

SPEEDMATIC 1309 MASTER SPEEDMATIC 1305 MASTER



EN INSTALLATION AND OPERATING INSTRUCTIONS (7 ... 11)

IT ISTRUZIONI D'INSTALLAZIONE E USO (12 ... 16)

FR INSTRUCTIONS POUR L'INSTALLATION ET L'EMPLOI (17 ... 21)

ES INSTRUCCIONES PARA LA INSTALACIÓN Y UTILIZACIÓN (22 ... 26)

Warning symbols contained in this service manual - Simboli di avvertenze contenute in queste istruzioni
Symboles d'avertissement contenus dans le présent chapitre - Símbolos de advertencia contenidos en este manual



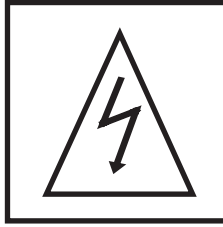
Only applies to type MASTER.
Si applica soltanto al tipo MASTER.
Il applique seulement au type MASTER.
Sólo aplica al tipo MASTER.



Risk by electric shock.
Rischio di scosse elettriche.
Risque de choc électrique.
Riesgo por energía eléctrica.



Rischio per le persone e/o per gli oggetti.
Risk for people and/or objects.
Risque pour les objets et/ou de gens.
Riesgo para personas y/o objetos.



WARNING !! INTERNAL PARTS UNDER HIGH VOLTAGE. BEFORE REMOVE THE COVER. Capacitor voltage may be hazardous. After disconnecting the electric supply, wait for 20 minutes to discharge capacitor.

ATTENZIONE !! PARTI INTERNE SOTTO ALTA TENSIONE. PRIMA DI RIMUOVERE IL COPERCHIO.

La tensione del condensatore può essere pericolosa. Dopo aver scollegato l'alimentazione elettrica, attendere 20 minuti per scarica del condensatore.

ATTENTION !! PARTIES INTÉRIEURES SOUS HAUTE TENSION. AVANT RETIRER LE CAPOT.

La tension du condensateur peut être dangereuse. Après avoir débranché l'alimentation électrique, attendez 20 minutes à décharge de condensateur.

VORSICHT !! GEFÄHRLICHE HOCHSPANNUNG IM INNEREN. VOR ÖFFNEN DES DECKELS.

Kondensatorspannung kann gefährlich sein. Nach dem Abschalten der elektrischen Versorgung, für 20 Minuten auf Entladekondensator warten.

ATENCIÓN !! PARTES INTERIORES BAJO ALTA TENSIÓN. ANTES DE RETIRAR LA CUBIERTA.

La tensión del condensador puede ser peligrosa. Desconectar el suministro eléctrico y esperar 20 minutos para descargar el condensador.

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ENGLISH

WARRANTY

The product **Speedmatic 1305-1309 and Speedmatic 1305-1309 MASTER** is guaranteed the first 2 years after its production date.

This guarantee does not include damages in case of an inadequate installation or manipulation.

RECOMMENDATIONS

 **Read carefully this instructions manual before installation.**

Do not throw away this manual after installation, it can be useful 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: $I_{\Delta n} = 30 \text{ mA}$ (class A or AC). It is recommended to use a 16 A (1305-1309) and 20A (1309) magnetothermic switch. 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.

The device must operate with a clean water flow, if there is risk of presence of gravel or small particles (facilities with submersible pumps) is recommended to use a filter to avoid the possibility of blocking the flow sensor.

Speedmatic should be used only for vehiculation of clean water, it cannot be used for transport of another kind of liquids.

It is recommended to use an expansion tank in order to avoid continuous start-stops due to the deterioration of taps, valves, ... and also to prevent "water hammer" in installations with valves of wide diameter.

 **WARNING**, before doing any maintenance inside the device, it must be unplugged from the electric supply and wait a minimum of 20 minutes after the disconnection to avoid electrical discharges.

INSTRUCTIONS FOR DELIVERY, TRANSPORT, RECEPTION AND STORAGE

Speedmatic must be inspected at the time of dispatch and reception in order to check if it has suffered a damage or they are missing parts.

Transportation must be done carefully and by competent personnel.

Avoid significant impacts.

These instructions are for storage periods under 12 months from the date of shipment. If longer, please request instructions for long storage. Must be stored in a protected place, away from shocks and moisture. Avoid stacked devices.

Transportation and handling equipment must be carried out with adequate means to bear the weight that usually will be shown on the packing list.

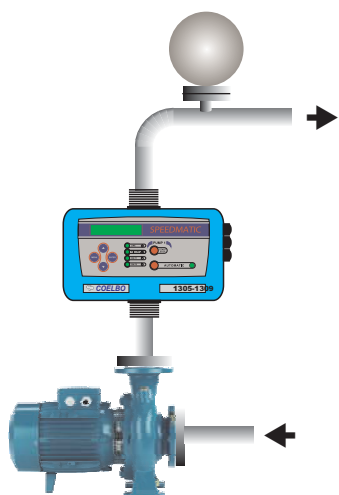


fig.1a. Individual assembly.

