SPEEDRIVE V2



EN User's manual (translation)

EN: EVIDENCE OF CONFORMITY

We declare, under our responsibility, that the products in this manual comply with the following directives and standards:

- Directive 2014/35/UE (low voltage): Standard EN 61800-5-1.
- Directive 2014/30/UE (electromagnetic compatibility).
- Directive 2012/19/EU (on waste electrical and electronic equipment (WEEE)):

Standard EN 50419:2006 about marking of electrical and electronic equipment.

The Speedrive module has been designed, and is certified, for united installation to the pump electric motor. Any other configuration or installation can be subject to additional certifications. ESPA 2025 SL disclaims all liability for uses not covered in this manual.

UKCA CERTIFICATE OF CONFORMITY

EVIDENCE OF CONFORMITY

We declare, under our responsibility, that the products in this manual comply with the following directives and standards:

- Electrical Equipment (Safety) Regulations 2016: Standard BS 61800-5-1.
- Electromagnetic Compatibility Regulations 2016.

Banyoles, January 5th 2021



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Safety warning.

The following symbols  shown beside a paragraph represent danger warnings associated to the failure to comply with the corresponding instructions.

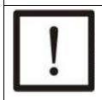
	**DANGER!** ***Risk of electrocution.***	Not observing this precaution involves a risk of electrocution.
	**DANGER!**	Warns that not observing the precaution involves a risk of damage to people and/or materials.
	**WARNING**	Warns that not observing the precaution involves a risk of damage to the pump or the installation.

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1) GENERAL INFORMATION.

These instructions are intended to explain the basic operation and regulation of a pump equipped with Speedrive.

For more information, or if you are an installer, you can download the installer manual at: www.espa.com

1.1) Description

The Speedrive inverters have been designed to adjust the speed of **three-phase motors** used with water pumps.

The inverter receives a signal from the pressure transducer that is proportional to the installation's pressure. This signal is processed and it regulates the speed of the motor to keep the pressure constant, even though the consumption of water varies.

It can be used with 50Hz or 60Hz motors. Selecting the output frequency with the menu option.

The units have a constant pressure control system. The PI system used provides two numerical constants that are processed by the unit to achieve a stable regulation.

This type of regulation can greatly reduce the consumption of energy when compared to unregulated systems, since the consumption of electricity will be proportional to the consumption of water. Another of the advantages of regulated units is the decrease in voltage surges, softening current peaks and, therefore, increasing the working life of the pump.

1.2) Plug & Pump

With our units regulated using Speedrive technology from ESPA you will enjoy the latest generation of Plug & Pump pumping systems, ready for optimal pumping operation.

1.3) Dry run protection.

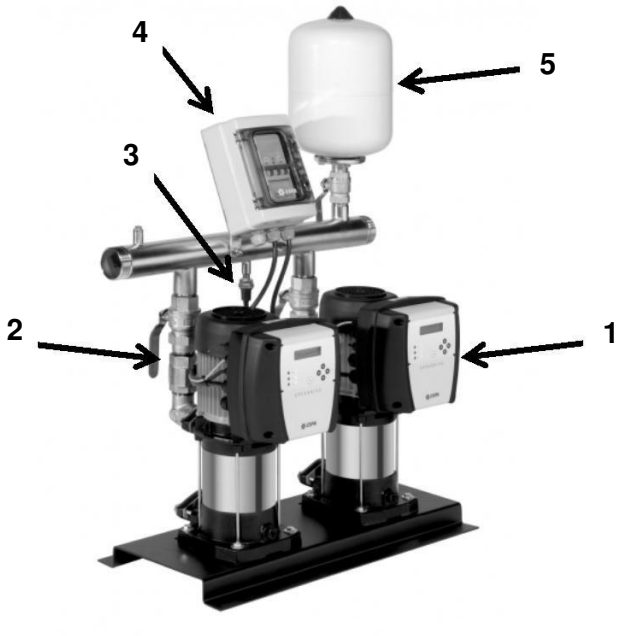
If the unit detects that a pump is not receiving intake water, it will stop and the "DRY RUN" alarm will be activated, with 3 reset attempts until the unit completely shuts down in order to repair the problem or breakdown in the intake of this pump.

2) TECHNICAL SPECIFICATIONS.

2.1) Models.

