry, ventilated place.
- During cleaning tasks of spilt components, it will be essential to use eye protection, gloves and wearing breathing apparatus. Spilt isocyanate can be collected with any absorbent inert product, such as sawdust. In any case, it is important to avoid skin contact. The absorbent product is to be immediately collected and dumped into an open container through the upper part.
- Throughout the entire operation explained above, the area must be correctly ventilated.

Safety personnel equipment:

Celtipol recommends the following personnel safety equipment:

» Protective mask for airways.

» Goggles to protect the eyes.

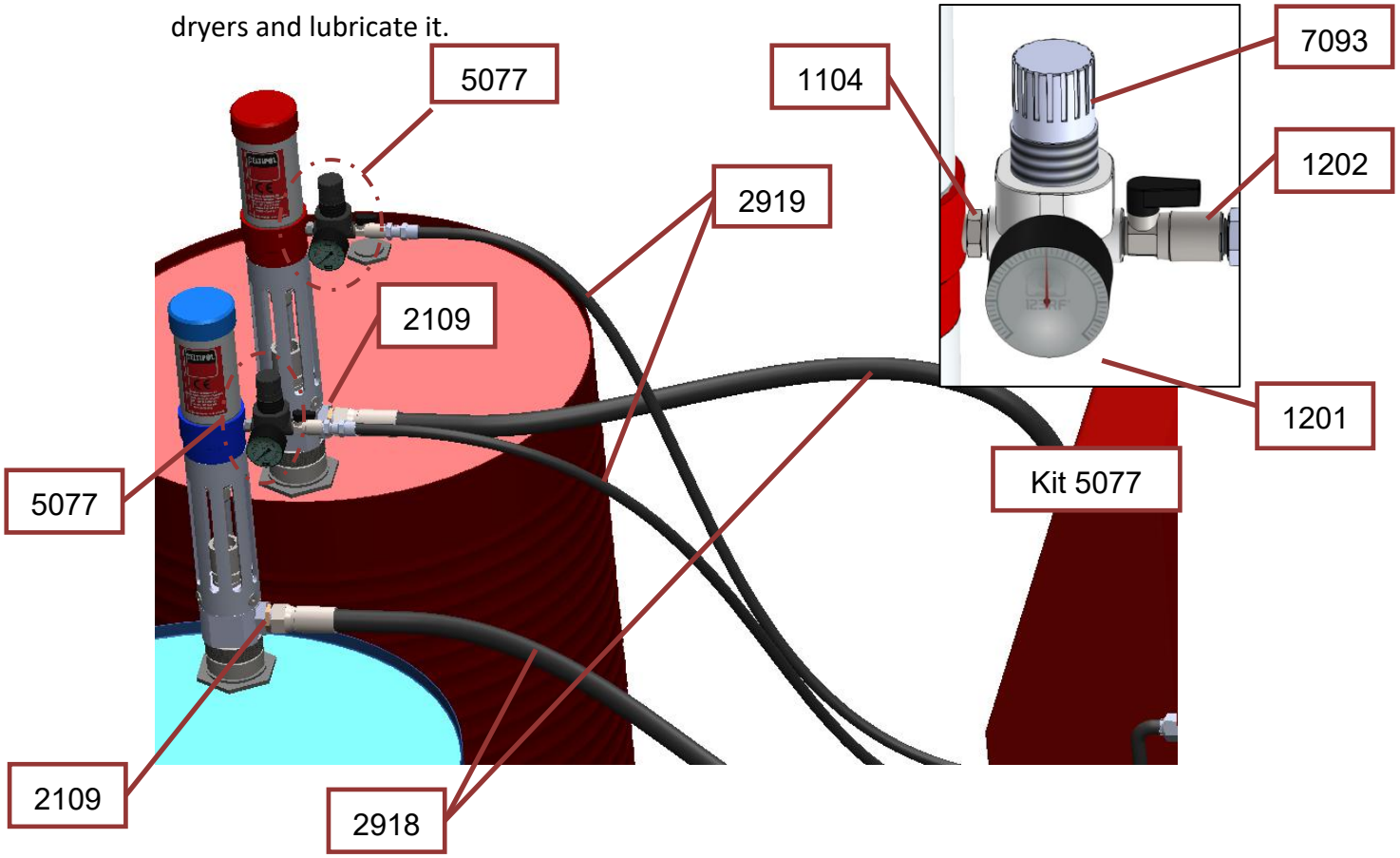
» Headset to protect against noise.

