Installation Manual

Enerwell

TEWXPRO SERIES

PANEL WITH PUMP VARIATOR FOR THE SUPPLY OF CONSTANT PRESSURE

V1.1
03/04/2025

Abstract

Thank you for your preference when purchasing our ENERWELL control panel with variable speed pump.

With the help of this installation manual you will be able to carry out a correct installation and keep your equipment in optimal operation, so we recommend that you follow the instructions included here.

Keep this manual in a safe place for future reference.

The information contained in this document may change without notice.

Table of Contents

1. INTRODUCTION

This manual provides all the necessary information for operating and understanding the equipment. Please read this manual carefully before installation, start-up, maintenance, or revision. Pay close attention to the safety and warning signs included in this document. Keep this manual in a safe place for future reference.

2. SAFETY WARNINGS

This manual is intended for those responsible for the electrical installation, assembly, operation, and maintenance of the equipment. The responsible person must ensure the environment is safe and provide instructions and warnings to those on-site about potential hazards and required precautions.

CAUTION

- We always recommend reading and understanding the installation manual before beginning the installation and operation of these products. Installation, maintenance, and start-up must be performed by qualified personnel. Failure to follow the recommendations in this manual may result in equipment damage, material damage, severe personal injury, or even death.
- The equipment should only be operated by qualified personnel who have read and understood the content of this manual.
- Install the board in a well-ventilated area, away from excessive heat sources or direct sunlight.

DANGER

- Under no circumstances should you open or handle the equipment without first disconnecting it from the power supply.
- The board must be properly grounded before starting up.
- The mains voltage must be compatible with the nominal operating voltage of the board.

3. PACKAGING AND STORAGE CHECK

- Upon receiving the product, verify that all materials are complete, intact, and match your order.
- Inspect the product and its accessories for any damage, such as scratches, dents, or cracks. If there are any anomalies, contact your authorized dealer.

STORAGE

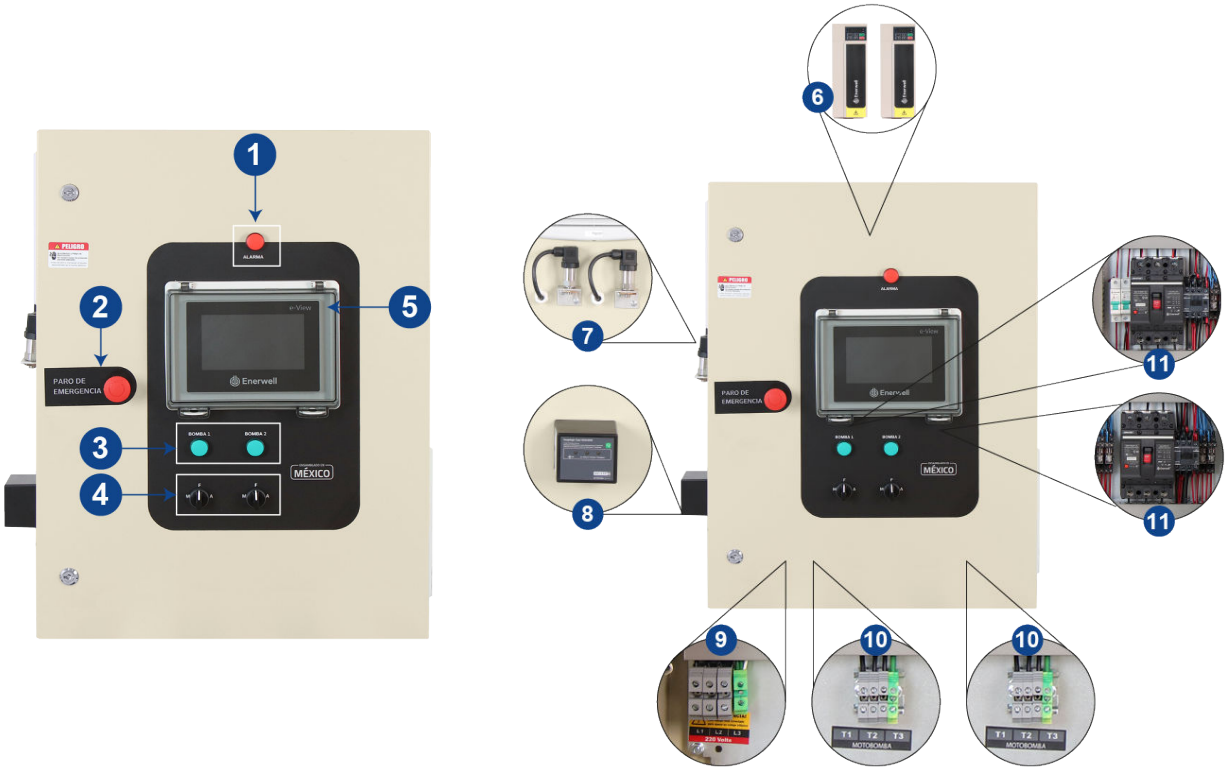
If the board is not to be installed immediately, you must strictly follow the following storage conditions:

- Keep it in its original packaging at all times.
- Store it in an area with good air circulation and protect it from dirt and water.
- If the board is stored in a cold or humid area, it should not be completely covered. Provide heating to prevent moisture condensation on the equipment.
- Avoid positioning the board at an excessive forward angle, backward tilt, or lateral tilt. Do not stack anything on the board.

WASTE DISPOSAL

- To prevent harm to the environment, dispose of the product packaging correctly to avoid contamination from the decomposition of materials. Adhere to the environmental laws applicable in your area.

4. DASHBOARD DESCRIPTION



No.	Component
1	Red alarm LED
2	Emergency stop button
3	Green operating LEDs
4	3-position selectors (manual, outside, automatic)
5	Enerwell Management and Supervision System
6	Enerwell® variable speed drive
7	Pressure sensors
8	Peak suppressor
9	Robust power supply
10	Motor pump connection clam
11	Thermomagnetic switches

5. INSTALLATION

WARNING

- Mishandling the board can cause serious injury or death.
- Only handle the board in an upright position.
- Use appropriate lifting equipment, such as hoists, pulleys, forklifts, etc., to lift the board.

- Select an installation area free from inclement weather, humidity, vibrations, high temperatures, and away from flammable materials and substances.
- Before making connections, read the electrical diagram once the board is installed.

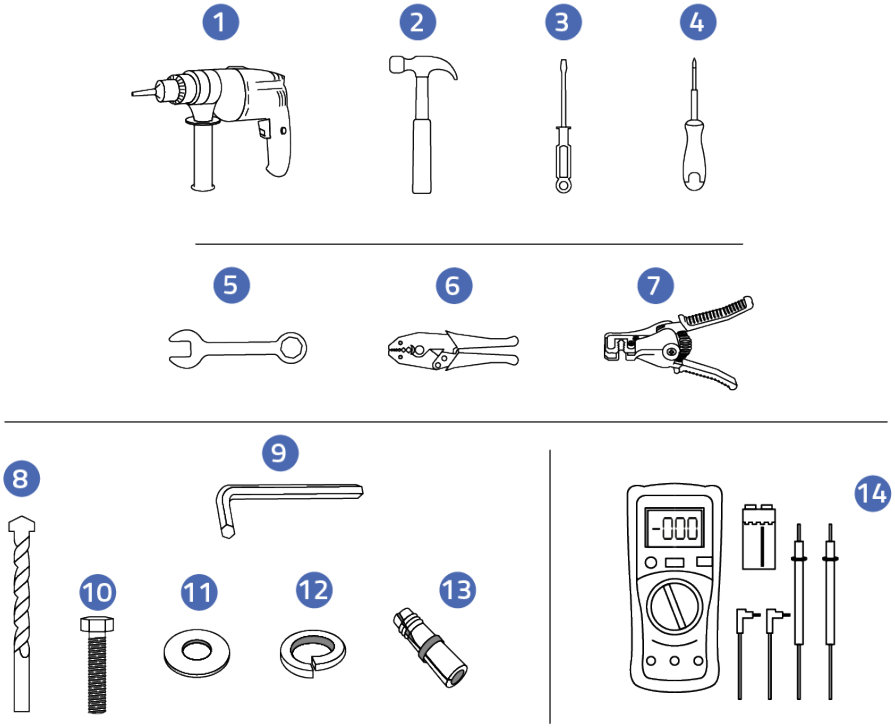
CAUTION

- Secure the board properly before handling it with hoists or forklifts to avoid displacement or falls. Additionally, place protective material between the dashboard and the forklift to prevent damage.
- Do not lift or handle the board by the HMI screen to avoid damaging the board.
- When lifting, ensure the load is properly balanced.
- Lift the board just enough to avoid contact with any existing floor obstructions. Never lift it over an area with staff present.
- Be cautious during maneuvers to avoid collisions with structures, equipment, or personnel while moving the board.

5.1. MECHANICS

5.1.1. NECESSARY TOOLS

The following are the tools needed for mechanical installation:



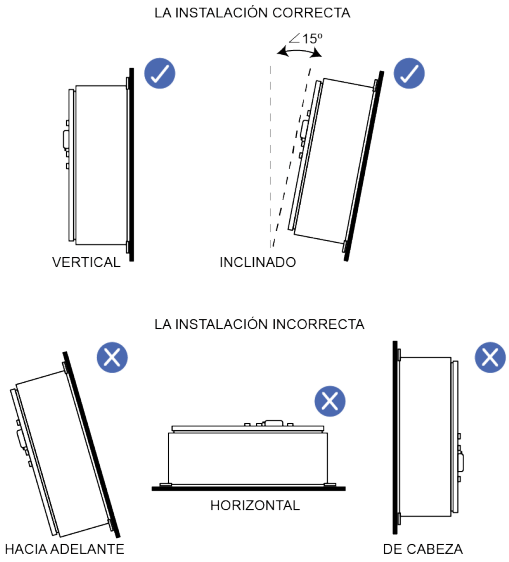
No	Tool
1	Drill
2	Hammer
3	1/4" x 6" flat screwdriver
4	1/8" x 6" flat screwdriver
5	9/16" (14 mm) Spanish wrench
6	Punching clamp
7	Cable stripper
8	5/8" diamond-tip concrete drill bit
9	Insulated 5 and 6 mm allen wrench
10	9/16" standard grade 8.8 screw
11	Flat washer
12	Pressure washer
13	5/8” expander socket
14	Multimeter

5.1.2. ASSEMBLY

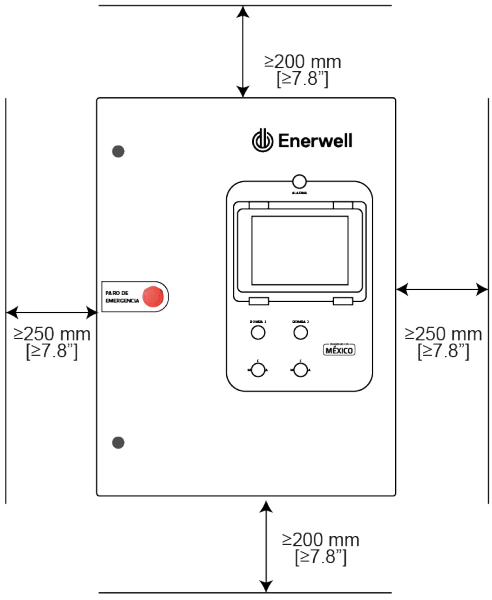
The installation location of the board must ensure proper protection against inclement weather, direct sunlight, or any other factors that could affect the product's performance. Additionally, the board must not be installed in explosive or flammable environments or areas containing such materials.

