Pioneering for You

Wilo – FFS–E Control Panel

Installation and operating instructions

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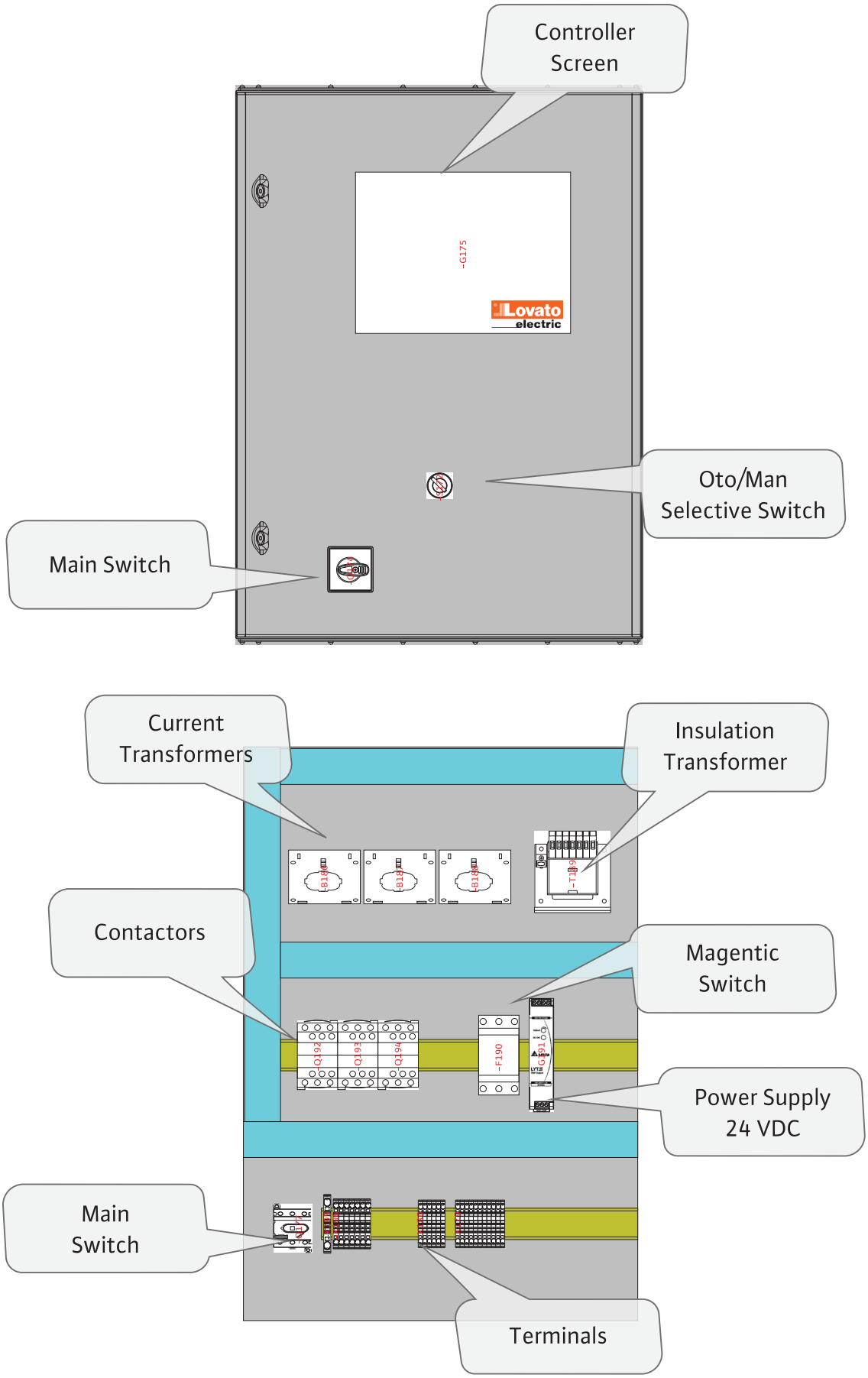
Panel Layout Plan



1. General

Installation and commissioning must only be carried out by qualified mechanically and electrically competent personnel guided by authorized services authorized and declared by WILO Pompa Sistemleri A.Ş.
Installation and operating guide are part of the device. It should be kept ready next to the device as a resource that can be consulted at any time. The complete observance of these instructions is essential for the proper use and correct operation of the device.The installation and operating instructions must be convenient to the model of the device and to the safety standards in force at the time of printing.

2. Safety

This use guide includes the fundamental explanations in operating and installation.. Therefore, these operating instructions must be read by the installer and the relevant operator during installation and operating. It should not only considered these instructions also in the same time Not only the general safety instructions under this basic safety heading, but also the specific safety instructions under the following points must be observed.

2.1. Symbols Related to the Descriptions in the Operating Instructions

In these operating instructions, the following symbols indicate the safety regulations which, if not followed, can lead to injury and disability.

Warnings against electric shock are specifically indicated by the following symbol.

The Symbol is used to indicate safety regulations which, if not followed, may cause damage to machinery, equipment or system.

CAUTION!

2.2. Staf Training

Staff who makes the installation must be properly trained for these applications.

2.3. Dangers May Occur if Safety Regulations are not Followed

Failiure to follow the safety instructions may result in injury to staff and damage to the equipment. It also invalidates claims for compensation for damages arising from non-compliance with safety rules. In general, not following the rules causes the following negative effects:

- Failure of important functions of the equipment,
- Staff injuries which depends on the electrical and mechanical reasons.

2.4. Safety Rules for the Operating Staff

Regulations on accident prevention must be followed. Dangers may occur due to electrical energy, necessary precautions must be taken. Electrical hazards must be taken into account and the directives of the local electricity distribution organizations must be followed.

2.5. Safety Rules fot Inspection and Installation Work

The operator must ensure that all inspection and installation work is carried out by authorized and qualified specialist staff and that they are sufficiently familiar with the details contained in the operating instructions. In principle, work on the system must only be carried out when the system is completely stopped.

2.6. Unauthorized Modification and Spare Parts Use

Modifications to the assembly are only possible with the approval of the manufacturer. The use of spare parts recommended by the manufacturer ensures complete safety. The use of other parts may invalidate any claims for compensation.

2.7. Unauthorized Operating Types

The operational safety of the delivered device can only be ensured if it is operated under the conditions specified in paragraph 4 of the operating instructions. The operating limit values given in the catalog or brochure must never be exceeded.

3. Transportation and Interim Storage

CAUTION!

The panel supplied by the factory must be sent in a cardboard box or tied to a pallet, protected against dust and moisture.

When receiving the product

- Should be controlled against a delivery damage.
- If there is any delivery damage, necessary applications must be made.

During transportation

- Must be protected against damages during transportation.
- Always use the proper lifting equipments and secure parts against falling.
- Fix the product on a flat pallet, use a suitable pallet truck for transportation. In order not to cause any accident or to prevent damage to your product by falling or slipping, fix it to the carrier vehicle during transportation.
- Don’t stand under the lifted loads. Use cell during lifting and fix product flatly in cell.
- Firstly Panel must be stand solid and balanced before the storage, transportations and Installation works.

CAUTION! The control device must be protected against moisture and mechanical damage. It must not be used outside ambient temperatures between –10°C and +50°C.

4. Purpose of Use

Automatic and manual control of each main fire pump driven by electric motor separately and independently by electrical panel.

5. Product Information

5.1. Application

FFS-E control panels are designed according to EN 12845 to offer state-of-the-art functions of electric motor driven pumps for fire fighting applications. Specialized components and an extremely compact, modern design LCD display provide a clear and intuitive user interface.