» Gloves to protect hands.

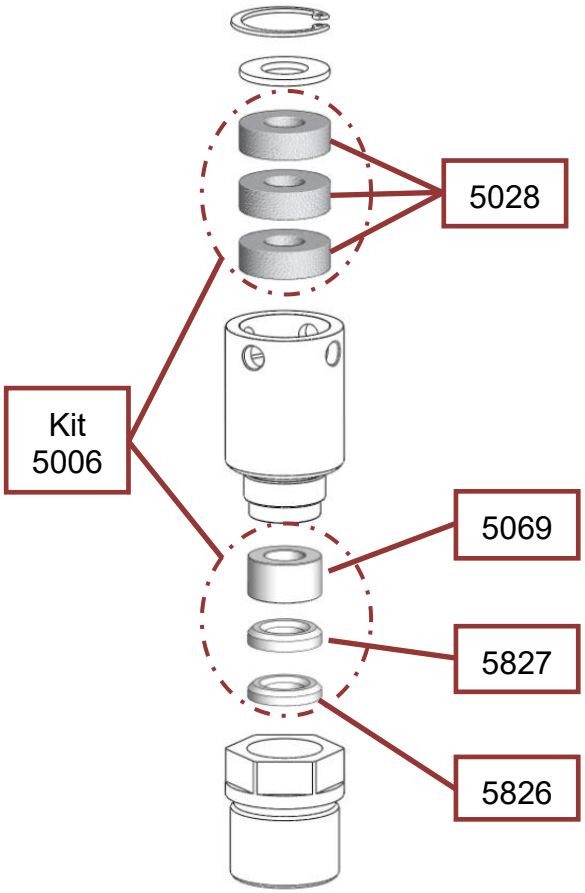
» Protective clothing for the body.

Start up

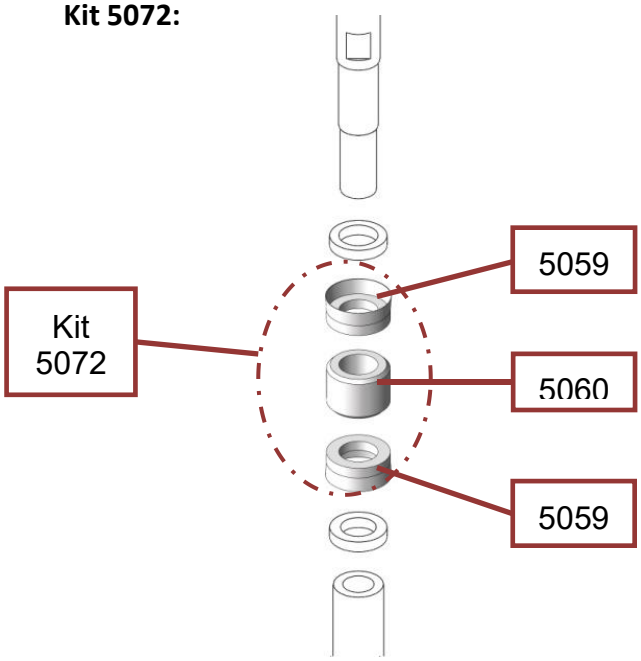
- Insert the pump through the mouth of the drum
- Screw the clamp to the drum (5074) and tighten the seal (It is recommended to apply grease to both threads and gasket).
- Open the breather cap of the drum.
- Connect the product outlet hose (2918) at both ends.
- Connect the air inlet hose (2919) to the pump, through the pressure regulator kit 5077.
- Connect the air hose (2919) to the air outlet *. The pump will start working when the stopcock (1202) is opened.
- Turn the regulator (7093) until the pressure gauge (1201) reaches a maximum of 7 bar.
- * To increase the durability of the equipment it is recommended to treat the air using dryers and lubricate it.



