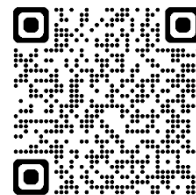




Year: 2025
Version 1.02
Software Version:1012+



This user manual provides comprehensive information for the effective and safe operation of the CCS-M Compressor Control Panel. It includes detailed guidance on menu navigation, display indicators, electrical wiring diagrams, as well as alarm and fault descriptions—covering every step for seamless usage.

The CCS-M Compressor Control Panel is designed for precise management of screw and piston compressors in industrial environments. Featuring a 2.8-inch color TFT display, it presents operating data clearly and supports features such as parallel operation, energy saving, and fault backup to ensure efficient and reliable system control. Engineered for harsh conditions, the panel has an IP65-rated enclosure, delivering durable and high-performance control in compliance with industrial standards.

CCS-M panels feature a unique “Parallel Operation” and “Equal Aging” algorithm, enabling the management of any number of compressors with capacity-based priority programs, fault-backup modes, and demand-based redundancy strategies. CAN Bus communication allows multiple control modules to be connected in parallel—eliminating the need for a master controller.

The built-in USB port enables system configuration using the license-free PC-Tools software package. For SCADA network integration, an optional RS485 port with Modbus protocol can be added. Additional communication modules can also be integrated to enhance performance for more demanding applications.

With an advanced fault logging system, the CCS-M stores the last 50 faults complete with timestamps and all relevant operating data at the time of the event.

The CCS-M module is compatible with both Star-Delta starter setups and direct interfacing with inverters. All necessary parameters are available in the system menu and can be easily configured. Equipped with digital and analog I/O ports, the panel is suitable for a wide range of industrial applications.

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2 FACEPLATE INTRODUCTION



- **A:** Customer marking area. Laser marking can be applied to this area according to the order.
- **B:** Left / Exit button. Used for returning to the previous page while navigating the menu, exiting, or switching digits when adjusting parameters.
- **C:** Up button. Used for navigating within the menu or changing a setting or parameter.
- **D:** Start button. Used to operate the compressor.
- **E:** Status LED. (See DEFINITION OF LED INDICATORS)
- **F:** Right button. Used for switching digits when navigating the menu or adjusting parameters.
- **G:** Down button. Used for navigating within the menu or changing a setting or parameter.
- **H:** Enter button. Used to access the main menu from the home screen, enter submenus from the main menu, or save a configured parameter or setting.
- **I:** Stop button. Used to stop the operating compressor.
- **J:** Fault LED. (See DEFINITION OF LED INDICATORS)
- **K:** Horn Mute / Fault Reset button. Used to clear faults and activate the horn output, if present, when a fault occurs and is resolved in the system.
- **L:** Information button. Used to easily access information about the compressor and the panel.
- **M:** Service button. Used to quickly access the service menu that displays compressor service intervals.
- **N:** Fault Log button. Used to quickly access the menu containing the records of faults that occurred in the compressor.
- **O:** 2.8" TFT screen.

2.1 Description of Led Indicators

There are 2 led indicators on the panel.



Status Indicator: Provides information about the status of the panel and the compressor.

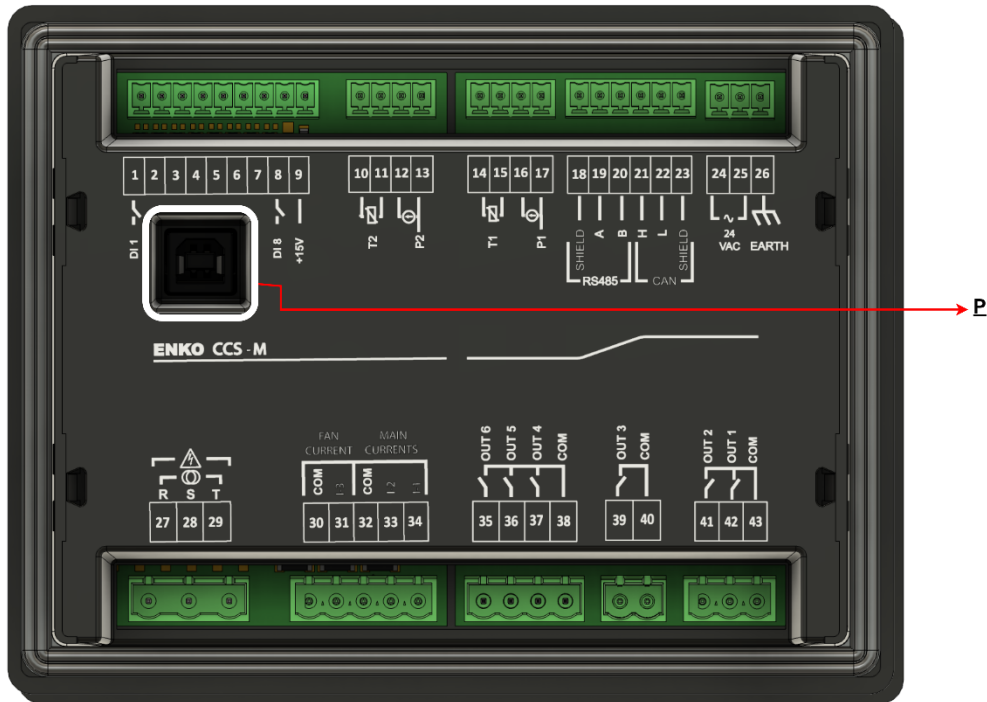
Led Color	Status	Description
Green	Fixed	If the START button on the compressor panel is used to start the compressor, it remains continuously lit regardless of the compressor's operating status.
Green	Flash 0.5 sec.	After pressing the START button on the compressor panel, the light flashes with a 0.5-second period while the start delay time is being counted.
Green	Flash- 1 sec.	If started with the START button, the light flashes with a 1-second period when transitioning to the "Automatic-Standby" operating mode.
Blue	Fixed	When the compressor is started via Digital Input or communication , the status indicator remains solid blue while the motor is running.
Blue	Flash- 0.5 sec.	When the compressor is started via Digital Input or communication , the light flashes with a 0.5-second period while the start delay time is being counted.
Blue	Flash -1 sec.	If the compressor is started via Digital Input or communication , the light flashes with a 1-second period when transitioning to the "Automatic-Standby" mode.



Fault Indicator: Provides information about the fault status on the panel.

Led Color	Status	Description
Red	Flash slow	Indicates that there is a warning on the device.
Red	Fixed	Indicates that there is a fault on the device.
Red	Flash fast	Indicates that the device is in the software boot stage. (USB cable is connected to the PC)

3 BACK SIDE INTRODUCTION



P:

USB Type B socket. This socket, which enables the panel to connect to a computer, is used for various operations such as software updates, parameter upload/download, and language changes.

Terminal 1-9:

This terminal group contains digital inputs. Terminal 1 represents Digital Input 1. Similarly, terminals 2, 3, 4, 5, 6, 7, and 8 represent digital inputs 2, 3, 4, 5, 6, 7, and 8, respectively. Terminal 9 is the common terminal for these inputs.

For the inputs:

- Different functions can be assigned,
- Contact types can be modified,
- Detection times other than zero can be assigned.

Terminal 10-13:

This terminal group includes the T2 temperature sensor and the P2 pressure sensor. The T2 temperature sensor, connected between terminals 10 and 11, is the second temperature sensor and is optional. Similarly, the P2 pressure sensor, connected between terminals 12 and 13, is the second pressure sensor and can be used to measure the compressor’s internal (screw) pressure. This sensor connection is also optional.

Terminal 14-17:

This terminal group includes the T1 temperature sensor and the P1 pressure sensor. The T1 temperature sensor, connected between terminals 14 and 15, is used to measure the screw temperature. Similarly, the P1 pressure sensor, connected between terminals 16 and 17, is the first pressure sensor and is used to measure the compressor’s external (Network/Tank/Line) pressure.

Terminal 18-23:

This terminal group contains the panel's communication sockets.

- Terminals 18, 19, and 20 are for the isolated RS-485 socket. Terminal 18 is used for shielding connections to reduce noise interference, terminal 19 is used for the RS-485 A line, and terminal 20 is used for the B line. The RS-485 socket can be used for inverter or SCADA communication, depending on the application.

Terminals 21, 22, and 23 are for isolated CAN communication. Terminal 21 is for the CAN High line, terminal 22 is for the CAN Low line, and terminal 23 is for shielding to reduce noise interference. The CAN line can be used for communication between two or more compressors to perform functions such as equal aging, fault redundancy operation, sequential operation, or power redundancy operation.

Terminal 24-26:

This terminal group includes the power supply inputs and the ground connection for the panel. Terminals 24 and 25 are used for the required 24 VAC power input. Terminal 26 is used for the ground input, which protects the panel from external noise and leakage currents.

Terminal 27-29:

This terminal group is used for measuring the input voltages of the compressor motor, ensuring phase sequence control, and calculating the power consumed by the motor. (For power calculation, motor phase current connections must also be made in addition to input voltages.)

Terminal 30-34:

This terminal group is used for measuring the currents drawn by the compressor motor and fan, protecting the motor and fan from overcurrent, and calculating power consumption. (For power calculation, input voltage connections for the motor phases must also be made, in addition to the current connections.)

Terminal 35-43:

This terminal group contains outputs.

- Terminal 38 is the common terminal for terminals 35, 36, and 37.
- Terminal 35 represents Output 6, terminal 36 represents Output 5, and terminal 37 represents Output 4.
- Terminal 340 is the common terminal for terminal 39.
- Terminal 39 represents Output 3.
- Terminal 43 is the common terminal for terminals 41 and 42.
- Terminal 41 represents Output 2, and terminal 42 represents Output 1.

For the inputs:

- Different functions can be assigned,
- Contact types can be modified,
- Detection times other than zero can be assigned.

4 SCREEN AND MENU STRUCTURE

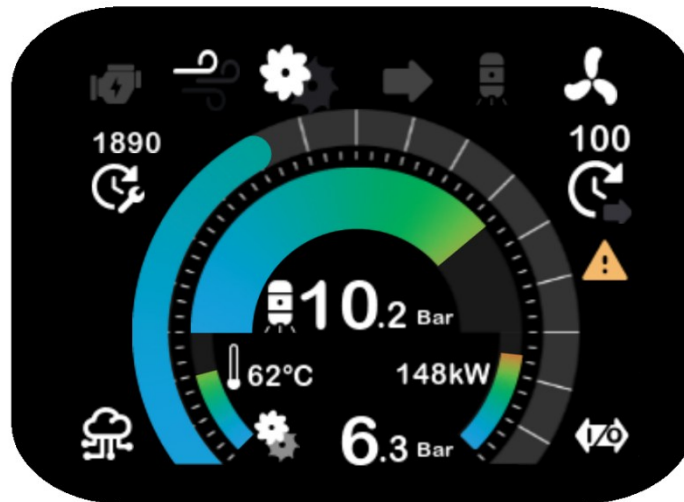
4.1 Opening Screen

When the device is first powered on, it displays the following information on the screen:

- **Software Version:** Indicates the version of the installed software on the device.
- **Bootloader Version:** Indicates the version of the device's bootloader software.

After displaying the software version for **3 seconds**, the device shows the **company information screen**, which can be customized and uploaded based on customer requirements. (After displaying the company information screen for **3 seconds**, the device transitions to the main operating screen.)

4.2 Main Operation Screen



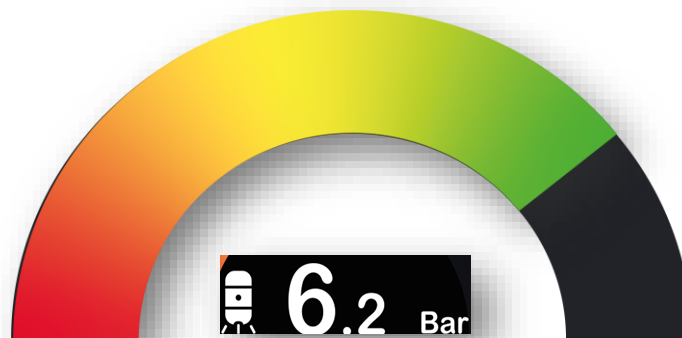
On the startup screen, at the top, there is a mimic diagram that shows the operating status of the compressor's main instruments. In the top left area, below the mimic diagram, the counter indicates the remaining time for the nearest service. In the top right area, below the mimic diagram, the counter and icons indicate the operating stages and fault conditions of the compressor. The icon in the bottom right shows the compressor's control source, while the icon in the bottom left indicates the compressor's operating mode. The indicators and values in the center display the values of the compressor's analog measurement sensors and their corresponding indicators based on fault levels.

4.3 External Pressure Gauge



Indicates the internal pressure of the compressor. The minimum value of the display is "0" Bar, while the maximum value is determined according to the fault value of the internal pressure analog sensor.

4.4 Internal Pressure Gauge



Indicates the external pressure of the compressor. The minimum value of the display is "0" Bar, while the maximum value is determined according to the fault value of the external pressure analog sensor.

4.5 Screw Temperature Indicator



Indicates the screw temperature of the compressor. The minimum value of the display is equal to the minimum value of the temperature sensor, while the maximum value is equal to the maximum measurement value of the sensor.

4.6 Power Indicator



Indicates the instantaneous power consumed by the compressor. While the minimum value of the indicator is "0" kW, the maximum value is determined according to the power value calculated with the high current fault and high voltage fault value.

4.7 Compressor Status Indicator



It is in this area that indicates the condition of the compressor;

- At the top is the status counter of the compressor. The unit is seconds. If the compressor counts a time to change state, this time is shown here.
- The alarm and warning icon of the compressor, if present, appears at the bottom. If the icon is blinking red, it indicates a fault in the system and if it is blinking orange, it indicates a warning in the system.
- In the center there are icons showing the status of the compressor:



Indicates that the compressor is in stop position.



Indicates that the compressor is about to start (the compressor starts after the timer on the icon expires).



It indicates that the compressor motor has started, and the motor is trying to reach the speed required for the compressor according to the drive source (Star-Delta or Inverter).



Indicates that the compressor is idle.



Indicates that the compressor will switch to load at the end of the counter time.



Indicates that the compressor is idle for Preheating.



Indicates that the compressor is running at load for Preheat.



Indicates that the compressor is on load.



Indicates that the compressor will switch to stop position at the end of the counter time.



Indicates that the compressor is in the automatic standby phase.



It indicates that the internal pressure is high for the compressor to start working and that the compressor will start working as a result of the pressure relief on the screw.



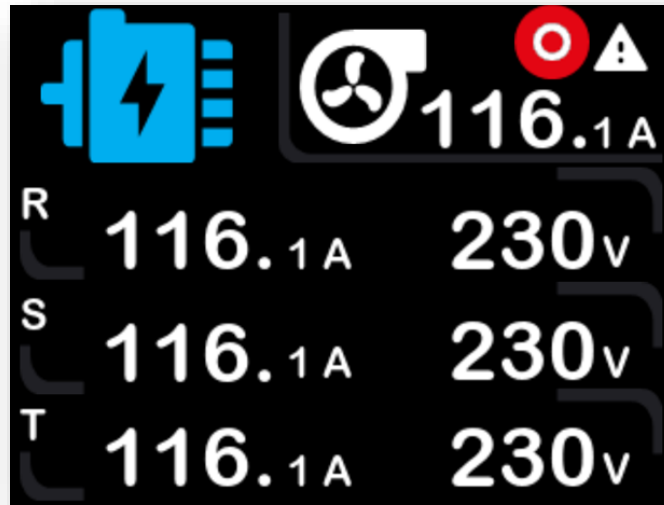
Indicates that the compressor is in the bleeding phase.

4.8 Analog Values Display



- On this screen, the value of the 2nd temperature sensor, compressor status information icon, alarm information icon are located in the upper right area. In the rest of the screen from top to bottom respectively;
- Value of the internal pressure sensor corresponding to the screw pressure
- The value of the external pressure sensor corresponding to the mains / operating / tank pressure
- The value of the screw temperature sensor is shown.

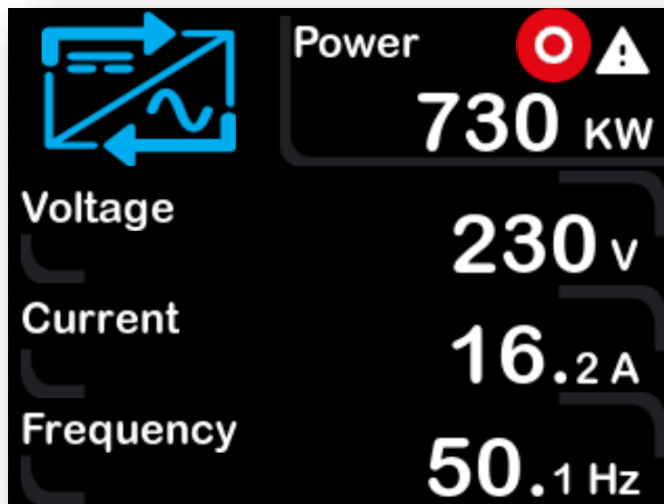
4.9 Network Measurement Screen



On this screen, in the top right area, the fan motor current value, compressor status icon, and alarm information icon are displayed. Continuing down the screen, from top to bottom and left to right, in order:

- The current and voltage values of the R-phase
- The current and voltage values of the S-phase
- The current and voltage values of the T-phase are shown.

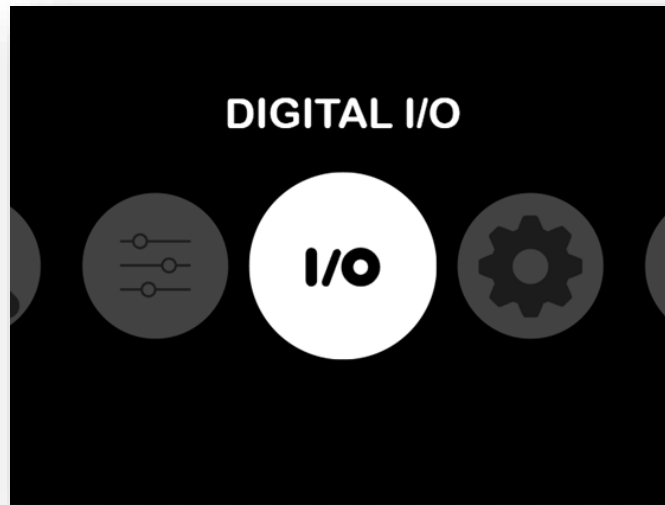
4.10 Inverter Monitoring Screen



On this screen, in the top right area, the instantaneous power value of the inverter, the compressor status icon, and the alarm information icon are displayed. Continuing down the screen, from top to bottom and left to right, in order:

- The voltage value applied by the inverter to the motor
- The current value applied by the inverter to the motor
- The frequency values applied by the inverter to the motor phases are shown.

4.11 Main Menu Screen



To access this screen, the enter key should be pressed on the main screen or tracking screens. On this screen, you can use the navigation (left and right) buttons to see different menu headings and access these menus with the enter key;

• **Digital I/O:**

Represents the digital input and output menu. Under this menu, you can observe the functions assigned to the digital inputs and outputs, their active/inactive statuses, and contact types.

• **Parameters:**

Represents the menu containing parameter headings for the compressor and panel. Under this menu, the following headings are available:

- ✓ Pressure
- ✓ Timing
- ✓ Digital Inputs
- ✓ Digital Outputs
- ✓ Service Hours
- ✓ Calibration
- ✓ Temperature
- ✓ Network
- ✓ General Settings
- ✓ Inverter (depending on the driver parameters)
- ✓ Parallel Control (depending on the Operating Mode parameters)

You can access, observe, or configure the relevant parameters under these headings.

• Fault Records:

Represents the menu where faults that occurred based on motor running hours are recorded. There are 50 fault records available for the panel. With each new fault record, the stored fault sequence increases by one. When the 50th fault record is reached and a new fault record is created, the 50th fault is deleted and the 49th fault takes its place.

• Service Hours:

The compressor's service counters, including total and load operating hours, can be tracked under this heading.

• Panel Settings:

Shortcuts to various settings related to the panel can be accessed under this menu:

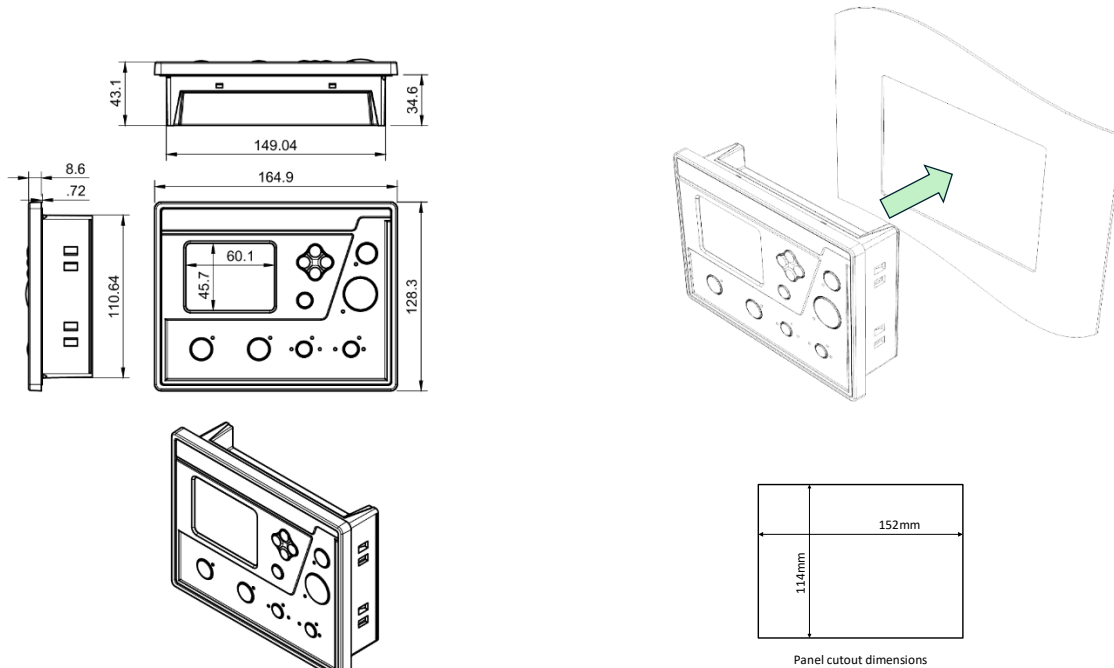
- **Language:** The device's language can be adjusted under this heading.
- **Service:** The service page is where analog sensor inputs in the device, 12-bit analog values, and current measurement results can be compared. This page is organized to provide more information to technical service in case of a potential issue.
- **Device Information:** A page showing the device's software and hardware information, machine serial number, and production code.
- **Screen Brightness:** A page created to adjust the screen brightness.
- **Exit:** A shortcut for quick return to the main screen.

5 TECHNICAL SPECIFICATIONS

Technical Specification	Value	Description
Input Supply Voltage:	10Vac to 24Vac	The device can be powered from AC or DC isolated power sources.
	20Vdc to 50Vdc	
Input Supply Frequency:	45Hz to 75Hz	Suitable for 50Hz and 60Hz utility systems
Display:	2.8" LCD Color	High-resolution, high-brightness TFT type.
Keypad:	Silicone Rubber	UV-resistant keypad and enclosure
AC Voltage Measurement:	3- Phase	Up to 540Vac ph-ph, TRUE rms
Phase sequence detector	3-ph	Phase direction detection
AC Current Measurement:	2-Phase Main Motor	Motor current reading with power calculation and monitoring.
	1-Phase Fan Motor	
Digital Inputs:	8- Digital Inputs	Configurable inputs.
Analog Inputs:	4- Analog Inputs	2 Temperature (NTC, KTY, Pt100/1000)
		2 Pressure (4-20mA)
Digital Outputs:	6- Digital Outputs	6 Outputs, 5A 250Vac each.
Communication Ports:	USB2.0 Type-B	Configuration software connection.
	RS485 Mod BUS	For modem, frequency inverter, and SCADA
	CAN Bus Port	For multi-unit operation.
Operating Temperature:	-20°C to +60°C	Wide operating range.
Storage Temperature:	-25°C to +85°C	
Operating Humidity:	10%RH to 97%RH	Non-condensing.
EMC Compliance:	EN61000-6-2 EN61000-6-4	Class-A EMC emissions and immunity compatibility
Safety Compliance:	CATIII, 300V	UL508, UL94 flammability
Vibration & Shock:	MIL810G	Transportation
Protection Rating:	IP54	From the front (with gasket)
	IP00	From the back
Overall Dimensions:	165 x 129 x 45	Dimensions are in millimeters
Panel Cutout:	151 x 113	
Mounting Type:	Panel Mount	With screw type retention clamps
Weight:	180gr	Approximate weight.

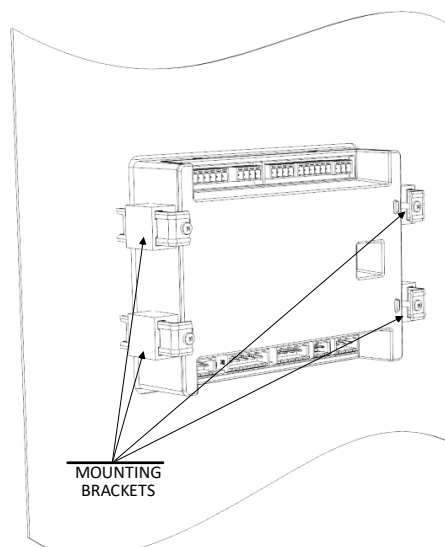
6 CCS-M MECHANICAL INSTALLATION

CCS-M plastic enclosure is designed for panel mounting and installation must be made from the front side of the panel. The IP protection class complies with IP54 from the front side and IP00 from the back side of the enclosure. Mechanical dimensions, mounting position and direction are shown below. All dimensions are given in mm units:

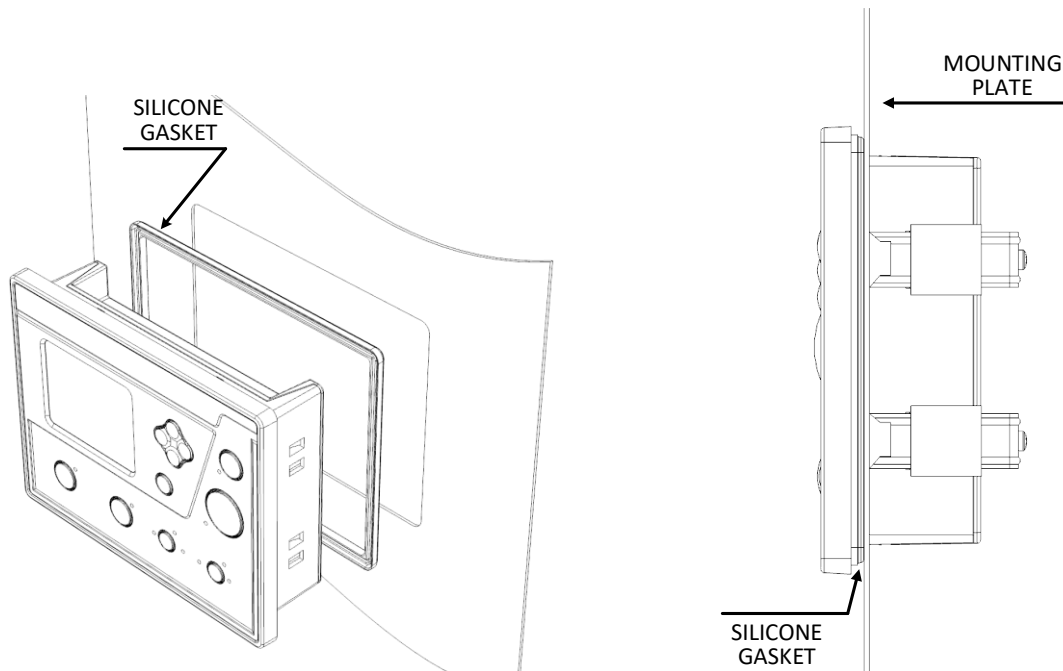


Minimum mounting panel plate thickness is 1.0mm and maximum allowed plate thickness is 5.0mm.

