

# **NOCCHI**

# CPS 10

# CPS 20

CE

IT - ISTRUZIONI ORIGINALI IN LINGUA ITALIANA



# SUMMARY

CHAPTER	DESCRIPTION	PAGE	
1	INTRODUCTION	1.1 PARTICULAR SIGNS	22
		1.2 GENERAL INFORMATION	22
		1.3 PRELIMINARY CHECKS	22
2	TECHNICAL FEATURES	2.1 FIELD LIMITATIONS	23
		2.2 INBOUND SIGNAL FEATURES	23
3	INSTALLATION	3.1 COOLING THE MOTOR	24
		3.2 HYDRAULIC CONNECTION	24
		3.3 PRESSURISED TANK (EXPANSION VESSEL)	24
		3.4 MOTOR PUMP ELECTRICAL CONNECTION	24
		3.5 CONNECTING THE PRESSURE UNIT TO THE POWER SUPPLY	25
4	FUNCTIONING	4.1 PRODUCT DESCRIPTION	26
		4.1.1 MOTOR PUMP	26
		4.1.2 PRESSURE UNIT	27
5	PROGRAMMING	5.1 CONTROL PANEL DESCRIPTION	28
		5.2 DESCRIPTION OF SIGNALS ON DISPLAY	28
		5.3 PROGRAMMING MENU	29
		5.3.1 PROGRAMMING CLOCK/DAY	30
		5.3.2 SET POINT	30
		5.3.3 ADVANCED PARAMETERS	31
		5.3.4 INSTALLATION PARAMETERS	32
		5.4 MANUAL START OF MOTOR/PRIMING	33
5.5 MANUAL START/STOP	34		
6	SIGNALS, ALARM STATUS AND ERRORS	6.1 HISTORY (SAVED)	34
		6.2 SIGNAL TABLE	34
		6.3 ALARM TABLE	35
		6.4 ERROR TABLE	35
7	RESETTING AND FACTORY SETTINGS	7.1 GENERAL SYSTEM RESET	36
		7.2 TO RESET FACTORY SETTINGS	37
		7.3 SOFTWARE VERSION	37
8	TABLES AND DESIGNS	8.1 DATA PLATE	37
		8.2 TO INSTALL THE NEGATIVE SUCTION HEAD	38
		8.3 TO INSTALL THE POSITIVE SUCTION HEAD	39
		8.4 ELECTRICAL CONNECTION BOARD – POWER BOARD	40
		8.5 CONNECTIONS BOARD – CONTROL BOARD	40
-	WARRANTY	-	144

# CHAPTER 1

## INTRODUCTION

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### 1.1 PARTICULAR SIGNS

**ATTENTION**

The attention sign indicates the procedures requiring your absolute attention, otherwise you may cause damage to the machine or equipment connected to it.

**WARNING**

The danger sign indicates the procedures requiring your absolute attention, otherwise you may get an electric shock.

**NOTE**

The note sign offers important information highlighted outside the text to which it refers.

### 1.2 GENERAL INFORMATION

With this manual PENTAIR INTERNATIONAL S.A.R.L.wants to provide the necessary information to install, use and maintain the CPS inverter coupled with a NOCCHI motor pump.

**ATTENTION**

Incorrect use can dangerously damage the machine or the equipment, as well as result in guarantee forfeiture.

The CPS module has a single phase power supply and controls a three phase pump by reading the pressure of the electronic transducer mounted on the collector outlet.

The module enables the operator to select the various system functions using a keyboard and LCD display mounted on same.

**NOTE**

This manual refers to standard type execution.

### 1.3 PRELIMINARY CHECKS

**NOTE**

This manual refers to standard type execution.

- Check the packaging is intact
- Open the packaging and remove the machine
- Check the machine corresponds to that ordered
- Check the machine is not damaged
- If you receive an incorrect or damaged machine, notify PENTAIR INTERNATIONAL S.A.R.L. or the authorised dealer within and not after 10 (ten) days from date of purchase

# CHAPTER 2

## TECHNICAL FEATURES

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**NOTE**

For the motor pump refer to the information contained in the specific manuals.

**ATTENTION**

Do not use the product in environments with acid, corrosive and/or inflammable gas.

**ATTENTION**

Do not use the motor pump with dangerous liquids.

## 2.1 FIELD LIMITATIONS



### ATTENTION

If the electrical system is equipped with a motor-generator unit and/or high power machine tools, the CPS shall be powered via a stabilizer and filters of adequate size.

- Environmental temperature: +0 °C to 50 °C
- Temperature of pumped liquid: refer to the specific motor pump manual
- Level of CPS protection: IP55
- Level of system protection: IP55 (if installed on motors with an IP55 or superior level)
- Maximum operational pressure: refer to the specific motor pump manual
- Voltage of inverter: 1x230 Vac  $\pm$  10 %
- Voltage of outlet inverter: 3x230 Vac  $\pm$  10 %
- Inbound frequency: 50/60 Hz  $\pm$  3%
- Maximum power at outlet: 1.5 kW
- Maximum nominal outbound current: 8 Amp
- Wave shape: sinusoidal
- Inbound filter: complies with EMC directive

CPS complies with the Directive on Electromagnetic Compatibility EN 55014-1, EN 55014-2+A1+A2 and EN 61000-3-2, 61000-3-3.

## 2.2 INBOUND SIGNAL FEATURES

### PRESSURE OF TRANSDUCER: (STANDARD ISSUE):

- Pressure field: from 0 to 10 Bar
- Outbound signal: from 0 to 5 Volt
- Connection: 1/4 male
- Electrical connector: removable, provided with 2 m of cable

# CHAPTER 3

## INSTALLATION

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### ATTENTION

The installation operations must be performed by expert, qualified personnel.