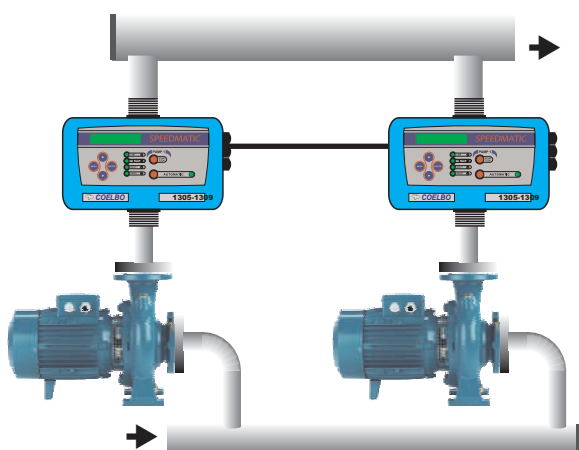


fig.1b. Group assembly of 2 pumps in MASTER-SLAVE mode.

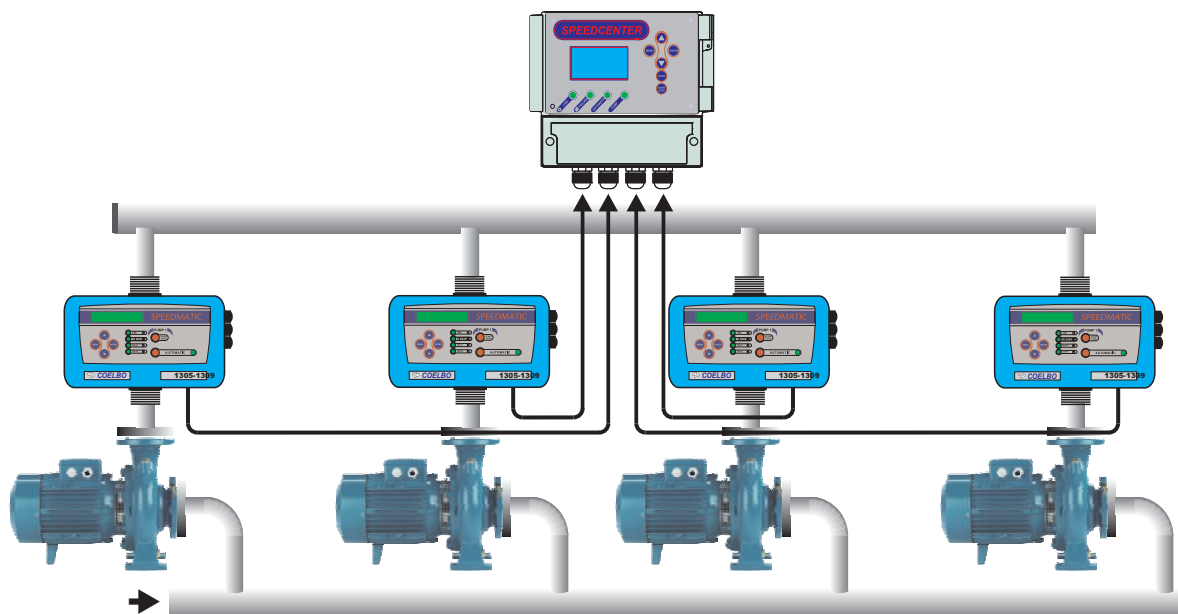


fig.1c. Group assembly of 3 or 4 pumps in MASTER-SLAVE mode through the Speedcenter.