CCS-M can be fixed on to the panel plate with mounting brackets, which are supplied together with the unit. As standard application, 4 mounting brackets should be used to fix the control panel to the plate but in some restricted case, 2 mounting brackets can also be used and they **MUST** be mounted on opposite corners as shown in the diagram below:



If the control panel is going to be mounted in open environment, where it will be exposed to atmospheric conditions, optional “silicone gasket” MUST be used. This part is available on demand and should be inserted into the “gasket nest” on the back side of the controller plastic frame as shown in the figure below:



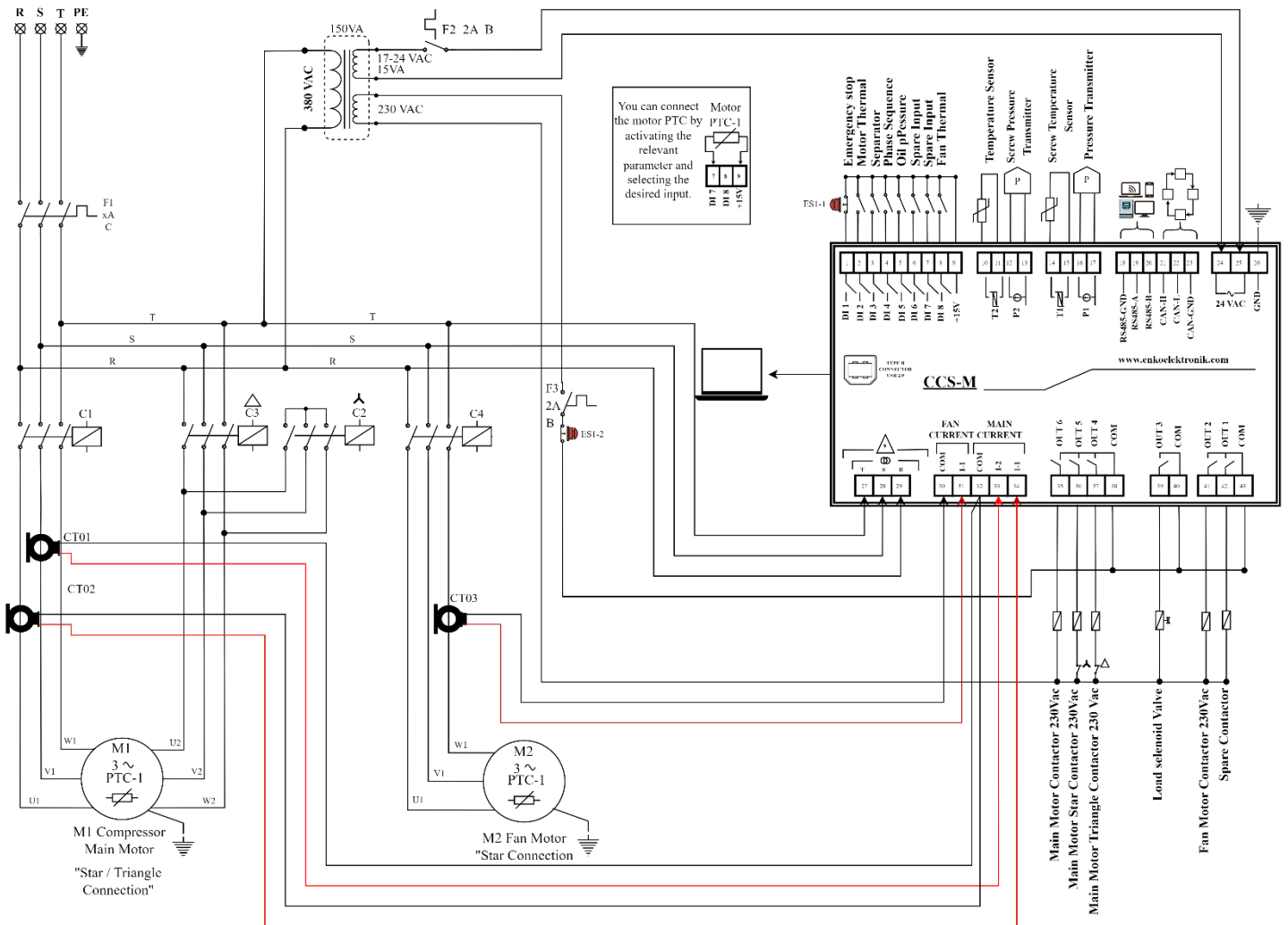
When tightening the mounting bracket screws, do not tighten the screws more than necessary. If the panel is mounted without the silicone gasket, make sure that all mounting bracket screws tightened equally and just enough to keep the enclosure rigidly on the panel opening. If the panel is mounted with the silicone gasket, just tighten the screws until the silicone gasket is completely pressed and the plastic frame edges is touching the mounting plate surface.

⚠ NOT

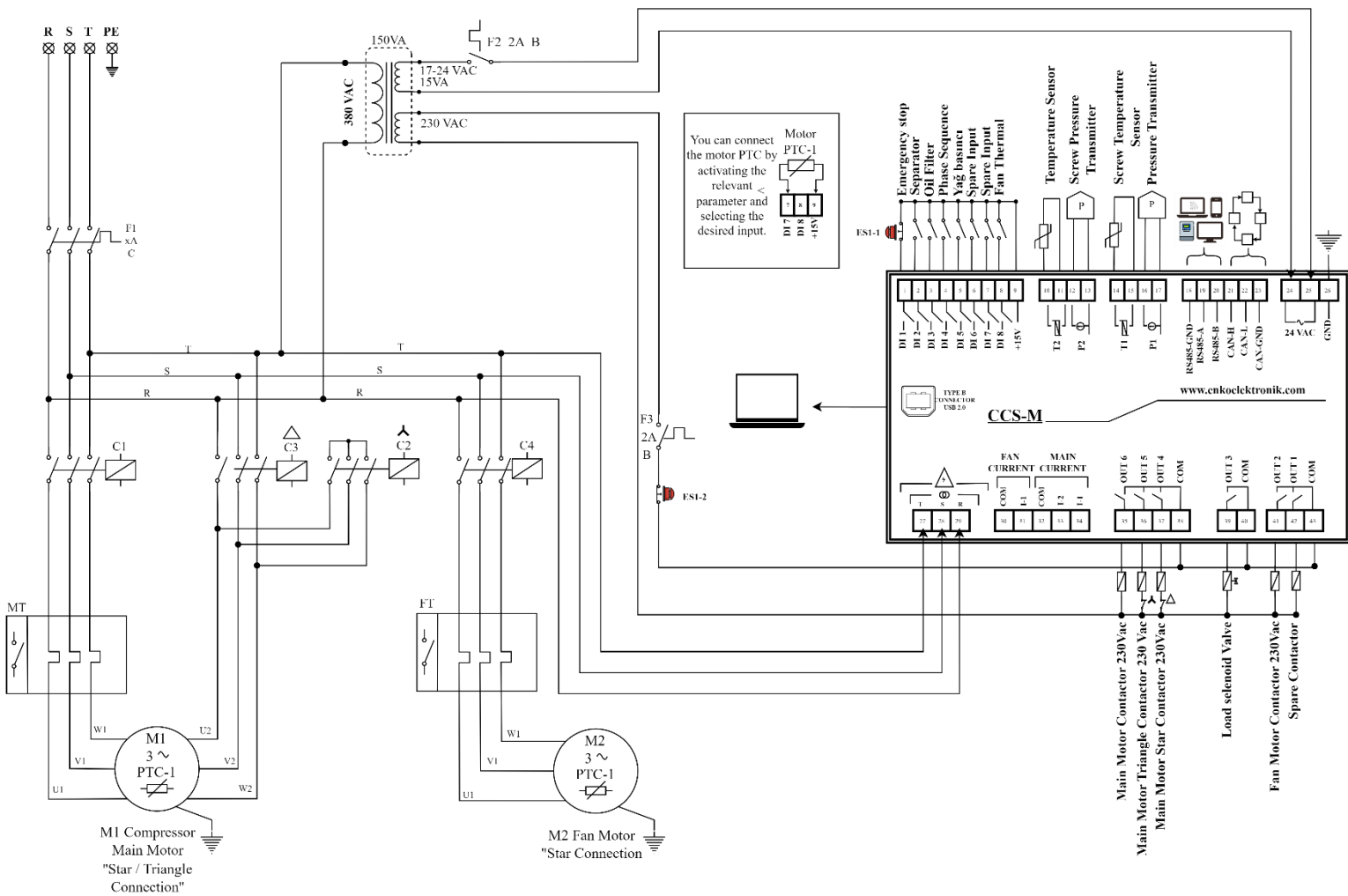
- Do not tighten the mounting bracket screws too tight. This may cause the plastic enclosure sidewalls to be deformed and jeopardise proper operation in the long term use.
- Ensure proper fitting of the silicone gasket into the frame slot prior to mounting process. If the gasket is not placed properly, IP protection cannot be guaranteed.

7 ELECTRICAL INSTALLATION AND SAMPLE CONNECTION

7.1 CCS-M Star- Triangle Application (With Current Transformer)

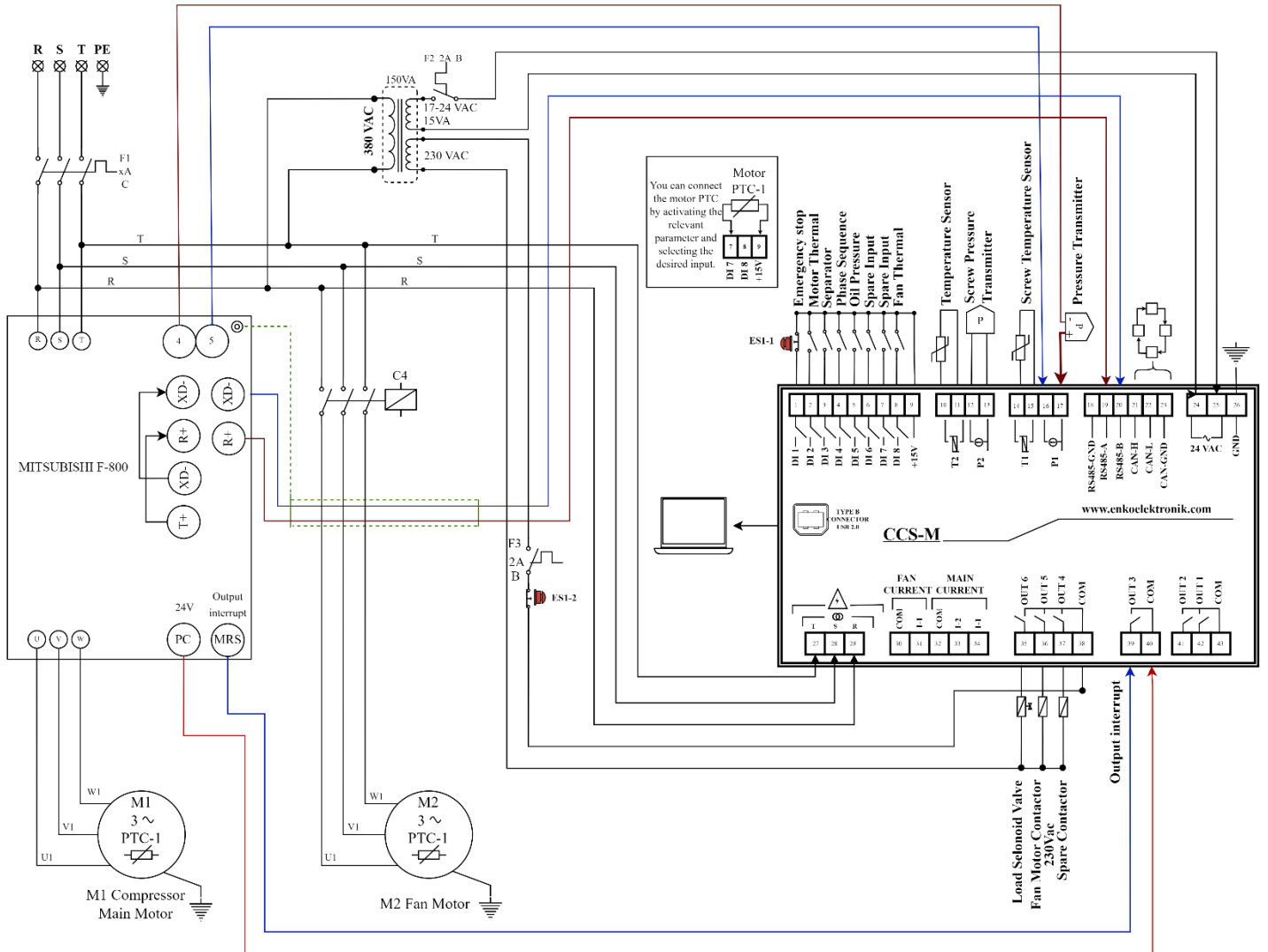


7.2 CCS-M Star- Triangle Application (with Thermocouple)

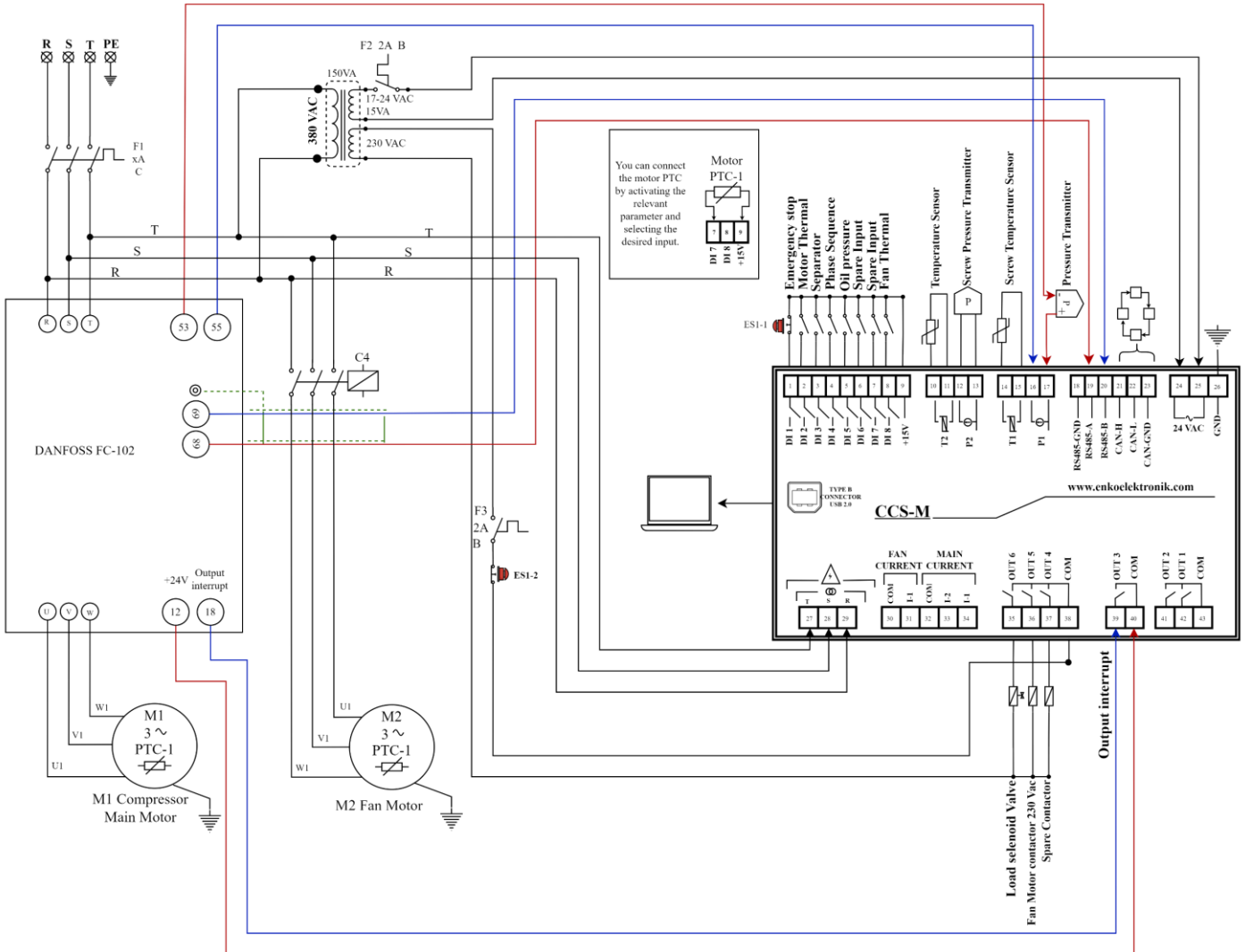


7.3 CCS-M Inverter Applications

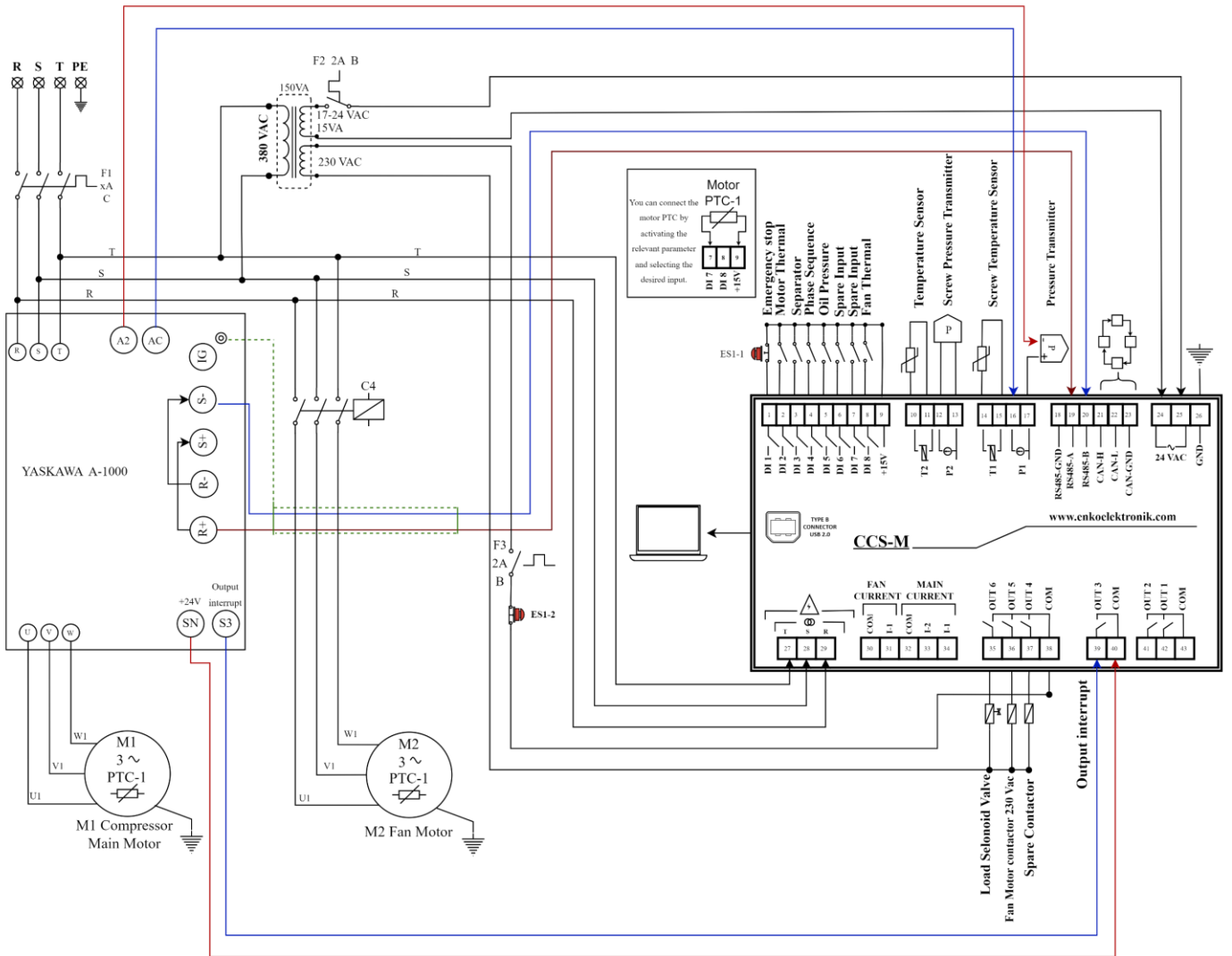
CCS-M/MITSUBISHI F-800 Connection Diagram:



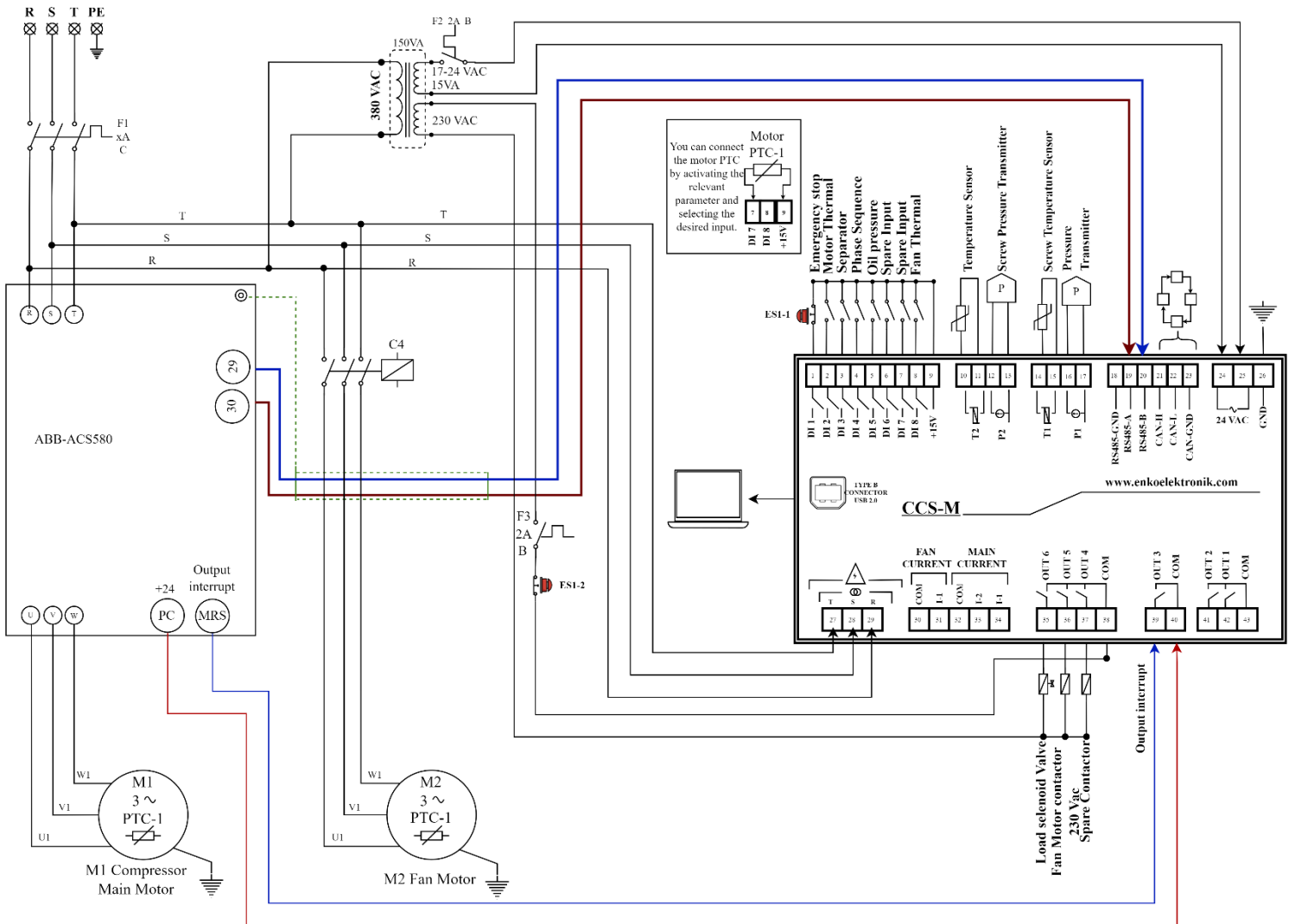
CCS-M/DANFOSS FC-102 Connection Diagram:



CCS-M/YASKAWA A-1000 Connection Diagram:



CCS-M/ABB-ACS580 Connection Diagram:



8 ALARM DESCRIPTIONS AND SOLUTION RECOMMENDATIONS

8.1 Digital Input Failures

Common procedures to be performed for all digital input failures:

- ✓ The device's digital input assignments can be changed later. The first thing to check for digital input failures is to identify which digital input the relevant fault is assigned to.
- ✓ Once the digital input fault is identified, ensure that the equipment connected to the respective input sends a **+15V** signal from the 9th terminal when the device is active.
- ✓ Ensure that the contact type of digital fault input is correctly defined.
- ✓ Check if there is any error in the wiring connections between the terminal of the device's respective input and the device's **9th terminal**.
- ✓ Ensure that the equipment connected to the respective input is working correctly.
- ✓ Check that the **+15V** signal from the 9th terminal is not shorted with another signal due to a faulty connection.

NOT

- 15 Vdc voltage is generated by the device from the terminal 9 of the device defined as +15V and will be used for the equipment to be connected to the inputs. No external voltage should be applied to this terminal. If it is applied, the device will malfunction and will be out of warranty.
- It is recommended to select the function parameters of the unused inputs of the device as "None" and to select the Contact Type parameters as "NO" normally open

8.1.1 Emergency Stop

Fault Description: A fault that stops the compressor quickly.