### ATTENTION

Use specific guards and equipment as per safety standards.



### ATTENTION

Fully comply with safety and accident prevention standards in force.



### ATTENTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Carefully read the use and maintenance manual for the pump.

### 3.1 COOLING THE MOTOR

Follow the precautions described below to ensure that the motor and electronics are cooled:

- Install the pump in a well-aerated area to guaranteed sufficient cooling to the motor and electronics
- Ambient temperatures should not be above 40 °C
- Keep the cooling fins and ventilator clean

### 3.2 HYDRAULIC CONNECTION

The system can be used with a direct connection to the aqueduct or suction from a first tank (see chapter 8.2 – 8.3).



#### ATTENTION

For connection to the aqueduct, pay full attention to local standards in force.



#### ATTENTION

Check the sum of the intake pressure and the maximum pressure of the motor pump do not exceed the maximum values allowed by the system.

#### TANK

follow the indications described in the use and maintenance manual for the motor pump used. It is possible to use a float to deactivate the system (to avoid the system drying up).

### 3.3 PRESSURISED TANK (EXPANSION VESSEL)



#### ATTENTION

Check the maximum pressure of the tank can support the maximum pressure of the system.

It is necessary to install an expansion vessel on the outlet side of at least 8 litres to avoid the motor pump functioning continuously. Check the preloading pressure of the first tank on the system: this value must be 0.5/0.8 Bar less than working pressure (lower SET-POINT).

### 3.3 MOTOR PUMP ELECTRICAL CONNECTION



#### WARNING

Ensure power is cut to all the connections.



#### WARNING

Always disconnect the electrical power cable before performing operations on the electrical or mechanical parts of the motor pump.



#### WARNING

Having disconnected the power cable, wait for the LINE led to switch off (about 2 minutes) and until the condensers unload before performing intervention on the CPS.



#### ATTENTION

Perform the electrical connections in compliance with local standards in force.



#### ATTENTION

It is the responsibility of the installer to ensure that the electrical power supply system has an effective earthing system in compliance with standards in force.

Follow the instructions below to connect the machine to the electrical power supply system:

- The pump must have an earth connection and must be protected against indirect contacts in accordance with local regulations
- If a differential switch is provided on the pump's electrical power supply as extra protection, the switch must flip when it becomes aware of the presence of dispersions of current towards the earth with a continuous component (constant pulsating current)
- Check that voltage is 1–230 Vac, 50/60 Hz
- The CPS comes with a Shuko EEC 7/7 type power plug
- Connect the plug in an accessible position in case it is necessary to deactivate the system
- In case of damage to the power cable, it must be replaced in an assistance centre or by qualified personnel
- The CPS comes with a 2 m shielded cable, for the pressure transducer, connected to the module
- For positioning see chapter 5



**NOTE**

Before switching on or after a long period without power, the display may flash; this indicates the internal clock must be regulated (see chap. 5.3.1).



**NOTE**

In particular situations, some other additional components (for ex. Filters, ext) might be required to limit the electromagnetic interference

### 3.4 CONNECTING THE PRESSURE UNIT TO THE POWER SUPPLY



**WARNING**

Check to ensure that all connections are free from electricity.



**WARNING**

Always disconnect the electrical power supply cable before working on electrical or mechanical parts in the pressure unit.



**WARNING**

After disconnecting the power supply, wait until the led LINE goes off (approximately 2 minutes) so that the capacitors can unload, before working on the CPS.



**ATTENTION**

Perform the electrical connections in compliance with local standards in force.

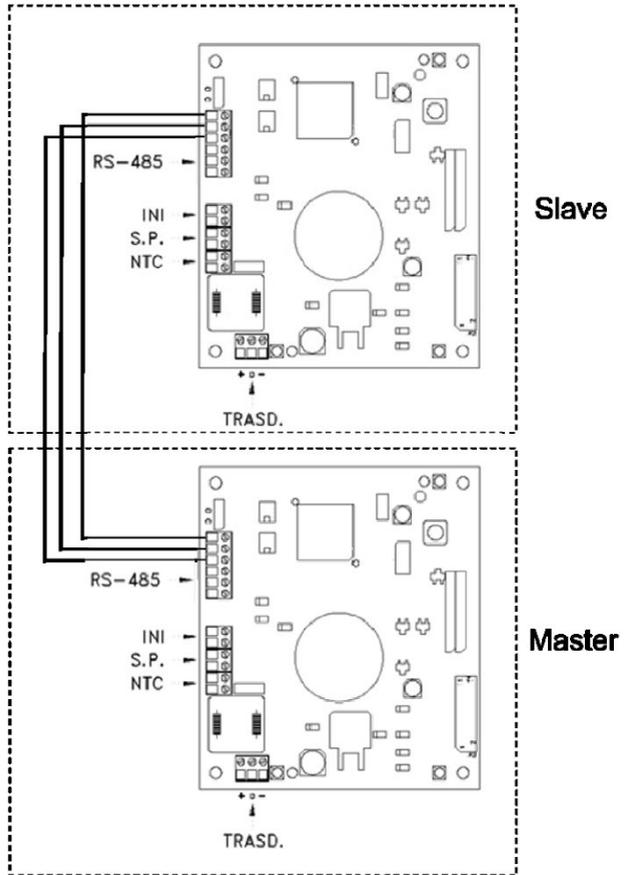


**ATTENTION**

The installer is responsible for checking that the electrical power supply system is equipped with an efficient earthing system in accordance with current regulations.