INSTALLATION SCHEME

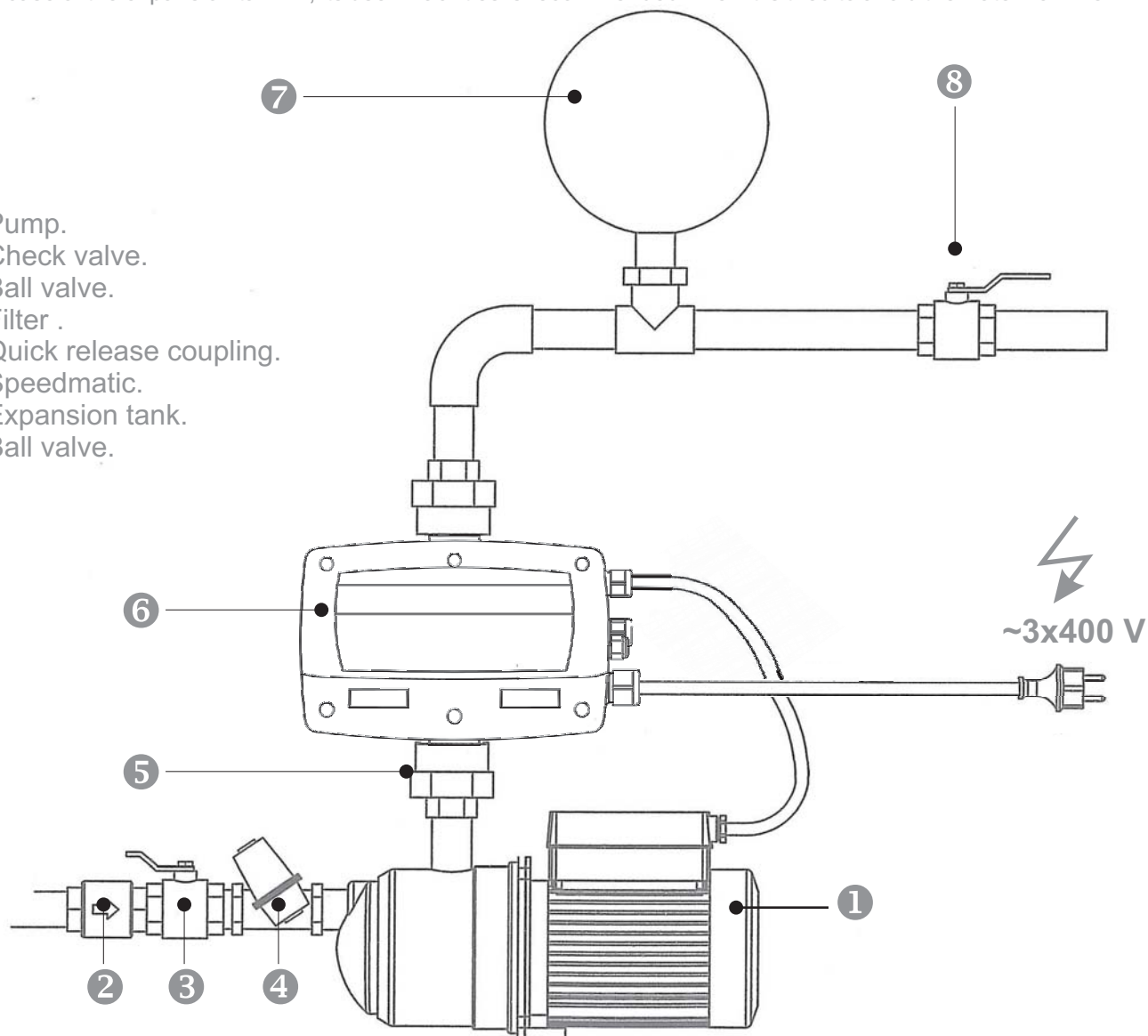
fig.2

OBSERVATIONS:

A) Accessories ②, ③, ④, ⑤, ⑦ and ⑧ are recommendable but nonessential.

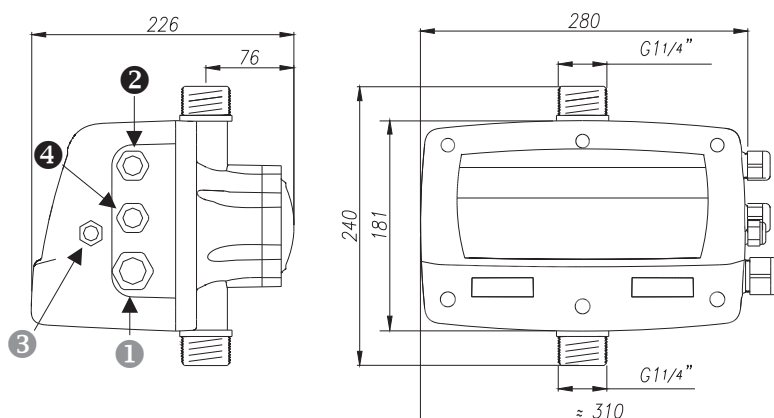
B) In the case of the expansion tank ⑦, its use in facilities is recommended when it is tried to avoid the water hammer effect.

- ①.- Pump.
- ②.- Check valve.
- ③.- Ball valve.
- ④.- Filter .
- ⑤.- Quick release coupling.
- ⑥.- Speedmatic.
- ⑦.- Expansion tank.
- ⑧.- Ball valve.



