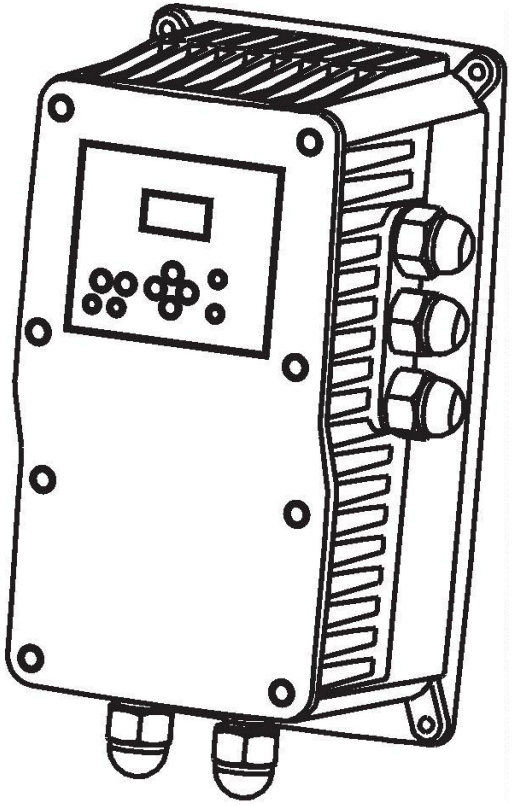
EN INSTALLATION AND OPERATING INSTRUCTIONS



CE

SPEEDBOX

1010 MT
1112 MM
1305 TT / 1309 TT / 1314 TT

EN

WARRANTY AND RECOMMENDATIONS

The product is guaranteed the first 2 years after its production date.
This guarantee does not include damages in case of an inadequate installation or manipulation.
Read carefully this instructions manual before installation**.**

Do not throw away this manual afer installation, it can be usefull for later modifications or for solving the different types of alarms.

Hydraulic and electrical installations must be set up by qualified personnel according to the safety prescriptions as well as the standards and legislation of every country.When carrying out the electrical connection it is recommended to use a differential switch of high sensitivity: $I_{\Delta n}$ = 30 mA (clase A o AC). It must be used an MCB curve C of 16A (1314 and 1112MM), 6A (1305TT), 10A (1309 TT) and 20A (1010MT). It is recommended to use an independent electrical line, with the purpose of avoiding electromagnetic interferences that could create nonwished alterations in household electronic devices.
WARNING, before doing any maintenance inside the device, it must be unplugged from the electric supply and wait a minimum of 2 minutes after the disconnection to avoid electrical discharges.

Warning symbols contained in this service manual



Only applies to type MASTER.



Risk by electric shock.



Risk for people and/or objects.

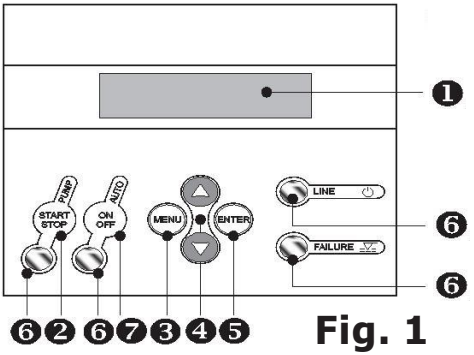


Fig. 1

EN

1- **LCD** screen. Shows the pressure in working mode.
2 - **MANUAL START-STOP** pushbutton.
3 - Pushbutton for **ENTER** or **EXIT** menu.
4 - With these pushbuttons we can change programming values showed in the **LCD** screen (1).
5 - **ENTER** for saving programmed values. Every pulsation is succeeded by a new field of the **CONFIGURATION MENU**. Whenever we want to quit the configuration sequence press **MENU** (3) accepting the changes.
6 - Led lights:
- **LINE** green: Electric supply. ON when it is connected.
- **FAILURE** red: Bright or intermittent depending on type of failure.
- **PUMP** yellow: When it is bright means pump working. It is lit with the pump stopped or when the device is not connected.
- **AUTOMATIC** green: it is bright in AUTOMATIC mode. When it is intermittent in MASTER&SLAVE mode it means that this device will be auxiliary in the following cycle.

7- **ON/OFF**: It allows to change from **AUTOMATIC** to **MANUAL** mode or vice versa.

TRANSPORTATION AND STORAGE

- Inspect the delivery

1. Check the outside of the package.
2. Notify our distributor within eight days of the delivery date, if the product bears visible signs of damage.
3. Open the carton.
4. Remove packing materials from the product. Dispose of all packing materials in accordance with local regulations.
5. Inspect the product to determine if any parts have been damaged or are missing.
6. Contact the seller if anything is out of order.

- Transportation guidelines

Precautions

WARNING:

• Observe accident prevention regulations in force.

• Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.
Check the gross weight that is indicated on the package in order to select proper lifting equipment.

Position and fastening

The unit must be transported only in its horizontal position as indicated on the package. Make sure that the unit is securely fastened during transportation and cannot roll or fall over. The product must be transported at an ambient temperature from -10°C to 70°C (14°F to 158°F) with a non-condensing humidity of <95% and protected against dirt, heat source, and mechanical damage.

- Storage guidelines

Storage location

NOTICE:

• Protect the product against humidity, dirt, heat sources, and mechanical damage.

• The product must be stored at an ambient temperature between 10°C and 70°C (14°F and 158°F) and a non-condensing humidity below 95%.

• The converter uses electrolytic capacitors which can deteriorate when not used for a long period of time. If storing for a year or more, make sure to run them occasionally to prevent deterioration.

INSTALLATION SCHEME

OBSERVATIONS / OSSERVAZIONI / OBSERVATIONS / OBSERVACIONES / ANMERKUNGEN / VASTSTELLINGEN:
A) Accessories ❸, ❹ and ❽ are recommendable but not essential.

B) In the case of the hydropneumatic tank ❼, minimum capacity should be 5 l.

C) It must be installed a pressure transmitter ❺, otput 4-20 mA, with pressure range either 0-10 bar or 0-16 bar.

