

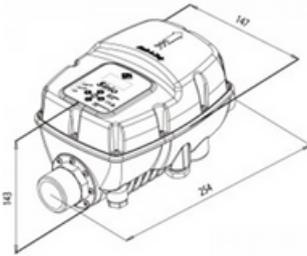


SIRIO VSD CONTROLLER

Catalogue

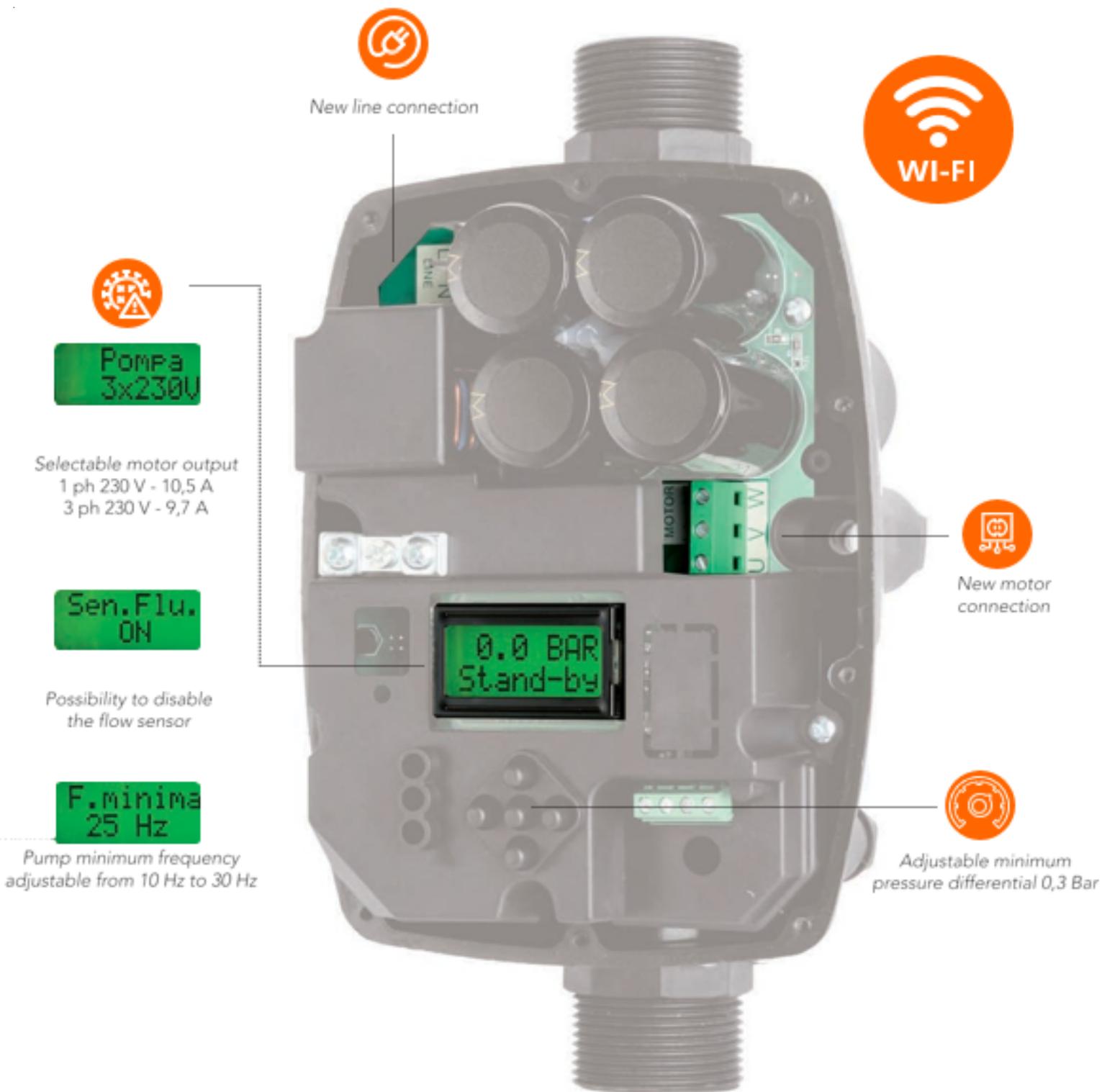
APPLICATION

- Electronic device for the electric pumps control based on inverter technology.
- It controls the starting and stopping of the electric pump and modulates the motor rotations according to the water request from the system.
- Constant pressure due to motor pump speed regulation.
- Energy saving due to less pump absorption.
- Gradual pump start and stop reduces hammering and avoids breakaway starting current.
- Protection against dry running in event of water shortage on the suction.
- Automatic reset in event of dry running, with autonomous error condition recovery.
- Efficient leakage monitoring to protect pump in event of repeated restarts.
- Digital pressure display.
- Motor over current control.
- Operation/error status signalling via LEDs and on-screen alerts.
- Operation in master/slave configuration into twin booster sets.
- Double set point with remote control option.
- Remote start and stop of electric pump.
- Rotation direction inversion via software (it does not require wiring alterations).