Possible Causes and what to do: The Emergency Stop button may have been pressed. The contact type may be incorrect. Check that the terminal of the Emergency stop button is correctly connected to the default input “DI1” terminal 1 and that the signal is transferred from terminal 9 to the corresponding input when the ignition is closed.

8.1.2 Separator

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The filter sensor contact may have been activated due to a clogged separator. The sensor may be faulty. The contact type may be incorrect. Verify that the separator filter contact terminal is correctly connected to terminal 3, the default input “DI3,” and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.3 Oil Pressure

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The sensor contact may have been activated due to low oil pressure levels. The sensor may be faulty. The contact type may be incorrect. Verify that the oil pressure contact terminal is correctly connected to terminal 5, the default input “DI5,” and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.4 Phase Sequence - DI (Digital Input Usage)

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The motor phases may have been connected incorrectly. The phase sequence relay contact may have been activated. The contact type may be incorrect. The phase sequence relay may be faulty. Verify that the phase sequence relay contact terminal is correctly connected to terminal 4, the default input “DI4,” and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9. Check the phase connections.

8.1.5 Motor Thermal

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The motor protection thermal may have been activated. The contact type may be incorrect. Verify that the motor thermal contact terminal is correctly connected to terminal 2, the default input “DI2,” and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.6 Fan Thermal

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The fan motor protection thermal may have been activated. The contact type may be incorrect. Verify that the fan motor thermal contact terminal is correctly connected to terminal 8, the default input “DI8,” and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.7 PTC Fault

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: The motor temperature may have exceeded the specified limits. The PTC connected to the device may be faulty. The PTC used may not be compatible with the device. Verify that the motor PTC is connected between terminal 7, “DI7,” and terminal 9.

8.1.8 Spare Fault 1

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: A signal may be coming to the terminal assigned to the Spare Fault 1 function. The contact type may be incorrect. Verify that the equipment terminal connected to the relevant fault is correctly connected and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.9 Spare Fault 2

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: A signal may be coming to the terminal assigned to the Spare Fault 2 function. The contact type may be incorrect. Verify that the equipment terminal connected to the relevant fault is correctly connected and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.10 Cover Opened

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: A fault indicating that the compressor’s panel cover is open. Verify that the equipment terminal connected to the relevant fault is correctly connected and ensure that when the contact closes, the signal is transmitted to the relevant input from terminal 9.

8.1.11 Low Pressure

Fault Description: A fault that stops the compressor quickly.

Possible Causes and Actions to Take: This fault mode occurs when a compressor operating in booster mode generates a Low Pressure signal for the duration specified in parameter P121. To resolve this fault, ensure that the pressure in the input pressure line is sufficient and that the Low Pressure Switch on this line is functioning correctly.

8.2 Analog Input Failures

Analog inputs are defined as terminals 10-13 (P1, P2, T1, T2), voltage inputs as terminals 27-29 (R, S, T), and current inputs as terminals 30-34 (COM-I3, COM-I2-I1).

8.2.1 Phase Sequence Failures

Fault Description: Indicates that the sequence of the 3-phase voltage connected to terminals 27, 28, and 29, defined as R, S, T, is incorrect. This fault stops the compressor quickly.

Possible Causes and Actions to Take: The phases connected to the R-S-T terminals of the device may not be connected correctly. There may be an issue with the cable connection. Check the Phase Voltages screen on the device information display to see if there is an imbalance in the voltage values.

8.2.2 Output Pressure Sensor Error

Fault Description: Indicates a problem with the Output Pressure Sensor connection at terminals P1 (16-17). This fault stops the compressor immediately.

Possible Causes and Actions: The Output Pressure Sensor connected to the respective terminal might be faulty, or there might be an issue with the cable connections.

Additionally, check the Supply Voltages and Sensor Voltages on the following screen. If the Supply Voltage is not between 18-30V, check the transformer used for power supply and its connections. If the Sensor Voltage is not between 14-16V, check for a short circuit in the sensor voltage connections from CCS-M terminals 9, 13, and 17. Correct any faults and verify the sensors connected to these terminals.

If the problem cannot be detected, disconnect all sockets on CCS-M terminals 1-17 and check whether the Sensor Voltage is within 14-16V. If the sensor voltage is outside this range, the device may be faulty; send it to the service center. If the voltage is within the range after removing sockets, there is a connection error. Reconnect the connections one by one to identify and correct the faulty connection.

Verify the minimum operating voltage of the pressure sensor and ensure that the sensor voltage is above this value.

8.2.3 Internal Pressure Sensor Error

Fault Description: Indicates a problem with the Internal Pressure Sensor connection at terminals P2 (12-13). This fault stops the compressor immediately.

Possible Causes and Actions: The Internal Pressure Sensor connected to the respective terminal might be faulty, unconnected, or there might be an issue with the cable connections. If the Internal Pressure Sensor is not used, the P6 Internal Pressure Sensor Usage parameter should be set to "Passive."

Additionally, check the Supply Voltages and Sensor Voltages. If the Supply Voltage is not between 18-30V, check the transformer used for power supply and its connections. If the Sensor Voltage is not between 14-16V, check for a short circuit in the sensor voltage connections from CCS-M terminals 9, 13, and 17. Correct any faults and verify the sensors connected to these terminals.

If the problem cannot be detected, disconnect all sockets on CCS-M terminals 1-17 and check whether the Sensor Voltage is within 14-16V. If the sensor voltage is outside this range, the device may be faulty; send it to the service center. If the voltage is within the range after removing sockets, there is a connection error. Reconnect the connections one by one to identify and correct the faulty connection.

Verify the minimum operating voltage of the pressure sensor and ensure that the sensor voltage is above this value.

8.2.4 Temperature Sensor 1 Error

Fault Description: Indicates a problem with the screw temperature sensor connection at terminals T1 (14-15). This fault stops the compressor immediately.

Possible Causes and Actions: The screw temperature sensor connected to the respective terminal might be faulty, or there might be an issue with the cable connections.

8.2.5 Temperature Sensor 2 Error

Fault Description: Indicates a problem with the screw temperature sensor connection at terminals T2 (14-15). This fault stops the compressor immediately.

Possible Causes and Actions: The screw temperature sensor connected to the respective terminal might be faulty, or there might be an issue with the cable connections.

8.2.6 Output Pressure Warning

Warning Description: Indicates that the value read by the Output Pressure Sensor exceeds the P5 Output Pressure Warning parameter. This is only a warning message and does not stop the motor.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application.

8.2.7 Output Pressure Failure

Fault Description: Indicates that the value read by the Output Pressure Sensor exceeds the P4 Output Pressure Fault Value parameter. This fault stops the compressor immediately.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application.

8.2.8 Internal Pressure Warning

Warning Description: Indicates that the value read by the Internal Pressure Sensor exceeds the P9 Internal Pressure Warning parameter. This is only a warning message and does not stop the motor.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application.

8.2.9 Internal Pressure Failure

Fault Description: Indicates that the value read by the Internal Pressure Sensor exceeds the P8 Internal Pressure Fault parameter. This fault stops the compressor immediately.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application.

8.2.10 Pressure Difference Warning

Warning Description: Indicates that after the Internal Pressure value exceeds the P13 Adequate Pressure parameter, the difference between Output Pressure and Internal Pressure exceeds the P12 Pressure Difference Warning parameter. This is only a warning message and does not stop the motor.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application. Check for air leaks in the system.

8.2.11 Pressure Difference Failure

Fault Description: Indicates that after the Internal Pressure value exceeds the P13 Adequate Pressure parameter, the difference between Output Pressure and Internal Pressure exceeds the P11 Pressure Difference Fault parameter. This fault stops the compressor immediately.

Possible Causes and Actions: Ensure that the relevant parameter is appropriate for your application. Check for air leaks in the system.

8.2.12 Minimum Pressure Reached

Fault Description: This fault occurs when the measured internal pressure fails to reach the value entered in the P13 “Sufficiency Pressure” parameter within the time specified in the P118 “Sufficiency Delay” parameter while the compressor is running. It rapidly stops the compressor.

Possible Causes and Actions: Ensure the relevant parameter is appropriate for your application. There may be an air leak in the system.

8.2.13 High Screw Temperature Warning

Warning Description: Indicates that the value read by the screw temperature sensor connected to terminals 14-15, defined as T1, exceeds the value entered in the P602 “Temperature 1 High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a temperature-generating issue in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.14 High Screw Temperature Fault (SCK1.UST Fault)

Fault Description: Indicates that the value read by the screw temperature sensor connected to terminals 14-15, defined as T1, exceeds the value entered in the P601 “Temperature 1 High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a temperature-generating issue in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.15 Second High Temperature Warning

Warning Description: Indicates that the value read by the second temperature sensor connected to terminals 10-11, defined as T2, exceeds the value entered in the P614 “Temperature 2 High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a temperature-generating issue in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.16 Second High Temperature Fault

Fault Description: Indicates that the value read by the screw temperature sensor connected to terminals 10-11, defined as T2, exceeds the value entered in the P613 “Temperature 2 High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a temperature-generating issue in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.17 Screw Low Temperature Warning

Warning Description: Indicates that the value read by the screw temperature sensor connected to terminals 14-15, defined as T1, is below the value entered in the P604 “Temperature 1 Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.18 Low Screw Temperature Warning

Warning Description: Indicates that the value read by the second temperature sensor connected to terminals 10-11, defined as T2, is below the value entered in the P616 “Temperature 2 Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be an issue preventing temperature rise in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.19 Second High Temperature Warning

Warning Description: Indicates that the value read by the second temperature sensor connected to terminals 10-11, defined as T2, exceeds the value entered in the P616 “Temperature 2 Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be an issue generating temperature in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the application.

8.2.20 Second High Temperature Fault

Fault Description: Indicates that the value read by the screw temperature sensor connected to terminals 10-11, defined as T2, is below the value entered in the P615 “Temperature 2 Low Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a temperature-generating issue in the system. The sensor may have been selected incorrectly. An incorrect sensor type may have been chosen. The relevant parameter value may have been incorrectly set for the applicatio.

8.2.21 Voltage Imbalance Fault

Fault Description: Indicates that the ratio of phase voltages connected to terminals 27-28-29, defined as “R-S-T,” exceeds the value entered in the P701 “Voltage Imbalance” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage imbalance in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.22 R Phase High Voltage Warning

Warning Description: Indicates that the R Phase Voltage connected to terminal 27, defined as “R,” exceeds the value entered in the P705 “Voltage High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be an overvoltage condition in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.23 R Phase High Voltage Fault

Fault Description: Indicates that the R Phase Voltage connected to terminal 27, defined as “R,” exceeds the value entered in the P704 “Voltage High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be an overvoltage condition in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.24 S Phase High Voltage Warning

Warning Description: Indicates that the S Phase Voltage connected to terminal “28,” defined as “S,” exceeds the value entered in the P705 “Voltage High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a voltage rise in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.25 S Phase High Voltage Fault

Fault Description: Indicates that the S Phase Voltage connected to terminal “28,” defined as “S,” exceeds the value entered in the P704 “Voltage High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage rise in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.26 T Phase High Voltage Warning

Warning Description: Indicates that the T Phase Voltage connected to terminal “29,” defined as “T,” exceeds the value entered in the P705 “Voltage High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a voltage rise in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.27 T Phase High Voltage Fault

Fault Description: Indicates that the T Phase Voltage connected to terminal “29,” defined as “T,” exceeds the value entered in the P704 “Voltage High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage rise in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.28 R Phase Low Voltage Warning

Warning Description: Indicates that the R Phase Voltage connected to terminal “27,” defined as “R,” is below the value entered in the P703 “Voltage Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.29 R Phase Low Voltage Fault

Fault Description: Indicates that the R Phase Voltage connected to terminal “27,” defined as “R,” is below the value entered in the P702 “Voltage Low Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.30 S Phase Low Voltage Warning

Warning Description: Indicates that the S Phase Voltage connected to terminal “28,” defined as “S,” is below the value entered in the P703 “Voltage Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.31 S Phase Low Voltage Fault

Fault Description: Indicates that the S Phase Voltage connected to terminal “28,” defined as “S,” is below the value entered in the P702 “Voltage Low Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.32 T Phase Low Voltage Warning

Warning Description: Indicates that the T Phase Voltage connected to terminal “29,” defined as “T,” is below the value entered in the P703 “Voltage Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.33 T Phase Low Voltage Fault

Fault Description: Indicates that the T Phase Voltage connected to terminal “29,” defined as “T,” is below the value entered in the P702 “Voltage Low Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a voltage drop in the system. The relevant parameter value may have been incorrectly set for the application.

8.2.34 High Frequency Warning

Warning Description: Indicates that the frequency of the 3-phase voltage connected to terminals “27-28-29,” defined as “R-S-T,” exceeds the value entered in the P709 “Frequency High Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be an increase in the mains frequency. The relevant parameter value may have been incorrectly set for the application.

8.2.35 High Frequency Fault

Fault Description: Indicates that the frequency of the 3-phase voltage connected to terminals “27-28-29,” defined as “R-S-T,” exceeds the value entered in the P708 “Frequency High Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be an increase in the mains frequency. The relevant parameter value may have been incorrectly set for the application.

8.2.36 Low Frequency Warning

Warning Description: Indicates that the frequency of the 3-phase voltage connected to terminals “27-28-29,” defined as “R-S-T,” is below the value entered in the P707 “Frequency Low Warning” parameter. It is only a warning message and does not stop the motor.

Possible Causes and Actions: There may be a decrease in the mains frequency. The relevant parameter value may have been incorrectly set for the application.

8.2.37 Low Frequency Fault

Fault Description: Indicates that the frequency of the 3-phase voltage connected to terminals “27-28-29,” defined as “R-S-T,” is below the value entered in the P706 “Frequency Low Fault” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a decrease in the mains frequency. The relevant parameter value may have been incorrectly set for the application.

8.2.38 Current Imbalance Fault

Fault Description: Indicates that the ratio of the phase currents connected to terminals “I1, I2, and COM,” defined as “32-33-34,” exceeds the value entered in the P710 “Current Imbalance” parameter. It rapidly stops the compressor.

Possible Causes and Actions: There may be a current imbalance caused by a fault in the system, motor windings, or screw. The relevant parameter value may have been incorrectly set for the application.

8.2.39 Motor Thermal AI (analog input) Fault

Fault Description: This fault occurs when the thermal protection function is triggered due to the phase currents connected to terminals 32-33-34, defined as “I1-I2 and COM”, exceeding the set thermal limits. It results in immediate shutdown of the compressor to prevent damage.

Possible Causes and Actions: Excessive current may be flowing through the phases due to a fault in the system, motor windings, or the screw unit. One or more related parameters may have been incorrectly configured based on the application requirements.

8.2.40 Fan Thermal AI (analog inputs) Fault

Fault Description: This fault occurs when the thermal protection function is activated due to phase currents connected to terminals 30-31, defined as “COM-I3”, exceeding the set thermal limits. It causes an immediate shutdown of the compressor to prevent potential damage.

Possible Causes and Actions: Excessive current may be flowing through the relevant phase due to a fault in the fan windings. The associated parameter may have been incorrectly configured based on the application requirements.

8.2.41 I-1, I-2, I3 Sensor Fault

Fault Description: This fault occurs when the current sensors connected to the device fail to detect any current at a time when current measurement is expected. For example, if motor currents are read as zero when the compressor starts running, it indicates a sensor malfunction, triggering this fault. This fault results in an immediate shutdown of the compressor.

Possible Causes and Actions: Ensure that the connected current transformers are functioning correctly. If current transformers are not used in the system, the corresponding sensor ratio and current parameter values must be set to “0”.

8.2.42 High Fan Current Fault

Fault Description: Indicates that the fan current connected to terminals “COM-I3,” defined as 30-31, exceeds the value entered in the P713 “Fan Current High Fault” parameter. It rapidly stops the compressor.

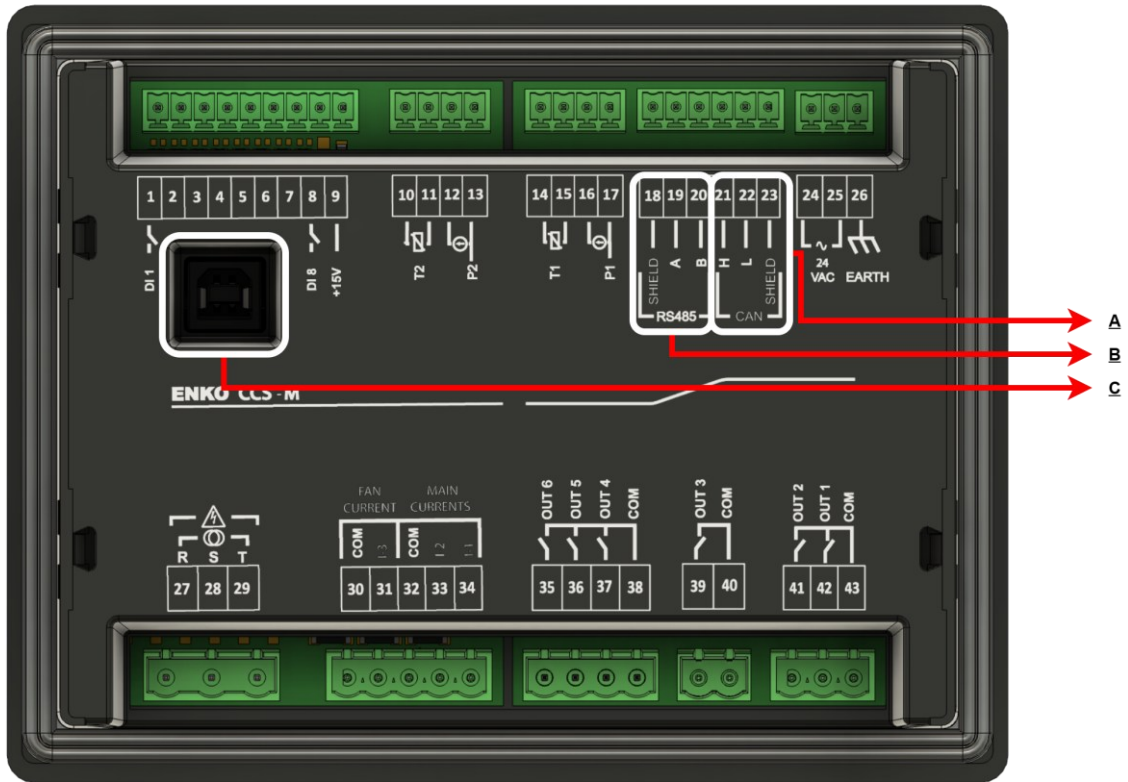
Possible Causes and Actions: High current may flow due to a fault in the fan windings. The relevant parameter value may have been incorrectly set for the application.

8.2.43 Phase Sequence Fault

Fault Description: Indicates that the 3-phase voltage connected to terminals “27-28-29,” defined as “R-S-T,” is not connected in the correct sequence or is partially missing. It rapidly stops the compressor.

Possible Causes and Actions: There may be an issue with the mains connections.

9 COMMUNICATION



A: Isolated CAN communication port:

This port allows multiple CCS units to communicate over the same BUS and operate in parallel.

B: Isolated RS485 communication port:

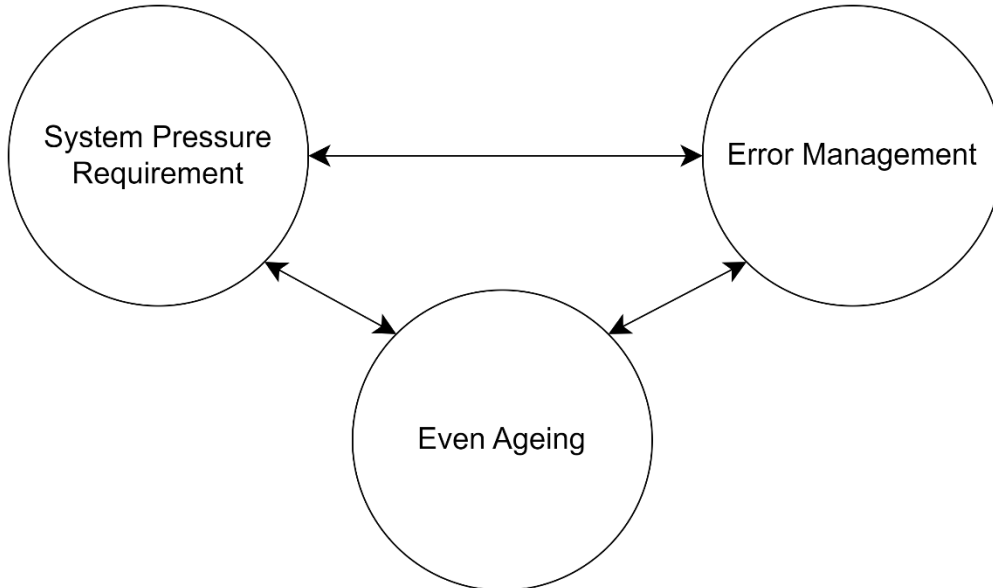
This port enables communication between the CCS and the inverter depending on the application. In the Star-Delta drive mode, this port operates in **Modbus-Server** protocol. This allows communication with **Power Cloud MKII** or a custom SCADA application, offering remote monitoring or control options.

C: USB port:

This port allows you to connect the device to a computer, perform software updates, and upload your parameter lists into the device

9.1 Parallel Control

Parallel Control: Refers to the operation of multiple CCS units with minimal equal parameters to achieve a specific target independently from each other (Multi-Master) in a system.



Equal Aging: Refers to the operation of multiple CCS units in Parallel Control mode with the aim of equal aging. The goal of equal aging is to ensure that CCS units in the system operate in turn according to their total operating times periodically.

9.2 Parallel Control LED Indications

In the **Parallel Control - Equal Aging Operation Mode**, the LED indications located just below the "Start" button represent different meanings during Parallel Mode operation:

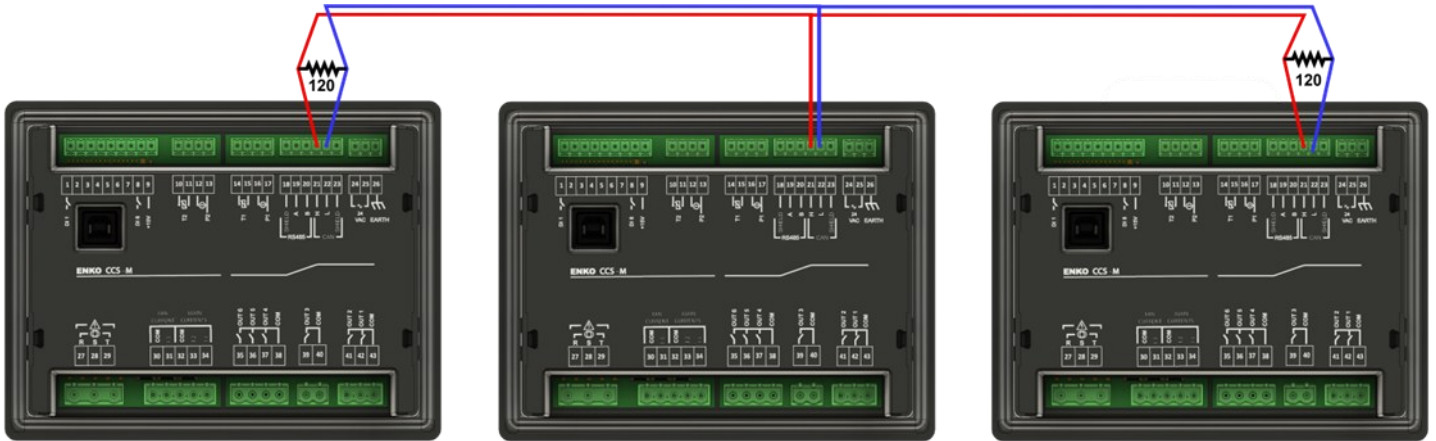


- **Flashing Red LED:** If the working LED is flashing red, it indicates that a CCS unit has not yet synchronized with the Parallel Control system or has been disconnected from the system.
- **Solid Red LED:** Indicates that a CCS is missing from the Parallel Control system, but operation has started due to the pressure requirements of the system.
- **Flashing Blue LED:** Indicates that the specified number of CCS units are present in the Parallel Control system and will start operating under appropriate conditions.
- **Solid Blue LED:** Indicates that the specified number of CCS units are present in the Parallel Control system and operation has started due to the pressure requirements of the system.

9.2.1 Parallel Control System Setup

For the installation of the Parallel Control System;

The connections of the CCS-M CAN communication line in the connection example below must be provided.



NOT

- **The first and last devices in the connection must have 120 Ω termination resistors installed. The devices in between should not have these resistors installed.**
- **For devices that have established communication links, are energized for the first time, and have the Operating Mode set to "Parallel," the system can be started by pressing the "START" button on any of the devices. All devices that are not faulty or blocked and are included in the system will start operating in the Parallel Control System when the "START" button is pressed.**

Devices connected to the CAN bus must have the P807 "Operation Mode" parameter set to "Parallel (2)."

For devices with a communication connection established and the "Operation Mode" set to "Parallel," the Parallel Control parameters should be adjusted according to the application.