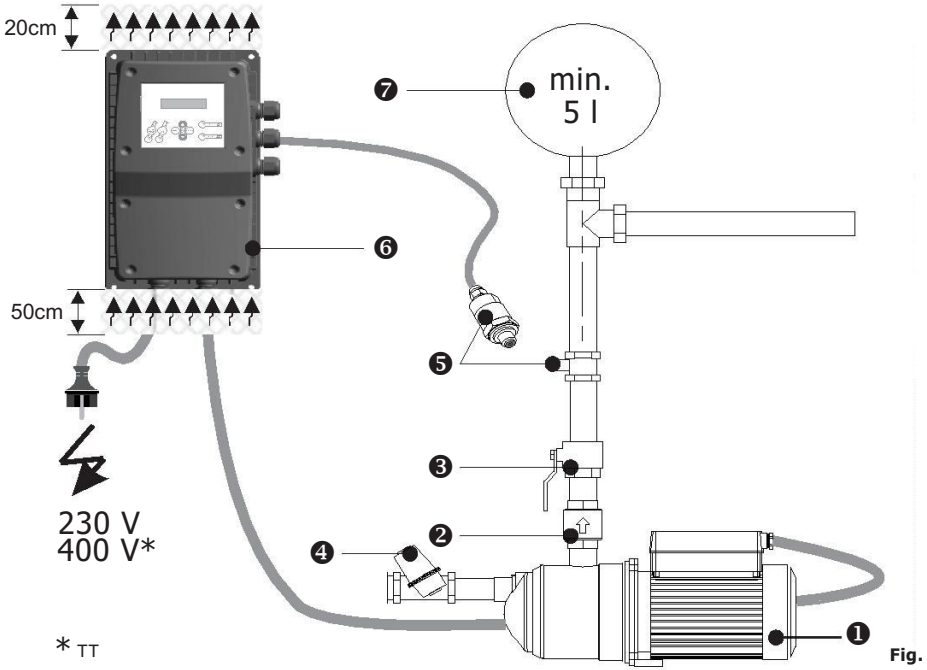
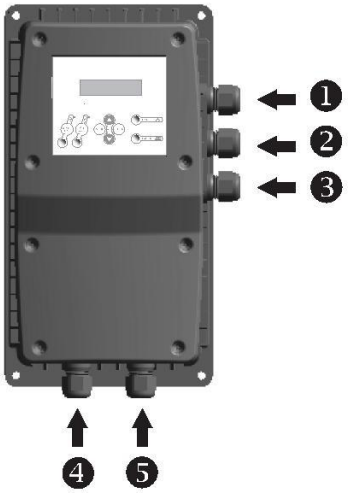


Fig. 2

❶.- Pump
❷.- Check valve
❸❽. - Ball valve
❹.- Filter
❺.- Pressure transmitter
❻.- Device
❼.- Hydropneumatic tank

WIRING



(TT)	(MT) & (MM)	
3	1	Master&Slave communications cable
1	2	Pressure transmitter
2	3	Minimal level (optional)
4	4	Power supply
5	5	Pump connection

Fig. 4

CABLE SECTION

	10 m	20 m	30 m	40 m	50 m	60 m	70 m	80 m	90 m	100 m	110 m	120 m	130 m	140 m
5 A	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.5	2.5	2.5	2.5	2.5	2.5
9 A	1.5	1.5	1.5	1.5	2.5	2.5	2.5	4	4	4	6	6	6	6
12 A	1.5	1.5	2.5	2.5	4	4	4	6	6	6	10	10	10	10
14 A	2.5	2.5	2.5	4	4	6	6	6	10	10	10	10	10	10
	NO FILTER				**dV/dt FILTER**				**SINUSOIDAL FILTER**					

External level probe when MASTER&SLAVE.

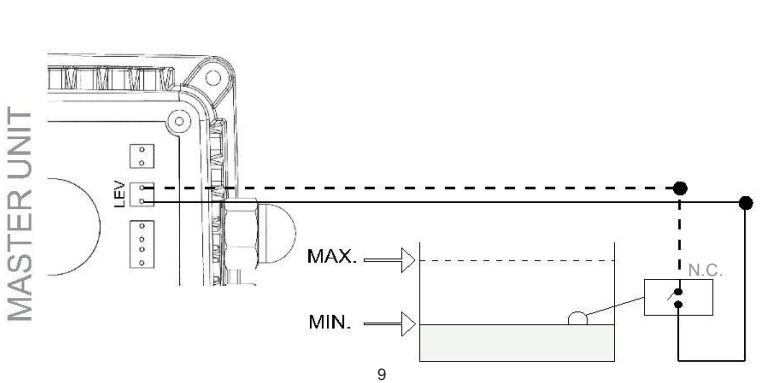


Fig.6

CONNECTION MASTER&SLAVE COMMUNICATION, PRESSURE TRANSMITTER and EXTERNAL LEVEL SENSOR

EN - Use cables with reinforced isolation.

1. Unscrew the cover and loosen the PG located on the lateral side of the plastic body.
2. Insert the cord through the PG.
3. Remove the connector from its housing.
4. Set up the connection following the schema 5.
5. Relocate the connectors on its housing. Screw the cover and the PG.

If the devices are provided with the communication cable, it governs the following color code: 1-black, 2-brown, 3-grey and 4-yellow / blue. They will be connected by following detail A; the two central wires (brown and grey) must go crossed.

