



TEWX SERIES

CONTROL BOARD FOR CONSTANT PRESSURE

V1.0
17/08/2024

Abstract

Thank you for choosing our ENERWELL constant pressure control panel.

This installation manual will guide you through the proper installation process to ensure optimal performance of your equipment. We strongly recommend following the included instructions carefully.

Please keep this manual in a safe place for future reference.

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The information contained in this document is subject to change without notice.

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1. INTRODUCTION

This manual provides all the necessary information for the operation and detailed description of the equipment. Please read it carefully before installation, start-up, maintenance, or inspection. Pay special attention to the safety warnings and precautionary signs included. Keep this manual in a safe place for future reference.

2. SAFETY WARNINGS

This manual is intended for personnel responsible for the electrical installation, assembly, operation, and maintenance of the equipment. The responsible individual must ensure a safe environment and inform others on-site of potential hazards and necessary precautions.



CAUTION

- We always recommend thoroughly reading and understanding the installation manual before starting the installation and operation of these products. Installation, maintenance, and startup must be performed by qualified personnel. Failure to follow the recommendations outlined in this manual may lead to equipment damage, general material damage, serious personal injury, or even death.
- The equipment should only be operated by qualified personnel who have read and understood the contents of this manual.
- Install the board in a well-ventilated area, away from sources of excessive heat 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 you detect any anomalies, contact your authorized dealer immediately.

STORAGE

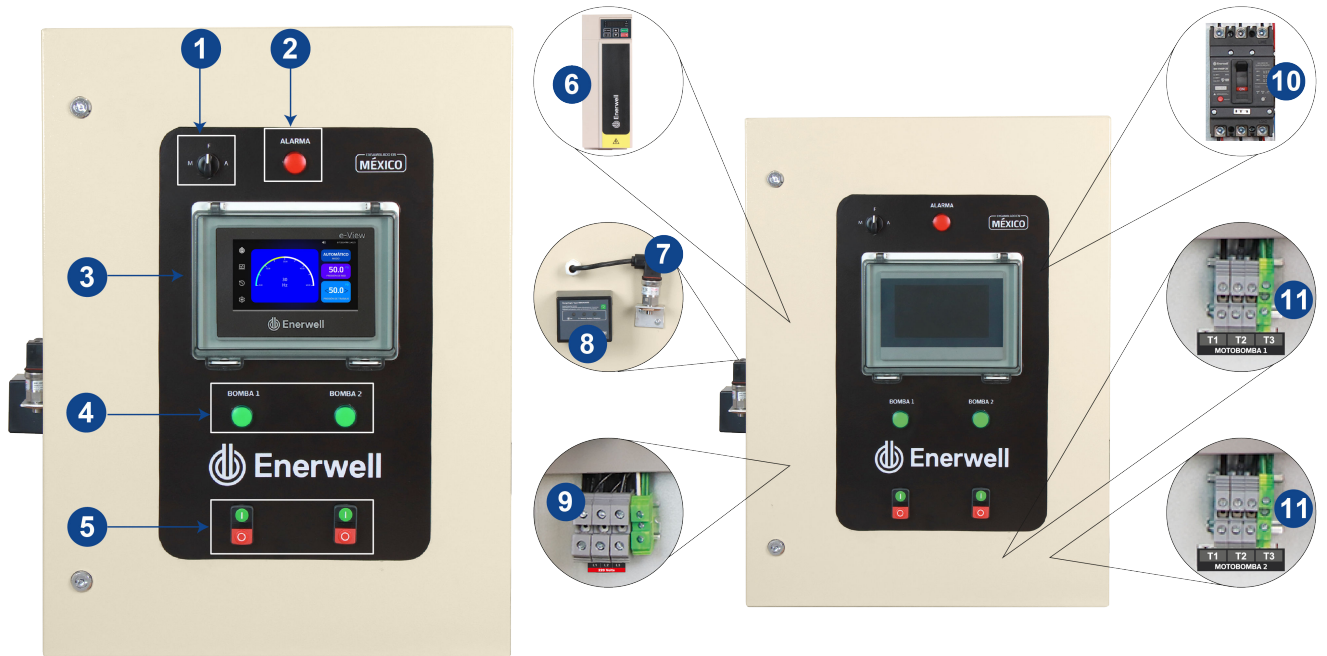
If the control panel is not to be installed immediately, follow these storage conditions strictly:

- Keep it in its original packaging at all times.
- Store it in a well-ventilated area, free from dirt and water.
- If stored in a cold or humid environment, avoid fully covering it; instead, ensure some heating to prevent moisture condensation on the equipment.
- Do not position the panel at an improper angle, such as excessively tilted forward, backward, or sideways. Never place heavy objects on top of it.

WASTE DISPOSAL

- To minimize environmental impact, dispose of the product packaging properly, following local environmental regulations. Incorrect disposal may lead to contamination due to material decomposition.

4. STARTER DESCRIPTION



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

5. INSTALLATION



WARNING

- Improper handling of the board may result in serious injury.
 - Always handle the board in an upright position.
 - Use appropriate lifting equipment (hoist, pulleys, forklifts, etc.) to transport the board.
-
- Select an installation area that is free from extreme weather conditions, humidity, vibrations, high temperatures, and flammable materials or substances.
 - Once the board is installed, carefully review the electrical diagram before making any connections.



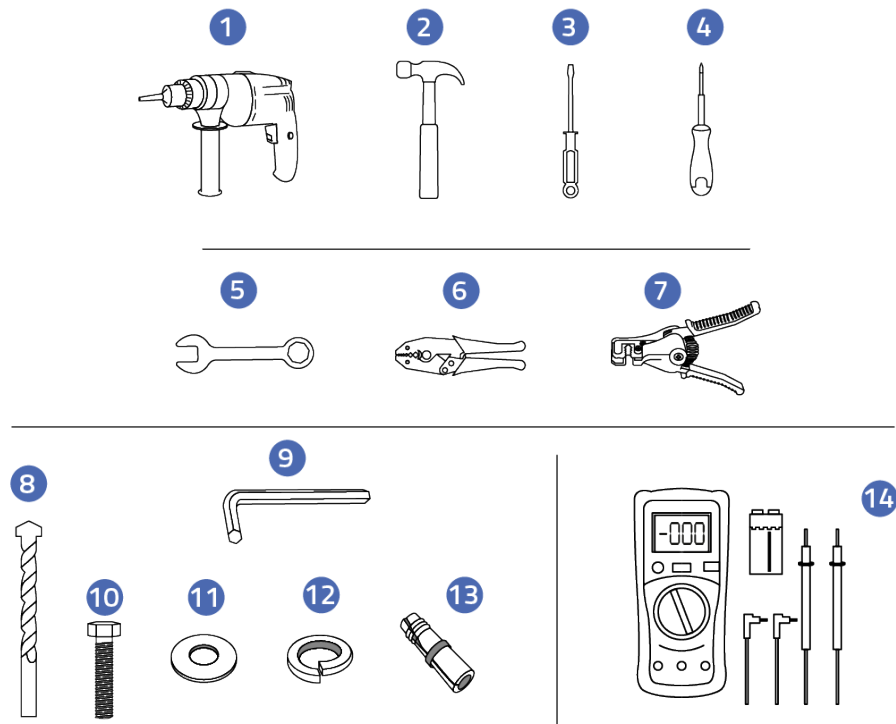
CAUTION

- Ensure the board is securely fastened before handling it with a hoist or forklift to prevent shifting or falling. Additionally, place protective material between the board and the forklift to avoid damage.
- Do not hold or lift the board by the HMI screen, as this could cause damage.
- When lifting, verify that the load is properly balanced.
- Raise the board only as much as necessary to clear any floor obstructions. Never lift it over an area where personnel are present.
- Exercise caution during maneuvering to prevent collisions with structures, equipment, or personnel.