5.2. Panel Coding

Example	**:**	FFS-E 75
FFS	**:**	Fire Pump Control Panel
E	**:**	Electrical Engines
75	**:**	Maximum rated po P2 [kW]

5.3. Working Principle

Automatic Mode

In this operating mode, the state of the pressure switch is monitored, motor start when there is no pressure initiates attempts. When there is no signal from the pressure switches, the LCD backlight flashes (visible from a distance) and the PRESS/Pressure text flashes on the display, emphasizing the lack of signal. Motor starting can be performed in different ways depending on the type of motor starting (direct, star-delta, soft starter, etc.). Proper operation of the electric pump is monitored by electrical parameters (balanced currents, rated active power, etc.). Once the electric motor has been started, the motor can be stopped by pressing the STOP button on the front panel when the pressure switches are restored (i.e. the fire condition is eliminated).

Manual Mode

If the device is in manual mode (red LED lights up and is also highlighted by the text on the LCD display), the pressure switch status is not monitored in manual mode. In this operating mode, inspection and maintenance work is carried out and the system can be started by pressing the START button to test that the system is working properly.

5.4. Product Features / Benefits

- Checking the fire pump with electrical engine according to the EN12845
- Graphic LCD display 128x80 pixels, backlit, 4-level gray.
- 8 keys for functions and setup.
- 7 LEDs for displaying operating modes and status.
- Texts for measurements, settings and messages in 5 languages.
- Additional digital I/O, static or relay outputs;
- PT100 analog I/O for temperature, current and voltage.
- Advanced programmable I/O functions.
- Thresholds, counters, alarms, states with integrated PLC logic.
- Fully user defined alarms.
- 24VAC auxiliary supply.
- Three phase voltage measurement input 100...600VAC.
- Three phase current measurement
- Storage of the last 128 events

5.4.1. Keypad Functions

A. 5 Key for the navigation and installation
B. Manuel START key
C. Manuel STOP key
D. Alarm silence key

5.4.2. Front LED's

a) Pump is running (green):
b) If a pressure switch is used, this **LED** indicates the status of the switch. Otherwise, it indicates the running status of the motor. If there is a discrepancy between the status of the pressure switch and the running status of the motor, the **LED** flashes.
c) Mains voltage status (double color):
d) Illuminates green if the mains voltage is within the defined parameters, red otherwise
e) Launch request (yellow)
f) Indicates the initialization status of the pressure switch.
g) Automatic mode disabled (red).
h) Illuminates when the device is in manual mode
i) Engine stopped (double color):
j) The **LED** goes out if the motor is stopped. If the motor is running with a current higher than 10% of the rated current, the **LED** is green, otherwise the **LED** is red
k) Alarm silencing (**RESET**). Flashes if there is an alarm that can be reset.
l) STOP button active (yellow).
Illuminates when it is desired to stop the engine manually by pressing the STOP button.

6. Electrical Connections

Electrical connection must be carried out by trained persons in accordance with the regulations of the regional electricity distribution utility.

7. Commissioning

We recommend that the installation is commissioned by WILO Customer Service. Before the first commissioning, the cables on the construction side must be checked for correct connection and, in particular, for earthing. Individual precautions for commissioning must be taken from the installation and operating instructions for the complete assembly. All connection terminals must be tightened before commissioning.

7.1. Factory Settings

The control panel is preset at the factory. The factory setting can be recreated by WILO Service.

7.2. Control of Motor Rotation Direction

Each pump must be switched on briefly in “Manual operation” to check that the direction of rotation of the mains-operated pump matches the arrow marking on the pump casing. Incorrect or correct rotation in wet rotor pumps direction is indicated by a control LED in the terminal box. If all pumps rotate in the wrong direction during mains operation, change the optional 2 phases of the mains line.

8. Maintenance

Periodic maintenance and repair work must only be carried out by qualified personnel directed by authorized services authorized and announced by WILO Pump Systems Inc.

Vital Danger

When working on electrical devices, there is a danger to life from electric shock.

- For all maintenance and repair work, the control unit must be de-energized and secured so that it cannot be restarted by unauthorized persons.
- Any damage to the connection cable must only be repaired by a qualified electrician.
- Following maintenance should be checked monthly by the user;
- The control cabinet must be kept clean, if there is dust, the outside of the cabinet must be cleaned with a dry cloth.
- Check the entire system every month with a 10-minute trial run. Monitor whether a malfunction occurs.A residual current protection relay must be installed on the power line to which the control panel is connected. The service life of the device is 5 years.

9. Spare Parts

Spare parts are ordered through services authorized by WILO Pompa Sistemleri A.Ş. The spare parts list is on the back page of the electrical project.

10. Authorized Services

You can access the list of services authorized by WILO Pompa Sistemleri A.Ş. from the following internet address.
http://www.wilo.com.tr/anasayfa/servis-destek/yetkili-servisler/

11. Incorrect Use

- Control panel door always must be closed and locked.
- Do not turn off the energy supply switch of the control panel except for periodic maintenance (controlled conditions).
- Do not intervene in the panel without cutting the energy supply.
- Do not place any material on or in front of the control panel.
- Lay an insulated carpet in front of the control panel and intervene the panel by stepping on the carpet.
- Do not draw energy supply line from inside the control panel to outside.

12. Safety and Environment Instructions

WEEE Directive Compliance and Waste Product Disposal:
This product complies with the EU WEEE Directive (2012/19/EU). This product has a classification symbol indicating waste electrical and electronic equipment (WEEE). In the European Union, this symbol may appear on the product, packaging or related documentation. The symbol indicates that these electrical and electronic products must not be disposed of with household waste. To guarantee the proper transportation, recycling and disposal of these used products, observe the following points:

- Deliver these products only to certified collection points.
- Always comply with applicable local regulations!

For information on the proper disposal procedure, please contact your local municipal authorities, the nearest waste disposal center or the retailer from whom you purchased the product.

For more information on recycling;
Go to the address.
http://www.wilo-recycling.com

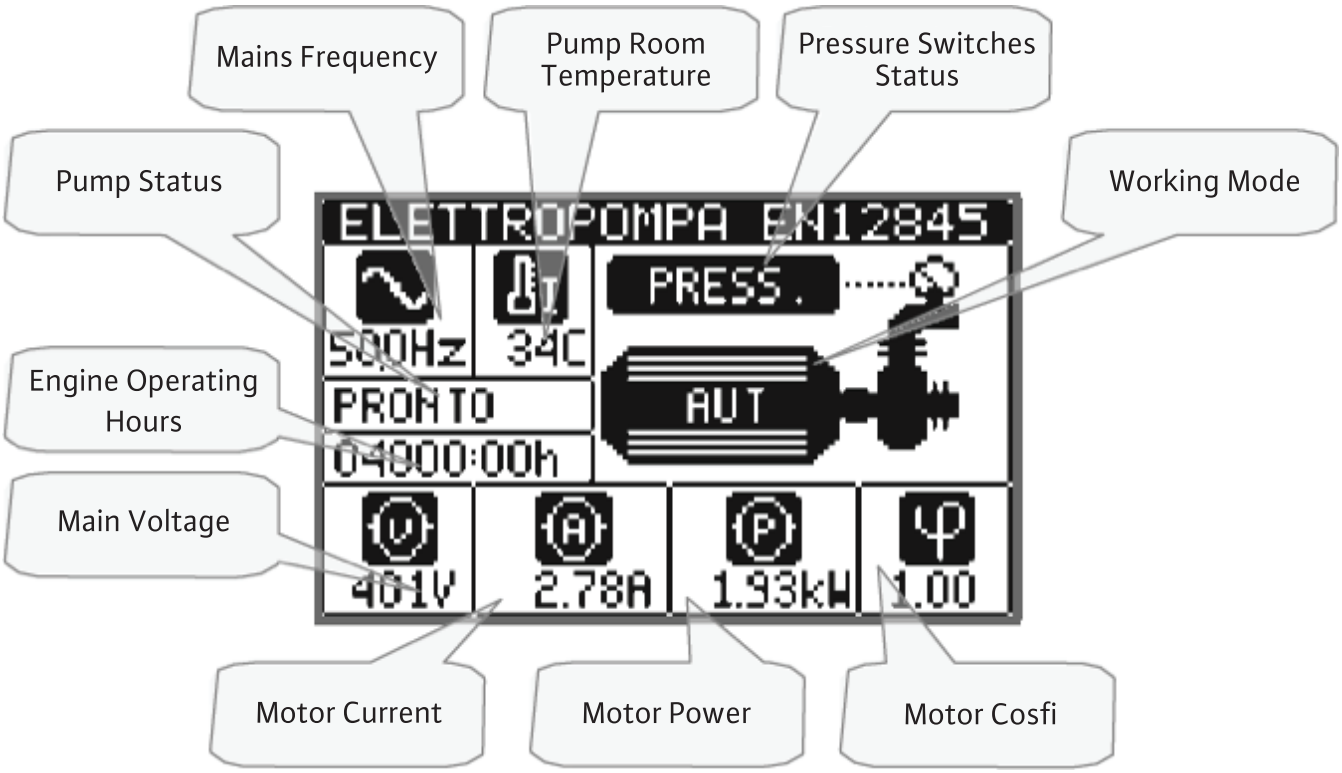
Packaging Information : The packaging materials of the product are made of recyclable materials in accordance with the National Environmental Legislation. Do not dispose of packaging materials with household waste or other waste. Take these materials to the recycling points designated by local authorities.

