



PRODUCT CATALOG



*We manage water.
You can use it safely.*

**MADE IN
TURKEY**

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BCF series on-motor drives pumps are activated with frequency control in order to activate, remove and protect specially designed. The drivers are based on the analog information received over the pressure transmitter: activates and deactivates the pumps. Microprocessor specially designed to perform these operations used. System pressure on the control unit display on the front panel and pumps in operation can be monitored. On the control unit screen, all fault information is displayed. Set pressure value and pump numbers via the control unit adjustable. Up to 4 pumps can be controlled.

General Information

- Microprocessor based design.
- 48Mhz operating frequency.
- 64 Kb Program memory.
- 3936 byte SRAM
- 1024 byte EEPROM.
- 1.000.000 read/write data capacity.
- 100 years data retention life.
- Nanowatt technology design.
- PWM modül kontrollü PID.
- PID speed adjustment slow-normal-fast mode.
- Hydrophore + circulation + heating + cooling operation mode selection
- Upgrading frequency to avoid constant pressure instability when switching to sleep.
- Communication between drivers with 2- wire shielded cable
- On-screen monitoring of pumps operation, standby, failure and cancellation
- Monitoring of set pressure and working pressure on the screen.
- Ability to set pump transition time settings.
- Sleep active passive option and sleep time set.
- Ability to adjust takeoff, stop and constant pressure holding times.
- 150% 1 min. while 170% for 2 sec. Excessive moment capacity with time.
- Installation at the motor terminal or anywhere desired thanks to the internal cooling fans.
- Built-in emc filter.
- High Pressure Protection.
- Ability able to see the pump current values.
- Ability to set high current protection value.
- Possibility to set error delay time.
- Auto Manual selection switch.
- Protection with floater against running without water.
- Ability to see all error states on the screen.
- Reporting fault conditions with relay contact.
- 3 isolated digital inputs
- 2 Analog input.
- 2X16 LCD screen.
- Turkish-English Language Option.
- Monitoring of pump running times.
- Automatic pump change. Master pump selection.
- Remote on/off digital input.
- Working frequency, current, voltage and pressure values can be seen on the screen.
- Full sinusoidal output with sinusoidal PWM (Pulse- width modulation) control.
- The Multipump feature can be selected from the menu.
- Protection against engine blockage with its frost protection feature
- Protection against pipe explosions with installation protection feature
- Password Access to Menu.

For the 3-phase asynchronous motor to rotate at different speeds or to rotate at the same speed in all conditions, the frequency inverter must be used. There are some advantages of speed control of asynchronous motor with frequency inverter. Motors consume high energy. To prevent this high energy consumption and in order to ensure that it rotates at the desired speed under all conditions, PID controlled frequency inverter motor drives are produced that operate at the desired constant speed without tiring the motor by generating different frequencies. Frequency control works by adjusting the speed level required by the load under optimal conditions. Even a slight change in speed can significantly reduce energy consumption. When the motor driver is not used, the pump runs at full speed in all conditions. Thanks to frequency control, energy can be saved by reducing the speed of the pump motor when the need for water is reduced. Considering that 40% of the world's electrical energy is consumed in motors, the efficient use of frequency control motor applications can reduce the global energy consumption by 10%.



