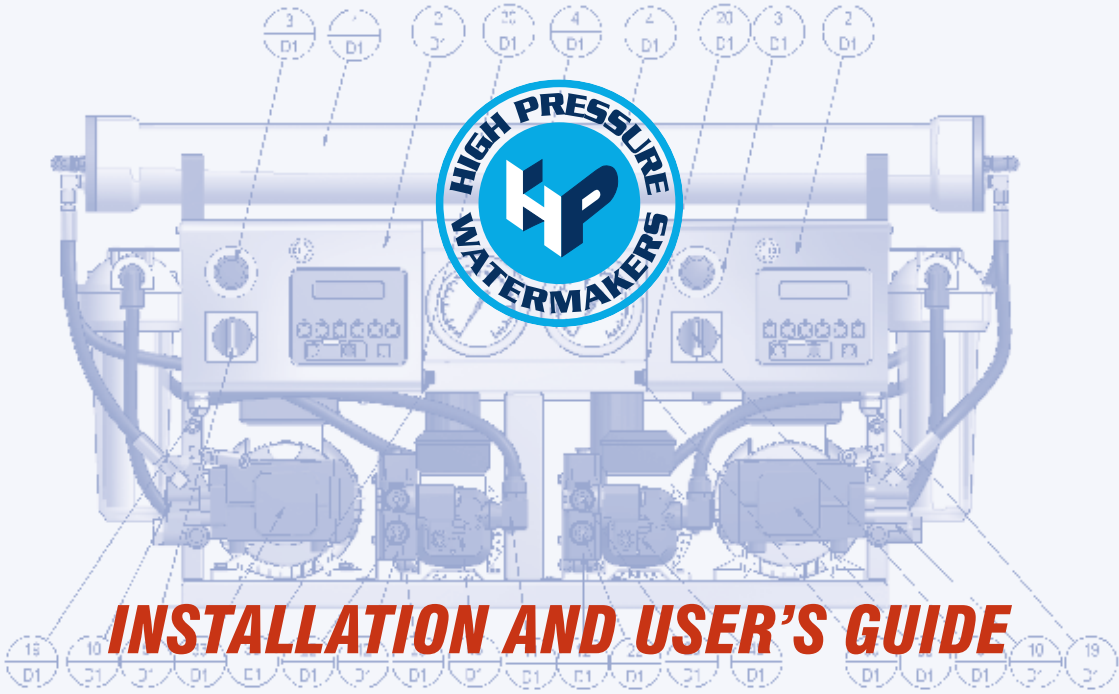
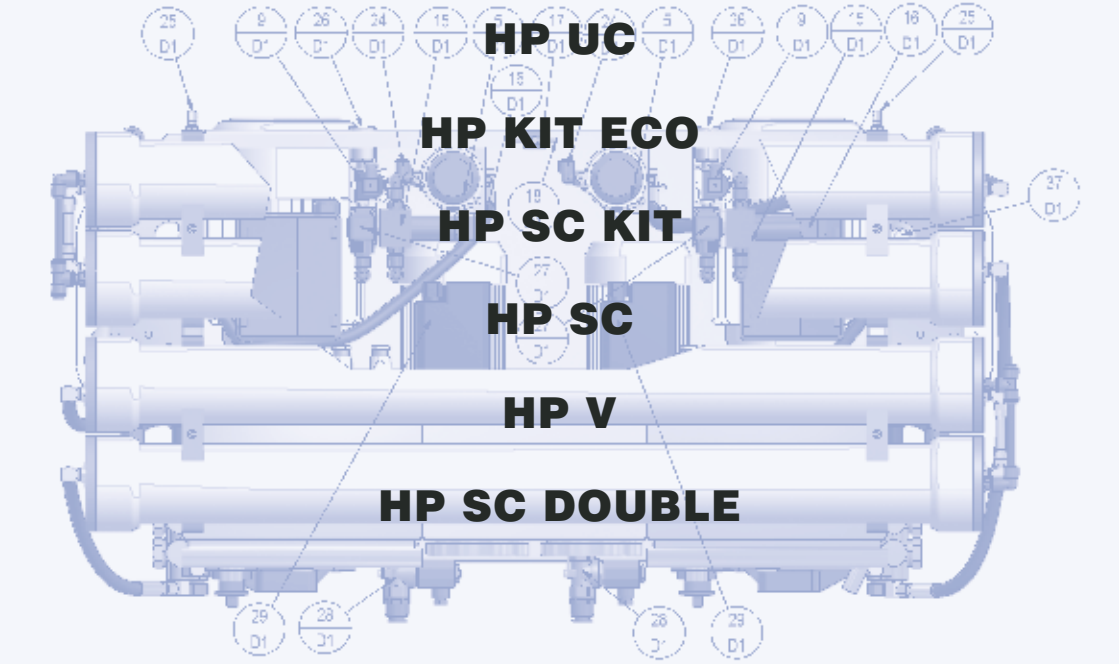


INSTALLATION AND USER'S GUIDE



HP UC

HP KIT ECO

HP SC KIT

HP SC

HP V

HP SC DOUBLE

Dear Customer,

we thank you for having chosen HP WATERMAKERS.
The quality of the materials and the technical devices installed in our systems make these products absolutely new and functional. All the HP units are seriously tested before leaving the factory and they respond to the highest production standards and quality (ISO 9001).
The manual and Auto series machines are covered by a standard 24 months warranty for European Countries and 12 months for Extra EU ones.
All the RP TRONIC and AMCS models (full automatic) are covered by 36 months warranty all over the world on the functioning and on the corrosion.

The warranty is valid only if the registration card has been returned filled in and signed by HP WATERMAKERS Srl – at the following address, Via Fratelli Cervi 16 – 20080 ZIBIDO SAN GIACOMO (MI) – ITALY or sent by fax at the +39 02 90005377.

We remind you that for the best functional result of your watermaker, it would be better install it below the Waterline (if on a yacht) or below a water column under pressure. The installation of a non return valve on the sea water suction line, is always compulsory to avoid lack of water during the treatment.

Before starting the unit, please read this manual carefully, following the installation and use instructions, to avoid functional problems and warranty invalidation.

HP HIGH PRESSURE SRL

WARRANTIES

24 MONTHS (Manual – Auto Series)
36 MONTHS (RP TRONIC – AMCS)

On the functioning and on the corrosion

COMPULSORY: COMPLETE AND RETURN THE CUSTOMER REGISTRATION CARD

The warranty is valid only if the registration card (HP INTERNATIONAL WARRANTY REGISTRATION CARD is sent to HP within 60 days from the date of the purchase. In case the card will not be sent the warranty will not be considered valid.

To activate the registration after that period, a written request to info@hpwatermaker.it, containing all the machine datas, will be required.

The warranty will cover any manufacture defect, of the material and of the part assembly, and it is limited to the replacement and/or reparation of the defective part at HP factory in Zibido San Giacomo (MI).
The warranty is submitted to the yearly technical intervention of the HP authorized technical services, please see the list at the end of this manual.
The technical service intervention (see page x of this book) must be effected yearly at the end of each working season, by any of the service point listed in the HP WATERMAKERS SERVICE NETWORK. The service intervention will be charged to the end user.
The units will be considered covered by warranty after the first year only after the authorized service intervention of maintenance, which will be recognized valid only if the card of maintenance will be stamped and signed by any of the authorized dealers.
Any intervention made by non authorized dealer will automatically decay all the warranties even in case one of the yearly intervention will not be effected.
The warranty does not give any right for the request of indemnity of any kind. HP WATERMAKERS declines any responsibility for material damages directly or not, caused by the watermaker

The warranty is invalidated:
- If the machine has been repaired, unassembled or modified by non authorised personnel
- If the malfunctioning has been caused by mistake during the installation of the electrical cables or non conforming protection fuses.
- If the plant installation has not been done following the correct procedures or if the malfunctioning has been caused by incorrect or bad operation (PLC DIAGNOSTIC).
- If the unit has been used in harbours or in other polluted waters.
- If the unit has been over used or reached by non correct and non conforming voltages (VOLTAGE – PLC DIAGNOSTIC)
- If the unit has been in contact with abrasive and corrosive agents
- If the materials has been subjected to the normal aging (as for example corrosion).

The unit or the defective part will have to be sent back to HP WATERMAKERS factory in Zibido San Giacomo, (at customers cost. HP HIGH PRESSURE will investigate the causes of the defect, and will judge if it will be considered a case of warranty. After the reparation that will be subjected to the costs of intervention, the unit will be sent back to the customer charging the shipping costs.

HP has the right to modify the warranty rules without any notice.

COMPETENT COURT – MILANO (ITALY)

INDEX

WATERMAKER FUNCTIONING DESCRIPTION

MANUAL SERIES PLANTS

The 3 WAY VALVE (38) selects the fluid to use ie. SEA WATER (22) for the desalination phase, FRESH WATER (23) for the plant flushing. The LOW PRESSURE PUMP (8) sends the water selected to the HIGH PRESSURE PUMP (10), via the CARTRIDGE FILTERS, 1st a 20 Micron charcoal filter and 2nd at 5 micron (13 – 14), which remove all particles in suspension larger than 5 micron.
From the HIGH PRESSURE PUMP the water is pushed at 60 bar into the OSMOTIC MEMBRANES (32), where the desalination process takes place, by the REVERSE OSMOSIS PROCESS.
The 60 bar pressure, is reached, by manually adjusting the NEEDLE VALVE (49), installed at the end of the hydraulic circuit, immediately after the membranes high pressure line. The desalinated water, leaving the membranes, is checked by a CONDUCTIVITY SENSOR (16). The water then passes through a three way SOLENOID VALVE (27) and sent to the FLOWMETER (9), which measures the water produced in litres per hour at the moment of the reading.
If the salt content increases over the set values, the salinity control system send a signal to the PLC, which redirects the non conforming produced water to the overboard dump.
At this time the display shows the message WASTE. If the values decreases below the limit set, the water produced will be sent to the fresh water tank.
The dumped water (24), after leaving the membrane passes through the NEEDLE VALVE (49) with hand operated regulation for the adjustment of the watermaker working pressure.
The pressure is read by a PRESSURE SENSOR (7), that sends a signal to the PLC, that in case of too low pressure or too high pressure will stop the unit warning the user on the display.
At the end of the circuit the brine water is directed overboard (24).

AUTO SERIES PLANTS

The automatic flushing valve HP VAL (PATENTED) (12) automatically selects the fluid to pump into the system, SEA WATER (22) for the production phase, FRESH WATER (23) for the watermaker flushing.
The LOW PRESSURE PUMP (8) sends the water selected to the HIGH PRESSURE PUMP (10), via the CARTRIDGE FILTERS, 1st a 20 Micron charcoal filter and 2nd at 5 micron (13 – 14), which remove all particles in suspension larger than 5 micron.
From the HIGH PRESSURE PUMP the water is pushed at 60 bar into the OSMOTIC MEMBRANES (32), where the desalination process takes place, by the REVERSE OSMOSIS PROCESS.
The 60 bar pressure, is reached, by manually adjusting the NEEDLE VALVE (49) installed at the end of the hydraulic circuit, immediately after the membrane high pressure line. The desalinated water is checked by a CONDUCTIVITY SENSOR (16). The water then passes through a three way SOLENOID VALVE (27) and sent to the FLOWMETER (9), which measures the water produced in litres per hour at the moment of the reading.
If the salt content increases over the set values, the salinity control system send a signal to the PLC, which redirects the non conforming produced water to the overboard dump. At this time the display shows the message WASTE. If the values decreases below the limit set, the water produced will be sent to the fresh water tank.
The dumped water (24), after leaving the membrane passes through the NEEDLE VALVE (49) with hand operated regulation for the adjustment of the watermaker working pressure. The pressure is read by a PRESSURE SENSOR (7), that sends a signal to the PLC, that in case of too low pressure or too high pressure will stop the unit alarming the user on the display.
At the end of the circuit the brine water is directed overboard (24).

RP TRONIC SERIES

The 3 WAY VALVE (38) selects the fluid to use ie. SEA WATER (22) for the desalination phase, FRESH WATER (23) for the plant flushing. The LOW PRESSURE PUMP (8) sends the water selected to the HIGH PRESSURE PUMP (10), via the CARTRIDGE FILTERS, 1st a 20 Micron charcoal filter and 2nd at 5 micron (13 – 14), which remove all particles in suspension larger than 5 micron.
From the HIGH PRESSURE PUMP the water is pushed at 60 bar into the OSMOTIC MEMBRANES (32), where the desalination process takes place, by the REVERSE OSMOSIS PROCESS.
The 60 bar pressure, is obtained by the RP TRONIC VALVE (PATENTED) (5) with full automatic regulation which adjust the watermaker working pressure installed at the end of the hydraulic circuit, just after the membranes high pressure line.
The desalinated water, leaving the membranes, is checked by a CONDUCTIVITY SENSOR (16). The water then passes through a three way SOLENOID VALVE (27) and sent to the FLOWMETER (9), which measures the water produced in litres per hour at the moment of the reading. If the salt content increases over the set values, the salinity control system send a signal to the PLC, which diverts the non conforming produced water to the outboard dump.
At this time the display shows the message WASTE. If the values decrease below the limit set, the water produced will be sent to the fresh water tank.
The dumped water (24), leaves the membrane via the RP TRONIC VALVE (PATENTED) (5) .
The pressure in the system is read by a PRESSURE SENSOR (7), that sends a signal to the PLC, that in cases of too low or too high pressure will stop the unit and warn the user on the display.
At the end of the circuit the brine water is sent overboard (24).

AMCS FUNCTION

During the automatic flushing of the system in the series AUTO and RP TRONIC the AMCS system, installed on the fresh water line inlet, doses a minimum quantity of conserving product, to prevent bacteria growth in the circuit and on the membranes film. Once the flushing cycle is ended the AMCS pumps stops automatically.

MODBUS PROTOCOL

The MODBUS communication protocol, combined with the MB mother board allows the yacht monitoring systems to access all the functions and data of the watermaker directly from the main monitoring system installed on the cockpit. This function is available on request.