9.2.2 Parallel Control Initial Operation and States

INITIAL OPERATION:

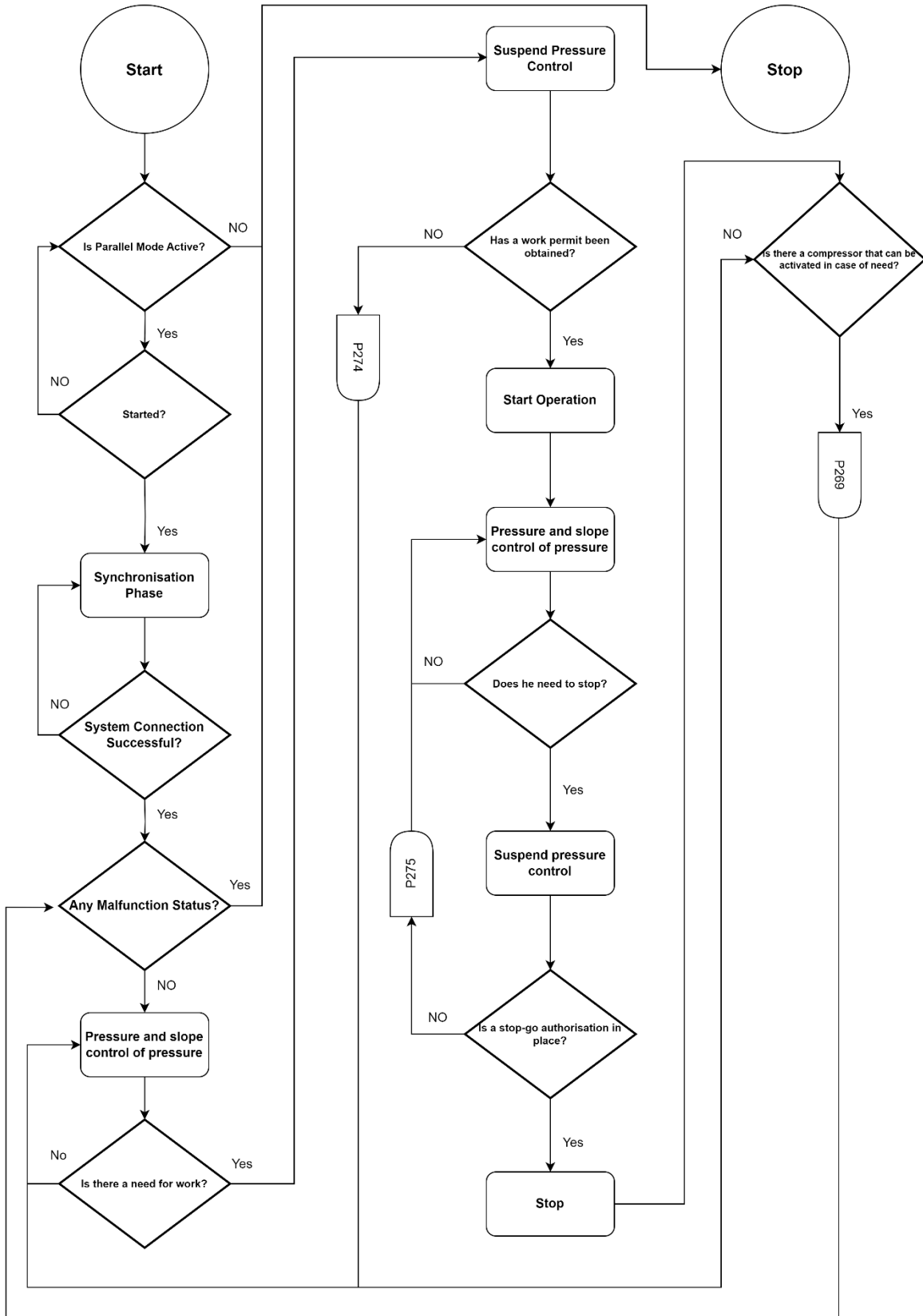
Devices with the communication, system connections, and parameters properly configured according to the requirements are powered on. The "START" button is pressed on any selected device in the system, which triggers the start command for all non-blocked devices. The devices will begin synchronizing with each other for the duration set in the "Timeout" parameter. You can evaluate the system's operational status by referencing the LED indicators.

Once the start command is received and the synchronization phase begins, the devices calculate the pressure gradient required to reach the target, taking the target time into account. Based on this calculation, the system's pressure requirements are evaluated, and the network pressure is monitored for the "Minimum Start Time." After this period, if the network pressure is below the load-on pressure, one CCS will be activated to start supplying the system.

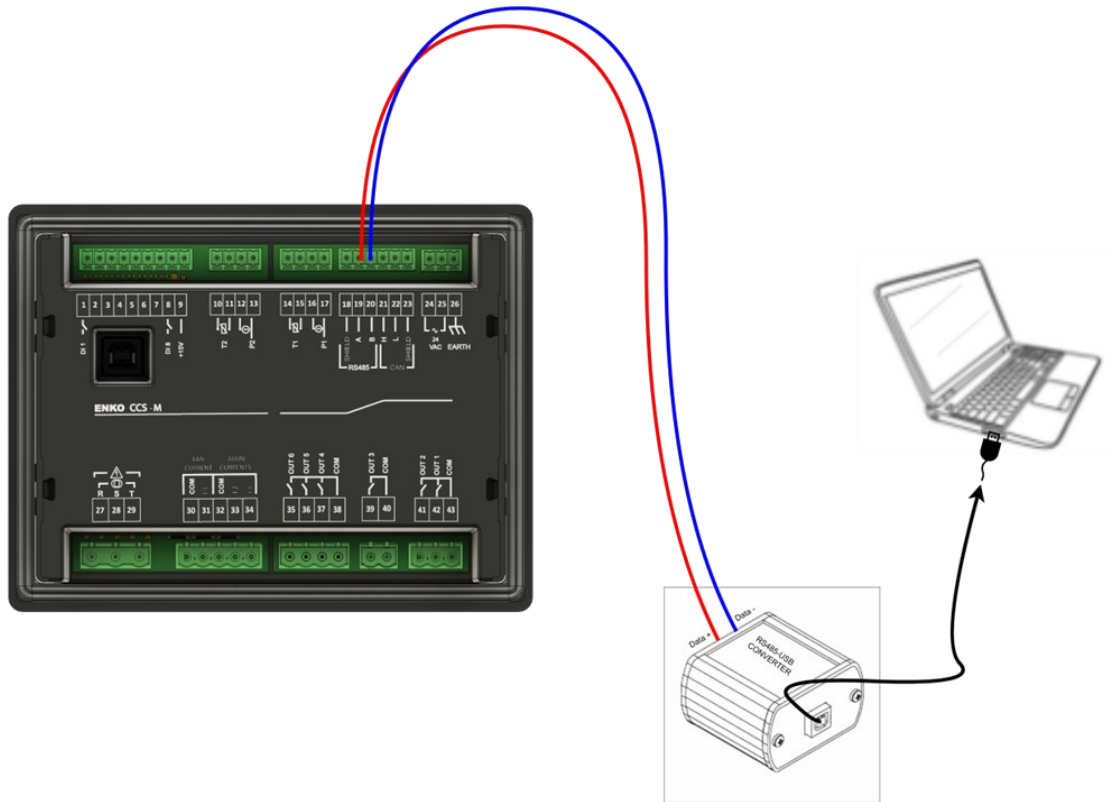
STATES: In the Parallel Control system, devices operate in specific phases. There are 8 phases in the system:

- **Synchronizing:** Devices check each other's presence and parameters to ensure suitable operating conditions are met.
- **Blocked:** Devices enter this phase when recovering from an error state or when the "STOP" button is pressed on the device. Devices in this state are connected to the system but are not considered in Parallel Operation.
- **Fault:** Devices that encounter a fault enter this phase. Devices in this state are connected to the system but are not considered in Parallel Operation.
- **Ready:** This phase indicates that the device is ready, and it will activate in the system when there is a pressure demand, according to its operating mode (Equal Aging).
- **Resting:** After exiting the operating state, the device remains in this phase for a specified time (P.269) and will not activate. The device can exit this phase prematurely if a higher priority or pressure demand overrides its set parameters.
- **Starting:** When a pressure demand arises and the need for operation is triggered, the device enters this phase and begins operation according to its operating mode (Equal Aging) and priorities.
- **Transitioning:** Devices in this phase are either transitioning from Operating to Resting or from Starting to Operating. During these transitions, decisions are reassessed and the impact on the system is monitored.
- **Operating:** This phase indicates that the device is actively operating.

9.2.3 Parallel Control Flow Diagram



9.3 RS485 and Modbus Communication



The above connection diagram is shared as a sample connection diagram. RS485 data cable is recommended to be twisted and shielded cable.

9.3.1 RS485 Communication Parameters

Baud Rate:	19200 kBit/s
Data Bits:	8 Bit
Stop Bit:	1 Bit
Parity	None
Unit-ID	1

The parameters provided in the table are predefined and unchangeable within the CCS, and they represent the required parameters for the system into which it will be integrated. A compatible communication line can be established with any device that has these parameters and supports the Modbus communication protocol.

9.3.2 Monitor Address

The monitor addresses of the CCS that can be displayed after communication is established are given in the table below:



NOT

- All values read in Modbus addresses are 16-bit signed (integer) values.

Register Name	Modbus Register Address	Coefficient (over 10)	Example
External Pressure	42001	-1	82 = 8.2Bar
Internal Pressure	42002	-1	65 = 6.5Bar
Supply Voltage of Pressure Sensor	42005	-1	148 = 14.8V
Supply Voltage	42006	-1	324 = 32.4V
Vr-s Voltage	42007	0	385 = 385V
Vs-t Voltage	42008	0	390 = 390V
Vt-r Voltage	42009	0	387 = 387V
Mains Frequency	42010	-1	498 = 49.8Hz
Digital Inputs	42011	0	Max:0x00FF Min:0x0000 Each bit of the 8-bit value read in this register represents a digital input. Note Affected by contact type selection.
Digital Outputs	42012	0	Max:0x003F Min:0x0000 Each bit of the 6 bit value read in this register indicates whether 6 role output contacts are pulled or not.
Temperature 1 – T1	42013	-1	763 = 76.3°C
Temperature 2 – T1	42014	-1	267 = 26.7°C

Register Name	Modbus Register Address	Coefficient (over 10)	Example
Total Working Time MSB	42015	0	0x ABC DEFGH Indicates the part of the above 32bit surah marked in bold
Total Working TimeLSB	42016	0	0xABC DE FGH Indicates the part of the above 32bit surah marked in bold
Onload Working MSW	42017	0	0xABC DE FGH Indicates the part of the above-mentioned 32bit surah marked in bold
Onload Working LSW	42018	0	0xABC DE FGH Specifies the bolded part of the 32-bit period mentioned above
Remaining of General service time	42041	0	1453 [hrs]
Remaining of Bearing service time	42042	0	18810 [hrs]
Remaining of Oil Change service time	42043	0	1923 [hrs]
Remaining of Air Filter service time	42044	0	610 [hrs]
Remaining of Oil Filter service time	42045	0	10 [hrs]
Remaining of Separator service time	42046	0	1934 [hrs]

9.3.3 Modbus- Server Authorisation

Modbus security address:

Register Name	Modbus Register Address
SECURITY_CODE_1	9969
SECURITY_CODE_2	9970
ENKO_ID_1	9986
ENKO_ID_2	9987
ENKO_ID_3	9988

SECURITY_CODE_1: Modbus protocol value at address 9969.

SECURITY_CODE_2: Modbus protocol value at address 9970.

ENKO_ID_1: Modbus protocol value at address 9986.

ENKO_ID_2: Modbus protocol value at address 9987.

ENKO_ID_3: Modbus protocol value at address 9988.

After establishing a connection to the CCS via the RS485 port, the values of SECURITY_CODE_1, SECURITY_CODE_2, ENKO_ID_1, ENKO_ID_2, and ENKO_ID_3, as specified in the table above, are read using the "FC:3 Read Holding Registers" method. Then, the following mathematical operation is applied to obtain the PASSWORD_1 and PASSWORD_2 values.



NOT

- The symbol "^" used in the bottom operation stands for "Bitwise XOR (exclusive OR)".

1. $PASSWORD_1 = SECURITY_CODE_1 \wedge (ENKO_ID_1 + ENKO_ID_3)$

2. $PASSWORD_2 = SECURITY_CODE_2 \wedge (ENKO_ID_2 + ENKO_ID_3)$

The obtained PASSWORD_1 and PASSWORD_2 values are written as follows:

- **PASSWORD_1 → Address 9967**
- **PASSWORD_2 → Address 9968**

This is done using the "FC:6 Write Single Register" method.

After the writing process is completed, the authorisation is opened in the modbus communication of CCS. If there is no communication for a certain period of time, the authorisation level is closed and the above mentioned steps must be repeated for authorisation.



- CCS's modbus authorisation automatic logout time is 10 seconds.

9.3.4 Scada Application Parameters

You can refer to the table below for the management parameters, modbus addresses and descriptions of the compressor that can be used in SCADA applications:

Address Name	Modbus Address	EXPLANATION
COMPRESSOR_START_STOP_SOURCE (R/W)	40806	It is the register address related to the parameter that determines the compressor's working source. The values are: 0: Panel- Digital Input – Modbus 1: Digital Input 2: Digital Input 3: Modbus RTU 4: Digital Input - Modbus
MODBUS_UID (R/W)	40812	
COMPRESSOR_START_STOP (R/W)	41101	It is the register address where the Start/Stop operations of the compressor can be controlled. After the written values are processed, the value returns to "0." The values are: 0: Callback Done 1: Compressor Start 2: Compressor Stop 3: Compressor Hard Stop 4: Fault Reset
COMPRESSOR_STATUS (R)	41103	It is the register address that holds the status information of the compressor. The values are: 0: Stop State 1: Automatic Standby 2: Idle Running 3: Pre-Heating 4: Under Load 5: Will Stop 6: Screw Pressure Control
COMPRESSOR_ALARM_STATUS (R)	41105	It is the register address that holds the alarm status information of the compressor. The values are: 0: No Alarm 1: Warning Present 3. Fault Present

FAULT_LOG_INDEX (R/W)	41107	It is the register address where the fault index is written (1-15), which changes the values at the FAULT_CODE, FAULT_TIME_MSB, and FAULT_TIME_LSB addresses based on the index. After the written values are processed, it returns to "0": 0: Callback Done 1-15: Fault index
FAULT_ACTIVESC (R)	41108	Number of active faults
FAULT_CODE (R)	41109	FAULT_LOG_INDEX shows the error code of the error based on the index value last written to FAULT_LOG_INDEX.
FAULT_TIME_MSB (R)	41110	FAULT_LOG_INDEX (MSB): Contains the Most Significant Byte (MSB) of the motor time when the last fault was logged based on the last written index value.
FAULT_TIME_LSB (R)	41111	FAULT_LOG_INDEX (LSB): Contains the Least Significant Byte (LSB) of the motor time when the last fault was logged based on the last written index value.

9.3.5 Fault Codes Descriptions

The names and descriptions of the codes in the "FAULT_CODE" register address shared in the previous table are given in the table below:

Fault Code	Fault Name	Failure Description
0	FAULT_LINE_WARN	Header Pressure Warning
1	FAULT_SCREW_WARN	Screw Pressure Warning
2	FAULT_PRESS_DIFF_WARN	Pressure Difference Warning
3	FAULT_TEMP_ABOVE_WARN	High Temperature Limit Warning
4	FAULT_TEMP_BELOW_WARN	Low Temperature Limit Warning
5	FAULT_POWERCUT_WARN	Power Loss Warning
6	FAULT_SERVICE_LEVEL1	Service Level 1 Warning
7	FAULT_TEMP2_ABOVE_WARN	High Temperature 2 Limit Warning
8	FAULT_TEMP2_BELOW_WARN	Low Temperature 2 Limit Warning
9	FAULT_VR_HIGH_WARN	VR High Voltage Warning
10	FAULT_VS_HIGH_WARN	VS High Voltage Warning

Fault Code	Fault Name	Failure Description
11	FAULT_VT_HIGH_WARN	VT High Voltage Warning
12	FAULT_VR_LOW_WARN	VR Low Voltage Warning
13	FAULT_VS_LOW_WARN	VS Low Voltage Warning
14	FAULT_VT_LOW_WARN	VT Low Voltage Warning
15	FAULT_FREQ_HIGH_WARN	Frequency High Warning
16	FAULT_FREQ_LOW_WARN	Frequency Low Warning
17	FAULT_MOTOR_THERMIC	Engine Thermal Fault
18	FAULT_SEPERATOR	Seperator Malfunction
19	FAULT_FAN_THERMIC	Fan Thermal Malfunction
20	FAULT_PHASE_SEQ_DIN	Phase Sequence (Digital Input) Fault
21	FAULT_RESERVED	Reserved Failure
22	FAULT_LINE_ALARM	Line Pressure Failure
23	FAULT_SCREW_ALARM	Screw Pressure Failure
24	FAULT_PRESS_DIFF_ALARM	Pressure Difference Failure
25	FAULT_TEMP_ABOVE_ALARM	Temperature Upper Limit Failure
26	FAULT_TEMP_BELOW_ALARM	Temperature Lower Limit Fault
27	FAULT_CUSTOM1	Special Fault 1
28	FAULT_CUSTOM2	Special Fault 2
29	FAULT_SS_PER_HOUR	Number of Starts per Hour Exceeding Failure
30	FAULT_PRESS_LINE_BROKE	Line Pressure Sensor Broken Fault
31	FAULT_PRESS_SCREW_BROKE	Screw Pressure Sensor Broken Malfunction
32	FAULT_PRESS_MIN_ALARM	Minimum Internal Pressure Alarm
33	FAULT_SERVICE_LEVEL2	Service Level 2 Fault

Fault Code	Fault Name	Failure Description
34	FAULT_SERVICE_LEVEL3	Service Level 3 Failure
35	FAULT_SERVICE_LEVEL4	Service Level 4 Fault
36	FAULT_SERVICE_LEVEL5	Service Level 5 Failure
37	FAULT_VR_HIGH_ALARM	VR High Voltage Alarm
38	FAULT_VS_HIGH_ALARM	VS High Voltage Alarm
39	FAULT_VT_HIGH_ALARM	VT High Voltage Alarm
40	FAULT_VR_LOW_ALARM	VR Low Voltage Alarm
41	FAULT_VS_LOW_ALARM	VS Low Voltage Alarm
42	FAULT_VT_LOW_ALARM	VT Low Voltage Alarm
43	FAULT_PHASE_SEQ_AN	Phase Sequence (Analogue Input) Fault
44	FAULT_PTC	PTC Failure
45	FAULT_EMERGENCY_STOP_VARIABLE	Emergency Stop Failure
46	FAULT_A3_BROKE	1. Temperature Sensor Broken Fault
47	FAULT_A4_BROKE	2. Temperature Sensor Broken Fault
48	FAULT_TEMP2_ABOVE_ALARM	Temperature 2 Upper Limit Alarm
49	FAULT_TEMP2_BELOW_ALARM	Temperature 2 Lower Limit Alarm
50	FAULT_FREQ_ABOVE_ALARM	Frequency High Alarm
51	FAULT_FREQ_BELOW_ALARM	Frequency Low Alarm
52	FAULT_MAINS_UNBALANCE	Network Unbalance Malfunction
53	FAULT_OIL_PRESS	Oil Pressure Failure
54	FAULT_INV_COMMERR	Inverter Communication Error
55	FAULT_INV_GENERR	Inverter Operation Error
56	FAULT_DOOROPEN	Door Open Malfunction
57	FAULT_CPCA_ID	Parallel Control ID Failure

Fault Code	Fault Name	Failure Description
58	FAULT_CPCA_OLP	Parallel Control Load Switching Pressure Mismatch Malfunction
59	FAULT_CPCA_IDLE	Parallel Control Unloading Pressure Mismatch Malfunction
60	FAULT_LOW_PRESS_IN	Low Pressure Failure (Booster Mode)

10 PARAMETERS AND DESCRIPTIONS

10.1 Parameter List

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Pressure Transmitter	Pressure	Bar	1	8	60	16
Discharge Pressure	Pressure	Bar	2	0	16	7,5
Load Switching Pressure	Pressure	Bar	3	0	16	6,0
Output Pressure Alarm	Pressure	Bar	4	0	16	8,5
Output Pressure Warning	Pressure	Bar	5	0	16	8,0
Internal Pressure Sensor	Pressure		6	0	1	1
Internal Pressure Start Value	Pressure	Bar	7	0	16	0.5
Internal Pressure Alarm	Pressure	Bar	8	0	16	8,6
Internal Pressure Warning	Pressure	Bar	9	0	16	8,1
Pressure Unit	Pressure		10	0	1	0
Pressure Difference Alarm	Pressure	Bar	11	0	16	2,4
Pressure Difference Warning	Pressure	Bar	12	0	16	2,0
Sufficiency Pressure	Pressure	Bar	13	0	16	4,8
Load Standard Pressure	Pressure	Bar	14	50	16	7,5
Start Delay	Timing	sec	101	2	60	5
Downtime	Timing	sec	102	0	180	20
Air Evacuation Time	Timing	sec	103	0	60	10
Idle Working Time	Timing	sec	104	0	300	10
Reload Time	Timing	sec	105	0	60	5
Automatic Standby Delay	Timing	sec	106	0	1200	180
Power Cut Delay	Timing	sec	107	0	60	5
Star Working Time	Timing	sec	108	1	30	5
Main Contactor Pull Delay	Timing	msec	109	0	100	30
Star Triangle Transition	Timing	msec	110	0	100	30
Preheating Load Duration	Timing	sec	111	0	60	10
Preheating Idle Time	Timing	sec	112	1	120	15
Output Pressure Error Delay	Timing	sec	113	0	30	3
Internal Pressure Error Delay	Timing	sec	114	0	30	3

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Pressure Difference Error Delay	Timing	sec	115	0	30	3
Fan Maximum Operating Time	Timing	sec	116	0	1200	20
Dryer Time	Timing	min	117	0	60	50
Qualification Delay	Timing	sec	118	0	600	300
Horn Duration	Timing	sec	119	10	999	60
Reserved	Timing		120	Reserve	Reserve	Reserve
Booster Delay	Timing	sec	121	10	120	60
Digital Input Function 1	Introduction		201	0	18	1
Digital Input Delay 1	Introduction	sec	202	0	30	0
Digital Input Contact Type 1	Introduction		203	0	1	0
Reserved	Introduction		204	Reserve	Reserve	Reserve
Digital Input Function 2	Introduction		205	0	18	5
Digital Input Delay 2	Introduction	sec	206	0	30	3
Digital Input Contact Type 2	Introduction		207	0	1	0
Reserved	Introduction		208	Reserve	Reserve	Reserve
Digital Input Function 3	Introduction		209	0	18	2
Digital Input Delay 3	Introduction	sec	210	0	30	3
Digital Input Contact Type 3	Introduction		211	0	1	0
Reserved	Introduction		212	Reserve	Reserve	Reserve
Digital Input Function 4	Introduction		213	0	18	4
Digital Input Delay 4	Introduction	sec	214	0	30	1
Digital Input Contact Type 4	Introduction		215	0	1	0
Reserved	Introduction		216	Reserve	Reserve	Reserve
Digital Input Function 5	Introduction		217	0	18	12
Digital Input Delay 5	Introduction	sec	218	0	30	3
Digital Input Contact Type 5	Introduction		219	0	1	0
Reserved	Introduction		220	Reserve	Reserve	Reserve
Digital Input Function 6	Introduction		221	0	18	13
Digital Input Delay 6	Introduction	sec	222	0	30	3
Digital Input Contact Type 6	Introduction		223	0	1	0
Reserved	Introduction		224	Reserve	Reserve	Reserve

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Digital Input Function 7	Introduction		225	0	18	0
Digital Input Delay 7	Introduction	sec	226	0	30	0
Digital Input Contact Type 7	Introduction		227	0	1	0
Reserved	Introduction		228	Reserve	Reserve	Reserve
Digital Input Function 8	Introduction		229	0	18	6
Digital Input Delay 8	Introduction	sec	230	0	30	0
Digital Input Contact Type 8	Introduction		231	0	1	0
Reserved	Introduction		232	Reserve	Reserve	Reserve
Output Function1	Output		301	0	28	0
Output Delay1	Output	sec	302	0	30	0
Output Contact Type1	Output		303	0	1	0
Reserved	Output		304	Reserve	Reserve	Reserve
Output Function2	Output		305	0	28	8
Output Delay2	Output	sec	306	0	30	0
Output Contact Type2	Output		307	0	1	0
Reserved	Output		308	Reserve	Reserve	Reserve
Output Function3	Output		309	0	28	4
Output Delay3	Output	sec	310	0	30	0
Output Contact Type3	Output		311	0	1	0
Reserved	Output		312	Reserve	Reserve	Reserve
Output Function4	Output		313	0	28	3
Output Delay4	Output	sec	314	0	30	0
Output Contact Type4	Output		315	0	1	0
Reserved	Output		316	Reserve	Reserve	Reserve
Output Function5	Output		317	0	28	2
Output Delay5	Output	sec	318	0	30	0
Output Contact Type5	Output		319	0	1	0
Reserved	Output		320	Reserve	Reserve	Reserve
Output Function6	Output		321	0	28	1
Output Delay6	Output	sec	322	0	30	0

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Output Contact Type6	Output		323	0	1	0
Reserved	Output		324	Reserve	Reserve	Reserve
Maintenance General Duration	Maintenance	h	401	200	30000	2500
Maintenance Bearing Period	Maintenance	h	402	200	30000	20000
Maintenance Oil Change Period	Maintenance	h	403	200	30000	5000
Maintenance Air Filter Duration	Maintenance	h	404	200	30000	5000
Maintenance Oil Filter Time	Maintenance	h	405	200	30000	2500
Maintenance Separator Filter Period	Maintenance	h	406	200	30000	5000
Stop Activation	Maintenance		407	0	1	0
Maintenance Time Reset	Maintenance		408	0	6	0
Temperature1 High Error	Temperature	°C	601	-328,0	392,0	100,0
Temperature1 High Warning	Temperature	°C	602	-328,0	392,0	90,0
Temperature1 Low Error	Temperature	°C	603	-328,0	392,0	-20,0
Temperature1 Low Warning	Temperature	°C	604	-328,0	392,0	-10,0
Temperature Preheating	Temperature	°C	605	-328,0	392,0	10,0
Temperature1 Sensor Type	Temperature		606	0	3	0
Temperature Unit	Temperature		607	0	1	0
Fan Operating Temperature	Temperature	°C	608	-328,0	392,0	80,0
Fan Stop Temperature	Temperature	°C	609	-328,0	392,0	60,0
Dryer Operating Temperature	Temperature	°C	610	-328,0	392,0	15,0
Dryer Stop Temperature	Temperature	°C	611	-328,0	392,0	5,0
PTC-Activate	Temperature		612	0	1	0
Temperature2 High Error	Temperature	°C	613	-328,0	392,0	100,0
Temperature2 High Warning	Temperature	°C	614	-328,0	392,0	90,0
Temperature2 Low Error	Temperature	°C	615	-328,0	392,0	-20,0
Temperature2 Low Warning	Temperature	°C	616	-328,0	392,0	-10,0
Temperature2 Sensor Type	Temperature		617	0	3	0
Temperature2 Mode	Temperature		618	0	2	0
Temperature Compensation Value	Temperature	°C	619	-328,0	392,0	0
Screw Oil Freeze Prevention	Temperature	°C	620	-328,0	392,0	-99,9
Voltage Unbalance	Mains	%	701	0	40	20

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Low Volt. Alarm	Mains	V	702	0	600	310
Low Volt. Warn	Mains	V	703	0	600	330
High Volt. Alarm	Mains	V	704	0	600	466
High Volt. Warn	Mains	V	705	0	600	450
Low Freq. Alarm	Mains	Hz	706	0	800	450
Low Freq. Warn	Mains	Hz	707	0	800	470
High Freq. Alarm	Mains	Hz	708	0	800	550
Hgh Freq. Warn	Mains	Hz	709	0	800	530
Current Unbalance	Mains	%	710	0	40	10
Motor Current Ratio	Mains		711	0	9999	400
Motor Traformer Conn.	Mains		712	0	1	0
Motor Rated Current	Mains	A	713	0	9999	250
Motor Thermic Type	Mains		714	1	5	1
Fan Current Ratio	Mains		715	0	9999	250
Fan Rated Current	Mains	A	716	0	9999	20
Fan Thermic Type	Mains		717	1	5	1
Phase Seq Control	Mains		718	0	1	0
Mains Faults	Mains		719	0	1	0
Reserved	General		801	Reserve	Reserve	Reserve
Factory Password	General		802	0	9999	1923
Service Password	General		803	0	9999	1922
User Password	General		804	0	9999	1934
Maximum number of departures per hour	General		805	0	9999	10
Compressor Start Source	General		806	0	4	0
Compressor Operation Mode	General		807	0	2	1
Idle Running Time S/D	General		808	0	1	0
Horn Mode	General		809	0	1	0
Pressure Loss Prevention	General		810	0	2	0
Save/Use Parameter	General		811	0	2	0
Modbus UID	General		812	0	247	1

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Language Selection	General		813	0	2	0
Factory Reset	General		814	0	2	0
Clear Fault Records	General		815	0	1	0
Resetting Motor Run Times	General		816	0	1	0
Menu Logout Time	General	min	817	0	30	3
Menu Logout	General		818	0	1	0
Dynamic Encryption	General		819	0	10	0
Motor Driving	General		820	0	4	0
Frequency Minimum	Inverter	Hz	901	0	500,0	20,0
Frequency Maximum	Inverter	Hz	902	0	500,0	51,0
Frequency Nominal	Inverter	Hz	903	0	500,0	50,0
Ramp Up	Inverter	sec	904	0	100	5
Ramp Down	Inverter	sec	905	0	100	5
Pole Pair	Inverter		906	1	12	2
Current Nominal	Inverter	A	907	0	3200,0	0
Voltage Nominal	Inverter	V	908	0	1000	400
CosFi [Cos(ϕ)]	Inverter		909	0	1,00	0
Power	Inverter	kW	910	0	3200,0	0
Operation Mode	Parallel Control		1001	0	0	0
Device ID	Parallel Control		1002	1	12	1
Aging Resolution	Parallel Control	h	1003	1	100	8
Rest Time	Parallel Control	min	1004	0	60	1
Maximum Operating Time	Parallel Control	min	1005	30	6000	600
Total Runtime Offset	Parallel Control	h	1006	-32000	32000	0
Timeout	Parallel Control	sec	1007	10	60	10
Target Duration	Parallel Control	sec	1008	1	3600	300
Minimum Commissioning Time	Parallel Control	sec	1009	10	30	15
Minimum Switch-Off Time	Parallel Control	sec	1010	10	30	15
Offset Offset	Parallel Control	Bar	1011	1	1,0	0,3
Total Number of Devices	Parallel Control		1012	1	12	2
Modbus Authorisation Timeout	Communication	sec	1201	0	32767	600

Parameter Name	Categories	Unit	P.No	Min	Max	Default
Port-1 Device ID	Communication		1202	1	247	1
Port-1 Baud Rate	Communication	bps	1203	0	4	3
Port-1 Accompaniment	Communication		1204	0	2	0
Port-1 Stop Bit	Communication		1205	1	2	1

10.2 Parameter Descriptions

In the tables below, the units, minimum-maximum values, coefficients (parameter value x 10(Coefficient) method for parameter evaluation via Modbus), levels (1: User Level 2: Service Level 3: Factory Level 4: Manufacturer Level), and Modbus address are given with explanations.