Figure 1: Control Unit View

Connection Diagrams

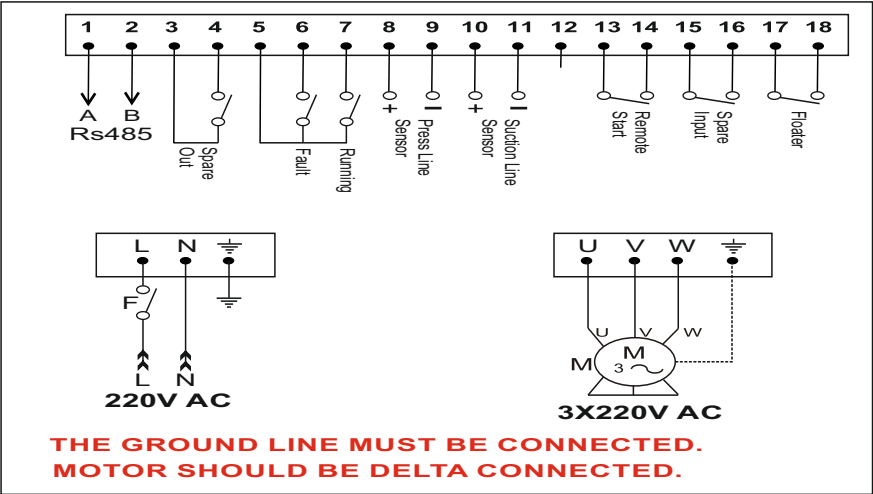


Figure 2: BCF-20 Terminal Connect

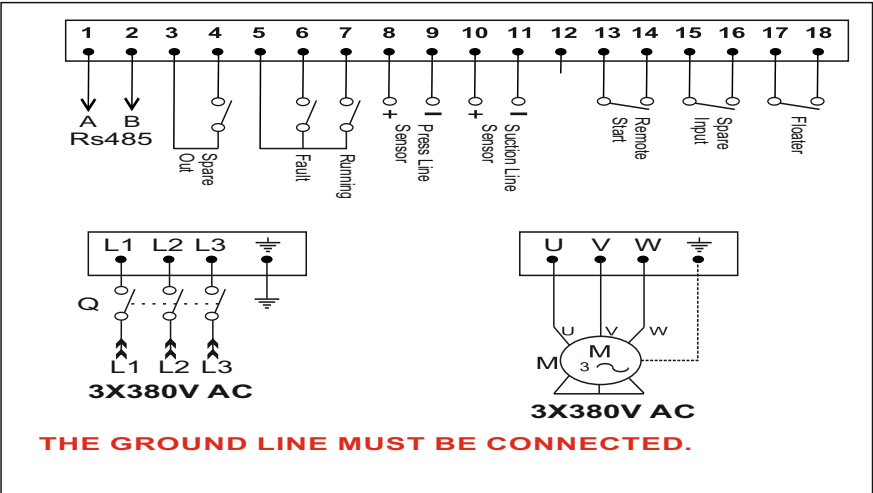


Figure 3: BCF-21 Terminal Connect

Connection Diagrams

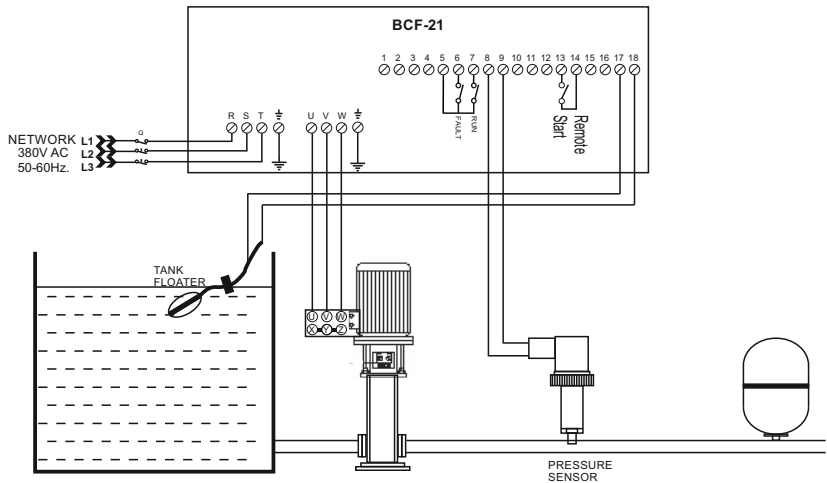


Figure 4: BCF-21 Panel Connection Diagram

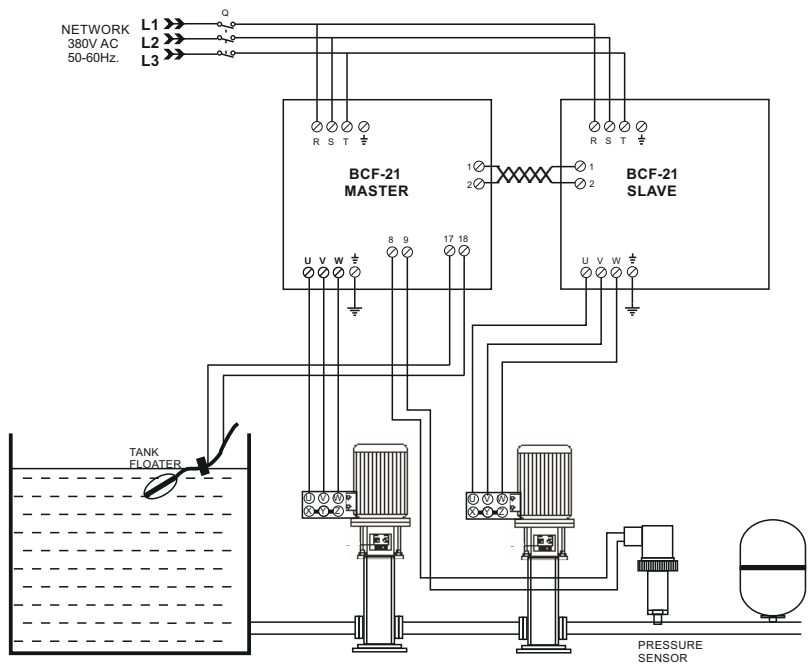


Figure 5: BCF-21 2 Pump Connection Diagram

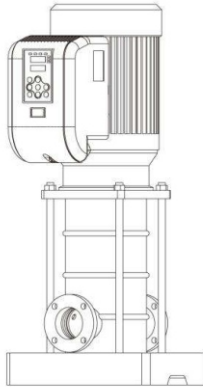


Figure 6: BCF 1 Pump Mounting Figure

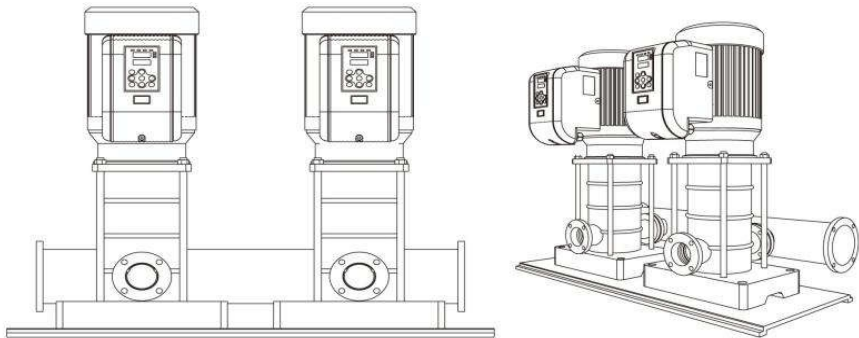


Figure 7: BCF 2 Pump Mounting Figure

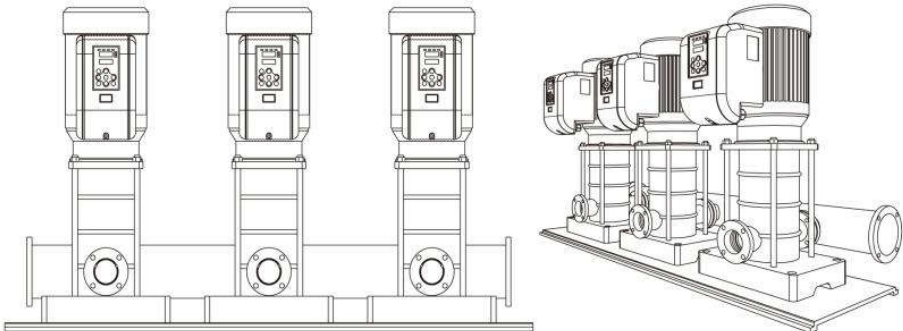


Figure 8: BCF 3 Pump Mounting Figure

Panel Technical Draw

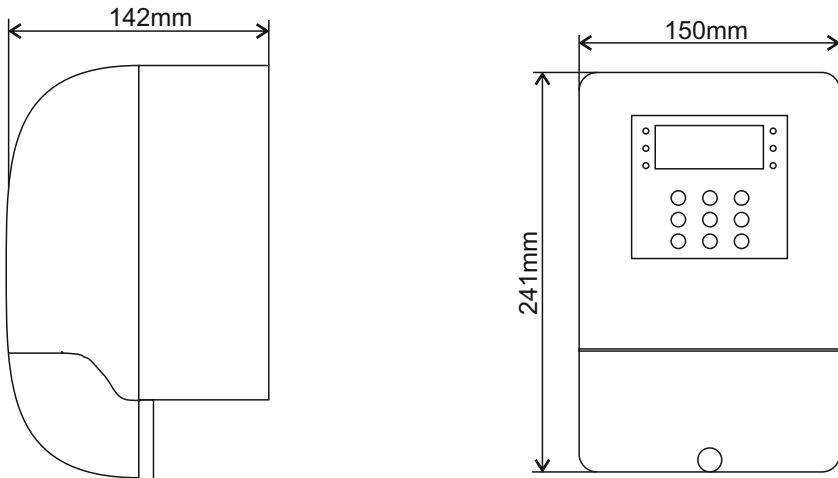


Figure 9: Control Unit Dimensions

Technical Details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating Temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	2X16 CD and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter

DRIVER POWER & CURRENT TABLE

BCF20/P SERIES		MOTOR MOUNTED DRIVER			
POWER		INPUT VOLTAGE	OUT VOLTAGE	STARTING TYPE	CURRENT (A)
HP	KW				
1,5	1,1	220V AC	3X220V AC	INVERTER	6
2,2	1,5	220V AC	3X220V AC	INVERTER	8
3	2,2	220V AC	3X220V AC	INVERTER	10
Motor Connection 3X220V must be compatible with the connection.					

BCF21/P SERIES		MOTOR MOUNTED DRIVER			
POWER		INPUT VOLTAGE	OUT VOLTAGE	STARTING TYPE	CURRENT (A)
HP	KW				
3	2,2	3X380V AC	3X380V AC	INVERTER	5,5
4	3	3X380V AC	3X380V AC	INVERTER	7,2
5,5	4	3X380V AC	3X380V AC	INVERTER	9,5
7,5	5,5	3X380V AC	3X380V AC	INVERTER	13
10	7,5	3X380V AC	3X380V AC	INVERTER	17
Motor Connection 3X380V must be compatible with the connection.					

BCF Series drives of full load current;

%125 1 min.

%150 30sec.



The BPL-U control panel has the opportunity to monitor and control the operating status and error details of the pumps in single booster systems and submersible systems.

The Panel includes a specially designed mainboard and 2 units of 7 segment display. System parameters can be easily adjusted from the setting menu with the Set / Up / Down buttons. There is on-off switch on the panel. The system can be turned on and off without opening the panel door through this switch.

