

Handling and Operating Manual

CC-LB/LC Control Panel



CC-LB/LC Control Panel Handling and Operating Manual

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Figure: 1 (Wall Type)

- 1- FC Magnetic switch
- 2- Isolation transformer thermal magnetic switch
- 3 Phase control relay
- 4- Thermostat
- 5- Isolation transformer
- 6- Frequency converter
- 7–24VDC Transformer
- 8- PLC
- 9- Thermal magnetic circuit breaker
- 10- Auto-Man selector switch
- 11- Contactors
- 12– Fan
- 13- Main switch
- 14- Terminals
- 15- Running&Fault info relays
- 16- Door lock
- 17- Touch screen
- 18- Emergency stop button

" Panel design; The number of pumps may vary according to the power and selected options "



Figure: 1 (Standing Type)

- 1-Frequency converter
- 2-Thermostat
- 3-FC Magnetic switch
- 4- Thermal magnetic circuit breaker
- 5- FC and Network contactors
- 6- Auto-Man selector switch
- 7- Star triangle relays
- 8- Running&Fault info relays
- 9–Terminals
- 10- Fan
- 11- Main switch
- 12– Isolation transformer thermal magnetic

switch

- 13- Phase control relay
- 14-Isolation transformer
- 15-PLC
- 16-24VDC Transformer
- 17-Ventilation grilles
- 18- Door lock
- 19- Touch screen
- 20- Emergency stop button

"Panel design; The number of pumps may vary according to the power and selected options"

1. General

Installation and operating should only be carried out by qualified personnel!

Installation and operating instructions are part of the device. It should be available at the side of the device as a source for reference at any time. Completely observing this manual is essential for proper use of the device and proper operation. The installation and operating manual conforms to the device model and the current safety technical norms at the time of printing.

2. Safety

This user manual contains basic explanations that should be taken into account during installation and operation. For this reason, this manual must be read by the installer and the relevant operator during installation and operation. Not only the general safety instructions under this basic safety title but also the special safety instructions added under the following points must be taken into consideration.

2.1 Symbols related to explanations in the user manual

In this operating guide, the safety rules if not followed that may cause injuries and handicaps are indicated by the following symbol.



The warnings against electric shock are specified by the following symbol.



For the purpose of specifying safety rules that may cause damage to machinery, equipment or systems when not in compliance



Symbol is used.

2.2 Staff education

The personnel performing the installation must have been properly trained for these operations.

2.3 Dangerous hazards if the safety rules are not observed

Failure to comply with the safety instructions may result in personal injury and damage to the equipment. Failure to comply with the safety rules will also invalidate compensation claims that may arise due to possible injuries. Failure to comply with the rules in general can lead to the following negative facts:

The important functions of the equipment are disabled,
Personnel injuries resulting from electrical or mechanical reasons.

2.4 Safety rules for operating personnel

The current legislation on the prevention of accidents should be respected. Necessary precautions should be taken against the hazards that may be caused by electricity. Hazardous electrical hazards must be considered and the directives of the local electricity distribution companies must be respected.

2.5 Safety rules for control and installation works

The business manager should ensure that all control and installation work is carried out by authorized and qualified specialist personnel and that they have information at a sufficient level regarding to the details given in the user manual. In principle, the work on the system should only be carried out when the system is in a completely stopped position.

2.6 Unauthorized modification and spare parts use

Changes to the appliance are only possible with the manufacturer's approval. The use of spare parts recommended by the manufacturer ensures that the safety is complete. The use of other parts may invalidate claims for compensation.

2.7 Unacceptable operating types

The operating safety of the supplied equipment is only guaranteed in case of operation in working condition indicated in paragraph 4 of the operating instructions. The operating limit values given in the catalog or brochures should never be exceeded.

3. Shipping and interim storage



The panel is shipped from the factory in boxes or on a pallet, protected against dust and moisture. Receiving the product:

• The transport should be checked for damage,

• If any transport damage is detected, the transport company must make necessary initiatives.

During transport:

• Always use suitable lifting devices and take the safety nets to prevent parts from falling,



• Secure the product on a flat pallet, use a suitable pallet truck for transportation.

Never stop under suspended loads, use a cage during lifting and secure the product straight into the cage.
Ensure that the panel is stable and stable in storage and transport, and before the installation work in a safe place. The control unit must be protected against nausea and mechanical damage.