10.2.1 Pressure Parameters

P1: Pressure Sensor Type

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	60,0 ⁽¹⁾	16,0 ⁽¹⁾	-1	3	40001
<p>Indicates the operating range of pressure sensors operating with 4-20 mA.</p> <ul style="list-style-type: none"> When this parameter is edited, internal and external pressures are also configured according to this parameter. 						

P2: Discharge Pressure

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	7,5 ⁽¹⁾	-1	1	40002
<p>When the output pressure reaches/exceeds the value specified by this parameter, the device switches to idle operation.</p> <ul style="list-style-type: none"> When this parameter is edited, it goes through limit control with the values of parameters P1, P3, P4 and P5. If the value to be changed is outside these limits, the value is automatically taken into the limits. If the "Operation Mode" parameter is selected as "Parallel", the parameter value is broadcasted on the CAN line as a result of editing this parameter, allowing it to be edited on other devices. 						

P3: Load Switching Pressure

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	6,0 ⁽¹⁾	-1	1	40003

If the output pressure reaches or falls below the value specified by this parameter while the compressor is in Auto standby or Idle mode, the compressor will start to run and switch to load.

- When this parameter is edited, it goes through limit control with the values of parameters P1, P2, P4 and P5. If the value to be changed is outside these limits, the value is automatically taken into the limits.
- If the "Operation Mode" parameter is selected as "Parallel", as a result of editing this parameter, the parameter value is broadcasted on the CAN line, allowing it to be edited on other devices.

P4: Output Pressure Failure Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	8,5 ⁽¹⁾	-1	2	40004

When the outlet pressure reaches the value specified here, the device switches to the fault position at the end of the time entered in the "Output Pressure Fault Delay" parameter. Protection function can be cancelled by setting the related parameter to "0".

- When this parameter is regulated, it goes through limit control with the value of parameter P5. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P5: Output Pressure Warning Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	8,0 ⁽¹⁾	-1	2	40005

When the output pressure exceeds the value specified here, the device displays the relevant warning on the screen after the time entered in the "Output Pressure Error Delay" parameter.

- When this parameter is regulated, it goes through limit control with the value of parameter P4. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P6: Internal Pressure Sensor Usage

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Pasif	1: Aktif	Aktif	0	3	40006

It is used to activate the use of internal pressure sensor.

- If the value of this parameter is set to active and there is a digital input selected as Digital Input Function Vd Switch, the compressor evaluates the Digital input value as the screw pressure source. If no Vd Switch function is assigned to any Digital Input Function, the compressor evaluates the pressure sensor connected to P2 as the compressor screw pressure source.

P7: Internal Starting Pressure

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	0,5 ⁽¹⁾	-1	2	40007

If the internal pressure is equal to or above the value entered in this parameter, the compressor is not started and the pressure value is expected to decrease. When the internal pressure drops below this value, the start-up process continues.

P8: Internal Pressure Failure Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	8,6 ⁽¹⁾	-1	2	40008

When the internal pressure reaches the value specified here, the device switches to the fault position after the time entered in the "Internal Pressure Error Delay" parameter. Protection function can be cancelled by setting the related parameter to "0".

- When this parameter is regulated, it goes through limit control with the value of parameter P9. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P9: Internal Pressure Warning Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	8,1 ⁽¹⁾	-1	2	40009

When the outlet pressure exceeds the value specified here, the device displays the relevant warning on the screen after the time entered in the "Internal Pressure Error Delay" parameter.

- When this parameter is regulated, it goes through limit control with the value of parameter P8. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P10: Pressure Unit

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Bar	1: PSI	Bar	0	1	40010

It determines the unit of pressure that the device measures and displays on the screen and controls. It can be selected as BAR or PSI.

- When this parameter is edited, all parameters, displays and values related to these units are reconfigured according to the edited value.

P11: Pressure Difference Failure Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	2,4 ⁽¹⁾	-1	3	40011

If the difference between the internal pressure and the outlet pressure is above this value, the device switches to failure mode with the message “Pressure Difference Failure” at the end of the “Pressure Difference Error Delay” period.

- When this parameter is edited, it goes through limit control with the value of parameter P12. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P12: Pressure Difference Warning Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	2,4 ⁽¹⁾	-1	3	40012

If the difference between the internal pressure and the outlet pressure is above this value, the message "Pressure Difference Warning" is displayed on the screen at the end of the "Pressure Difference Error Delay" period.

- When this parameter is regulated, it goes through limit control with the value of parameter P11. If the value to be changed is outside this limit, the value is automatically taken into the limits.

P13: Adequacy Pressure:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	4,8 ⁽¹⁾	-1	3	40013

When the internal pressure value reaches the value entered in this parameter, pressure differential and warning functions are activated. Related controls are not performed at pressure values below the value entered in these parameters.

P14: Standard Pressure Load:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0	16,0 ⁽¹⁾	4,8 ⁽¹⁾	-1	2	40014

It is used to quickly load standard pressure values. The parameters that change automatically with the value entered in this parameter and the formulas of the change values are given in the table below.

Affected Parameter	Affected Status
P002: Unload Pressure (Bosa Gecme Bsn.):	= P014
P003: Load Pressure (Yuke Gecme Bsn.):	= P014 – 1.5 BAR
P004: Output Pressure Fault Value (Seb Bsn Fault):	= P014 + 1.0 BAR
P005: Output Pressure Warning Value (Seb Bsn Uyari):	= P014 + 0.5 BAR

P008: Internal Pressure Fault Value (Internal Pressure Fault):	= P014 + 1.1 BAR
P009: Internal Pressure Warning Value (Internal Pressure Warning):	= P014 + 0.6 BAR

(1): The values given vary according to P001 "Pressure Sensor Type" and P010 "Pressure Unit".

10.2.2 Timing Parameters

P101: Start Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	2	60	5	0	3	40101
When the device receives the run command, it waits for the time entered in this parameter.						

P102: Stop Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	180	20	0	3	40102
When the device receives a stop command, it waits for the time entered in this parameter.						

P103: Air Evacuation Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	180	20	0	3	40103
Waiting time for the air pressure of the screw to drop after the compressor stops. The compressor cannot be started during this period.						

P104: Idle Running Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	300	10	0	3	40104
Indicates the idle running time before the device switches to load when it receives the run command.						

P105: Reload Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	60	5	0	3	40105

During the idle operation process that starts after the compressor running on load switches to idle, when the outlet pressure drops below the value entered in the P3 "Load Pressure" parameter, the time specified by this parameter is operated and the device switches to load again.

P106: Automatic Standby Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	1200	180	0	3	40106

The time to wait for the compressor to stop after the idle pressure is reached is set with this parameter. During this time, the compressor runs idle. This parameter works with the condition that the value entered in the "Compressor Operation Mode" parameter is selected as "Automatic".

P107: Power Outage Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	60	5	0	3	40107

In case of power interruptions that occur while the compressor is being operated, the device switches to the operating position at the end of the time set with this parameter when the power is restored. By entering the value "0" in the related parameter, the automatic start function in power failure is cancelled.

P108: Star Operation Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	1	30	5	0	3	40108

During the motor starting phase, how long the star contactor of the motor will be operated is set with this parameter.

P109: Main Contactor Pull Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
msec	0	100	30	0	3	40109

After the star contactor is removed, the main output is activated at the end of the value entered in this parameter.

P110: Star Triangle Crossing:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
msec	0	100	30	0	3	40110

After the star contactor becomes inactive, the delta contactor output is activated at the end of the value entered in this parameter.

P111: Preheating Time at Load:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	60	10	0	3	40111

Indicates the load duration in the preheat operating position.

P112: Preheating Idle Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	1	120	15	0	3	40112

Indicates the idle time in the preheat operating position.

P113: Output Pressure Error Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40113

It is the expected delay time for the output pressure failure fault.

P114: Internal Pressure Error Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40114

It is the expected delay time for internal pressure failure fault.

P115: Pressure Difference Error Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40115

The expected delay time for the pressure differential failure fault.

P116: Fan Maximum Operating Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	1200	20	0	3	40116

If the compressor stops while the fan running condition continues, the fan continues to run during this period. At the end of the period, the fan is stopped regardless of the temperature conditions.

P117: Dryer Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Min	0	60	50	0	3	40117

It is the duration of the dryer function. There are two types of dryer functions in CCS-M. When these functions are assigned to one of the CCS-M outputs, they operate as follows:

Dryer-Z: This is the output related to the dryer. The dryer output is activated from the moment the compressor starts running (pre-heating, idle, and load modes). After the compressor stops, the output remains active for the duration specified in this parameter, and at the end of this period, the dryer output is deactivated.

Dryer-S: This is the output related to the dryer. Based on the value measured by the Temperature2 sensor, the dryer output is controlled according to the “**Dryer Operating Temperature**” and “**Dryer Stopping Temperature**” parameters. While the compressor is running (idle, load, and pre-heating modes), if the temperature measured by the second temperature sensor exceeds the “**Dryer Operating Temperature**”, the dryer output is activated. When the measured temperature reaches the “**Dryer Stopping Temperature**”, the output is deactivated.

If the compressor switches to automatic standby, air discharge, or stop mode, and if the measured temperature has already reached the “**Dryer Stopping Temperature**”, the output is deactivated. Otherwise, after the compressor stops, the dryer output will remain active for the duration specified in this parameter.

P118: Qualification Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	600	300	0	3	40118

Delay time for the sufficiency pressure fault set by parameter "P13: Sufficiency Pressure".

P119: Horn Duration:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	10	999	60	0	3	40119

Specifies the operating time of the horn when an alarm occurs. After this time, the horn is silenced.

P121: Booster Delay:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	10	120	60	0	3	40121

This parameter, used in Booster Operation, determines how long the compressor will run before triggering an error based on the activity of the “**Low Pressure**” input function and the operating state of the compressor. After the compressor starts operating, the “**Low Pressure**” input is expected to become inactive within the duration specified by this parameter. If the “**Low Pressure**” input remains active at the end of this time, the compressor will stop with a “**Low Pressure Error**”.

10.2.3 Digital Input Parameters

All Digital Input Parameters Configurable on the Device

The common terminals of the digital inputs are terminal **9** on the panel. One leg of any instrument to be connected should be wired to terminal **9**, while the other leg should be connected to the relevant terminal (between **1-8**) assigned/ to be assigned with a function.

Functions Assignable to Inputs

A function can only be assigned to a single input. If a function assigned to an input is already defined on another input, the value of the previously assigned input will reset to “**None**”.

The functions assignable to inputs and their descriptions are as follows:

1. **None:** No function is assigned to the corresponding digital input. If no connection has been made, it is recommended to assign this value as “**None**.”
2. **Emergency Stop:** Emergency stop input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
3. **Separator Filter Blocked:** Separator filter blocked switch input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
4. **Oil Pressure:** Oil pressure fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
5. **Phase Sequence:** External phase sequence relay fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
6. **Motor Thermal:** Motor thermal protection relay fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
7. **Fan Thermal:** Fan thermal protection relay fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
8. **Remote Start:** Remote start input. According to the defined contact type, when the relevant input signal becomes active, a start command is sent to the compressor. When the signal is removed, a stop command is sent to the compressor.
9. **Start Button:** Function used to control the compressor via a remote start button. When this function is assigned and the input becomes active, the device considers the **Start** button pressed.
10. **Stop Button:** Function used to control the compressor via a remote stop button. When this function is assigned and the input becomes active, the device considers the **Stop** button pressed.

11. **Remote Load:** Used to control the remote load valve. If the compressor mode is set to automatic, when this function is assigned to any digital input, the compressor switches to **automatic standby mode**. When a signal is applied to the remote load input, the compressor starts running. When the signal is removed, the compressor switches back to **automatic standby mode**.
12. **PTC:** When this function is assigned to the relevant input, the motor PTC must be connected to the input. High temperatures detected by the PTC will activate this input and unconditionally stop the compressor.
13. **Spare Fault-1:** First spare fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
14. **Spare Fault-2:** Second spare fault input. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
15. **Sb Switch:** Function used for output pressure control in applications running with a pressure switch. The pressure switch transmits a digital signal to the relevant input, enabling the compressor to switch between **unload** and **load** states. When this function is active, parameters **P2, P3, P4, P5, P11, P12, P13, P113, and P115** are no longer relevant.
16. **Vd Switch:** Function used for internal pressure control in applications running with a pressure switch. To allow the compressor to start from an idle state, the internal pressure must be below a specific value. The internal pressure switch evaluates this condition and transmits the **"Start"** signal via the relevant input. When this function is active, parameters **P7, P8, P9, P11, P12, P114, and P115** are no longer relevant.
17. **Fault Reset:** Remote fault reset function. When this function is assigned and the input becomes active, the fault is cleared if the fault condition is resolved.
18. **Cover Opened:** Compressor panel cover control function. When this function is assigned and the input becomes active, the compressor is unconditionally stopped.
19. **Low Pressure:** This input function must be assigned for the compressor to operate in **Booster mode**. The input becomes active when the input pressure is low in Booster mode.

P201: Digital Input Function 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	1	0	3	40201

It is the function parameter to be assigned to the input of the terminal 1 of the device defined as DI 1. The default function is "Emergency Stop" (see "Functions that can be assigned to inputs").

P202: Digital Input Delay 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40202

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P203: Digital Input Contact Type 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0 : NO	1 : NC	0	0	3	40203

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P205: Digital Input Function 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	5	0	3	40205

It is the function parameter to be assigned to the input of the terminal 2 of the device defined as DI 2. Default function is "Motor Thermal" (see "Functions that can be assigned to inputs").

P206: Digital Input Delay 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40206

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P207: Digital Input Contact Type 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40207

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P209: Digital Input Function 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	2	0	3	40209

It is the function parameter to be assigned to the input of the terminal 3 of the device defined as DI 3. The default function is "Separator" (see "Functions that can be assigned to inputs").

P210: Digital Input Delay 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40210

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P211: Digital Input Contact Type 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40211

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P213: Digital Input Function 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	4	0	3	40213

It is the function parameter to be assigned to the input of the terminal 4 of the device defined as DI 4. The default function is "Phase Sequence" (see "Functions that can be assigned to inputs").

P214: Digital Input Delay 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	1	0	3	40214

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P215: Digital Input Contact Type 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40215

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P217: Digital Input Function 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	12	0	3	40217

It is the function parameter to be assigned to the input of the terminal 5 of the device defined as DI 5. The default function is "Oil Pressure" (see "Functions that can be assigned to inputs").

P218: Digital Input Delay 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40218

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P219: Digital Input Contact Type 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40219

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P221: Digital Input Function 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	13	0	3	40221

It is the function parameter to be assigned to the input of the terminal 6 of the device defined as DI 6. The default function is "Spare Input-1" (see "Functions that can be assigned to inputs").

P222: Digital Input Delay 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	3	0	3	40222

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P223: Digital Input Contact Type 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40223

The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).

P225: Digital Input Function 7:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	0	0	3	40225

It is the function parameter to be assigned to the input of the terminal 7 of the device defined as DI 7. Default function is "None" (see "Functions that can be assigned to inputs").

P226: Digital Input Delay 7:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40226

After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.

P227: Digital Input Contact Type 7:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40227
The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).						

P229: Digital Input Function 8:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	18	6	0	3	40229
It is the function parameter to be assigned to the input of the terminal 8 of the device defined as DI 8. Default function is "Fan Thermal" (see "Functions that can be assigned to inputs").						

P230: Digital Input Delay 8:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40230
After the related input is active, the device accepts the input as active at the end of the value entered in this parameter.						

P231: Digital Input Contact Type 8:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40231
The contact type of the respective input can be selected as NO (normally open) or NC (normally closed).						

10.2.4 Digital Output Parameters

A function can only be assigned to a single output. If a function assigned to an output is already defined on another output, the previously assigned output's function value will reset to **“None.”** The functions assignable to digital outputs and their descriptions are as follows:

- 0 **None:** No function is assigned to the corresponding digital output. If no connection is made, it is recommended to set this value as **“None.”**
- 1 **Main Contactor:** Digital output function for the main contactor connection.
- 2 **Star Contactor:** Digital output function for the star contactor connection.
- 3 **Delta Contactor:** Digital output function for the delta contactor connection.
- 4 **Load Valve:** Digital output function for the load valve connection.
- 5 **Fault:** The digital output becomes active in case of any fault.
- 6 **Warning:** The digital output becomes active in case of any warning.
- 7 **Fault + Warning:** The digital output becomes active in case of any fault or warning.
- 8 **Fan:** Digital output function for the fan contactor connection.
- 9 **Loaded:** The digital output becomes active when the compressor is running and the solenoid valve is active.
- 10 **Unloaded:** The digital output becomes active when the compressor is running and the solenoid valve is inactive.
- 11 **Running:** The digital output becomes active when the compressor motor is running.
- 12 **Stopped:** The digital output becomes active when the compressor motor is stopped.
- 13 **Horn:** Digital output for connecting horns, sirens, or similar warning equipment.
- 14 **Dryer-Z:** Output related to the dryer. From the moment the compressor starts (pre-heating, idle, and loaded), the dryer output becomes active. After the compressor stops, the output remains active for the duration defined by **P037** and is then deactivated.
- 15 **Dryer-S:** Output related to the dryer. The dryer output is triggered based on the value measured by the **Temperature2** sensor and the thresholds defined in **P181** and **P182**. While the compressor is running (idle, loaded, or pre-heating), if the temperature measured by the second temperature sensor exceeds the value set in **P181**, the dryer output becomes active. When the measured temperature reaches the value set in **P182**, the output is deactivated.
- 16 If the compressor switches to automatic standby, air discharge, or stop mode and the measured temperature has reached the value set in **P182**, the output is cut. Otherwise, the dryer output remains active for the duration defined by **P037** after the compressor stops.
- 17 **RSS Active:** The output becomes active when the start source is set to **Modbus, Digital Input, or Modbus+Digital Input**.
- 18 **Low Temperature Fault:** The output becomes active when the screw oil temperature drops below the value entered in **P174 Temperature1 Low Fault**.
- 19 **High Temperature Fault:** The output becomes active when the screw oil temperature exceeds the value entered in **P172 Temperature1 High Fault**.

- 20 **Low Temperature Warning:** The output becomes active when the screw oil temperature drops below the value entered in **P175 Temperature1 Low Warning**.
- 21 **High Temperature Warning:** The output becomes active when the screw oil temperature exceeds the value entered in **P173 Temperature1 High Warning**.
- 22 **P1 Fault:** The output becomes active when an error occurs in the sensor reading the output pressure.
- 23 **P2 Fault:** The output becomes active when an error occurs in the sensor reading the internal pressure.
- 24 **T1 Fault:** The output becomes active when an error occurs in the sensor reading the screw temperature.
- 25 **T2 Fault:** The output becomes active when an error occurs in the sensor reading the second temperature.
- 26 **T2 Low Fault:** The output becomes active when the temperature measured by the sensor connected to the **Second Temperature Input** falls below the value entered in **P186 Temperature2 Low Fault**.
- 27 **T2 High Fault:** The output becomes active when the temperature measured by the sensor connected to the **Second Temperature Input** exceeds the value entered in **P184 Temperature2 High Fault**.
- 28 **T2 Low Warning:** The output becomes active when the temperature measured by the sensor connected to the **Second Temperature Input** falls below the value entered in **P187 Temperature2 Low Warning**.
- 29 **T2 High Warning:** The output becomes active when the temperature measured by the sensor connected to the **Second Temperature Input** exceeds the value entered in **P185 Temperature2 High Warning**.

P301: Digital Output Function 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	0	0	3	40301

It is the function parameter to be assigned to the output of the device at terminals 42-43 defined as OUT 1. The default function is "None" (see "Functions that can be assigned to outputs").

P302: Digital Output Delay 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40302

The related output becomes active at the end of the value entered in this parameter.

P303: Digital Output Contact Type 1:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40303
The contact type of the respective output can be selected as NO (normally open) or NC (normally closed).						

P305: Digital Output Function 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	8	0	3	40305
It is the function parameter to be assigned to the output of the device at terminals 41-43 defined as OUT 2. The default function is "Fan" (see "Functions that can be assigned to outputs").						

P306: Digital Output Delay 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40306
The related output becomes active at the end of the value entered in this parameter.						

P307: Digital Output Contact Type 2:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40307
The contact type of the respective output can be selected as NO (normally open) or NC (normally closed).						

P309: Digital Output Function 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	8	0	3	40309
It is the function parameter to be assigned to the output of the device at terminals 39-40 defined as OUT 3. The default function is "Load Valve" (see "Functions that can be assigned to outputs").						

P310: Digital Output Delay 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40310
The related output becomes active at the end of the value entered in this parameter.						

P311: Digital Output Contact Type 3:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40311
The contact type of the respective output can be selected as NO (normally open) or NC (normally closed).						

P313: Digital Output Function 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	8	0	3	40313
It is the function parameter to be assigned to the output at terminals 37-38 defined as OUT 4 of the device. Default function is "Triangle Contactor". (See "Functions that can be assigned to outputs").						

P314: Digital Output Delay 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40314
The related output becomes active at the end of the value entered in this parameter.						

P315: Digital Output Contact Type 4:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40315
The related output becomes active at the end of the value entered in this parameter.						

P317: Digital Output Function 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	8	0	3	40317
It is the function parameter to be assigned to the output at terminals 36-38 defined as OUT 5 of the device. Default function is "Star Contactor". (See "Functions that can be assigned to outputs").						

P318: Digital Output Delay 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40318
The related output becomes active at the end of the value entered in this parameter.						

P319: Digital Output Contact Type 5:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40319
The contact type of the respective output can be selected as NO (normally open) or NC (normally closed).						

P321: Digital Output Function 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	28	8	0	3	40321
It is the function parameter to be assigned to the output at terminals 35-38 of the device defined as OUT 6. Default function is "Main Contactor". (See "Functions that can be assigned to outputs").						

P322: Digital Output Delay 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	30	0	0	3	40322
The related output becomes active at the end of the value entered in this parameter.						

P323: Digital Output Contact Type 6:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NO	1: NC	0	0	3	40323
The contact type of the respective output can be selected as NO (normally open) or NC (normally closed).						

10.2.5 Maintenance Periods Parameters

P401: General Maintenance Period:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	200	30000	2500	0	3	40401
The time of the General Maintenance period is set with this parameter.						

P402: Bearing Maintenance Period:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Saat	200	30000	20000	0	3	40402
The time of the bearing maintenance period is set with this parameter.						

P403: Oil Change Period:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	200	30000	5000	0	3	40403
The time of the oil change period is set with this parameter.						

P404: Air Filter Duration:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	200	30000	5000	0	3	40404
The air filter change time is set with this parameter.						

P405: Oil Filter Duration:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	200	30000	2500	0	3	40405
Maintenance Oil change time is set with this parameter.						

P406: Separator Filter Duration:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	200	30000	5000	0	3	40406
Separator filter change time is set with this parameter.						

P407: Maintenance Error Activation:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Passive	1: Active	Passive	0	3	40407

According to the value of this parameter, the events of the service times occur as indicated in the table below.