Fig.5 - 1006-1010(MT) & 1106-1112(MM)

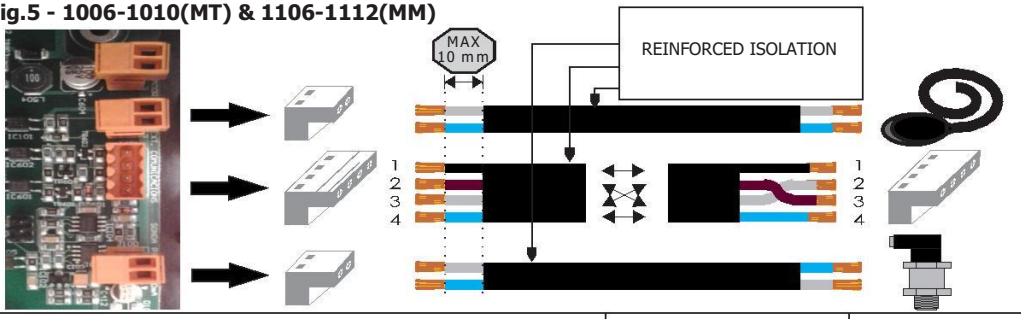
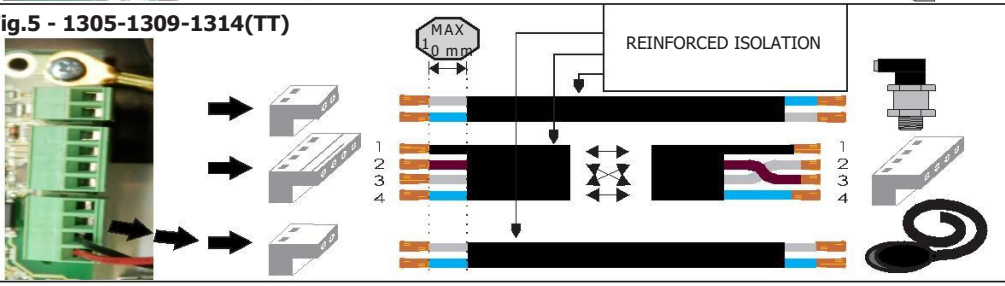


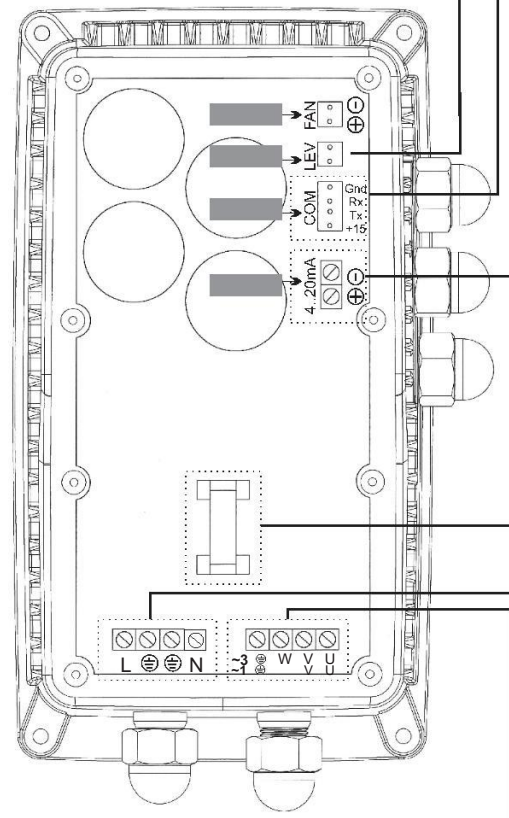
Fig.5 - 1305-1309-1314(TT)



External level probe

Connection master&slave communication

Fig. 5



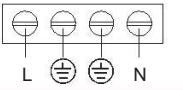
Pressure transmitter

General fuse

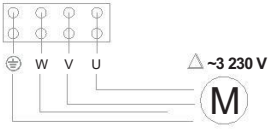
1112 MM: 16 A

1010 MT: 20 A

Power supply



3-phase motor connection



Single-phase motor connection

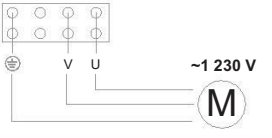
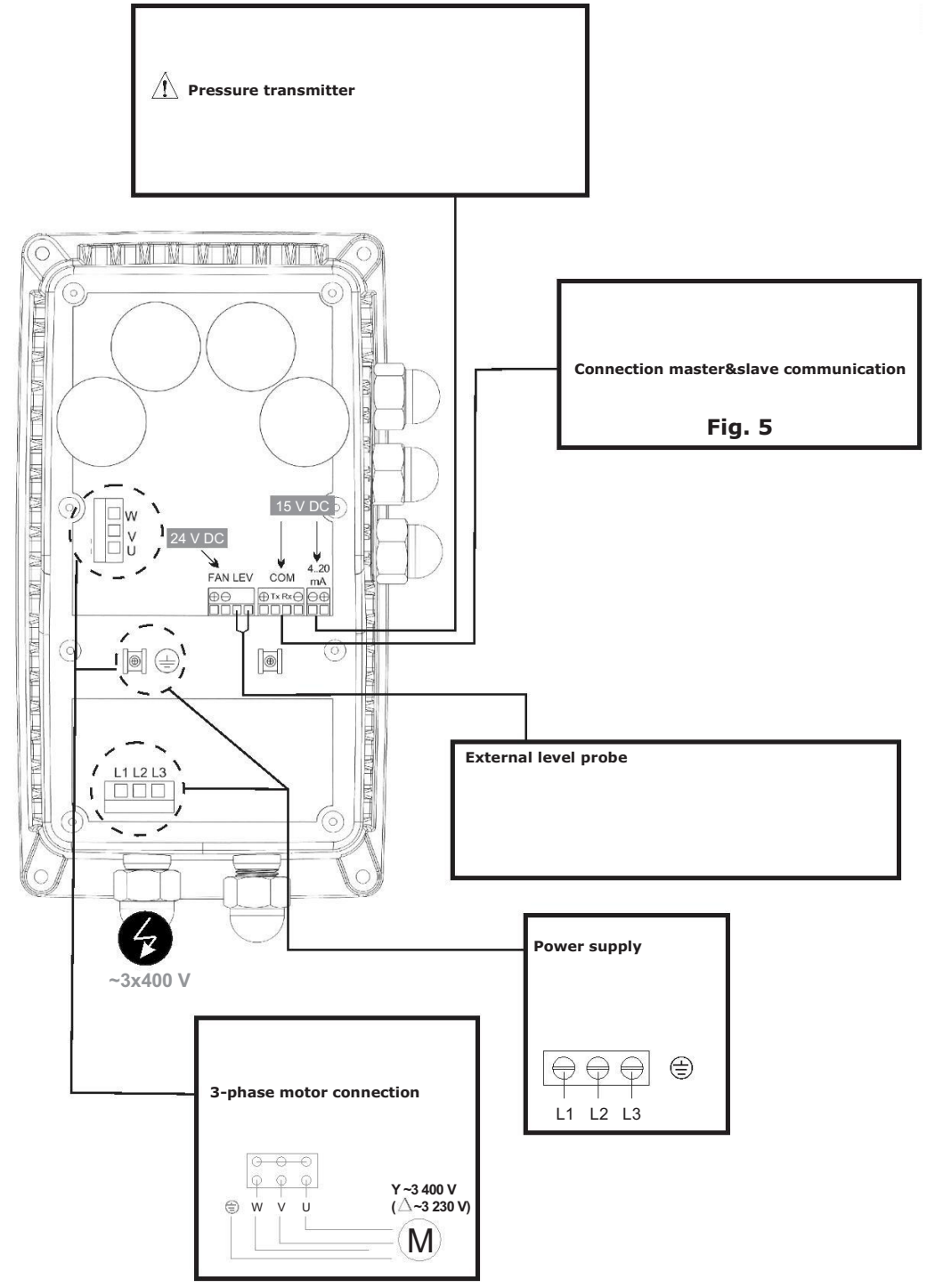