- RS-485 → Communication port
- INI → INIBIT input: NC external contact or NO for the START/STOP command
- S.P. → External Set Point (EST) command: NA contact
- NTC → NTC sensor input to control temperature
- TRASD. → Input 0÷5 Volts for pressure transducer

- + → Positive
- → Negative
- D → Signal



## CHAPTER 4 FUNCTIONING

### 4.1 PRODUCT DESCRIPTION

#### 4.1.1 MOTOR PUMP

- The system is composed of a motor pump and an electronic control system (inverter) that enables the pressure to be maintained constant in the system, reducing or increasing the rotation speed of the pump motor
- When the system pressure goes below the threshold set, the module starts the pump to reset the set point pressure; the rotation speed of the pump varies based on the water request, therefore, greater request requires greater speed, until the maximum set pressure is reached
- When the request for water decreases, speed will also reduce until the pump reaches the minimum speed set and after which, if there are no further decreases in pressure (i.e. new water requests), the pump will go in stand by until a new cycle begins

## 4.1.2 PRESSURE UNIT



### NOTE

CPS controls for the unit, such as MASTER (PRI – P) and SLAVE (SEC – S), are automatically configured. Alternatively, the "advanced parameters" can be used to configure the controls.

- The system is comprised of two electrical pumps equipped with an electronic control system (inverter) which allows it to maintain the system's pressure constant, reducing or increasing the speed at which the electronic pump motor rotates
- When the system's pressure falls below the set threshold level, the module starts-up the first pump (Master - PRI P) to reset set point pressure
- The speed at which the pump rotates varies based on water requirements, as such, greater requirements will result in higher speeds until the maximum threshold level is reached
- After this, the module will activate the second pump (Slave - SEC "S") to provide support and maintain a stable pressure if greater performances are required
- As water requirements diminish, speed of the last pump which has come into play will be reduced until it is switched off. The module will keep the first pump which came into play working until the minimum set speed is reached. The pump is stopped if pressure is not reduced further (that is new water requirements)
- If the pump stops because of a fault, the second pump will automatically substitute it

The system has five settings:

- **CYCLICAL:** Indicates that the first pump to come on at the next request for water will be the one which has not started-up or which started-up second. The second pump can support the first in this mode [BOOSTER setting – CH1 see Chpt. 5.3.4]
- **ALTERNATING:** The two motors function in an alternating manner, changing place at each start-up or after a set period of time entered in the installation parameter menu (see chpt. 5.3.4: CH2, SCA T and SCA S). The second pump cannot support the first in this mode
- **CYCLICAL WITH RUNNING HOURS:** The two motors function based on the number of hours worked, changing place after set number of hours entered in the installer menu (see chpt. 5.3.8: CH4, SCA T and SCA S). If the pump stops because of a fault, the second pump will automatically substitute it. The second pump cannot support the first in this mode
- **ALTERNATING WITH RUNNING HOURS:** The two motors function based on the number of hours worked, changing place after set number of hours entered in the installer menu (see chpt. 5.3.8: CH4, SCA T and SCA S).
- If the pump stops because of a fault, the second pump will automatically substitute it. The second pump cannot support the first in this mode
- **JOCKEY:** In this mode, the first pump to start-up is the one entered as the "type of pump" parameter. Regardless of the conditions for turning off the system, the second pump can support the first in this mode [BOOSTER setting – CH5 see Chpt. 5.3.4]



### NOTE

Settings for the master motor (PRI "P") can be selected using the installation menu parameters.



### NOTE

Settings will be saved in case of a power failure.



### NOTE

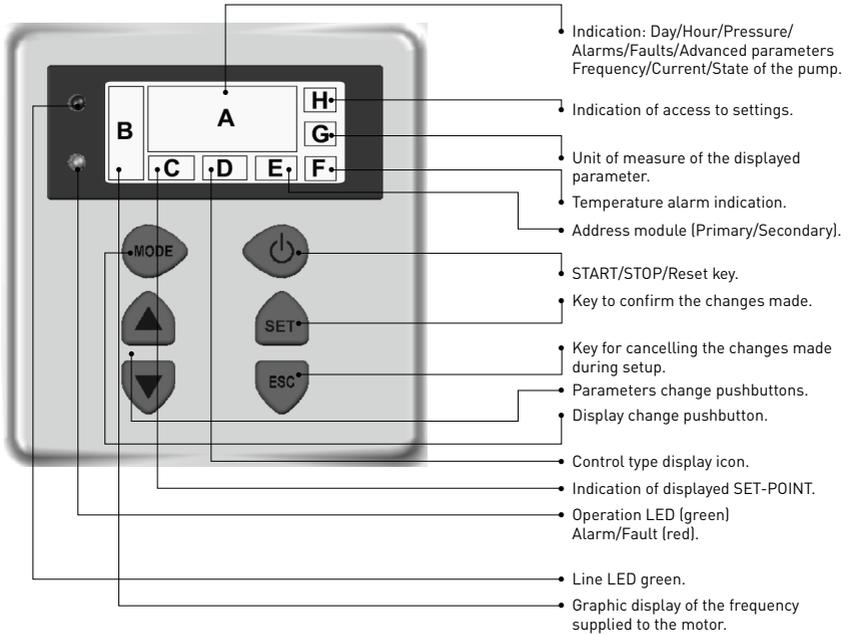
For a correct configuration, we recommend using the installation parameter menu (Lev. 2) with the machine on STOP and connected to the power supply.

# CHAPTER 5

## PROGRAMMING

### 5.1 CONTROL PANEL DESCRIPTION

The control panel is shown in picture below.