Technical changes can be made!

13. Screen Descriptions

Home Page

Working Modes



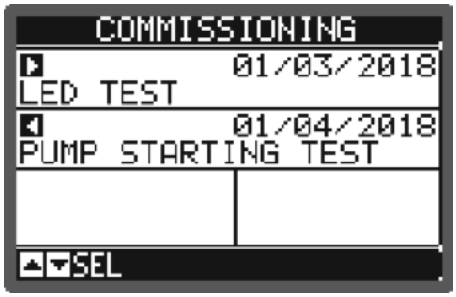
The device is normally in automatic mode
Manual mode selection is possible with an external digital input assigned to the “Automatic Start Inhibit” function.
When the controller is not in automatic mode, the red LED (d) on the front of the device lights up, indicating that the device is not ready to start with the signal from the pressure switch.

Automatic Mode
The device is normally in automatic mode
In this operating mode, it monitors the status of the pressure switch, initiating engine start attempts when there is no pressure.
When there is no signal from the pressure switches, the **LCD** backlight flashes (visible from a distance) and the **PRESS/Pressure** text flashes on the display, emphasizing the lack of signal.
Starting the motor can be performed in different ways depending on the motor starting type (direct, star-delta, soft starter, etc.).
The proper functioning of the electric pump is monitored by electrical parameters (balanced currents, rated current power, etc.).
After starting the electric motor, if the status of the pressure switches is restored (i.e. the fire condition is eliminated), the motor can be stopped by pressing the **STOP** button on the front panel.

Manual Mode
If the device is in manual mode (the red LED lights up and is also highlighted by the text on the **LCD** display), the pressure switch status is not monitored in manual mode. In this operating mode, it is possible to press the **START** buttons for control and maintenance work and to test the system for proper operation.

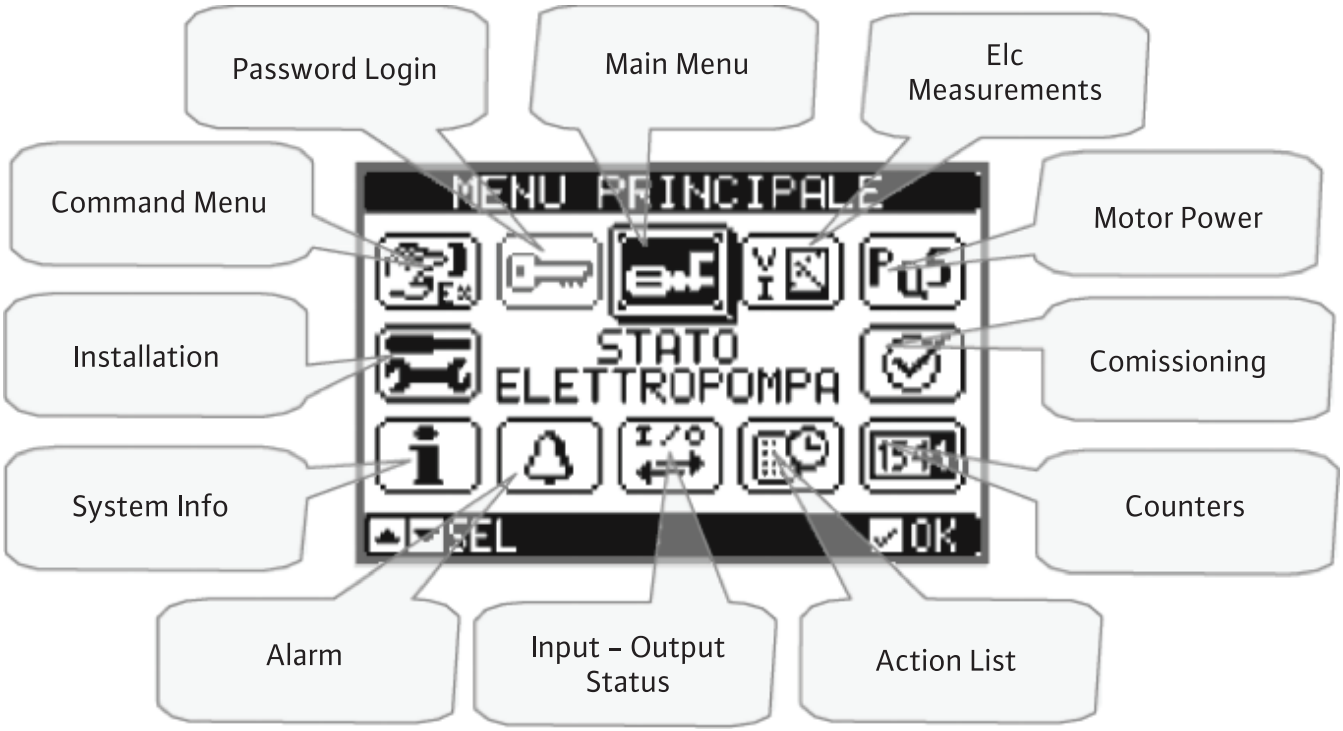
Test Procedure
The periodic test procedure includes simulation of automatic start–up attempts with pressure loss.

Commissioning Procedure



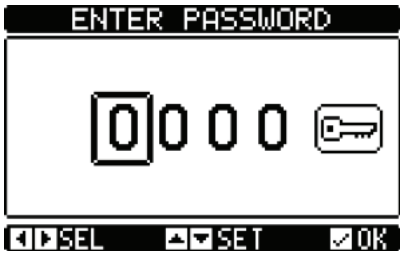
By pressing the right arrow button from this page, the signalization leds on the front can be tested. With the left arrow; it is possible to simulate the lack of signal from the pressure switch and simulate the engine starting.
Each time the tests are performed, the date of the test is recorded and shown on the display.

Main Menu
- The main menu consists of a group of graphical icons (shortcuts) that provide quick access to measurements and settings.
- The selected icon is highlighted and a description of the function appears in the center of the screen.
- Press the buttons to rotate clockwise / counterclockwise to select the desired function. The selected icon is highlighted and a description of the function appears in the center of the screen.
- Press √ to activate the selected function.
  If some functions are not available, the corresponding icon in light gray will be disabled.
-  – Opens the password entry page. Protected functions are unlocked from this page (e.g. parameter setting, commands menu, etc.)
-  – Access point to the setup menu for parameter programming. Refer to the relevant chapter for details.
-  – Access point to the commands menu. Authorized users can perform some deletions and restores from here.