To handle the board, use appropriate loading equipment capable of supporting the board's maximum weight.

- The board must be mounted on a flat surface in a vertical position, securing it with the 4 attachment points to ensure stability.



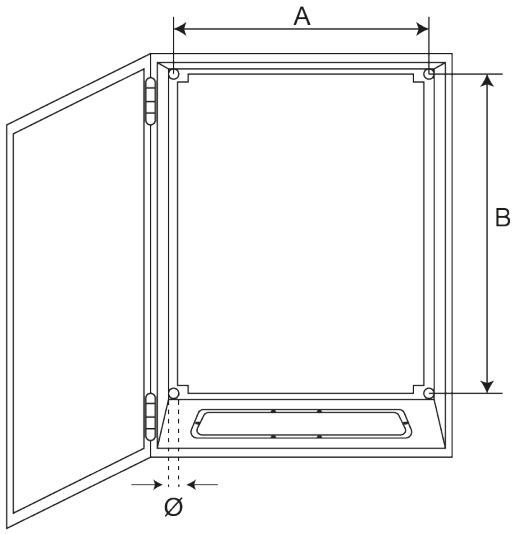
- It is essential to leave enough space for the proper installation and connection of plumbing systems. Also, allow for sufficient space to facilitate future maintenance.



Ensure that liquids, dust, or any conductive foreign objects are prevented from entering the board. The energy dissipated by the board generates heat, affecting the surrounding environment during operation.

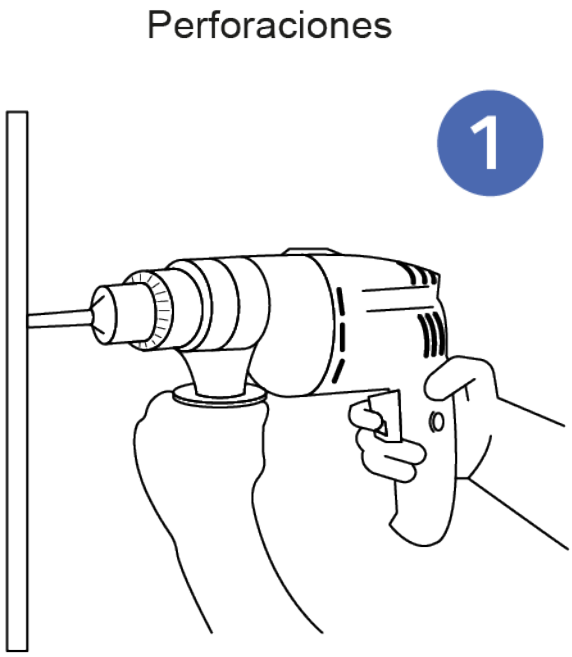
FIXATION

1. Locate the 4 mounting holes on the board and use the following dimensions as a reference.

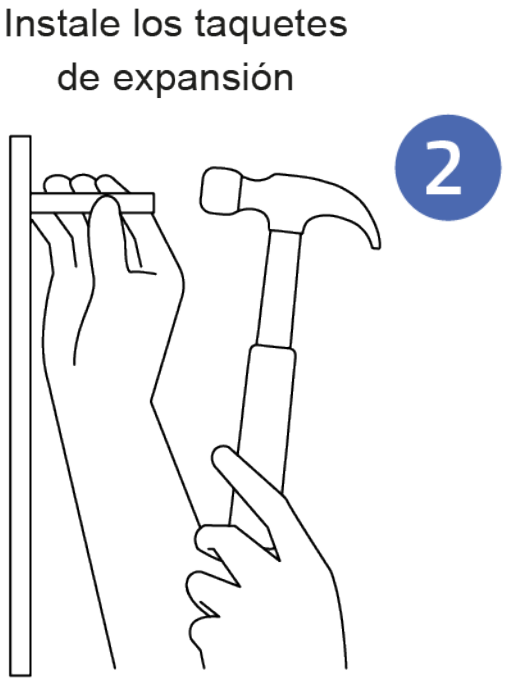


DIMENSION NAMING	DIMENSIONS (mm)		
	A	B	Ø
1	800	600	8.24
2	1000	800	8.24
3	1400	1000	8.24

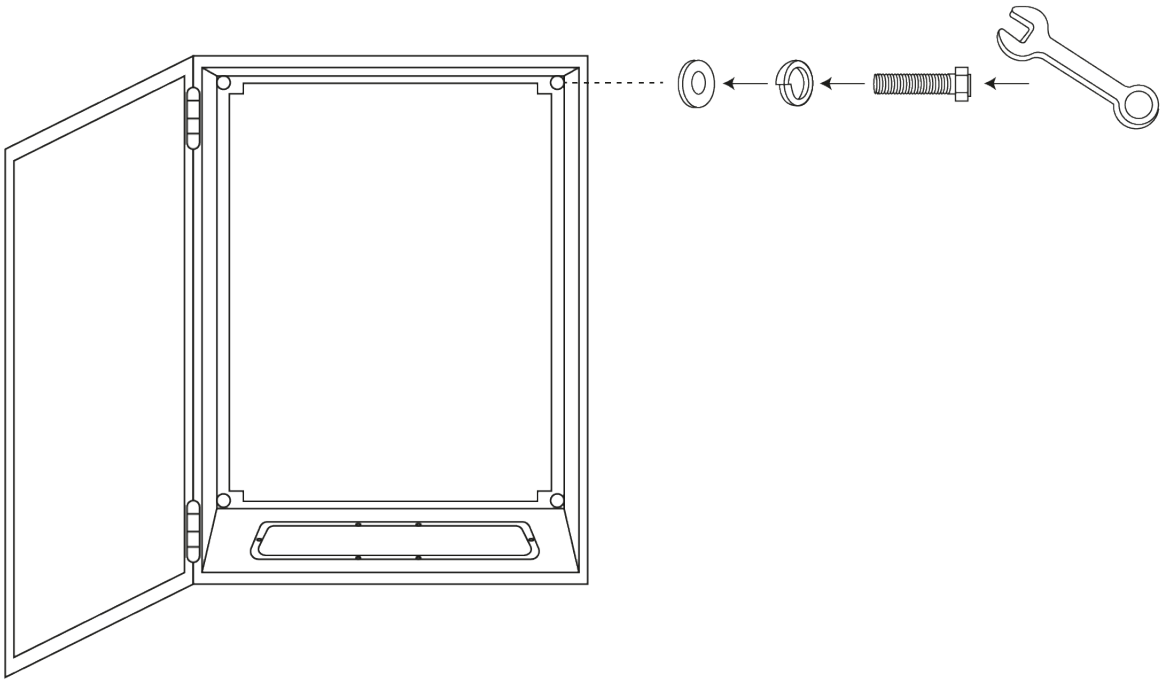
2. Mark and drill the corresponding holes, ensuring the proper distances between each of them.



3. Install the expansion brackets into the previously drilled holes.



4. Align the holes on the board with those in the wall, then proceed to install the screws following this sequence: flat washer, pressure washer, and screw.
5. Tighten the screws using a Spanish wrench to securely attach the board to the wall.



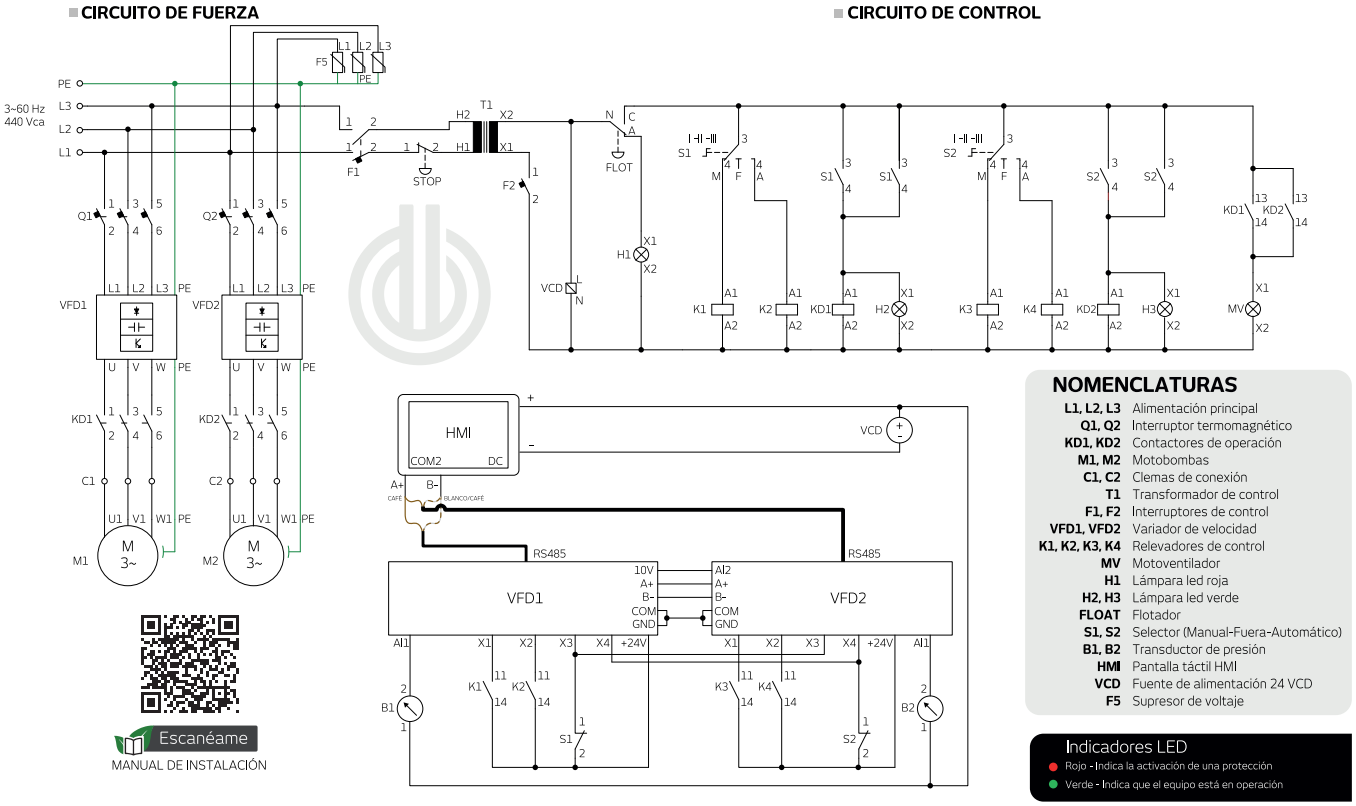
Once the board is installed, refer to the electrical diagram before proceeding with the connection.