5.1. MECHANICS

5.1.1. NECESSARY TOOLS

The following are the tools needed for mechanical installation:



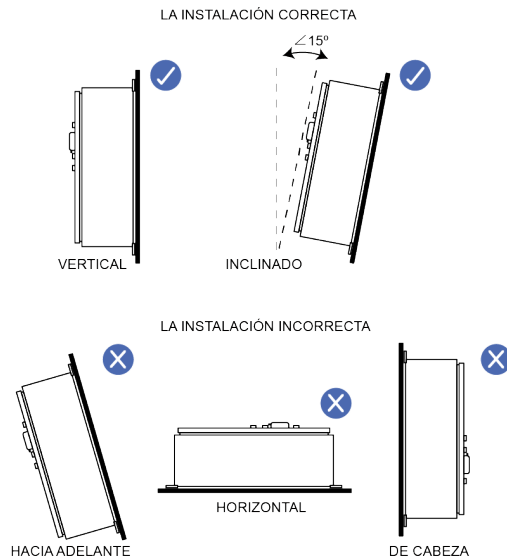
No	Tool
1	Drill
2	Hammer
3	1/4" x 6" flat screwdriver
4	1/8" x 6" flat screwdriver
5	9/16" (14 mm) Spanish wrench
6	Punching clamp
7	Cable stripper
8	5/8" diamond-tip concrete drill bit
9	Insulated 5 and 6 mm allen wrench
10	9/16" standard grade 8.8 screw
11	Flat washer
12	Pressure washer
13	5/8" expander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

5.1.2. ASSEMBLY

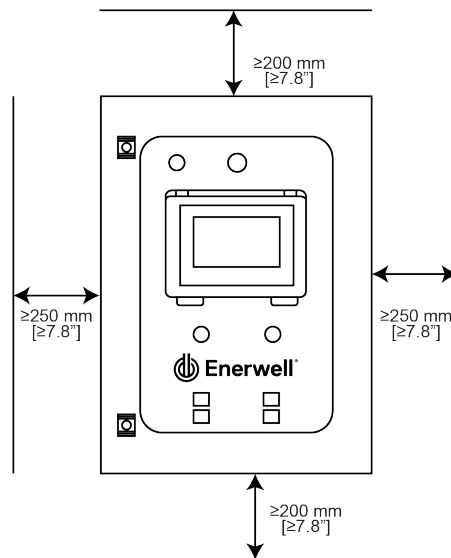
The installation location for the panel must ensure proper protection against adverse weather conditions, direct sunlight, or any other factors that could affect the product's performance. Additionally, the panel must not be installed in explosive atmospheres or areas with flammable materials.

Use appropriate lifting equipment capable of supporting the panel's maximum weight.

- The panel must be mounted on a flat surface in a vertical position, secured using the 4 attachment points to ensure stability.



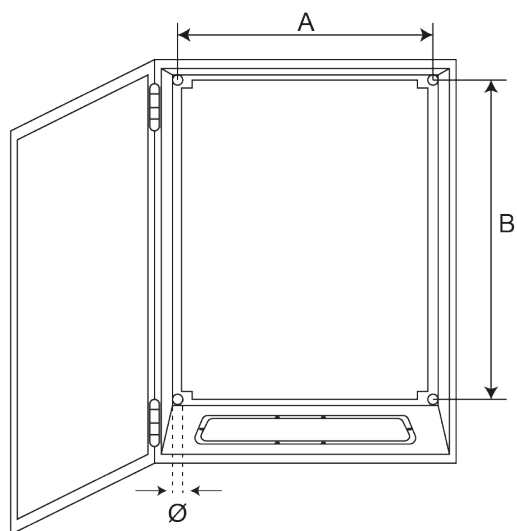
- It is crucial to allow enough space for the proper installation and/or connection of plumbing systems, as well as for future maintenance needs.



Ensure that no liquids, dust, or any conductive foreign objects can enter the panel. The energy dissipated by the panel generates heat in its surroundings during operation.

FIXATION

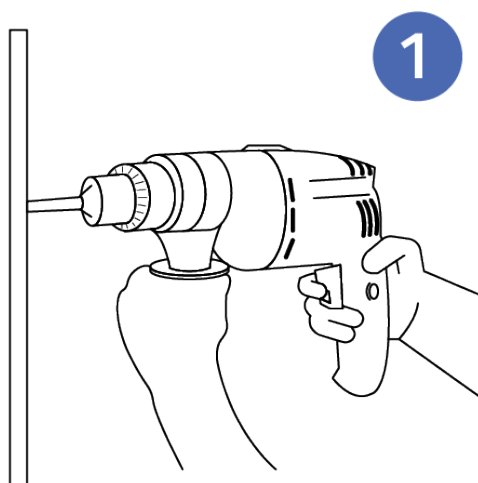
1. Locate the 4 mounting holes on the panel and use the following dimensions as a reference.



DIMENSION NAMING	DIMENSIONS (mm)		
	A	B	Ø
1	460	660	8.24
2	560	760	8.24
3	760	960	8.24
4	960	1360	8.24

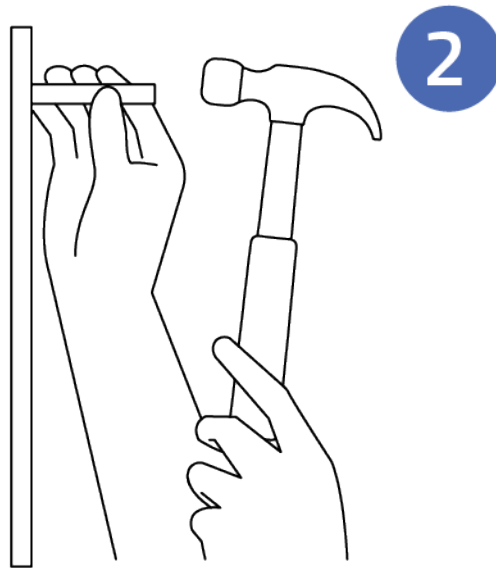
2. Mark and drill the corresponding perforations for the 4 holes, considering the distances between each of them.

Perforaciones

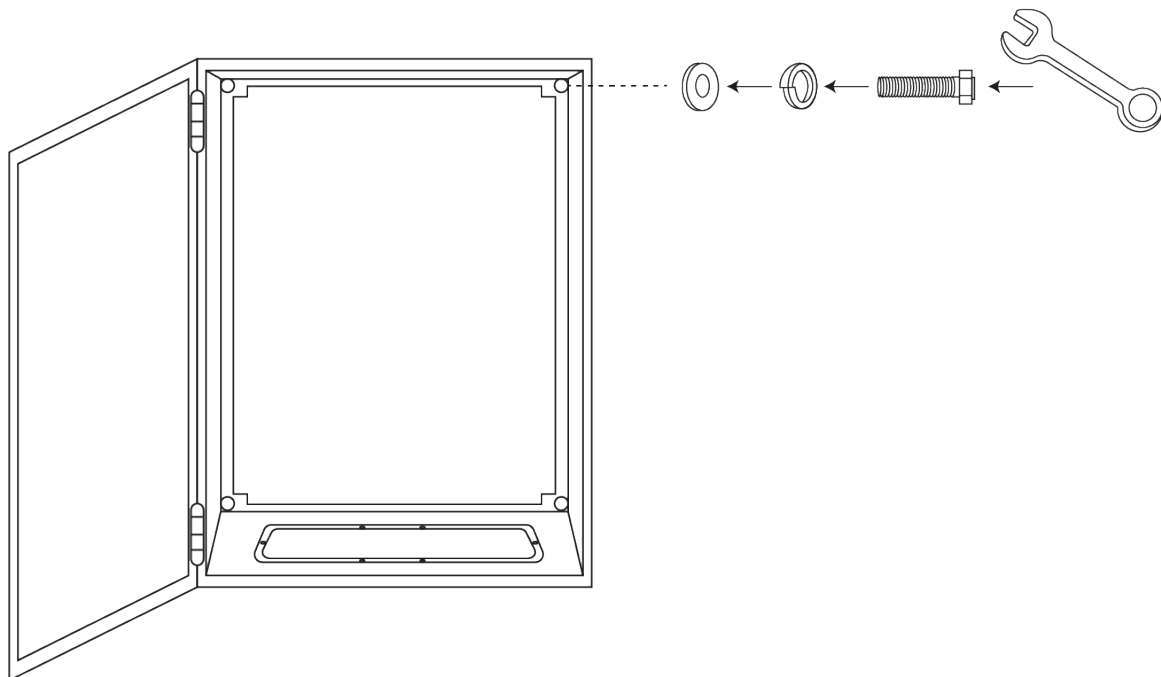


3. Install the expansion brackets into the previously drilled holes.

Instale los taquetes de expansión



4. Align the holes made with those on the board, then install the screws in the following order: flat washer, spring washer, and screw.
5. Tighten the screws with a wrench to securely attach the board to the wall.