Press the START/STOP button to start and/or stop the pump

### 5.2 DESCRIPTION OF SIGNALS ON DISPLAY

When running normally (that is, in the absence of any alarms) press the MODE button to alternate the various displays available:

#### 1. BAR/PSI - SYSTEM PRESSURE

- Current pressure, shown in large numbers on the display
- Currently active set point (set 1 or set 2), shown in small numbers on the display
- Pressure unit of measurement [bar or PSI]
- Frequency graph indicator
- Day of the week
- Master (P) or Slave (S), only for unit configuration

#### 2. HZ - MOTOR FREQUENCY

- Current frequency of the pump in Hz
- Frequency graph indicator
- Day of the week

### 3. A - ABSORBED CURRENT

- Current absorbed by the pump in Ampere
- Frequency graph indicator
- Day of the week

### 4. HH:MM - TIME

- Time
- Day of the week
- Frequency graph indicator

### 5. COMPLEMENTARY PUMP STATUS (UNIT ONLY)

- "STB" the complementary pump is on standby
- "TOP" the complementary pump is on and is at the maximum possible frequency
- < Alarm Code > the complementary pump is in alarm (for a description of alarm codes, please see Chpt. 6.0)
- "ON" the complementary pump is on and regulating

The parameter displayed by default is pressure (BAR or PSI); after 10 minutes of displaying one of the other parameters the system automatically returns to displaying pressure.

### 5.3 PROGRAMMING MENU



#### NOTE

The CPS module indicates with the symbol  the modification status of the parameter.



#### NOTE

Press the SET button to save the set parameters and exit the programming mode.



#### NOTE

Press ESC to exit the programming mode without saving any of the changed parameters.

Functioning of the module is programmable using a series of parameters grouped into 4 sub-menus:

MENU	DESCRIPTION
TIME/DAY	To enter the time and day of the week.
SET-POINT	To change the system pressure SET-POINT.
ADVANCED PARAMETERS (LEV.1)	To change setting parameters.
INSTALLATION PARAMETERS (LEV.2)	To change system setting parameters.



#### NOTE

For a correct configuration, we recommend using the "installation" and "advanced" parameters with the machine on STOP and connected to the power supply.

### 5.3.1 PROGRAMMING CLOCK/DAY



**NOTE**

During the first installation phase, the module display flashes to indicate the internal clock needs updating.



**NOTE**

The clock is equipped with a battery to maintain the time and date for 24 hours if there is no power.

MENU	DESCR DISPLAY	PARAMETER NAME	DESCRIPTION	DEF	MIN	MAX
PROG. TIME	ORA	Time	Time on system	00:00	00:00	23:59
	GIO	Day of week	Day of week	MO	MO	SU

To modify the time, repeatedly press the "MODE" button until you arrive to the time parameter:

- Press the "SET" button to enter the menu to change the date and hour
- During the modification of the parameters, the symbol on the display lights up
- With the buttons it is possible to modify the time

- Press MODE to move onto changing the day
- With the buttons it is possible to modify the day

- To save the values press "SET". The symbol will disappear and the words "REC" will appear on the screen for a few seconds to show that the data has been saved
- Press "MODE" to go back to the pressure screen



### 5.3.2 SET POINT

MENU	DESCR DISPLAY	PARAMETER NAME	DESCRIPTION	DEF (bar)	MIN (bar)	MAX (bar)
SET POINT	SET 1	Set Point 1	Main pressure value	3	1	8
	SET 2	Set Point 2	Secondary pressure value (can be set only if the parameter SET n = 2)	2	1	8

To access this menu press and release the SET button:

- During the modification of the set point parameters, the symbol lights up on the display
- With the buttons it is possible to modify the pressure values

- SET POINT 1: Pressure desired by the system, the module varies the motor speed to maintain the system pressure as near as possible to the set one. During the regulation of this parameter, "SET 1" appears

- SET POINT 2: Present only if the module was set to function with two set points (SETn = 2", see "ADVANCED PARAMETERS"). When setting this parameter the display shows SET1 followed by SET2, proceed to program



**NOTE**

Press the MODE button to go from SET1 (Set-point1) to SET2 (Set-point2).

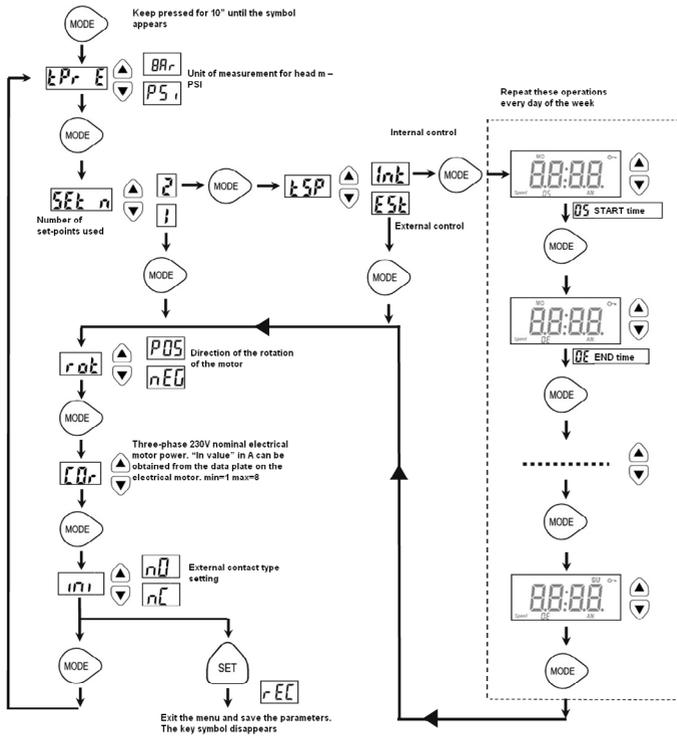
Pres "SET" to confirm. The symbol will disappear. The words "REC" will appear on the screen for a few seconds to show that the data has been saved. If two SET POINTS are present, it is possible to select the one desired using the "S.P." external contact (see electrical connections diagram) or the internal clock (see Chapter 5.3).