INSTALLATION

Install the watermaker if possible below the Waterline (or in the case of land based applications, below an adequate column of sea water, i.e. sea water holding tank), fixing it with the four holes on the base of the frame. To avoid vibration transmissions, due to the motor and pump running, it is advised to install on SILENT BLOCKS (Rubber mounts) (44), which are not supplied because they can vary in shape, size and type depending on different installation cases.
Install a 1" (one inch) seacock connected to a strainer, this may be reduced to ½" (half inch)
The non return valve is compulsory in the installation.

Connect the sea water line to inlet of the unit (22), half inch (½").

Connect the pressurised fresh water line linked to the holding tanks with the fresh water inlet (23), half inch (½"). The working pressure of the water going to the unit must not exceed 3 bar, otherwise install a pressure reducing device in the sea water inlet.

Connect the main dump (24), and the non conforming produced water (25) to the dump outboard, by two separate independent lines or connect them together by using a Y fitting. In the case of installation of a T fitting (46), refer to the installation schemes in the next pages. In the SC DOUBLE models the concentrate dump and the non conforming water lines are already connected together.
Connect the produced fresh water outlet (26) to the holding tank (47). NOTE: Do not connect the production outlet pipe to the vent system of the tank.

Connect the electrical supply cable (19) to the main switchboard, using adequate magneto thermal switches (Circuit Breakers) following the AMPS table here below.
Plug the remote control panel cable (serial door – 20) to the unit electrical switchboard.

AMP TABLE

HP UC	1X10A
HP KIT ECO	1X16A
HP SC KIT	1X16A
HP SC	1X16A
HP V	1X16A
HP SC DOUBLE FINO A 540	2X16A
HP SC DOUBLE FINO A 1600	2X20A

Provide the grounding of the plant, with a link between the frame and the general mass on board. If the AISI 316 stainless steel pressure vessels are installed on the unit, please link them to the grounding system to avoid that the galvanic corrosions on the metal. In this case it will be compulsory to connect both side of the pressure vessel. Where the pressure vessels are the type made of carbon fibre this procedure will not be necessary.
Once electrically and hydraulically installed, the watermaker is ready to be commissioned, and started as described in the next paragraphs.
For all the fitting connections we recommend the use of Teflon tape or LOCTITE 5331. For the AISI316 ones we recommend the use of LOCTITE 542. If other types of sealant are used, HP High Pressure Srl will not be responsible for any damage caused by these. We recommend the use of 2 X AISI 316 hose clips on all the pipes connections to the unit and between all the components of the installation (sea inlet, strainer, non return valve etc.).

NOTE: We remind you that installation mistakes and damages caused by and related to, faulty installation will make all warranties invalid.

COMMISSIONING OF THE PLANT

BEFORE STARTING THE UNIT

Be sure that all the installation instructions have been followed carefully. For the first start during the commissioning be sure that the unit is reached by the sea water checking that the machine or the low pressure pump, has been installed below the sea level or in any case that the non return valve (40) is installed after the strainer. WARNING: Avoid the operation of the low pressure pump without water. Starting the low pressure pump without water can cause seals and bearings damage. Also do not start the high pressure pump without water. Starting the HP pump without water can cause piston damage.

Both sea water (22) and the fresh water (23) must reach the watermaker, before starting.

All the related valves must be opened.

In the case of modular systems with separate components, check that all the hydraulic pipes and fittings are all sealed. If leaks are found on the PVC or AISI 316 fittings, the problem can be solved tightening them adequately.

WARNING:

MANUAL AND AUTO SERIES: to avoid starting the unit under pressure, it will be necessary to open the hand operated pressure regulation needle valve fully, turning it anti-clockwise.

RP TRONIC SERIES: It will not be necessary to adjust the pressure regulation valve (please read carefully when an intervention on the RP TRONIC VALVE is needed).

NOTE: The warranty will be void if the installation instructions are not followed fully, or if any parts are modified or manipulated, and if the unit is not maintained following the service programs.

MANUAL SERIES COMMISSIONING

Be sure that the check valve on the sea water line is completely open and the fresh water circuit is under pressure (boat fresh water pump ON). Open the hand operated flushing valve (38), to the sea water line (22). Check that the hand operated pressure regulation valve (49) is completely open, by turning it anti-clock wise. Press PRIME and let the unit be filled with water for about 5 minutes. During this phase it will be necessary to clear the air contained in the pre filters (13 – 14), by opening with a screwdriver the bleed valves (37). When all the air is completely eliminated, the water will leak out from a small hole positioned on the vent valve, which can now be closed. When the plant is primed, verify that the brine water is being dumped overboard; it will now be possible to start the plant.
Directly press START without stopping the low pressure pump and turn the hand operated pressure valve (49) clockwise, to obtain a pressure of 50 bar.
Wait for 2 minutes to stabilise the pressure, after that adjust the valve slowly clockwise up to 60 bar.
Check on the display the hourly production (lt/h) and the quality of the water (GOOD).

AUTO SERIES COMMISSIONING

Be sure that the check valve on the sea water line is completely open and the fresh water circuit is under pressure (boat fresh water pump ON). Insert the spacer (17), on the piston shaft (12-2) of the automatic flush valve stopper (12), which must be lifted manually, opening the sea water inlet (22). Check that the hand operated pressure regulation valve (49) is completely open, turning it anti clockwise. Press PRIME and let the unit be filled with water for about 5 minutes. During this phase it will be necessary to clear the air contained in the pre filters (13 – 14), by opening with a screwdriver the bleed valves (37). When all the air is completely eliminated, the water will leak out from a small hole positioned on the vent valve, which can now be closed. When the plant is primed, verify that the brine water is being dumped outboard, it will now be possible to start the plant.

Directly press START without stopping the low pressure pump and turn the hand operated pressure valve (49) clock wise, to obtain a pressure of 50 bar. Wait for 2 minutes to stabilise the pressure, after that adjust the valve slowly clockwise up to 60 bar.
Check on the display the hourly production (lt/h) and the quality of the water (GOOD). Once the watermaker is working at its best it will be necessary to remove the spacer (17) - see page 60 -, in order for the the automatic flushing of the unit when the machine is stopped.

RP TRONIC SERIES COMMISSIONING

Be sure that the check valve on the sea water line is completely open and the fresh water circuit is under pressure (boat fresh water pump ON). Insert the spacer (17), on the piston shaft (12-2) of the automatic flush valve stopper (12), which must be lifted manually, opening the seawater inlet (22). Check that the hand operated pressure regulation valve (49) is completely open, turning it anti clockwise. Press PRIME and let the unit be filled with water for about 5 minutes.
During this phase it will be necessary to clear the air contained in the pre filters (13 – 14), by opening with a screwdriver the bleed valves (37). When all the air is completely eliminated, the water will leak out from a small hole positioned on the vent valve, which can now be closed.
When the plant is primed, verify that the brine water is being dumped outboard, it will now be possible to start the plant.
Directly press START without stopping the low pressure pump. After some seconds the automatic pressure regulation RP TRONIC (5) will gradually adjust the pressure (2 minutes) and the plant will reach a pressure of 60 bar. Check on the display the hourly production (lt/h) and the quality of the water (GOOD).
Once the watermaker is working at its best it will be necessary to remove the spacer (17), in order for the the automatic flushing of the unit when the machine is stopped.

START

It is not necessary to press PRIME when the machine has to be started after initial commissioning.

MANUAL SERIES

Open the sea water line (22) via the hand operated flushing valve (38) and press START. For the first 10 seconds the low pressure pump will work and then the high pressure pump. Turn the pressure regulation valve (49) clockwise, until the pressure reads 50 bar. Wait for 2 minutes to stabilise the pressure, then further adjust the valve clockwise up to 60 bar.

AUTO SERIES

The automatic flushing valve (12) automatically selects fresh water for initial start to ensure feed water at start then sea water for the desalination phase and again fresh water at stop for flushing.
Press START. For the first 10 seconds the low pressure pump will work (when the watermaker is equipped with Shurflo or Flowjet pumps, these could work intermittently, due to the pressure switch, that detects the presence of the pressure in the circuit). After the first 10 seconds the high pressure pump will start running. Turn the pressure regulation valve (49) clockwise, up to 50 bar. Wait for 2 minutes to stabilise the pressure, then further adjust the valve clockwise up to 60 bar.

RP TRONIC SERIES

The automatic flushing valve (12) automatically selects fresh water for initial start to ensure feed water at start then sea water for the desalination phase and again fresh water at stop for flushing.
Press START. For the first 10 seconds the low pressure pump will work (when the watermaker is equipped with Shurflo or Flowjet pumps, these could work intermittently, due to the pressure switch, that detects the presence of the pressure in the circuit). After the first 10 seconds the high pressure pump will start running. At this point the automatic RP TRONIC valve activates, automatically adjusting the working pressure, in a first phase at an intermediate pressure for about 2 minutes, then further adjustment to 60 bar (+ or – 1 bar). During the regulation phase the buttons + and – will flash.
The start phase can be also operated from the remote control panel.

NOTES FOR ALL THE MODELS

During the working phase the LEDs on the PRIME, SAND FILTER & START button will be illuminated.
The display shows:
1. Working pressure (bar)
2. Water quality (BEST W – produced water at the maximum quality standard – GOOD W produced water at a good standard – POOR W – non conforming water, which is dumped out board),
3. Quantity of water produced (lt/h) the working hours (Wh).

The quantity of produced water depends on three variables, working pressure (60 bar), sea water conductivity (32.000 ppm), sea water temperature (25°). The values in the parenthesis indicates the best values, for getting the nominal production of the plant. If one of them changes, the productivity of the plant changes. With a higher salinity of the water the productivity of the plant decreases as well as with a lower pressure and temperature. The production increases when the salinity of the water decreases, and when the pressure and the temperature increase.
There are limits for pressure and temperature that must be respected (max 72 bar and 45°C) .
With regards to the feedwater temperature, for every degree lost below 25°C, there is a production decrease of the 3% as well as a production increase for each degree gained to a maximum of 45C.

PRODUCTION STOP – MEMBRANE FLUSHING

To stop the unit and the related fresh water flush of the circuit and membranes follow the procedures below. Once the desalination process is ended it is always necessary to flush the unit with fresh water to avoid that the salt contents would settling on the membranes, crystallising and clogging the membranes.

MANUAL SERIES

Turn the hand operated pressure regulation valve (49) anti clockwise to obtain a pressure of 25 bar. Press STOP. During this phase the high pressure pump (10) stops while the low pressure pump (8) goes on working (when machines are equipped with the Shurflo or Flojet Low Pressure pumps, these could be working intermittently). Turn the hand operated flushing valve (38), to divert the fresh water line (23), coming from the pressurised fresh water line and wait for the end of the flushing time count down (XXX – WASH on the display). At the end of the flushing it will be necessary to turn the hand operated valve (38) back to the position of sea water inlet (22) to avoid emptying of the fresh water tank. At the end of the flushing cycle the low pressure pump stops and the unit is at a standby mode.

AUTO SERIES

The membranes and circuit flushing on the AUTO series is automatic. At the end of every production cycle the flushing valve (12) automatically opens the fresh water line, flushing the circuit and the membranes to avoid that the salt contents settling on the membranes, crystallising and clogging the membranes. Turn the hand operated pressure regulation valve (49) anti clockwise to obtain a pressure of 25 bar. Press STOP. During this phase the high pressure pump (10) stops while the low pressure pump (8) goes on working (in case the machines are equipped with the Shurflo or Flojet Low Pressure pumps, these could be working intermittently). Wait for the end of the flushing time countdown (XXX – WASH on the display).
At the end of the flushing cycle the low pressure pump stops and the unit is at a standby mode.

RP TRONIC SERIES

The membranes and circuit flushing on the RP TRONIC series is automatic. At the end of every production cycle the flushing valve (12) automatically opens the fresh water line, flushing the circuit and the membranes to prevent the salt contents settling on the membranes, crystallising and clogging the membranes. Turn the hand operated pressure regulation valve (49) anti clockwise to obtain a pressure of 25 bar. Press STOP.
During this phase the high pressure pump (10) stops while the low pressure pump (8) goes on working (in case the machines are equipped with the Shurflo or Flowjet LP pumps, these could be working intermittently). In the RP TRONIC series the pressure regulation valve (RPT - 5) opens automatically, allowing the outflow of the brine coming from the membranes flushing. In this phase the LED of the – (minus) button flashes. Wait until the end of the flushing time countdown (XXX – WASH on the display). At the end of the flushing cycle the low pressure pump stops and the unit is at a standby mode.

WARNING: Do not stop the watermaker at the dedicated switch on the main electrical switchboard of the boat or by stopping the genset. This procedure would interrupt the flushing cycle with serious consequences to the productivity of the membranes in the future production phases. The system diagnostics record all the operations of starts and stops and all the machine alarms. Where there is no correspondence between the number of stars and stops, the warranty could be compromised.

AMCS

During the automatic flushing phase in the AUTO and RP TRONIC systems, the AMCS device, installed on the fresh water flushing line, doses a minimal quantity of conserving product to preserve the membranes from the bacteria growth. Once the flushing cycle is finished the AMCS system deactivate automatically. (SEE THE INSTALLATION SCHEME).

The AMCS has its own switch, 0-1 and/or ON-OFF (depending on the models supplied). To verify if the system is working and during the wintering phase, proceed as follows. On the watermaker control panel press MAN.VALVE button and then press PRIME, to start the low pressure pump and simultaneously giving the consent to the AMCS system to be activated). The AMCS pump during the factory test is always left with the switch ON. In case it was found on OFF position, it will be necessary to switch it ON, adjusting the dimmer at 5% during the normal service and at the 30% during the wintering service. In order to let the AMCS system work automatically, keep the switch in the position ON. The pump will be activated only during the flushing phase. To stop the hand operated usage of the AMCS press PRIME and MAN. VALVE just after.