TECHNICAL DATA

- Power mains supply: Single-phase 230Vac $\pm 10\%$ - 50/60Hz
- Motor power output: Three- phase 220V~
- Max motor power: 2200W 3PH / 1800W 1PH
- Max line absorption: 9.7A @ 230V(3PH) / 10.5A @ 230V(1PH)
- Max allowable pressure: 800 KPa (8 bar)
- Max fluid temperature: 35°C
- Pressure drop: 0,1 bar at 150 l/min
- Set-point adjustment range: 1,5-7 bar
- Start pressure adjustment range: 1-6,7 bar
- Hydraulic connection: male-male 1" $\frac{1}{4}$
- Frequency modulation range: 25-50 Hz
- Protection degree: IP X5



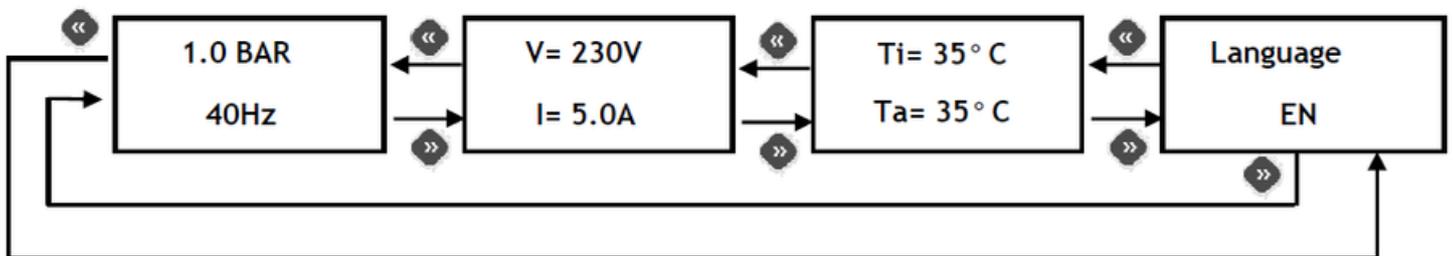
CONTROLLERS

PROGRAMMING

MAIN MENU STRUCTURE

Understanding the System: Key Operational Values

The main menu of the system displays crucial operational values that include pressure, current frequency of the motor, input voltage, output current of the motor, and internal temperature of the inverter. Additionally, you have the option to choose the language that works best for you.



ADVANCED PARAMETER

The advanced parameters are accessible only to the technical assistance service. For access to these parameters, it is necessary to contact the re-seller, a technical assistance centre or the manufacturer.

The following table lists the advanced parameters for reference when technical assistance is required.

| REF. | PARAMETER | DESCRIPTION |
|------|------------------------------|---------------------------------------------------------------------------------------------------------|
| 1.2 | Minimum frequency | Minimum motor start-up frequency |
| 1.3 | Stop frequency | Motor shutdown frequency |
| 1.4 | Nominal motor frequency | Maximum nominal motor frequency |
| 1.5 | Switching frequency | PWM Switching frequency |
| 1.6 | Frequency correction | Maximum frequency correction |
| 1.7 | Soft-start | Soft-start activation/deactivation |
| 2.0 | Flow switch activation | Flow switch activation or deactivation |
| 2.1 | Command source | Source of manual or automatic command |
| 2.2 | Auxiliary contact function | Selection of auxiliary contact function |
| 2.3 | I/O board input function | Function of I/O auxiliary board input contact |
| 2.4 | I/O board output function | Function of I/O auxiliary board output contact |
| 2.5 | Delay on stop | Delay on shutdown after closure of utilities |
| 2.6 | Autoreset interval | Time interval between autoreset attempts |
| 2.7 | No. autoreset tests | Number of autoreset attempts |
| 2.8 | Total automatic reset | Enabling of overall reset of all alarms |
| 3.0 | Pressure calibration 0.0 Bar | To carry out calibration of the pressure sensor at 0 Bar |
| 3.1 | Pressure calibration 5.0 Bar | To carry out calibration of the pressure sensor at 5 Bar |
| 3.2 | Flow sensor calibration | To carry out calibration of the flow sensor |
| 3.3 | Pressure test | Current pressure test signal |
| 3.4 | Flow switch test | Flow switch test signal |
| 3.5 | Software Release | Release of software |
| 3.6 | Power supply timing | Inverter power supply timer |
| 3.7 | Pump timing | Electric pump operational timer |
| 3.8 | Last error | Last error occurred log |
| 3.9 | Start-up | Pump start-up counter |
| 4.0 | Vboost | Voltage boost at 0Hz |
| 4.1 | Dry run | Time delay before activation of the protection due to no water |
| 4.2 | Protection starts per hour | Activation or deactivation of the control on the number of start-ups per hour (leak checks) |
| 4.3 | Anti-blockage protection | Activation or deactivation of a function that automatically starts up the pump after 24 hours of disuse |
| 4.4 | Dead time PWM | Dead time PWM setting |
| 4.5 | Ki | PID controller integral constant |
| 4.6 | Kp | PID controller proportional constant |
| 4.7 | Boost time | Boost time at maximum frequency with soft start disabled |
| 5.0 | Ta max | Maximum ambient temperature |
| 5.1 | Tm max | IGBT module maximum temperature |
| 5.2 | Ta reduction index | Frequency reduction index on ambient temperature |
| 5.3 | Tm reduction index | Frequency reduction index on module temperature |
| 5.6 | Minimum voltage | Minimum power supply voltage threshold |
| 5.7 | Maximum voltage | Maximum power supply voltage threshold |
| 5.9 | Debug Variable | Debug variable selection for process value display |