Password Login

- For new devices (with factory settings installed) password protection is disabled and access to the menus is possible. If a password has been created and password protection is turned on, you must first enter the created password via the keypad.
- To activate password protection and create a password, see menu M03 Password entry.
- Depending on the password entered, there are two different levels of access:
- User level access – Allows clearing saved values and editing a limited number of setup parameters.
- Advanced access level – covers user level access, plus allows editing and restoring all settings.
- To recall the main menu in normal monitoring mode, press √, select the password entry icon and press √
- The screen description is shown below:

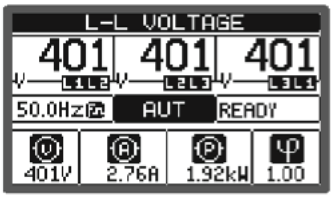
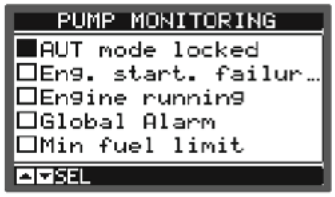
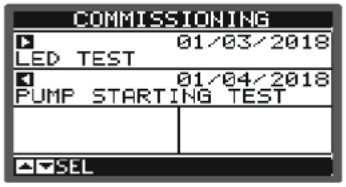
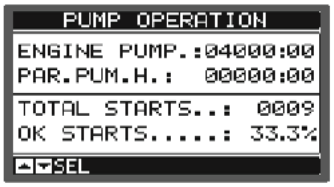


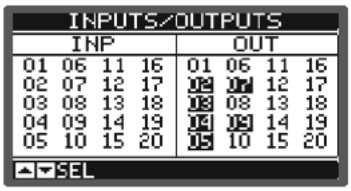
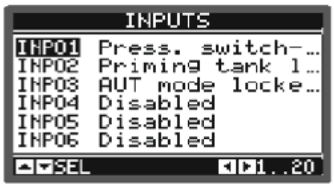
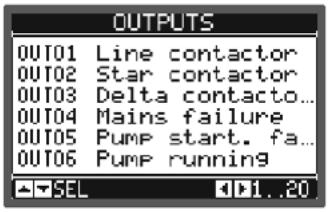
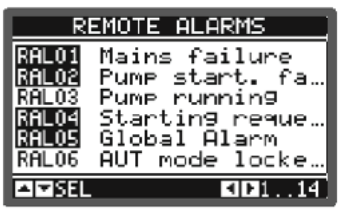
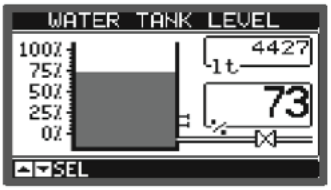
- ▲ and ▼ buttons change the selected step
- The ◀ and ▶ keys move between the digits.
- Enter all digits of the password and then switch to the key icon.
- If the entered password code matches the User login password or advanced login password, the password matching message is displayed.
- After entering the password, access rights continue until one of the following situations occurs:
- 1 the device is switched off

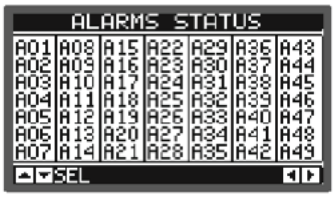
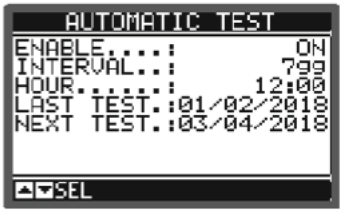
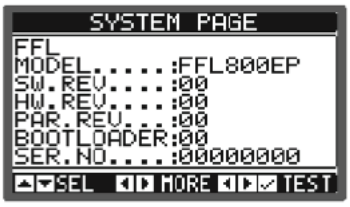
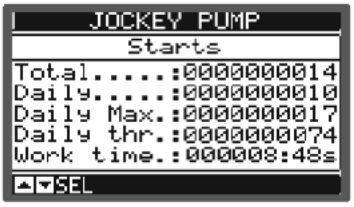
Navigating Between Pages

- ▲ And ▼ buttons to switch between measurement pages. The title bar shows the current page.
- Depending on the system programming and connections, some measurements may not be displayed (e.g. if a fuel sensor has not been set, the relevant page will not be displayed).
- ▶ can be displayed in sub-pages with the button. (e.g. voltage and current sub-sheets in bar graph format can be displayed)
- The user can specify which page and which sub-page the screen should automatically return to after a certain period of time without any key presses.
- The system can also be programmed to keep the display on the page it was last on.
- This can be done from the M01 – Operation menu.

Table-Shaped Display Pages

Measurement Voltage Power PF	
Pump Following	
Commissioning	
Pump Operation	
Maintenance	

Information Page	
Event Log	
Input/Output	
Inputs	
Outputs	
Remote Alarms	
Water Tank Level	

Alarm Status	
Date/Time	
Automatic Test	
System Page	
Jokey Pump	

User Alarms (UAx):

- The user has the possibility to define a maximum of 8 programmable alarms (UA1... UA8).
- For each alarm, it is possible to define the following 3 items: the source of the condition that generates the alarm; the text of the message that must appear on the display when this condition occurs; the characteristics of the alarm (as for standard alarms), i.e. in which situations the alarms must be activated.
- The condition that triggers the alarm can, for example, be caused by exceeding a threshold. In this case, the alarm source will be one of the limit thresholds (LIMx).
- Or the condition generating the alarm can be assigned depending on the state of an external digital input signal, in which case the alarm source will be an INPx.

- With the same criteria, it is also possible to associate an alarm with the results of logic combinations of inputs, outputs, limits, etc. In this case, Boolean logic variables PLCx must be used.
- For each alarm, the user can define a message to be displayed on the alarm page.
- The properties of user alarms can be defined in the same way as normal alarms. You can choose whether a specific alarm will stop the motor, activate the sounder, turn off the global alarm output, etc. See Alarm properties section.
- When multiple alarms are active at the same time, they are displayed in sequence and their total number is shown in the status bar.
- To reset an alarm programmed as locked, use the corresponding reset command in the command menu.
- Refer to the M18 setup menu for details on alarm programming and definition.

Automatic Test

- The self-test is a periodic test that is performed at certain intervals (set during installation) when the system is in AUT mode and the function is activated.
- Note: Activating the self-test means that stopping is also automatic. Therefore, periodic testing with this function enabled does NOT comply with UNI 12845. See the UNI/EN 12845 compliance section.
- It is possible to specify on which days of the week and at which time of the day (hour - minute) the self-test can be performed.
- Refer to the M07 Self-test menu for more information on self-test programming.
- After starting, the motor pump runs for a certain time and then stops. The message “T.AUT” is displayed before the engine starts.
- If the pressure switch detects sufficient hydraulic pressure, the automatic test can be stopped with the STOP button.
- At the end of the automatic test, the engine is only stopped with the hydraulic pressure detected by the pressure switches.

UNI/EN 12845 Compliance

- The controller complies with UNI/EN 12845 with factory settings.
- To maintain compliance, the following conditions must be met: 1 - self-test must be disabled (P07.01 = OFF);
- the automatic delayed stop parameter must be disabled (P02.10 = OFF);
- the digital input for the self-test enable function must be switched off or not matched with any digital input (by default).
- If any of the above conditions are not respected, the UNI/EN12845 text will disappear from the main display page.

Setting parameters from the front panel (setup)

- To open the parameter programming menu (setup):

1. Set the unit to MAN mode (activate the AUT mode lockout input - the 'lockout' LED lights red);
2. While in normal measurements view, press √ to go to the main menu;
3. Select the icon. If it is deactivated (grayed out) you must enter the password (see chapter - Password entry);

Press the √ key to open the setup menu.