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

5.2. ELECTRIC

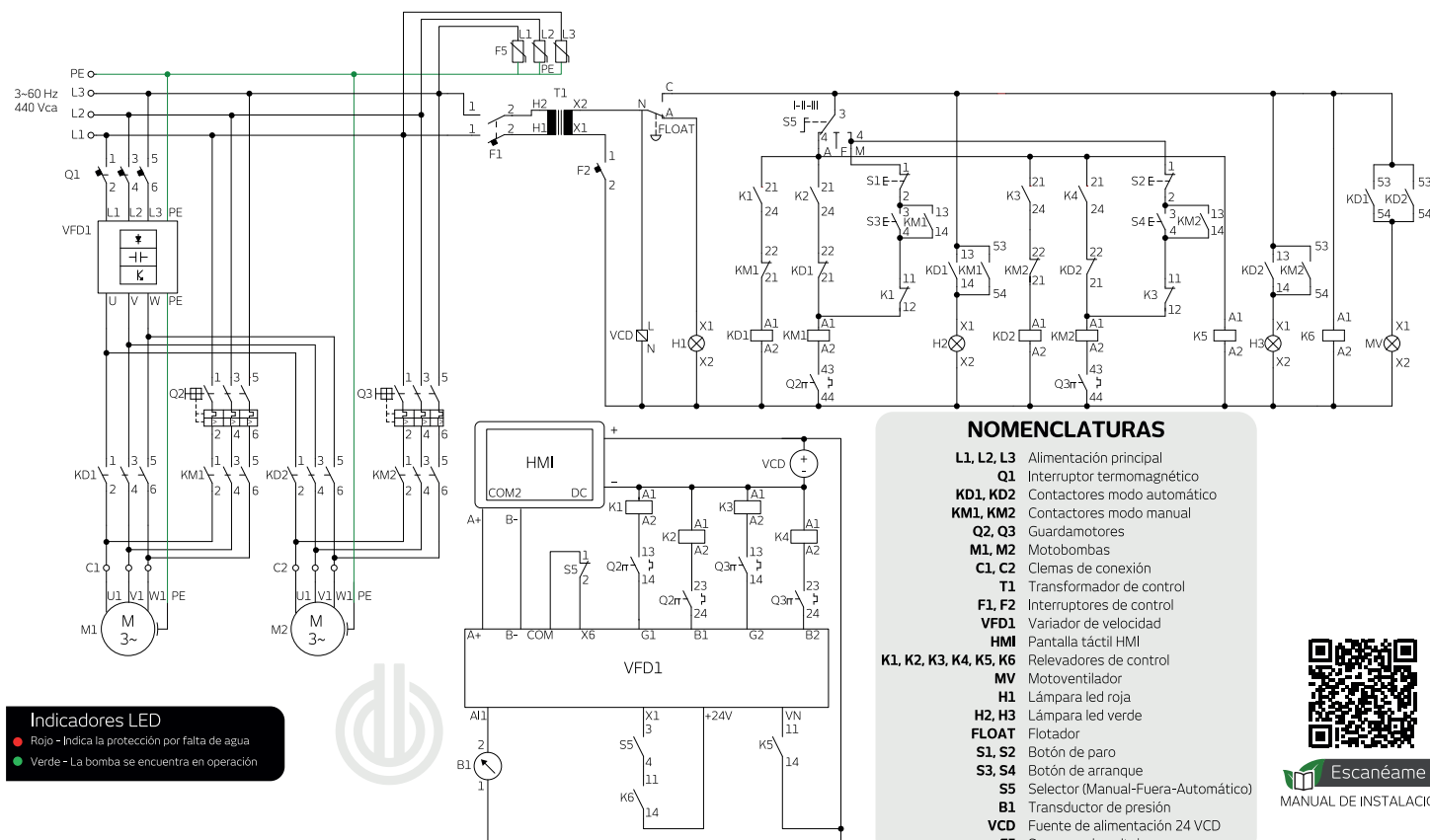
5.2.1. CONTROL DIAGRAM

TABLERO TEWX CON 2 BOMBAS



■ CIRCUITO DE FUERZA

■ CIRCUITO DE CONTROL



Escanéame
MANUAL DE INSTALACIÓN

5.2.2. ELECTRICAL CONNECTION



CAUTION

Before beginning the electrical connection, inspect the board's connections to detect any loose contacts that may have occurred during transportation and assembly. If necessary, adjust any connections that need attention.



DANGER

Before connecting the power supply, ensure that the power cables are not energized.

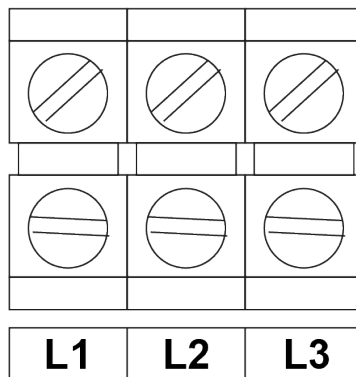
The board has a bottom cover that can be removed, allowing you to pass the connection cables through this opening. You may use cable glands or any compatible protective and cable management accessories.



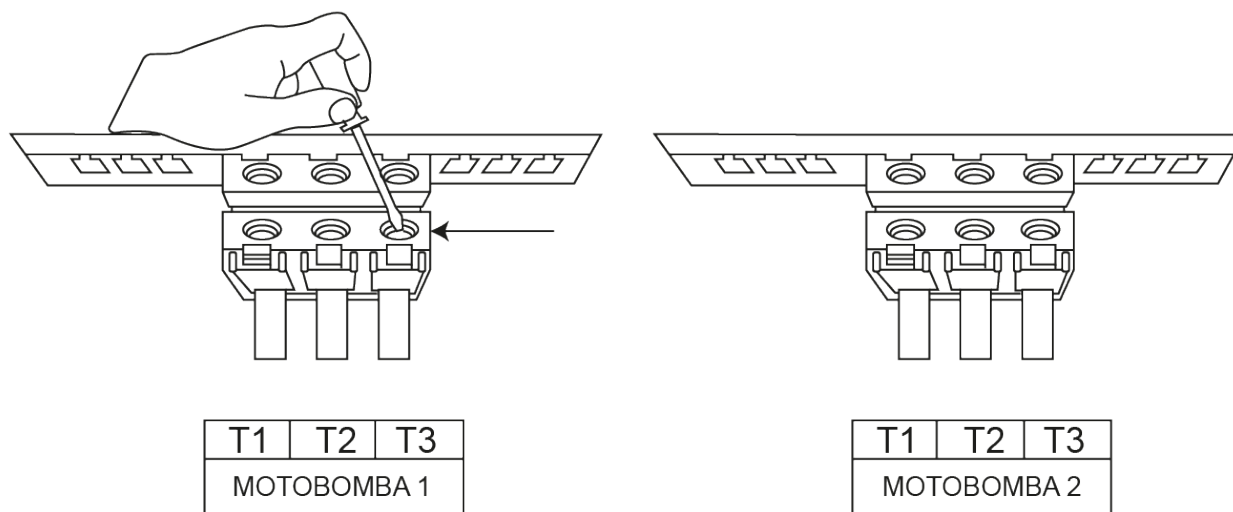
WARNING

- It is recommended to use cable resins to protect your electrical cables and maintain watertightness.
- A main thermomagnetic switch must be installed to ensure proper and complete disconnection from the electrical supply. The voltage rating of the main switch must match the specifications of the electrical network, and its current capacity should be higher than the maximum protection design value of the board.
- Take precautions to protect internal components before proceeding with the electrical installation to prevent debris or particles from falling inside the board.
- Power supplies should remain open and locked until all wiring has been completed and the entire system has been verified.
- Verify that the contacts provided are compatible with the type of cables being installed.
- Ensure that the mains voltage is compatible with the product specifications.

Identify the power connection sign of the board (9) shown in the chapter DASHBOARD DESCRIPTION. Then, locate the terminals marked L1, L2, and L3, which are the connection points for the main power supply. Always verify that there is no voltage before performing any operation. For the correct selection of cable gauge, consider the operating voltage of the system, the maximum amperage of the application, and the distance of the cable route.



Before connecting the motors, ensure that the maximum current is within the protection range of the board and that the gauge of the motor connection cable is adequate. Once this is confirmed, connect the motor cables to the terminals identified as "T1," "T2," and "T3" of the corresponding connection code for each motor (11) shown in DASHBOARD DESCRIPTION.

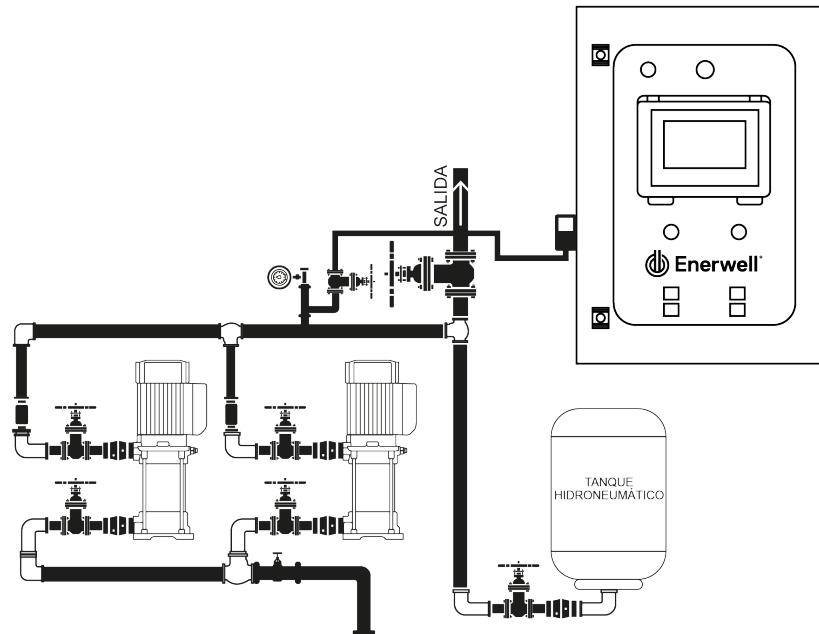


CAUTION

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

5.2.3. PRESSURE SENSOR

The dashboard features a sensor that allows for monitoring the hydraulic system. It is recommended to install the sensor in a tube with at least three or four directional changes to reduce water pressure and prevent potential damage to the device.