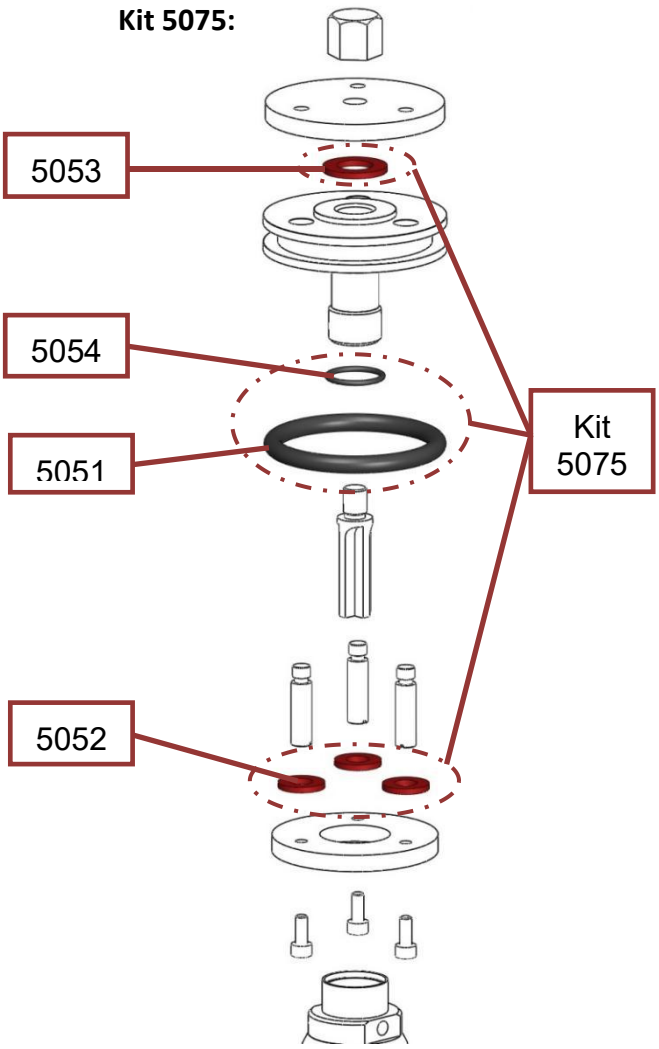
Kit 5006:



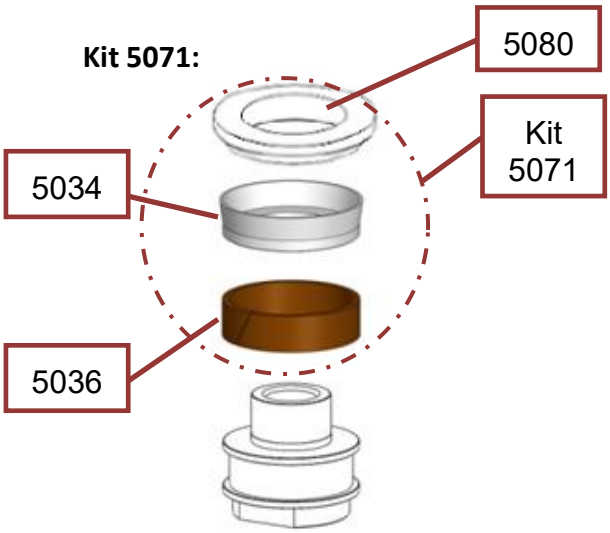
Kit 5072:

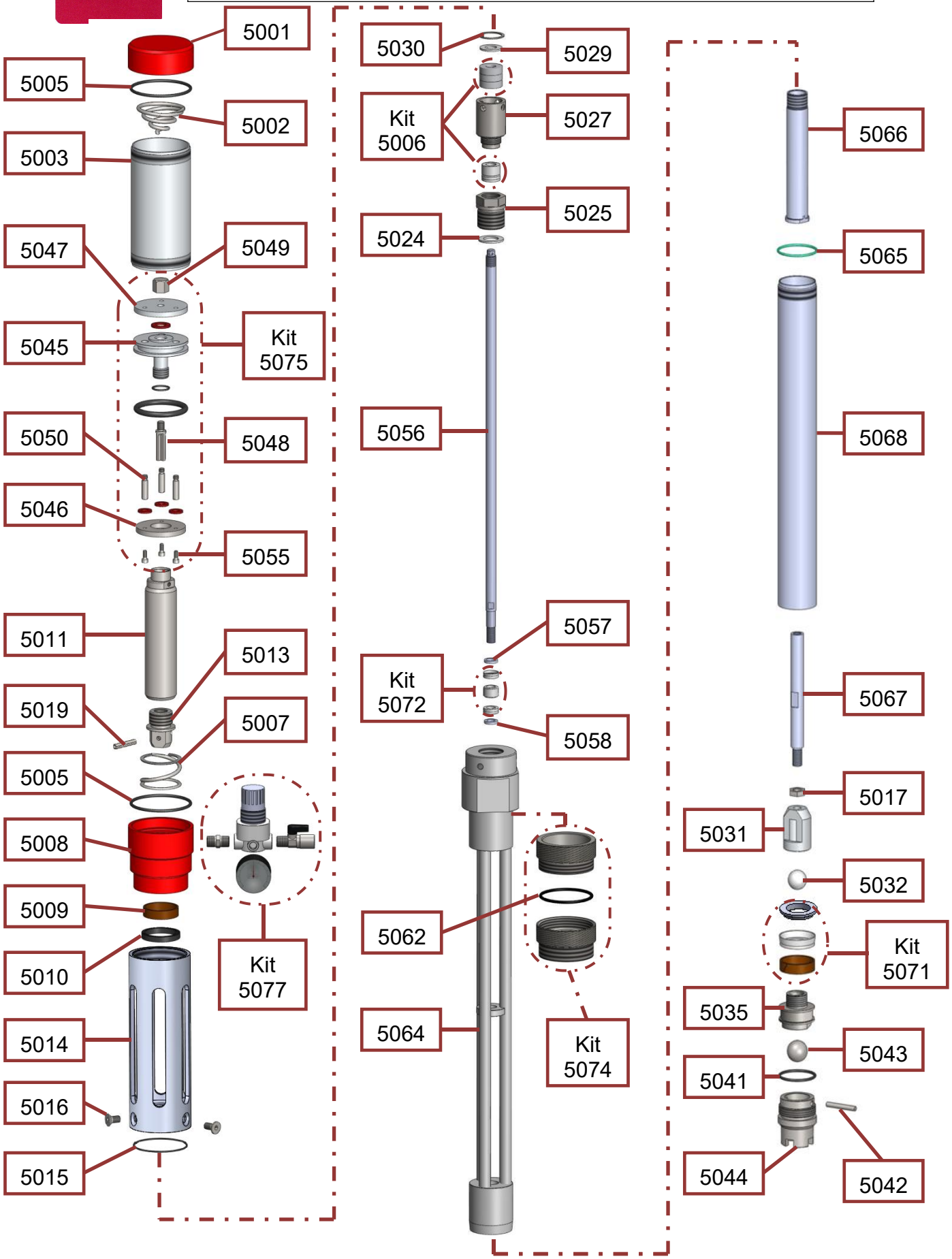


Kit 5075:



Kit 5071:




5001
5005
5002
5003
5047
5049
5045
Kit 5075
5050
5048
5046
5055
5011
5013
5019
5007
5005
5008
5009
5010
5014
5016
5015
Kit 5077
5030
5029
Kit 5006
5027
5025
5024
5056
5057
Kit 5072
5058
5062
5064
Kit 5074
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5065
5068
5067
5017
5031
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Kit 5071
5035
5043
5041
5044
5042

Transfer pump part list C-M 16

REF	DESCRIPTION	QT
2109	Joint M 3/4" – M 1 1/16" SAE	2
2918	Product outlet hose	1
2919	Air inlet hose	1
5001	Cilinder head cover	1
5002	Upper spring	1
5003	Liner	1
5005	O-ring Øint 65x3	2
5007	Lower spring	1
5008	Cylinder head base	1
5009	Rod guide	1
5010	Seal	1
5011	Piston rod	1
5013	Rod cane joint	1
5014	Main pump union	1
5015	O-ring Øint 60x1,75	1
5016	Screw M8	3
5017	Nut M10	1
5019	Pin	1
5024	Nylon closure ring	1
5025	Packing housing	1
5027	Felt housing	1
5029	Felt stop ring	1
5030	Pin	1
5031	Sphere holder	1
5032	Sphere Ø20	1
5035	Lower piston	1
5041	O-ring Øint 36x2,5	1
5042	Sphere holder	1
5043	Sphere Ø22	1
5044	Lower sphere holder	1
5045	Upper piston	1
5046	Lower piston plate	1
5047	Upper piston plate	1
5048	Stem	1
5049	Piston nut	1
5050	Piston stay bolt	3
5055	Screw M4	3
5056	Upper stem	1
5057	Top stop ring	1
5058	Lower stop ring	1
5064	Fluid separator	1
5065	O-ring Øint 40x2	1
5066	Internal cane	1
5067	Lower stem	1
5068	Suction rod	1
5080	Piston ring	1