ATTENTION! The control unit must be protected against humidity and mechanical damage. Environment between -10 °C and + 50 °C Should not be used except this temperature range

4. Purpose of use

The CC-LB-LC control unit is for automatic and easy adjustment of the pressure boost devices (single and multiple pump systems). It is used in high-dwelling buildings, hotels, hospitals, administration and industrial buildings for water supply. In conjunction with the appropriate signal transmitters, the pumps are operated with no noise and energy saving. The power of the pumps is adapted to the ever- changing needs of the heating / water supply system.

5.Product information



5.1Application

Automatic control of booster and circulation systems with frequency converter and 4-20mA pressure, differential pressure or temperature sensor. Up to maximum 7 pumps

5.2 Panel Coding

Sample: CC-LB 3x5.5 FC

- Sample: CC-LC 3x5.5 FC
- CC-LB Frequency converter booster panel

CC-LC Frequency converter circulation panel

- 3x Number of pumps controlled
- 5.5 Nominal power of each pump P2 [kW]
- FC Panel board wall with frequency converter

5.3 Working Principle

The frequency converter in the panel adjusts the number of revolutions depending on the load of the pump it controls. The pressure sensor connected to the installation senses the pressure on the installation and transmits it as 4-20mA signal to the panel. The control system (PLC) keeps the set pressure value in the system constant at the set pressure value. If the required flow rate is not provided by the working pump(s), the other pump(s) enters the circuit starting from the most powerful one. In case of less need; starting from the oldest, the pump(s) is deactivated and fixed at the system setpoint.

5.4Product Features / Benefits

- PID control
- Lockable main switch
- Manual-0-Automatic switch
- Special frequency converter for pump applications
- Phase protection
- Preventing dry run with liquid level float
- · Extra protection with external electrode to prevent dry run
- Fluidity control
- Auto test
- · Emergency stop
- External on/off
- General operation / General fault signals Individual operation / Individual fault signals
- Automatic pump replacement
- · Frequency converter failure function without frequency converter
- · Color touch screen for all values and operating status

Through the screen;

- Different language option (English, Turkish, Russian and France)
- Setting the system pressure value
- Existing pressure value in the system
- Selecting a replacement pump
- Delay times of pump on and off
 The "network", "backup" and "drive" operating positions of each pump
- Individual operating/recovering hours of pumps
- Resetting the pump operating time
- Total time of system operation
- · Setting external setpoint with 4-20mA
- Work in 4 different pressure values during the day
- Switch to factory settings
- Reading drive speed / frequency value
- 6 different operating modes
- The pump controlled by the frequency converter is stationary, other pumps enter the circuit from the network or; All pumps are switched on via the frequency converter
- Cavitation control
- Pipe filling-detection feature
- With the FC swap feature, if it is selected from the
- options and the system is stably operating over 47 Hz for a long time, then the network contactors operates
- Advanced option options can be enabled / disabled on the screen.
- Easy setting of automation communication settings from the screen
- MODBUS communication (standard)
- Digital analog inputs can be monitored from the screen. (for easily failure follow-up)
- Automatic day or time-based automatic on / off of the system
- Flow calculation
- Web- server (standard)
- Android & OS apps

• System status monitoring (When any changes in settings that affect the operating principle occur, it can be monitored from the main system warning section.)

- Memory holding up to 100 alarms
- Limit number of switches

5.4.1 Control and Signal Functions

- 4-20 milliamperes analog signal input for external setpoint
- Operation / stop with external dry contact
- SSM general fault signal
- SBM general operation signal
- Individual error signal for each pump
- Individual operation signal for each pump
- Monitor system pressure value in 4–20 milliamperes

5.4.2 Bus Types

- With LON / Bacnet Gateway addition
- Modbus (Standard)

5.4.3 Communication

- GSM Modem(Optional)
- Web-server (Standard)

5.5 Equipment used in Panel

The structure of the control panel is designed according to power of connected pumps.

• Main switch: It switches the control device on / off. (Fig. 1 no. 11, Fig. 2 no. 13)

• Touch screen: Operational data (see. Menus) and operation The status is indicated by the color change of the background lighting. It provides menu selection and parameter entry via the touch screen. Figure 1: (Fig. 19, No. 2)

• Memory programmable logical controler (PLC):

The network is made up of modular construction. (Figure 1 No: 15 Figure 2 No: 8)

• Frequency converter (drive):

It is a frequency converter for setting the number of revolutions of the basic load pump depending on the load. (Figure 1 No:1, Figure 2 No:6)

• Power source: 24V DC power supply (Figure 1 No: 16 Figure 2 No:7)

• Protective / protection combinations:

There are safeguards for the operation of the pumps: Overcurrent fuse thermal isolator (current rating: 0.58 IN) Time relay and contactors for star-to-delta transformation. (Figure 1 No: 4–7 Figure 2 No: 9)

• Manual-0-automatic switch:

Switch for selection of pump operation types. (Figure 1 No:6 Figure 2 No:10)

"Manual" (emergency operation on mains/test operation: motor protection available)

"0" (pump off – can not be activated via PLC) "automatic" (pump is released via PLC for automatic operation)

• Emergency stop button

ATTENTION!