5.2. ELECTRIC

5.2.1. CONTROL DIAGRAM

TABLERO DE CONTROL TEWX PRO (2 BOMBAS)

Enerwell®



Escanéame
MANUAL DE INSTALACIÓN

NOMENCLATURAS

L1, L2, L3	Alimentación principal
Q1, Q2	Interruptor termomagnético
KD1, KD2	Contactores de operación
M1, M2	Motobombas
C1, C2	Clemas de conexión
T1	Transformador de control
F1, F2	Interruptores de control
VFD1, VFD2	Variador de velocidad
K1, K2, K3, K4	Relevadores de control
MV	Motoventilador
H1	Lámpara led roja
H2, H3	Lámpara led verde
FLOAT	Flotador
S1, S2	Selector (Manual-Fuera-Automático)
B1, B2	Transductor de presión
HMI	Pantalla táctil HMI
VCD	Fuente de alimentación 24 VCD
F5	Supresor de voltaje

Indicadores LED

- Rojo - Indica la activación de una protección
- Verde - Indica que el equipo está en operación

5.2.2. ELECTRICAL CONNECTION

CAUTION

Before beginning the electrical connection, inspect the board connections to identify any loose contacts that may have occurred during transportation or assembly. If necessary, adjust any connections that require it.

DANGER

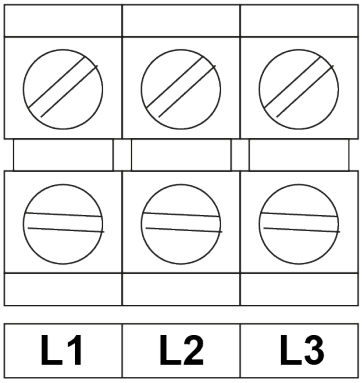
Before connecting the power supply, make sure that the power cables have no voltage.

The board includes a removable bottom cover, allowing the connection cables to be inserted through the opening. You may use cable glands or any other compatible protective and cable management accessories.

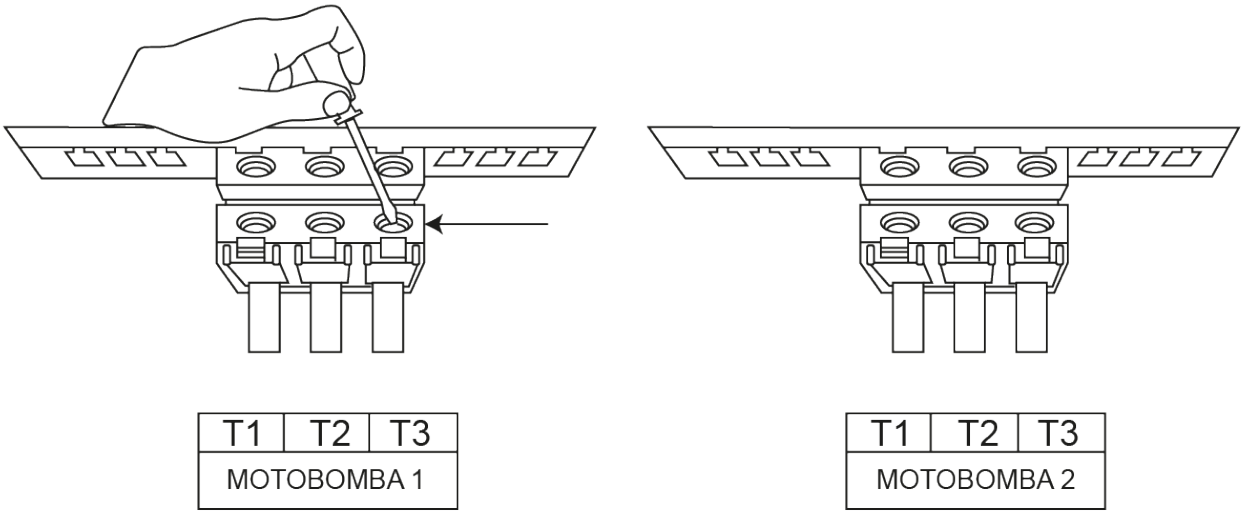
WARNING

- It is recommended to apply cable resin to protect electrical conductors and ensure watertight sealing.
- A main thermomagnetic circuit breaker must be installed to guarantee a complete and safe disconnection of the board from the power supply. The rated voltage of the breaker must match the electrical network specifications, and its current capacity must exceed the board's maximum protection design value.
- Make sure to protect all internal components prior to performing the electrical installation, in order to prevent debris or particles from entering the board.
- Power supplies must remain open and locked until all wiring is completed and the entire system has been thoroughly verified.
- Ensure that the terminal connectors used are compatible with the type of cables being installed.
- The supply voltage must comply with the product's specifications.

Identify the power connection label on the board (9) as shown in chapter DASHBOARD DESCRIPTION. Then, locate the terminals marked L1, L2, and L3, which will serve as the connection points for the main power supply. Always verify that there is no voltage present before performing any operation. To select the appropriate cable gauge, consider the system's operating voltage, the application's maximum current, and the total length of the cable run.



Before connecting the motors, ensure that the maximum current is within the protection range of the board and that the motor connection cable is of adequate gauge. Once verified, connect the motor cables to the terminals labeled "T1," "T2," and "T3" according to the corresponding connection code for each motor (10) as shown DASHBOARD DESCRIPTION.



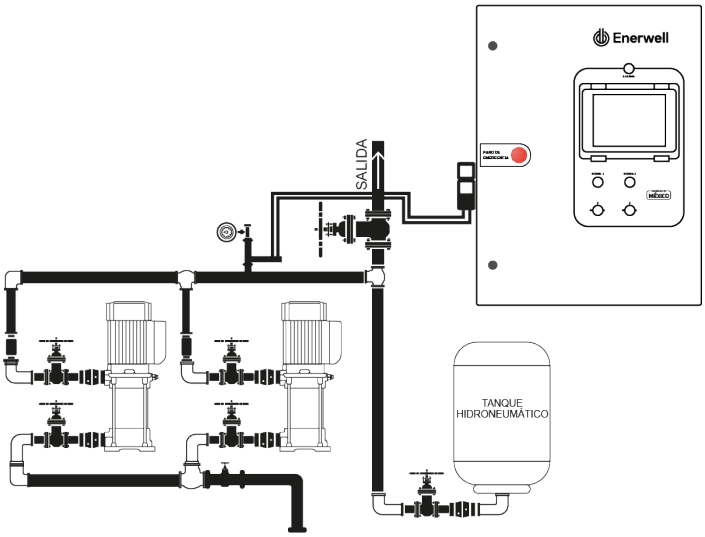
CAUTION

Ensure that all components are properly grounded and that all board connections are securely fastened.

5.2.3. PRESSURE SENSOR

The control panel is equipped with sensors that enable the variable frequency drives to measure the pressure within the hydraulic system and send signals to activate the motor pumps. It is recommended that

the piping where the sensors are installed include at least three or four directional changes, in order to reduce water pressure and prevent potential damage to the sensors.



5.3. HYDROPNEUMATIC TANK

Variable speed control panels allow for a reduction in the size of the hydropneumatic tank, but do not eliminate its necessity within the hydraulic supply system. The tank is essential to prevent abrupt pressure variations—also known as pressure spikes—during the start and stop cycles of the motor pumps, which would otherwise hinder effective system control.

Likewise, start/stop cycles shorter than 5 seconds can cause damage to the drive due to voltage regeneration in the motor. It is also critical that the tank is properly calibrated to avoid rapid cyclic starts.

6. PRINCIPLE OF OPERATION

When we refer to speed variation, we are describing the controlled regulation of a pump's revolutions per minute (RPM) based on the required flow demand, while consistently maintaining constant pressure.

In ENERWELL systems equipped with variable frequency drives (VFDs), pressure is measured by a pressure transducer. This transducer senses the pressure in the pipeline and sends analog signals to the VFD. The VFD, through specific programming, increases or decreases the RPM of the pump motor in order to match the flow to the system's demand.

The primary advantage of variable speed systems is that the required flow is delivered at a constant pressure, without sudden fluctuations or oscillations between pumping and consumption. This not only ensures stable hydraulic performance but also results in significant energy savings, since regulating the motor's RPM allows it to consume only the minimum energy needed to maintain constant pressure.

The equipment offers two operating modes, which can be selected via the selector switch located on the front panel of the control board:

AUTOMATIC MODE (A): In this mode, the VFDs control the motor pumps automatically according to hydraulic demand, maintaining constant system pressure. For proper operation, the VFD parameters must be configured as outlined in the PARAMETER CONFIGURATION section.

MANUAL MODE: (M) When set to manual mode, the motor pump is activated directly using the corresponding selector switch. In this mode, the pressure setpoint configured in the control board is not taken into account.

7. ENERWELL MANAGEMENT AND SUPERVISION SYSTEM

The ENERWELL control panel has a management and supervision system with which you can view and configure the values of your installation through its 4 menus: START MENU, DIAGNOSTIC MENU, PERFORMANCE MENU And SETUP MENU.