Kit.5006 Gaskets and felts		
REF	DESCRIPTION	QT
5028	Felts	3
5826	Packing base	1
5827	Central packing	1
5069	Packing guide	1

Kit.5071 Lower piston		
REF	DESCRIPTION	QT
5034	Piston board	1
5036	Piston guide	1
5080	Piston ring	1

Kit.5072 Internal gaskets		
REF	DESCRIPTION	QT
5059	Gasket ring kit	2
5060	Guide kit	1

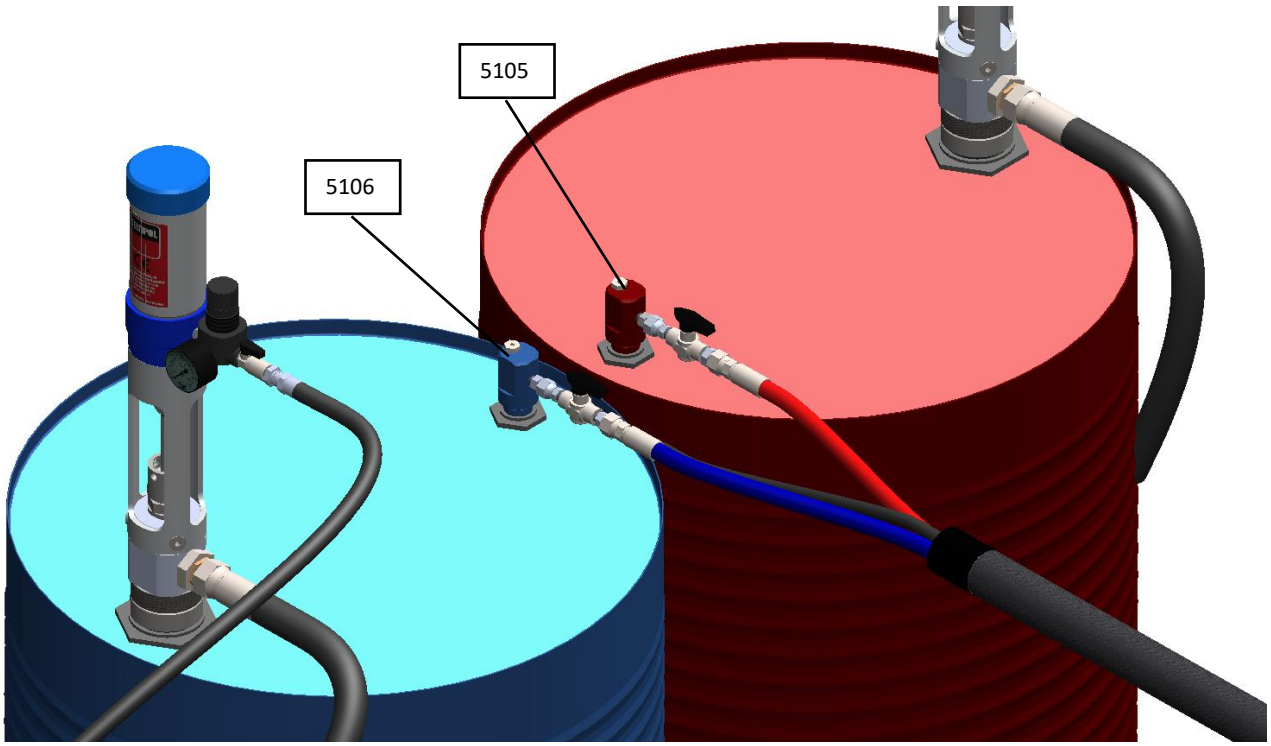
Kit.5074 Drum holder		
REF	DESCRIPTION	QT
5061	Waterpr. pump support	1
5062	O-ring Øin. 53x3	1
5063	Drum connection	1