EXTERNAL CONNECTION

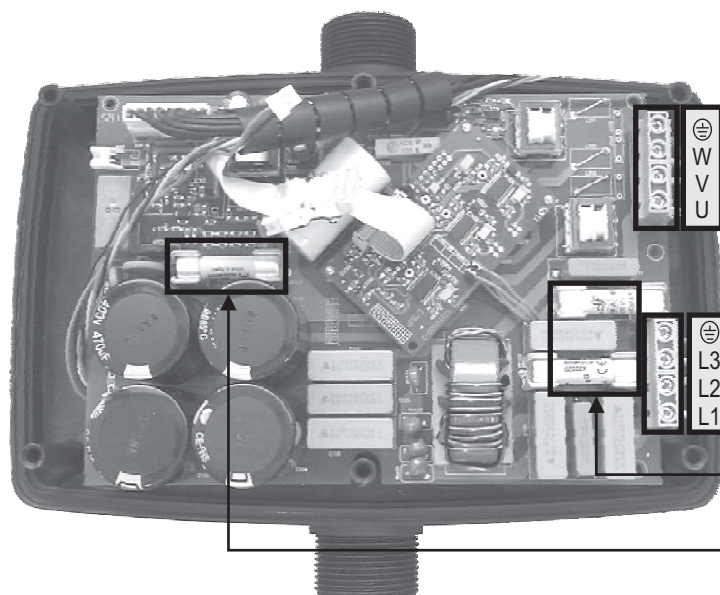
fig.3



- ① Power supply
- ② Pump
- ④ Minimal level (optional)
- ④ Alarm monitoring (optional)
- ③ Communications cable Master&Slave

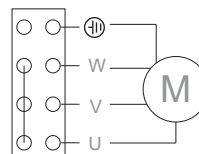
L (m)	S (mm ²)
1 ÷ 50	1.5
50 ÷ 85	2.5
85 ÷ 140	4