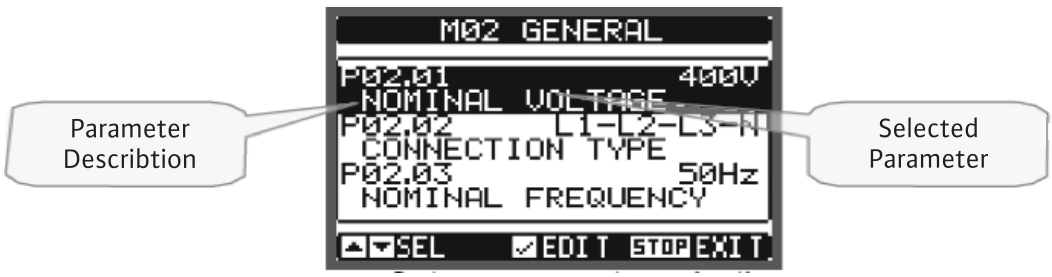
- See the table below for an example of access to the sub-setting menus of the parameters according to their basic functions.
- Select the desired ▲ ▼ menu tile and confirm with √.
- Press the **STOP** key for a step back.

Settings:Menu Selection

The following table lists the available submenus of the setup menu:

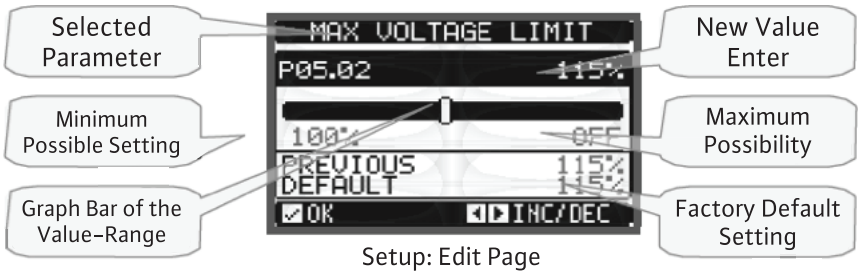
CODE	MENU	DESCRIPTION
M01	USAGE	Language, brightness, screen pages, etc.
M02	GENERAL	System features
M03	PASSWORD	Password settings
M04	ROOM TEMPERATURE	Measurement source, limit thresholds
M05	PROTECTION	Temperature measurement source, limit thresholds
M06	VOICE ALARMS	Internal and external audible siren control
M07	AUTOMATIC TEST	Automatic test mode, duration, period
M08	MAINTENANCE	Maintenance intervals
M09	PROGRAM INPUT	Programmable digital input functions
M10	PROGRAM OUTPUT	Programmable digital output functions
M11	COMMUNICATION	Adres, format, protokol
M12	LIMIT THRESHOLDS	Customizable limit thresholds
M13	COUNTERS	Programmable generic counters
M14	DISTANCE ALARMS	External relay alarm/status signals
M15	TIMER	Programmable timers for PLC logic
M16	ANALOG INPUTS	Voltage / current / temperature inputs
M18	USER ALARM	Programmable alarms
M19	ALARM TABLE	Alarms should make their effects active

- Select the submenu and press √ to show the parameters.
- Each parameter is shown with code, description and actual setting value.



Setup: Parameter Selection

- To change the setting of a parameter, select it and then press the √ button.
- If the advanced level access password has not been entered, it will not be possible to enter the edit page and the message Access denied will be displayed.
- If the access password is confirmed instead, the edit screen will be displayed.



Setup: Edit Page

- When the edit screen is displayed, the parameter setting can be changed with the ◄ and ► buttons. New setting on the display,a graph showing the setting range, maximum and minimum values, previous setting and factory default bar is displayed.
- Pressing the ◄ + ▲ buttons sets to the lowest possible value, pressing the ▲ + ► buttons sets to the lowest possible value. is set to the maximum value.
- Pressing ◄ + ► simultaneously returns the setting to the factory default.
- When entering a text message, the ▲ and ▼ buttons are used to select numeric characters and the ◄ and ► buttons are used to select letters.to select characters. Pressing the ▲ and ▼ buttons at the same time directly selects the character "A" character.
- Press to return to parameter selection The entered value is stored.
- Press **STOP** to save all settings and exit the setup menu. The controller is reset and then returns to normal operation.
- If the user does not press any key for more than 2 minutes, the system automatically exits the installation and returns to normal view without saving the changes made to the parameter

M01 - Usage		Unit	Default	Range
P01.01	Language		English	ENG ITA FRA SPA DEU
P01.02	Clock setting after energization		OFF	OFF-ON
P01.03	LCD contrast	%	50	0-100
P01.04	High intensity of screen backlighting	%	100	0-100
P01.05	Low intensity of screen backlighting	%	25	0-50
P01.06	Low backlight transition time	sn	180	5-600
P01.07	Back to the default page	sn	300	OFF / 10-600
P01.08	Default Page		Global	(page list)
P01.09	ID Engine Pump		FFL	20 character

These parameters can be accessed with the user level password.

P01.01 - Language selection for on-screen text.

P01.02 - Activation of automatic access to the clock setup after energizing.

P01.03 - LCD contrast settings

P01.04 - High intensity of screen blacklighting

settings

P01.05 - Low intensity of screen backlighting

settings

P01.06 - Display backlight transition delay

P01.07 - Return to the default page when keys are not pressed. If set to OFF, the last selected page always remains on the screen.

P01.08 - When set to On, after the delay time, the default page is shown on the screen.

P01.09 - Free text that you can use to describe the specific system.

M02 - GENERAL		Unit	Default	Range
P02.01	Nominal voltage	VAC	400	110…600
P02.02	Connection type		L1-L2-L3	L1-L2-L3-N / L1-L2-L3 / L1-N
P02.03	Nominal frequency	Hz	50	50-60
P02.04	Nominal current	A	10.0	0.1…1000.0
P02.05	Minimal power	kW	AUT	AUT / 1.0…1000.0
P02.06	CT primer	A	5	1…5000
P02.07	CT sekonder	A	5	1, 5
P02.08	CT okuma		3-TA	1-TA-L1, 1-TA-L2, 1-TA-L3, 3-TA
P02.09	Start mode		Star	Star-delta, Direct, Static, Impedance, Autotransformer
P02.10	Slow running time	s	15	1…60
P02.11	Locking time	s	0.10	0.02…0.50
P02.12	Temperature measuring unit		°C	°C °F
P02.13	Pressure switch start delay	s	1.0	0.0-60.0
P02.14	Filling float start delay	s	1.0	0.0-60.0
P02.15	Filling float automatic stop waiting time	s	OFF	OFF/1… 10000
P02.16	Waiting time for automatic stop from pressure switch	s	OFF	OFF/5… 10000
P02.17	AINx analog channel - to monitor the water level in the tank		OFF	OFF/1-4
P02.18	Tank low water level threshold	%	20	0-100%
P02.19	Water level threshold for empty tank	%	10	0-100%
P02.20	Max number of jockey starts	OFF	OFF	OFF/1…10000
P02.21	Jockey pump max. run time	min	OFF	OFF/1…1000
P02.22	A25 and A26 delay	s	60	1-1000

P02.01 – Mains nominal voltage.
P02.02 – Connection type (mono-phase, three-phase neutral or three-phase neutral).
P02.03 – Mains nominal frequency
P02.04 – Rated current value of electric motor
P02.05 – Rated power value of electric motor
P02.06 – Current transformer primary current value
P02.07 – Current transformer secondary current value
P02.08 – Number and position of current transformers
P02.09 – Electric motor starting / wiring method. Output relay functions must be programmed according to this selection.
P02.10 – Start time with reduced voltage (e.g. star time for a star/delta start method).
P02.11 – Locking time between reduced voltage and rated voltage (e.g. intermediate time value for the star-delta starting method).
P02.12 – Measurement irimi for all temperature measurements and thresholds.
P02.13 – Delay time between opening the contacts of the pressure switch and starting the automatic start procedure
P02.14 – Delay time between the closing of the filling float contact and the start of the automatic start procedure
P02.15 – Automatic engine stop delay after engine start for the fill level. If set to OFF, the engine must be switched off manually with operator intervention. By setting a time, the engine is stopped automatically after the filling float contacts have been open for this time. The input “Enable automatic stop” must also be enabled to activate the automatic stop. To comply with UNI EN 12845, this setting must be set to OFF/OFF.
P02.16 – Automatic motor stop delay after opening the pressure switches. If set to OFF, the motor must be switched off manually by operator intervention. If a time is entered, the motor will be stopped automatically after the pressure switch contacts have been closed for the entered time. The “Enable automatic stop” input must also be activated for the automatic stop to take effect To comply with UNI EN 12845, this setting must be set to OFF/OFF
P02.17 – Selects the analog channel (AINx) to monitor the water level in the tank.
P02.18 – P02.19 – The minimum water level thresholds of the tank that generate alarms A20 and A21 respectively
P02.20 – Limit on the maximum number of times the jockey pump can run per day. If this setting is not set to OFF and the “Jockey Pump Operation” input function is activated, the “A33 Jockey pump alarm” alarm occurs when the set threshold is exceeded.
P02.21 – Max continuous running time of the Jockey pump. If the parameter is not OFF and the “Jockey Pump Run” input function is enabled, the A35 “Jockey pump max run time” alarm is activated when the set threshold is exceeded.
P02.22 – Initial activation delay for alarms A25 and A26.