Kit.5075 Upper piston		
REF	DESCRIPTION	QT
5051	Piston O-ring Øin 50x6	1
5052	Bottom plate gasket	3
5053	Upper plate gasket	1
5054	O-ring Øin. 16x2	1

Kit.5076 O-rings		
REF	DESCRIPTION	QT
5005	O-ring Øint 65x3	2
5015	O-ring Øint 60x1,75	1
5041	O-ring Øint 36x2,5	1
5065	O-ring Øint 40x2	1

Kit.5077 Pressure regulator		
REF	DESCRIPTION	QT
1104	Connector 1/4''NPT Male	1
7093	Pressure regulator 10bar	1
1201	Manometer Ø42	1
1202	Stopcock 1/4'' 20bar	1

29. RECIRCULATION KITS.



REF	DESCRIPTION
5105	Recirculation ISO KIT
5106	Recirculation POLI KIT

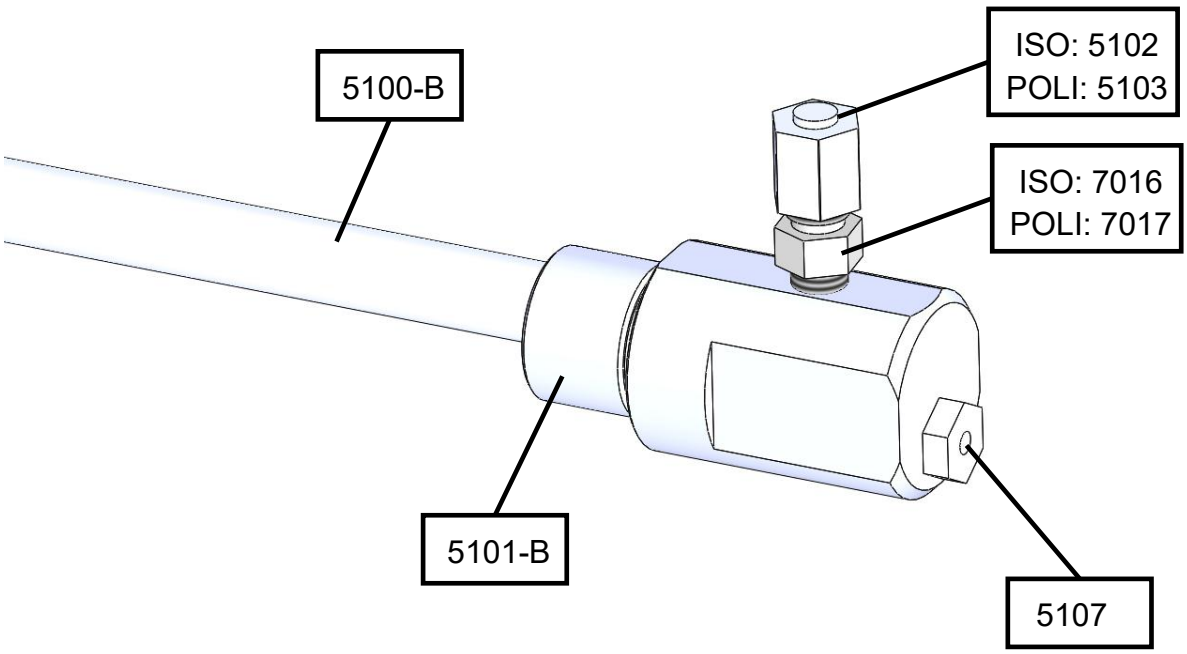
Eventually, the products from the machine must be recirculated. With the recirculation of the products it is possible to raise their temperature before their application and the air and moisture is purged, this being specially important when the weather is cold.

When heating the products, their viscosity decreases and the pressure of each product tends to vary. After a few minutes of recirculation, the temperatures of the products (in hose and heaters) stabilize at the set value, and the pressures of the Isocyanate and the Polyol are equalized in most occasions.

Periodically, the recirculation of the products must also be carried out as a maintenence task, to avoid the crystallization of the Isocyanate in the hoses and ducts. This is especially important when the machine is left idle for long periods. To avoid problems, it is advisable to recirculate the machine every 8days during periods of 10/20 minutes.