Fig. 3

1305-1309-1314 (TT)

CONNECTIONS



BEFORE INSTALLATION AND USE READ THE FOLLOWING INSTRUCTIONS CAREFULLY. THE MANUFACTURER DECLINES ALL RESPONSABILITY IN THE EVENT OF ACCIDENT OR DAMAGE DUE TO NEGLIGENCE OR FAILURE TO OBSERVE THE INSTRUCTIONS DESCRIBED IN THIS MANUAL OR IN CONDITIONSTHATDIFFERFROM THOSEINDICATEDONTHEDEVICE.

OPERATION

Is a wall-mounted automatic control device designed for the single and three-phase pump´s automation, with an electronic system managed by a software responding to the rigorous requirements of efficiency and safety of the most important pump manufacturers. It includes a frequency inverter that regulates the speed of the pump in order to keep constant the pressure independently of the flow given.

The system incorporates an LCD screen where the parameters configuration is very easy and intuitive. Once the configuration parameters are set, the device manages the start-up of the pump and the frequency inverter. It assures a constant pressure and an important costs reduction because at any time the control will feed the system with the right and necessary output, obtaining a maximum energetic efficiency. In order to establish the optimal pressure in the installation is suitable to consider following criteria:

Hm: Max. water column height in m. It depends on the number of floors and it corresponds to the height from the pump to the last floor. Every 10 m of height corresponds approximately to 1 bar (0.98) bar.

Pw: Available minimum pressure in last floor (usually 1.5 bar).

Pc: Pressure drop. It can be considered with a simplified criteria as 0.033 bar/m.

Prmin: Minimum resultant pressure. It is the sum of the previous pressures and it will be the operating pressure of the pump.

Example for a 5 floors building (15 m) with pump placed at level 0:
Hm =15 m ≅ 1.5 bar Pw = 1,5 bar Pc=15 x 0,033 bar ≅ 0,5 bar Prmin = 1,5 + 1,5 + 0,5 = 3,5 bar

M→ MASTER AND SLAVE OPERATION

The group MASTER-SLAVE is constituted by a device configured as MASTER - responsible of the group´s control - and a device configured as SLAVE controlled by the master device.

Due to the alternating sequence of operation, the one configured as MASTER began the first cycle as MAIN device - its pump is the first to start - but in the next cycle it becomes SECONDARY - its pump is the second to start - and so on. Therefore, the fact that a device is configured as MASTER involves control of the group but this fact does not avoid its operation alternately as SECONDARY device. Each device must be provided with its own pressure transmitter.

MAIN CHARACTERISTICS

- Wall-mounted frequency inverter for the pump control.
- Control and safety system against over-intensities.
- Control and safety system against dry operation.
- **ART** function (Automatic Reset Test). If the device has been stopped due to the action of the safety system against over-current, the **ART** tries to connect the pump, with a programmed periodicity because the water supply could have been restored
- Automatic restore system after an interruption of power supply. System is activated in AUTOMATIC mode keeping the configuration parameters (see "CONFIGURATION" chapter).
- External pressure transducer (4..20 mA) under demand.

M→ Possibility of communication with another device to operate in MASTER & SLAVE regime.

- Control panel (Fig.1):
  - LCD screen, for alarm menu with permanent pressure indication.
  - START/STOP push-button to act by hand each one of the pumps
  - ENTER pushbutton to save data in memory.
  - ON/OFF pushbutton to change rom AUTOMATIC to MANUAL mode or vice versa.
  - MENU push-button
  - Keyboard for the access to programming menu.
  - Digital gauge.
- Connections for detection of minimum water level in aspiration tank. This system is independent of the safety against dry operation. Is optional.
- Register of operational controls: infomation about operating hours, counter of starts, counter of connections to the power supply.
- Register of alarms: information about type and number of alarms since the starting up of thedevice.

CLASSIFICATION AND TYPE

According to EN: 60730-1 and EN:60730-2-6 this unit is a control electronic device for pressure groups, with flexible cable for permanent assembly type Y, action type 1Y (transistor output). Operating value: flow 2.5 l/min. Degree of contamination 2 (clean environment). Software Class A.

Impulse rating voltage: cat II / 2500V. Applied temperature for the ball pressure test: enclosure (75ºC) and PCB (125ºC). Control circuit for AC motor with cos fi ≥ 0,6 (single-phase) and cos fi ≥ 0,75 (3-phase).

According to EN 61800-3 this device is C2 class - C1 class under request.