STANDARD MAINTENANCE

We remind you to check and maintain the unit frequently, to avoid problems during the usage of the units and expenses for the machine reparation. This is not only a recommendation but an obligation to maintain the warranty valid. However the warranty is considered valid only if the maintenance program is followed and respected (see the end of this manual).

FILTER CHANGE

The frequency of the filter change (charcoal filter (13) and 5 micron (14)) depends on the water quality of the water pumped in the unit and so is variable from case to case. However the filters are installed in transparent housings in order to check the clog level. When the filters are clogged, the machine will warn the user displaying the following message LOW PRESSURE – NO WATER IN CIRCUIT.

HP PUMP OIL CHANGE

After the first 500 working hours the PLC will warn to change the oil showing the message CHANGE OIL. So it will be necessary to change the oil (SAE 20-40). Unscrew the oil cap (52) from the HP pump, and remove the old oil with the help of a oil syringe and fill the pump body with SAE 20-40 oil, reaching the level on the probe of the oil cap. Once the oil is replaced press RESET.

HP PUMP SEAL AND PISTONS CHANGE

The piston seal consumption is variable, (between 500 and 900 working hours). Anyhow they have to be changed if the pump is leaking from the pump manifold. To change the gasket and pistons, order the KIT (COD.10 for the HP UC MAN – HP UC RP TRONIC models - COD.12 for all the models, MANUAL from 70 up to 540 lt/h – COD.13 for all the models RP TRONIC from 70 up to 540 lt/h).

AUTOMATIC FLUSHING VALVE

The automatic valve, being in contact with the sea water in the inner chamber, can be subjected to clogs due to the salt deposits coming from the sea water line. To prevent the blocking of the piston, the inner chamber of the valve must be cleaned at every season's end.
Unplug the fittings on the sea water and fresh water lines going into the valve. Open the valve cap, by the four screws on the top.
Extract the piston and clean it with warm fresh water, and soap. AVOID abrading (scratching) the internal wall with tools. Once the components are cleaned check that the seat of the piston is not damaged, and the seals are not spoiled. In case these last are damaged please contact HP factory to get the repair kit. Silicone grease the seal and fit the piston back to its original position and close the valve cap tightening the screws.
If it is difficult to get the piston out from the valve body please contact HP factory.

BELTS (only UC series)

After the first 30 working hours it is necessary to adjust the pump-motor coupling belts, by adjusting (tightening) the screws posed on the rear side of the plant and check them every 50 working hours.

ERROR MESSAGES - TROUBLESHOOTING

PROBLEM:
PLC message: ALARM LOW PRESSURE NO WATER IN CIRCUIT
Press reset to go back to the stand by position.

CAUSES	REMEDY
1) Lack of water in the inlet	Open the sea water valve. Purge the pre filters of air.
2) Sea water check valve closed	Lack of water in the fresh water holding tanks – Emergency start with the valve spacer on the automatic flushing valve. Insert the spacer (17), on the piston (12-2) of the automatic flush valve stopper (12), that must be previously extracted (pulled up) manually, opening the sea water inlet (22) and Press PRIME and let the unit be filled with water for about 5 minutes. During this phase it will be necessary to clear the air contained in the pre filters (13 – 14), opening with a screwdriver the bleed valves (37). When all the air is completely eliminated, the water will leak out from a small hole positioned on the vent valve, which can now be closed. Press START to let the unit work. The spacer (17) can be removed from the emergency position.
3) Valve of auotclaves closed	Open the valve of autoclaves
4) Clogged filters	Clogged filters change
5) Pressure sensor not working properly (i.e. pressure reading on the display 0 bar, reading on the gauge. 30 bar)	Pressure sensor change. It is possible to work in emergency mode deactivating from the PLC the pressure sensor (PRESSURE SENSOR - OFF), by entering the sub menu. In case the pressure sensor is defective the reading on the display will be 0 bar. This 0 reading will prevent the RP Tronic valve from starting (the minimum working pressure reading should be 2 bar). So it will be necessary to use the automatic pressure valve in the manual mode.
6) Lack of Power supply	Check that the generator is providing a constant power supply, during normal usage of other equipment (i.e. air conditioning). To verify the voltage arriving to the watermaker press once the button +
7) Dirty high pressure pump valves (see drawing hp pump - 10.9)	Open the six caps of the valves on the HP pump manifold (10.8), extract the valves (10.9) from each of the seats and check that each valve is free from particles or grains. Clean them up and re introduce them in their seats,replace and tighten the caps. If the problem remains contact the HP techni-

8) SR safety valve (brass), too open only on the MANUAL plants (of the series SC – V – SC KIT - SCD)	cal service. If these valves are dirty, the pump does not build the required pressure. Tighten the screw on the upper part of the SR valve and restart the system.

PROBLEM:
At the start:
NOISY HP PUMP - EMPTY FILTERS - LOW PRESSURE ALARM

CAUSES	**REMEDY**
Lack of water in the inlet Sea water check valve closed	Open the sea water intake valve and check if the EV2 valve is opening when the watermaker is started. Press RESET. Vent the pre filters. RESET the thermal overload relay of the LP pump only if alarmed by the PLC display.

PROBLEM:
PLC message: MAX PRESSURE ALARM
Press reset to go back to the stand by position.

CAUSES	**REMEDY**
1) Lack of water	Open the sea water valve. Vent the pre filters. Lack of water in the fresh water holding tanks
2) Closed valves on the dump lines	Open all the dump valves.
3) Clogged Membranes	Proceed with the chemical flushing of the membranes or change the membranes where the production is below the 60% of the nominal rate at 25°C, 35000 ppm TDS, 60 bar.
4) Lack of power supply	A lack of power supply, normally caused by over loads on the generator (i.e. starting of A/C compressors) can influence the RP TRONIC functioning. Low voltage, causes a minor number or revolutions per minute of the electrical motor which causes a pressure shortage, that is revealed by the pressure sensor. This sends the value to the PLC, that orders the RP TRONIC valve to close to adjust the pressure to the best working value. When the voltage stabilises, the rpm of the motor goes back to the normal, and with it the quantity of water pumped through the membranes (volumetric pump), but in this phase the RP TRONIC valve, is already closed by the PLC, (because it

	found a lack of pressure due to a lack of voltage) so when the right amount of water goes back to the machine, an over pressure alarm can be generated. Press the RESET button and START the unit again.

PROBLEM:
PLC message: WASTE

The watermaker is dumping all the produced water outboard.	Wait for the conductivity values of the produced water to stabilise. If the values are not conforming to the set ones within 5 minutes from the start the following message will be shown. ALARM HIGH SALINITY CHECK MEMBRANES.

PROBLEM:
PLC message: ALARM HIGH SALINITY CHECK MEMBRANES
Press reset to go back to the stand by position.

CAUSES	**REMEDY**
The maximum conductivity level has been exceeded.	Check the quality of the produced water. Press RESET and START the system. If the problem persists, proceed as follows. INCREASE ALARM SET POINT (page CONDUCTIVITY SET HIGH): to get access at the program menu, press the button + e – together and insert the password. Keep the + button pressed up to the page CONDUCTIVITY SET HIGH and verify the value that is on the right side of the screen (which indicates the actual conductivity reading). Press ENTER to be able to modify the set value (1500 by default). With the + button is possible to modify the value. It will be necessary to increase the default value over 100 points, compared to the actual value read on the right of the display. Press ENTER to set the new default value and go back to the main menu pressing + and – button together. CONDUCTIVITY SENSOR DEACTIVATION (ONLY IN CASE OF EMERGENCY): In case the actual conductivity value (read on the right side of the display at CONDUCTIVITY SET HIGH page) is exceeding 2000 (water of average quality, usable for services i.e. toilets), but the water produced by the watermaker is strictly needed, it is possible to deactivate electronically the conductivity sensor.): to get access at the program menu, press the button + e – together and insert the password. Keep the button + pressed up to the page CONDUCTIVITY SENSOR (ON). Press ENTER to modify the state and press + to exclude it from the system (OFF). Press ENTER to set the new value and get back to the main menu pressing the + and – button together.

PROBLEM:
PLC message: LOW PRESSURE PUMP THERMAL PROTECTION
Press reset to go back to the stand by position.

CAUSES WARNING: The low pressure pump thermal overload set point has been exceeded due to low voltage or the low pressure pump is blocked. (SC – V – SCK – DOUBLE series).	Unblock the low pressure pump, rotating the electric motor shaft (rear side – fan cover), using a screwdriver. Open the electrical switchboard and press the blue button (reset) on the thermal overload relay of the low pressure pump. Close the switchboard door and press RESET on the PLC. Press START. If the problem continues contact the HP technical service.

PROBLEM:
PLC message: HIGH PRESSURE PUMP THERMAL PROTECTION
Press reset to go back to the stand by position.

CAUSES WARNING: The high pressure pump thermal overload set point has been exceeded due to low voltage or the high pressure pump is blocked. The most common and frequent cases depend on the low voltage reaching the unit, which means higher current consumption and then the intervention of the thermal overload relay.	Open the electrical switchboard and press the blue button (reset) on the thermal overload relay. Close the switchboard door and press RESET on the PLC. Press START. If the problem continues contact the HP technical service.
The motor of the high pressure pump can be blocked.	Unblock the pump motor and check that the capacitors are not broken or exploded and working properly..
The high pressure pump can be blocked.	In case the high pressure pump is blocked it will be necessary to disassemble the high pressure pump and the manifold, then check the shaft rotation, and piston movement.

PROBLEM:
PLC message: UNDER VOLTAGE (blinking)

CAUSES WARNING: UNDER VOLTAGE alarm corresponds to a lack of correct power supply	WARNING : Verify that the voltage, reaching the unit, is correct related to the nominal values of the motors (get the test on the internal clips of the selector 0 -1). If the voltage is low, verify the cable size and distances ad the correct functionalities of the generator.

PROBLEM:
PLC message: OVER VOLTAGE (blinking)

CAUSES	REMEDY
WARNING: OVER VOLTAGE alarm corresponds to an over feeding of voltage, that can make the capacitors explode.	WARNING: Verify that the voltage, reaching the unit, is correct related to the nominal values of the motors (get the test on the internal clips of the selector 0 -1). If the voltage is low, verify the cable size and distances ad the correct functionalities of the generator.

PROBLEM:
WATER LEAK FROM THE HIGH PRESSURE PUMP AND OIL EMULSION IN THE PUMP BODY

CAUSES	REMEDY
Damaged gaskets	Change the gaskets (see the HP pump schemes)

PROBLEM:
AUTOMATIC DEACTIVATION OF THE MAGNETO THERMAL SWITCH IF THE MAIN SWITCHBOARD

CAUSES	REMEDY
1) Watermaker switch below the limits.	Install an adequate switch, corresponding to the nominal values of the unit electrical consumption. Verify the table in the chapter “Installation” .
2) Short-circuit on the watermaker power supply line.	Verify that there are not short-circuit on the power supply line.
3) Internal short-circuit inside the watermaker.	Verify that there are not short-circuit inside the watermaker (i.e. electrical motors or sensors).

PROBLEM:
POWER SUPPLY FUSES BLOW ON START

CAUSES	REMEDY
The main cause for this inconvenience is due to the complete closing of the pressure regulation valve. At the moment of the start the circuit is completely closed and the high pressure pump, finding a full resistance is not able to start and the fuses blow.	In the MANUAL or AUTO series is necessary to open the hand operated pressure regulation valve (49), turning it anti clock wise. In the RP TRONIC series, press the MAN. VALVE button and keep pressed the – button for at least 10 seconds, in order to open completely the automatic pressure regulation valve, helping the pump to start without problem.

PROBLEM:
24V FUSE BLOWS

CAUSES	REMEDY
The main causes of this inconvenience are normally due to a short-circuit on one of the sensors (pressure MN, conductivity SD, flow meter SF).	Verify each of the sensors SD, MN, FL, disconnecting the plugs, and reconnecting each of them, one after the other, to check the defective one.
Defective motherboard transformer	Change the complete motherboard

PROBLEM:
PRODUCTION AND SALINITY EXCEEDING THE NOMINAL VALUES

CAUSES	REMEDY
One or more membranes may be damaged	Check each membrane to understand which of them is damaged.

PROBLEM:
EPROM ERROR

CAUSES	REMEDY
Microchip internal memory error	Change the microchip

PROBLEM:
SECURITY BLOCK CODE (XXXX)

CAUSES	REMEDY
Security Block. The unit has been set to work within a limited period of time, after which automatically it stops working, generating an alarm blocking the unit and visualising a four number series.	Contact HP HIGH PRESSURE to get the unlocking code.

PROBLEM:
EMERGENCY KEY

CAUSES	REMEDY
1) The emergency button is pushed.	Unlock the emergency button turning it anti clock wise.
2) A PLC component is damaged.	Change the PLC Board .

PROBLEM:
BEST W.

CAUSES During the normal functioning the conductivity of the produced water is below the lower set point and the water can be considered of a very high quality level.	

PROBLEM:
GOOD W.