7.1. START MENU

Once the board is powered on, the system will begin loading the graphical interface. The first screen displayed will be the Home Screen. This screen provides a real-time view of your installation's actual values, the system status, and key information about the operation of the motor pump(s).To access this Home Screen, press the designated button .

Element	Description
 **Operating frequency**	Displays the actual frequency at which the motor is operating when the system is in automatic mode.
 **Mode of operation**	Shows the operating mode of the board. **Out mode:** The drive is stopped. **Manual mode:** The system controls the maximum operating frequency for each motor pump manually. **Automatic mode:** Using a variable frequency drive, the system automatically starts and controls the motor pumps based on hydraulic demand, in order to maintain constant network pressure.
 **Network pressure**	Displays the current pressure in the hydraulic network, shown in PSI.
 **Working pressure**	Allows you to set the desired working pressure for your hydraulic system, displayed in PSI.

7.2. DIAGNOSTIC MENU

This screen is designed to provide detailed, real-time information regarding the status and performance of your system. You can access it by pressing the corresponding button .

Element	Description
 **Frequency**	Displays the operating frequency at which the selected motor pump is currently running.
 **Real-time current**	Shows the actual current (amperage) being drawn by the motor pump during operation.
 **Nominal current**	Displays the nominal (rated) current of the motor pump, based on its nameplate specifications.
 **Sensor signal**	Indicates the signal currently being received from the connected sensor.
 **Input voltage**	Displays the voltage level of the power supply feeding your installation.
 **Network pressure**	Shows the current working pressure of the hydraulic system, displayed in PSI.

Element	Description
 **Wake up pressure**	It allows you to visualize the pressure point from which the motor pump will be activated to start pressurizing the hydraulic system.
 **Wake up to the sensor**	It allows you to configure the wake up value according to the pressure sensor, this value is represented as a percentage (%).

7.3. PERFORMANCE MENU

This screen displays critical information about the performance of your installation. You can access it by pressing the . The screen is organized into two main sections to facilitate the analysis of system performance: **Events** And **Graphics**. The function of each section is described below.

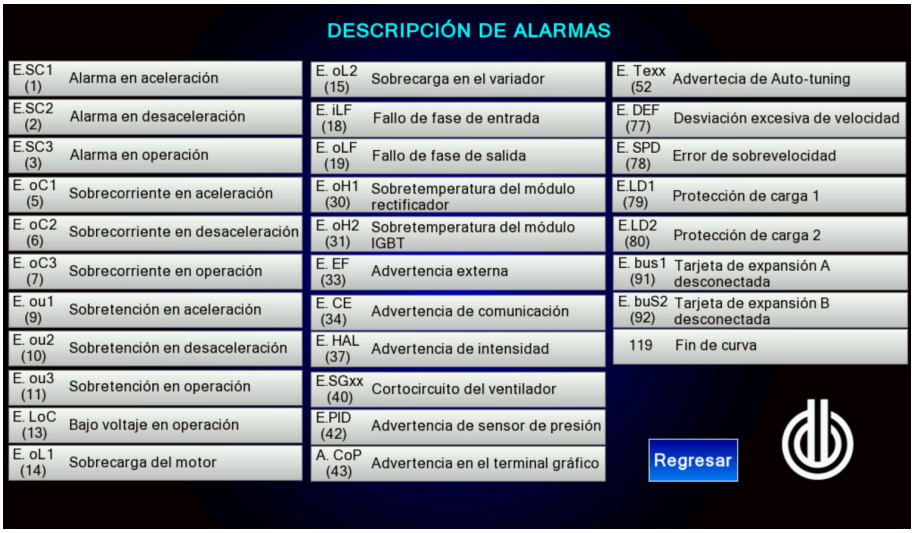
EVENTS SCREEN

This screen allows you to view detailed information about the faults and anomalies detected in your system.

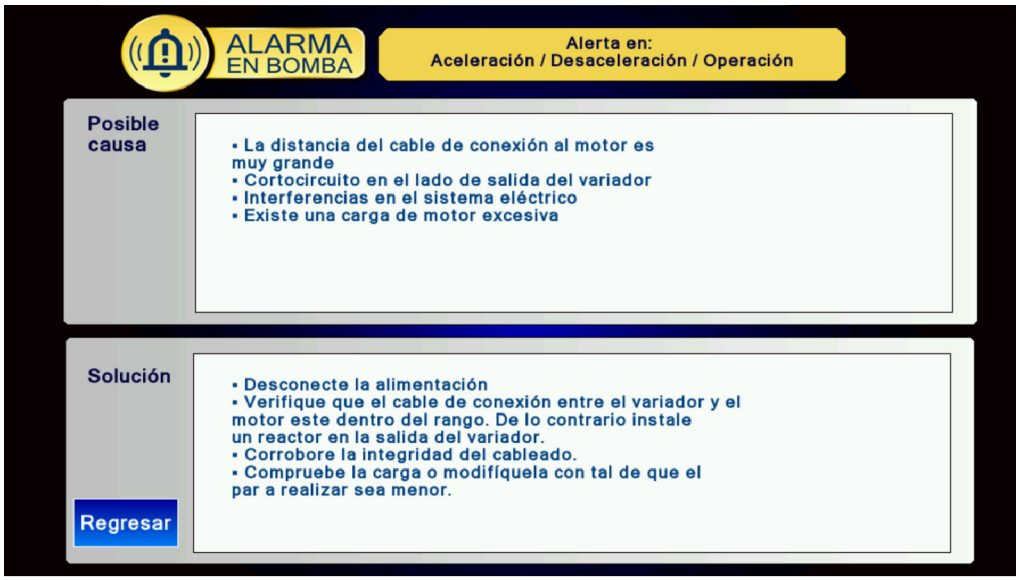
Column	Description
Number	Displays the unique identification number assigned to each event.
Date	Indicates the exact date on which the event occurred.
Time	Shows the specific time the event was recorded.

Column	Description
VFD alarm	Displays the code corresponding to the fault detected in the associated variable frequency drive (VFD).
Failure frequency	Indicates the frequency value at which the fault occurred.

To understand the meaning of each fault code, as well as to identify possible causes and recommended solutions, you can access the Help screen by pressing the corresponding button . This will open a new screen displaying the fault codes along with their descriptions.



By selecting a specific fault code, you will be redirected to a detailed guide that outlines potential causes and step-by-step solutions for the selected code.



NOTE

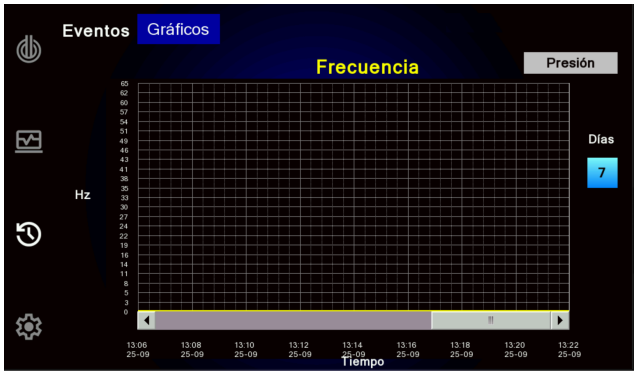
Pressing the button Regresar You will be able to return to the screen **Events**.

GRAPHICS SCREEN

This screen offers two graph options: Pressure and Frequency. Upon entering this screen, the Pressure Graph is displayed by default, providing a visual representation of the hydraulic system's pressure behavior over time (shown on the left side of the interface). To switch to the Frequency Graph, press the corresponding button Frecuencia This graph displays the operating frequency of the motor pump(s) used to maintain the target pressure level, offering insight into system performance and motor load response.

Pressure

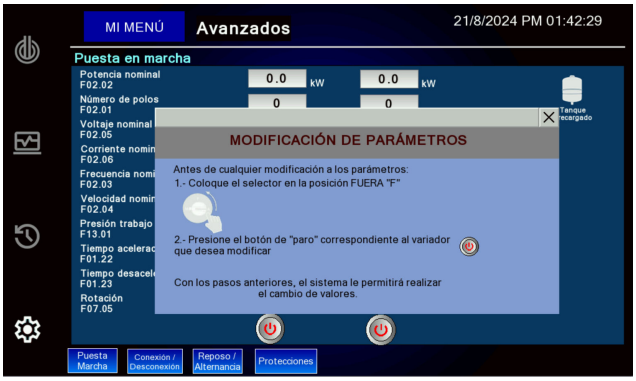
Frequency



7.4. SETUP MENU

This screen allows you to view and configure the parameters required for the startup of the control panel (see section INITIAL STARTUP). To access the settings screen, press the corresponding button. ⚙.

Upon entry, a warning screen will appear. Carefully follow the on-screen instructions before making any parameter adjustments to ensure proper system configuration and avoid operational issues.

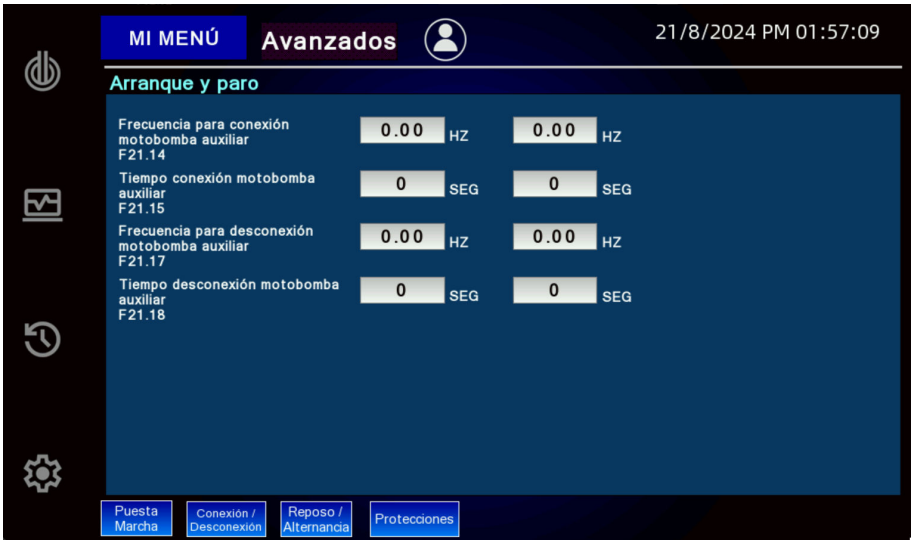


At the top right of the Start-Up section, you will see a pre-charged tank icon 

. When you press this icon, a table will appear with recommendations for correctly sizing the tank.