Specifications

- Microprocessor based design.
- Hydrophore, deep well (submersible) mode.
- Ability to set the time of well filling in deep well (submersible) mode.
- 2 units of 9,2mm 3 digit 7 segment display
- Ability to display voltage values on screen
- Ability to set the high voltage and Low Voltage Protection value
- Ability to display pump current values
- Ability to set high current and low current protection values
- Ability to set error delay time.
- General Error / Dry Run and Pressure Switch signal Warning LEDs
- Protection against dry running with floater
- Additional low current protection against dry running
- Ability to display all error conditions
- Notifying error conditions with buzzer and relay contact

Connection Diagram

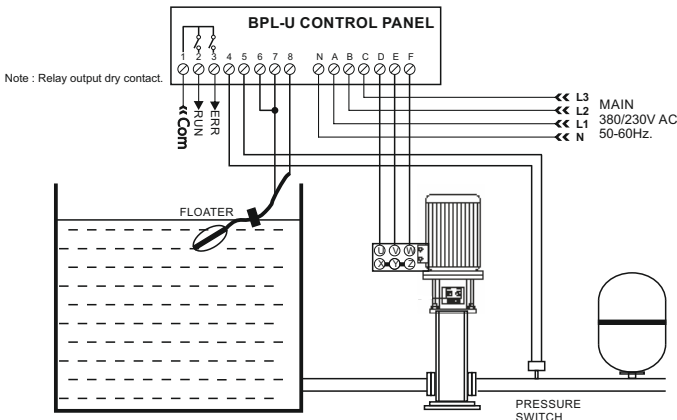




Figure 10: BPL-U Panel Outer View

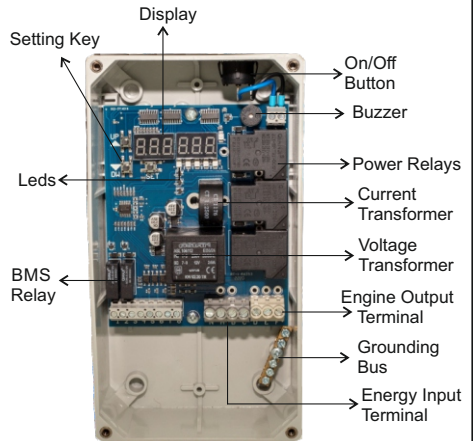


Figure 11: BPL-U Panel Inner View

Technical Data

Operation Voltage	230V – 380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	2X3 digit 9,2mm display and Leds
Connection Type	Terminal Connection
Contact	17A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diameter	2.5mm² (Current and Voltage Input)
Weight	800gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	190X145X80mm



The BPL-U2 control panel is a panel that has the opportunity to monitor and control the operating status and error details of the pumps in two-pump booster systems. The Panel includes a specially designed main board and 5 units of 7 segment display. System parameters can be easily adjusted from the setting menu with the Set / Up / Down buttons. There are automatic/manual selection buttons (which determine the operating mode of each pump), switches, pump operation and automatic operation LEDs, as well as SET/RESET/ESC buttons.

Specifications

Microprocessor based design.

48 Mhz operating frequency.

5X9,2mm 3 digit 7 segment display.

Automatic test solenoid valve output.

Measuring 3 phase voltage values and displaying them on the screen.

Ability to set voltage protection upper and lower values.

Ability to monitor pump error conditions from the screen.

Ability to display pump currents from the screen.

Ability to set pump upper and lower current values.

Ability to limit the number of pumps engaged (switchgear) within 1 hour.

Automatic resetting of current errors.

Ability to set automatic reset waiting time and number.

Automatic and manual operation selection.

Operation as you press the test button in manual operation.

Protection against dry running by float or electrode.

Undercurrent protection against dry running.

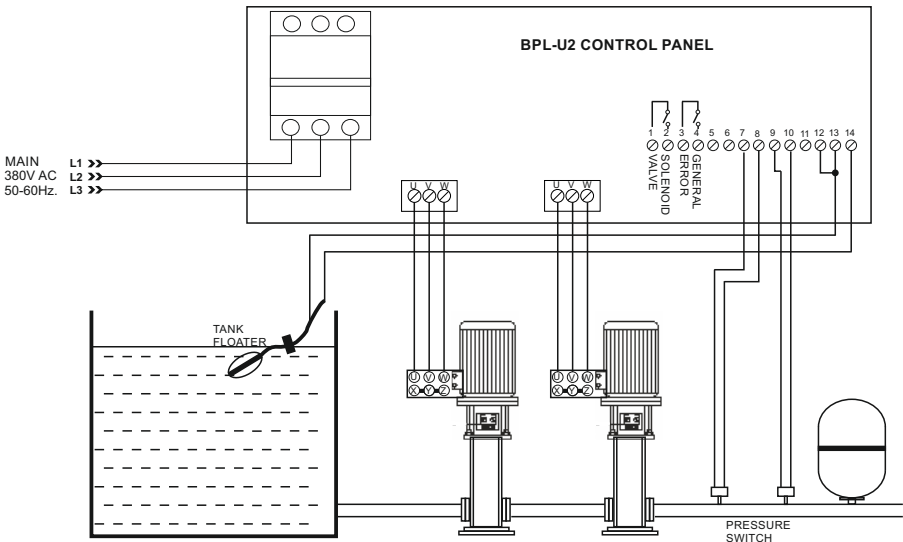
Ability to see all error conditions on the screen.

Notifying error conditions with audible buzzer and relay contact.

Ability to display the pump running times on the screen.

Pump co-aging.

Connection Diagram



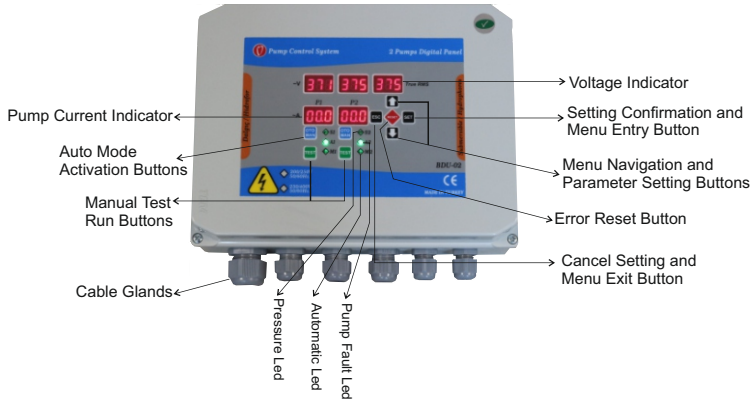


Figure 12: BPL-U2 Panel Outer View

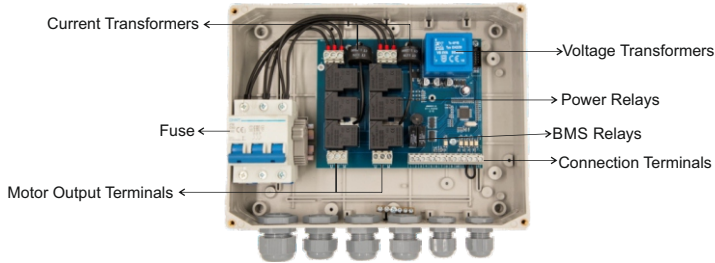


Figure 13: BPL-U2 Panel Inner View

Technical Data

Operation Voltage	380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	5X3 digit 9,2mm display and Leds
Connection Type	Terminal Connection
Contact	17A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diamater	2.5mm² (Current and Voltage Input)
Weight	800gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	250X200X90mm



The BPL-T control panel has the opportunity to monitor and control the operating status and error details of the pumps in single booster systems and submersible systems. The Panel includes a specially designed mainboard and LCD Screen. System parameters can be easily adjusted from the setting menu with the Set / Up / Down buttons.

Specifications

Microprocessor based design.

Hydrophore, deep well (submersible) mode.

Ability to set the time of well filling in deep well (submersible) mode.

2X16 LCD screen.

Measuring 3 phase voltage values and displaying them on the screen.

Ability to set voltage protection upper and lower values.

Ability to display pump currents from the screen.

Ability to set current protection upper and lower values.

Ability to set error delay time.

General Error / Dry Run and Pressure Switch signal Warning LEDs

Protection against dry running with floaters

Additional low current protection against dry running

Ability to display all error conditions

Notifying error conditions with audible buzzer and relay contact.