5.3. HYDROPNEUMATIC TANK

Variable speed panels help reduce the size of the hydropneumatic tank, but they do not eliminate its use in the hydraulic supply system. The hydropneumatic tank is essential to prevent abrupt pressure fluctuations during the start and stop of the motor pumps, which can cause pressure peaks. These sudden variations in pressure make effective control difficult.

Similarly, start/stop cycles of less than 5 seconds can damage the drive, as they cause voltage regeneration in the motor. It is also critical that the tank is properly calibrated to avoid cyclic starts.

6. PRINCIPLE OF OPERATION

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

In ENERWELL systems with variable speed drives, pressure is measured using a pressure transducer. This transducer senses the pressure in the network and sends analog signals to the variable frequency drive. The drive, through specific programming, increases or decreases the RPM of the pump motor to adjust the requested flow.

The main advantage of equipment with variable speed is that it ensures the required flow is pumped at a constant pressure without sudden fluctuations or oscillations between pumping and demand. Additionally, it achieves significant energy savings, as controlling the motor's RPM only consumes the minimum energy needed to maintain constant pressure.

The equipment has two operating modes, which can be selected by adjusting the selector on the front panel of the dashboard:

AUTOMATIC MODE (A): In this mode, the system will automatically turn on and control the motor pumps according to hydraulic demand to maintain a constant pressure in the network. For this, the drive parameters must be configured as shown in the section BASIC DRIVE CONFIGURATION.

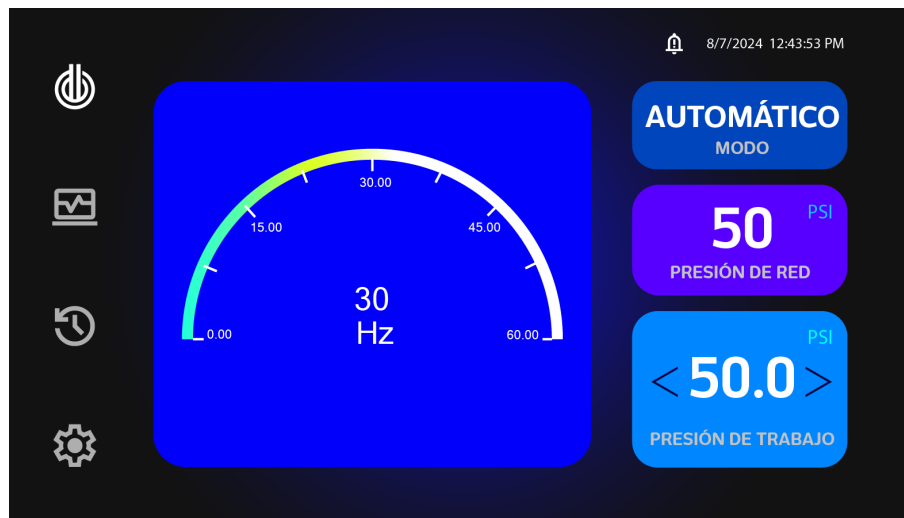
MANUAL MODE: (M) In manual mode, the motor pump(s) can be started at a fixed speed using the start and stop buttons. In this operating mode, the working pressure set in the board configuration will not be considered.

7. ENERWELL MANAGEMENT AND SUPERVISION SYSTEM

The ENERWELL control panel features a management and supervision system that allows you to view and configure the values of your installation through its four menus: [START MENU \[17\]](#), [DIAGNOSTIC MENU \[18\]](#), [PERFORMANCE MENU \[19\]](#) And [SETUP MENU \[21\]](#).

7.1. START MENU

Upon powering on the board, the system will begin loading the graphical interface, displaying the first screen as the home screen. From this screen, you can view the actual values of your installation, system status, and motor pump(s) operation details. To access this home screen, you need to press the button

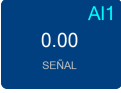


Element	Description
 Operating frequency	When the system is in automatic mode, this shows the actual frequency at which the motor is operating.
 Mode of operation	Displays the operating mode of the board: Out mode: Indicates that the drive is stopped. Automatic mode: Through a variator, the system will automatically turn on and control the motor pumps according to hydraulic demand, in order to maintain a constant pressure in the network.
 Network pressure	Allows you to visualize the actual pressure in the hydraulic network, shown in PSI.
 Working pressure	Displays the working pressure of your hydraulic system, shown in PSI.

7.2. DIAGNOSTIC MENU

This screen is designed to provide relevant information about the status and performance of your system. You can access it by pressing the button .



Element	Description
 Frequency	Allows you to view the operating frequency at which the indicated motor pump is working.
 Real-time current	Displays the actual current value at which the motor pump in operation is working.
 Nominal current	Shows the nominal current value of your motor pump, based on the data from the motor's nameplate.
 Sensor signal	Displays the signal received from the sensor.
 Input voltage	Shows the voltage value of the electrical network in your installation.
 Network pressure	Allows you to view the working pressure of your hydraulic system, displayed in PSI.

Element	Description
 Wake up pressure	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	Enables 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 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

On this screen, you can view in detail the faults and anomalies presented in your installation.



Column	Description
Number	This column displays the event number.
Date	This column shows the date the event occurred.
Tiempo	This column shows the time when the event occurred.
Fault code	This column shows the code referring to the presented fault.
Failure frequency	In this column, the frequency at which the fault occurs is placed.

To understand the meaning of the fault codes, as well as to identify their causes and solutions, you can consult the help screen by pressing the  button. This will open the next screen, displaying the fault codes along with their descriptions.

DESCRIPCIÓN DE ALARMAS		
E.SC1 (1)	Alarma en aceleración	E. oL2 (15) Sobrecarga en el variador
E.SC2 (2)	Alarma en desaceleración	E. iLF (18) Fallo de fase de entrada
E.SC3 (3)	Alarma en operación	E. oLF (19) Fallo de fase de salida
E. oC1 (5)	Sobrecorriente en aceleración	E. oH1 (30) Sobretemperatura del módulo rectificador
E. oC2 (6)	Sobrecorriente en desaceleración	E. oH2 (31) Sobretemperatura del módulo IGBT
E. oC3 (7)	Sobrecorriente en operación	E. EF (33) Advertencia externa
E. ou1 (9)	Sobretención en aceleración	E. CE (34) Advertencia de comunicación
E. ou2 (10)	Sobretención en desaceleración	E. HAL (37) Advertencia de intensidad
E. ou3 (11)	Sobretención en operación	E.SGxx (40) Cortocircuito del ventilador
E. LoC (13)	Bajo voltaje en operación	E.PID (42) Advertencia de sensor de presión
E. oL1 (14)	Sobrecarga del motor	A. CoP (43) Advertencia en el terminal gráfico
		E. Texx (52) Advertencia de Auto-tuning
		E. DEF (77) Desviación excesiva de velocidad
		E. SPD (78) Error de sobrevelocidad
		E.LD1 (79) Protección de carga 1
		E.LD2 (80) Protección de carga 2
		E. bus1 (91) Tarjeta de expansión A desconectada
		E. bus2 (92) Tarjeta de expansión B desconectada
		119 Fin de curva

Regresar



By pressing the desired fault code, you will be redirected to an additional screen that provides a detailed guide to the possible causes and solutions for that code.

ALARMA EN BOMBA

Alerta en:
Aceleración / Desaceleración / Operación

Possible cause

- La distancia del cable de conexión al motor es muy grande
- Cortocircuito en el lado de salida del variador
- Interferencias en el sistema eléctrico
- Existe una carga de motor excesiva

Solution

- Desconecte la alimentación
- Verifique que el cable de conexión entre el variador y el motor este dentro del rango. De lo contrario instale un reactor en la salida del variador.
- Corrobore la integridad del cableado.
- Compruebe la carga o modifíquela con tal de que el par a realizar sea menor.

Regresar



NOTE

Pressing the button [Regresar](#) You will be able to return to the screen **Events**.

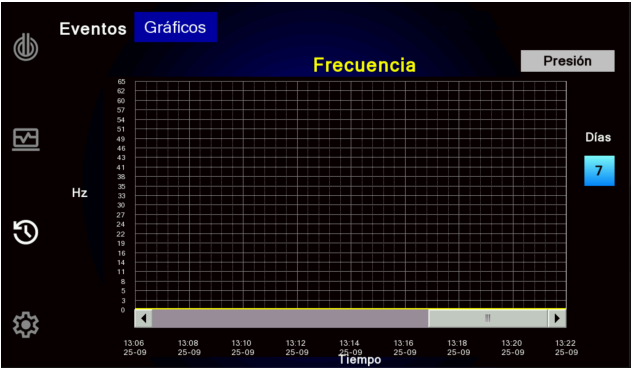
GRAPHICS SCREEN

This screen has two graphics options: Pressure and Frequency. Upon entering this screen, the pressure graph is displayed by default, providing a visualization of the pressure behavior of the hydraulic system over time (figure on the left side). To view the frequency graph, press the button [Frecuencia](#) This graph provides information on the operating frequency of the motor pump(s) to maintain the set pressure.