Error Level and Time Interval (Hour)	P407 = 0	P407 = 1	Period of Occurrence (Hour)
Service Level 1 [100: 0)	Warning: Can be cleaned.	Warning: Can be cleaned.	100
Service Level 2 [0: -100)	Warning: Cleanable.	Error: Cleanable.	100
Service Level 3 [-100: -200)	Warning: Cleanable.	Error: Cleanable.	20
Service Level 4 [-200: -300)	Warning: Cleanable.	Error: Cleanable.	10
Service Level 5 [-300: ...)	Warning: Cannot be cleaned.	Error: Cannot be cleared.	---

P408: Maintenance Time Reset:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	6: Separator	0	0	2	40408

Based on the value of this parameter, service time events occur as described below:

0. **No (0):** Used to exit without performing a reset. Additionally, when any reset operation is applied, the parameter value reverts to this value.
1. **General (1):** Resets the **General Service Time** to the value set in the “General Maintenance Time” parameter.
2. **Bearing (2):** Resets the **Bearing Service Time** to the value set in the “Bearing Maintenance Time” parameter.
3. **Oil Change (3):** Resets the **Oil Change Service Time** to the value set in the “Oil Change Time” parameter.
4. **Air Filter (4):** Resets the **Air Filter Service Time** to the value set in the “Air Filter Time” parameter.
5. **Oil Filter (5):** Resets the **Oil Filter Service Time** to the value set in the “Oil Filter Time” parameter.
6. **Separator Filter (6):** Resets the **Separator Filter Service Time** to the value set in the “Separator Filter Time” parameter.

7.

10.2.6 Temperature Parameters:

P601: Temperature 1 High Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	100,0	-1	3	40601

When the temperature measured by the screw temperature sender connected to terminals 14-15 defined as T1 of the device exceeds the value entered in this parameter, the device stops the compressor by giving "Temperature 1 Ust Failure" fault.

P602 Temperature 1 High Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	90,0	-1	3	40602

When the temperature measured by the screw temperature sender connected to terminals 14-15 defined as T1 of the device exceeds the value entered in this parameter, the device gives "Temperature 1 Warning" warning.

P603: Temperature 1 Low Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	-20,0	-1	3	40603

When the temperature measured by the screw temperature sender connected to terminals 14-15 defined as T1 of the device goes below the value entered in this parameter, the device stops the compressor by giving "Temperature 1 Sub Failure" fault.

P604: Temperature 1 Low Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	90,0	-1	3	40604

When the temperature measured by the screw temperature sender connected to terminals 14-15 defined as T1 of the device goes below the value entered in this parameter, the device gives "Temperature 1 Lower Warning" warning.

P605: Temperature Preheating:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	10,0	-1	3	40605

If the temperature measured by the screw temperature sender connected to terminals 14-15 defined as T2 at the first start-up is below the value entered in this parameter, the device operates in preheating mode until the temperature rises above this value.

P606: Temperature 1 Sensor Type:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NTC	4:PT100	0	0	3	40606

The type of the screw temperature sender connected to terminals 14-15 of the device defined as T1 is determined by this parameter.

Sensor types:

- 0. NTC – 10k 2. PT1000 4. PT100
- 1. KTY81 -210 3. KTY13.5

P607: Temperature Unit:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: °C	1: °F	0	0	3	40607

It determines the temperature unit that the device measures and displays on the display and controls. It can be selected as °C or °F.

- When this parameter is edited, all parameters, displays and values related to these units are reconfigured according to the edited value.

P608: Fan Operating Temperature:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	80,0	-1	3	40608

After the function of one of the outputs of the device is set as "Fan", if the value measured by the screw temperature sender connected to terminals 14-15 defined as T1 is above the value entered with this parameter, the related Fan output is activated until it reaches the stop temperature.

P609: Fan Stop Temperature:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	60,0	-1	3	40609

After the function of one of the outputs of the device is set as "Fan", if the value measured by the screw temperature sender connected to terminals 14-15 defined as T1 is below the value entered with this parameter, the relevant Fan output is disabled until it reaches the operating temperature.

P610: Dryer Operating Temperature:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	15,0	-1	3	40610

There are 2 different dryer functions, Dryer-Z and Dryer-S, in the digital output functions. When the Dryer-S function is selected, the dryer signal output is generated according to this parameter. For details, please refer to the "Digital Output Functions" section.

P611: Dryer Stop Temperature:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	5,0	-1	3	40611

There are 2 different dryer functions, Dryer-Z and Dryer-S, in the digital output functions. When the Dryer-S function is selected, the dryer signal output is generated according to this parameter. For details, please refer to the "Digital Output Functions" section.

P612: Reserved:

P613: Temperature 2 High Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	100,0	-1	3	40613

When the temperature measured by the screw temperature sender connected to terminals 10-11 of the device defined as T2 exceeds the value entered in this parameter, the device stops the compressor by giving "Temperature 2 Upper Failure" fault.

P614: Temperature 2 High Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	90,0	-1	3	40614

When the temperature measured by the screw temperature sender connected to terminals 10-11 of the device defined as T2 exceeds the value entered in this parameter, the device gives "Temperature 2 Upper Warning" warning.

P615: Temperature 2 Low Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	-20,0	-1	3	40615

When the temperature measured by the screw temperature sender connected to terminals 10-11 of the device defined as T2 falls below the value entered in this parameter, the device stops the compressor by giving "Temperature 2 Sub Failure" fault.

P616: Temperature 2 Low Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	90,0	-1	3	40616

When the temperature measured by the screw temperature sender connected to terminals 10-11 of the device defined as T2 goes below the value entered in this parameter, the device gives "Temperature 2 Lower Warning" warning.

P617: Temperature 2 Sensor Type:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: NTC	4:PT100	0	0	3	40617

The type of the screw temperature sender connected to terminals 10-11 of the device defined as T2 is determined by this parameter. **Sensör tipleri:**

0: NTC -10k
 1: KTY81 -210
 2: PT1000
 3: KTY -13.5
 4: PT100

P618: Temperature 2 Mode:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Closed	2: Fark	0	0	3	40618

The operating mode of the second temperature sender connected to terminals 10-11 of the device, defined as T2, is determined by this parameter. The descriptions of the three different options are as follows:

- 1 **Off (0):** The second temperature sender must be turned off when it is not in use.
- 2 **Normal (1):** The second temperature sender is defined to function like the screw temperature sender, providing warnings and malfunctions when measured values fall outside the defined limits.
- 3 **Difference (2):** The value measured by the second temperature sender is subtracted from the value measured by the first screw sender. Error/warning conditions are triggered based on the obtained difference value.

P619: Temperature Compensation Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	0	-1	3	40619

If the value measured by the screw temperature sender connected to terminals 14-15 of the device defined as T1 is lower than the value specified with this parameter, the compressor switches to idle according to the new idle pressure below instead of "P2 Idle Pressure".

$$P2 \text{ Unloading Pressure} = P3 + (P2 - P3)/4$$

P620: Screw Oil Freeze Prevention:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
°C / °F	-328,0	392,0	-99,9	-1	3	40620

This function can be used to prevent the screw oil from freezing in cold weather. If the compressor will not operate in a cold environment for a long period of time (for example for 2 days at the weekend), it may be desirable to heat the screw oil at certain intervals. In this case, when the value measured by the screw temperature sender connected to terminals 14-15 of the device defined as T1 reaches the value measured by P620, the compressor is started for a short time. If you do not want to use this feature, you can set the value of P620 to -99.9°C.

10.2.7 Mains Parameters:

P701: Voltage Unbalance:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
%	0	40	20	0	3	40701

It is the parameter used to control the imbalance between the phases in percentage. Entering the parameter value "0" ensures that the control is not performed.

P702: Voltage Low Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	600	310	0	3	40702

If one of the mains voltage phases connected to the terminal numbered "27-28-29" defined as "R-S-T" is below the value specified by this parameter, the device switches to the fault position and stops the motor. Failure delay is 1 second. Entering the parameter value "0" ensures that the control is not performed.

P703: Mains Voltage Low Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	600	330	0	3	40703

If one of the mains voltage phases connected to the terminal numbered "27-28-29" defined as "R-S-T" is below the value specified by this parameter, the device gives a warning by indicating the relevant phase. Failure delay is 1 second. Entering the parameter value "0" ensures that the control is not performed.

P704: Voltage High Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	600	466	0	3	40704

If one of the mains voltage phases connected to the terminal numbered "27-28-29" defined as "R-S-T" is above the value specified by this parameter, the device switches to the fault position and stops the motor. Failure delay is 1 second. Entering the parameter value "0" ensures that the control is not performed.

P705: Voltage High Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	600	450	0	3	40705

If one of the mains voltage phases connected to the terminal numbered "27-28-29" defined as "R-S-T" is above the value specified by this parameter, the device gives a warning by indicating the relevant phase. Failure delay is 1 second. Entering the parameter value "0" ensures that the control is not performed.

P706: Frequency Low Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	80,0	45,0	-1	3	40706
<p>If the mains frequency connected to the terminal numbered "27-28-29" defined as "R-S-T" is below the value specified by this parameter, the device switches to the fault position and stops the motor by indicating the "Frequency Low Fault" message. Failure delay is 3 seconds. Entering the parameter value "0" ensures that the control is not performed.</p>						

P707: Frequency Low Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	80,0	47,0	-1	3	40707
<p>If the mains frequency connected to the terminal numbered "27-28-29" defined as "R-S-T" is below the value specified by this parameter, the device displays a warning message "Frequency Low Warning". Warning delay is 2 seconds. Entering the parameter value "0" ensures that the control is not performed.</p>						

P708: Frequency High Error:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	80,0	55,0	-1	3	40708
<p>If the mains frequency connected to the terminal numbered "27-28-29" defined as "R-S-T" is above the value specified by this parameter, the device switches to the fault position and stops the motor by indicating the "Frequency High Fault" message. Failure delay is 2 seconds. Entering the parameter value "0" ensures that the control is not performed.</p>						

P709: Frequency High Warning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	80,0	53,0	-1	3	40709
<p>If the mains frequency connected to the terminal numbered "27-28-29" defined as "R-S-T" is above the value specified by this parameter, the device displays a warning message "Frequency High Warning". Warning delay is 2 seconds. Entering the parameter value "0" ensures that the control is not performed.</p>						

P710: Current Unbalance

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
%	0	40	10	0	3	40710
<p>It is the parameter used to control the imbalance between I1 and I2 currents in percentage. Entering the parameter value "0" ensures that the control is not performed.</p>						

P711: Motor Current Ratio:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	9999	20	0	3	40711

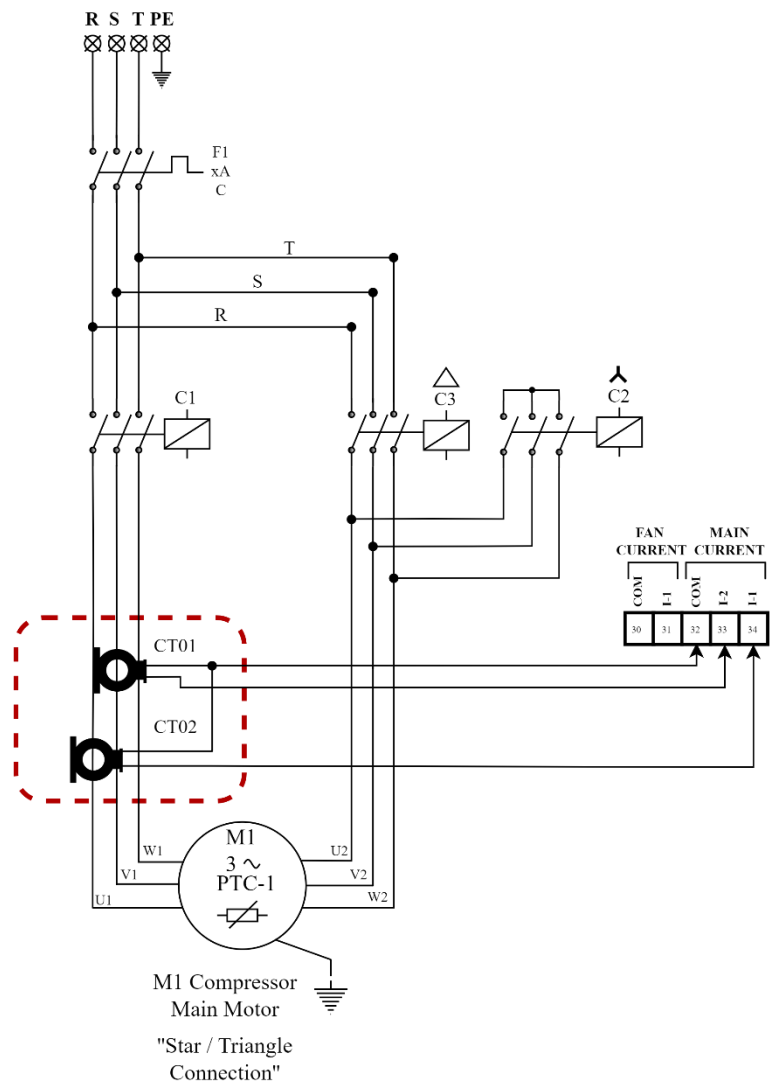
It is the parameter used in the conversion ratio of I1 and I2 currents. The current drawn by the motor is calculated by multiplying the parameter value with the current value read at I1 and I2 terminals. Entering the parameter value "0" ensures that power calculation checks are not performed.

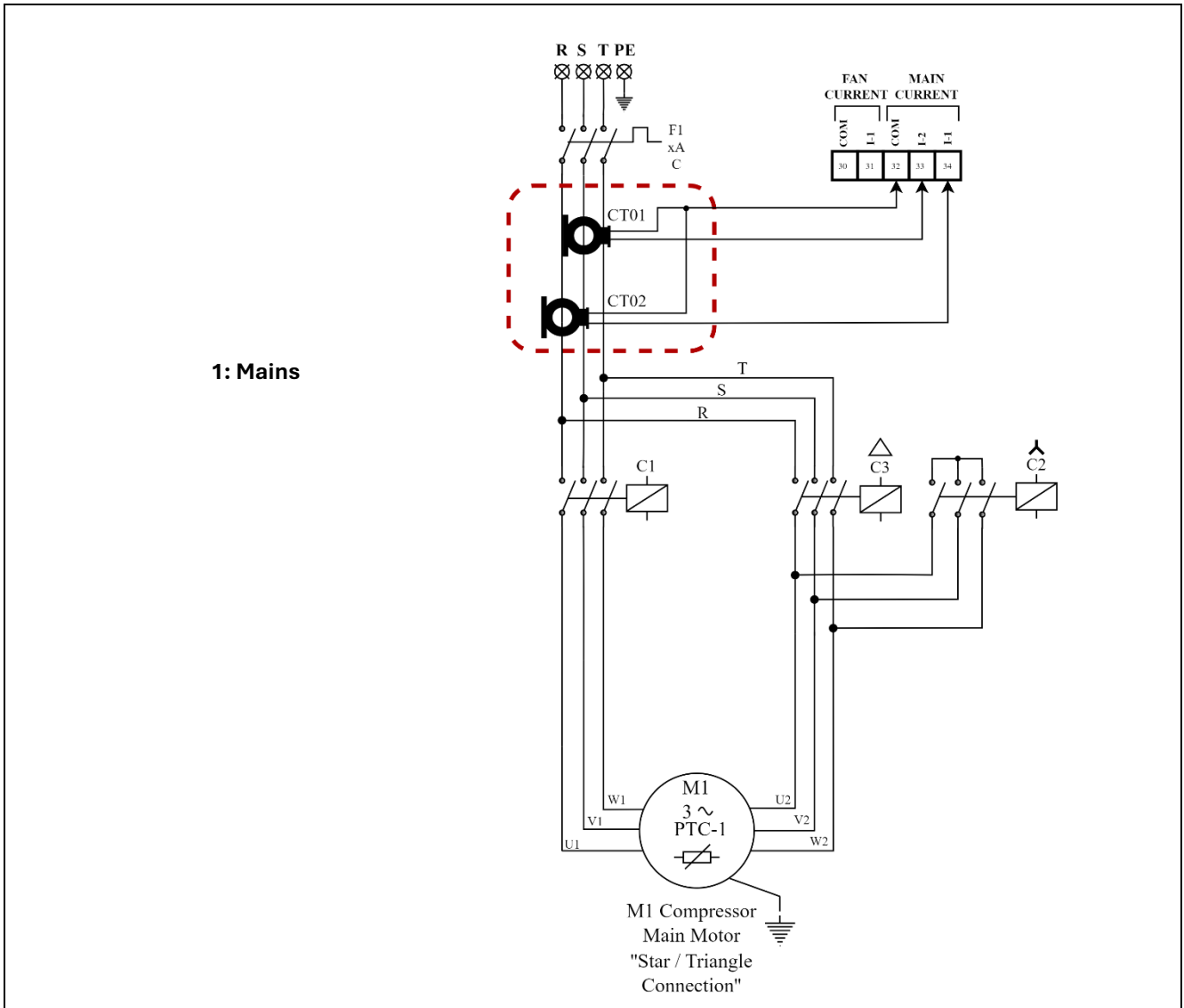
P712: Motor Transformer Connection:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	1	0	0	3	40712

This parameter allows the device to recognize the connection terminals of the current transformers, enabling accurate power calculation.

0: Motor Windings





P713: Motor Rated Current:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
A	0	9999	250	-1	3	40713

It represents the RMS value of the nominal current that should flow through the motor for a single phase. The motor thermal protection functions operate based on this parameter.

P714: Motor Thermic Type:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
	1	5	1	0	3	40714

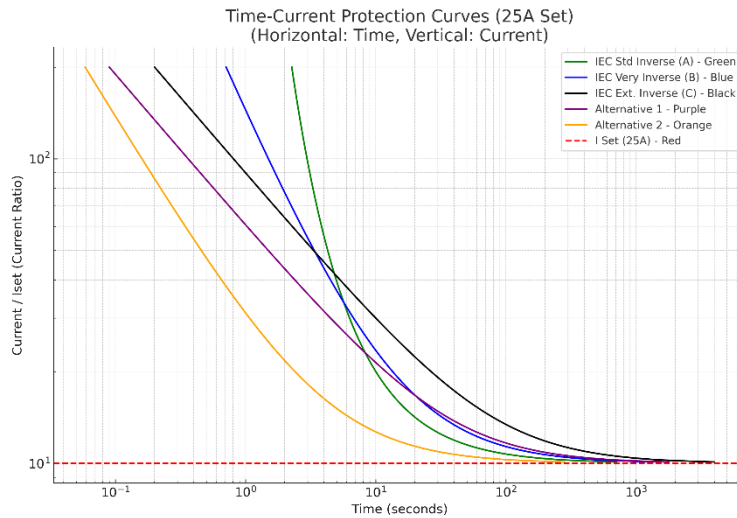
This parameter defines the IDMT curve required for the operation of the motor current thermal function. IDMT (Inverse Definite Minimum Time) indicates that the response time to overcurrent events above a certain level becomes shorter as the current increases.

1. IEC Standard Inverse Curve A
2. IEC Very Inverse Curve B
3. IEC Extremely Inverse Curve C
4. Alternative 1
5. Alternative 2

Example of operation:

IDMT Calculation Formula:
$$x = T \cdot \left(\frac{k}{\left(\frac{y}{I}\right)^a - 1} \right)$$

x = time, y = actual current, T = time multiplier setting (TMS), k = curve constant, a = curve exponent, I = set current value (default: 2.0A)



Colour	Curve	T	k	a
Green	IEC standard inverse curve A	1	0.140	0.02
Blue	IEC very inverse curve B	1	13.5	1
Black	IEC extremely inverse curve C	1	80	2
Purple	Alternative 1	0.449	80	2
Orange	Alternative 2	28.57	0.140	1.4142

P715: Fan Current Ratio:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	9999	250	0	3	40715
<p>This parameter is used for the conversion ratio of the IF current. The current value read at the IF terminal is multiplied by this parameter to calculate the current drawn by the fan. If the parameter value is set to '0', power calculation and related checks are disabled.</p>						

P716: Fan Rated Current:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
A	0	9999	20	-1	3	40716
<p>This parameter represents the RMS value of the nominal current that should flow through the fan motor for a single phase. The thermal protection functions of the fan motor operate based on this parameter.</p>						

P717: Fan Thermic Type:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
	1	5	1	0	3	40717

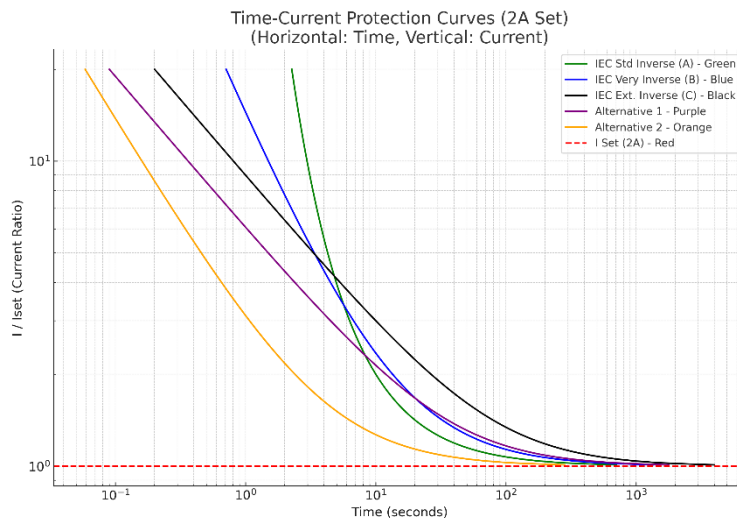
This parameter defines the IDMT curve required for the operation of the fan current thermal protection function. IDMT (Inverse Definite Minimum Time) indicates that the response time to overcurrent conditions above a certain threshold decreases as the current increases.

1. IEC Standard Inverse Curve A
2. IEC Very Inverse Curve B
3. IEC Extremely Inverse Curve C
4. Alternative 1
5. Alternative 2

Example of operation:

IDMT Calculation Formula:
$$x = T \cdot \left(\frac{k}{\left(\frac{y}{I}\right)^a - 1} \right)$$

x: time, y: current, T: TMS time constant, k: curve constant, a: curve constant, I: Set current value 2.0A(default)



Colour	Curve	T	k	a
Green	IEC standard inverse curve A	1	0.140	0.02
Blue	IEC very inverse curve B	1	13.5	1
Black	IEC extremely inverse curve C	1	80	2
Purple	Alternative 1	0.449	80	2
Orange	Alternative 2	28.57	0.140	1.4142

P718: Phase Seq Control:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Passive	1: Active	1	0	3	40718

This parameter is used to enable or disable the phase sequence control function.

- When this parameter is activated, the value of parameter P718 – Network Errors and Warnings – is automatically enabled as well.

P71: Mains Faults:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Pasif	1: Aktif	1	0	3	40719

This parameter determines whether the faults, warnings, and checks under the Mains Parameters section are enabled or disabled.

10.2.8 General Settings Parameters

P801: Reserve:

P802: Factory Password:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0000	9999	1923	0	3	40802
This parameter sets the authorised password to access the factory level parameters. Factory value is 1923.						

P803: Service Password:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0000	9999	1922	0	2	40803
This parameter sets the authorised password to access service level parameters. Factory value is 1922.						

P804: User Password:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0000	9999	1934	0	1	40804
This parameter sets the authorised password to access user level parameters. Factory value is 1934.						

P805: Maximum number of departures per hour:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	9999	10	0	3	40805
Determines the maximum number of times the compressor can be run in one hour.						

P806: Compressor Start Source:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: PAN-DI-MBS	4: DI-MBS	0	0	2	40805
This parameter selects where the panel will receive the run command. There are options for remote operation via panel, remote operation via digital input, remote operation via communication: PAN-DI-MBS: The compressor is allowed to operate via panel, digital input and modbus.						
<ol style="list-style-type: none"> 0. Panel: The compressor is only allowed to operate via panel. 1. Digital Input: The compressor is only allowed to operate via digital input. 						

- 2. **Modbus: The compressor is only allowed to operate via Modbus.**
- 3. **DI-MBS: The compressor is allowed to operate via digital input and modbus.**

P807: Compressor Operation Mode:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Manuel	2: Parallel	1	0	2	40807

It is the parameter that determines the operation mode of the panel. Manual (0), Automatic (1) or Parallel can be selected:0. Manual: When this mode is selected, when the outlet pressure reaches the idle pressure, the compressor is put into idle but the compressor continues to run continuously. It is not possible for the compressor to stop unless a malfunction occurs or a stop command is sent by the user.

- 0. 1. Automatic: When this mode is selected, if the output pressure is still above the load pressure after a certain period of time after the compressor is idle, the compressor is switched to automatic standby and the compressor motor is stopped. Thus, energy saving is provided. When the compressor is in automatic standby mode, the compressor starts to run automatically when the outlet pressure reaches the load pressure. The parameters affecting the start of the compressor are P3, P7, P103 and P807.
- 1. 2. Parallel: In this mode, more than one CCS works in parallel by communicating with each other via CAN line. In this operating mode, CCSs are switched in and out of the circuit sequentially and automatically according to the need. Selecting the operation mode as Parallel makes the "Parallel Control" parameter menu and "Parallel Control Tracking" screen available on the panel. Otherwise, "Parallel Control" parameters and "Parallel Control Tracking" screen cannot be accessed on the panel.

P808: Idle Running Time S/D:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Passive	1: Active	0	0	3	40808

Dynamically changes the time for the compressor to switch to automatic standby mode to save energy. This function can be used if P807- Compressor Operating Mode is Automatic (1). After the compressor reaches the idle pressure, it continues to run idle for the time specified by parameter P106. When P808 "Idle Run Time S/D" is activated, this time is tried to be reduced in order to save energy. If the time elapsed in Auto-Standby state (TAuto) is greater than the time the compressor was idle (TIdle) before switching to Auto-Standby mode, i.e. TAuto> TIdle condition is met, the "Auto Standby Delay" time assigned by the user with P106 is gradually reduced. The reduction amount is 30 seconds. However, this reduction is not reflected in the parameter. Therefore, if the power of the device is cut off for any reason, the reduced automatic standby delay time value is lost during the operating time.

P809: Horn Mode:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Continuous	1: Impact	0	0	2	40809

If the "Horn" function is assigned to one of the outputs, the horn output operates continuously or pulsed depending on this parameter.

P810: Pressure Loss Prevention:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Passive	2: Slope	0	0	3	40810

While the compressor is in **automatic standby mode**, it starts operation when the **Output Pressure** reaches the load activation pressure and must go through several stages before transitioning to load mode. Since these stages require a specific amount of time, the **Output Pressure** may drop to undesirable levels until the compressor switches to load. This function is used to prevent such situations:

- 1 Passive (0):** The pressure loss prevention mode is inactive.
- 2 Step (1):** This is an iteration-based step method. At the end of each load activation process, the Output Pressure is checked, and the new load activation pressure value is updated in increments of **0.1 bar**. For example: If the **Load Activation Pressure** defined by **P3** is **4 bar** and the Output Pressure measured when the compressor reaches full load is **3.6 bar**, the next load activation pressure will be set to **4.1 bar**. Thus, instead of the **P3** defined value of **4 bar**, the next load activation pressure becomes **4.1 bar**. If, through iterations, the load activation pressure increases to **4.6 bar** (starting from the P3-defined **4 bar**), the compressor will send a start command when the **Output Pressure** drops to **4.6 bar** while in standby mode. If, at this point, the measured Output Pressure upon entering load exceeds **4 bar** (P3-defined value), the next load activation pressure will be updated by **reducing it by 0.1 bar** to **4.5 bar** for the subsequent control cycle.
- 3 Slope:** This method calculates the new load activation pressure value based on the current **pressure drop rate** and the countdown time required for the compressor to transition to load mode. If there is a rapid pressure drop, a start command is sent to the compressor **before the value defined by P3 is reached**.