TECHNICALCHARACTERISTICS

TYPE	1010 MT	1112MM	1305TT	1309TT	1314TT
Power suply voltage	~1x230 Vca +10% -20%		~3x400 Vca +10% -20% / ~3x230 Vca +10% -20%		
Frecuency	50/60 Hz				
Output	~3 230 V	~1 230 V	~3x400 Vca / ~3x230 Vca		
Max. current each	10 A	12 A	5 A	9 A	14A
Max. peak of current.	20% 10 sec.				
Range of set pressure	0,5 - 16 bar o 0,5 - 10 bar (type config.)				
Protection degree	IP 55	IP 55	IP 55	IP 55	IP 55
Max. enviorn. temp.	5 - 40 °C				
Relative humidity	Maximum relative humidity 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C				
Cooling method	Forced	Forced	Forced convection		
Net weight	4,5 kg	3,5 kg	4,5 kg	4,5 kg	4.5 kg
Fuses	20 A	16 A	-	-	-

⚠ **MECHANICALINSTALLATION (fig. 2)**

- Store in a clean and dry environment, do not remove theunit fromits packaginguntilit mustbeused.
- Thedevicemustbeinstalled inenvironmentspollutiongrade2accordingtoEN-60730-1.
- TheprotectiondegreeisIP55/IP65 dependingonthemodel,thereforemustbemountedinplacesprotectedfromtherain.
- Installthedeviceinanuprightwall, leaving at least 200 mm of space on its topandbottomtofacilitate heatdissipation.
- Theunit will be anchored in the wall using the 4 holes of 7 mm in diameter located on its corners.
- **The rearsideof thedevicemustbecoveredif itisnotwallmountedtoguaranteetheairflowof thefan!**

⚠ **HYDRAULIC INSTALLATION (fig. 2)**

Before proceeding with hydraulic connection it is essential to install a non-return valve in the pump´s inlet.
In case of assembly in group, it must be mounted a collector for the communication of the devices water outputs. The inlet must proceed from a common origin.
For mounting the pressure sensor can be used any outlet G1/4 "at the pipe after the pump outlet.
•It must be installed an hydropneumatic tank of at least 5 l to avoid problems caused by leakeages in the hydraulic net
•The device is provided with an automatic system that stops the pump if there is no demand in the installation. If you are in an installation where the device does not stop the pump when there is no demand, this happens because there are leaks in the installation (tanks, faucet, check valves...). In these cases it can be used the frequency minimum value like a frequency stop. (see CONFIGURATION)
•PROCEDURE: Open a faucet of the installation and set the desired minimum flow. With this flow, visualize in the screen the frequency at which the pump is rotating. Set the minimum frequency to the frequency displayed on the previous screen.

⚠ **ELECTRIC CONNECTION (fig. 3, 4 and 5)**

The electrical installation must be performed by qualified personal in compliance with safety regulations and to regulations of each country.
Before doing manipulations inside the device, it should be disconnected of the electric supply and after disabling, wait for 2 minutes in order to avoid electrical discharges.
The basic unit is served with power cabling, motor cabling and pressure transmitter cabling. The power cord can be replaced only by the manufacturer or his accredited representative (Y).Then the cabling is exposed as would be done to address any eventuality:

- Use cablestypeH07RN-Fwith sectionenoughtothepower installed:
  - Power supply: s ≥ 1,5mm²
    - 1112MM- 1314TT:s≥ 1,5mm²
    - 1010MT: s ≥ 2,5mm²
    - 1305TT - 1309TT: s ≥ 1 mm²
  - Motorsupply:
    - 1010MT- 1305TT- 1309TT: 1 mm² dependingonthelengthof thecable(see fig.4).
    - 1314TT,1112MM: 1.5mm² dependingonthelengthof thecable(see fig.4).

  If is necessary to increase the cable length, outer joint is performed following the guidelines of the regulations applicable to low voltage installationcountryandandthesectionof cablewill besizedaccordingtothesame criteria
- Verify if the power supply is 220/240 V (MM & MT), ~3x400V or ~3x230V (TT). Dismountthe cover of the electroniccircuitand carry out theconnectionsaccordingtotheindicationslocatedontheconnectionstripbase.
- Do the power supply connection (being sure there is a good earth connection): **L1 N ⏚ (MM & MT)**, **L1 L2 L3 ⏚ (TT)** Do the connectionbymeanof magnetothermicswitch in OFF mode.
- The earth conductor must be longer than the others. It will be the first one to be mounted during the assembly and the last one The earth conductor must be longer than the others. It will be the first one to be mounted during the assembly and the last one to disconnect duringdisassembling.
- Do the pump connection (fig. 3 and 4).
- Normally the device is served with the pressure transmitter connected with cable length of 1.5 m. Otherwise, connect the pressure transmitter(fig.3and4). H03VV 2x0, 5mm cable is used.
  If is necessary to increase the cable length, outer joint is performed following the guidelines of the regulations applicable to low voltage installationcountry- the cable length should not exceed 15 m.
- Do the pressure transmitter connection (fig. 3 and 4). In case of M-S communication it will be connected a pressure transmitter in each unit.
- Min. level control (optional). There is an input for stopping the pump as soon as is disconnected the external switch of minimum level. See fig.3

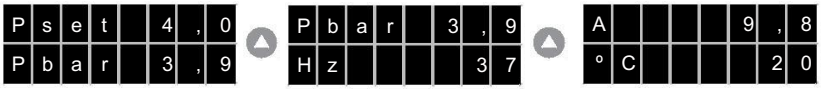
M→ Min.levelcontrolincaseof master-slavecommunication(optional):OnlyMasterunit mustbeconnectedatthelevelcontrol.
M→ Connection of 2 devices (optional): for the communication of 2 devices it will be used a cable of 4x0.25 mm², it will be inserted throw the PG cable gland located in the lateral of thedevice.See fig.4 and 5.

WARNING!. Wrong connections could spoil the electronic circuit. The manufacturer declines all responsability in damages caused by wrong connection.

SCREENDISPLAY.