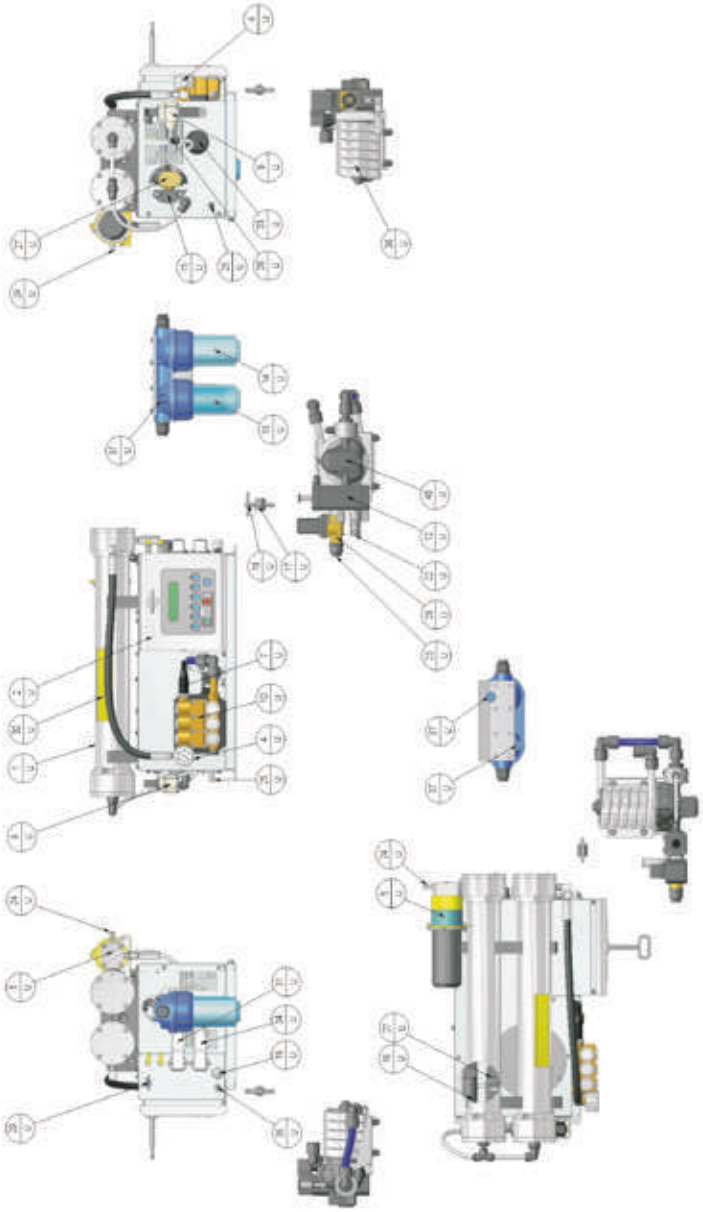
CAUSES During the normal functioning the conductivity of the produced water is between the lower and the higher set point and the water can be considered of good quality.	

PROBLEM:
POOR W.

CAUSES During the normal functioning the conductivity of the produced water is above the higher set point and the water can be considered of poor quality. (This water can be used for showers and toilet usages)	