M03 - PASSWORD		Unit	Default	Range
P03.01	Password active		OFF	OFF-ON
P03.02	User level password		1000	0-9999
P03.03	Advanced level password		2000	0-9999
P03.04	Remote acces password		OFF	OFF/1-9999

P03.01 - If set to OFF, password entry is disabled; access to settings and the command menu can be accessed directly without entering a password.

P03.02 - P03.01 password set for the user level when enabled. See Password Entry section.

P03.03 - P03.02 similarly, the password set for the advanced level.

P03.04 – If assigned to a numeric value, it must be entered to send a remote command.

M04 - ROOM TEMPERATURE		Unit	Default	Range
P04.01	Room temperature readout		INT	OFF INT EST
P04.02	Min. temperature alarm threshold	°	4	0-70
P04.03	Minimum temperature alarm delay	sec	10	0-600
P04.04	Max. temperature alarm threshold	°	40	0-160
P04.05	Maximum temperature alarm delay	sec	10	0-600
P04.06	Starting threshold for ambient heating	°	8	0-70
P04.07	Stop threshold for ambient heating	°	10	0-70
P04.08	Delay to start/stop heating	sec	10	0-600

P04.01 - Defines the source of the room temperature. OFF = measurement is off. INT = measurement comes from the internal sensor. EXT = measurement comes from the NTC remote probe connected to terminals 53 e 54.

P04.02 - P04.03 - Alarm 'A46 Temperature too low' threshold and delay.

P04.04 - P04.05 - Alarm 'A47 Temperature too high' threshold and delay. These thresholds are also used for "room ventilation": the corresponding output is activated when the temperature is lower than the threshold.

P04.06 - P04.07 - P04.08 - Thresholds values and activation/deactivation delays for the heater.

M05 - Protection		Unit	Default	Range
P05.01	MIN voltage threshold	%	85	70-100
P05.02	MAKS voltage threshold	%	115	100-130 / OFF
P05.03	MIN frequency threshold	%	90	OFF/80-100
P05.04	MAKS frequency threshold	%	110	100-120/OFF
P05.05	MAX voltage asymmetry threshold	%	15	OFF / 5-25
P05.06	MIN current threshold	%	30	OFF/ 20-100
P05.07	MAKS current threshold	%	150	130-180 /OFF
P05.08	MIN power threshold	%	30	OFF/ 20-100
P05.09	MAKS power threshold	%	150	130-180 /OFF
P05.10	Alarm blocking delay at startup	s	AUT	AUT/5...120
P05.11	Initial trial period	s	30	5...120
P05.12	Pressure timeout	s	30	5...120
P05.13	Power factor threshold (dry run)		0.25	0.10...1.00
P05.14	MAX current asymmetry threshold	%	30	10...100

P05.01-P05.02 - Thresholds controlling the occurrence of alarms A01 Low mains voltage and A02 High mains voltage after 5s delay.

P05.03 - P05.04 - Thresholds controlling the occurrence of alarms A03 Low mains frequency and A04 High mains frequency after 5s delay.

P05.05 - A05 Threshold controlling the occurrence of mains voltage asymmetry alarm after 5s delay.

P05.06 - After 5s delay, A11 Threshold controlling the occurrence of current too low alarm

P05.07 - A12 Threshold controlling the occurrence of current too high alarm (this alarm is prevented from occurring for the time set in P05.10).

P05.08 - Threshold to control the occurrence of A40 very low power alarm after 5s delay.

P05.09 - A41 threshold controlling the occurrence of the too high power alarm (this alarm is prevented from occurring for the time set in P05.10).

P05.10 - Blocking time for the generation of alarms immediately after initialization. If left to AUT, it is set automatically according to the type of initialization selected.

P05.11 - The time required for the motor parameters to be entered in the correct range before generating the A08 pump start failure alarm (motor started with > 10% of the nominal value). This time starts after all outputs required for motor start are activated (e.g. from the moment the delta contactor is closed).

P05.12 - If any, the time required for the pump under pressure signal to be received from the relevant pressure switch, if no signal is received within this time, A08 Pump start failure alarm is generated.

P05.13 - Minimum Power Factor threshold at which an A10 alarm is generated (Dry run).

P05.14 - A13 Threshold value for unbalanced current alarm (threshold value for maximum current asymmetry alarm)

M06 - Voice Alarms		Unit	Default	Range
P06.01	Acoustic alarm silencer mode		Keypad	OFF Keypad Time repetitive
P06.02	Voice activation time for alarm	sec	30	OFF/1-600
P06.03	Voice activation time before start	sec	OFF	OFF / 1-60
P06.04	Voice activation time in remote connection	sec	OFF	OFF / 1-60
P06.05	Acoustic device activation		Acoustic Alarm	OFF Acoustic Alarm

P06.01 - OFF = Acoustic Alarm is disabled. Keypad = Acoustic Alarm sounds continuously until canceled by pressing a button on the front panel. Timed = Sounds for the time specified in P06.02. Repeated = Sounds for the time in P06.02, hold three times and then repeats cyclically.

P06.02 - Acoustic signal activation time in alarm.

P06.03 - Acoustic signal activation time before engine start.

P06.04 - Acoustic signal activation time following the activation of a remote control over a communication channel.

P06.05 - Activate the acoustic device

M07 - Automatic TEST		Unit	Default	Range
P07.01	Activate the automatic test	day	OFF	OFF / ON / ON-OUT
P07.02	Time interval between TEST'S		7	1..60
P07.03	Activate TEST for Monday		ON	OFF / ON
P07.04	Activate TEST for Tuesday		ON	OFF / ON
P07.05	Activate TEST for Wednesday		ON	OFF / ON
P07.06	Activate TEST for Thursday		ON	OFF / ON
P07.07	Activate TEST for Friday		ON	OFF / ON
P07.08	Activate TEST for Saturday		ON	OFF / ON
P07.09	Activate TEST for Sunday		ON	OFF / ON
P07.10	TEST start-up time	hour	12	00-23
P07.11	TEST start-up minute	min.	0	00-59
P07.12	Test time	min.	30	OFF/1-600

P07.01 - Enable periodic test. This parameter can be changed directly from the front panel without accessing the setup menu (see chapter Automatic Test) and the current status is shown on the relevant page of the display. ON-OUT = The automatic test is initiated by an outlet opening a test valve that creates a pressure drop in the plant.

P07.02 - The time interval between periodic tests. If the test is not active on the day the period expires, the interval is extended based on the next active day.

P07.03… P07.09 - Activates the automatic test on the desired day of the week. OFF means that the test will not be performed on that day. Warning!!! The actual time clock setting must be set correctly.

P07.10 - P07.11 The time (in hours and minutes) at which the periodic test starts is set.

Warning!!! The actual time clock setting must be set correctly.

P07.12 - Duration of the periodic test in minutes.