5.3.3 ADVANCED PARAMETERS

Key sequence to access the advanced menu, button pressed for 10 seconds 

MENU	DESCR. DISPLAY	PARAMETER NAME	DESCRIPTION	DEF	MIN	MAX
PARAMETRI AVANZATI	TPR E	Unit of measurement.	Pressure unit of measurement.	BAR	BAR	PSI
	SET N	Number of SET POINTS.	Number of set points used.	1	1	2
	ROT	Motor rotation direction.*	Motor rotation direction.	POS	POS	NEG
	CDR	Nominal current.*	Pump nominal current (read on plate: In).	In	1	8
	INI	Outside contact setting.	Type of inhibitor signal, n.a. (normally open) or n.c. (normally closed).	NO	NO	NC

\* Manufacturer's setting.



### 5.3.4 INSTALLATION PARAMETERS

Key sequence to access the installation menu, last button pressed for 10 seconds.



- During the modification of the parameters, the symbol  on the display lights up
- Use the MODE key to change various parameters

- With the buttons it is possible to modify the values



- To memorize the values press the button "SET". The symbol . The words "REC" will appear on the screen for a few seconds to show that the data has been saved

MENU	DESCR. DISPLAY	PARAMETER NAME	DESCRIPTION	DEF	MIN	MAX
INSTALLATION PARAMETERS	TIP 0	Pump type	Identifies whether the pump is part of a unit or whether it is a single pump, possible values: <ul style="list-style-type: none"> <li>• NCON: pump not configured (factory setting)</li> <li>• SING: single pump</li> <li>• PRI: primary or master pump for a unit</li> <li>• SEC: secondary or slave pump for a unit</li> </ul>	SING	N.A.	N.A.
	SCA	Type of exchange	This parameter indicates the mode used to change pumps when the pump is part of a unit (PRI, SEC). <ul style="list-style-type: none"> <li>• CH01: Indicates that the first pump to come on at the next request for water will be the one which started-up second or which did not start-up during the last cycle. The second pump cannot support the first in this mode (BOOSTER setting).</li> <li>• CH02: Indicates that the first pump to come on at the next request for water will be the one which did not start up during the last cycle. The second pump cannot support the first in this mode.</li> <li>• CH03: Indicates that the first pump to come on at the next request for water will be the one which has run for the least amount of time (see functioning hours parameter). The second pump cannot support the first in this mode (BOOSTER setting).</li> <li>• CH04: Indicates that the first pump to come on at the next request for water will be the one which has run for the least amount of time (see functioning hours parameter). The second pump cannot support the first in this mode.</li> <li>• CH05: In this setting, the first pump to start-up is the one entered as the primary pump in the "type of pump" parameter. The second pump can support the first in this mode; however, the cyclical function is not available.</li> </ul>	01	01	05
	INF F	Minimum frequency	Parameter defining minimum motor rotation frequency.	30	20	40
	SUP F	Maximum frequency	Parameter defining maximum motor rotation frequency.	50	40	60
	ANP F	Reactivity factor	Parameter defining the speed with which the motor responds to changes in pressure. The lower the setting the faster the motor's response.	15	1	50
	SUP S	Bottom scale sensor	Parameter defining the sensor at the bottom of the scale (in bar).	10	2	30
	INF S	Zero sensor	Minimum value read by the sensor (zero).	0,6	0	1
	OFF P	Offset sensor	Use to enter an offset value for the pressure sensor.	0	0	10,0
	SPE T	Switching off time	Interval of time during which pressure must remain stable (+/- 0.1 Bar) with a rotation lower than the average switching off frequency + 10 to trigger the motor shutdown cycle (seconds).	10	3	50

MENÚ	DESCR. DISPLAY	NOME PARAMETRO	DESCRIZIONE	DEF	MIN	MAX
INSTALLATION PARAMETERS	DIF P	Pressure threshold	Subtract this figure from the set point to obtain pressure when the motor is started-up. In other words, the motor starts-up when pressure reaches the set point value minus the threshold value (BAR).	0,3	0,1	0,5
	ALL P	Water alarm pressure	Indicates minimum system pressure, a lack of water alarm will be generated under this threshold value Set to zero to disable this function.	0,5	0	1
	RIP 1	1st start-up	Waiting time between the first lack of water reading and first attempt to automatically restart the system (minutes). The module will not attempt to restart if this parameter is set to zero.	1	0	1440
	RIP 2	2nd restart	Waiting time between the first restart and the second attempt to automatically restart the system (minutes).	5	0	1440
	RIP 3	3rd restart	Waiting time between the second restart and the third attempt to automatically restart the system (minutes).	60	0	1440
	RIP 4	4th restart	Waiting time between the third restart and the fourth attempt to automatically restart the system (minutes).	720	0	1440
	RIP F	Restart type	Parameter used to define how the restarting mechanism works. If set to FIN, the module will go into a definitive alarm after the fourth attempt. If sent to CICL, it will attempt to restart indefinitely using the interval specified during the fourth attempt.	FIN	FIN	CICL
	RIP T	Intervention time	Waiting time after restarting within which pressure must return to above the minimum threshold level for lack of water. (seconds)	15	5	300
	ORE P	Hours running	Number of hours the pump has been running.	N.A.	N.A.	N.A.
	SCA T	Exchange time	Parameter indicating the amount of time a pump must run for. Once this value has been reached, the pump will stop and a second pump will commence working. This parameter is expressed in minutes until it reaches 60, after which it is expressed in hours. The difference is indicated by the presence of an "H" for hours and an "M" for minutes. Must be set to primary for a unit or for twin pumps.	0	0	168
	SCA S	Exchange time mode	Pumps are exchanged once the SCAT parameter has been reached: T1: The active pump is switched off first, before the second pump starts up T2: The second pump is switched off first, before the first pump starts-up.	1	1	2
	FP	PWM frequency	Frequency of the PWM which controls the motor.	15,9	5,1	15,9
TAB	Anti-locking	Amount of time the pump is inactive. Once this amount of time has expired, the pump will start up for 15 seconds at maximum frequency. Then, the frequency will be slowly lowered until the minimum set frequency is obtained. This parameter is expressed in minutes until it reaches 60, after which it is expressed in hours. The difference is indicated by the presence of an "H" for hours and an "M" for minutes.	0	0	999	

#### 5.4 MANUAL START OF MOTOR/PRIMING

This procedure is applicable when you want to manually start the system or prime the pump. It is possible to manually start the motor by pressing the following sequence of buttons:

Buttons sequence with pump off, last button pressed for 10 seconds.    