BODY CONNECTIONS



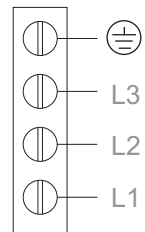
3-phase motor connection

~3 400 Vca



Power supply

~3x400 Vca



Pumps fuses

16A

10A

General fuse

20A

16A



fig. 4

OPTIONAL CONNECTIONS: EXTERNAL LEVEL AND ALARM MONITORING

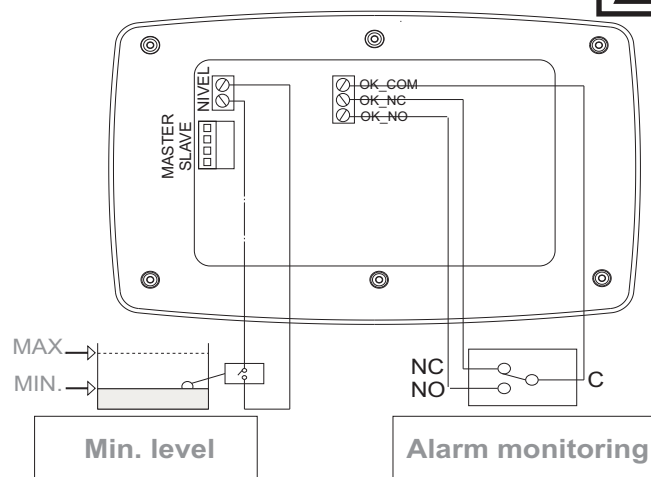


fig. 5

CONTROL PANEL

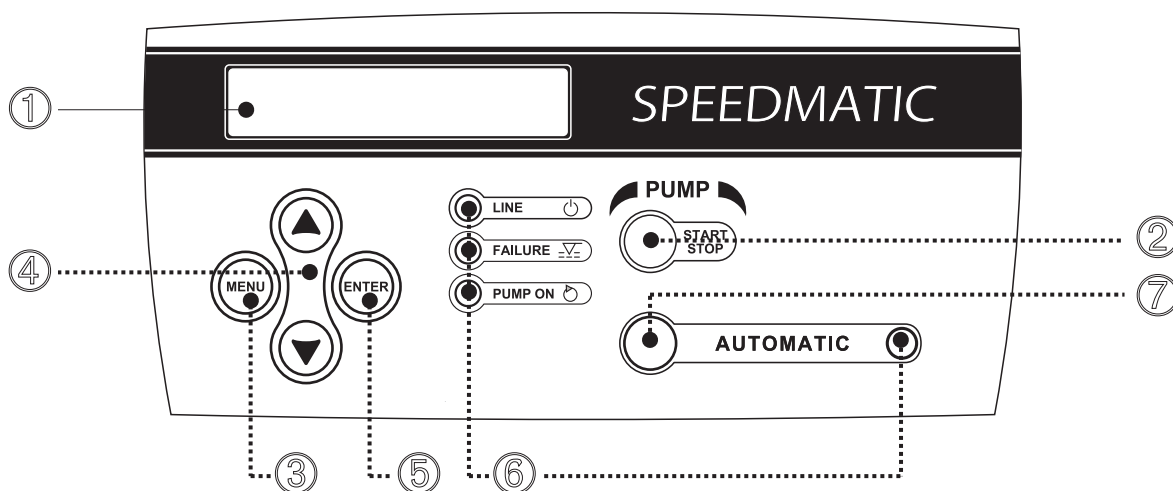
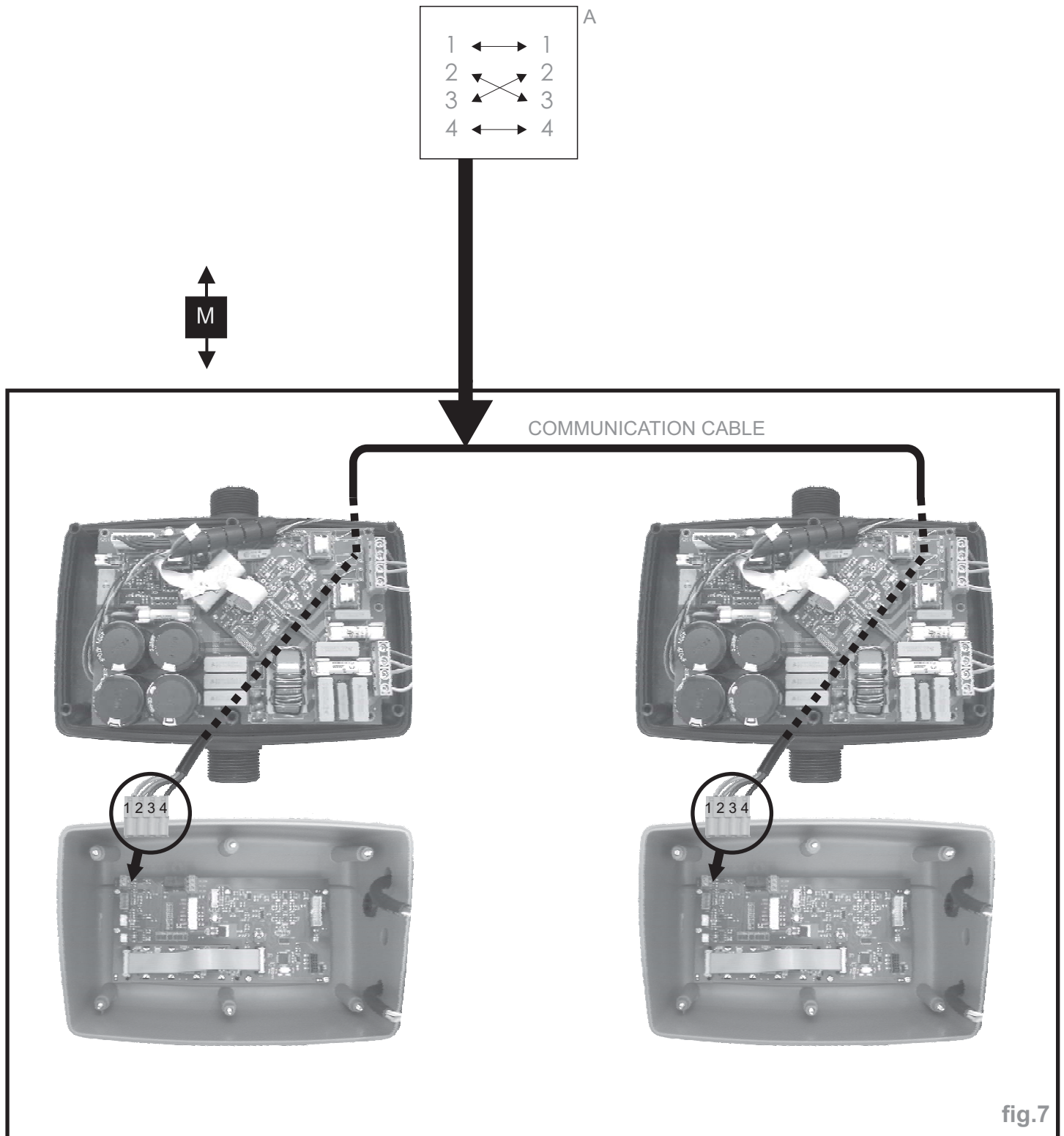


fig. 6

CONNECTION MASTER&SLAVE COMMUNICATION

1. Unscrew the cover ❶ and loosen the PG gland located on its base ❷.
2. Enter the communication cable through the PG.
3. Remove the terminal board from its housing.
4. Carry out the connection as indicated in fig.7.
5. Replace the strip in its housing. Screw the cover and screw the PG gland.
6. If the equipment has been supplied with the communication cable, it governs the following color code: 1-black, 2-brown, 3-blue and 4-yellow/green. They will be connected according to detail A:



OPERATION

SPEEDMATIC is a compact automatic control device designed for the 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 builders of pumps. 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 a LCD screen where the parameters configuration is very easy and intuitive. Once the configuration parameters are introduced, the SPEEDMATIC 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 ideal 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:

$Hm = 15 \text{ m} \cong 1.5 \text{ bar}$ $Pw = 1.5 \text{ bar}$ $Pc = 15 \times 0.033 \text{ bar} \cong 0.5 \text{ bar}$ $Prmin = 1.5 + 1.5 + 0.5 = 3.5 \text{ bar}$

M

MASTER AND SLAVE OPERATION

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

Due to the alternating sequence of operation, the SPEEDMATIC 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 work alternately as SECONDARY device.