Model Speedrive	INPUT			OUTPUT			Weight
	Power supply voltage [V]	Max. rated current [A]	Recommended line protection [A]	Pn Motor [kW]	Max. motor current [A]	Motor voltage [V]	[kg]
M22	1~ 230V AC ±10%	16	25	≤ 2.2	10	3~ 230V AC	2.6
T22	3~ 400V AC ±10%	7	10	≤ 2.2	6	3~ 400V AC	2.4
T55		15	20	≤ 5.5	14		2.6

3) INSTALLATION.



1. Pumps with Speedrive.
2. Non-return valves.
3. Pressure transducer.
4. Main electrical panel
5. Accumulator.
   The pre-charge pressure must be 1 bar lower than the pressure set point.
   Check the pressure with the unit stopped and the installation de-pressurized.

4) OPERATING MODES.

Automatic mode.

This is the common operating mode.

The inverter controls the motor's rotation speed to maintain a constant pressure in the installation (set pressure).

Manual mode.

Allows the pump start-up or stop manually at an adjustable frequency.

5) SETUP.

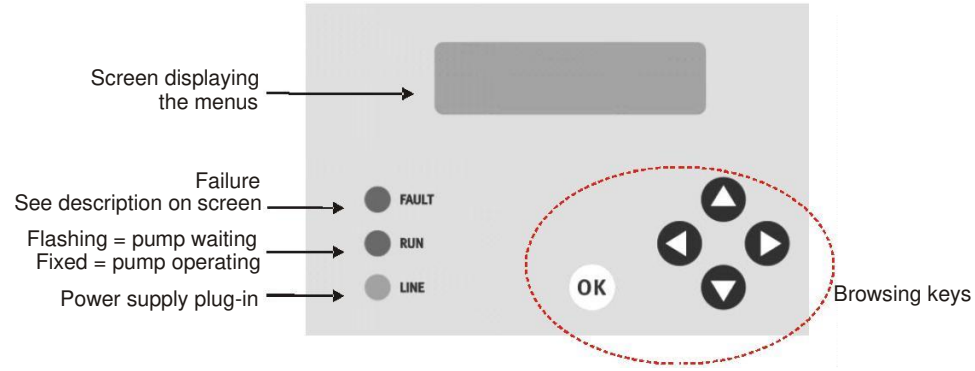
Espa ESD pumps and Espa pressure booster sets are pre-configured in origin with an optimum pressure set point for equipped pumps. Do not need any further adjustment.

5.1) Definitions.

- **Set pressure:** is the pressure that the unit will maintain in the installation.
- **Differential pressure:** is the differential pressure required for the unit to activate again.
- **Stop frequency:** frequency at which the inverter stops the pump.
- **Stop delay:** timer used by the unit before it stops.
- **Auxiliary regulated pump:** auxiliary pump that is equipped with a Speedrive.

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5.2) Browsing.



▲▼	Browsing the menus.
◄►	Variation of the flashing parameter. Browsing a submenu.
OK	Accepting changes. Return to the general screen from display of parameters.

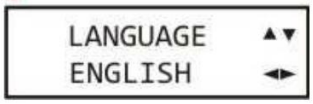
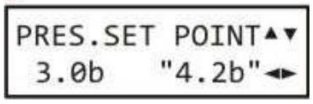
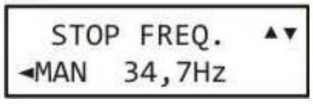
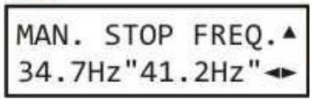
	**Backlight** The screen is backlit display for better reading. To save power, the backlight turns off in 60 seconds without pressing any keys. To activate the backlight, press **OK**. Without backlight does not work any other key.

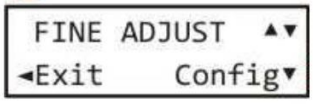
5.3) Description of the menus.

START SCREENS	
1 ESPA T22 V 2.0 2.0	**Introduction screen** Displayed during a few seconds when connecting the equipment. Indicates: model and versions of control and power software.
2 XXX Manual► ◄Auto Config▼	**Start screen** The pump is not activated. **XXX**: **MST** = Master / **SLV** = Slave. To start the pump manually, press ► (Man) For automatic operation, press ◄ (Auto) To configure parameters, press ▼ (Config)
MAIN SCREEN	
2.1 Press.: 6.0 bar ◄View Menu►	It shows the system pressure. The pump will run automatically, as needed. To display parameters, press ◄ (View) To return to the start screen, press ► (Menu)

MANUAL OPERATION	
2.2 MANUAL ON▲OFF▼ 5,8bar 43,2Hz	It shows the system pressure and Speedrive output frequency. Press ▲ ON, to activate the pump. Start-up is always performed at 15Hz. Press▼ OFF, to stop the pump. Press◄ or ►, to adjust the frequency. Press **OK** to exit the screen.