The emergency stop button does not interrupt the power supply,only stops the operation of the system. When you intervene to the control panel, cut off the input power supply. (Figure 1 No:20, Figure 2 No:18)

Technicial Specifications			
Mains supply voltage (V)	3~400 V, 50/60 Hz		
Nominal current (A)	See. Product label		
Protection type	IP54		
Maximum permissible ambient temperature	50 °C		
Mains insurance	According to the circuit plan		

5.6 Delivery scope

- Control panel WILO CC-LB-LC
- Electrical Circuit Diagram
- Installation and operating instructions

5.7 Options / Accessories

The CC–LB/LC system can optionally be equipped with the options listed below. They must be ordered exclusively. The connection of the pumps must be carried out on the contact site in accordance with the circuit diagram,

- PTC Control roles
- Lon-Bacnet-Gateway



6.Electrical connections

The electrical connection must be carried out by trained personnel in accordance with the regulations of the regional electricity distribution company.

Network connection:

Explanations regarding the installation and operating instructions of the whole equipment must be taken into account. Pump network connections

ATTENTION!

Take into account the installation and operating instructions of the pump!

6.1 Pressure sensor

According to the installation and operating instructions, connect the 4/20 mA pressure sensor to the terminals according to the circuit diagram. Use shielded cable, place shield in one-sided circuit box

ATTENTION!

Do not apply external voltage to the terminals!

6.2 External on / off circuit:

According to the circuit plan, the tele (remote) on / off circuit can be connected via the potential free contact (opener) after the bridge has been removed with the corresponding terminals (pre-assembled by the factory).

External on / off circuit		
Contact off	Auto ON	
Contact on	Auto OFF, reporting on the screen with a symbol.	
Contact load	24 VDC / 10 mA	

ATTENTION!

Do not apply external voltage to the terminals!

6.3 Actual frequency indicator

In frequency converter control units there is a 0 –10 V signal to provide the possibility of externally measuring / displaying the current actual frequency via the related terminals according to the circuit diagram. The frequency range 0 ... 10 V equals 0 ... 50 Hz.



Do not apply external voltage to the terminals!

The individual precautions must be taken from the installing and operating guide for the complete equipment.

7.Operation

We recommend that the device be operated by WILO Customer Service. Before the first commissioning, the cables on the side of the building must be checked for proper connection and especially grounding. The individual precautions must be taken from the installing and operating guide for the complete equipment.

ATTENTION!

All connection terminals must be tightened before commissioning. Do not cover the fan inlet and outlet filters.

7.1Factory settings

Preset of the control panel was made in the factory. The factory setting can be recreated by the WILO Service.

7.2 Control of motor rotation

Each pump should be activated for a short period of time as «manual operation» to check whether the direction of rotation of the mains operated pump is the same as the arrow mark on the pump casing. In wet rotor pumps, an incorrect or correct direction of rotation is indicated by a control LED in the terminal box. If all the pumps turn in the wrong direction during mains operation, change 2 phases according to the demand of the mains line.

8. Maintenance

Periodic maintenance and repair works are only carried out by WILO Pompa Sistemleri A.Ş. By qualified personnel who are authorized and authorized by the authorized service department!



There is a life-threatening hazard due to electric shock when working on electrical devices.

• During all maintenance and repairs, the control unit must be switched off and must be picked up in such a way that it can not be re-started by unauthorized personnel.

• Damage that may occur in the connection cable may only be rectified by a qualified electrician.

The following maintenance by the user must be visually checked once a month;

• The control cabinet must be kept clean,

If dusting occurs, it should be cleaned with a dry cloth outside the panel.

• The filter elements in the fans should be checked by removing the fan cover by means of the tabs on the fan without opening the panel cover, cleaned with air and cleaned if necessary.





ATTENTION!

The leakage current protection relay must be installed in the power line where the control panel is connected.

Do not cover the fan inlet and outlet filters.

9. Spare parts

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

10. Authorized services

You can find a list of services authorized by WILO Pompa Sistemleri A.Ş. : http://www.wilo.com.tr/anasayfa/servis-destek/yetkili-servisler/

11. Misuse

The control panel cover must be kept closed and locked.
Do not switch off the power supply switch of the control panel except for periodic maintenance (controlled conditions).