M08 - Maintenance (MNTn, n=1…3)		UdM	Default	Range
P08.n.01	Service interval	Hour	720	1-99999
P08.n.01	Counting type for the service interval		Total hour	Total hour Engine
Note: This menu is divided into 3 independent service intervals named MNT1… MNT3. P08.n.01 - Defines the scheduled maintenance period in hours. If set to OFF, this service interval is disabled. P08.n.02 - Defines how time is counted for a given maintenance interval: Total hours = Actual time since the date of the previous service. Engine hours = Engine operating hours.				

M09 - DIGITAL INPUT (INPn, n=1…20)		Unit	Default	Range
P09.n.01	INPn input function		(type)	(bkz. Input functions
P09.n.02	Function index (x)		OFF	OFF / 1…99
P09.n.03	Contact type		NO	NA/NK
P09.n.04	Closing delay	sn	0.05	0.00-600.00
P09.n.05	Opening delay	sn	0.05	0.00-600.00
Note: This menu is divided into 20 subsections for the 20 possible digital inputs that can be managed by the FFL, INP1…to INP20; INP1 … INP8 is used for internal inputs on the FFL, INP8… INP20 is used for those on the external expansion module. P09.n.1 - Function assignment is made for the relevant input. (see table of programmable input functions). P09.n.2 - Index assignment is made to the function programmed in the previous parameter. Example: If the input function is set as Cxx commands menu and this entry executes the C.07 command in the commands menu. P09.n.02 must be assigned as 7. P09.n.3 - Select the contact type: NO (Normally Open) or NC (Normally Closed). P09.n.4 - Closing delay for the selected input.				

M09 - DIGITAL INPUT (INPn, n=1…20)		Input	Default	Range
P17.n.01	Source of Alarm		OFF	OFF , INPx, OUTx, LIMx, REMx, PLCx, RALx, TIMx
P17.n.02	Number of Canal (x)		1	OFF / 1…99
P17.n.03	Text		Uan	(Text– 16 character)
Note: This menu is divided into 8 sections for user alarms UA1… UA8. P17.n.01 - Digital input, digital output, etc. Source selection to create a user alarm when an internal variable becomes active. P17.n.02 - Channel number x related to the previous parameter. P17.n.03 - Free text to appear on the screen when the alarm window is active.				

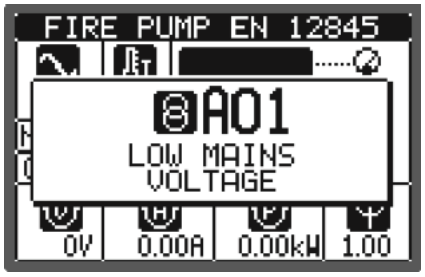
Remote Alarms/Statuses

These 14 variables and their definitions can be changed as desired by the user from the M14 menu.

P14.01.01	Network error
P14.02.01	Pump starting error
P14.03.01	Pump running
P14.04.01	Starting command
P14.05.01	Global alarm
P14.06.01	OTO mode locked
P14.07.01	Suction valve partially open
P14.08.01	Drain valve partially open
P14.09.01	Drain pump error
P14.10.01	Pump room low temperature alarm
P14.11.01	Jockey pump alarm
P14.12.01	Sprinklers were activated
P14.13.01	OFF
P14.14.01	OFF

Alarms

- When an alarm occurs, the screen shows an alarm icon, the alarm code, and the alarm description in the selected language.



- If the navigation buttons on the pages are pressed, the relevant alarms disappear after being seen on the screen for a short time, and appear again after a few seconds.
- When an alarm is active, the red LED next to the alarm icon on the front panel flashes.
- If activated, on-device and remote audible alarms are also activated.
- Alarms can be reset by pressing the RESET key.
- If the alarm is not reset even though the reset key is pressed, the problem causing the alarm continues and must be resolved.
- In the event of one or more alarms, the behavior of the FFL depends on the feature settings of the active alarms. varies.

Alarm Features

Various properties can be assigned to each alarm, including user alarms (User Alarms, UAx):

- Alarm active - Activation of the general alarm. If the alarm is not active, the alarm will not occur even if there is an alarm condition.
- Retained alarm - Even if the cause of the alarm is eliminated, the alarm remains in memory.
- Global alarm - The output assigned to this function becomes active.
- Type A alarm - The output assigned to this function becomes active.
- Type B alarm - The output assigned to this function becomes active.
- Siren - The output assigned to this function becomes active, as set in the Audible alarms menu.
- Repeat for 4 hours - If the audible alarm has been silenced and the alarm is still active after 4 hours, the audible signal will be activated again.
- Repeat for 24 hours - If the audible alarm has been silenced and the alarm is still active after 24 hours, the audible signal will be active again.
- Engine running – The alarm is only active when the engine starts running.
- Blocking - The alarm can be temporarily disabled by activating a programmable input assigned the alarm blocking function.
- Modem - In the relevant parameters As configured, a modem connection is made.
- Held alarm - Even if the cause of the alarm is eliminated, the alarm remains in memory.
- Global alarm - The output assigned to this function becomes active.
- A type alarm - The output assigned to this function becomes active.
- Type B alarm - Its output assigned to this function is activated.
- Siren - Its output assigned to this function is activated as set in the Audible alarms menu.
- Repeat for 4 hours - If the audible alarm is silenced and the alarm is still active after 4 hours , the audible signal is activated again.
- Repeat for 24 hours - If the audible alarm has been silenced and the alarm is still active after 24 hours, the audible signal is activated again.
- Engine running – The alarm is only active when the engine starts running
- Blocking - The alarm can be temporarily disabled by activating a programmable input assigned the alarm blocking function.
- Modem - A modem connection is made, as configured in the relevant parameters.
- No LCD - The alarm is handled normally, just not shown on the LCD screen.

Alarm Table

CODE	DESCRIPTION	DEFAULT ALARM FEATURES											
		Active	Held	Global	Type A	Type B	Siren	Repeat 4	Repeat 24	Engine	Prevention	Modem	No LCD
A01	Low network voltage	•		•		•	•		•			•	
A02	High network voltage	•		•		•	•		•			•	
A03	Low network frequency	•		•		•	•		•			•	
A04	High network frequency	•		•		•	•		•			•	
A05	Voltage asymmetry network	•		•		•	•		•			•	
A06	Phase failiure	•		•		•	•	•	•			•	
A07	Wrong phase sequence	•		•		•	•	•	•			•	
A08	Pump running failiure	•	•	•		•	•	•		•		•	
A09	Rotor is blocked	•	•	•		•	•	•		•		•	
A10	Dry run	•	•	•		•	•	•		•		•	
A11	Current is too low	•	•	•		•	•	•		•		•	
A12	Current is too high	•	•	•		•	•	•		•		•	
A13	Unbalanced Current	•	•	•		•	•			•		•	
A14	Unexpected Current		•	•		•	•					•	
A15	Incorrect CT connection	•		•		•	•		•			•	
A16	System failiure xx	•	•	•		•	•					•	
A17	Room temperature is too low	•	•	•		•	•					•	
A18	Room temperature is too high	•	•	•		•	•					•	
A19	Water reserve	•		•		•	•					•	
A20	Water reserve is too low	•		•		•	•					•	
A21	Water reserve is too high	•		•		•	•					•	
A22	Low fill tank level	•		•		•	•					•	
A23	System is not in the automatic mode	•		•		•	•					•	