Connection Diagram

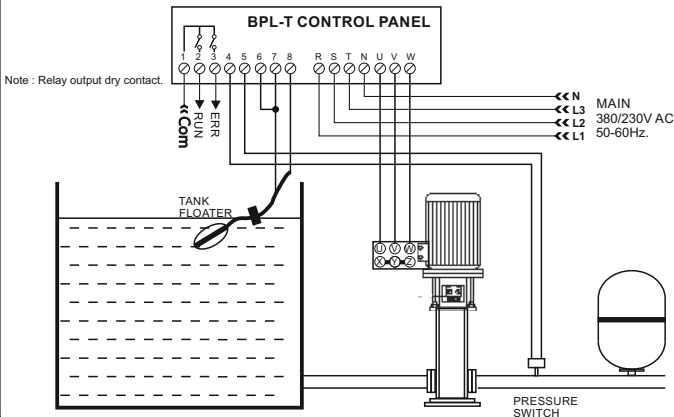




Figure 14: BPL-T Panel outer View

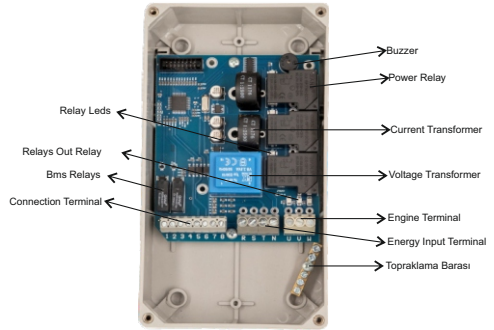


Figure 15: BPL-T Panel Inner View

Technical Data

Operation Voltage	230V – 380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	2X16 LCD Screen and Leds
Connection Type	Terminal Connection
Contact	17A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diamater	2.5mm² (Current and Voltage Input)
Weight	800gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	220X125X120mm



The BPL-1T control panel is a panel that has the opportunity to monitor and control the operating status and error details of the pumps in two-pump booster systems. The Panel includes a specially designed mainboard and 4x20 LCD display. It uncludes General Error / No Water / Phase Error LEDs and Up / Down buttons that allow you to navigate and adjust the menu. Moreover, There are SET/RESET/ ESC buttons as well as switch, pump running and automatic operation warning leds. System parameters can be easily adjusted from the setting menu with the Set / Esc / Up / Down buttons

Specifications

- Microprocessor based design.
- 48 Mhz operating frequency.
- 4x20 LCD (Liquid Crystal Display).
- Displaying the date and time information on the screen.
- Ability to automatically self-test 2 days a week (real time clock).
- Automatic test solenoid valve output.
- Measuring 3 phase voltage values and displaying them on the screen.
- Ability to set voltage protection upper and lower values.
- Ability to monitor pump error conditions from the screen.
- Ability to display pump currents from the screen.
- Ability to set pump upper and lower current values.
- Automatic calculation of pump current values with recognition mode.
- Ability to limit the number of pumps engaged (switchgear) within 1 hour.
- Automatic resetting of current errors.
- Ability to set automatic reset waiting time and number.
- Automatic and manual operation selection.
- Operation as you press the test button in manual operation.
- Protection against waterless operation by floater or electrode.
- Undercurrent protection against dry running
- Ability to see all error conditions on the screen.
- Notifying error conditions with audible buzzer and relay contact.
- Ability to use with pressure transmitter.
- Ability to see the pressure value on screen when using with pressure transmitter.
- Adjustment of set pressure value when using pressure transmitter.
- Ability to display the pump running times on the screen.
- Real-time warehousing.
- PTC (temperature) protection of all pumps.
- Ability to use as a waste water panel (menu option).
- Awater leakage connection in the selection of waste water panel.
- Password protection against unauthorized access.
- Turkish and English Usage Menu.
- Failure record-The device stores the last 20 faults with date and time.

Connection Diagram

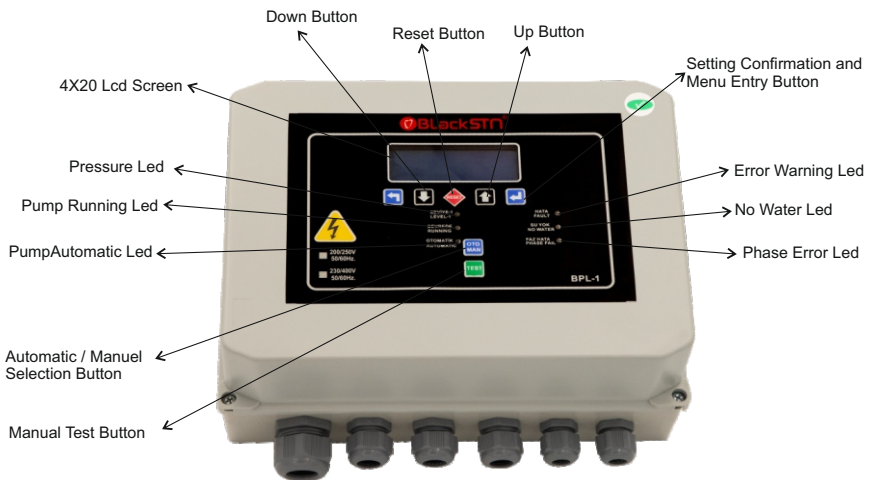
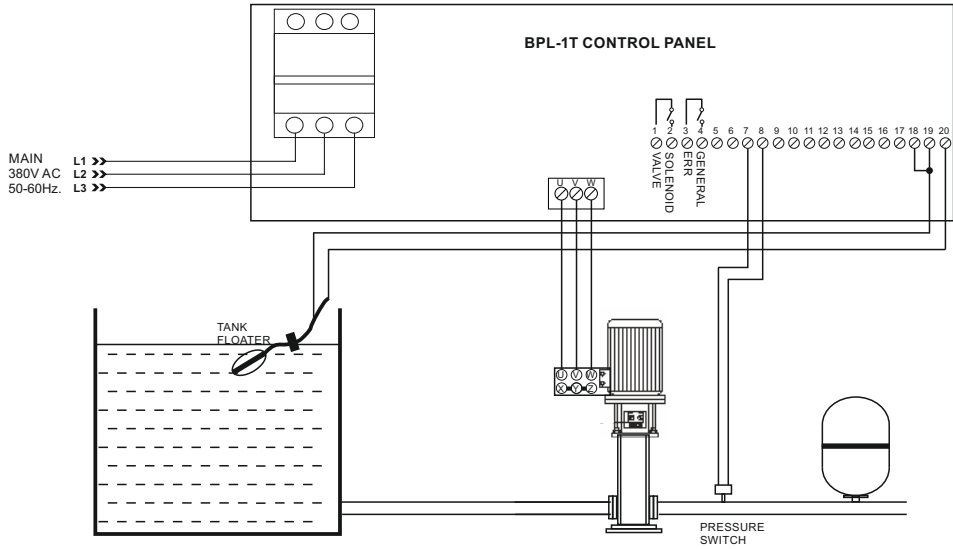


Figure 16: BPL-1T Panel Outer View

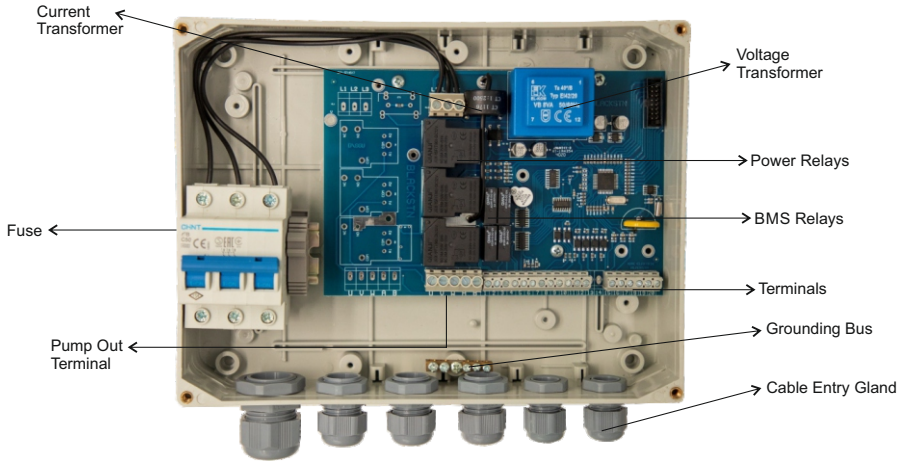


Figure 17: BPL-1T Panel Inner View

Technical Data

Operation Voltage	380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	4X20 LCD and Leds
Connection Type	Terminal Connection
Contact	17A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diamater	2.5mm² (Current and Voltage Input)
Weight	2000gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	310X230X130mm



The BPL-2 series control panel is a panel that has the opportunity to monitor and control the operating status and error details of the pumps in two-pump booster systems. The Panel includes a specially designed mainboard and 4x20 LCD display. It uncludes General Error / No Water / Phase Error LEDs and Up / Down buttons that allow you to navigate and adjust the menu. Moreover, There are SET/RESET/ ESC buttons as well as switch, pump running and automatic operation warning leds. System parameters can be easily adjusted from the setting menu with the Set / Esc / Up / Down buttons

Specifications

Microprocessor based design.