ALARMS

In the event of system anomalies or malfunctions, one of the following screens will appear on the Sirio display. Each error is coded with the letter "E" followed by a number from 0 to 13. The number which appears in brackets represents the number of recurrences of each error. To reset an alarm, after having resolved the cause, it is usually sufficient to press the central "reset" key or interrupt the electrical power supply for a few seconds

E0 (0)
Lo.Volt

E0 – Low voltage: indicates that the power supply voltage is too low. Check the input voltage value

E1 (0)
Hi.Volt

E1 – High voltage indicates that the power supply voltage is too high. Check the input voltage value

E2 (0)
Shortcir

E2-Short Circuit: This message will appear on the screen when a short circuit is detected at the inverter output; this may occur following incorrect connections of the electric motor, damage to the electrical insulation in the wires which connect the electric pump to the should be checked as soon as possible by specialised personnel. The error may only be removed by disconnecting the equipment from the electrical power source and resolving the cause of the fault. Attempting to restart the inverter in the presence of a short-circuit in output may cause serious damage to the equipment and be a source of danger to the user.

E3 (0)
Dry run

E3-Dry running: this message appears when the system is stopped following a pump intake water shortage. If the auto-reset function has been enabled, the Sirio will carry out automatic attempts to check for the availability of water. To clear the error status, press the central “reset” button.

E4 (0)
Amb.Temp

E4- Ambient temperature: the error appears if the maximum internal ambient temperature of the inverter is exceeded. Check the conditions of operation of the inverter

E5 (0)
IGBTtemp

E5-module temperature: the error appears if the maximum temperature of the IGBT module of the inverter is exceeded. Check inverter operating conditions, in particular the water temperature and the current absorbed by the pump.

E6 (0)
Overload

E6-Overload: this alarm is displayed when electric pump absorption exceeds the maximum set current as entered in the I_{max} value: this may occur following intensive use of the electric pump, continuous restarts at close intervals, problems with the motor windings, or following problems with the electrical connection between the motor and Sirio. If this alarm trips frequently, arrange for the system to be checked by the installer.

E8 (0)
Ser.Err

E8-Serial error: this alarm may occur where there is an internal serial communication on Sirio. Contact the technical assistance.

**E9 (0)
Ov.Pres**

E9-Pressure limit: the alarm intervenes when the maximum set pressure threshold has been exceeded. If the error appears repeatedly, check the setting of the "P limit" parameter. Also check other conditions which may have caused an overpressure (for example, partial freezing of the fluid).

**E10(0)
Ext.Err**

E10- External error: this alarm will be displayed if, after having set the external error function on the auxiliary I/O board, the I/O input contact is closed.

**E11(0)
Start/H**

E11-Number of maximum starts/hour: this error appears if the maximum number of admissible start-ups per hour has been exceeded. Check for the presence of any leaks in the system. Check the pre-loading of any installed tanks.

**E12(0)
Err.12V**

E12- Error 12V: an anomaly has been detected in the internal low voltage power supply circuit. Have the manufacturer check the device.

**E13(0)
Pres.Sen**

E13- Pressure sensor error: the pressure sensor has detected an incorrect value. Have the manufacturer check the device.



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