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CONFIGURATION	
	Screen descriptions: Top: parameter being configured. - Lower left: current value of the parameter. - Lower right, "flashing": new value being configured. - Press◄ or ►, to adjust values. Press **OK** to confirm.
3 	**LANGUAGE** Select the desired language.
9 	**PRESSURE SET POINT** Configuration of the work pressure of the unit.
10 	**CALCULATED STOP FREQUENCY** The stop frequency is calculated automatically. Will be recalculated every time that is changed the nominal pressure. To set a value in the manual mode, press◄ (Man)
10.1 	**STOP FREQUENCY MANUALLY** Enter the desired stop frequency. ***Note: This value should only be recorded by experts.***

ADDITIONAL PARAMETERS SETTING	
12 	**FINE ADJUSTMENTS** To set additional parameters, press ▼(Config) ***Note: This values should only be recorded by experts.*** To complete the setup, press ◄ (Exit)

DISPLAY OF PARAMETERS	
The Speedrive displays the configuration values of all its parameters. It does not allow you to change parameters, just display them. On the main screen press ◄ (Vis)	
2.1.1 	**DISPLAY OF PARAMETERS** Press **OK** to confirm. Parameters can only be displayed, not modified. To display the alarms, press ◄ (Alarm) To return to the main screen, press ► (Auto)
From any screen, tap OK to return to the main screen 2.1	

DISPLAY OF THE ALARM LOG	
The Speedrive counts the number of times an alarm has been activated. Only for operation information.	
2.1.20 VIEW ALARMS ◄Hist. Settings►	**DISPLAY ALARMS** Press **OK** to confirm. To display the log, press ◄ (Hist) To display the parameters, press ► (Param)
From any screen, tap OK to return to the main screen 2.1	

DISPLAY OF THE OPERATION LOG	
The Speedrive remembers its history.	
2.1.30 VIEW HISTORY Alarms►	**DISPLAY LOG** Press Ok to confirm. To display the alarms, press ► (Alarm)
From any screen, tap OK to return to the main screen 2.1	

6) PROTECTION AND ERRORS.

DANGER. *Risk of electrocution*. Never open the Speedrive cover.

DANGER: The failure to follow the instructions in this Manual can lead to motor overloads, diminishment in technical characteristics, reduction of the unit's working life and all types of subsequent results, for which we decline any responsibility.

The Speedrive has several built-in protection devices to protect its integrity against different operational failures.

If a fault occurs, the error appears on the screen and, in some cases, the Speedrive tries to restore operations. Other cases require user intervention to restart.

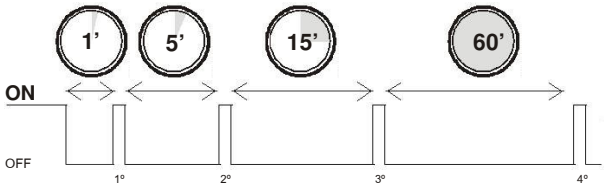
WARNING: In both cases, even if operations are restored, you should inform your technical service so they can review the unit and the installation.

6.1) Errors that may require user intervention:

OVERCURRENT ERROR	**OVERCURRENT** The circuit permanently controls the motor's current consumption. If the current exceeds the values established in parameter "MAXIMUM MOTOR CURRENT" at any moment, the system will stop. The reset is automatic. If the error is not solved 4 new attempts* are performed. If the error is still present after the fourth attempt, the system will be set to a permanent fault. **Press OK to reset. The start screen (#2) will appear.**
INST.MAX.CURR. ERROR	**INSTANTANEOUS MAXIMUM INTENSITY** The unit stops if an excessive current consumption spike is detected. It automatically resets. If the error persists, it will retry 4 times*. If the error persists after the fourth try, the unit will go into permanent failure. **Press OK to reset. The start screen (#2) will appear.**