• Do not intervene in the panel without interrupting the power supply.

• Do not place any material on or in front of the control panel.

• By inserting an isolated carpet in front of the control panel and pressing on the carpet Interfere with the board.

• Do not pull the power supply line out of the control cabinet.

12. Safety and Environmental Instructions

Waste disposal and Complying with WEEE Regulation on Control of Hazardous Wastes:

This product is in accordance with EU WEEE Instructions(2012/19/EU). This product includes a symbol that is used for management of waste from electric and electronical equipment. Within the European Union this symbol may be present on the product, packing or its relative manual. This symbol means that the relevant electric or electronic product must not be disposed alongside household waste products. The relevant products must be transported, recycled or disposed of according the following statements:

• These products must only be handed over to a certified disposal center.

• Comply with local law at all times! For the proper disposal procedure please contact local authorities, nearest disposal center or the dealer where you have made your purchase. For more information on recycling visit; http://www.wilo-recycling.com .

Packing Information Ambalaj Bilgileri : Packaging of this product is made from recycleable materials that comply with National Environmental Legislation. Do not dispose of packaging materials with household or other waste. Take these materials to recycling points designated by local authorities.

Technical differences may apply!

13. Screen Views and Explanations





9. Screen View and Explantions

Screen View	Descriptions
Set Value 4.0 bar P=C Actual Value 3.1 bar FC 50 26 26 25 26 26 26 C 0 43.9 0: C 0 43.9 0: C 0 43.9 0: C 0 90 73 P4 0 90 73 P4 0 90 73 P4 0 90 73 P4 0 90 P3 P4 0 P1 P2 P3 P4 Menu 0 0 P1 P1	9.4 Çalışma modları 9.4.1 \triangle PC mode \triangle PC mode means constant pressure control. This mode is only for use in circulation systems. System, with 1 value read from the pressure difference sensor tries to catch the desired set value. In this system at least 1 pump is continuously remain active. Even if the pressure difference sensor in the system faults, the Frequency Converter continues to operate with the "FC faulty working frequency" value input from the screen.Even if both the Sensor and the Frequency Converter are defective, at least one The pump remains active to provide water circulation in the system.If the system is designed to operate in \triangle PC mode ,the main page next to the opening screen saver page starts up when the panel is energized. On this page, monitoring of the faults and operating conditions of the pumps and system monitoring can be performed.
SETPOINT 14:04:17 Set Yalue: 4.0 GH: 0.0 Wake-up 3.5 DH: 1.11 OFF: 6.11 Alarm Upper Limit 5.2 Dar	Setpoint page System operation set value is entered on Setpoint page. (The sensor unit entered on the scale operations page in the Service menu is valid.) The entered "ON" time determines the system start time and the "OFF" time specifies the system shut down time, so that the system can be operated within the desired time zone (if the ON and OFF hours are set to 0 (zero) the system works constantly) If the system pressure is out of the set alarm upper and lower limits, the system turns into error condition.
Actual Alarms Clean ALARMS TIME Min.Water Level 14 05/20 Min.Water Level 14 0	Current Alarms page To access the Current Alarms Page, on the Operation screen (the screen of the system monitoring) by clicking Alarm Button. If there is an error in the system at that moment appears on the Current Alarms page. You must click Clean button for alarm reset.
ARMS TIME DATE State Water Level 14:06:20 08/06/17 RTN	Past Alarms page Past Alarms page is accessible, at the bottom of the Current Alarms page clicking the button.On this page, a list of alarms that have already been reset (reset) is displayed, and the alarms that have been reset are listed in green.If there is anerror in the system at that moment and it is still continuing, it will appear red in the Past Alarms page.