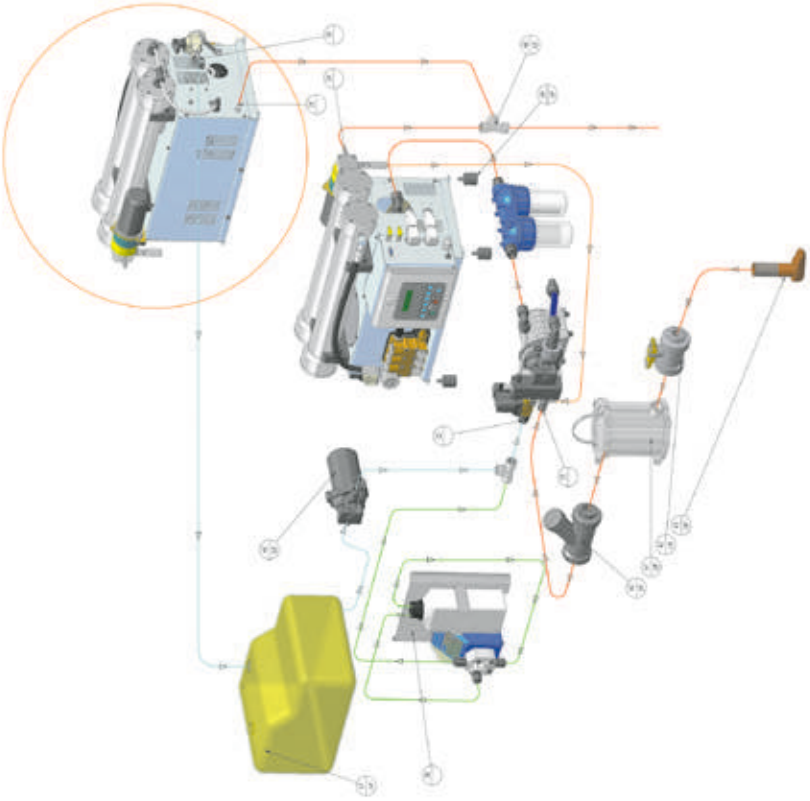
HP UC

Schema Componenti / *Components Outline*



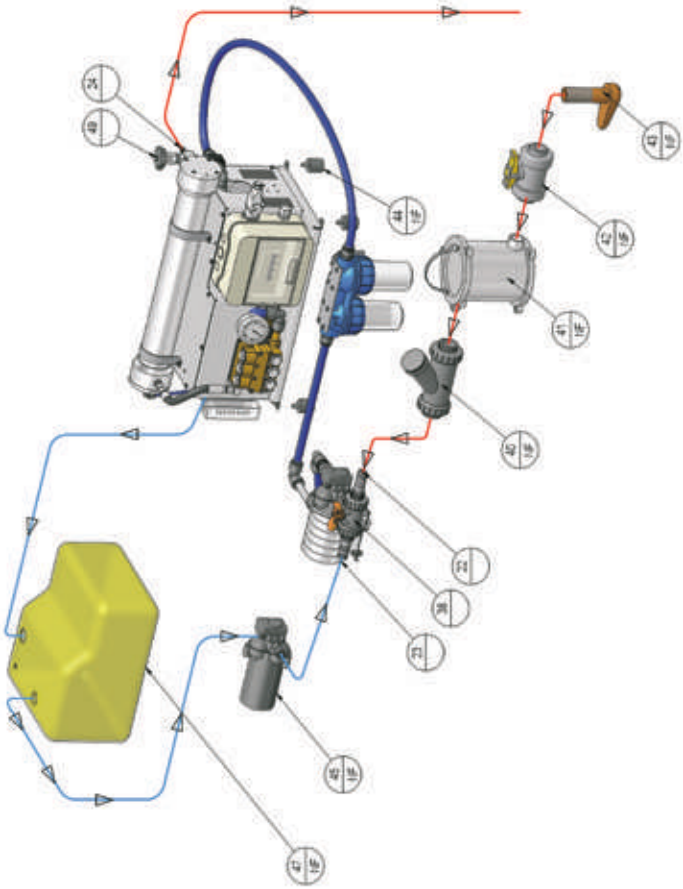
HP UC RP TRONIC

Schema Installazione / *Installation*



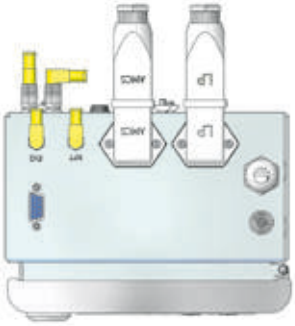
HP UC Manual

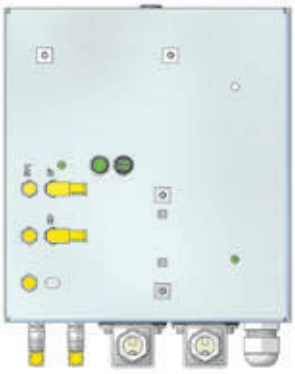
Schema Installazione / *Installation*



HP UC

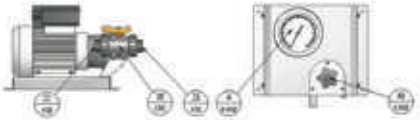
Quadro Elettrico / *Switchboard*





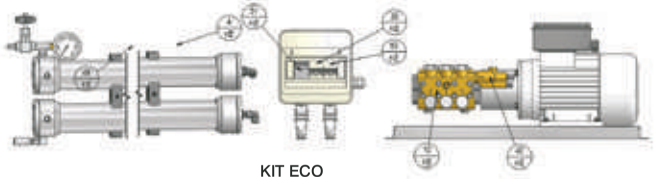
HP SC KIT - KIT ECO

Schema Componenti / *Components Outline*

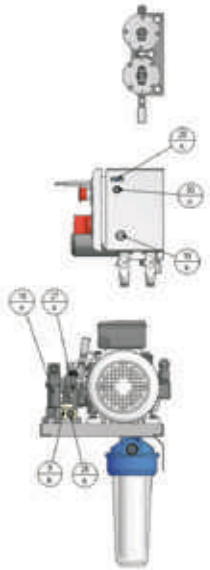


MANUAL

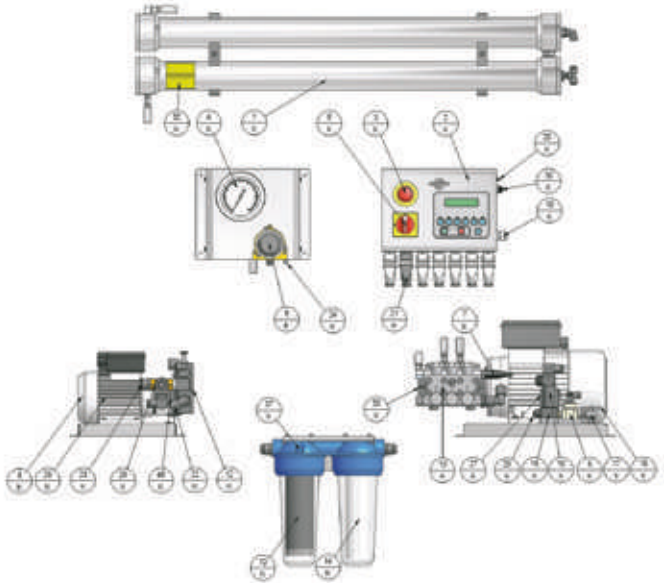
MANUAL - AUTO



KIT ECO

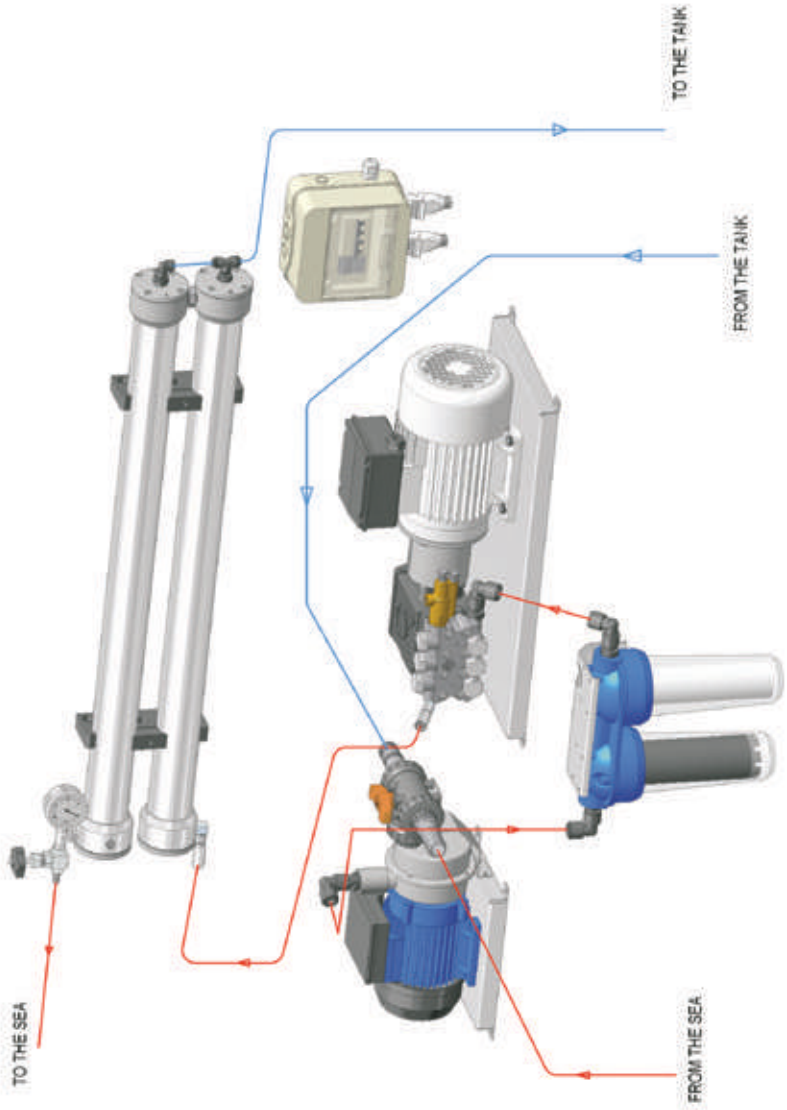


RP TRONIC



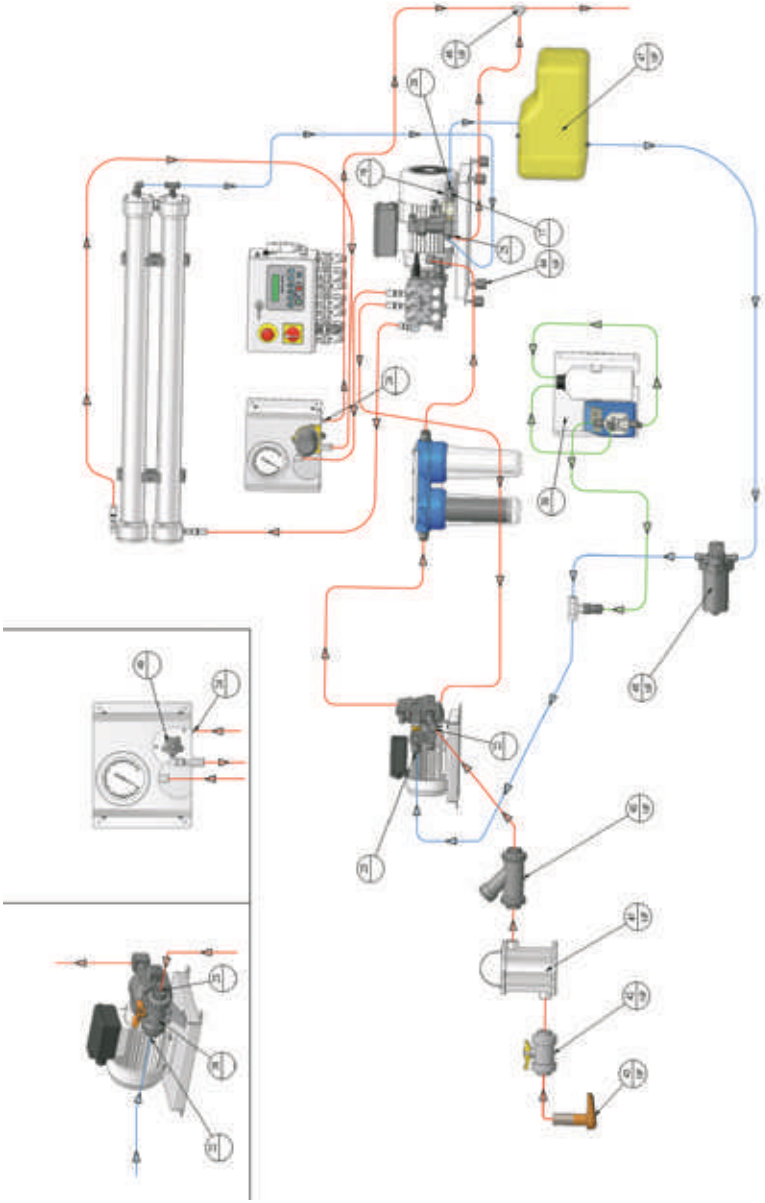
HP KIT ECO

Schema Installazione / *Installation*



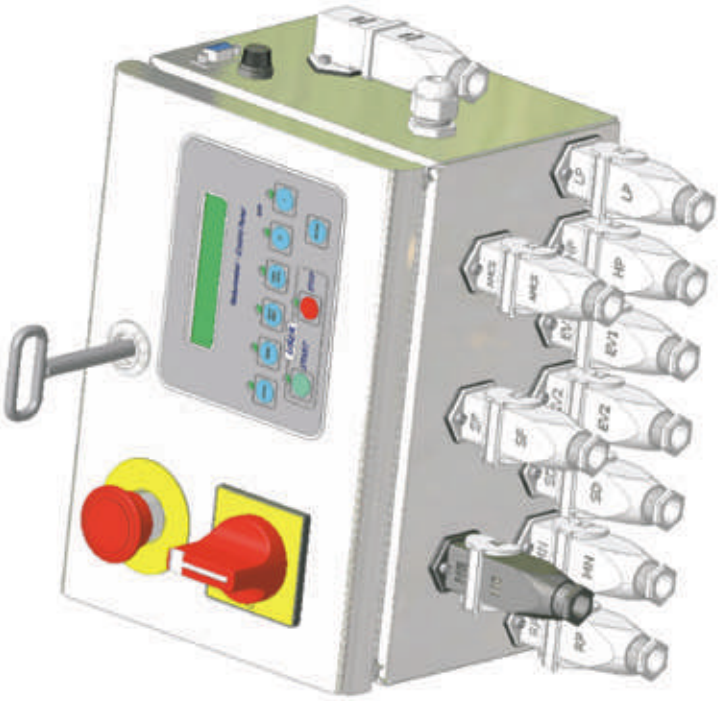
HP SC KIT

Schema Installazione / *Installation*



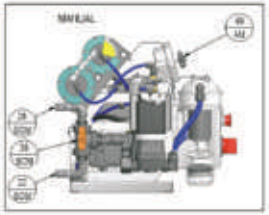
HP SC KIT

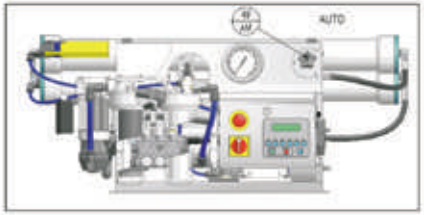
Quadro Elettrico / *Switchboard*

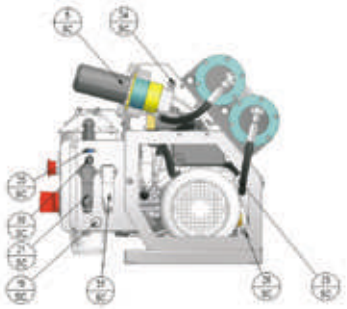


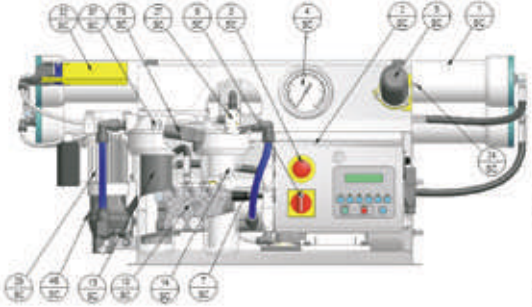
HP SC Manual- Auto - RP Tronic

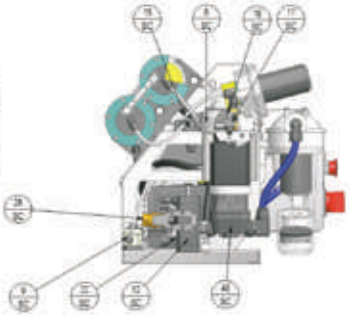
Schema Componenti / *Components Outline*