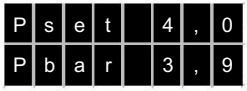
Being the unit in automatic mode (LED AUTO ON) by mean of the push-button ▲ can be displayed several operation parameters. Where:

- Pset is the set pressure or targetpressureinbar.
- Pbaristheinstantaneouslectureof pressure in bar.
- Hz istherotationfrequencyof the motor in Hz.
- AistheinstantaneouscurrentconsumptioninA.
- ºCisthemoduletemperatureinºC.



EXPERT MENU. Special configuration, there is no need to adjust these values, they are factory set.

Using ▲▼ we can change the values and press **ENTER** for validation. Whenever we want to quit the configuration sequence press**MENU**. After every **ENTER** it will appearsautomaticallythedifferentscreensthatconstitutetheconfigurationsequence.



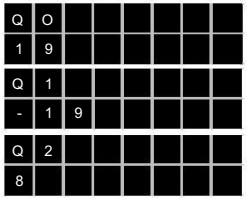
To start the configuration secuence press **MENU + ENTER** during 3"

ENTER + MENU 3"



Press **ENTER**

ENTER



PID parameter, factory set. For any doubt contact with the manufacturer.

ENTER



ACELERATION. Using ▲▼it can be adjusted the desaceleration. Rank 5-20 (Hz/s). Press ENTER to confirm.

ENTER



DECELERATION. Using ▲▼it can be adjusted the desaceleration. Rank 5-20 (Hz/s). Press ENTER to confirm.

ENTER



COMMUTATION FREQUENCY Using ▲▼it can be adjusted the commutation frequency 8KHz o 4KHz. Press ENTER to confirm.
For installations with submersible pumps or where the cable of the device to the pump exceeds20m,it is advisable to work inacommutationfrequencyof4Khz.

ENTER



MAXIMUM PRESSURE. Maximum pressure configuration of the system. With the value 0,0 bar this control is disabled. If the system detects a higher pressure than the one configured as "MAX PRESS" during a longer time "t P.MAX" configured the alarm A12 will appear.

ENTER



MAXIMUM PRESSURE TIME. Configuration of the time "t P.MAX".

START UP (SINGLE DEVICE).

- Be sure that the pump is correctly primed
- Connect the device to the electric supply with the magnetothermic switch, FAILURE led light will be ON. Wait for 10 seconds while the device is doing the autotest. Once it finishes, led light FAILURE is OFF and led light LINE is ON. The LCD screen will showmessage "SPEEDBOX" andinmediatelythelanguagedisplayof theconfigurationmode.
- The device is ready for beingconfigured.

START UP(2DEVICES ASSEMBLY).

If we wish to mount 2 devices for working in groups,previouspointshould be exactly followed - the orderof connectionis irrelevant. Duringtheconfigurationprocesswe will be able to choose which device is the**MASTER**.

If we wish to assembly 3 or 4 devices for groupoperation,communicationmaynotbedirect.Thedeviceswill beconnectedthrough thecentralSpeedcenterwhichwill managetheoperation.

⚠ **CONFIGURATION.** Using ▲▼ we can change the values and press **ENTER** for validation. Whenever we want to quit the configuration sequencepress**MENU**.Afterevery **ENTER** it will appearsautomaticallythedifferentscreensthatconstitutetheconfigurationsequence.



To start the sequence of configuration press **MENU** during 3"

MENU 3"



By mean of keys ▲▼we can choose the languages: "LANGUAGE ENGLISH", "LANGUE FRANÇAISE", "LINGUA ITALIANA" and "IDIOMA ESPAÑOL".

ENTER



By mean of keys ▲▼input the nominal current intensity value in A of the pump enabling the thermal protection. This value is located over the characteristics plate of the motor. Press **ENTER** for validation.
WARNING: this value is linked with the flow detection system, it is very important to enter the exact current consumption indicated on the nameplate.

ENTER



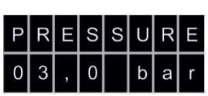
ROTATION SENSE. Using the **START/STOP** pushbutton verify the rotation sense. By mean of keys ▲▼(0/1) we can change it. Press **ENTER** for validation.

ENTER



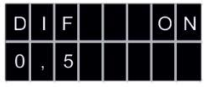
MINIMUM FREQUENCY. Using ▲ we can increase the lower frequency value, within 15-48 Hz for 3-phase pumps and 30-48 Hz for single-phase pumps.
*The minimum frequency value will be used as frequency stop in installations where the automatic detection of the device do not act due to leaks in the system. See hydraulic installation.

ENTER



This will be the system operating pressure. Use keys ▲▼for modify the initial value (2 bar).
WARNING ! The input pressure must be al least 1 bar lower than the maximum pressure of the pumps.
NOTE: In case of group assembly, all the system operates at the pressure set in the MASTER device, so thattheconfigurationof setpressureintheslave deviceissuperfluous.

ENTER



The default value is 0,5 bar. This value of pressure is substracted to the system setpoint, resulting the final pressure to which the system will set in motion the pump when the hydraulic network has a demand. Use keys pq to modify the initial value. It is recommended to maintain this value between 0,3 and 0,6 bar. Example:

- Input pressure: 2 bar.
- Differential start: 0,3 bar
- Final start pressure: 2 - 0,6 = 1,4 bar.

ENTER



EXTERNAL INPUT. Use keys ▲▼to select the external input type:
0-DISAB: Disabled
1-LEVEL: Enabled as external level control.
2-ON/OFF: Closed contact -> System enabled / Opened contact -> System disabled
3- 2 PRES.: Closed contact -> Principal pressure / Opened contact -> Second pressure enabled (PR_2)

ENTER



If 2 PRES. (second pressure). You must configurate the second working pressure with the same criteria as the principal pressure. The PR_2 will be enabled only when the external contact is open.

ENTER



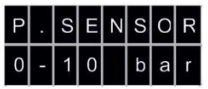
The device is configured by default as **SINGLE**. In case of individual assembly just confirm **SINGLE** by pushing **ENTER**. In case of group assembly (M-S), we will choose respectively **SLAVE** and **MASTER** in each unit pushing ▼. In case of assembly of more than 2 devices, we will change "SLAVE" by "SPEEDC" pushing ▼ twice - see instructions of our station **SPEEDCENTER.**

ENTER



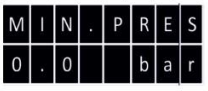
In case 1-MASTER is selected it can be ajusted a maximum time of continued functioning. After the configurated time (t.A) of a continued functioning an alternance will be forced. Value 00 means this parameteris disabled.