Pressure



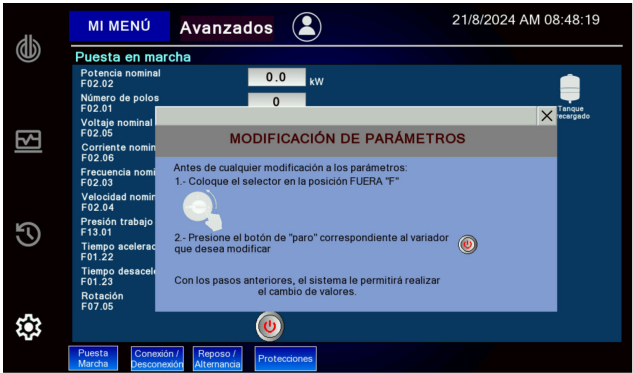
Frequency



7.4. SETUP MENU

On this screen, you can view and adjust the parameters necessary for starting up the dashboard (see section INITIAL STARTUP). You can access the settings screen by pressing the .

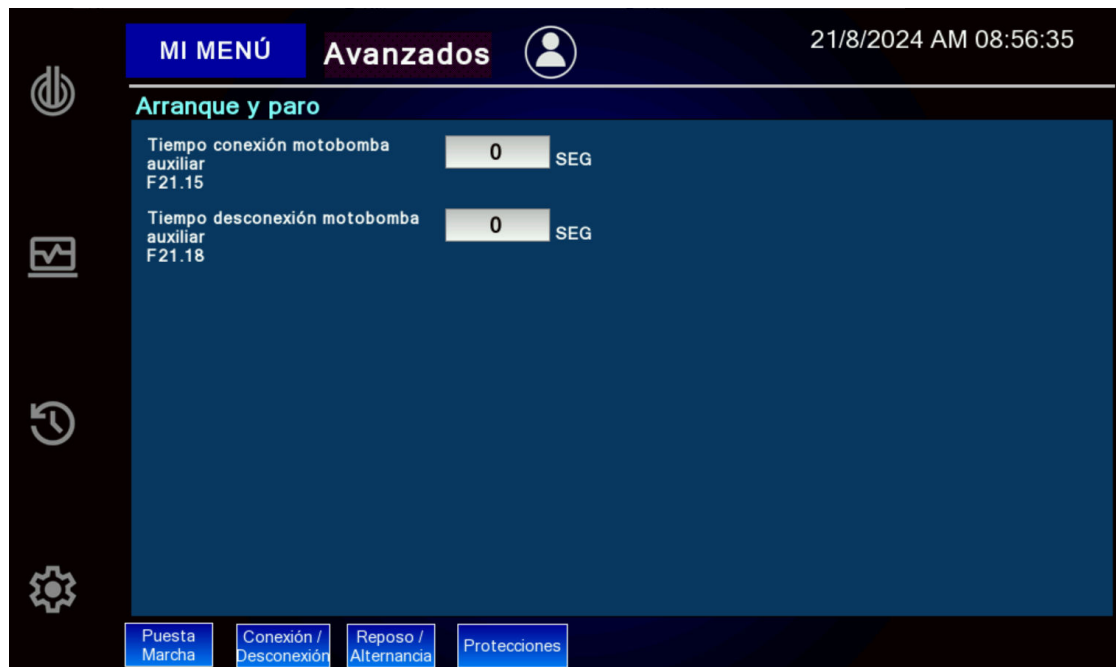
Upon logging in, the following warning screen will appear. Follow the instructions provided before making any changes to the parameters.



In the start-up section, at the top right, a pre-charged tank icon appears . When you press it, a table will appear with recommendations for the correct dimensioning of the tank.

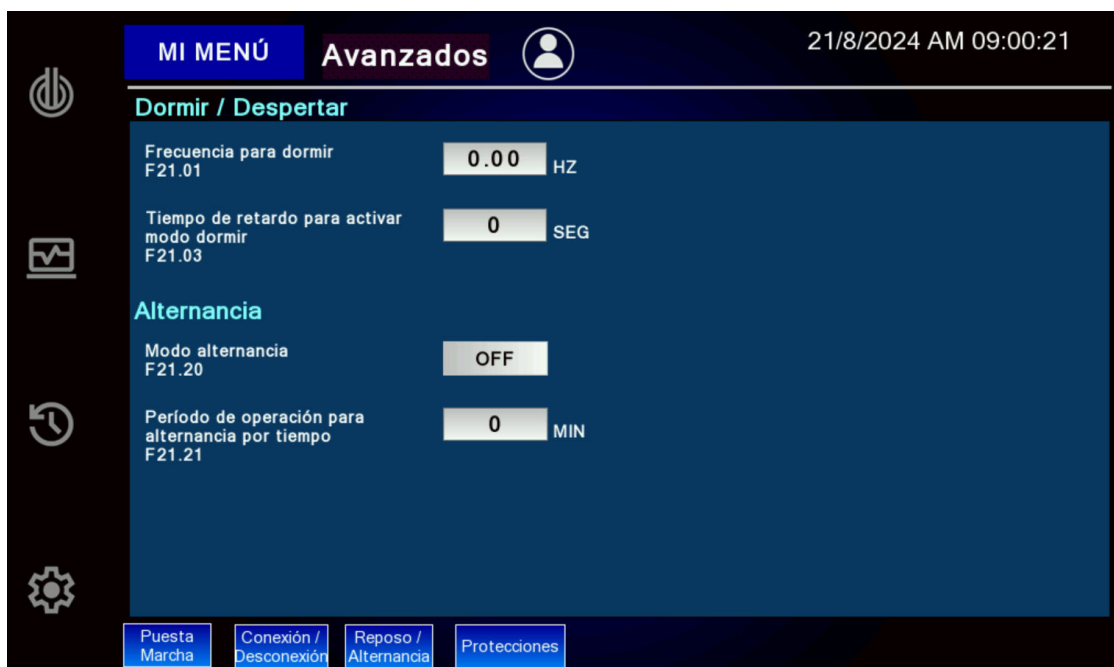


At the bottom of the screen you will find buttons that will take you to the different parameter sections. Press the button  to enter the configuration of the connection and disconnection parameters.



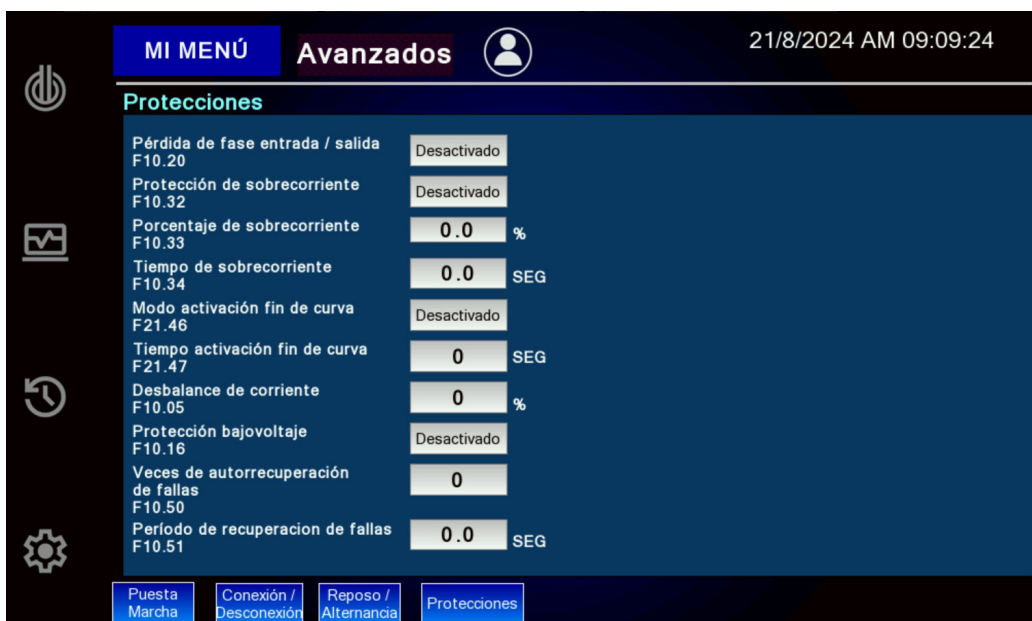
Rest and alternation parameters.

To access the settings of the sleep and toggle parameters, press the button **Reposo / Alternancia**. In this section, you can adjust the times and conditions for sleep mode and alternation options.