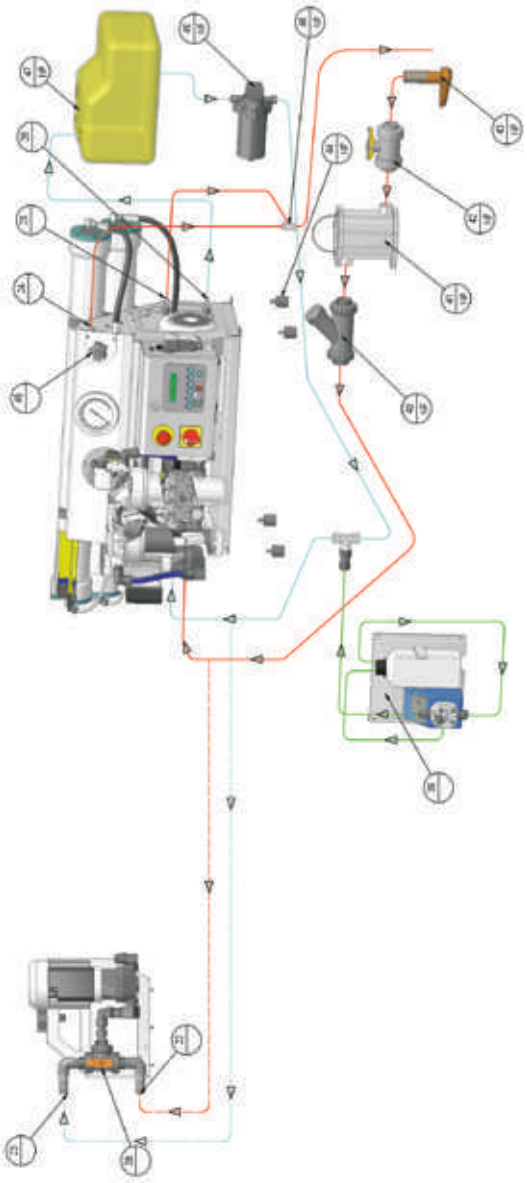






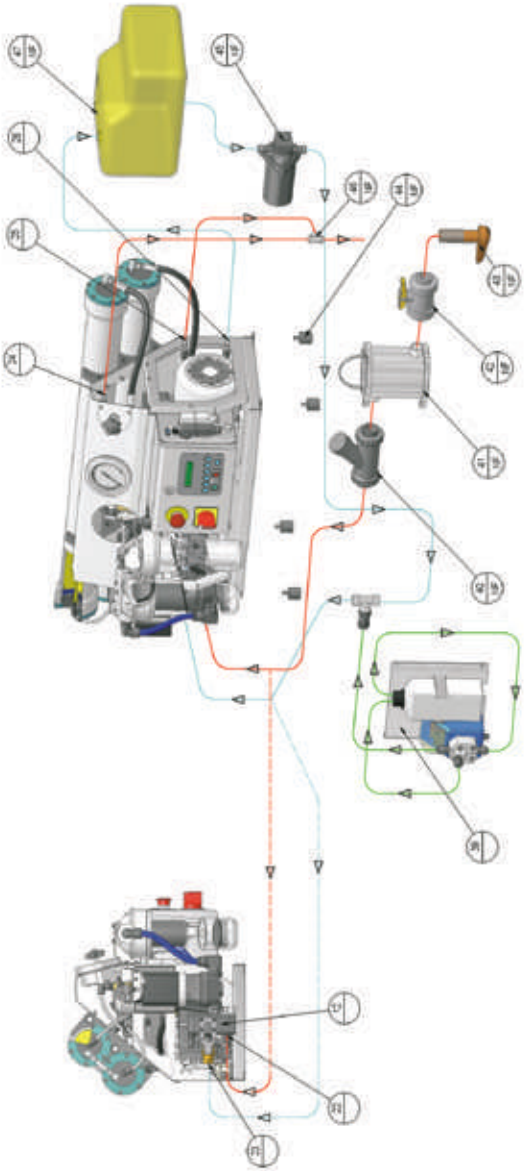
HP SC Manual

Schema Installazione / *Installation*



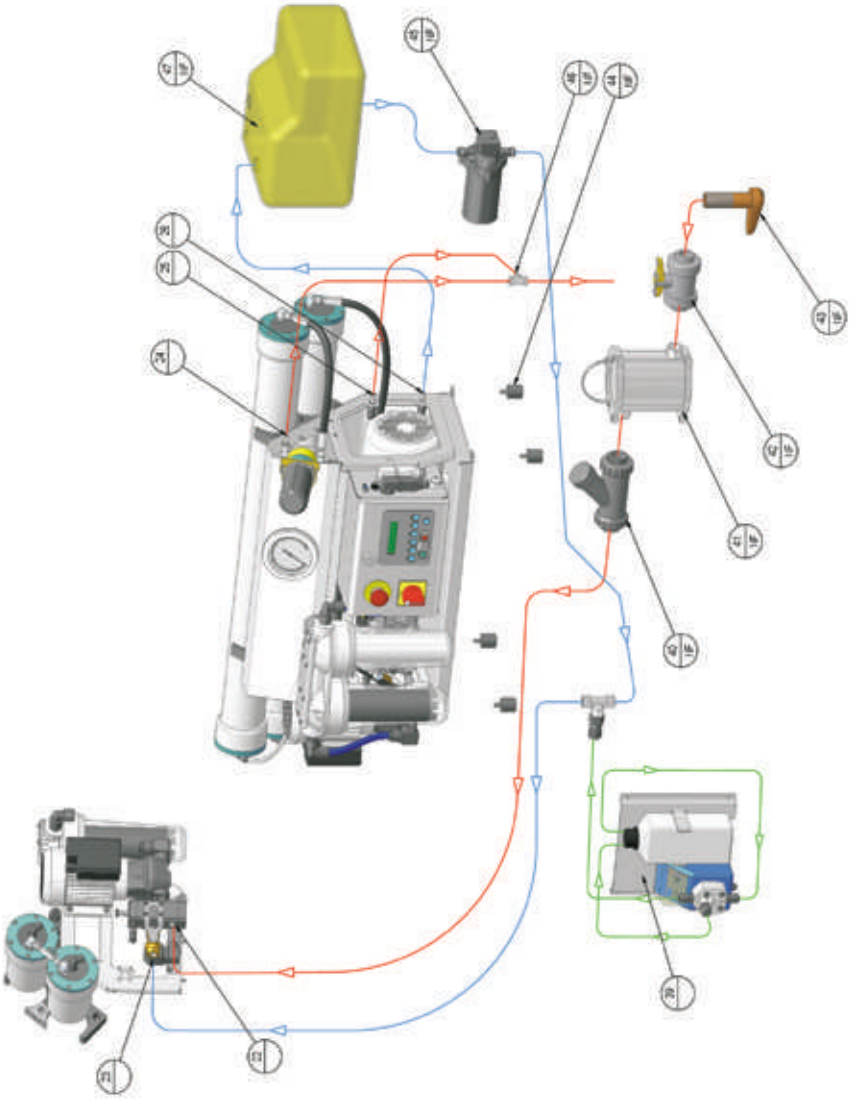
HP SC Auto

Schema Installazione / *Installation*



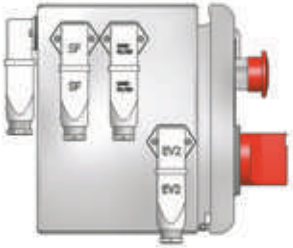
HP SC RP Tronic

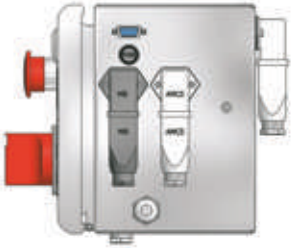
Schema Installazione / *Installation*

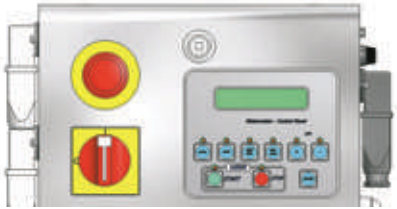


HP SC Manual- Auto - RP Tronic

Quadro Elettrico / *Switchboard*

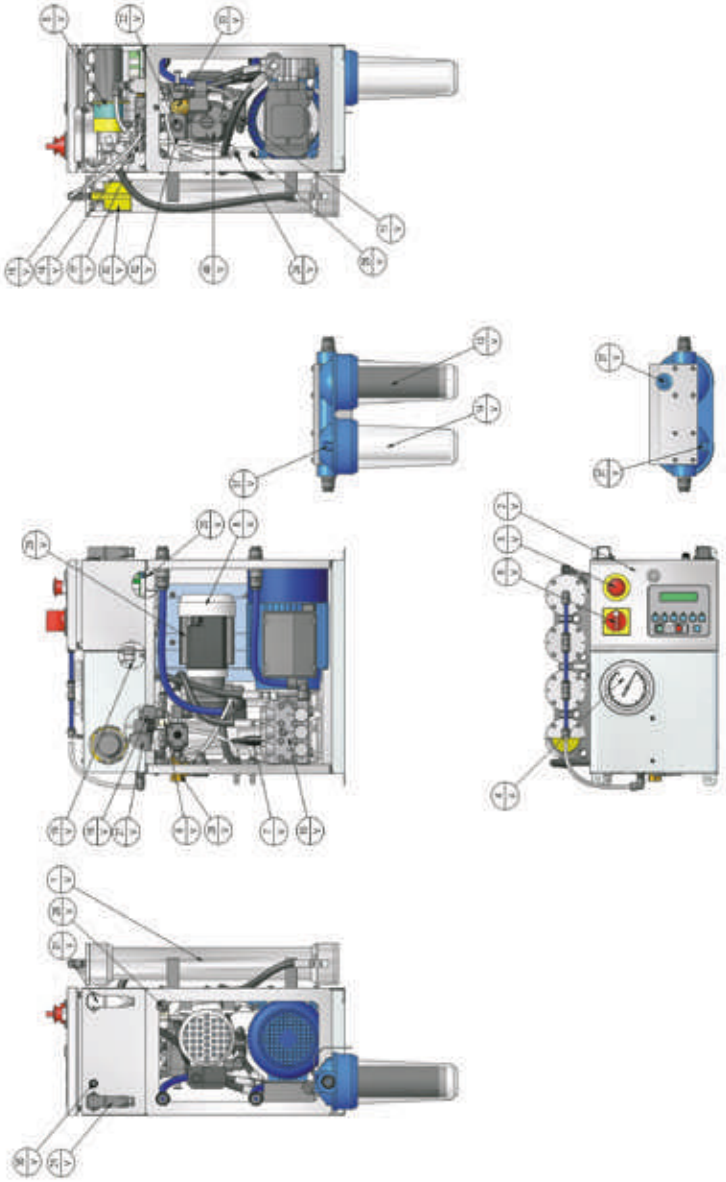






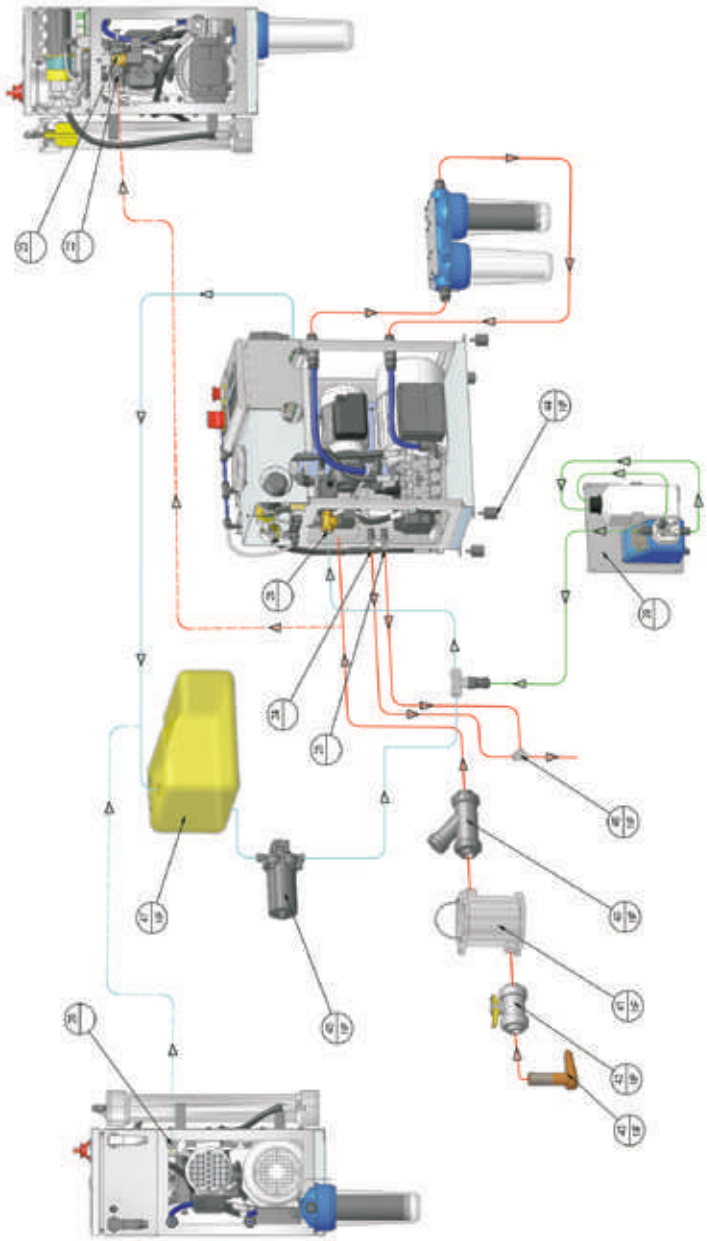
HP V

Schema Componenti / *Components Outline*



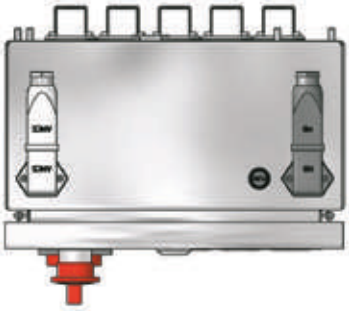
HP V

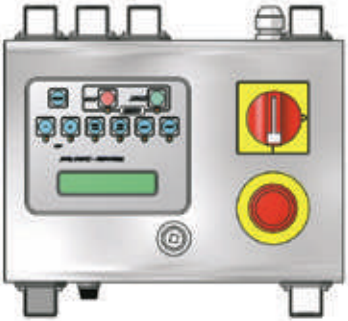
Schema Installazione / *Installation*

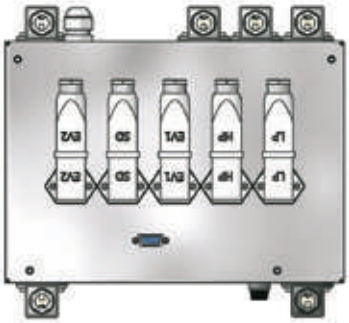


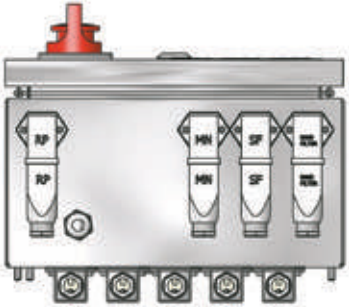
HP V

Quadro Elettrico / *Switchboard*



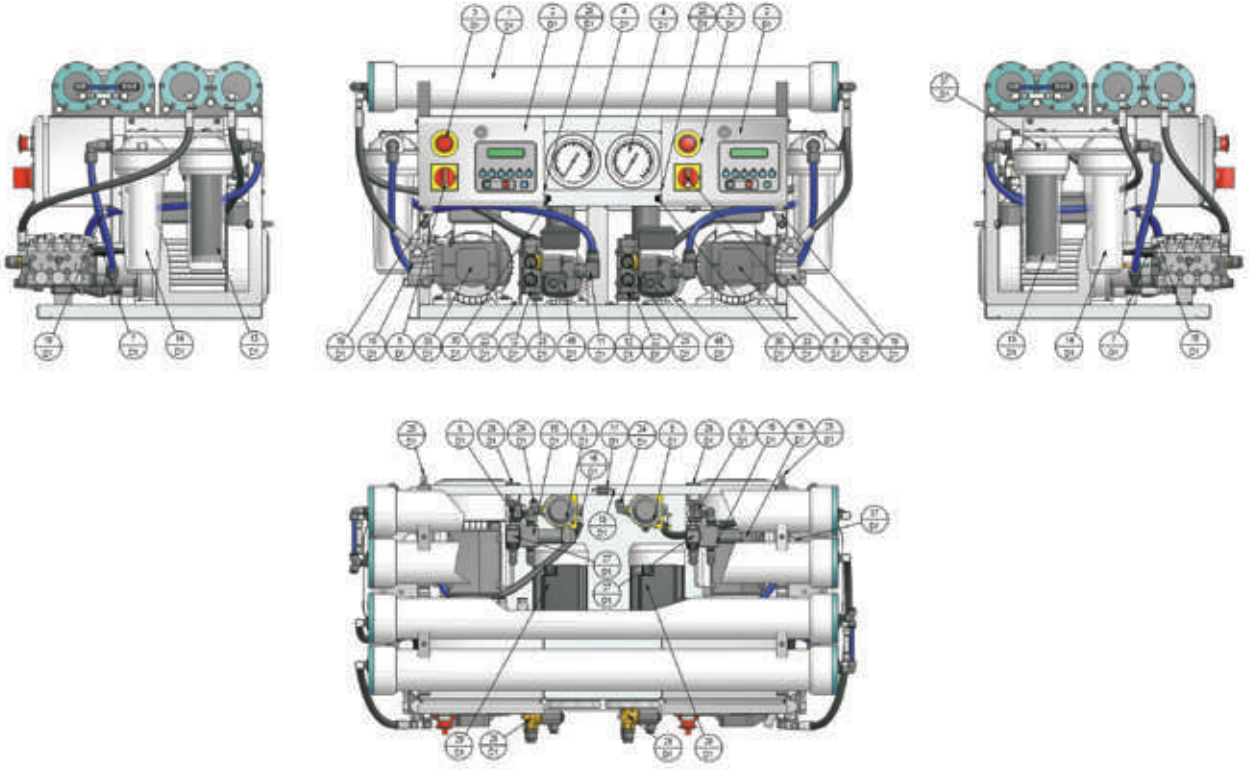






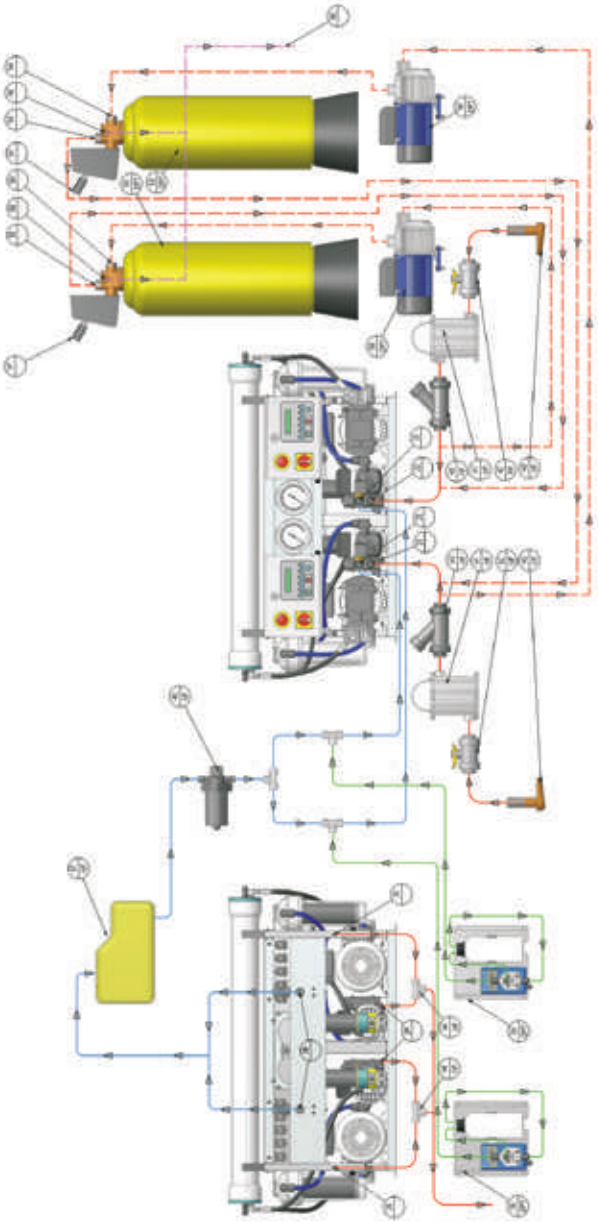
HP SC DOUBLE

Schema Componenti / *Components Outline*



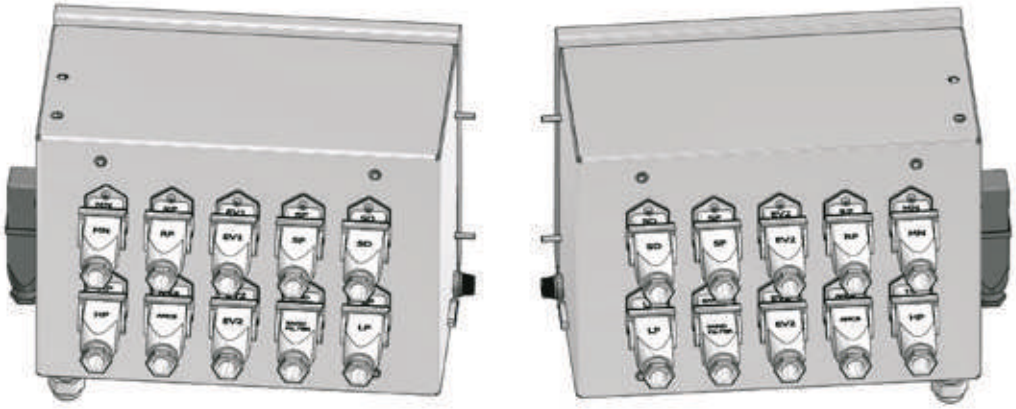
HP SC DOUBLE

Schema Installazione / *Installation*



HP SC DOUBLE

Quadro Elettrico / *Switchboard*

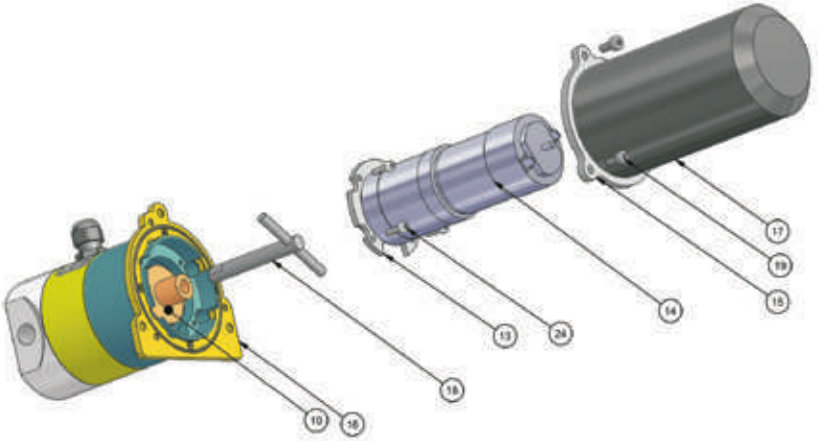


REAR VIEW

HP RP Tronic

Schema Componenti / *Components Outline*

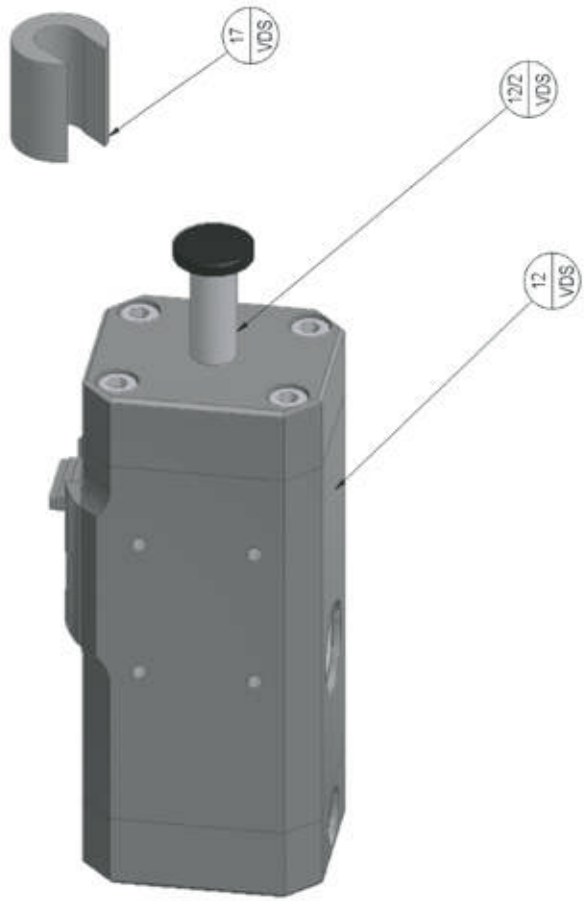
Elenco parti		
ELEM	Q.TÀ	NUMERO PARTE
1	1	3217 CORPO PORTA BRONZINA
2	1	3214 BISCOTTO
3	1	OR 2262
4	1	OR 2224
5	2	3224 SPESSORE OR
6	1	3215 BRONZINA
8	4	ISO 7092 2.40
10	1	3226 SUPPORTO MOTORE
11	1	3220 GIUNTO
12	1	3222 OTTURATORE
13	1	3223 PIATTELLO PORTA MOTORE
14	1	3221 MOTORE E192.24.625
15	1	3218 FLANGIA PORTA COPERCHIO
16	1	3219 FLANGIA PORTA VALVOLA
17	1	3216 COPERCHIO
19	3	ISO 4762 - M4 x 8