#### ATTENTION

During manual start-up, the motor rotates at maximum speed and the pressure control is not activated, therefore the pump reaches its maximum pressure.



#### ATTENTION

Ensure there is water inside the pump unit, otherwise the pump seal will be destroyed.

## 5.5 MANUAL START/STOP

It is possible to manually stop the pump by pressing the START/STOP button: in this situation the display alternatively shows the writing STOP. During STOP status the module is not operative unless the anti-lock mode is activated (TAB parameters - installation parameters 5.3.4). The word "abl" will be displayed if the condition is active.

START/STOP sequence of buttons, push the STOP button 



### ATTENTION

Press the START/STOP button again to exit the STOP condition.

## CHAPTER 6 SIGNALS, ALARM STATUS AND ERRORS

### 6.1 HISTORY (SAVED)

Key sequence:

Press ESC for 5 seconds.



Press MODE to scroll the error log.



Press STOP to see the hour and the date of the event (when the clock has been set correctly).



### 6.2 SIGNAL TABLE

MESS. DISPLAY	DESCRIPTION		ACTION
INIT	System initiation signal.	The condition occurs when the system is first started-up or after a prolonged power failure.	Wait for a change in status.
REIN	System re-initiation signal.	The condition occurs when a short power failure takes place.	
INIB	Inhibitor intervention signal.	This is an operative condition generated by an external command which closes entry to the inhibitors. (NO - NC)	Check the external inhibitor command (i.e. switch, float, pressure gauge).
RPC	Reset configuration.		
REC	Saving parameter signal.		
RST	Total reset signal.		The board has been reset. The cause of this signal can be a either prolonged absence of power or if the reset button has been pressed manually. The module will save all the information recorded, with the exception of clock setting.
RSE	Memory reset.		The eeprom memory has been reset (see chapter 7.2). The module returns to the factory settings.
ESG	Memory reset carried out.		Confirms that the eeprom memory has been reset (see chapter 7.2).
FAL	End of alarm (in memory).		Indicates the end of an alarm.
TOP	Maximum power complementary pump.		The complementary pump is on at the maximum frequency possible.
ON	Complementary pump on.		The complementary pump is on and regulating.
STB	Complementary pump on standby.		The complementary pump is on standby.

### 6.3 ALARM TABLE

MESS. DISPLAY	DESCRIPTION		ACTION
A01	No water alarm - temporary	Error due to the temporary absence of water. This occurs when water is absent and the restart mechanism has been activated. The will wait before restarting in order to attempt to automatically reset the error.	Check the water level in the first tank or the aqueduct pressure. Wait for the programmed attempted restart or press the button START/STOP for a manual restart.
A02	No water alarm - definitive	This condition occurs when there is no water and the automatic restart system has not activated or restart attempts occurred already without managing to reset the system functioning. This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.)	Check the water level in the first tank or the aqueduct pressure. Press the button START/STOP to manually restart the system.
A03	Pressure transducer alarm.	This signal occurs when the control board cannot identify the transducer pressure signal.	Check the pressure transducer is correctly connected. If the error occurs again, contact your nearest assistance centre.

### 6.4 ERROR TABLE

MESS. DISPLAY	DESCRIPTION		ACTION
E00	No event.	The error log appears when no errors have been signalled.	
E01	Fault generico. (segnalazione memoria)	This error occurs in the presence of: <ul style="list-style-type: none"> <li>• Internal module error</li> <li>• Overheating of the power module</li> <li>• Pump failure</li> </ul>	Press the START/STOP button to attempt to exit this condition. In case of a persistent error, contact technical support.
E02	Temporary external error.	An external error occurs when there is a problem with the power module. The module will not be operative during an EXTERNAL ERROR.	In this case, the module will attempt to restart normal functioning after 5 minutes and will repeat this procedure up to five times. Press the START/STOP button to attempt to exit these conditions. Please contact technical support of the error persists.
E03	Definitive external error.	The definitive external error condition is indicated after the temporary error condition is repeated 5 times.	Press the START/STOP button to attempt to exit this condition. Please contact technical support of the error persists.
E04	Communication error.	This error condition occurs when the control board cannot communication with the power part. This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.).	Cut the power off and wait until the LINE Led switches off and after which turn power back on. If the error condition occurs again, contact your nearest assistance centre.
E05	Over voltage error.	This error occurs when the current absorbed by the module is greater than triple the nominal current. This condition can be caused when the pump is blocked by foreign bodies. This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.)	Cut off the power supply and wait for the LINE Led to switch off. Check the pump freely rotates and if necessary remove foreign bodies that block correct functioning. Turn power back on. If the error persists, contact your nearest assistance centre.
E06	Under voltage error temporary.	This error condition occurs when the voltage is 10% less than the nominal voltage (230V). This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.)	Press the button START/STOP or cut the power off and wait until the LINE Led switches off and after which restart the system. If the error occurs again, contact your nearest assistance centre.
E07	Under voltage error definitive.	This error occurs when the temporary under voltage condition is repeated 5 times.	