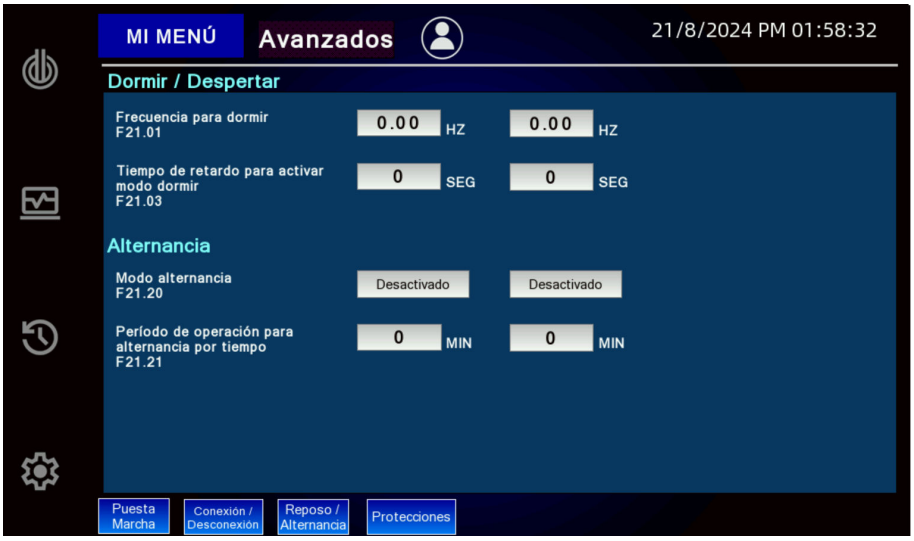
At the bottom of the screen, there are buttons that will navigate you to the different parameter sections. Press the button 

to access the configuration settings for the start and stop parameters.



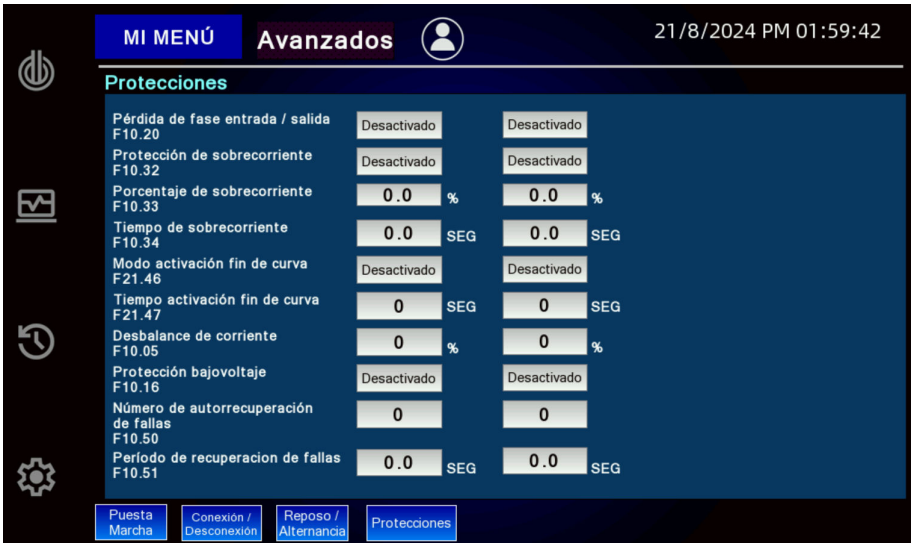
Rest and alternation parameters.

To access the settings for the sleep and toggle parameters, press the corresponding button Reposo / Alternancia. In this section, you can adjust the timing and conditions for sleep mode and toggle operations.



Protection parameters

To configure the protection parameters, press the corresponding button Protecciones. Here, you can adjust and calibrate system protection settings such as overcurrent limit, current suppression gain, and current imbalance.



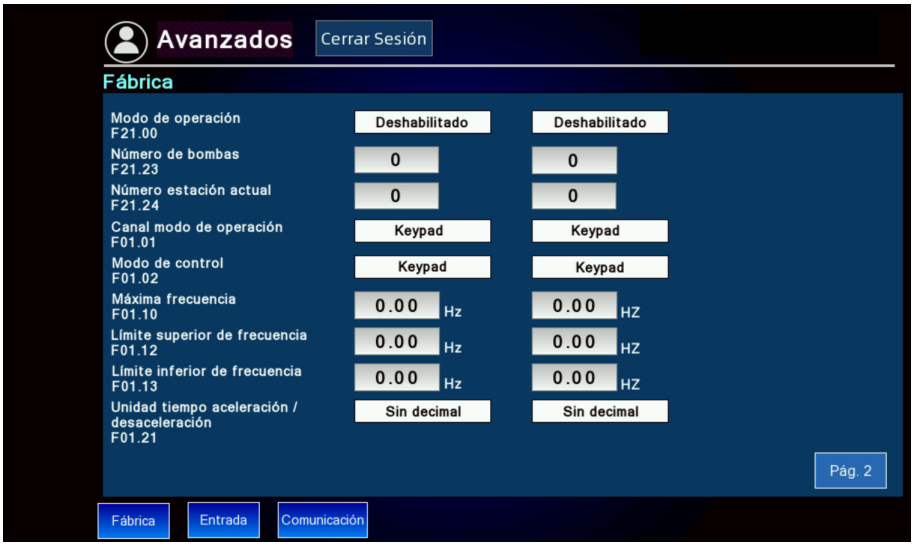
CONFIGURING ADVANCED PARAMETERS

To access the advanced parameter settings, press the designated button Avanzados". You will be prompted to enter a username and password. The username is "Enerwell" and the default password is "EW777777".

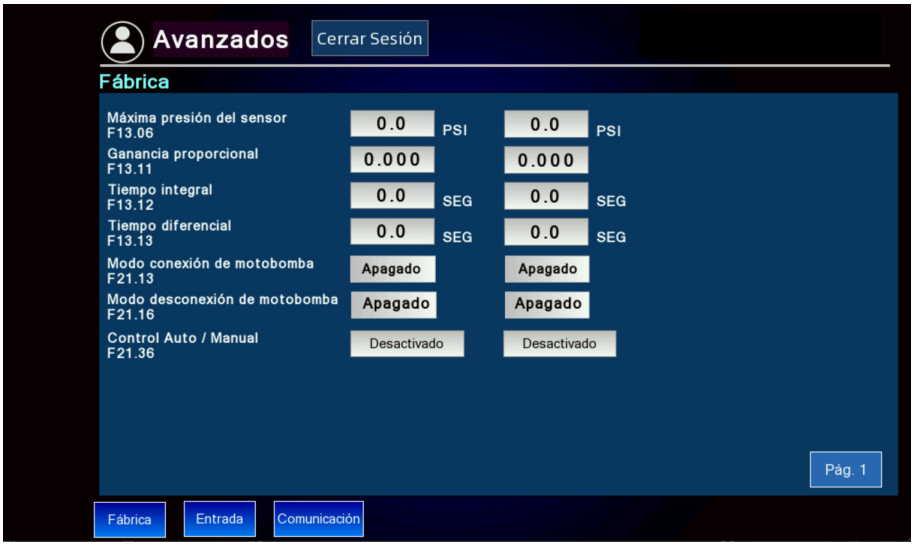
Factory parameters

Upon entering, the factory settings are displayed by default. This section is organized into two screens for easier navigation. To move to the second screen and explore additional options, simply press the corresponding button Pág. 2.

Factory parameters 1



Factory parameters 2



Input parameters

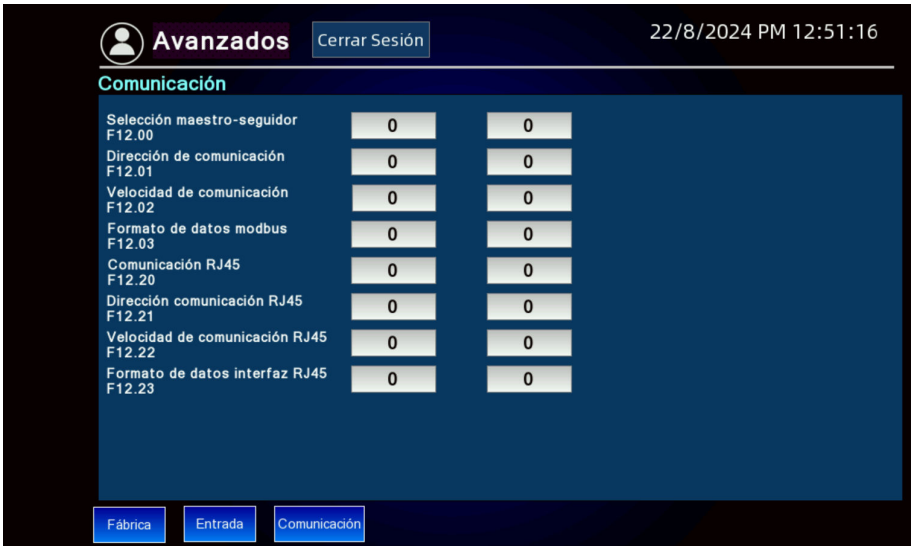
To configure the parameters for digital inputs and signals, press the designated button Entrada. This section is also organized into two screens for convenient navigation. To move to the second screen and explore more options, press the corresponding button. Pág. 2.

Input parameters 1

Input parameters 2

Communication parameters

To configure the communication parameters, press the corresponding button Comunicación.



8. START-UP

IMPORTANT

- All programming must be performed by qualified personnel who are knowledgeable about the operation of the unit and have fully understood this manual.

8.1. PARAMETER SETTINGS

The following table displays the symbols used to identify which parameters can be modified during the operation of the equipment:

Icon	Description
✓	The parameter can be modified during operation
●	The parameter cannot be changed during operation
X	The parameter can only be read, not modified.