48 Mhz operating frequency.

4x20 LCD (Liquid Crystal Display).

Displaying the date and time information on the screen.

Ability to automatically self-test 2 days a week (real time clock).

Automatic test solenoid valve output.

Measuring 3 phase voltage values and displaying them on the screen.

Ability to set voltage protection upper and lower values.

Ability to monitor pump error conditions from the screen.

Ability to display pump currents from the screen.

Ability to set pump upper and lower current values.

Automatic calculation of pump current values with recognition mode.

Ability to limit the number of pumps engaged (switchgear) within 1 hour.

Automatic resetting of current errors.

Ability to set automatic reset waiting time and number.

Automatic and manual operation selection.

Operation as you press the test button in manual operation.

Protection against waterless operation by floater or electrode.

Undercurrent protection against dry running

Ability to see all error conditions on the screen.

Notifying error conditions with audible buzzer and relay contact.

Ability to use with pressure transmitter.

Ability to see the pressure value on screen when using with pressure transmitter.

Adjustment of set pressure value when using pressure transmitter.

Ability to display the pump running times on the screen.

Real- time warehousing.

PTC (temperature) protection of all pumps.

Ability to use as a waste water panel (menu option).

Awater leakage connection in the selection of waste water panel.

Password protection against unauthorized access.

Turkish and English Usage Menu.

Failure record-The device stores the last 20 faults with date and time.

Connection Diagram

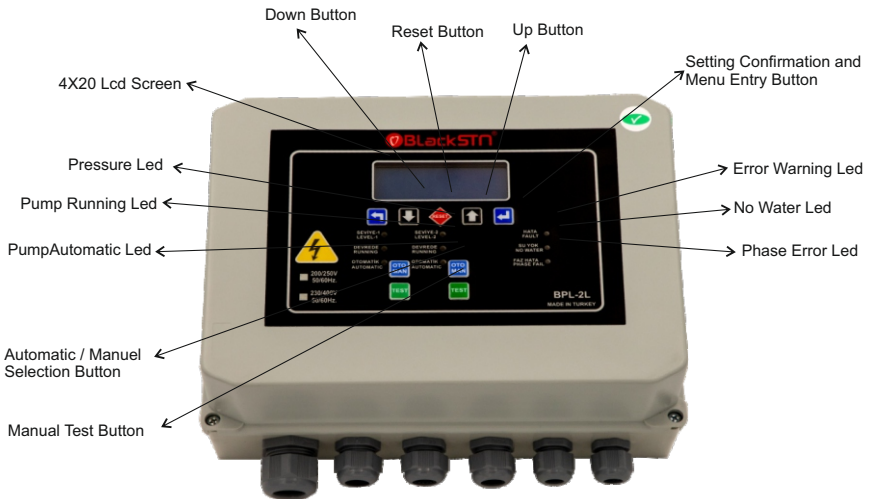
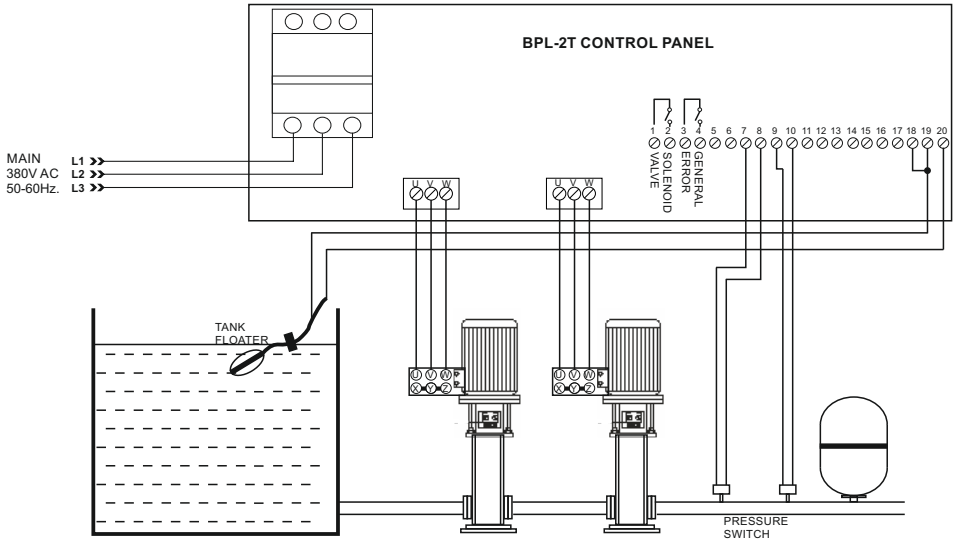


Figure 18: BPL-2T Panel Outer View

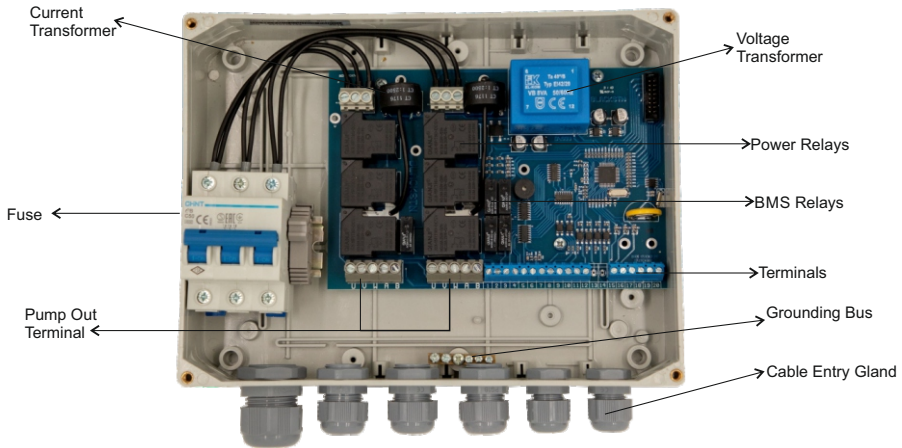


Figure 19: BPL-2T Panel Inner View

Technical Data

Operation Voltage	380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	4X20 LCD and Leds
Connection Type	Terminal Connection
Contact	17A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diamater	2.5mm² (Current and Voltage Input)
Weight	2100gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	310X230X130mm



The BKP series control panel is a panel that has the opportunity to monitor and control the operating status and error details of the pumps in three-pump booster systems. The Panel includes a specially designed mainboard and 2x16 LCD display. It uncludes General Error / No Water / Phase Error LEDs and Up / Down buttons that allow you to navigate and adjust the menu. Moreover, There are SET/RESET/ ESC buttons as well as switch, pump running and automatic operation warning leds. System parameters can be easily adjusted from the setting menu with the Set / Esc / Up / Down buttons.

Specifications

Microprocessor based design.

48 Mhz operating frequency.

2x16 LCD (Liquid Crystal Display).

Displaying the date and time information on the screen.