MESS. DISPLAY	DESCRIPTION	ACTION
E08	Over voltage error temporary. This error condition occurs when the voltage exceeds by 10% the nominal voltage (230V). This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.)	In this case, the module will attempt to restart normal functioning after 1 minute and will repeat the procedure up to five times. Press the button START/STOP or cut the power off and wait until the LINE Led switches off and after which restart the system. If the error occurs again, contact customer care.
E09	Over voltage error definitive. A definitive over voltage error occurs after a temporary over voltage error is repeated 5 times.	If the error occurs again, contact customer care.
E10	Absence of network power (in memory) This condition occurs following a network absence.	
E11	Power error. This condition indicates a motor power absorption error in terms of its running status.	Press the START/STOP button or cut off power and wait until the red Led LINE goes off, then power again to reset the system. If the error occurs again, contact your nearest customer care centre.
E12	Memory error. This error occurs when eeprom is unable to load the parameters which have been entered.	Wait for a few minutes. If the signal remains, press the button START/STOP or cut the power off and wait until the LINE Led switches off and after which restart the system.
E13	Configuration error. This error occurs when the control board cannot correctly communicate with the power part. This alarm condition closes the J3 contact on the power board for possible external signals (alarm light, siren, etc.).	Press the button START/STOP or cut the power off and wait until the LINE Led switches off and after which restart the system. If the error occurs again, contact your nearest assistance centre.
E99	Undefined error. This error occurs when an unforeseen error takes place.	Wait for a few minutes. If the signal remains, contact your nearest customer care centre.
485E	Communication error. This signal refers to pump units and is indicated when the devices are not communicating correctly.	Press the button START/STOP or cut the power off and wait until the LINE Led switches off and after which restart the system. Check the communication cable. If the error occurs again, contact your nearest customer care centre.

## CHAPTER 7

### RESETTING AND FACTORY SETTINGS

#### 7.1 GENERAL SYSTEM RESET



#### ATTENTION

Press only as a last resort to restart the system.

Triggers a general module reset and reloads set values saved in eeprom. Press as a last resort only in order to restart the module. If, for whatever reason, the module becomes blocked, wait approximately 10 seconds for the module itself to automatically launch a general reset. If this does not reset the system, use this key and contact a customer care centre.

Reset key sequence, press SET for 20 seconds.



## 7.2 TO RESET FACTORY SETTINGS



### ATTENTION

Loads all default values and deletes all previous values entered.

The factory values can be loaded by pressing a sequence of keys.

Key sequence to reset setting, press DOWN, ESC, ARROW DOWN, ESC, ARROW DOWN, ESC, press for 10 seconds.



Press SET to confirm reset.



## 7.3 SOFTWARE VERSION

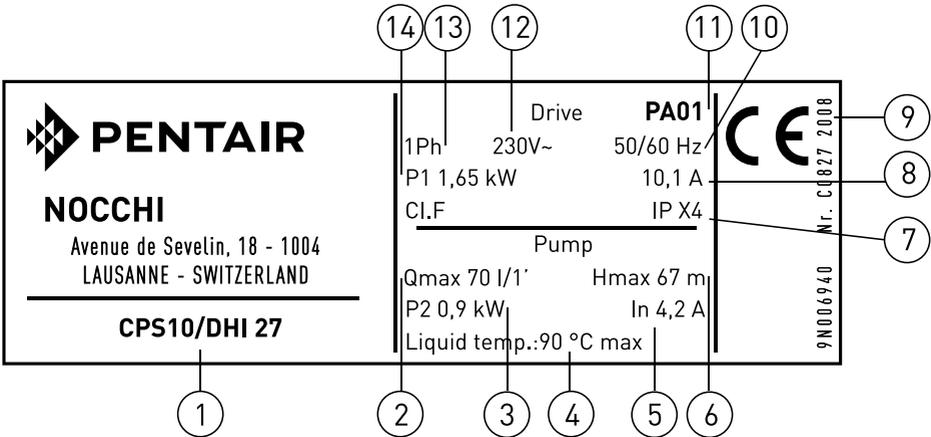
Key sequence to see the software version, ARROW UP for 5 seconds.