8.1.1. BASIC VARIATOR CONFIGURATION

The following is the configuration of the values that must be set for the drive parameters:

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F01.01	Operation Command Channel	It is used to select the channel on which the drive receives start/stop commands and the direction of operation. 0: Panel control (first external control panel) 1: Terminal control 2: RS485 communication control 3: Card (optional)	0 (0~3)	1	1	N/A	✓

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F01.02	Control mode	Control mode 0: Frequency adjustment using the numbers on the control panel 1: Control panel potentiometer setting 2: Adjustment by AI1 current/ voltage terminal 3: Adjustment by AI2 current/ voltage terminal 4: Reserved 5: Adjustment by PUL pulse terminal 6: Adjustment by RS485 communication 7: UP/DW terminal (up/ down) 8: PID adjustment 9: PLC adjustment 10: Card (optional) 11: Multi-speed adjustment 12: Adjustment by special RS485 communication	8 (0~12)	8	8	N/A	✓
F01.10	Max. frequency	Set the maximum frequency for the drive.	50.00 Hz (1.00 Hz ~ 500.00 Hz)	60	60	Hz	●
F01.12	Upper frequency limit	The upper limit of the frequency given to the channel when F01.11 is set to 0.	50.00 Hz (Lower limit ~max. frequency)	60	60	Hz	✓
F01.13	Lower frequency limit	Set the lower limit to limit the given frequency.	0.00 Hz (0.00 Hz ~ upper frequency limit)	30	30	Hz	✓
F01.21	Time unit for acceleration/ deceleration	The acceleration/ deceleration time adjustment unit. 0:1 s 1:0.1s 2:0.01s	2 (0~2)	0	0	Seg	●
F01.22	Acceleration time	Set the time needed for the output frequency to accelerate from 0.00 Hz to the reference frequency.	Engine adjustment (0.01s~650.00s)	5	5	Seg	✓
F01.23	Deceleration time	Set the time needed for the output frequency to slow down from the reference frequency to 0.00 Hz.	Engine adjustment (0.01s~650.00s)	5	5	Seg	✓

8.1.2. ENGINE CONFIGURATION

The following table shows the engine configuration parameters, modified according to the values shown on the engine data plate:

Parameter	Name	Description	Factory value (range)	Valor		Unit	Change during operation
				*Teacher	*Slave		
F02.01	Number of poles	Set the number of poles in the motor.	4 (2~98)	2	2	N/A	●
F02.02	Nominal power	Set the rated power of the motor.	Engine adjustment (0.1 kW~1000.0 kW)	1.5	1.5	kW	●
F02.03	Nominal frequency	Set the rated frequency of the motor.	Engine adjustment (0.01 Hz ~ max. frequency)	60	60	Hz	●
F02.04	Nominal speed	Set the rated engine speed.	Engine adjustment (0 rpm~ 65000 rpm)	3450	3450	rpm	●
F02.05	Nominal voltage	Set the rated voltage of the motor.	Engine adjustment (0 V~2000 V)	440	440	V	●
F02.06	Nominal current	Set the rated current of the motor.	Engine adjustment (0.1 A ~ 3000.0 A)	4.4	4.4	A	●
F07.05	Rotation	Set the direction of operation of the motor. **Digit units**: Direction of travel. 0: Maintain direction (Sense of progress) 1: Reverse direction (Backward direction)	0000 (0000~1121)	0	0	N/A	●

NOTE

* These values must be configured based on the data specified on the board of the selected motors.

8.1.3. CONTROL TERMINAL CONFIGURATION

Parameter	Name	Description	Factory value (range)	Valor		Unit	Change during operation
				Maestro	Slave		
F05.00	X1 function	Selecting the function of the X1 terminal	80 (0~95)	80	80	N/A	●
F05.01	X2 function	Selecting the function of the X2 terminal	82 (0~95)	82	82	N/A	●
F05.02	X3 function	Selecting the function of the X3 terminal	84 (0~95)	84	84	N/A	●

Parameter	Name	Description	Factory value (range)	Valor		Unit	Change during operation
				Maestro	Slave		
F05.03	X4 function	Selecting the X4 terminal function	85 (0~95)	85	85	N/A	●
F05.04	X5 function	Selecting the function of the X5 terminal	86 (0~95)	0	0	N/A	●
F05.05	X6 function	Selecting the X6 terminal function	0 (0~95)	0	0	N/A	●
F05.06	X7 function	Selecting the function of the X7 terminal	0 (0~95)	0	0	N/A	●
F05.40	Selecting the type of AI signal	Configure where you will receive the AI signal	0 (0~1)	1	1	N/A	✓
F05.41	Signal type AI1	Configure the AI1 signal type	0 (0~1)	1	1	N/A	✓
F05.42	AI2 signal type	Set the AI2 signal type 0: Voltage 0.00 V ~ 10.00 V 1: Current 0.00 mA ~ 20.00 mA	0 (0~1)	1	1	N/A	✓
F05.45	Lower limit AI1	Defines the signal received at the AI1 terminal. The voltage signal below this value is processed as a lower limit	0.0% (0.0% ~ 100.0%)	20	20	%	✓
F05.47	Upper limit AI1	Defines the signal received at the AI1 terminal. The voltage signal higher than this value is processed as an upper limit	100.0% (0.0% ~ 100.0%)			%	✓
F05.50	Lower limit AI2	Defines the signal received at the AI2 terminal. The voltage signal below this value is processed as a lower limit	0.0% (-100.0% ~ 100.0%)	20	20	%	✓
F0.52	Upper limit AI2	Defines the signal received at the AI2 terminal. The voltage signal higher than this value is processed as an upper limit	100.0% (-100.0% ~ 100.0%)			%	✓

8.1.4. MASTER-SLAVE COMMUNICATION SETTINGS

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F12.00	Teacher-follower selection	Select the operating mode of the drive 0: Slave 1: Teacher	0 (0~1)	1	0	N/A	●
F12.01	Communication direction	Set the address values for slave drives	1 (1~247)	1	2	N/A	●
F12.02	Communication speed	Set the communication speed 0:1200 bps 1:2400 bps 2:4800 bps 3:9600 bps 4:19200 bps 5:38400 bps 6:57600 bps	3 (0~6)	3	3	N/A	●
F12.03	Modbus data format	Set the type of format for Modbus communication data 0: (N, 8, 1) no parity, data bit: 8, stop bit: 1 1: (E, 8, 1) even parity, data bit: 8, stop bit: 1 2: (O, 8, 1) odd parity, data bit: 8, stop bit: 1 3: (N, 8, 2) no parity, data bit: 8, stop bit: 2 4: (E, 8, 2) even parity, data bit: 8, stop bit: 2 5: (O, 8, 2) odd parity, data bit: 8, stop bit: 2	0 (0~5)	0	0	N/A	●
F12.20	Communication mode: RJ45 port	Set the communication mode of the RJ45 port. 0: Two-line control panel communication 1: Modbus slave (set related parameters using F12.2x) 2: Modbus slave (set configuration parameters using F12.1x) 3: ENERWELL Customization	0 (0~3)	1	1	N/A	●
F12.21	RJ45 communication address	The RJ45 interface is for slave management during Modbus communication.	1 (1~247)	1	2	N/A	●
F12.22	RJ45 communication speed	The RJ45 interface is used for baud rate during Modbus communication. 0:1200 bps 1:2400 bps 2:4800 bps	3 (0~5)	3	3	N/A	●

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
		3:9600 bps 4:19200 bps 5:38400 bps					
F12.23	RJ45 interface data format	The RJ45 interface is for data formatting during Modbus communication 0: (N, 8, 1) no parity, data bit: 8, stop bit: 1 1: (E, 8, 1) even parity, data bit: 8, stop bit: 1 2: (O, 8, 1) odd parity, data bit: 8, stop bit: 1 3: (N, 8, 2) no parity, data bit: 8, stop bit: 2 4: (E, 8, 2) even parity, data bit: 8, stop bit: 2 5: (O, 8, 2) odd parity, data bit: 8, stop bit: 2	0 (0~5)	0	0	N/A	•

8.1.5. PID CONFIGURATION

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F13.01	Working pressure	Configure the working pressure. This is the pressure value that you want to keep constant.  **NOTE** NEED TO CHANGE TO UNITS INSTEAD OF%.	50.0% (0.0% ~ 100.0%)	45	45	PSI	✓
F13.06	Max. sensor pressure	The PID feedback signal range are dimensionless units that are used to regulate PID feedback.	100.0 (0.0~100.0)	145	145	PSI	✓
F13.11	Proportional gain	Proportional gain of group 1 of PID parameters.	0.100 (0,000~4,000)	0.15	0.15	N/A	✓
F13.12	Full-time	Integral time of the parameter group PID 1.	1.0s (0.0 s~600.0 s)	0.45	0.45	Seg	✓
F13.13	Differential time	Differential time of the PID parameter group 1.	0.000s (0,000s~6,000s)			Seg	✓

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F13.23	Lower PID output limit	Set the lower limit of the PID output.	0.0% (-100.0% ~F13.22)	0.45	0.45	%	✓

8.1.6. APPLICATION SETUP

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F21.00	Mode of operation	Configure your system's drive type	1 (0~3)	3	3	Multi-drive mode	●

8.1.7. SLEEP/WAKE SETTINGS

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F21.01	Sleep mode detection frequency	Set the frequency of sleep detection.	40 Hz (0~600Hz)	40	40	Hz	●
F21.03	Delay time to activate sleep mode	The sleep mode is activated when the duration of activation of the sleep condition is equal to or longer than the parameter.	5S (0~1000s)	5	5	Seg	●
F21.04	Wake up to the sensor	Low water consumption: consumes a small amount of water and there are some changes in water pressure in the pipe for a long time. This process may depend on the supply of water under pressure from the pipeline, there is no need to activate the controller, but it achieves the energy saving effect.	10.0% (0.0~ 100.0%)	2.7	2.7	%	●
F21.13	Motor pump connection mode	Set the mode for adding motor pumps 0: Off 1: Adding a smart motor pump 2: Adding a motor pump one by one	0 (0~2)	1	1	N/A	●

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F21.14	Frequency for aux motor pump connection.	It is used to configure the frequency limit for frequency for aux motor pump connection. The timer starts when the current output frequency of the operating motor pump is greater than F21.14, and the motor pump addition logic is activated when the motor pump addition detection time is reached	45.00 Hz (0.00~300.00 Hz)	45	45	Hz	●
F21.15	Aux motor pump connection time	It is used to configure the connection time of the aux motor pump. The timer starts when the current output frequency of the operating motor pump is greater than F21.14, and the motor pump addition logic is activated when the motor pump addition detection time is reached	5S (0~30000s)	5	5	Seg	●
F21.16	Motor pump disconnection mode	Turn off or turn on the motor pump reduction mode: 0: Off 1: On	0 (0~2)	0 (0~2)	1	N/A	●
F21.17	Frequency for disconnecting the aux motor pump.	Frequency limit for disconnecting aux motor pump	20.00 Hz (0.00~300.00 Hz)	42	42	Hz	●
F21.18	Aux motor pump disconnection time	Aux motor pump disconnection time	5 (0~30000s)	5	5	Seg	●
F21.20	Alternation mode	Set the motor pump change mode 0: Off. 1: Positive sequence of fixed time. 2: Inverted fixed time sequence. 3: By operating time	0 (0~3)	0	0	N/A	●
F21.21	Period of operation for time alternation	Set the operating time for alternating motor pumps	0 min (0~30000 min)			min	●
F21.23	Number of motor pumps	Set the total number of motor pumps in the system.	1 (0~10)	2	2	N/A	●