Ability to automatically self-test.

Automatic test solenoid valve output.

Measuring 3 phase voltage values and displaying them on the screen.

Ability to set voltage protection upper and lower values.

Ability to monitor pump error conditions from the screen.

Ability to display pump currents from the screen.

Ability to set pump upper and lower current values.

Automatic calculation of pump current values with recognition mode.

Ability to limit the number of pumps engaged (switchgear) within 1 hour.

Automatic resetting of current errors.

Ability to set automatic reset waiting time and number.

Automatic and manual operation selection.

Operation as you press the test button in manual operation.

Protection against waterless operation by floater or electrode.

Undercurrent protection against dry running

Ability to see all error conditions on the screen.

Notifying error conditions with audible buzzer and relay contact.

Ability to use with pressure transmitter.

Ability to see the pressure value on screen when using with pressure transmitter.

Adjustment of set pressure value when using pressure transmitter.

Ability to display the pump running times on the screen.

Real-time warehousing.

PTC (temperature) protection of all pumps.

Ability to use as a waste water panel (menu option).

Awater leakage connection in the selection of waste water panel.

Password protection against unauthorized access.

Turkish and English Usage Menu.

Failure record-The device stores the last 20 faults.

Connection Diagram

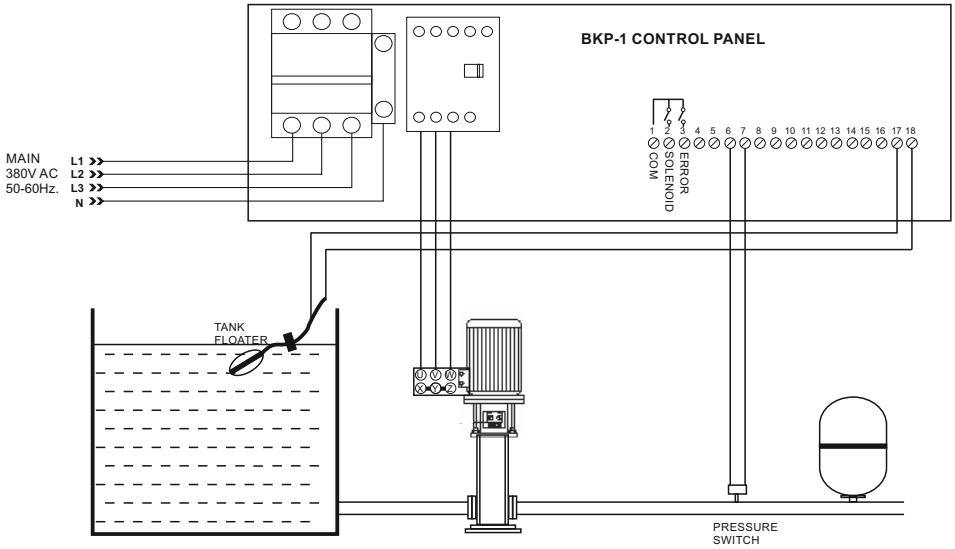


Figure 20: Bkp-1T Connection Diagram

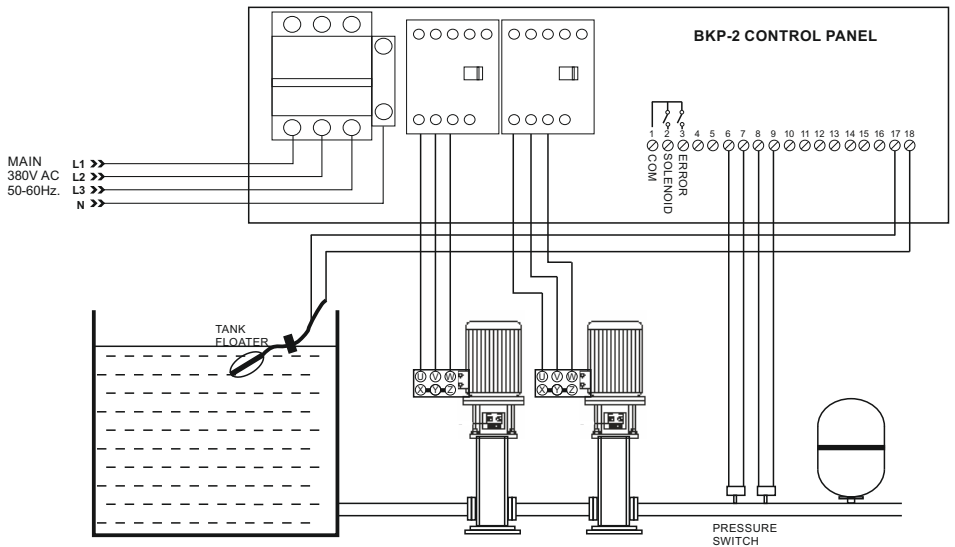


Figure 21: Bkp-2T Connection Diagram

Connection Diagram

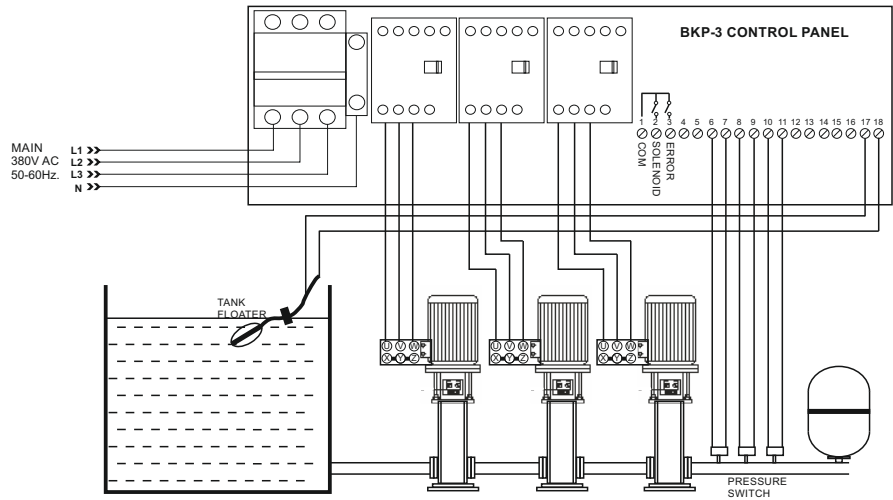


Figure 21: Bkp-3T Connection Diagram



Figure 22: BKP Panel Outer View

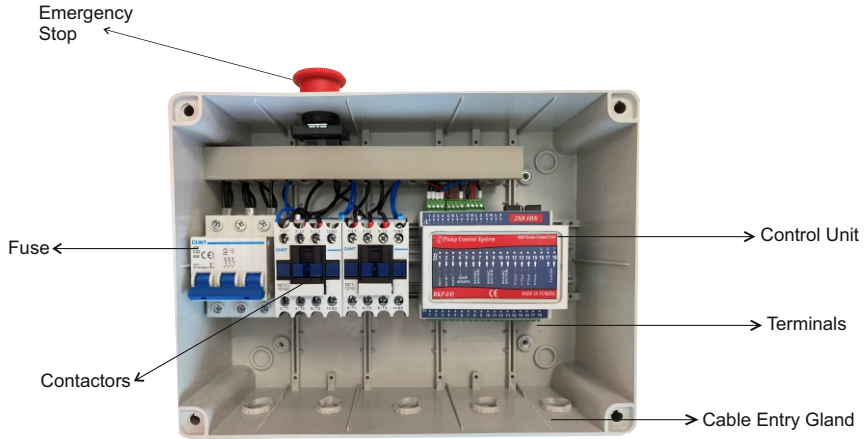


Figure 23: BKP-2 Panel Inner View

Technical Data

Operation Voltage	220-380VAC
Operation Frequency	50/60Hz.
Operation Power	<6VA
Operation Temperature	-20°C ile 55°C
Current Measurement Range	0,5A - 25A
Measurement Accuracy	%±1
Delay Time Settings	1-30 sec.
Indicator	2X16 LCD and Leds
Connection Type	Terminal Connection
Contact	5A/250V AC Resistive Load
Connection Insulation	2.5kV
Cable Diamater	2.5mm² (Current and Voltage Input)
Weight	2100gr.
Assembly	On the pump or on the wall
Protect Class	Ip55
Operation Altitude	<2000 meter
Dimensions	310X230X130



Y.OT series fire control panel with automatic test in fire systems commissioning and switching off pumps and performing self-tests. It has been specially designed for the purpose.