20	12	ISO 7049 - M2 x 5 - 4.8 - H
21	2	ISO 8752 - 3 x 20 - A
22	1	OR 3087
23	2	OR 115
24	4	ISO 4762 - M3 x 10
25	4	ISO 4762 - M5 x 35
26	3	ISO 4762 - M4 x 12
27	1	3213-1 BASE 1/4 SC
18	1	3229 chiave



SINCE 1995

Valvola di scambio - *Flushing valve*

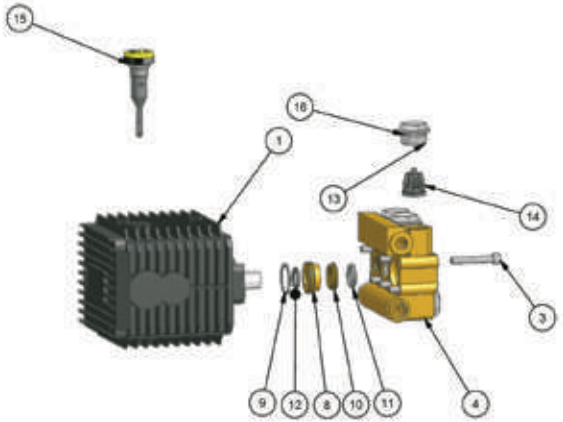
Schema Componenti / *Components Outline*



Pompa WW90 - *WW90 Pump*

Schema Componenti / *Components Outline*

Elenco parti			
ELEM.	QTÀ	NUMERO PARTE	DESCRIZIONE
1	1	CORPO WW90	
2	1	ALBERO WW90	
3	6	DIN 912 - M6 x 40	Vite a testa cilindrica
4	1	TESTATA WW90 FUSIONE ottone	
5	3	51.0400.09 PISTONE	
6	2	KIT 9S	
6.1	1	51.0800.70 ANELLO DI FONDO 15	
6.2	1	51.1000.51	
6.3	1	90.2620.00 anello di tenuta 15	GUARN.A V
6.4	1	OR 2100	OR 2100
6.5	1	OR 119	OR 119
7	5	TAPPO W90 +KIT 1	
7.1	1	KIT 1	
7.1.1	1	36.2003.66 SEDE VALVOLA	
7.1.2	1	36.2002.51 guida valvola	
7.1.3	1	36.2001.76 VALVOLA	
7.1.4	1	94.7376.00 MOLLA 9,4X14,8	
7.1.5	1	OR 3068	OR 3068
7.2	1	OR 3081	OR 3081
7.3	1	98.2218.00 TAPPO W90	
8	1	51.0800.70 ANELLO DI FONDO 15	
9	1	OR 2100	OR 2100
10	1	90.2620.00 anello di tenuta 15	GUARN.A V
11	1	51.1000.51	
12	1	OR 119	OR 119
13	1	98.2218.00 TAPPO W90	
14	1	KIT 1	
15	1	TAPPO LIVELLO OLIO	
16	1	OR 3081	OR 3081

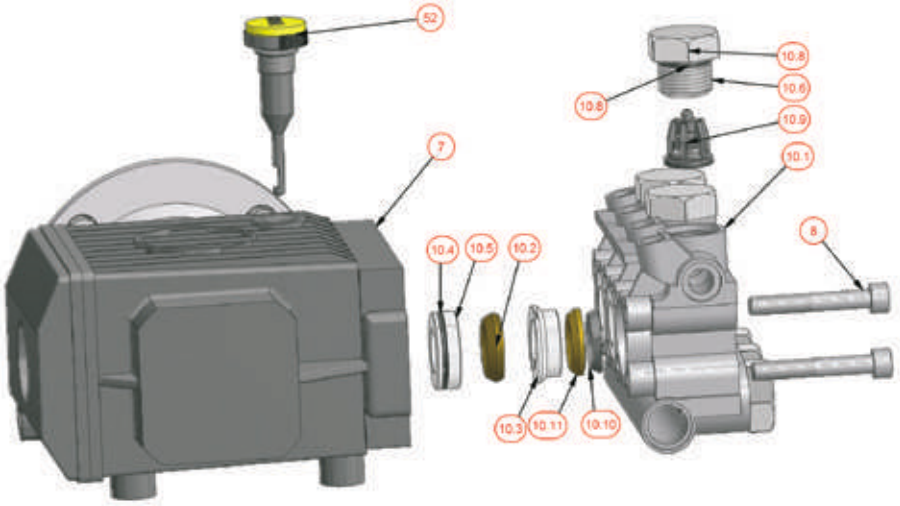


SINCE 1995

Pompa W71 - *W71 Pump*

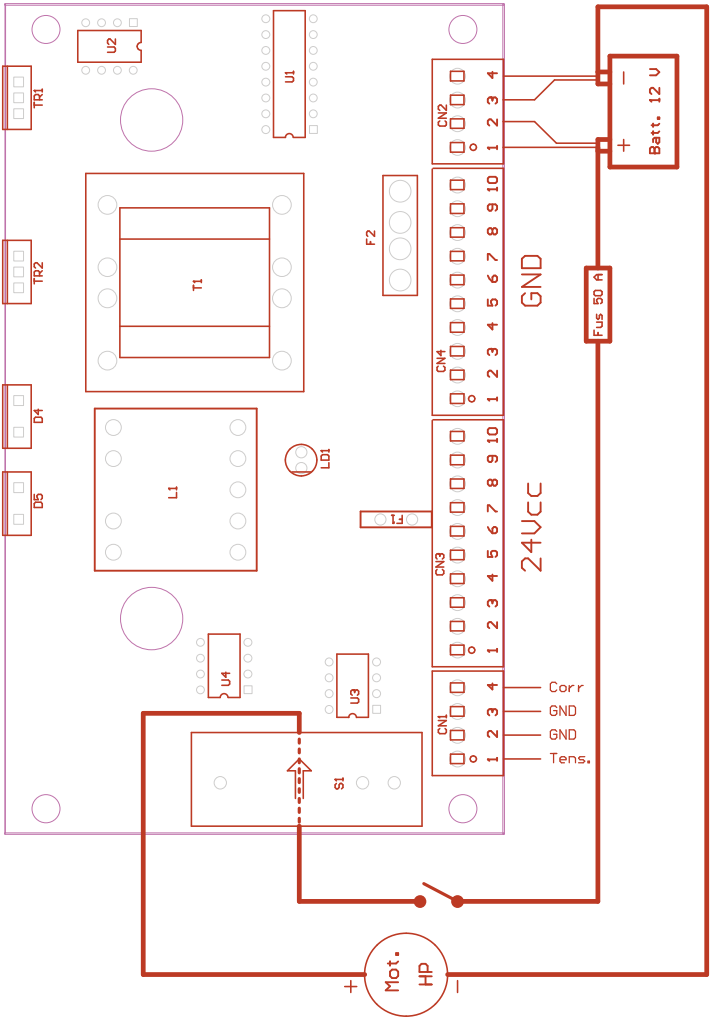
Schema Componenti / *Components Outline*

Elenco parti		
ELEM.	QTÀ	NUMERO PARTE
7	1	CORPO
8	2	DIN 912 - M8 x 55
52	1	TAPPO LIVELLO OLIO
10	1	TESTATA W98 MANUALE D'USO
10.1	1	TESTATA FUSIONE
10.2	3	GUARNIZIONE V W98
10.3	3	ANELLO INTERMEDIO W98
10.4	2	OR 2125
10.5	3	ANELLO SUPERIORE W98
10.6	6	TAPPO W98
10.7	1	OR 2125
10.8	4	OR 3081
10.9	6	KIT 1
10.10	3	50.1000.51
10.11	3	90.2703.00