Screen View	Descriptions
Will O System Operation Mode • P-Hydrophor • Number of Pumps 3 Number of Auxiliary 1 Pipes 1 Image: Pumps 1	Operating Mode Settings When the Sytem Settings button clicked, the System Operation Page is opened, in this page the operation mode, the number of pumps and auxiliary pump operation mode settings can be changed. To change the operation mode, system off button off must be switched. When the auxiliary pumps enter the circuit, they are not switched on the FC in the factory settings. But if the service considers necessary, by "b)" button auxiliary pumps through the network? Or through FC? are decided whether or not to operate.
System Operation Mode * Ar Shut down System F Status Number of Rur Exit Pumps * * ************************************	System Off Button If button If is switched, in the pop-up window, ON or OFF performs system log in / log out.
Scale Values 14.09/21 Sensor Filter Value 8 9 3.1 bar Sensor MaxMessurement Scaling 16,0000 000 000 000 Unit Choose bar bar 0 000 2 Bar 4 Bar 16 Bar 25 Bar 2 Bar 000 000 000 000	Scale Operations Page At the bottom of the previous System Operation mode page,it is accessed by clicking the button. It is decided from this menu by the authorized person or service with which measurement unit the system will work and in which sensor measurement range. In order to perform this operation, you first have to stop the system with the red button marked "OFF". "Sensor Max. Measurement Scales" based on the information of the catalogue of the sensor, the maximum value that the sensor gives can be only entered from this menu. For example, if you use a 16 bar sensor, you should enter the value 16. The sensor filter value determines the sensitivity of the analog data read by the system.
Frequency Settings 14:03:36 Fo Minimum Frequency : 20 Hertz AuxiliaryPump Startup Frequency : 49:0 Hertz AuxiliaryPump Cutout Frequency : 49:0 Hertz AuxiliaryPump Cutout Frequency : 20:0 Hertz FC Operation Frequency (Sensor Fault) : 45:0 Hertz FC Sleeping Frequency Threshold : 21:0 Hertz Image:	Frequency Settings Page The Frequency Settings Page is accessed by clicking the button is at the bottom of the previous page of Scale Operations. On this page, the frequency operation settings of the frequency converter used in the system are adjusted.

Screen View	Descriptions
Time Settings Pump Startup Delay Time 10 Pump Cutout Delay Time 25 Pump Startup Delay Time 25 Pump Cutout Delay Time 11 Shiften 11 Pump Cutout Delay Time (while FC is confine) 26 Shiften 26 Shiften 26	Time Settings-1 Page, press the button at the bottom of the previous Frequency settings page or on the system menu page by clicking the Time Settings button. In this page, the pump on and off time settingsare adjusted.
Time Settings-2 14.10.28 SensorLimit Fault Delay Time : 2 Sn Roater Notch Delay Time : 5 Sn Delay OF Pass to FC Contactors : 8 ms Time of protection contractors : 560 ms Image: Time of protection contractors : 500 ms	Time Settings-2 page is accessed by pressing the button at the bottom of the previous Time Settings-1 page.Delay times are entered in this page.
Cavitation Settings Scale of Cavitation Sensor 2.0 2.0 Herts Pump NPSH Vialue : 5.08 Control Frequency/or Cavitation : 20 Herts Set Point in Cavitation Alarm : 60 % 1.Delay 20 Sn 2.Delay 188 Sn Cavitation Control OFF Image: Set Point in Cavitation Image: Set Point in Cavitation : Sn :	Cavitation Settings Page To access to the Cavitation Settings page, press the button at the bottom of the previous Time Settings-2 page or press the Cavitation Setting button from the Main menü page. The cavitation control is activated by switching "Cavitation Control" button "ON". The cavitation control is performed above the threshold frequency value. Pump NPSH value enter by consulting to the catalogue of the pump. Suction pressure, below the NPSH value the system falls below the current set value, to the cavitation alarm percentage value Immediately counts up to the 2nd delay time and it turns on the alarm status.With the alarm that occurs at the end of the second delay period, the system will not stop.If you want to hold the system in this case You have to select the relevant option in the options section.
Filling Pipe Property Pipe to fill until Set Point Percent 1 58 % Filling Pipe Ramp Factor 5 5	Pipe Filling Page On the Filling Pipe roperty page, under the previous Cavitation Settings page the button should be clicked or on the System menu page the Pipe Filling Page button should be clicked. In order for this function to work, the Filling pipe button must be in the "ON" position. In order to prevent the ram from filling the pipe to reach the setpoint value, the system fills in slowly, considering the value of "Filling Pipe Ramp Factor" until reaching the percentage of the system

setpoint "Pipe to fill untill Set Point Percent".

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Screen View



Descriptions

Swap FC to Network Page

Swap FC to Network Page is accessed by clicking the button at the bottom of the previous PID Control Settings Page. This feature is used when the FC is not desired to be used at high frequencies. When the "FC Network clearing" button is set to "ON", the function is processed by the system. If FC operates for "maximum operation time" above the "minimum frequency required for swap", the system will count up to "FC network clearing delay time" and the pump FC contactor running in FC will be released and the network contactor will be activated. When the FC fails, the current value of the system drops below the set value by the value of "Tolerance over set value for clearing clearing"; Eg FC "Minimum frequency required for swapping" 47,% Tolerance value is 3 hertz In this case, when the system falls below "44" hertz value, the network contactor is deactivated and the FC contactor is switched on again.

Note: If there is a separate drive for each pump in the system (multi-drive system), there is a "Auxiliary Pump Working Limits" page instead of "FC's Network Exchange Page". For a description of this page, see page 26 of the manual.