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F21.24	Current station number	Current station number. Set during adjustment to distinguish master and slave numbers on test machines.	1 (0~10)	1	2	N/A	•
F21.36	Automatic and manual control	Set the switching mode: 0: Off 1: Turning on Manual, automatic and stop logic together with the terminal function. The manual and automatic multi-pump logic takes effect when turned on	0 (0~1)	1	1	N/A	•

8.1.8. CONFIGURING PROTECTIONS

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
F10.05	Current imbalance	Compare the ratio between the largest and the smallest phase of the three-phase current with the value set here to assess current imbalance	160% (0% ~ 500%)	0	0	%	●
F10.16	Low voltage protection	It automatically adjusts the operating frequency when the bus voltage is lower than the low voltage suppression point to prevent low voltage failures. 0: Off 1: On	0 (0~1)	1	1	N/A	●
F10.20	Input/output phase loss	Activate or deactivate the I/O phase loss protection function. **Digit units:** Outdated output 0: Off 1: On **Digit tens:** input phase loss protection function 0: Off 1: On, reports A.ilf when loss of input phase is detected, continues to work 2: Activated, reports e.ILF when input phase loss is detected, free stop **Digit hundreds:** Reserved **Thousands of digits:** Reserved	0021 (000~1121)	1	1	N/A	●
F10.32	Overcurrent protection	Configure the drive's load detection mode and warning mode at this time. **Digit units:** Load Sensing Setup 1 0: Detection disabled 1: Detect overload 2: Detect overload only at constant speed 3: Detect low load 4: Detect low load only at constant speed **Digit tens:** Configuring Load Detection Warnings 1 0: It continues to work, reports A.LD1 1: Free stop, reports E.LD1 **Digit hundreds:** Load detection configuration 2 0: Detection disabled 1: Detect overload 2: Detect overload only at constant speed 3: Detect low load	0000 (0000~1414)	2	2	N/A	●

Parameter	Name	Description	Factory value (range)	Valor		Unidad	Change during operation
				Maestro	Slave		
		4: Detect low load only at constant speed **Thousands of digits:** Configuring Load Detection Warnings 2 0: It continues to work, reports A.LD1 1: Free stop, reports E.LD1					
F10.33	Overcurrent percentage	Set the percentage value for overcurrent detection. For V/F control, 100% of the motor's rated current. For vector control, 100% of the motor's nominal output torque.	130.0% (0.0% ~ 200.0%)	0	0	%	●
F10.34	Overcurrent time	Sets the duration of overcurrent detection; if the current is greater than the value of the percentage of overcurrent detection for the set time, it reports the overcurrent warning.	5.0s (0.0 s~60.0 s)	0	0	Seg	●
F21.46	End of curve activation mode	Set the mode for activating the end of curve protection. 0: Disabled 1: Warning 2: Alarm	2 (0-2)	2	0	N/A	●
F21.47	End of curve activation time	Set the duration for the detection of the end of the curve protection.	5 (0-600)	5	5	Seg	●
F10.50	Self-healing times for faults	Set the number of times allowed to perform fault recovery **NOTE** 0 indicates that the self-fault recovery function is disabled; otherwise, it is enabled.	0 (0~10)	0	0	N/A	●
F10.51	Failure recovery period	Set the time to wait after a fault occurs until it restarts.	1.0s (0.0 s~100.0 s)	1	1	Seg	●

For more reference to the variable frequency drive configuration parameters, use the following link or QR.

https://docs.enerwell.com.mx/MI/MIEW-VFD22_PARAMETROS.pdf	

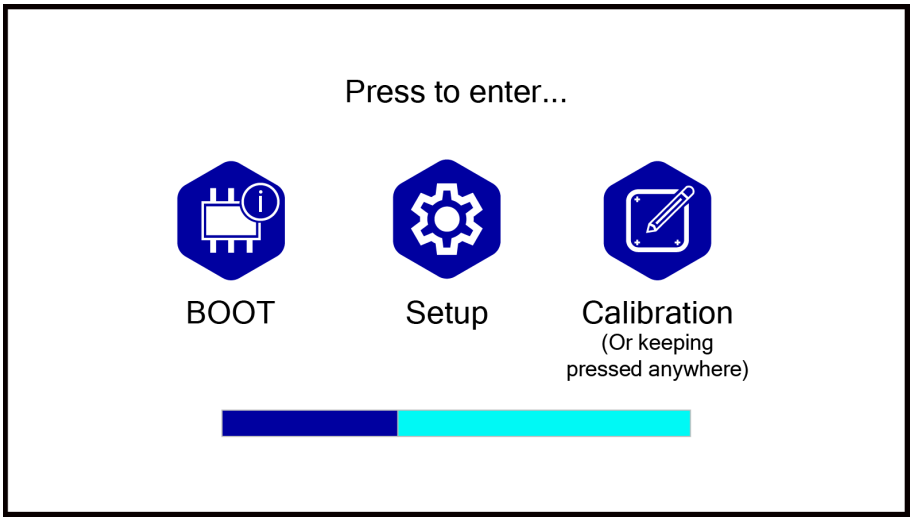
9. SET DATE AND TIME

CAUTION
To carry out any manipulation on the board, it is essential to have the necessary safety measures.

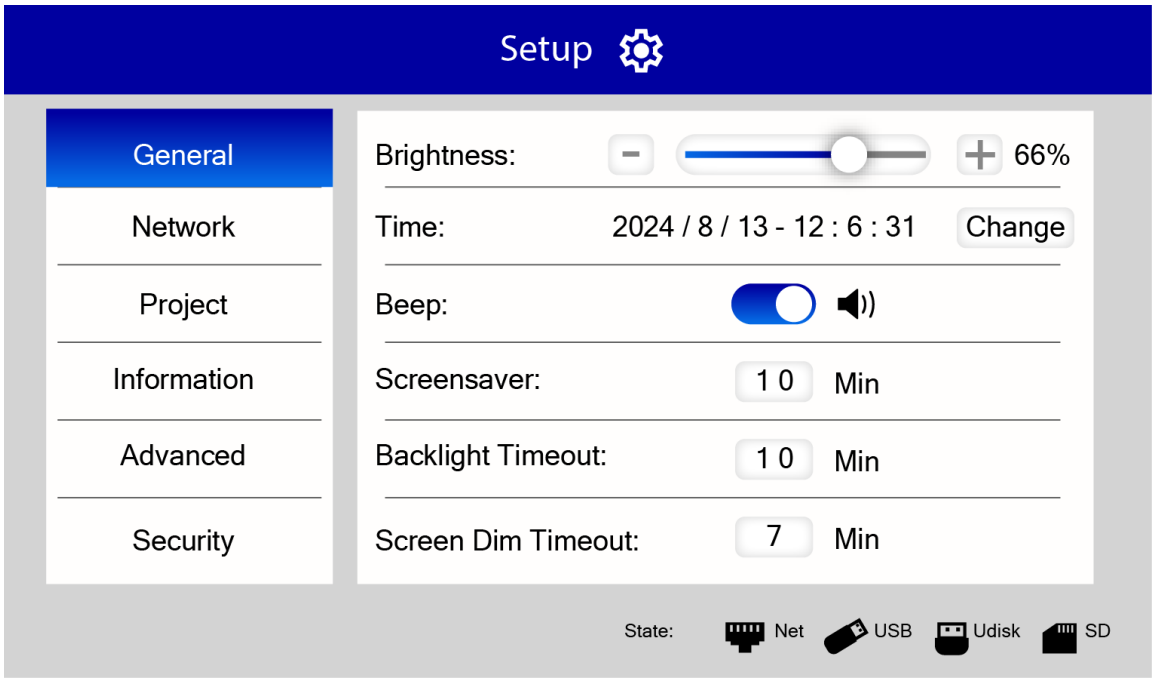
- To set the date and time, you must first turn off the HMI screen. To do so, set the control switches to a disconnected state.
- Afterward, turn the control switches back on. The HMI screen will then turn on, as shown in the figure below.

- Touch and hold the screen for 4-5 seconds. The screen shown in the following figure will appear. Then, press the “setup” button  .

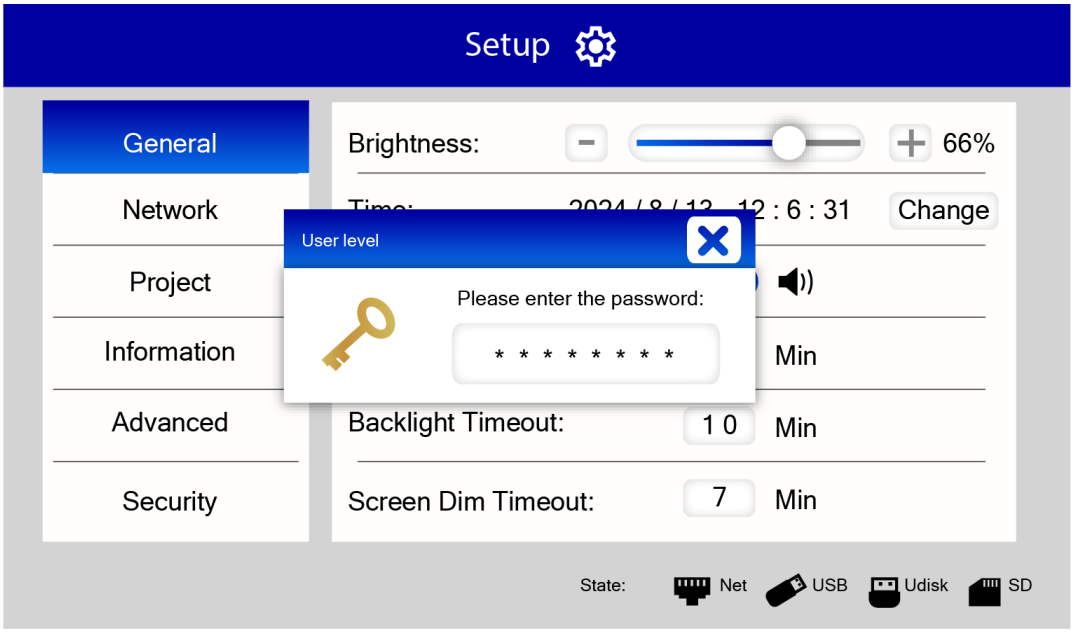
Setup



- After completing the previous step, you will access the HMI screen configuration menu. Select the option General, where the general values of the screen are displayed. To change the date and time, press the button Change.