Alarm Table

CODE	DESCRIPTION	DEFAULT ALARM FEATURES											
		Active	Held	Global	Type A	Type B	Siren	Repeat 4	Repeat 24	Engine	Prevention	Modem	No LCD
A24	Electric pump,fire situation	•		•	•		•					•	•
A25	Pump is running,switch contact is not active	•		•		•	•					•	
A26	Pump under pressure	•		•		•	•					•	
A27	Maintenance request 1	•	•	•		•	•					•	
A28	Maintenance request 2	•	•	•		•	•					•	
A29	Maintenance request 3	•	•	•		•	•					•	
A30	Suction valve partially open	•	•	•		•	•					•	
A32	Drain valve partially open	•	•	•	•	•	•					•	
A32	Sprinklers in pump room are active	•	•	•			•					•	
A33	Jockey pump max number of start	•	•	•		•	•					•	
A34	Jockey pump alarm	•	•	•		•	•					•	
A35	Timeout, jockey pump	•	•	•		•	•					•	
A36	Drain pump alarm failiure	•	•	•		•	•					•	
A37	Communication failiure	•		•		•	•					•	
A38	Pressure test is failed	•		•		•	•					•	
A39	Test valve opened	•	•	•		•	•					•	
A40	Power is too low	•	•	•		•	•			•		•	
A41	Power is too high	•	•	•	•	•	•			•		•	
A42	Electric fire pump is running	•		•			•					•	•
UA1	User alarm 1	•											
...	...												
UA12	User alarm 12	•											

Alarm Table

CODE	DESCRIPTION	ALARM DESCRIPTION
A01	Low network voltage	Network voltage lower than the threshold set in P05.01
A02	High network voltage	Network voltage higher than the threshold set in P05.02
A03	Low network frequency	Network frequency lower than the threshold set in P05.03
A04	High network frequency	Network frequency higher than the threshold set in P05.04
A05	Voltage asymmetry network	Voltage asymmetry network highter than the threshold set in P05.05
A06	Phase failiure	One of the phases is missing
A07	Wrong phase sequence	Phase sequence is not correct
A08	Pump running failiure	The motor did not start with a current greater than 10% of the nominal value with delays defined in the M05 menu or the programmable input with Pump pressure switch function was not activated.
A09	Rotor is blocked	Motor current greater than 500% of the nominal In value for more than 5 seconds
A10	Dry run	The pump runs dry. The measured power factor is lower than the threshold set in P05.13
A11	Current is too low	Engine current is lower than the threshold set in P05.06
A12	Current is too high	Engine current is higher than the threshold set in P05.07
A13	Unbalanced current	Current asymmetry exceeded the threshold set in P05.14
A14	Unexpected current	Even if there is no command to start the motor, the system detects a current greater than 5% of the rated current.
A15	Incorrect CT connection	One or more current transformers (CT) are not connected correctly (the system measures negative active power). Check the connections at terminals 57, 58, 59, 60

Alarm Table

CODE	DESCRIPTION	ALARM DESCRIPTION
A16	System failiure xx	Internal error. Please contact Lovato Electric Technical Support (tel. 035 4282422; e-mail: service@ LovatoElectric.com).
A17	Room temperature is too low	The room temperature is lower than the threshold set in P04.02 for a period longer than P04.03.
A18	Room temperature is too high	The room temperature is higher than the threshold set in P04.04 for a period longer than P04.05
A19	Water reserve	Alarm generated by the input programmed with the water reserve function
A20	Water reserve is too low	The water level in the tank is lower than the threshold set in P02.18.
A21	No water reserve	The water level in the tank is lower than threshold set in P02.19
A22	Low fill tank level	Programmable input with filling tank function enabled
A23	System is not in the automatic mode	The system is not in automatic mode for more than 24 hours
A24	Elektric pump, fire situation	Alarm generated by the input programmed with the 'pressure switch start' function
A25	Pump running, switch contact is not active	Alarm generated by the input programmed with the pump pressure switch inactive function after 1 minute while the engine is running.
A26	Pump under pressure	Alarm generated by the input programmed with the pump pressure switch active function after 1 minute with the engine not running.
A27	Maintenance request 1	Alarm generated when maintenance intervals reach zero. Refer to the M08 menu. Use the command menu to reset the clocks and reset the alarm.
A28	Maintenance request 2	
A29	Maintenance request 3	
A30	Suction valve partially open	An alarm occurs when the input programmed with the suction valve partially open function is active. In this case, the suction valve cannot provide the pump with the required maximum water flow rate.

Alarm Table

CODE	DESCRIPTION	ALARM DESCRIPTION
A31	Drain valve partially open	An alarm occurs when the input programmed with the partially open function of the discharge valve is active. In this case, the dispensing valve cannot supply the maximum water flow rate required for the sprinkler system.
A32	Sprinklers in the pump room are active	Alarm generated by input programmed with 'Sprinkler activated' function
A33	Jockey pump max number of start	An alarm is generated when the threshold set in parameter P02.20 is exceeded and there is an input programmed with the 'Jockey pump activated' function.
A34	Jockey pump alarm	Alarm generated by the input programmed with the function "Jockey pump failure".
A35	Timeout, jockey Pump	An alarm is generated when the threshold set in parameter P02.21 is exceeded and there is an input programmed with the 'Jockey pump activated' function.
A36	Drain pump alarm failiure	Alarm generated by the input programmed with the function 'Drainage pump failure'.
A37	Communication failiure	RS-485 communication between different FFL... is not working properly. Check the wiring and communication settings in the M11 menu.
A38	Pressure test failiure	Pressure switch closed for more than 1 minute during self-test (ON-OUT mode)
A39	Test valve opened	Alarm generated by the input programmed with the 'test valve' function.
A40	Power is too low	Motor power lower than the threshold set in P05.08
A41	Power is too high	Motor power higher than the threshold set in P05.09
A42	Electric fire pump is running	- An alarm occurs when at least one of the following conditions is verified: - the controller is in automatic mode, the command outputs of the pump are active, and the current drawn by the pump is less than the rated current. More than 10 per cent; - the controller is not in automatic mode but the current drawn by the pump is more than 50% of the rated current.
UA1 ... UA12	User alarm	The user alarm is generated by activating variables or related inputs in the M18 menu.

Commands Menu

- Commands menu, reading peaks, clearing counters, resetting alarms, etc.
- If the advanced level password has been entered, the commands menu allows the execution of automatic operations useful for device configuration.
- The following table lists the available functions in the commands menu divided by the required access level.

CODE	COMMAND	ACCES LEVEL	DESCRIPTION
C01	Reset maintanence interval 1	User	The maintenance alarm resets MNT1 and reloads the number of hours value assigned to the counter. Maintenance can only be reset if the following conditions have occurred during the previous 4 hours: - all starting attempts have been made with both batteries - the engine has been started; - pressure switch has been opened; - maintenance If there is no active alarm other than
C02	Reset maintanence interval 2	User	As above, reference parameter is MNT2
C03	Reset maintanence interval 3	User	As above,reference parameter is MNT3
C04	Reset engine partial hour counter	User	Resets the engine partial counter
C05	Reset general counters CNTx	User	Resets the general counters CNTx
C06	Reset limit states	User	Reset the limit states stored in LIMx memory.
C07	Reset engine total hour counter	Advanced	Resets the engine total hour counter.
C08	Engine hour counter settings	Advanced	Allows you to set the total hours counter of the motor to the desired value.
C08	Reset start attempts counter	Advanced	I've set the initialisation attempts counter and the reset the percentage of successful attempts

Alarm Table

CODE	COMMAND	ACCES LEVEL	DESCRIPTION
C09	Reset the initialisation attempts counter	Advanced	Set the initialisation attempts counter and the reset the percentage of successful attempts
C10	Reset event list	Advanced	Reset the list of historically recorded event records.
C11	Reset default parameters	Advanced	Reset all parameters in the settings menu to default values.
C12	Load parameters to backup memory	Advanced	Copies the current settings to backup memory for future restoration.
C13	Reload parameters from backup memory	Advanced	Backup restores the parameters saved in memory to the device as active settings.
C14	Forced I/O	Advanced	Enables test mode so you can manually energize any output. Warning!In this mode, the operator is entirely responsible for the output commands.
C15	Resistive sensors offset regulation	Advanced	
C16	Reset the PLC program	Advanced	

- After the desired command is selected, press the √ button to execute the command. The device will ask for confirmation. After pressing the √ key again, the command will be executed.
- Press the STOP button to cancel the execution of the command.
- Press the STOP button to exit the command menu.

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