Options-1 Page

From the System Menu page the Options button should be clicked to access the options page. Options, created for some special needs that the system may require The buttons, in turn, perform the following operations;

C.1) When it is desired to install a pressure switch operating with an external contact can be used.

C.2) It should be selected when you want to use thermistor for every pump in the system.

C.3) PLC 2. You can activate the button if the analog input is used as external set value. In this case, 2.Analog input only detects the external set value. Can not be used for other operations.

C.4) You can select the FC frequency from the second analogue output of the PLC by using the button to read the value of the temperature sensor.

C.5) If cavitation is selected in the system, it can be used when the cavitation alarm occurs and the system stops.

C.6) Normally the system stops auxiliary pumps at Max Limit fault. You can activate the button if you want the entire system, not just the auxiliary pumps. C.7) With this button you can access the activation options.

C.8) With this button, Min. You can stop the system when a float alarm occurs.



Options-2 Page

To access the Options-2 page press the button from the previous Options-1 page.

C.9) If the alarm sensor alarm occurs, the auxiliary pumps can stop.

C.10) The system allows the system to stop when an FC alarm occurs while operating in regulation mode.

C.II) Allows the system to continue if the FC stops when the system is in the booster mode, I.Analog alarm occurs.

C.12) I.Analog Sensor ensures that when the alarm occurs, the FC continues to operate at its last available speed.

C.13) The system allows the operator to ask for a password for the set value change.

C.14) The temperature low limit alarm is canceled.

C.15) The system allows the system to operate without FC even if there is an FC fault in Δ TV mode.

C.16) Activates sleep mode.







Screen View	Descriptions
External Set Settings FC Pump MaxOperation Difference (hour) : 25 From FC to Line Swap OFF	External Set Settings Page is accessed from Main Menu page by clicking the External Set Settings button. When the button is pressed and activated, the system operates according to the given external set value from automation. The Alarm Upper Limit% Value that we input on this page alarms when the pressure reading from the sensor exceeds the value of the external setpoint.
Adres 1 Baud Rate 9600 Parity None Frame Delay 0 Time 0	RS-485 Modbus (RTU) Port-2 Page: RS-485 Modbus (RTU) Port-2 Page is accessed from Main Menu page by clicking the Modbus Settings button. The Modbus communication settings are done with the arrow keys from this page.
P2 45 hour P2 45 hour P2 45 hour P2 46 hour P4 46 hour P4 47 hour	Operation Duration Page is accessed from Main Menu page by clicking the Operation Time Settings button. Only the operating time is monitored in this page.
Standby Duration Image: Constraint of the second secon	Standby Duration Page is accessed by clicking the button at the bottom of the previous Operation Duration page. The Satndby durations are monitored in this page.
Image: Constraint of the second se	Total Operation Time Page is accessed by clicking the button at the bottom of the previous Standby Duration page. The time monitored on this page gives the total operating time of the pumps. (The total time is not reset even if the run times are reset from the service settings menu)



= 60 Min

? Next 🕞 🔮

ed Time : 35 Min

Activation Quantities Page is accessed from the previous Set Change History Page by clicking the button. From this page you can monitor how many times the contactors have been switched on or off (ON / OFF) during the reset period.In addition, you can limit the number of ON / OFF by pushing the button and you can give the pump a warning to be disabled.





PLC Information Page

PLC Information Page is accessed from the previous I–O Watchin Page by clicking the button. On this page, information such as Battery Voltage, PLC Firmware and Hardware versions can be accessed in the PLC.



Language Selection Page

Language selection Page is accessed from the Main Menu Page by clicking the Language button. The display language can be set to Turkish, English, Russian and French.





9.4.3 RPM mode:

This mode can only be operated when there is only one pump in the system. This mode is used to operate the pump at a certain speed.

RPM operation screen:

When the RPM mode is selected, the operating screen of the system is opened like this. On this screen, the fault, operating status and system monitoring of the pump are performed.



9.4.4 △ TC Mode

In this mode, the system is used to provide circulation of water from the heating (burner) and cooling (chiller) units.

Δ TC heating mode operation screen

When the Δ TC heating mode is selected, the operating screen of the system is switched on like this. This mode is used for circulation the heating water, which means that the system is in heating mode is understood from the symbol on the page.