DRY RUNNING ERROR	**DRY RUNNING** If a pump runs for more than 10 seconds without water, the unit stops. The reset is automatic. If the error is not solved 4 new attempts* are performed. If the error is still present after the fourth attempt, the system will be set to a permanent fault. Before resetting, ensure that the pump is correctly primed again. **Press OK to reset. The start screen (#2) will appear.**
UNDER VOLTAGE ERROR	**LOW VOLTAGE IN THE MODULE** The power module protects itself against internal voltage drops. **Press OK to reset. The start screen (#2) will appear.**
GROUND DERIVAT. ERROR	**ERROR DUE TO EARTH LEAKAGE IN THE ENGINE** Earth leakage has been detected in one of the engine phases. The unit stops. Before resetting, make sure that the engine malfunction has been repaired. **Press OK to reset. The start screen (#2) will appear.**
PHASE MOTOR ERROR	**ERROR DUE TO MOTOR PHASE FAILURE** It has been detected that one of the engine phases is disconnected or consuming very little. The unit stops. Before resetting, make sure that the engine malfunction has been repaired. **Press OK to reset. The start screen (#2) will appear.**
PHASE IN ERROR	**PHASE FAILURE AT THE CURRENT INPUT** A phase failure at the current input has been detected. It automatically resets. It will retry 4 times*. If the error persists after the fourth try, the unit will go into permanent failure. Before resetting, check the current input connections. **Press OK to reset. The start screen (#2) will appear.**
ERROR TEMP. MODULO	**EXCESSIVE MODULE TEMPERATURE** Overheating of the power module. This is an internal cooling failure. The unit stops. Press OK to reset. If the problem persists, it can only be repaired by an official technical service.

*= Illustration of the sequence and times of the 4 attempts, if not none of them succeed:



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6.2) Errors with automatic recovery:

INNER TEMP. ERROR	**MODULE TEMPERATURE** The inner temperature is monitored at all times. If the temperature goes above 85°C the unit stops. The reset is automatic when the normal temperature is reinstated.
OFF AUX. INPUT ERROR	**UNIT STOP DUE TO OPENING OF AUXILIARY INPUT** This occurs when a switch is installed at the auxiliary input (for example, a float sensor in the intake tank), and the contact of the switch opens. It automatically resets when the contact closes again (for example, when the water level is restored).
VBUS Max/Min ERROR	**VOLTAGE** The input voltage of the system will be monitored constantly. The system will stop if the +20% (Max)/-20% (Min) limits are exceeded. The reset is automatic when the nominal voltage is reinstated.

6.3) Permanent errors:

If a fault is ongoing and serious, the Speedrive displays the error on the screen and stops.

WARNING: These cases require the intervention of the technical service.

6.4) Transducer failure.

In a booster unit equipped with multiple transducers, if the main transducer fails, it automatically switches to a secondary transducer.

In this case, displays the following error:

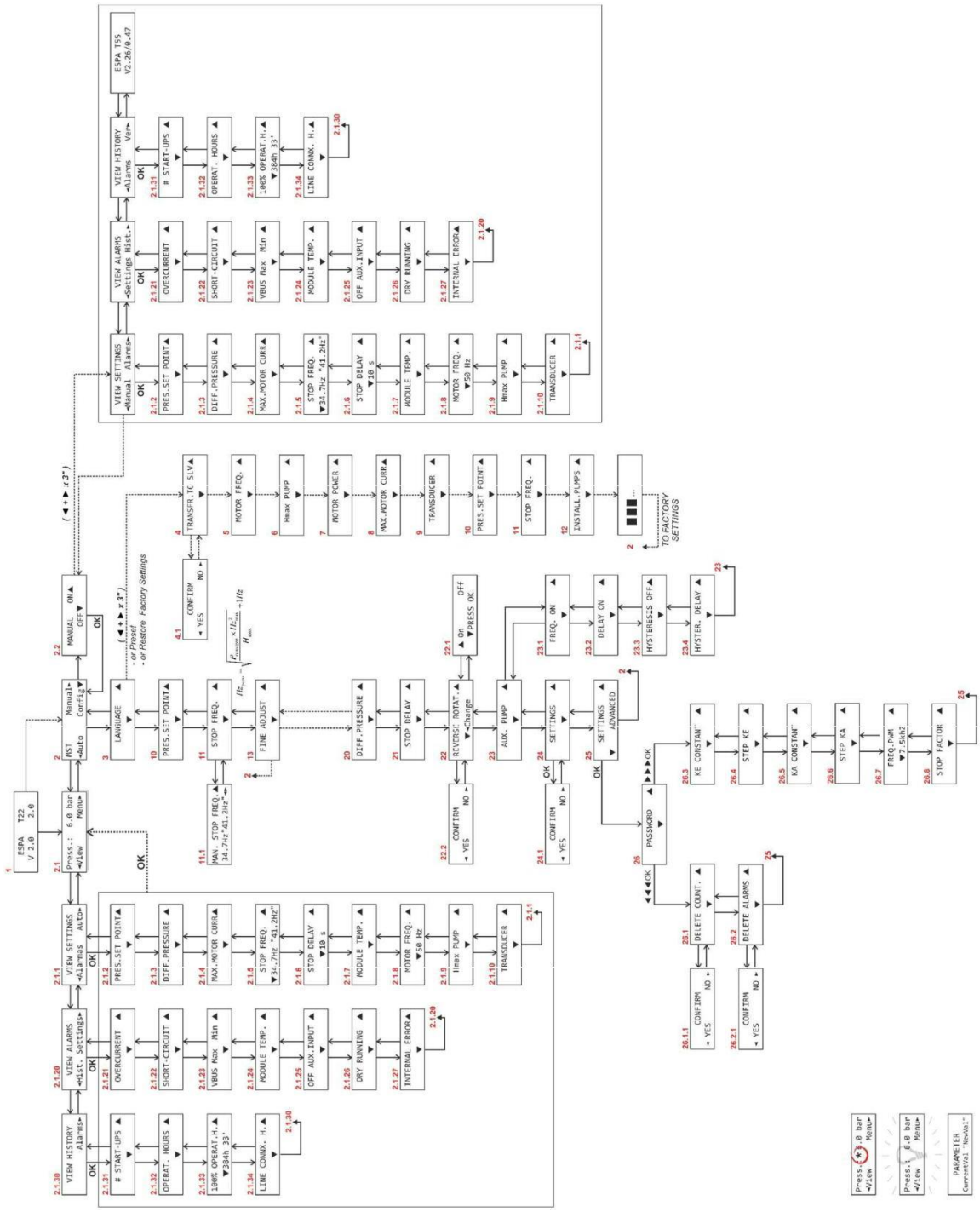
Press.: * 6.0 bar ◄View Menu►	**MAIN TRANSDUCER ERROR** It appears an asterisk in the pressure display = it is reading the pressure of an auxiliary transducer.

7) TROUBLESHOOTING

1. The Speedrive is in fault mode ("FAULT" LED lit). The screen displays the detected error.
2. The Speedrive does not display the screen and the 3 LEDs flash alternatively.
3. The unit will not start up.
4. The unit will not shut down.
5. The set pressure is not reached.
6. The set pressure is exceeded.
7. The auxiliary pumps will not start up.
8. Disordered or nonsensical alternation is occurring.
9. El grupo arranca y para continuamente

Faults	Causes	Solutions
1, 3	The Speedrive protects itself against any problems that may lead to a breakdown.	Find out the cause and the solution in section 6 of this instruction manual.
2	The signal cable between the motherboard and the display is not properly connected.	Connect the cable correctly. See section 6 of this instruction manual.
3	There is no power.	Check circuit breakers and other protective devices.
	If neither the screen nor the LEDs show any activity, the screen cable may be disconnected.	Connect the cable correctly. See section 6 of this instruction manual.
	The Master is not in "Auto".	The display should show screen no. 2.
4	The stopping frequency is too high.	Slightly modify the set pressure in order automatically to recalculate the stopping frequency. If the error persists, manually decrease the stopping pressure (screen 9.1) in intervals of 0.5 Hz.
5	The set pressure is higher than the capacity of the pumps.	Check that the parameter "Hmax PUMP" (No. 5) matches the specifications on the pump nameplate.
5, 6	The configured transducer does not match the full scale of the installed transducer.	Select the correct transducer on screen 7.
	The pressure transducer is blocked or malfunctioning.	Change the transducer.
7	The Slaves are not in "Auto".	All the displays should show screen no.2.
	Stop Frequency (no. 9) + Hysteresis Off (no. 23.4) ≥ ON Frequency (no. 23.2).	a) Review the hidden parameters or restore factory settings. b) Reduce the set pressure.
	Communications cable damaged or not properly connected.	Check the communications cable. Maintain the polarity of the connection.
8	More than one Speedrive is configured as Master.	Configure the micro-switches correctly.
9	The installation does not have enough inertia.	Check the pre-charge pressure of the accumulator (Pre-charge = Set pressure [in bars] – 1).
	One of the non-return valves is leaking.	Close the pump's valves one by one to find out which non-return valve is damaged. Replace it.

8) MENU DIAGRAM



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