The control panel has automatic - manual operation selection. Man-auto switch on the panel for manual operation must be set to man. Information received from the system pressure switch for automatic operation Activates and deactivates the pumps accordingly. A specially designed PLC is used to perform these operations. On the PLC unit screen on the front panel, the system is ready-circuited and fault conditions can be monitored. All fault information is shown on the PLC screen.

Automatic test and pump delay times can be adjusted via PLC.

Fire pump control panels which serve as the heart of fire installations are designed to control and monitor electrical or diesel engines of fire pumps, for many years in accordance with international standards. Fire pump control panels generally monitor the status of the line and start the fire pump when it receives a signal from the pressure switch. They cannot be used to meet the other water needs of their facility.

Pump jams and malfunctions in electrical or mechanical parts may occur due to long periods of inactivity. It is important to be able to see and intervene on time. It is important to be able to anticipate these malfunctions and take action in a timely manner. For this reason, they should be tested by running once a week. Test system is available in all our fire panels.

General Information

- ✦ Microprocessor based design.
- ✦ 48Mhz operating frequency.
- ✦ 64 Kb Program memory.
- ✦ 3936 byte SRAM
- ✦ 1024 byte EEPROM.
- ✦ 1,000,000 read/write data capacity.
- ✦ 100 years data retention life.
- ✦ Design with nanowatt technology.
- ✦ Automatic test feature.
- ✦ Automatic test solenoid valve output.
- ✦ Voltage protection active-passive option.
- ✦ Voltage protection high-low values possibility of adjustment.
- ✦ Pump stop delay setting.
- ✦ Turkish-English language support.
- ✦ Floater protection against run without water.
- ✦ Ability to select active-passive float protection.
- ✦ Measuring pump current values.
- ✦ Current protection active-passive option.
- ✦ Possibility to set error delay time.
- ✦ Auto Manual selection switch.
- ✦ Record of 20 events that occurred in the past.
- ✦ Ability to see all error states on the screen
- ✦ Reporting fault conditions by relay contact.
- ✦ Ability to monitor the number of pump switchgears on the screen.
- ✦ 2X16 character LCD display.
- ✦ Ability to monitor pump operating hours on the screen.

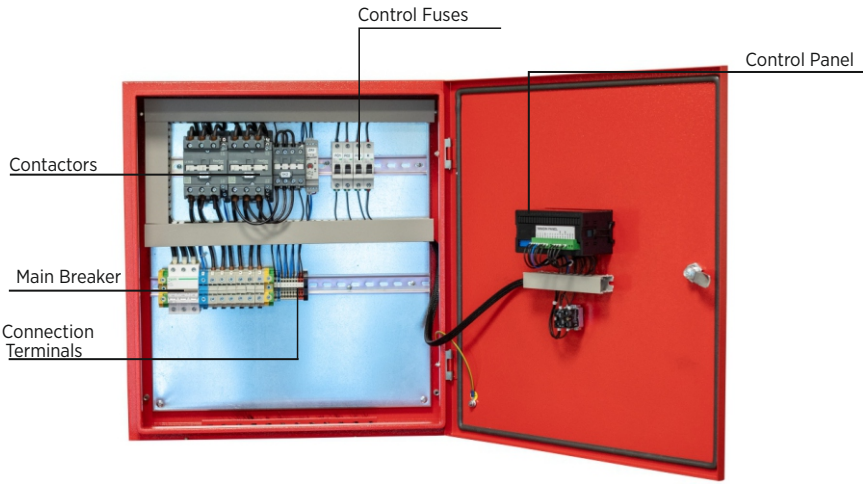


Figure-24: Y.OT Series Panel Inside View

Connection Diagram

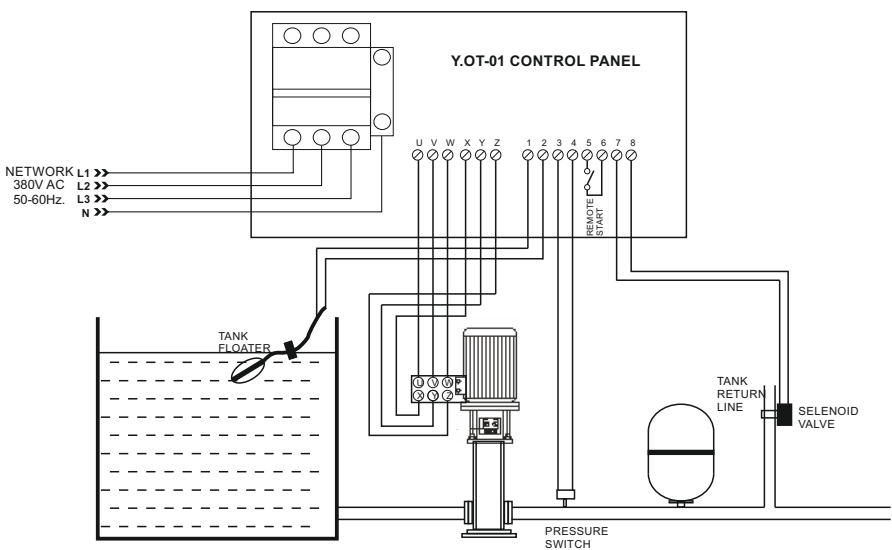


Figure 25: Y.OT Panel Connection Diagram

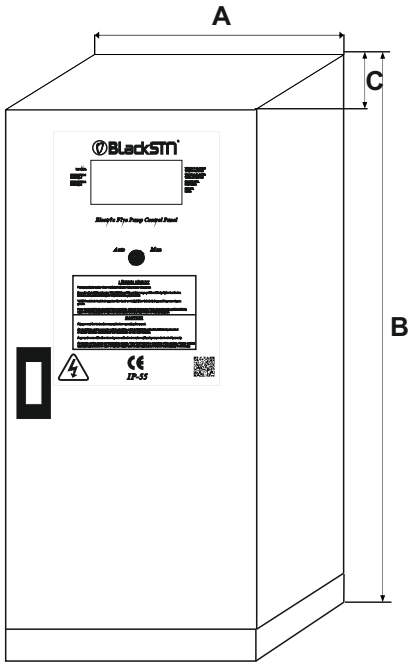


Figure-26: Y.OT Panel Outer View

POWER	A	B	C
7,5-11kW	450mm	500mm	170mm
15kW	450mm	500mm	170mm
18,5kW	450mm	500mm	170mm
22kW	450mm	500mm	170mm
30kW	550mm	600mm	170mm
37kW	550mm	600mm	170mm
45kW	550mm	600mm	170mm
55kW	550mm	600mm	170mm
75kW	700mm	1000mm	320mm
90kW	700mm	1000mm	320mm
110kW	700mm	1000mm	320mm
132kW	1000mm	1300mm	380mm
160kW	1000mm	1300mm	380mm
200kW	1000mm	1300mm	380mm
250kW	1400mm	1500mm	400mm
315kW	1400mm	1500mm	400mm

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	2X16LCD screen and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



NFPA series fire control panel pumps in fire systems commissioning and deactivation and automatic testing and all conditions. It has been specially designed for monitoring.

The control panel has automatic - manual operation selection.

Man-auto switch on the panel for manual operation must be set to man.

Information received from the system pressure switch for automatic operation activates and deactivates the pumps accordingly.