Screen View	Descriptions
B0 S0 S0<	Δ TC cooling mode operation screen When the Δ TC cooling mode is selected, the system operating screen starts up like this. Monitoring of the faults and operating conditions of the pumps and system monitoring can be performed .This mode is used in the circulation of the cooler, which means that the system is in cooling mode is understood from the symbol on the page.
System Operation Mode : 4 a)Heating Mode a)Heating Mode c)Double Temperature c)Double Temperature Control Threshold 20.0 Temperature Control Threshold 20.0 Number of Pumps : 3 b)Mode-1 Startup Audilary Pumps Temperature 3 Number of Audilary 1 OFF Control	Δ TC system settings screen The functions of the buttons on the Δ TC mode system operation screen; Heating mode screen Image: Symbol and a) Heating Mode buttons are visible. The system is used in the circulation of the heating (boiler) system
System Operation Mode : 4 At-c : 0Couling Mode 0:Double Temperature : 0Double Temperature Temperature Control Threshold 15.0 Number of Pumps : 6 Number of Auxiliary : 6 Number of Auxiliary : 6 Imps : 6 Imps : 6 Imps : 6 Imps : 7	Cooling mode screen symbol and b)Cooling Mode buttons are visible. The system is used in the circulation of the cooling (chiller) system.
System Operation Mode : 4 s)Heating Mode c)Double Temperature c)Double Temperature At-c c)Double Temperature	Return water temperature mode screen In this screen, on the sensor selection button if written; C) Single Temperature Assigned The system controls the return water temperature.

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OFF

Screen View	Descriptions
System Operation Mode : 4 Image: At-c At-c Bouble Temperature Assigned Comperation Temperature Control Threshold 20.0 Number of Pumps : 3 b)Mode-1 Stratup Auxiliary Number of Auxiliary : 1 b)Mode-1 Stratup Auxiliary Image: Auxiliary : 1 Comperature Image: Auxiliary : 1 Comperature	Temperature difference setting mode: On this screen, if written on the sensor selection button; c)Double Temperature Assigned The system controls the return and inlet water temperature difference and the return water temperature tries to stay above the temperature threshold value.
Set Value 20-50 *C At-v Actual Value 0.8 *C At-v 50 80 90 90 20.6 25 25 25 20.6 80 90 90 20.7 8 90 90 20.8 20 90 90 20.9 90 94 (14) Menu Operator Atarm	9.4.5 Δ TV mode The maximum temperature, minimum temperature and maximum frequency and minimum frequency entered into the system determine the drive speed in proportion to themselves. In order to use this mode in cooling, the upper and lower revolution values must be relocated.



9.4.6 Booster mode

This mode is selected when the control system is to be used in booster systems. Features such as sleeping and flow control in this mode are designed to allow the booster systems to operate comfortably.



Flow Control Settings Screen

This function can only be used actively in booster systems. If the FC speed is fixed on the "Zero-Flow Frequence Threshold" while the drive is operating on the system alone, the system counts up to the time of the "Zero-Flow Test Period". At the end of this period, "Zero-Flow Increasing Pressure" pressure system fora short time. If there is no need, the system turns on the sleep mode with enough pressure in the system. Then, when the pressure drops, the system turns off the sleep mode and resumes normal operation when needed.



P-1 Service Time =	10000	h	Year:	2099	Month 12	Day:	30
P-2 Service Time =	10000	h	Year:	2099	Month 12	Day:	30
P-3 Service Time 🛓	10000	h	Year:	2099	Month 12	Day:	30
P-4 Service Time 🕫	10000	h	Year:	2099	Month 12	Day:	30
P-5 Service Time =	10000	h	Year:	2099	Month 12	Day:	30
P-6 Service Time =	10000	h	Year:	2099	Month 12	Day:	30
P-7 Service Time =	10000	h	Year:	2099	Month 12	Day:	30
Maintena	nce Warn	ings	13		0 N		

Maintenance time settings

Maintenance times are entered on the System Maintenance Times page that is opened after the maintenance settings button is clicked, and Maintenance indications are take into account for activation.

Screen View	Descriptions
System Menu 14.03:11 System Settings Time Settings Cavitation Settings Frequency Operation Time Pipe Filling Settings Pactory Settings Fast Startup Options Pactory Settings Fast Startup Sileep Settings Settings Settings	Maintenance time reset After maintenance has been performed, the service password is entered on the System Menu page Operation Time Settings button should be clicked.
Pi PUMP-4 hour Pi 11000 hour 11000 hour hour Exit Exit bour	Maintenance time reset Pump that is maintained at operating time page and requested to be reset to zero is clicked to open the reset screen. On the pop-up screen RESET is it clicked, so that the pump operating time is reset when the button is pressed.
P1 P1 P1 P2 P3 P2 P1 PUMP-4 hour hour hour hour bour bour bour bour bour bour bour	