Protection parameters

To access the configuration of the protection parameters, press the button **Protecciones**. Here, you can adjust and calibrate settings related to system protection, such as overcurrent limits, current suppression gain settings, and current imbalance.



CONFIGURING ADVANCED PARAMETERS

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

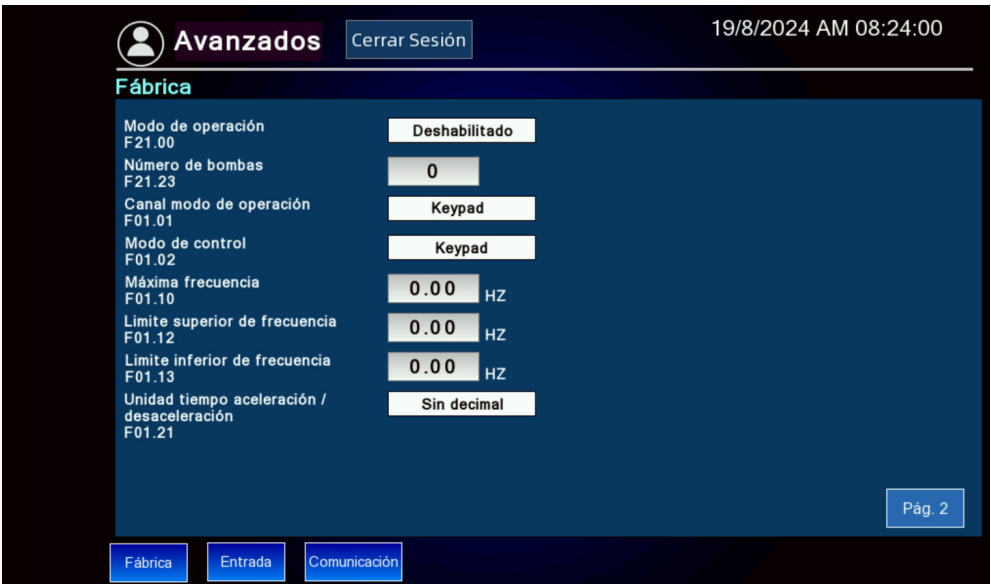


The image shows the Enerwell login interface. At the top right, the date and time are 16/8/2024 AM 09:57:22. The Enerwell logo is centered. Below it, there are two input fields: 'Usuario' (Username) and 'Contraseña' (Password). The password field is masked with asterisks. At the bottom, there are two buttons: 'Ingresar' (Login) and 'Salir' (Exit).

Factory parameters

Upon entering, the factory settings will be displayed by default. This section is organized into two screens for easier navigation. To advance to the second screen and explore more options, simply press the button **Pág. 2**.

Factory parameters 1



The image shows the 'Avanzados' (Advanced) settings screen. At the top, there is a user icon, the text 'Avanzados', a 'Cerrar Sesión' (Logout) button, and the date/time 19/8/2024 AM 08:24:00. The main section is titled 'Fábrica' (Factory). It contains a list of parameters and their current values:

Parameter	Value
Modo de operación F21.00	Deshabilitado
Número de bombas F21.23	0
Canal modo de operación F01.01	Keypad
Modo de control F01.02	Keypad
Máxima frecuencia F01.10	0.00 HZ
Limite superior de frecuencia F01.12	0.00 HZ
Limite inferior de frecuencia F01.13	0.00 HZ
Unidad tiempo aceleración / desaceleración F01.21	Sin decimal

At the bottom, there are three buttons: 'Fábrica', 'Entrada', and 'Comunicación'. A 'Pág. 2' button is located in the bottom right corner.

Factory parameters 2

Avanzados Cerrar Sesión 21/8/2024 AM 09:37:04

Fábrica

Máxima presión del sensor F13.06	0.0	PSI
Ganancia proporcional F13.11	0.000	
Tiempo integral F13.12	0.0	SEG
Tiempo diferencial F13.13	0.0	SEG
Modo conexión de motobomba F21.13	Apagado	
Modo desconexión de motobomba F21.16	Apagado	

Pág. 1

Fábrica Entrada Comunicación

Input parameters

To configure the parameters for digital inputs and signals, press the button **Entrada**. This section is organized into two screens for easier navigation. To advance to the second screen and explore more options, simply press the button **Pág. 2**.

Input parameters 1

Avanzados Cerrar Sesión 16/8/2024 AM 10:16:31

Entradas

Terminal X1 F05.00	0
Terminal X2 F05.01	0
Terminal X3 F05.02	0
Terminal X4 F05.03	0
Terminal X5 F05.04	0
Terminal X6 F05.05	0
Terminal X7 F05.06	0
Tipo de señal AI F05.40	Dip Switch
Tipo de señal AI1 F05.41	Voltaje
Tipo de señal AI2 F05.42	Voltaje

Pág. 2

Fábrica Entrada Comunicación

Input parameters 2

Avanzados Cerrar Sesión 16/8/2024 AM 10:27:10

Entrada

Limite inferior de AI1 F05.45	0.0	%
Limite superior de AI1 F05.47	0.0	%
Limite inferior de AI2 F05.50	0.0	%
Limite superior de AI2 F05.52	0.0	%

Pág 1

Fábrica Entrada Comunicación

Communication parameters

To access the communication parameter settings, press the button .

Avanzados Cerrar Sesión 16/8/2024 AM 10:31:27

Comunicación

Selección maestro-seguidor F12.00	0
Dirección de comunicación F12.01	0
Velocidad de comunicación F12.02	0
Formato de datos modbus F12.03	0
Comunicación RJ45 F12.20	0
Dirección comunicación RJ45 F12.21	0
Velocidad de comunicación RJ45 F12.22	0
Formato de datos interfaz RJ45 F12.23	0

Fábrica Entrada Comunicación

8. START-UP



IMPORTANT

All programming must be carried out by qualified personnel with adequate knowledge of the unit's operation and who have thoroughly understood this manual.

8.1. PARAMETER SETTINGS

The following table shows the symbols used to identify which parameters can be modified during the equipment's operation:

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)	Adjusted value	Unit	Change during operation
F01.01	Channel for operating mode	It is used to select the channel on which the drive receives start/ stop commands and the direction of operation. 0: Control by control panel (Keypad) 1: Terminal control 2: RS485 communication control 3: Card (optional)	0 (0~3)	1	N/A	✓

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F01.02	Control mode	Source A for frequency adjustment 0: Frequency adjustment using the numbers on the control panel (keypad) 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	N/A	✓
F01.10	Maximum frequency	Set the maximum frequency for the drive.	50.00 Hz (1.00 Hz ~ 500.00 Hz)	60	Hz	●
F01.12	Upper frequency limit	Set the upper frequency limit.	50.00 Hz (Lower limit ~max. frequency)	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	Hz	✓
F01.21	Time unit for acceleration/deceleration	Configure the time adjustment unit for acceleration/deceleration. 0:1 s (without decimal) 1:0.1s (1 decimal digit) 2:0.01s (2 decimal digits)	2 (0~2)	0	sec	●
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)	10	Sec	✓
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)	10	sec	✓

8.1.2. ENGINE CONFIGURATION

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

Parameter	Name	Description	Factory value (range)	* Adjusted value	Unit	Change during operation
F02.01	Number of poles	Set the number of poles in the motor.	4 (2~98)	2	N/A	●
F02.02	Nominal power	Set the rated power of the motor.	(0.1 kW~1000.0 kW)	2.2	kW	●
F02.03	Nominal frequency	Set the rated frequency of the motor.	(0.01 Hz ~ max. frequency)	60	Hz	●
F02.04	Nominal speed	Set the rated engine speed.	(0 rpm~ 65000 rpm)	3450	rpm	●
F02.05	Nominal voltage	Set the rated voltage of the motor.	(0 V~2000 V)	440	V	●
F02.06	Nominal current	Set the rated current of the motor.	(0.1 A ~ 3000.0 A)	5.2	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	N/A	●



NOTE

* These values must be configured based on the data specified on the plate of the selected motor.