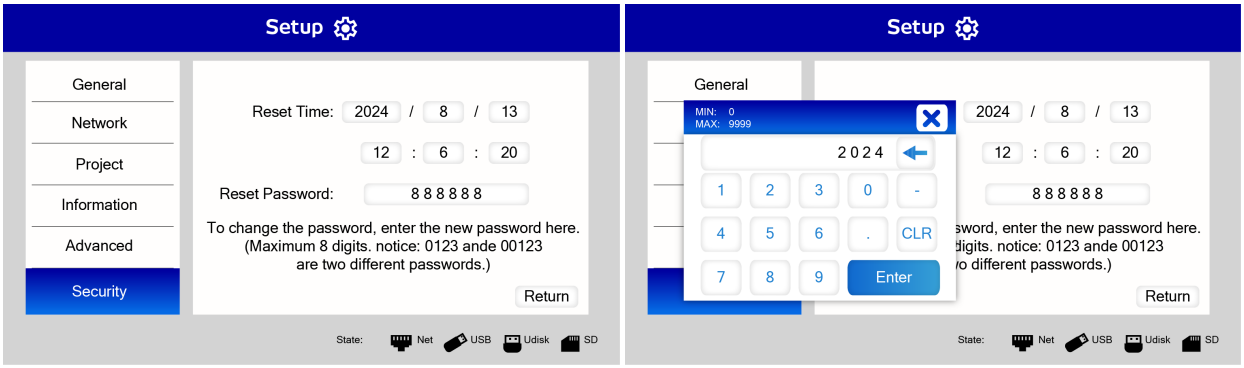


- You will be asked to enter a password.



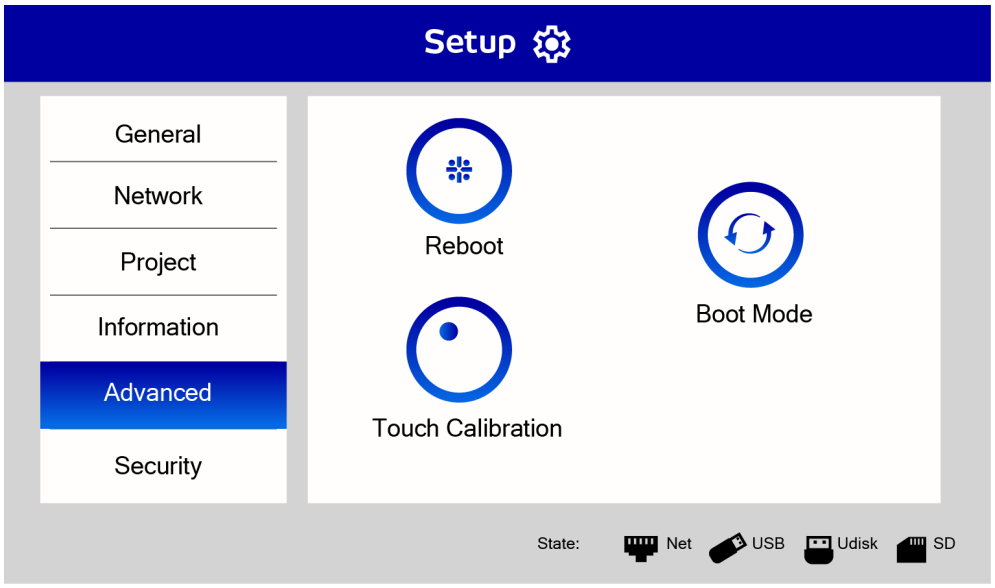
NOTE
The default password is 888888.

- Once the password is entered, you can configure the date and time values.



- To exit the configuration menu, select the option **“Advanced”**. then press the button 

to restart the graphical interface and update it.



10. ROUTINE MAINTENANCE

CAUTION

Before performing any inspection or maintenance, disconnect the board from the power supply.

It is recommended to perform the following tasks:

- Remove dust, dirt, and grease from the surface of the starter using a lint-free cloth, brush, or vacuum. Do not use pressurized air, as this could cause particles to enter the interior.
- Do not use aerosols or allow petroleum chemicals, solvents, or paints to come into contact with electrical connections, either inside or outside the switch.
- Tighten the component terminals to ensure a secure connection.
- Check the power cable to ensure it is in good condition, without any damage such as cracks, marks, or burnt copper wire.
- Inspect the internal components of the board for any burn marks or dents, and ensure they are properly secured to the starter.

11. POSSIBLE FAULTS AND SOLUTIONS

Code	Error	Possible cause	Solutions
E.SC1 (1)	Acceleration alert	• The distance from the connecting cable to the motor is too large • Short circuit on the output side of the drive • Interferences in the electrical system • There is excessive engine load	• Turn off the power. • Check that the connection cable between the drive and the motor is within range. Otherwise, install a reactor at the output of the drive. • Check the integrity of the wiring. • Check the load or modify it so that the torque to be performed is lower.
E. SC2 (2)	Slowdown alert		
E.SC3 (3)	Alert in operation		
E. oC1 (5)	Overcurrent during acceleration	• The load current is higher than programmed • The acceleration or deceleration time is too short • Possible electrical fake • The mains voltage is low • Vibration or load anomalies	• Set the maximum current. • Increase acceleration or deceleration time. • Check the wiring and mains voltage. • Check the free and correct operation of the load.
E. oC2 (6)	Overcurrent in deceleration		
E. or C3 (7)	Overcurrent in operation		
E. or 1 (9)	Overvoltage during acceleration	• The input voltage is abnormal • Fuga a Tierra • Poor network quality	• Check the mains voltage. • Check the correct start-up of the system. • Check that there are no ground faults in the motor by measuring the grounding resistance of the motor cables and the motor with a megaohmmeter. • Check the correct balance and electrical distribution.
E. or 2 (10)	Overvoltage during deceleration		
E. or 3 (11)	Overvoltage in operation		
E. LoC (13)	Low operating voltage	• The input voltage is abnormal • Phase loss or fluctuation in input lines • Poor network quality	• Check the mains voltage. • Check that the power cables are securely connected to the corresponding terminals. • Check the correct balance and electrical distribution.
E. OL1 (14)	Motor overload	• The input voltage is abnormal • The load current is higher than programmed • Vibration or load anomalies	• Check the mains voltage. • Set the current maximum and the correct class. • Check the free and correct operation of the load.
E. Lo2 (15)	Overload on the drive	• The input voltage is abnormal • The load current is higher than programmed • Vibration or load anomalies • The acceleration time is short • Multiple starts	• Check the mains voltage. • Set the current maximum and the correct class. • Check the free and correct operation of the load. • Increase acceleration time. • Check that the installation does not have anomalies that cause excessive starts.
E. LiF (18)	Input phase failure	• Phase loss or fluctuation in input lines	• Check that the power cables are securely connected to the corresponding terminals. • Verify the correct balance between phases.
E. OLf (19)	Output phase failure	• Phase loss or fluctuation in the output lines	• Check that the motor connection cables are securely connected to the corresponding terminals. • Check the voltage between phases.
E.oh1 (30)	Rectifier module overheating	• Dirt or damage to the forced ventilation system (fan) • The ambient temperature is too high	• Clean the air duct or change the fan. • Lower the room temperature.

Code	Error	Possible cause	Solutions
E. O2 (31)	IGBT module overheating		
E. EF (33)	External warning	• External digital input activated	• If it was activated by mistake, check that the wiring and connections of the digital inputs are properly connected.
E. EC (34)	Communication warning	• The connections from the screen to the drive are false • The connections between drives are false • Incorrect settings in the parameters • Interferences	• Verify that the communication wiring is properly connected. • Consult the manual for the correct configuration of parameters. • Verify the integrity of the communication cabling.
E. HAL (37)	Intensity warning	• Short circuit between motor phases • Loose connections at the drive output terminals	• Disconnect the power supply and verify the source of the short circuit, then repair the short circuit. • Adjust the terminals.
E.sgxx (40)	Fuga a Tierra	• Current coming from the ground output phase, either in the cable between the variable frequency drive and the motor or in the motor itself	• Check that there are no ground faults in the motor by measuring the grounding resistance of the motor cables and the motor with a megaohmmeter. • Check the effective grounding of the system.
E.FSG (41)	Short circuit in the fan	• Short circuit in the drive fan or in its wiring	• Disconnect the power and check the condition of the fan and its connections. If necessary, contact your dealer.
E.PID (42)	Pressure sensor warning	• Sensor disconnected • The sensor that provides the PID feedback has stopped working • Loss of sensor signal	• Check the PID feedback signal. • Check the condition and operation of the sensor.
A. CoP (43)	Warning in graphic terminal	• Damage to the wiring or graphic terminal	• Check if the wiring between the graphic terminal and the drive is properly connected.
E.TexX (52)	Auto-tuning warning	• Drive output current exceeds the upper or lower limit during Auto-Tuning	• Check the engine connection and restart Auto-Tuning.
E. DEF (77)	Excessive speed deviation	• Vibration or load anomalies • The acceleration or deceleration time is very short. • Blocked engine	• Check the free and correct operation of the load. • Increase the parameter F01.22 (acceleration time) or the parameter F01.23 (Deceleration time).
E. SPD (78)	Overspeed error	• The parameters related to the overspeed detection have not been set correctly	• Adjust the F10.44 parameter (Overspeed Detection Limit) or the F10.45 (Overspeed Detection Time) parameter.
E.LD1 (79)	Charging protection 1	• Damaged or blocked engine	• Check the electrical and mechanical condition of the motor.
E.LD2 (80)	Charging protection 2		
E. bus1 (91)	Expansion card A disconnected	• The mounting or wiring of the expansion card has false contacts • Interferences	• Verify that the expansion card is connected properly. • Verify the integrity of the communication cabling.
E. bUS2 (92)	Expansion card B disconnected		

NOTE
To replace any damaged component, contact your authorized dealer.