ENTER



The range of lecture of the pressure transmitter installed must be adjusted.
If the range is within 0-10 bar confirm by mean of **ENTER.**
If the range is within 0-16 or 0-25 bar change it by mean of ▲▼and then confirm with **ENTER.**

ENTER



Configuration of the minimum pressure in the system. With the value 0,0 bar, the control is disabled. If the system detects a pressure bellow the "MIN.PRES" during a time longer than "t.P.Min" alarm A13 will appear.

ENTER



Configuration of the time that the system can be working under the minimum pressure before the minimum pressure alarm appears.

ENTER



After pressing **ENTER** pushbutton, the system is ready to operate. Press **AUTOMATIC** in order to quit manual mode.
In case of group assembly press **AUTOMATIC** only in the device set as MASTER.

AUTOMATIC ON OFF

In case of group assembly, after pressing AUTOMATIC in the MASTER device, the AUTOMATIC LED LIGHT of the SLAVE device will start to flash intermittently, indicating that communication between both devices is ready. If this does not happen verify the connection (fig 5).

ALARMSFORSINGLE ASSEMBLY.
In case of simultaneous alarms, quit the automatic mode and go to manual mode, pressing the pushbutton **AUTOMATIC ON/OFF** (led light PUMP will turnoff).Usingkey▲▼will bedisplayedthesuccesivealarms.Oncevisualized,forleavingthemenu, press**ENTER** returningto**MANUAL** mode.

A1DRY RUNNING(✸Failureverification ●Finalfailure)
DESCRIPTION: if the system detects dry running during more than 10 seconds, it will stop the pump and the ART (Automatic ResetTest) will be activated.
SYSTEM REACTION: after 5 minutes ART system will start again the pump during 30 seconds, trying to restore the system. In case of persistent lack of water, it will try it again every 30 minutes for 24 hours. If after all these cycles , the system still detects lack of water, pump will remain permanently out of orderuntilthedamagewill berepaired.
SOLUTION: dry running, it has been activated the safety system: you should verify the feeding of the hydraulic network. The pumps can be primed usingthepush-buttonSTART/STOP(theledlightAUTOMATICshouldbeoff,if it isnot,pressthepush-buttontodisableit).
Special case: if thepumpcannotprovidetheprogrammedpressure(configurationmistake)theunitreactsasit wasdry-running.
Special Case 2: this device manages the dry running control through the nominal current consumption of the pump. It must be verified the introduced current consumption in the setup menu.

A2OVER-INTENSITY(✸Failureverification ●Finalfailure)
DESCRIPTION: the pump is protected against over currents by mean of the intensity values established in the installation menu. These over currents areproducedgenerally bydysfunctionsinthepumporintheelectricsupply.
SYSTEM REACTION:when detectingthe thermal failure,the pump will be automatically stopped. The system will try again to restartthe pump when the demand of consumption require it. The control system will carry out 4 attempts in this circumstances. If the system remain locked after the 4th attempt, the pumpwill remaindefinitivelyoutoforder.
SOLUTION: verify the state of the pump, for example the impeller could be blocked. Verify intensity values introduced in the configuration menu. Once the problem havebeen solved the operation will be restored going to the "SET UP" menu (see the chapter configuration) and configuring the adequated intensityvalues.

A3DISCONNECTEDP.(●Finalfailure)
DESCRIPTION:thedevicehasanelectronicsafetysystemincaseofnoloaddetection.
SYSTEMREACTION:thedeviceisdisconnected..
SOLUTION: the wound of the motor and the pump consumption should be verified. Once the problem have been solved the operation will be restored going to the "SET UP" menu (see the chapter configuration) and introducing the adequate intensity values. Verify the fuses (see fig.3), in case of being melt contactwith technicalservice.

A5TRANSDUCER(●Finalfailure)
DESCRIPTION:thetransducerdamagesareshowedintheLCDscreen.
SYSTEMREACTION:thedeviceoperationisinterrupted.
SOLUTION: checktheexternalpressuretransmitter.

A6EXCESSIVE TEMP. ●Finalfailure
DESCRIPTION:thesystemhasacoolingdevicetokeeptheINVERTER inoptimumworkingconditions.
SYSTEMREACTION:if anexcessivetemperatureisreachedtheownsystemleavestheinverteroutofserviceandasconsequencethepumptoo.
SOLUTION:verifythetemperatureenvironmentshouldbeunder50ºC. Contactwith technicalservice.

A7SHORTCIRCUIT (● Finalfailure)
DESCRIPTION:thedevicehasanelectronicsystemforprotectionagainstshortcircuitsaswell aspeaksofcurrent.
SYSTEM REACTION: the pump stops and then it starts again -performing 4 successive attempts. If the problem is not solved, the pump will remain definitivelyoutoforder.
SOLUTION:checkthepump,if theproblempersists,contactthetechnicalservice.

A8OVERVOLTAGE - A9UNDERVOLTAGE(✸Failureverification)
DESCRIPTION:thedevicehasanelectronicsafetysystemagainstovervoltagesandtoolowsupplyvoltages.
SYSTEM REACTION: in case of overvoltage or undervoltage the system remains stopped until an adequate value of voltage is reached. In this case, the systemisautomaticallyrestored.
SOLUTION:checktheelectricsupply.

A12MAXPRES (●) Fallodefinitivo
DESCRIPCIÓN:thedevicehasanelectronicsystemtoprotectmaximumpressures.
RESPONSE OF THE SYSTEM: If the device detects a higher pressure than the configurated as "P.MAX" during a longer time than the configurated as "t P.MAX" it will happenafinalfailurestoppingthesystem.
SOLUTION:Checkconsignpressureandmaximumpressure.