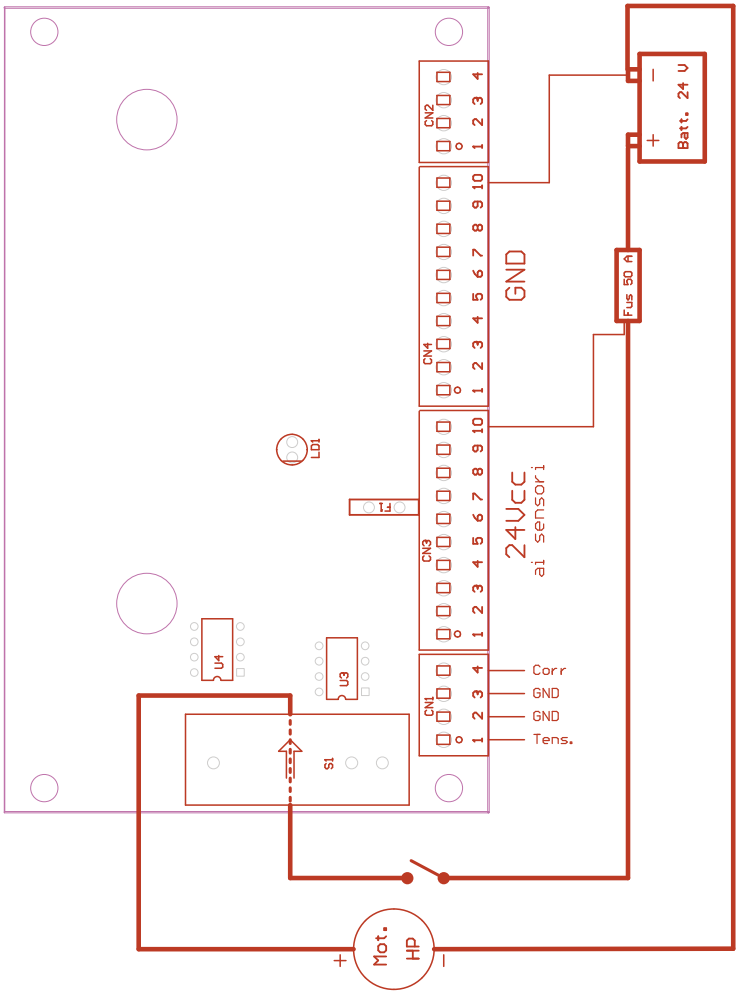
HP UC 35 12 V

M. BOARD



HP UC 35 - 70 24 V

M. BOARD



HP UC 230 V
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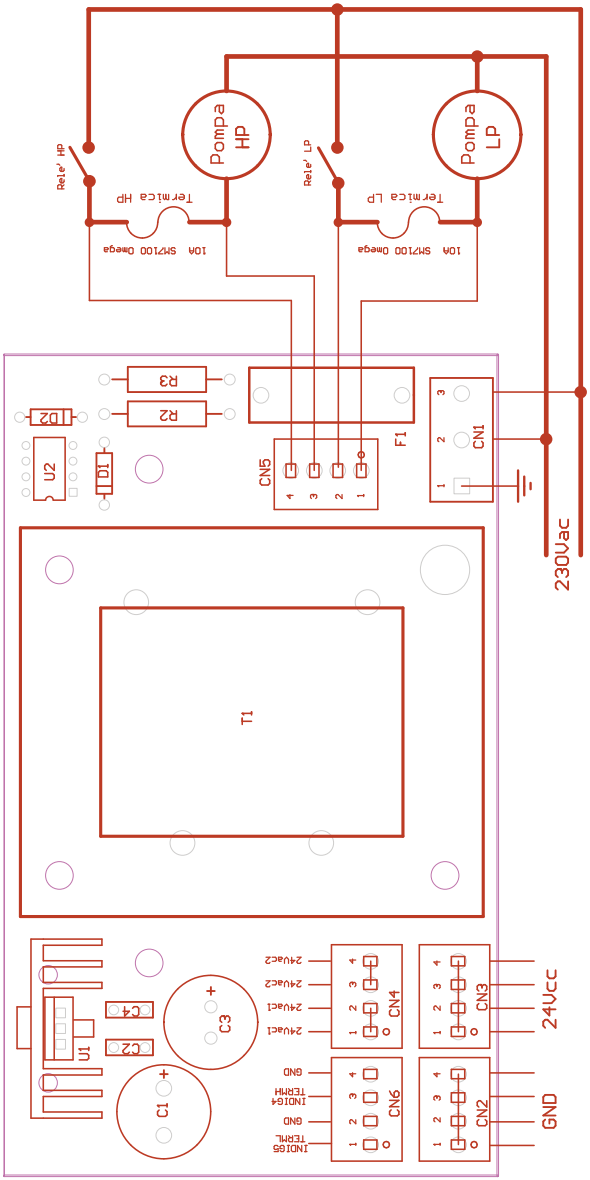
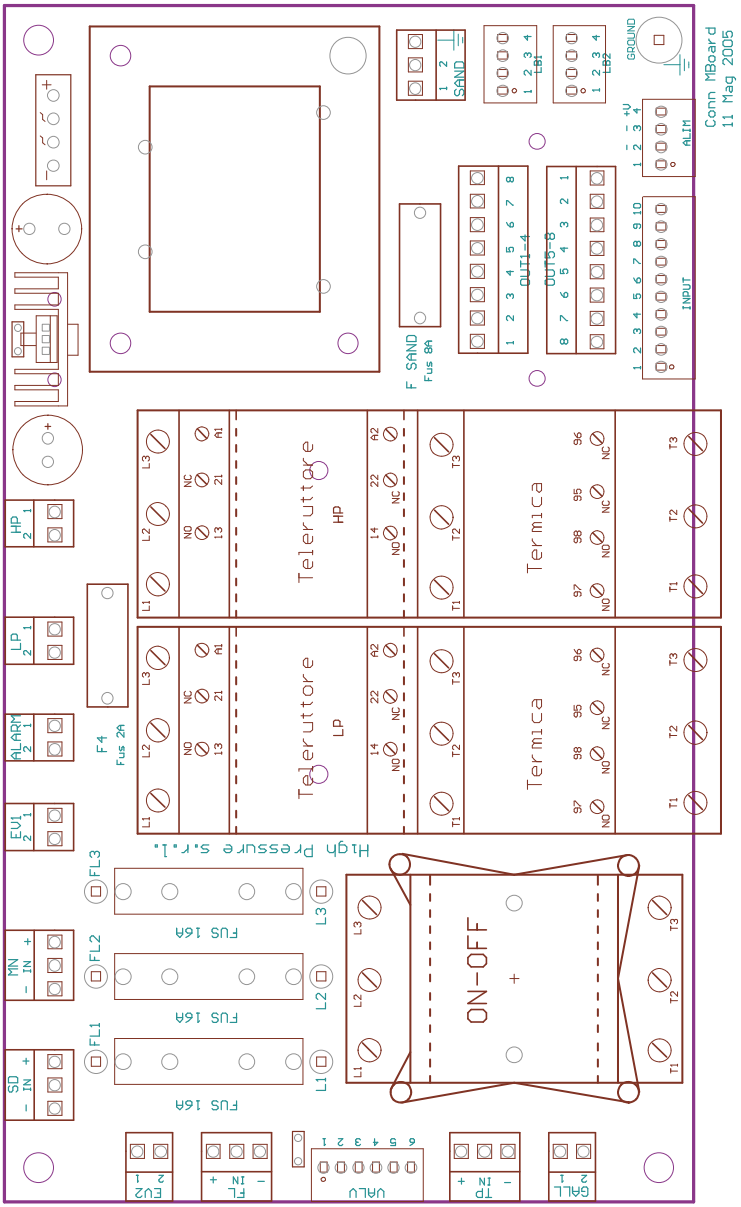


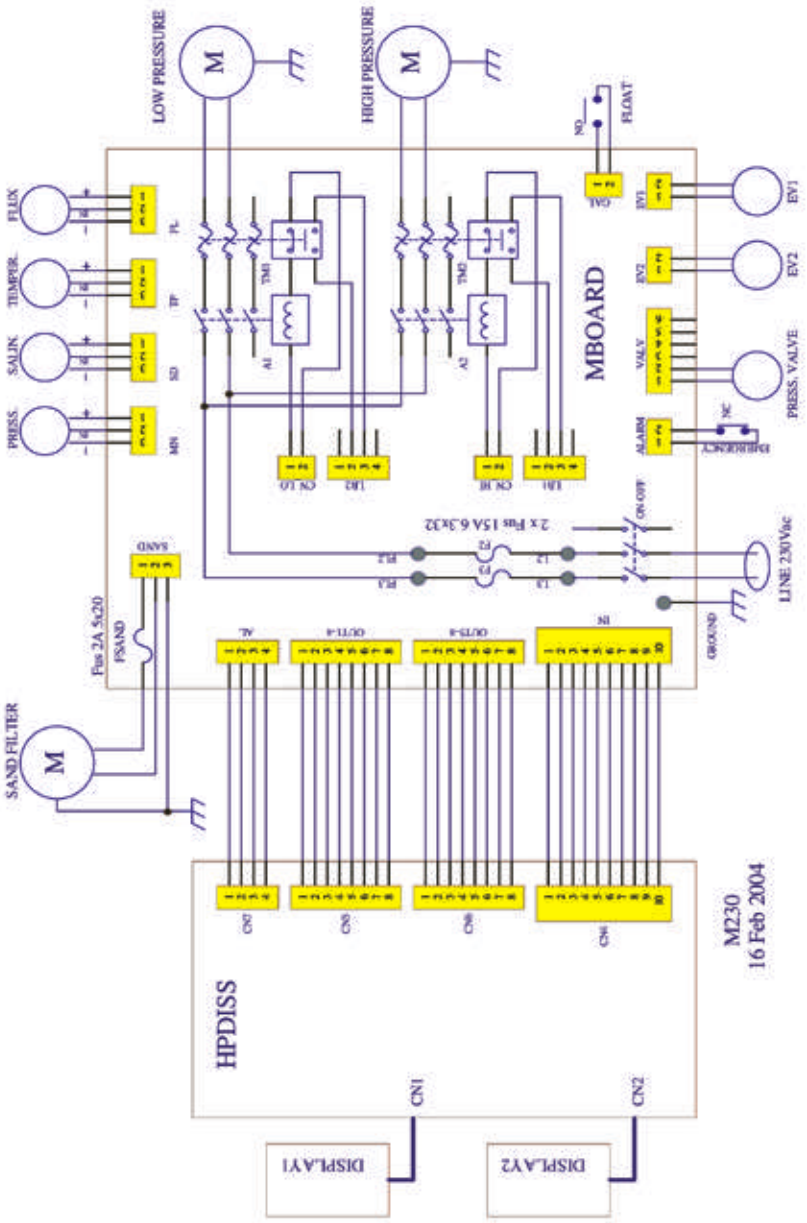
HP SC - V - SC KIT - DOUBLE

M. BOARD



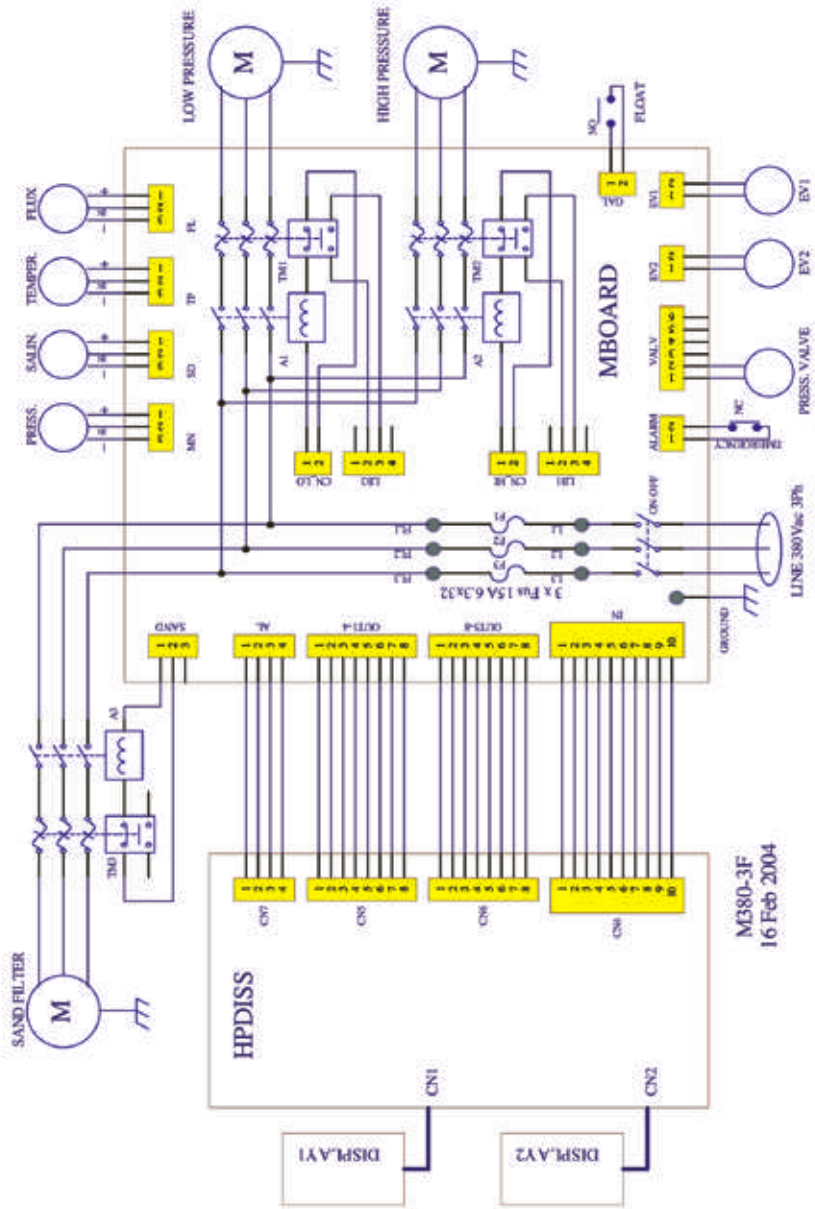
HP SC - V - SC KIT - DOUBLE

M. BOARD - 230 V



HP SC - V - SC KIT - DOUBLE

M. BOARD - 380 V



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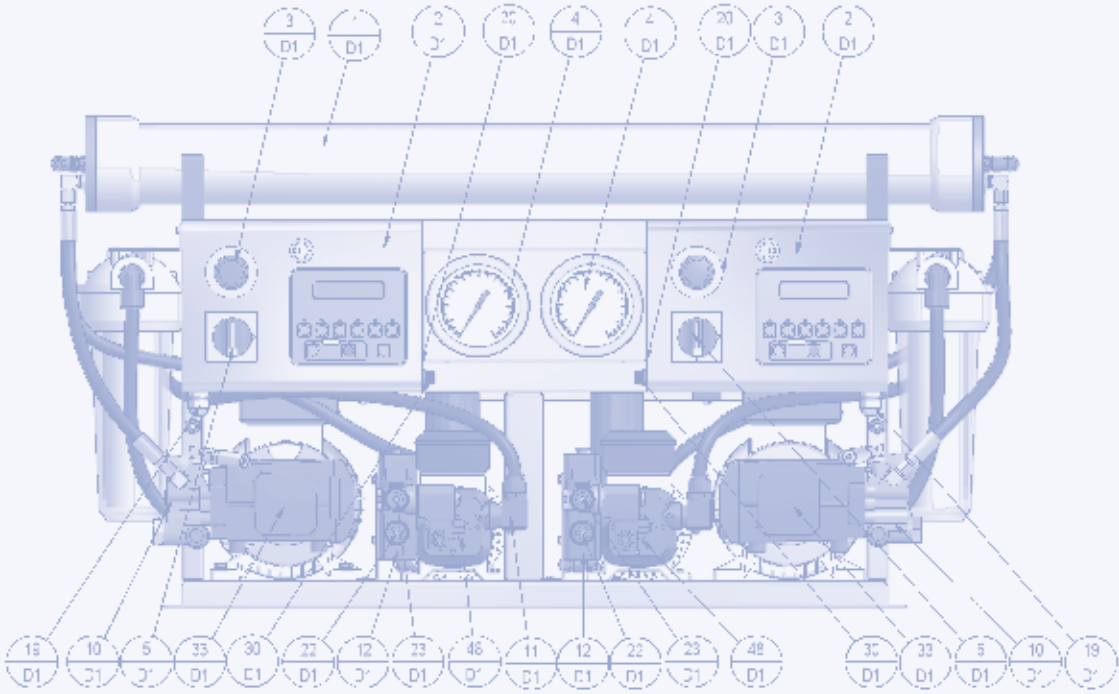

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