To recirculate the machine, proceed as follows:

- Introduce each transfer pump in its corresponding drum.
- Insert the recirculation rods in the breather caps of the Isocyanate and Polyol drums. Care must be taken not to insert the Isocyanate rod into the Polyol drum, or the Polyol rod into the Isocyanate drum.
  Red = Isocyanate; Blue= Polyol
- Unscrew the Polyol and Isocyanate nuts from the spray gun, taking care not to open the ball valves if there is pressure.
- Screw each hose nut onto its respective recirculation rod. The connections are of different sizes to prevent the connection of the Isocyanate hose in the Polyol and vice versa.
- Start the machine.
- Open the valves.
- Recirculate the necessary time.



Spare parts			
REF	**ISO**	**REF**	**POLI**
5100-B	Suction tube	5100-B	Suction tube
5101-B	Recirculation body	5101-B	Recirculation body
5107	Aeration valve	5107	Aeration valve
7016	Union 1/8”NPT-7/16”SAE	7017	Union 1/8”NPT-1/2”SAE
5102	Plug female 7/16”SAE	5103	Plug female 1/2””SAE

30. COMMERCIAL GUARANTEE.

Dear customer,

We thank you for your deference in purchasing this CELTIPOL product and hope you are satisfied with your purchase. In the event that this CELTIPOL product requires any service during the guarantee period, our technical service will assist you at the following address:

Faustino Santalices, Nº 35 - Bande - (Ourense) Spain
Tel: 988 443 105 - Fax: 988 444 410
E-mail: info@celtipol.com

YOUR GUARANTEE:

Through this consumer guarantee, CELTIPOL warrants the product against faults in material and workmanship for a period of 2 years from the original date of purchase.

If during this guarantee period the product has faults in materials or workmanship, CELTIPOL will repair or replace (at CELTIPOL's discretion) the product or its faulty parts, under the conditions specified below and without any charge for workmanship or parts. CELTIPOL reserves the right (at its sole discretion) to replace components of faulty products or to replace low-cost products with new or recycled products, in accordance with the laws of each country.

Conditions:

1. This guarantee is valid only when presented with the original invoice or sales receipt (indicating the date of sale and model purchased) along with the faulty product. CELTIPOL reserves the right not to offer the free guarantee service if these documents are not presented or if the information they contain is incomplete or illegible.

2. This guarantee does not cover or pay for damages resulting from changes or adjustments that may be made to the product, without the prior written consent of CELTIPOL in order to comply with safety or technical standards, national or local, in countries other than those for which the product has been designed and manufactured.

3. This guarantee shall not apply if the serial number of the product has been altered, deleted, has disappeared or is illegible.

4. This guarantee does not cover any of the following:

a. **Regular maintenance and repair or replacement of parts resulting from normal wear and tear.**
b. **Damage resulting from misuse, Including:**

- **Failure to use the product for purposes other than those for which it is designed or failure to comply with CELTIPOL's instructions for use and maintenance.**
- **Installation or use of the product in a manner that does not comply with the technical or safety regulations of the country where used.**
- **Repairs carried out by a non-authorized technical service or by the consumer.**
- **Accidents, lightning, water, fire, inadequate ventilation or any cause beyond the control of CELTIPOL.**
- **Electronic components (inside the control panel) affected by bad connections or sudden voltage changes (electrical fluid deficiencies).**
- **Faults of the system to which this product is incorporated.**
- **This guarantee has no influence whatsoever on the legal rights of the consumer granted by the applicable national legislation, nor on the rights of the consumer vis-à-vis the distributor deriving from the purchase/sale contract established between the two.**

31. CE DECLARATION.

Translation of the original Ec declaration of conformity

Ec declaration of conformity

According to Appendix II, No.1 A of the Machinery Directive 2006/42/CE

The company: **CELTIPOL S.L.**

C/ Faustino Santalices, 35

32840 Bande – Ourense-Galicia

SPAIN

Declares that the equipments types: **CHV-320**

With Serial-No.:

Are in conformance with the provisions of the above-mentioned directive.

CELTIPOL S. L.
CIF B - 32.207.062
Faustino Santalices, 35
32840 BANDE (Ourense)

Bande, 05.03.2021
Place, Date

José Torres Ambrosio
Manager

Translation of the original EC declaration of conformity

CHV-320 TECHNICAL MANUAL

03-2022

Translation of the original manual

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Ourense (España)
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Fabricado en España
Made in Spain