A13 P. MIN (●) Finalfailure
DESCRIPTIÓN:thedevicehasaprotectionsystemforlowpressures.
SYSTEM RESPONSE: If the device detects a pressure lower than the configurated as "P.MIN" during a longer time thas the configurated as "t P.Min" it will appearafinalfailurestoppingthesystem.
SOLUTION:Checkforleakagesontheinstalationandthevalueoftheminimumpressureconfigurated.

A14LEVEL(✸Verificationfailure)
DESCRIPTION:thedevicehasaexternexit thatif it siconfiguratedas"LEVEL",will activatethisalarm.
SYSTEMRESPONSE:Thefunctioningofthesystemisinterrupteduntilthestateofthelevel.
SOLUTION:Checkconectionsand/orconfigurationoftheexternexit asfunction"LEVEL".
ALARMINSTALLATION MASTER-SLAVE

A10COMUNICA(✸Failureverification)
DESCRIPTION:IfyouhaveconfiguredaMaster-Slavesystemandcommunicationcableisdisconnectedorthereisabadconnection,thesystemstops.
SYSTEMREACTION:TheMaster-Slavesystemstopsandstartstooperateindividually.
SOLUTION: Check the cable connection and if this is OK, check the connection inside the unit. Check the configuration of the Master-Slave system (setup menu).

DESCRIPTION:blankscreen.
SOLUTION:checktheelectricsupply.Incaseofbeinginrightconditions, thegeneralfuse,locatedinthemainplate(fig1)shouldbeverified.

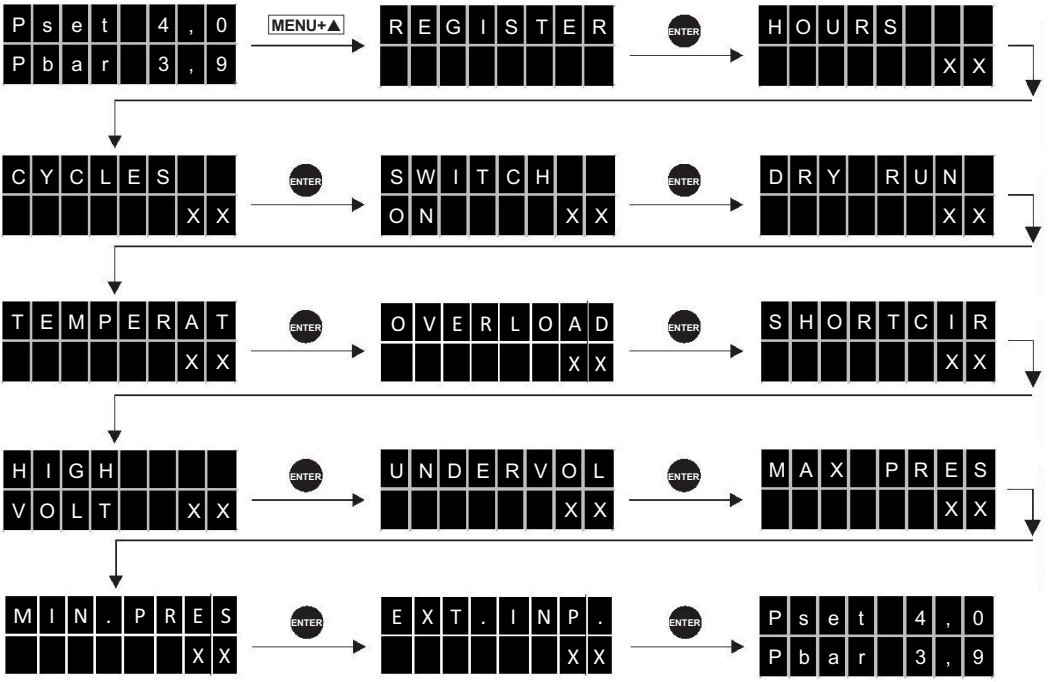
M → ALARMS FOR GROUP ASSEMBLY:

The alarms for assembled devices, are similar to those of the individual one with the specific particularities of operation with 2 communicated devices. Depending on the system´s reaction there are 3 types of alarm:

1 .- **COMMUNICATION FAILURE**: not any alarm is activated. Both devices continue operating independently. There will not be flashing led-light in any unit.
2 .- **DRY RUNNING OPERATION**: if there is a lack of water alarm in a single pump, the other one assumes the role of "main device", if there is an over-demand during next operating cycles, the system will try to restore the device in failure. If the device is restored in these conditions then it will be also restored the alternated operating mode. If there is lack of water on both devices, the system will activate the ART system in the MASTER unit.
3 .- **REST OF ALARMS**: If the alarm has occurred in a single device, the other will act as "main device". The system will try to restore the disabled device only in case of over demand, after 4 successive attempts without success the device is turned off, it should be restored manually. In case of alarms in both devices the system performs 4 restore attempts, if it does not succeed the system is disabled.

To restore manually a device disabled by an alarm push **AUTOMATIC ON / OFF** in MASTER device and then **ENTER** in the device with the alarm.

REGISTER OF OPERATION DATA AND ALARMS.
By using simultaneously **MENU** + ▲ during 3" is acceded to **REGISTER OF OPERATION DATA AND ALARMS**, by mean of **ENTER** we can advance through the sequence, once finished the sequence it returns to the main display. This is all the sequence:



- HOURS. Counter of total time that the pump has been operating.
- CYCLES. Number of cycles of operation, a cycle is a start and a stop.
- SWITCH. Number of connections to the electric supply.
- DRY RUN. Number of dry-running alarms.
- TEMPERAT. Number of alarms by excessive temperature.
- OVERLOAD. Number of overload alarms.
- SHORTCIRC. Number of short circuit alarms.
- HIGH VOLT. Number of alarms by high voltage
- UNDER VOL. Number of alarms by under voltage.
- MAX PRES. Maximum pressure reached by the installation. It allows the detection of water hammer.
- MIN.PRES. Number of alarms by minimum pressure.
- EXT.INP. Number of alarms by level entries.

All the records are saved even if the device has been disconnected from the electric supply.