P811: Save/Use Parameter:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No.	2: Use it	0	0	3	40811

This parameter is used to save device parameters and recall saved parameters.

0. No: Does not perform any operation.

1. Backup: Backs up the current state of the parameters.

2. Use: Restores the parameters stored with the Backup command.

Note: After the parameter saving process is finished, the value of the parameter returns to "No".

P812: Modbus UID:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0	247	1	0	3	40812

This parameter value is assigned to the UID (Uniq Identifier) of the panel in Modbus Server protocol provided from RS-485 port.

P813: Language Selection:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Turkish	1: English	1	0	3	40813

This parameter sets the language of the device. Turkish and English languages are available as standard.

P814: Factory Reset:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	2: user defined	0	0	3	40814

The device has 2 different factory reset options. These are; the default values embedded in the device and determined by the manufacturer and the user-defined factory values in a second field.

0. No: does not perform any operation.

1. ENKO: Loads the factory values to the device.

2. K. Defined (User Defined): It loads the parameters created with the "Power Cloud MKII" programme to the device via USB.

P815: Clear Fault Logs:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	1: Yes	0	0	3	40815

All fault records in the device are deleted with this parameter.

Note: After the parameter saving process is finished, the value of the parameter returns to "No".

P816: Resetting Motor Run Times:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	1: Yes	0	0	3	40816

Motor running and load running times in the device are reset with this parameter.

Note: After the parameter saving process is finished, the value of the parameter returns to "No".

P817: Menu Logout Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Min	0	30	3	0	3	40817

If no key is pressed for the time period specified by this parameter during the time period when the device stays in the parameter menu, the parameter menu is exited automatically. In addition, after logging in to the menu, if you do

not log out with the P818 "Menu Logout" parameter, you can log in to the menu without password within the time period specified here..

P818: Menu Logout:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	1: Yes	0	0	3	40818

It allows manual exit from the menu. Thus, the need for password entry arises in the next menu entry.

Note: After the parameter saving process is finished, the value of the parameter returns to "No"..

P819: Dynamic Encryption:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: No	10: Maxwell	0	0	3	40819

Please contact with our company about this parameter.

P820: Motor Driver

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Star-Triangle	4: Danfoss FC102	0	0	3	40820

Indicates the compressor motor driving option. If the value of this parameter is different from 0 "Star-Delta", the Modbus-Server application running on the RS-485 port on terminals 18, 19 and 20 of the device starts to work as Modbus-Client application.

- 0. Star-delta: The compressor motor is driven by Star-Delta switching method.
- 1. Mitsubishi FR-F800: The compressor motor is driven by Mitsubishi FR-F800 inverter model.
- 2. ABB ACS580: The compressor motor is driven by ABB ACS580 inverter model.
- 3. Yaskawa A1000: The compressor motor is driven by Yaskawa A1000 inverter model.
- 4. Danfoss FC102: The compressor motor is driven by Danfoss FC102 inverter model.

10.2.9 Inverter Parameters

All Inverter parameters that can be set with the device are under this heading. After these parameters are set in the device, they are configured on the inverter side using Modbus protocol via RS-485 line. In this way, it is not necessary to set the motor parameters of the inverter by the inverter.

P901: Frequency Lower Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	500,0	20,0	-1	3	40901

When the compressor is running, the minimum frequency value that the motor can go down except for the first start.

P902: Frequency Upper Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	500,0	51,0	-1	3	40902

Maximum frequency value that the motor can reach when the compressor is running at load.

P903: Frequency Nominal Value

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Hz	0	500,0	50,0	-1	3	40903

Rated frequency value that the motor can output when the compressor is running at load.

P904: Ramp Rise Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Saniye	0	100	5	0	3	40904

It is the parameter that determines in how many seconds the motor will reach the minimum frequency value at start-up.

P905: Ramp Drop Value:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	0	100	5	0	3	40905

It is the parameter that determines how many seconds the frequency of the motor will reach "0" at the time of stop..

P906: Pole Pair:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	1	12	2	0	3	40906

The number of pole pairs on the motor nameplate must be entered in this parameter.

Ex: A motor with 1500 rpm on the motor nameplate has 2 pole pairs (4 poles). This parameter value should be entered as 2

P907: Label Current:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
A	0	3200,0	0	-1	3	40907

The label current value on the motor label must be entered in this parameter.

P908: Label Voltaj:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	1000	400	0	3	40908

The label voltage value on the motor nameplate must be entered in this parameter.

P909: Power Factor:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
V	0	1000	400	0	3	40909

The Cos(ϕ) value on the motor nameplate must be entered in this parameter.

P910: Label Power:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
kW	0	3200,0	0	-1	3	40910

Label power value on the motor nameplate must be entered in this parameter.

10.2.10 Parallel Control Parameters

- All Parallel Control parameters configurable on the device are included under this section. This parameter group becomes accessible via the panel after the P807 Compressor Operating Mode parameter is set to "Parallel".
- Parallel Control: This defines the operation of multiple CCS units as an independent Multi-Master system with minimally equal parameters to achieve a specific target objective.
- Equal Aging: This refers to operating multiple CCS units in Parallel Control mode with an equal aging goal. The purpose of equal aging is to ensure that the CCS units in the system operate in sequence periodically based on their total operating times.
- Before configuring device parameters, it is recommended to establish the CAN physical connection. When the parameters within the same target are configured on one device, they are automatically applied to all devices in the system.
- The parameters that must be common across the system for proper operation are:
- [P2, P3, P1003, P1007, P1008, P1009, P1010, P1011, P1012, P1013].

P1001: Operation Mode:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	0: Equal Ageing	0: Equal Ageing	0	0	3	41001

In the current version of the device, this parameter includes only the Even Ageing option. It is foreseen that different options such as Energy Saving will be added later.

P1002: Device ID:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	1	12	1	0	3	41002

Device ID parameter is a necessary parameter for observing the status of the devices in the Parallel Control system in the communication between each other and at the same time for their separation in the system. This parameter must be selected sequentially starting from "1" for each device connected to the system. If more than one device in the same Parallel Control system has the same ID, the devices with the same ID give "Conflict Error-ID" fault.

P1003: Ageing Resolution:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	1	100	8	0	3	41003

The devices operating in the Parallel Control system continuously send age information to each other while working towards the goal of equal ageing. Before this information is sent, the total run time is divided by the value in this parameter and the priority in activation is determined according to the integer ages obtained as a result of that division.

P1004: Rest Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
min	0	60	1	0	3	41004

A device that has been running in the Parallel Control system and then entered the rest phase will not operate for the period in the relevant parameter. This state is maintained in the presence of another device waiting in the "Ready" state in the system. If there is no device in the system in the ready state, the device in the resting phase is switched to the ready position in order to meet the pressure requirement that will arise.

P1005: Maximum Operating Time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
min	30	6000	600	0	3	41005

After the device operating in the Parallel Control system has completed the relevant time in this parameter, if there is any device in the system that can take its place in the "Ready" state, it stops at the end of this time and enters the rest phase.

P1006: Offset time:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
hr	-32000	32000	0	0	3	41006

In Parallel Control operating system, the total operating time of the compressor is added to the total operating time of the compressor by the value in this parameter. With the added time (only in Parallel Control system), the new total running time of the compressor is changed.

P1007: Zaman Aşımı:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	10	60	10	0	3	41007

In case of any malfunction in the communication line of the devices included in the Parallel Control operating system or if there is a device that does not work, it is deleted from the Parallel Control operating system at the end of this period and the system continues to operate with the devices that maintain the current connection. Devices with solved connection problems are automatically re-included in the system and Parallel Control operation continues.

P1008: Target Duration:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	1	3600	300	0	3	41008

After the first "START" is given in the Parallel Control operating system, the devices in the system try to reach the "Empty Pressure" by targeting the time in this parameter. This time allows the necessary number of CCS to be activated to reach the target within the limits of P1013 "Number of Devices that can operate simultaneously" parameter.

P1009: Commissioning:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	10	30	15	0	3	41009

In the Parallel Control operating system, the pressure requirement of the system is evaluated at certain periods. After this evaluation, if there is a need for pressure in the system, a device is activated in a certain priority order. In order to observe the effect of the activated device on the system and to re-evaluate the needs of the system, no commissioning operation is performed in the system until the time in this parameter. If the need continues after this period, the device is activated within the limits of P1013 "Number of Devices that can operate simultaneously" parameter.

P1010: Deactivation

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Sec	10	30	15	0	3	41010

In the Parallel Control operating system, the pressure requirement of the system is evaluated at certain periods. After this evaluation, if the pressure requirement in the system is above the desired level, a device is deactivated in a certain priority order. In order to observe the effect of the deactivated device on the system and to re-evaluate the needs of the system, no deactivation operation is performed in the system until the time in this parameter.

P1011: Wasted Offset:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
Bar	0,1	1,0	0,3	-1	3	41011

In the Parallel Control working system, there are more than one device connected to the network. The pressure sensors of these devices reveal the situation of reading different pressure from each other due to the fact that the pressure in the network is not equal at every point. For this reason, different read pressures should also include the difference between each other, if any, in order for the system to operate synchronously in case of idle switching. If such a difference occurs in the system, the value of this difference must be entered in this parameter.

P1012: Total Number of Devices:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	1	12	2	0	3	41012

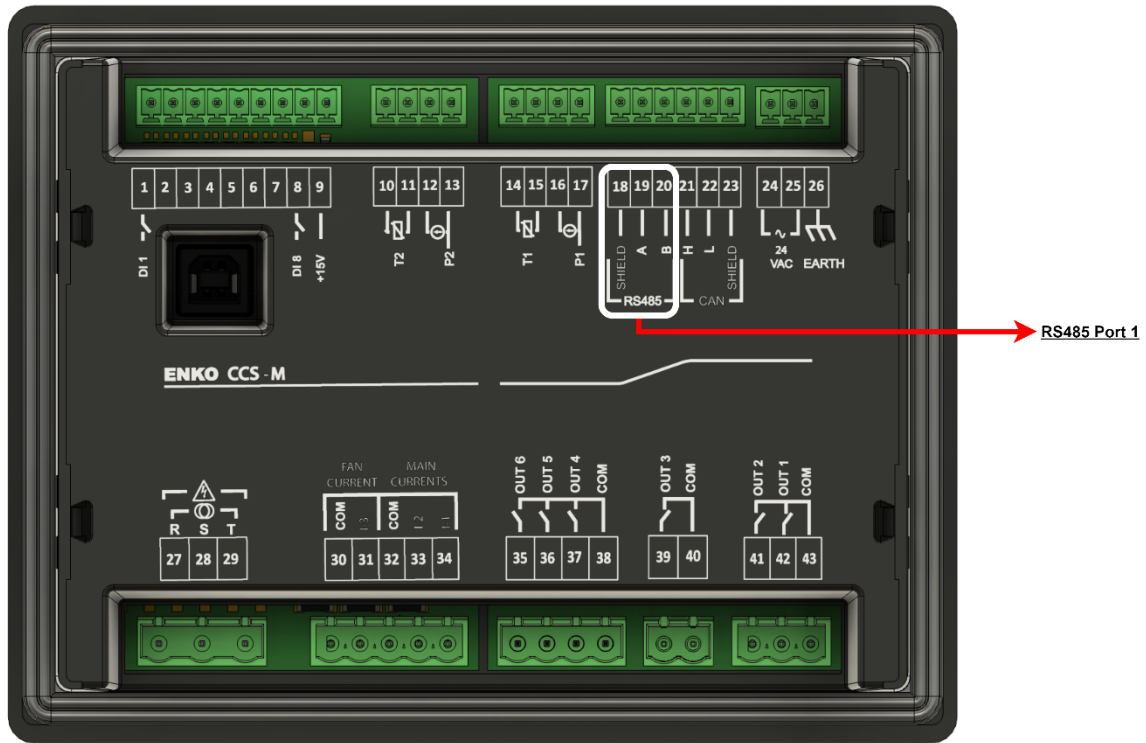
In the Parallel Control operating system, it is the parameter of the total number of devices included in the system. If there is a missing or faulty device in the system, it is controlled with this parameter.

P1013: Number of Simultaneous Devices:

Unit	Min	Max	Default	Coefficient	Level	Modbus Address
-	1	12	2	0	3	41013

Parallel Control is the parameter that determines the maximum number of devices that can operate at the same time. Even if the system is in need, the number of devices operating at the same time cannot exceed this parameter value.

10.2.11 Communication Parameters



This port enables communication between the CCS and an inverter, if required by the application. In Star-Delta drive mode, the port operates using the Modbus Server protocol. This allows integration with Power Cloud MKII or custom SCADA applications, offering options for remote monitoring and control. These parameters are used when configuring RS485 communication settings.

P1201: Modbus Authorisation Timeout:

Unit	Min	Max	Default	Coefficient	Level	Modbus address
Sn	0	32767	600	0	3	41201
In Modbus communication, the granted authority expires after the duration specified in this parameter if no communication is detected. If the parameter value is set to "0", no authority check is performed during Modbus communication.						

P1202: Port-1 Unit ID:

Unit	Min	Max	Default	Coefficient	Level	Modbus address
-	1	247	1	0	3	41202
In the Modbus Server protocol provided via RS485 Port-1, this parameter value is assigned as the panel's UID (Unique Identifier).						

P1203: Port-1 Baud Rate:

Unit	Min	Max	Default	Coefficient	Level	Modbus address
bps	0	4	3	0	3	41203
<p>The baud rate of the device connected via RS485 Port-1 is determined by this parameter.</p> <p>0: "115200"</p> <p>1: "57600"</p> <p>2: "38400"</p> <p>3: "19200"</p> <p>4: "9600"</p>						

P1204: Port-1 Parity:

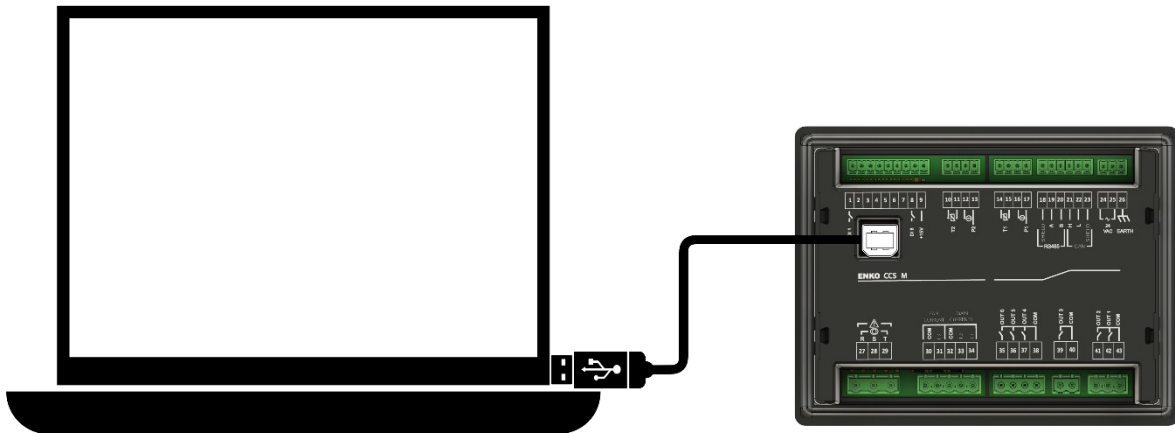
Unit	Min	Max	Default	Coefficient	Level	Modbus address
bps	0	2	3	0	3	41204
<p>The parity bit of the device connected via RS485 Port-1 is set according to this parameter.0: "Yok"</p> <p>1: "Çift"</p> <p>2: "Tek"</p>						

P1205: Port-1 Stop Bit:

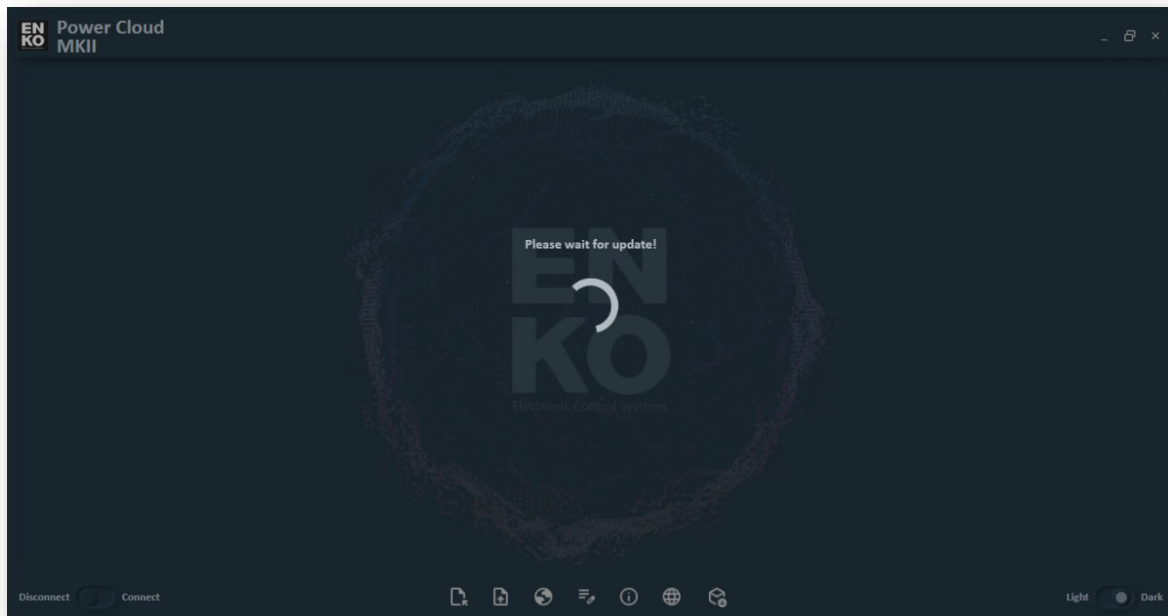
Unit	Min	Max	Default	Coefficient	Level	Modbus address
	1	2	1	0	3	41205
<p>The stop bit configuration of the device connected via RS485 Port-1 is defined by this parameter.</p>						

11 SOFTWARE UPDATE

To perform a software update, a USB communication link must be established between the computer and the CCS-M control panel.

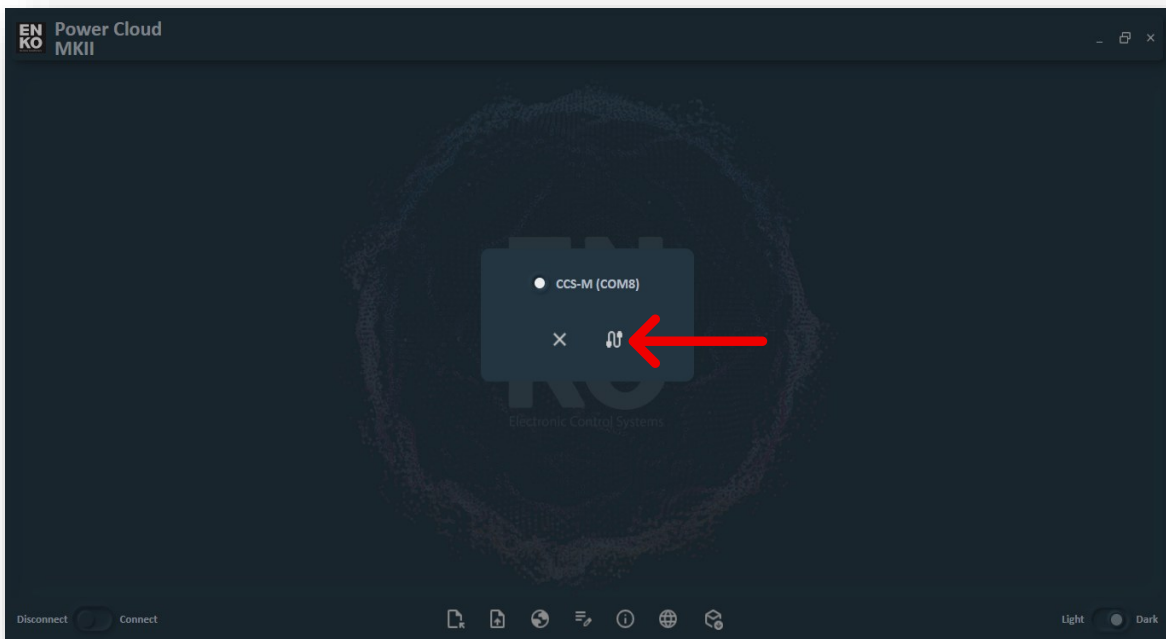
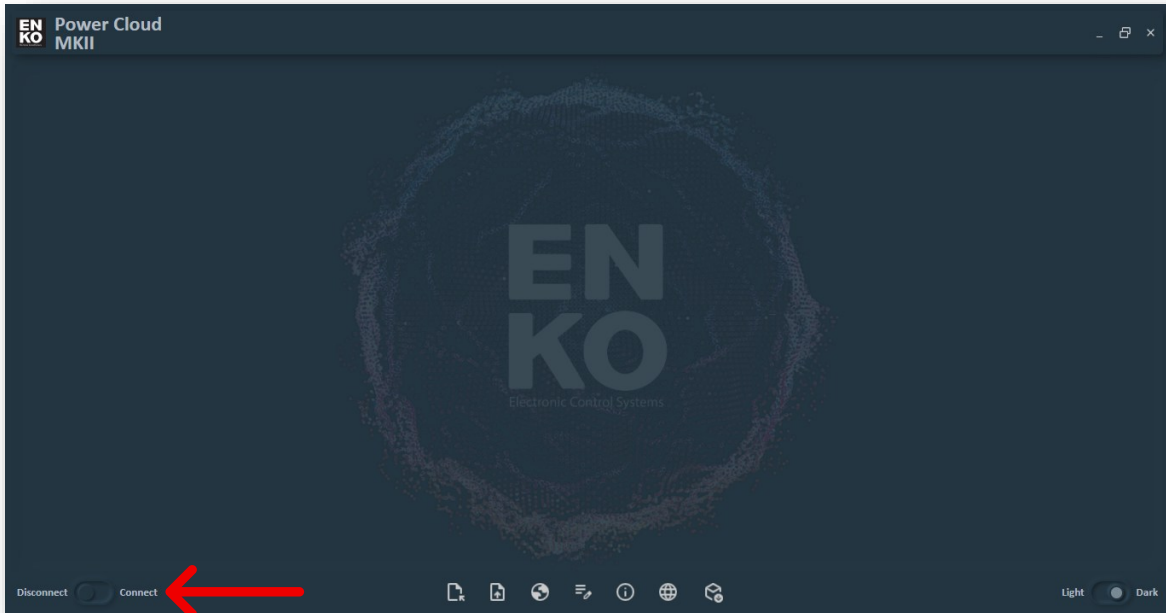


The **Power Cloud MKII** application is required for the software update. You can download it from the following link: https://enkoelektronik.com/assets/repository/software/Power_Cloud_MKII_v1.0.1.zip After downloading, extract the contents using the "Extract to folder" option. Run the **Power Cloud MKII.exe** file inside the extracted folder to launch the application. When launching the software for the first time, it will automatically download device-related data from the internet.

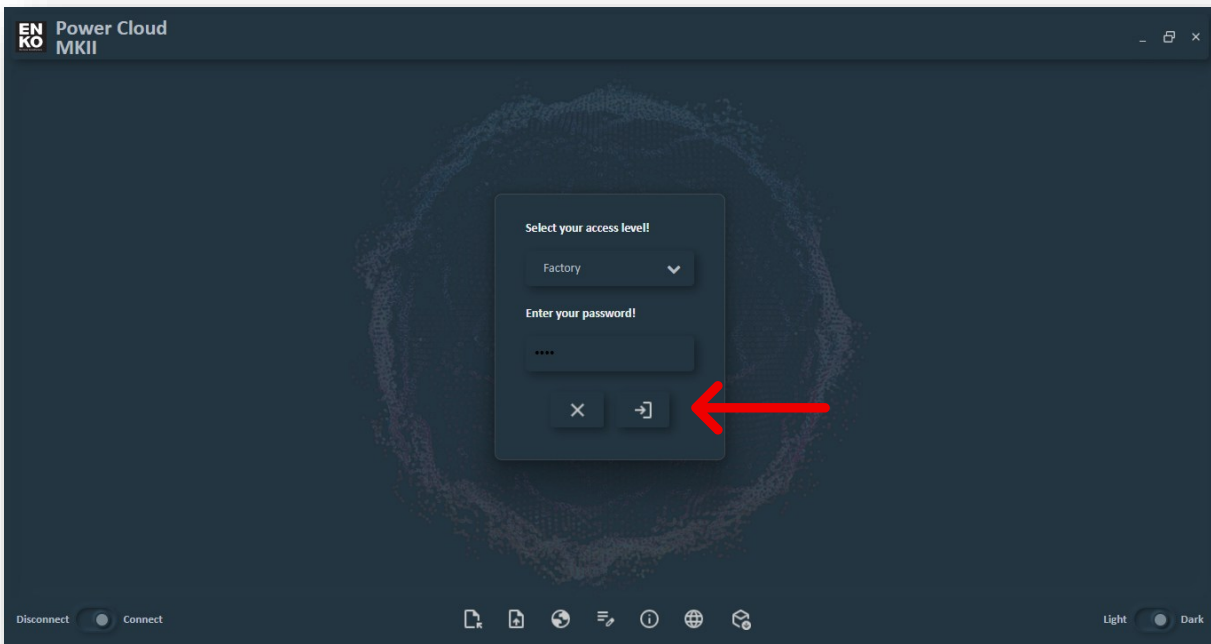


11.1 Standart Software Update

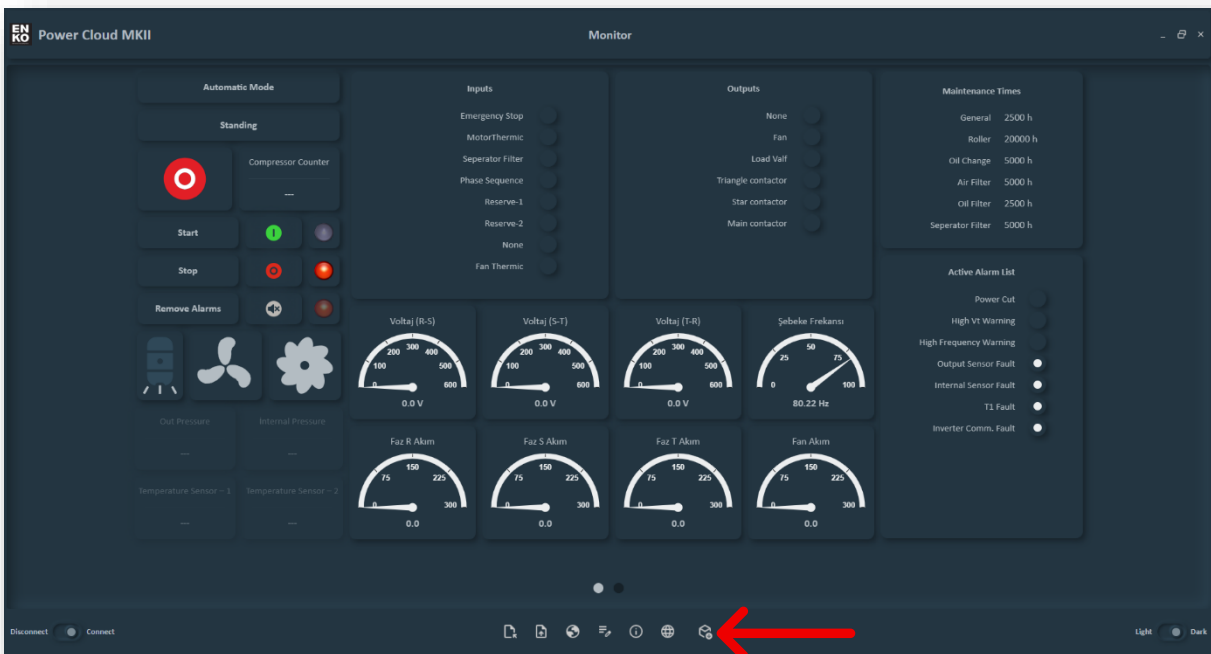
On the application startup screen, the **Connect** button located at the bottom left allows you to connect to the device. Once connected, you can perform parameter configuration, monitoring, and software update operations.