CLASSIFICATION AND TYPE

According to IEC 60730-1 and EN 60730-1 this unit is a control electronic device for pressure systems of independent assembly, action type 1Y (transistor output). Operating value: flow 2.5 l/min. Degree of contamination 2 (clean environment). Impulse rating voltage: cat II / 2500V. Applied temperature for the ball pressure test: enclosure (75°C) and PCB (125°C).

MAIN CHARACTERISTICS

- DN ports G1"1/4 Male.
- 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-intensities, 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).
- Inside pressure transducer.
- Volt-free contact for monitoring the alarms displayed in screen originated by irregularities or problems of the system.
- 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 from 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.

M

→ Mode MASTER&SLAVE. Communication with another device SPEEDMATIC to operate in group.

- **AIS** function (Anti-Ice System). If temperatures under 5 °C are detected it will start periodically the pump avoiding the freezing of the water inside the pump.

For environment temperatures under 0°C it is very important to take measures to avoid water freezing.

- Register of operational controls: information 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 the device.

TECHNICAL CHARACTERISTICS.

■ Power supply voltage	~3x400 Vca
■ Frequency	50/60 Hz
■ Max. current each phase	1305: 5A 1309: 9A
■ Max. peak of current	20% during 10"
■ Max. operating pressure	16 bar
■ Max. set pressure	12 bar
■ Protection index	IP55
■ Max. water temperature	40°C
■ Max. environment temperature	0-50°C
■ Max. flow	25.000 l/h

CONTROL PANEL (fig.6).

1- LCD screen. Shows the pressure in operating 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).

6 - Led lights:

- LINE green: Electric supply. Bright when it is connected.
- FAILURE red: Bright or intermittent depending on type of failure.
- PUMP yellow: When it is bright means pump operating. 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.

⚠ HYDRAULIC CONNECTIONS (fig. 2 and 3).

Before proceeding with hydraulic connection it is recommended 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 can proceed from a common or independent origin for each device.

The SPEEDMATIC control device must be connected in vertical position (fig.2).

If the pump is operating in full aspiration, is strongly recommended to install the external level detector (fig. 8) because the inner flow sensor of the Speedmatic will protect the pump but it will not avoid loss priming in case of dry-running.

⚠ ELECTRIC CONNECTION (fig. 4, 5 and 7).

Before doing manipulations inside the device, it should be disconnected of the electric supply and after disabling, wait for 20 minutes in order to avoid electrical discharges.

- Use screened cables type H5VV-F with section enough to the power installed:
 - Power supply: min. 4G1,5 (max.4G4).
 - Motor supply: min. 4G1,5 (max.4G4) depending on the cable length (see fig.3).
 - Verify if the power supply is ~3x400 V. Dismount the cover of the electronic circuit and carry out the connections according to the indications located on the connection strip base.
 - Do the power supply connection (being sure there is a good earth connection): **L1 L2 L3** ⊕ Do the connection by mean of magnetothermic switch 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 to be disconnected during disassembling.
 - Do the pump connection (fig. 3 and 4).
 - 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.5.
 - Alarm monitoring (optional). Volt-free contact with 1 A of max. current for monitoring the alarms displayed in screen
- M** → originated by irregularities or problems of the system. See fig.5.
- 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 back side of the device. See fig.7

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

START UP (SINGLE DEVICE).

Be sure that the pump is correctly primed. Carry out the connection of the SPEEDMATIC to the electric supply through the magnetothermic switch, instantaneously will flash all the led light indicators. Wait for 10 seconds while the SPEEDMATIC is doing the autotest. Once it finishes, led light LINE is ON. The LCD screen will show the message "SPEEDMATIC ". The device is ready for being configured.

M →

START UP (2 DEVICES ASSEMBLY).

If we wish to mount 2 devices for group operation, previous step (STARTUP SINGLE DEVICE) should be exactly followed - the order of connection is irrelevant. During the configuration process we will be able to choose which device is the **MASTER**. If we wish to assembly 3 or 4 devices for group operation, communication may not be direct. The devices will be connected through the central Speedcenter which will manage the operation.

! CONFIGURATION

Using ▲▼ we can change the values and push **ENTER** for validation. After every **ENTER** are sequenced the successive messages that make up the configuration process. Whenever we want to quit the configuration sequence press **MENU** being saved the modified parameters until this point.