# CHAPTER 8

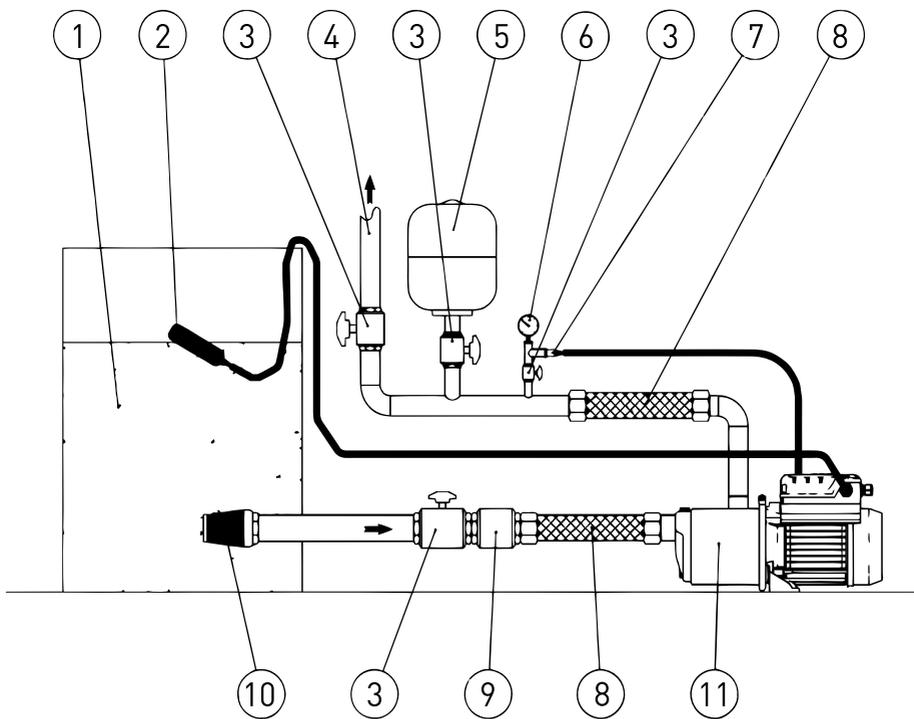
## TABLES AND DESIGNS

### 8.1 DATA PLATE



- |                                  |   |                         |
|----------------------------------|---|-------------------------|
| 1) Type of motor pump            | 7) Insulation class and level of protection | 12) Power voltage       |
| 2) Maximum flow rate l/min       | 8) Absorbed current                         | 13) Number of phases    |
| 3) Nominal power [P2]            | 9) Date and year of production              | 14) Absorbed power [P1] |
| 4) Maximum temperature of liquid | 10) Frequency                               |                         |
| 5) Nominal current               | 11) Software version                        |                         |
| 6) Maximum head in metres        |   |                         |

8.2 INSTALLATION OF THE NEGATIVE SUCTION HEAD

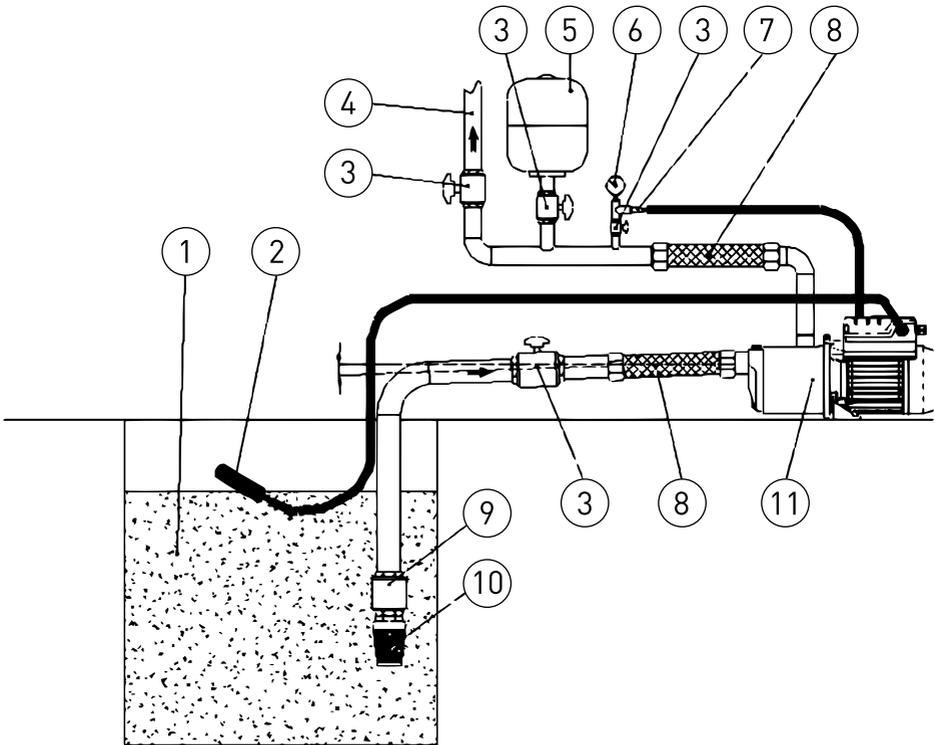


- 1) Basin or tank
- 2) Float
- 3) Shut-off valve
- 4) Outlet tubing

- 5) Tank/autoclave membrane [8 l/min]
- 6) Gauge
- 7) Pressure transducer
- 8) Flexible tube

- 9) Non return valve
- 10) Filter
- 11) Motor pump complete with inverter

## 8.3 INSTALLATION OF THE POSITIVE SUCTION HEAD

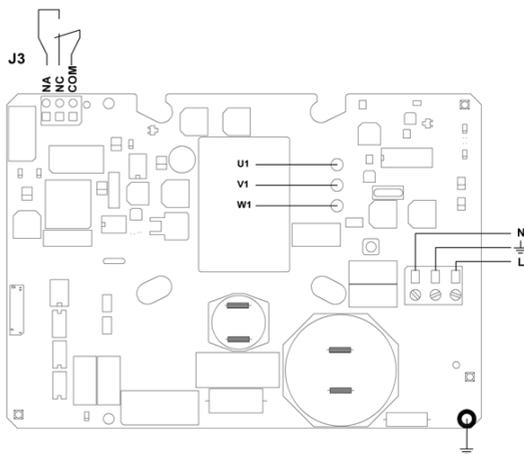


- |                   |                                      |                                       |
|-------------------|--------------------------------------|---------------------------------------|
| 1) Basin or tank  | 5) Tank/autoclave membrane (8 l/min) | 9) Non return valve                   |
| 2) Float          | 6) Gauge                             | 10) Filter                            |
| 3) Shut-off valve | 7) Pressure transducer               | 11) Motor pump complete with inverter |
| 4) Outlet tubing  | 8) Flexible tube                     |                                       |

For the installation of the positive suction head, ensure the correct inclination of the suction piping until the air present in the tubing can exit the outlet tubing.

### 8.4 ELECTRICAL CONNECTION BOARD – POWER BOARD

- LINE → Power entry
- J3 → Alarm exit
- $U_1, V_1, W_1$  → Motor connections



### 8.5 CONNECTIONS BOARD – CONTROL BOARD

- RS-485 → Communication port;
- INI → INIBIT input: NC external contact;
- S.P. → External Set Point (EST): NA contact;
- NTC → NTC sensor input to control temperature;
- TRASD. → Input 0=Volts for pressure transducer.

- + → Positive
- → Negative
- D → Signal