8.1.3. CONTROL TERMINAL CONFIGURATION

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F05.00	X1 function	Selecting the function of the X1 terminal	80 (0~95)	82	N/A	●
F05.01	X2 function	Selecting the function of the X2 terminal	82 (0~95)	0	N/A	●
F05.02	X3 function	Selecting the function of the X3 terminal	84 (0~95)	0	N/A	●
F05.03	X4 function	Selecting the X4 terminal function	85 (0~95)	0	N/A	●
F05.04	X5 function	Selecting the function of the X5 terminal	86 (0~95)	0	N/A	●
F05.05	X6 function	Selecting the X6 terminal function	0 (0~95)	84	N/A	●
F05.06	X7 function	Selecting the function of the X7 terminal	0 (0~95)	0	N/A	●

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F05.40	Selecting the type of AI signal	Set through which you will receive the AI signal 0: DIP switch 1: Configuring Parameters	0 (0~1)	1	N/A	✓
F05.41	Signal type AI1	Set the type of AI1 signal 0: Voltage 0.00 V ~ 10.00 V 1: Current 0.00 mA ~ 20.00 mA	0 (0~1)	1	Corriente	✓
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	Corriente	✓
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	%	✓
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. Any voltage signal below this value is processed as a lower limit	0.0% (-100.0% ~ 100.0%)		%	✓
F05.52	Upper limit AI2	Defines the signal received at the AI2 terminal. Any voltage signal above this value is processed as an upper limit	100.0% (-100.0% ~ 100.0%)		%	✓

8.1.4. PID CONFIGURATION

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F13.01	Working pressure	Configure the working pressure. This is the pressure value that you want to maintain constant.  NOTE It is necessary to change the unit to PSI instead of %.	50.0% (0.0% ~ 100.0%)	45	PSI	✓
F13.06	Maximum sensor pressure	The PID feedback signal range uses dimensionless units to regulate PID feedback.	100.0 (0.0~100.0)	232	N/A	✓
F13.11	Proportional gain 1	Proportional gain of group 1 in PID parameters.	0.100 (0,000~4,000)	1.25	N/A	✓
F13.12	Full-time 1	Integral time for parameter group PID 1.	1.0s (0.0 s~600.0 s)	0.45	sec	✓
F13.13	Differential time	Differential time for PID parameter group 1.	0.000s (0,000s~6,000s)		sec	✓

8.1.5. APPLICATION SETUP

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F21.00	Motor pump operating mode	Configure the drive type of your system	1 (0~3)	2	A single variator	•

8.1.6. SLEEP/WAKE SETTINGS

Parameter	Name	Description	Factory value (range)	Adjusted value	Unidad	Change during operation
F21.01	Frequency for sleeping	Set the detection frequency for sleeping	40 Hz (0~600Hz)	50	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	sec	•

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F21.04	Wake up to the sensor	Wake-up percentage relative to working pressure: In cases of low water consumption, where only a small amount of water is used and pressure fluctuations in the pipeline persist over an extended period, the system may rely on the existing pipeline pressure without requiring controller activation. This process helps optimize energy efficiency.	10.0% (0.0~ 100.0%)	10	%	●
F21.13	Motor pump connection mode	Set the mode of adding a motor pump: 0: Off 1: Adding a smart motor pump 2: Adding a motor pump one by one	0 (0~2)	0	N/A	●
F21.14	Frequency for aux motor pump connection.	It is used to configure the auxiliary motor pump connection frequency limit. The timer begins when the current output frequency of the operating motor pump exceeds F21.14. The motor pump addition logic is activated once the motor pump addition detection time is reached.	45.00 Hz (0.00~300.00 Hz)	45	Hz	●
F21.15	Detection time for aux motor pump connection	It is used to configure the detection time for connecting an auxiliary 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	sec	●
F21.16	Motor pump disconnection mode	Turn off or turn on the auxiliary motor pump disconnection mode: 0: Off 1: On	0 (0~2)	1	N/A	●
F21.17	Frequency limit for disconnecting the aux motor pump.	It is used to configure the frequency limit for disconnecting an auxiliary motor pump. The timer starts when the current output frequency of the operating pump is lower than F21.17, and the pump reduction logic is activated after the pump reduction detection time [F21.18] is reached.	20.00 Hz (0.00~300.00 Hz)	42	Hz	●

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F21.18	Detection time for disconnecting the aux motor pump.	It is used to configure the detection time for disconnecting an auxiliary motor pump. The timer starts when the current output frequency of the operating pump is lower than F21.17, and the pump reduction logic is activated after the pump reduction detection time [F21.18] is reached.	5 (0~30000s)	5	sec	•
F21.20	Alternation mode	Set the motor pump change mode: 0: Off 1: Alternation time 2: By event 3: By operating time	0 (0~3)	1	N/A	•
F21.21	Operating time for 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	N/A	•

8.1.7. CONFIGURING PROTECTIONS

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
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	%	•
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	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	N/A	•

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
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 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	0000 (0000~1414)	2	N/A	•
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	%	•
F10.34	Overcurrent time	Sets the duration for overcurrent detection. If the current exceeds the specified overcurrent detection percentage for the configured time, an overcurrent warning is triggered.	5.0s (0.0 s~60.0 s)	0	sec	•
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	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	sec	•

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
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	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	sec	•

8.1.8. COMMUNICATION CONFIGURATION

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
F12.00	Teacher-follower selection	0: Slave 1: Teacher	0 (0~1)	0	N/A	•
F12.01	Communication direction	Set different values for different slaves.	1 (1~247)	0	N/A	•
F12.02	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)	0	bps	•
F12.03	MODBUS data format	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	N/A	•
F12.20	RJ45 communication	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: Customized	0 (0~3)	0	N/A	•
F12.21	RJ45 communication address	The RJ45 interface is for slave management during Modbus communication.	1 (1~247)	0	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 3:9600 bps 4:19200 bps 5:38400 bps	3 (0~5)	0	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	0 (0~5)	0	N/A	•

Parameter	Name	Description	Factory value (range)	Adjusted value	Unit	Change during operation
		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				

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

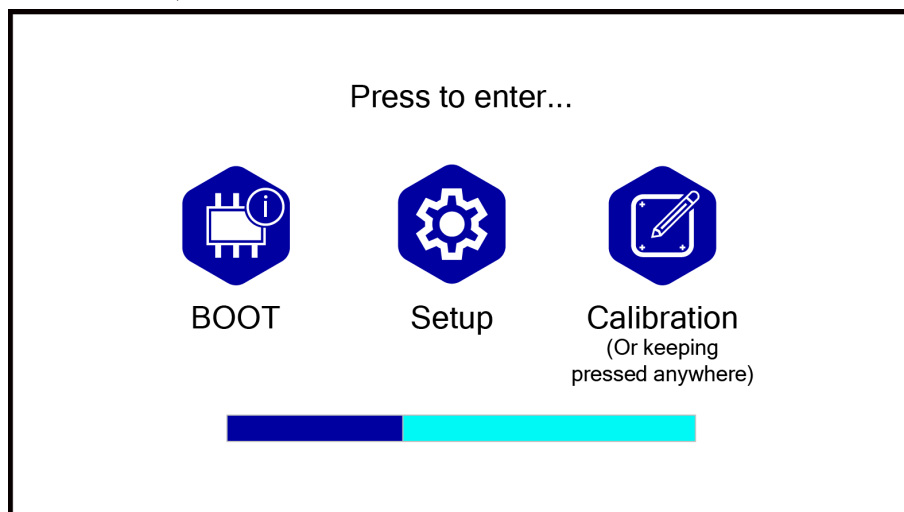
To carry out any manipulation on the board, it is essential to have the necessary safety measures.

- 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.

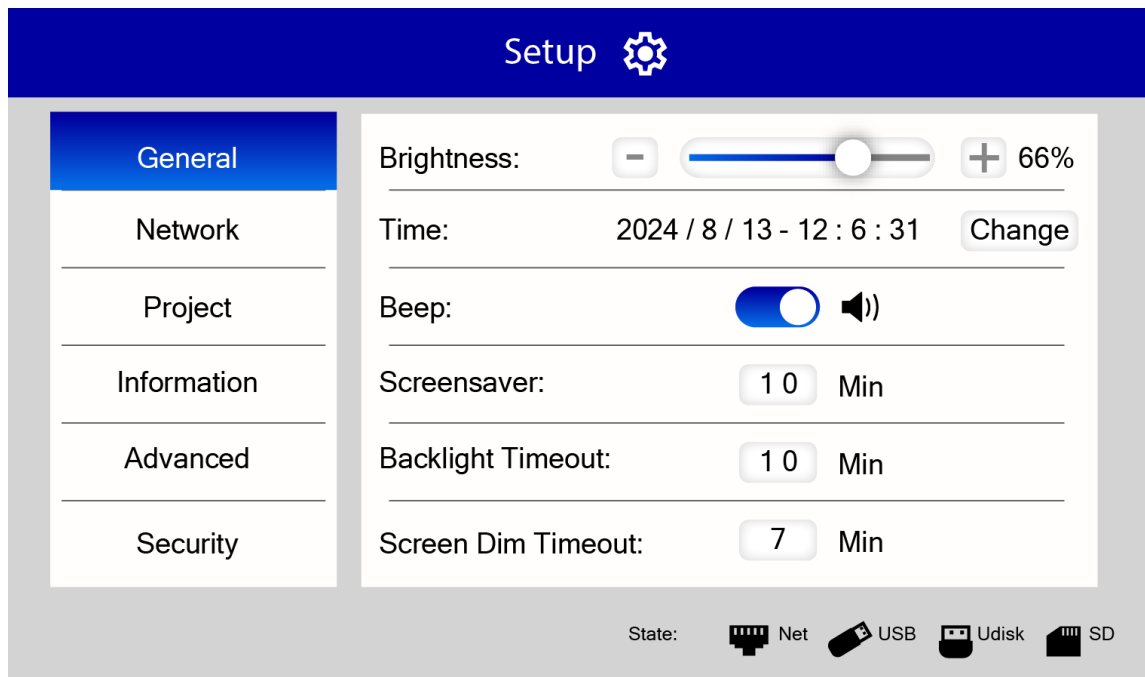


- Touch and hold the screen for 4-5 seconds. The screen shown in the following figure will appear. Then, press the “setup” button .