0	P. LINE 00,0 bar	SET P 00,0 bar	To start configuration sequence push MENU during 3".	MENU 3"
1	SET UP MENU		Being inside configuration menu we are having access to the phase of installation.	3"
2	LANGUAGE ENGLISH		By mean of keys ▲▼ we can choose the languages: "LANGUAGE ENGLISH", "LANGUE FRANÇAISE", "LINGUA ITALIANA" and "IDIOMA ESPAÑOL".	ENTER
3	MAX. INT. PUMP OFF		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. (Is recommended to enter a current vaule 15% higher than the nominal value).	ENTER
4	ROTATION SENSE 0	0 Hz	By mean of the START/STOP push-button is verified the rotation sense. By mean of keys ▲▼ (0/1) it can be changed. Press ENTER for validation.	ENTER
5	MIN. SPEED 15 Hz		By mean of keys ▲▼ we can increase the lower limit of the speed of rotation of the pump's motor.	ENTER
6	LEVEL PROBE NO		If the installation does not have level probe press ENTER to validate NO. If the installation has a level probe, use keys ▲▼ to change NO by YES.	ENTER
7	PROGRAMMING MENU		Being inside configuration menu we are having access to the phase of programming.	ENTER
8	SET PRESSURE 02,0 bar		This will be the system operating pressure. Use keys ▲▼ to modify the initial value (2 bar). WARNING ! The input pressure must be at 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 that the configuration of set pressure in the slave device is superfluous.	ENTER
9	DIF. START 0,3 bar		The default value is 0,6 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 ▲▼ 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
10	TIMER STOP 5 s		TIMER STOP default value is 5". This will be the employed time by the system in stopping once ceased the consumption in all the installation. Using keys ▲▼ we can modify the initial value.	ENTER
11	VIEW MODE NORMAL		There are 2 view modes to choose: ■ NORMAL : it is visualized "P LINE" (real pressure of the installation) and "INPUT P" (configured pressure). ■ SERVICE : it is visualized "Hz" (working frequency of the inverter), "SET" (configured pressure), "P.LINE" (real pressure of the installation) y "FL" (flow sensor state).	ENTER
12	SERIAL CONTROL SLAVE		The SPEEDMATIC is configured by default as "SLAVE". ■ In case of individual assembly just confirm "SLAVE" by pushing ENTER . ■ In case of group assembly (M-S), we will do the same for the slave device. For the "MASTER" device we will change "SLAVE" by "MASTER" pushing ▼. ■ In case of assembly of more than 2 devices, we will change "SLAVE" by "SWITCHER" pushing ▼ twice - see instructions of our station SPEEDCENTER .	ENTER
13	DIRECTION CH: 1		It allows to set the communication channel whe the sation SPEEDCENTER is connected. Push ENTER .	ENTER
14	LINE 00,0 bar	SET P 00,0 bar	After pressing ENTER pushbutton, the system will remain configured showing the type of view chosen in the previous section 11. Press AUTOMATIC in order to quit manual mode. In case of group assembly press AUTOMATIC only in the device configured as MASTER.	AUTOMATIC

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 7).

ALARMS FOR GROUP ASSEMBLY:

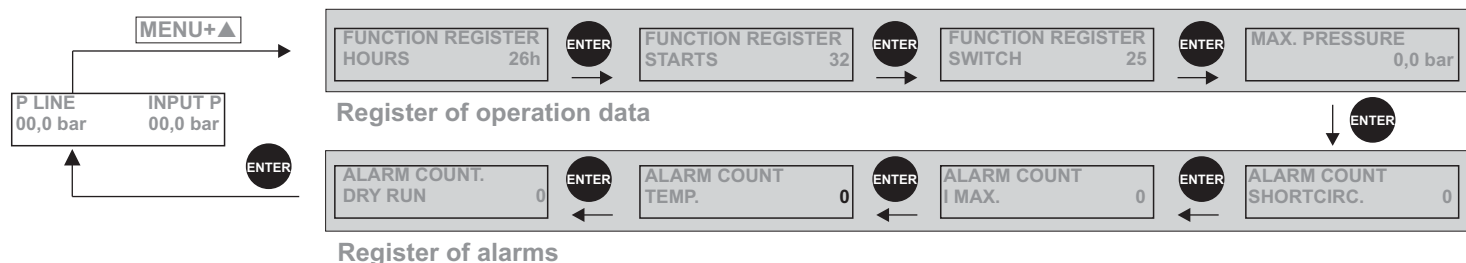
The alarms for assembled devices, are similar to those of the individual one with the specific particularities of the operation with 2 communicated devices. Depending on the system's reaction there are 4 types of alarm:

- 1.- **COMMUNICATION FAILURE:** not any alarm is activated. Both devices continue operating independently as a single SPEEDMATIC.
- 2.- **DRY RUNNING:** if there is a dry running alarm in a single pump, the other one assumes the role of "main device", if there is an over-demand during next working 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.- **MINIMAL LEVEL IN THE TANK:** the alarm "dry running" is activated and the device remains in failure. It will be automatically restored when the level sensor detects water again.
- 4.- **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 we come back to the main display. This is all the sequence:



- REGISTER HOURS. Counter of total time that the pump has been operating.
- REGISTER STARTS. Number of cycles of operation, a cycle is a start and a stop.
- REGISTER SWITCH. Number of connections to the electric supply.
- MAX PRESSURE. Maximum pressure reached by the installation. It allows the detection of water hammer.
- ALARM COUNT. SHORTCIRC. Number of short circuit alarms.
- ALARM COUNT I MAX. Number of overcurrent alarms.
- ALARM COUNT. TEMP. Number of alarms by excessive temperature.
- ALARM COUNT DRY RUN. Number of dry-running alarms.

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

AUTOMATIC MODE VISUALIZATION

With the device in automatic mode by pressing **▲** there are a succession of different types of display.



"CE" STAMENT OF COMPLIANCE.

COELBO CONTROL SYSTEM, S.L. We state, on our's own responsibility, that all materials herewith related comply with the following European standards:

2006/95/EC Low Voltage Directive on Electrical Safety
2004/108/CE Electromagnetic Compatibility.
2002/95/CE RoHS Directive

Product's name: **SPEEDMATIC**

Type: **1305-1309 and 1305-1309 MASTER.**

As per the European Standards:

UNE EN 60730-1:1998+A11:1998+A2:1998+A14:1998+A15:1998+A16:1998+A17:2001+ERRATUM A1:2001+A18:2003

UNE EN 60730-2-6:1997+A1:1998+A2:1999+CORR A1:2001+CORR A2:01

UNE EN 61000-6-2:2002

UNE-EN 61000-6-4:2002

UNE-EN 61000-3-2:2001

UNE-EN 61000-3-3:1997+CORR:1999+A1:2002

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ALARMS FOR SINGLE 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 turn off). Using key **▲** will be displayed the successive alarms. Once visualized, for leaving the menu, press **ENTER** returning to **MANUAL** mode.

TYPE LED FAILURE		DESCRIPTION	SYSTEM REACTION	SOLUTION
A1 ●	●	DRY RUNNING Failure verification	If the system detects dry running during more than 10 seconds, it will stop the pump and the ART (Automatic ResetTest) will be activated.	Dry running, it has been activated the safety system: you should verify the feeding of the hydraulic network. The pumps can be primed using the push-button START/STOP (the led light AUTOMATIC should be off, if it is not, press the push-button to disable it). Special case: If the pump cannot provide the programmed pressure (configuration mistake) the Speedmatic reacts as it was dry-running.
	●	Final failure		
A2 ●	●	OVER-INTENSITY Failure verification	The pumps are protected against over currents by mean of the intensity values established in the installation menu. These over currents are produced generally by dysfunctions in the pump or in the electric supply.	Verify the state of the pump, for example the impeller could be blocked. Verify intensity values introduced in the configuration menu. Once the problem have been solved the operation will be restored going to the "SET UP" menu (see the chapter configuration) and configuring the adequated intensity values.
	●	Final failure		
A3 ●	●	DISCONNECTED P. Failure verification	The SPEEDMATIC has an electronic system detecting the instantaneous motor consumption, if there is not consumption the pump is not connected.	Check the connection. Verify the fuses. (see fig.4). If the failure persists contact with the technical service.
	●	Final failure		
A5 ●	●	TRANSDUCER Failure verification	The transducer damages are showed in the SPEEDMATIC's LCD screen.	Contact with technical service.
	●	Final failure		
A6 ●	●	EXCESSIVE TEMP.	The system has a cooling device to keep the INVERTER in optimum working conditions.	Verify the temperature of the water, it should be under 40 °C and the temperature environment should be under 50 °C. Contact with technical service.
	●	Final failure		
A7 ●	●	SHORTCIRCUIT Failure verification	The Speedmatic has an electronic system for protection against short circuits as well as a fuse (see fig. 4).	Check the pump, if the problem persists, contact the technical service.
	●	Final failure		
A8 ●	●	OVERVOLTAGE Failure verification	The SPEEDMATIC has an electronic safety system against overvoltages.	Check the electric supply.
	●	Final failure		
A9 ●	●	UNDERVOLTAGE Failure verification	The SPEEDMATIC has an electronic safety system against too low supply voltages.	Check the electric supply.
	●	Final failure		
BLANK SCREEN	●	Blank screen.		Check the electric supply 400 V. In case of being in right conditions, the general fuse , located in the main plate (fig 3) should be verified.
	●	Final failure		