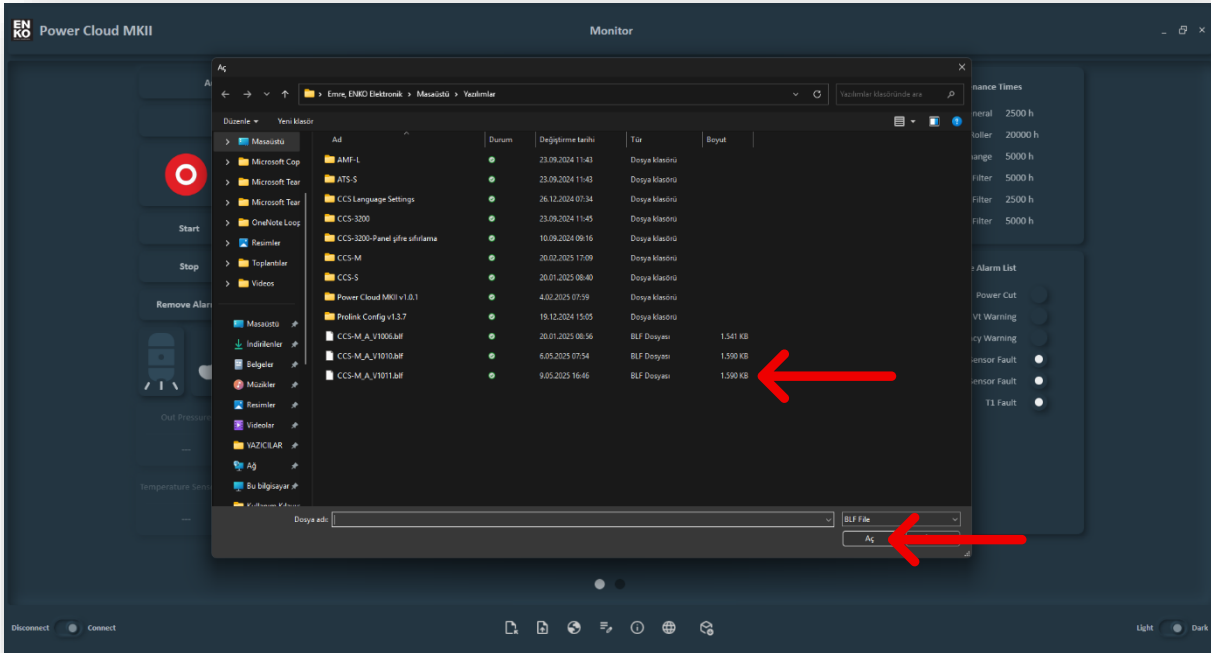
After initiating the connection request to the device, the appropriate access level and password must be entered to establish the connection.



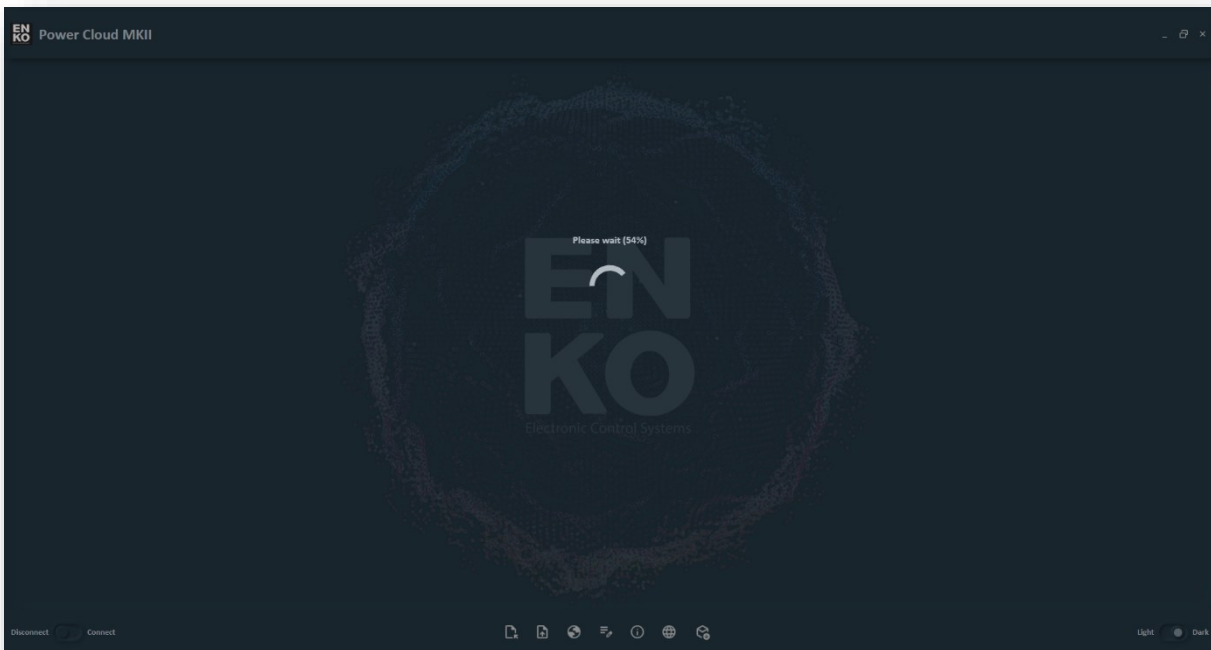
Click the software update icon located below to initiate the software update process.



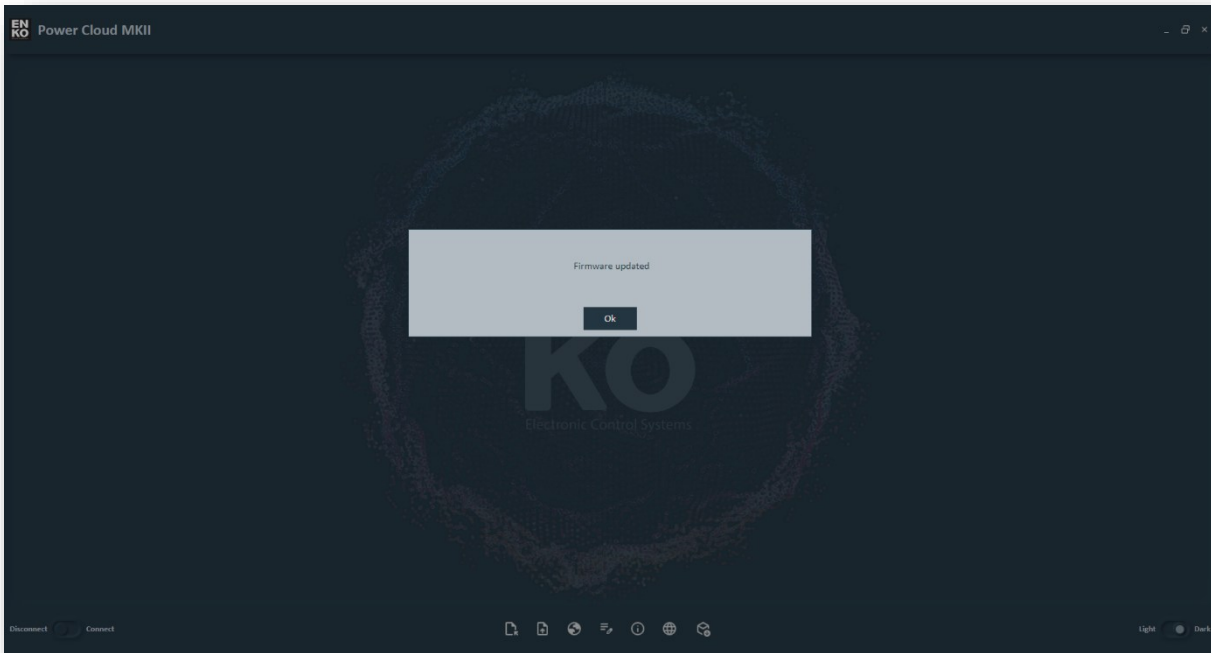
In the window that appears, select the relevant firmware file and click the **Open** button to start the software update process.



Once the software update has started, the connection between the device and the PC **must not be interrupted under any circumstances**. Any communication error during the update process may render the device inoperable. In such cases, a non-standard recovery method must be used to reinstall the firmware.

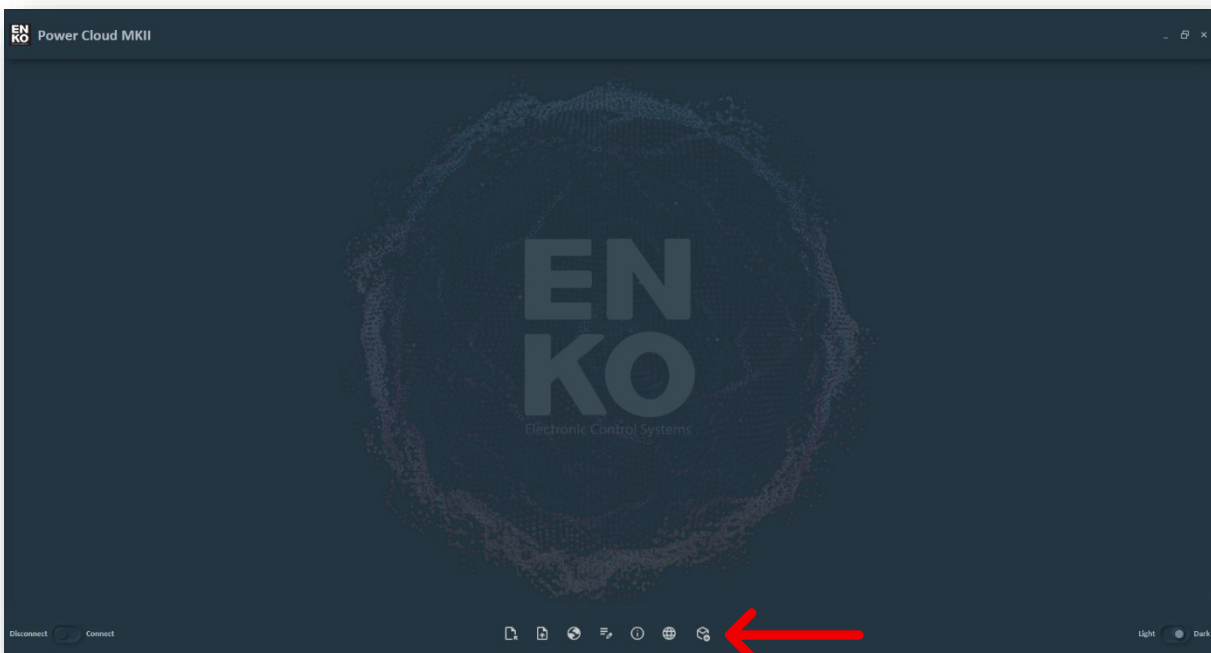


Once the update is complete, a **“Completed”** message will be displayed. At this point, the device firmware has been successfully updated.

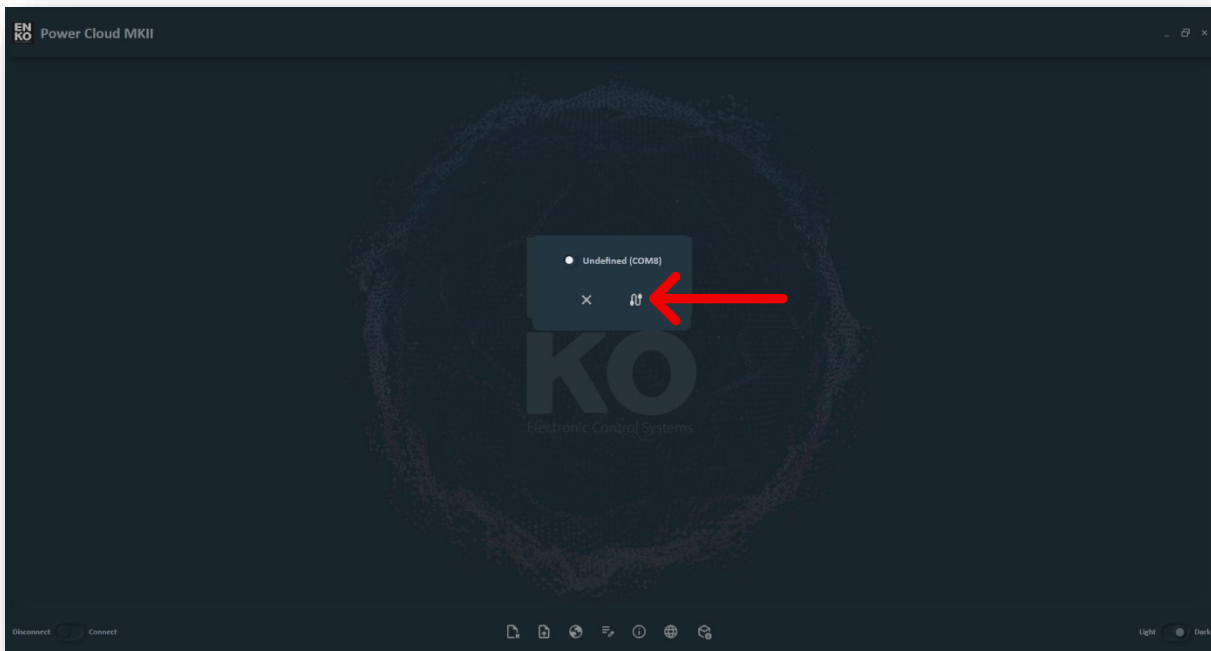


11.2 Non-Standard Software Update

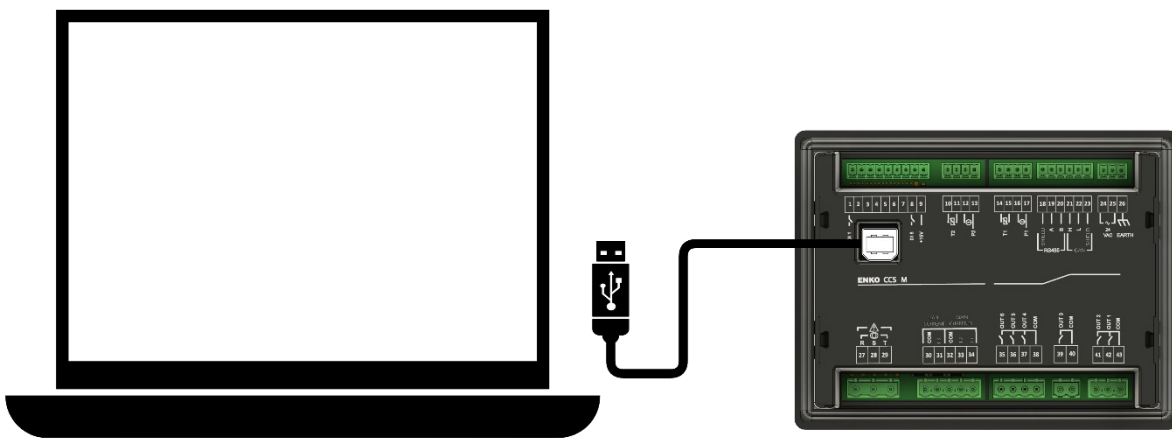
To start the software update process, click the software update icon indicated by the arrow.



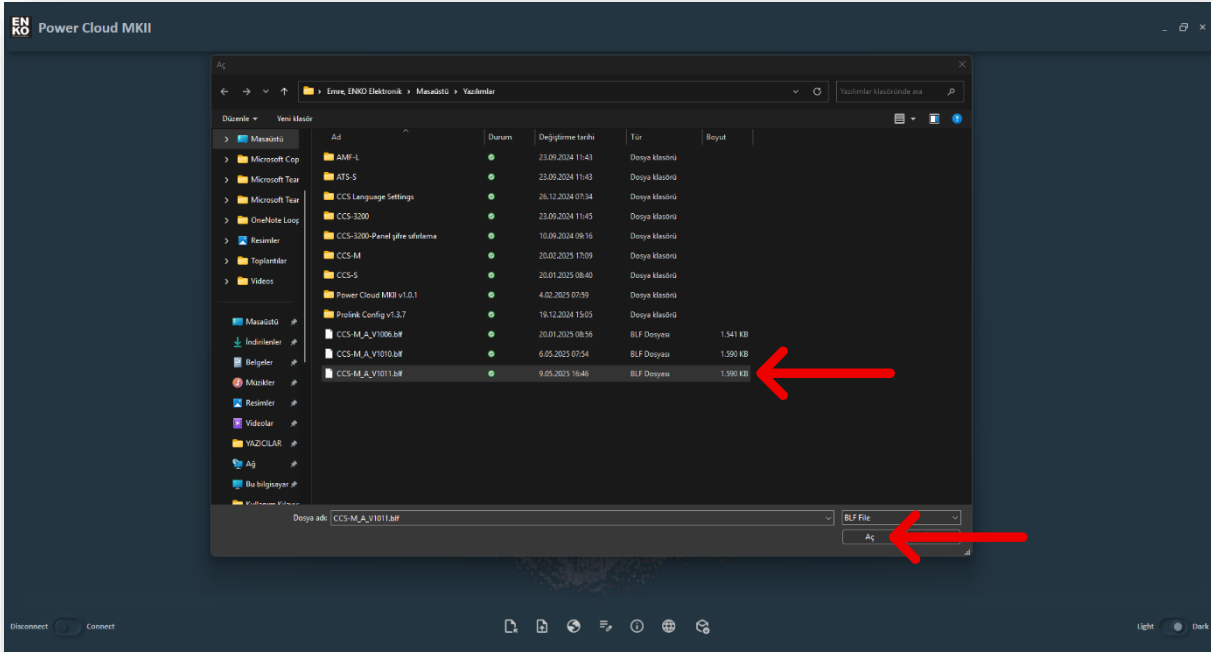
After clicking the software update icon, click the connection icon.



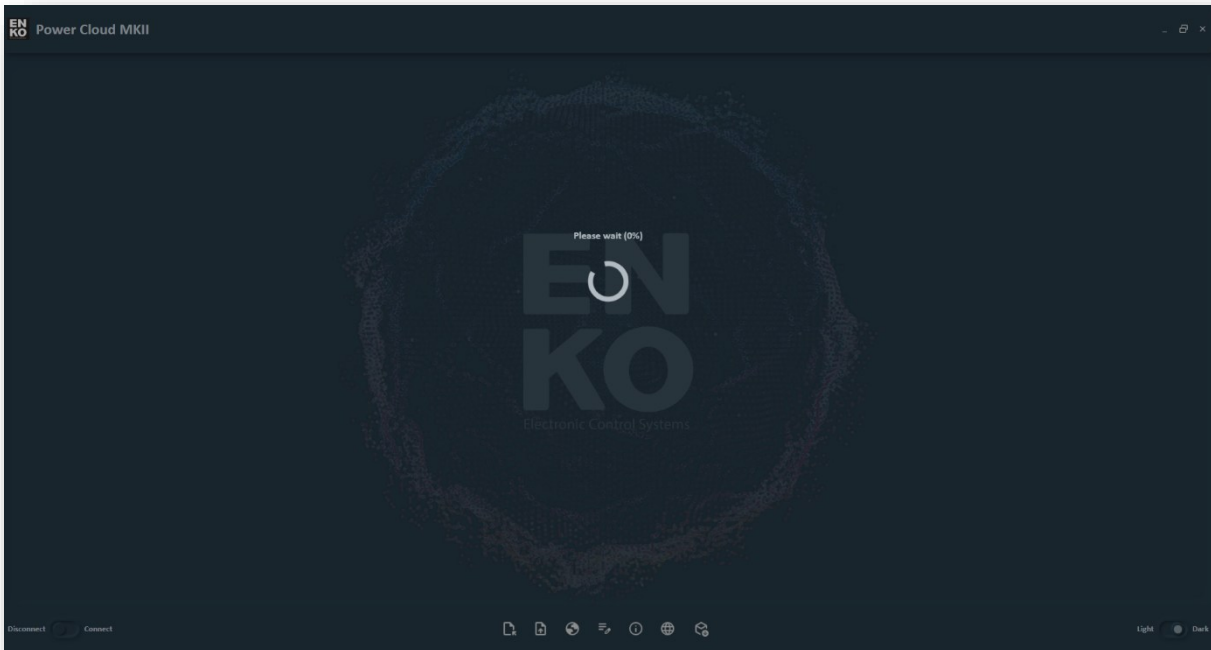
After logging in, the USB cable should be disconnected from the PC.



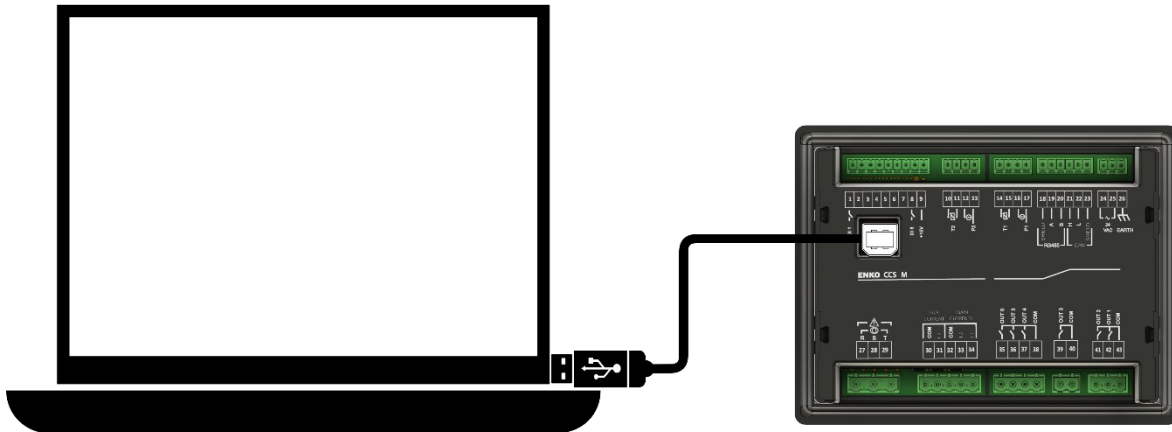
After selecting the software file, click the **Open** button.



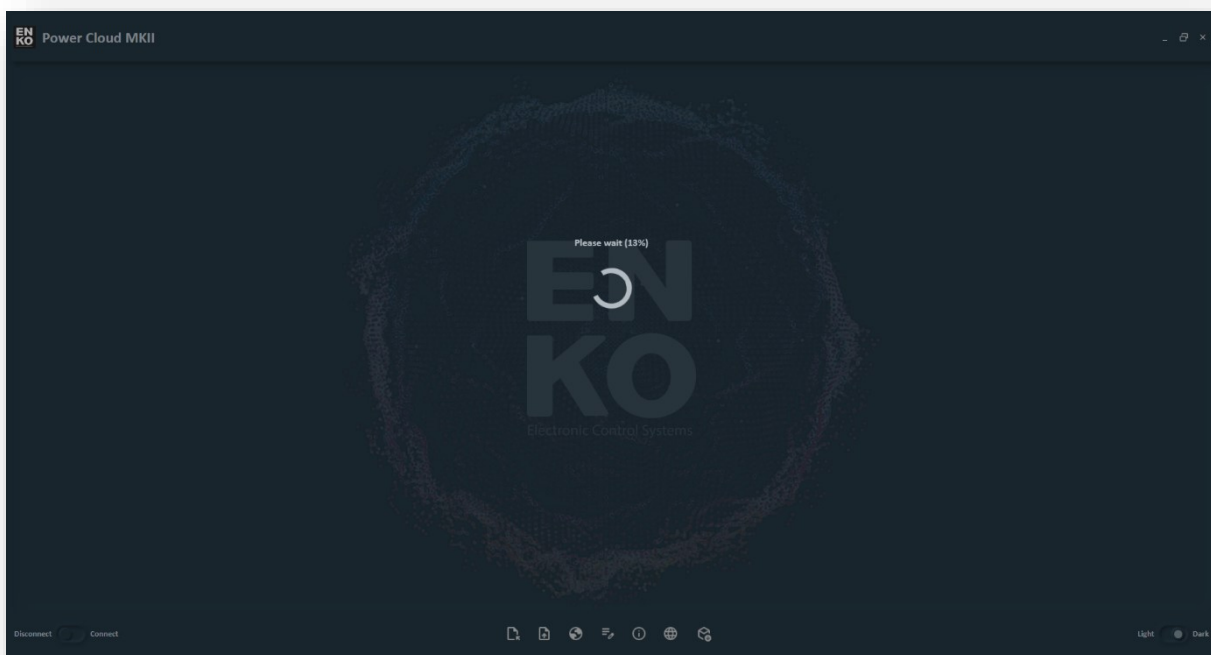
If the USB cable is disconnected during the loading screen, the update will not progress as shown below.



To start the update, the USB cable must be reconnected.



After reconnecting the USB cable, the update process will continue. Once the required time has elapsed, the software will be successfully installed



CUSTOMER SUPPORT

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- Warranty Period: 2 Years
- Scope of Warranty: Against Manufacturing Defects
- Warranty Start Date: As of the Invoice Date

Legal Notices

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Certificates

- CE Compliance Certificate
- ISO 9001:2015 Quality Management System
- TSE Compliance Certificate

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