10. Display screens and explanations that are different in the panels with multi-drive

Screen View	Descriptions
b)Mod - 2 Startup / Cutout Pumpa with FC	System operation page B) button on the system operation page of the multi-driver panel They can all operate in the same frequency (parallel operation) or separately.
Operation Limits For Aux.Pumps 96/Max 96/Max 96/Max 96/Max 96/0 75.0 80.0 90.0 96/0 90.0	Auxiliary Pumps Operation Limits Page On this page, operation frequencies of auxiliary pumps in multi-drive panel can be limited on this, over the number under Max% The maximum% value we want the driver to work on is entered. Here, a percentage of the value entered via the driver is calculated.

13. Failure causes and possible solutions

Definition of Problem	Possible reasons	Solution recommendation
The pump goes faulty when tripping over from the network to the FC	Acceleration and deceleration times are not compatible	Change the acceleration and deceleration ramp times over the drive.
	Direction of rotation is incompatible with network and drive operation	Change the positions of the two from the phase s
	Contactor stuck	Change the contactor which the contacts are stuck.
Pump operates short time and stops	Ground is not connected	Connect the grounding cable.
	The sensor reads incorrectly or interrupts the signal	Check the sensor cable and socket, the sensor cable must be a shielded cable, connect the display to the ground terminal.
	Sensor value not entered or entered wrong	Enter the sensor maximum measurement scale on the scale operations page.
	Pressure alarm upper limit set lower than set point	Change the pressure limit values on the Set Settings page.
4/20 amperes Pressure sensor fault / Analog module fault	Sensor cable faulty	Change the cable.
	Sensor grounding is not connected or grounding is insufficient	Connect the grounding cable, pull the additional grounding cable.
	Sensor may be faulty	Disconnect the sensor cable ends from the panel sensor (2) k ohm resistor is connected instead, if the error is erased the sensor is faulty
	Sensor cable ends are reversed	Replace the sensor cable ends.
The driver contactor works but the frequency (Hz) is not rising in the driver	0-10 V cable ends + - can be reversed in the drive	Replace the 0-10 V cable ends.
	No voltage from 0 to 10 V from PLC	Replace the analog module.
The driver contactor works and the frequency is rising but the pump is not running.	The drive start input is not energized	Check the cable.
The actual pressure in the board is different than the installation pressure	Sensor values may be misrepresented. The sensor value can be set low or high to allow equal perception	Enter the sensor maximum measurement scale on the scale operations page.
	The pressure sensor may be faulty if it's equal when the system is not running, and different during operation	Replace the sensor.
	PLC analog input faulty	Replace the analog module.

13. Failure causes and possible solutions

Definition of Problem	Possible reasons	Solution recommendation
Triangle mark on screen	Screen and PLC are not communicated, whether PLC program is removed or there is a problem with communication cables.	Check the communication cable, try to reload the program if the problem persists
No text or images on screen	No display power supply.	The power supply should be checked if the display supply does not measure 24VDC.
Frequency on the screen drops to 20 Hz but Drive frequency does not.	The low speed value in the drive parameter settings are too high.	Please set low speed 0 Hz.
The pump can not take off in the drive.	Drive KW and motor KW must be controlled and they must be compatible	The drive should be replaced if the KW and the motor KW are incompatible.
	The driver's motor revolutions do not match the driver's revolution in parameter and they must match.	Set the revolution written on the motor nameplate and drive parameters same.
	It means there is a problem whether in the driver's contactor or in the power cables	Change the cables.
	Test after changing Kw or motor speed	Change the drive parameter settings.
The active pressure is not constant on the display. The system is experiencing the same problem and frequency is navigating	Sensor may be faulty	Replace the sensor.
	Whether the sensor cable is not shielded cable or Shielding is not connected to the ground.	Change the cable, connect the shielding to the ground terminal.
	The voltage on the channel where the sensor cable is moved affects	Pull the sensor cable from a different channel.
	There may be devices that do not pressurize or leak back the check valve from the pumps	Do a mechanical check.
There is no fault on the screen, system doesn't work.	The system on-off button on the screen is left off position	Switch the System on/off button.
	All pumps are spare	Change the Replacement Pump Number on the System Operation page.
	Set value not entered	Set the system set value on the Set Setup page.
Earth fault and motor short circuit faults	Motor winding problems	The motor windings are measured.
	Short circuit in contactor	The contactor is changed.
	Touching the housing in the cables	A short-circuit check is performed and it is resolved if necessary.
	The drive outputs do not reach the motor regularly, the terminals may be loose.	Check the terminals.



05.2016

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