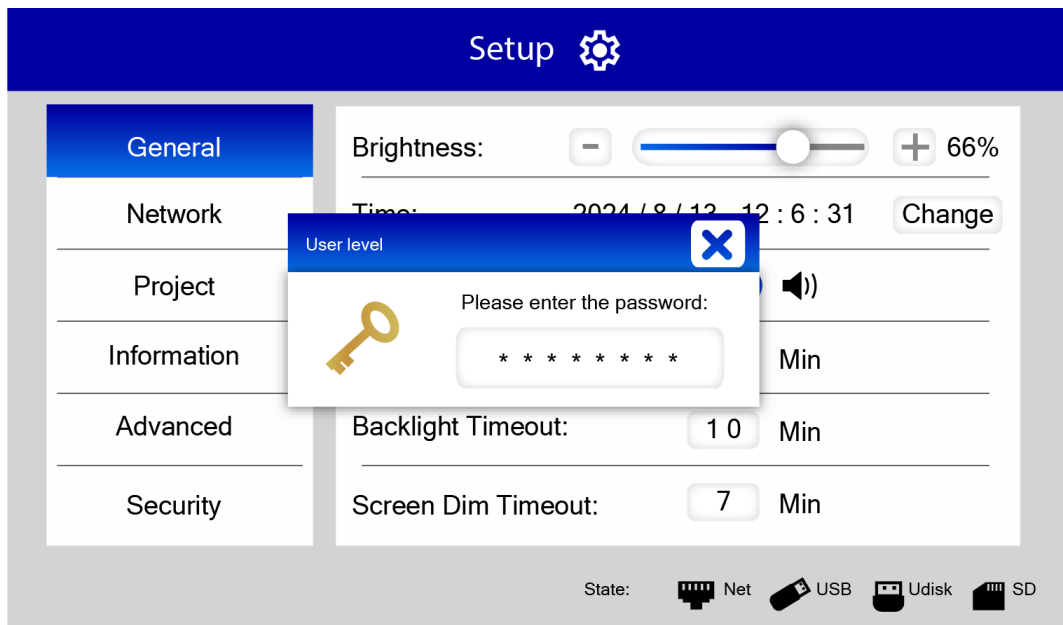
Setup



- 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**.



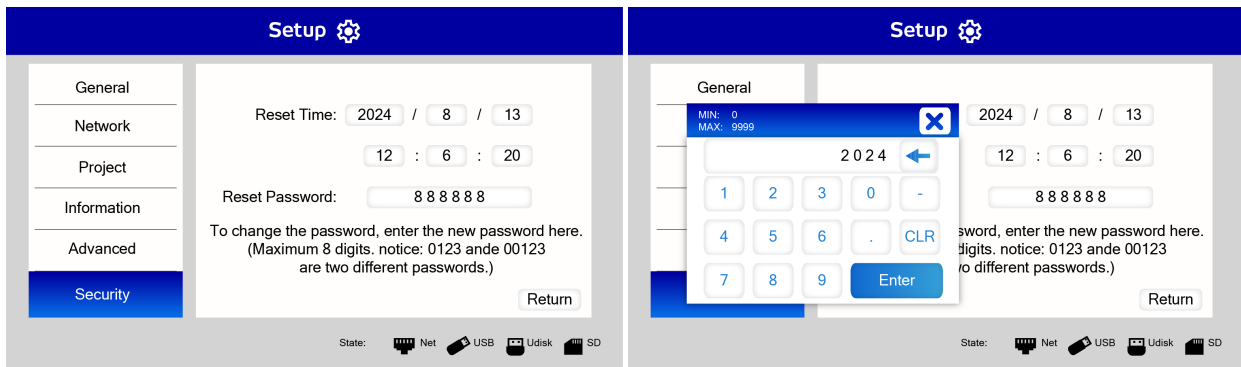
- You will be asked to enter a password.



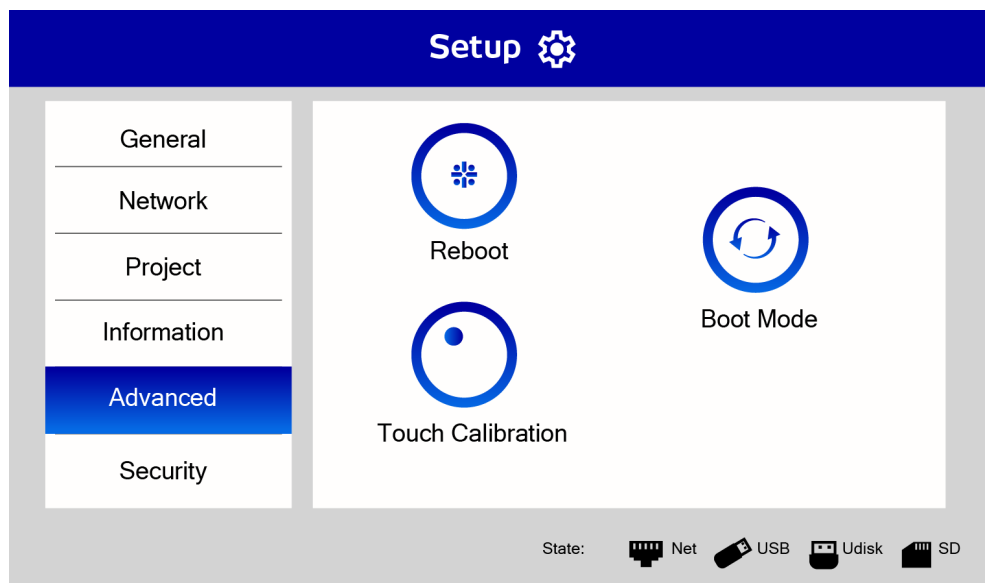
NOTE

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 carrying out any inspection or maintenance, disconnect the board from the power supply.

It is recommended to periodically de-energize the equipment and confirm that there is no voltage, carry out the following:

- Remove dust, dirt, and grease from the starter's surface using a lint-free cloth, brush, or vacuum cleaner. Do not use compressed air, as it may introduce particles inside
- Avoid using aerosols or allowing petroleum-based chemicals, solvents, or paints to come into contact with electrical connections, both inside and outside the switch.
- Tighten the component terminals according to the torque values (Nm) specified for each item.
- Ensure that the power cable is in good condition, with no visible damage such as cracks, marks, or burnt copper wires.
- Ensure that the internal components of the board show no signs of burns or impacts and that they are securely fastened to the starter.

11. 4.- POSSIBLE FAULTS AND SOLUTIONS

Code	Error	Possible cause	Solutions
E.SC1 (1)	Acceleration alert	- Excessive distance between the drive and the motor connection cable. - Short circuit at the drive output. - Electrical interference in the system. - Excessive motor load.	- Turn off the power supply. - Ensure the connection cable length is within the recommended range; if necessary, install a reactor at the drive output. - Inspect the wiring for integrity. - Verify and adjust the load to reduce torque demand.
E. SC2 (2)	Slowdown alert		
E.SC3 (3)	Alert in operation		
E. oC1 (5)	Overcurrent during acceleration	- Load current exceeds the programmed limit. - Acceleration or deceleration time is too short. - Possible electrical failure. - Low mains voltage. - Load imbalance or mechanical anomalies.	- Adjust the maximum current limit. - Increase the acceleration/deceleration time. - Inspect the wiring and verify mains voltage. - Ensure the load operates correctly without obstructions.
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 overtemperature	Dirt or damage to the forced ventilation system (fan)	- Clean the air duct or change the fan. - Lower the room temperature.

Code	Error	Possible cause	Solutions
E. O2 (31)	IGBT module overtemperature	The ambient temperature is too high	
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 detected from the ground output phase, either in the cable connecting the variable frequency drive to the motor or within the motor itself.	- Verify the absence of ground faults in the motor by measuring the grounding resistance of both the motor cables and the motor using a megaohmmeter. - Ensure the system is properly grounded.
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	Inspect 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		
119	End of curve protection	Pipeline leaks	Perform a thorough inspection of the hydraulic system to detect potential pipeline leaks and

Code	Error	Possible cause	Solutions
		Incorrect settings in the parameters	- carry out the necessary repairs to maintain system integrity and efficiency. - Verify that the speed and current parameters of the motor pump are correctly adjusted according to the specifications on its data plate.



NOTE

To replace any damaged component, contact your authorized dealer.