NFPA boards can be used with pressure sensors. In this case the line pressure can be monitored on the screen and the on-off pressures adjustable. NFPA boards provide all fault and working conditions with relay reports.

A specially designed PLC is used to perform these operations.

On the PLC unit screen on the front panel, the system is ready-circuited and fault conditions can be monitored. All fault-working-current and voltage information is displayed.

Automatic test and pump delay times can be adjusted via PLC.

NFPA 20 is the safety standard governing the installation of stationary fire-pumps for fire protection. It specifies guide lines for selecting and installing fire pumps to ensure they deliver adequate and reliable water supplies in the event of a fire. NFPA is short for "National Fire Protection Association". This body covers all fire fighting equipment in any building, platform or anywhere else in the US. It is widely accepted worldwide as a controlling document. Fire fighting system designs in Turkey are made according to NFPA standards. Insurance companies want solutions designed in accordance with NFPA 20 Standards.

Krk Elektrik (BLACKSTN) produces fire pump panels in accordance with NFPA 20 standard in order to meet national and international demands with more than 30 years of production experience and expert sales staff.

Fire pump control panels which serve as the heart of fire installations are designed to control and monitor electrical or diesel engines of fire pumps, for many years in accordance with international standards. Fire pump control panels generally monitor the status of the line and start the fire pump when it receives a signal from the pressure switch. They cannot be used to meet the other water needs of their facility. Pump jams and malfunctions in electrical or mechanical parts may occur due to long periods of inactivity. It is important to be able to see and intervene on time. It is important to be able to anticipate these malfunctions and take action in a timely manner. For this reason, they should be tested by running once a week. Test system is available in all our fire panels. One of the important tasks of fire pump control panels is the transmission of status/failure information audibly and visually. This process not only informs the operator in case of fire or faulty pump start, but also allows early intervention in possible failure situations.

General Information

- ✦ Microprocessor based design.
- ✦ 48Mhz operating frequency.
- ✦ 64 Kb Program memory.
- ✦ 3936 byte SRAM
- ✦ 1024 byte EEPROM.
- ✦ 1,000,000 read/write data capacity.
- ✦ 100 years data retention life.
- ✦ Design with nanowatt technology.
- ✦ Automatic test feature.(Reel Time Clock).
- ✦ Automatic test solenoid valve output.
- ✦ Voltage protection active-passive option.
- ✦ Voltage protection high-low valuespossibility of adjustment.
- ✦ Monitoring voltage values on the screen.
- ✦ Current protection active-passive option.
- ✦ Current protection high-low values possibility of adjustment.
- ✦ Monitoring the current values on the screen.
- ✦ Turkish-English language support.
- ✦ Floater protection against run without water.
- ✦ Ability to select active-passive float protection.
- ✦ Selection of closed-open type pressure switch.
- ✦ Starting the pump with remote start.
- ✦ Possibility to set error delay time.
- ✦ Auto Manual selection switch.
- ✦ 50 event logs from the past.
- ✦ Ability to see all error states on the screen
- ✦ Reporting fault conditions by relay contact.
- ✦ 8 isolated digital inputs.
- ✦ 6 isolated outputs.
- ✦ 10 Adet analog input.
- ✦ 10 relay contacts for isolated BMS.
- ✦ 4X20 character LCD display.
- ✦ Ability to display number of switchgear.
- ✦ Ability to display the pump running times.
- ✦ Ability to use with pressure transmitter.
- ✦ Ability to monitor pressure values on the screen.



Figure-27: NFPA 20 Panel Inside View

Connection Diagram

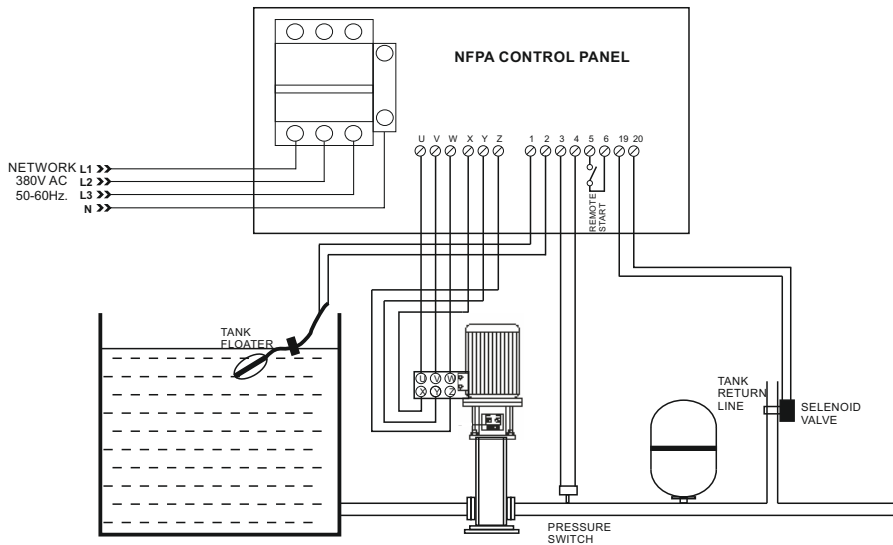


Figure-28: NFPA Panel Connection Diagram

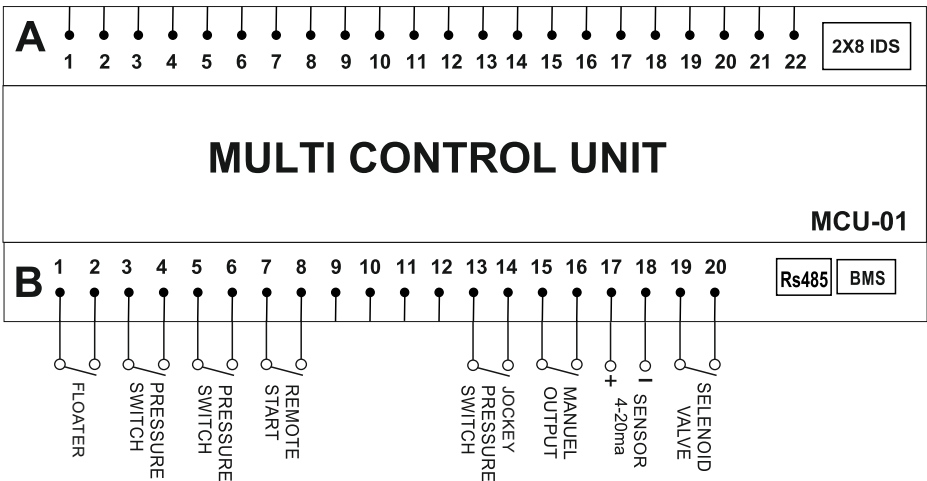


Figure-29: NFPA Control Unit Connection Diagram

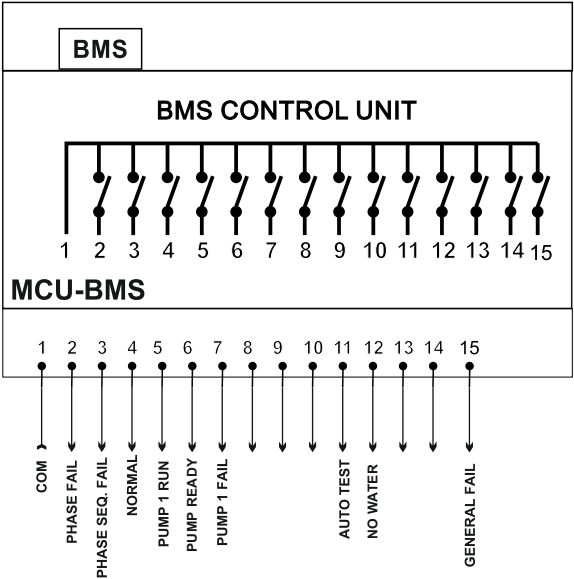


Figure-30: BMS Unit Connection Diagram

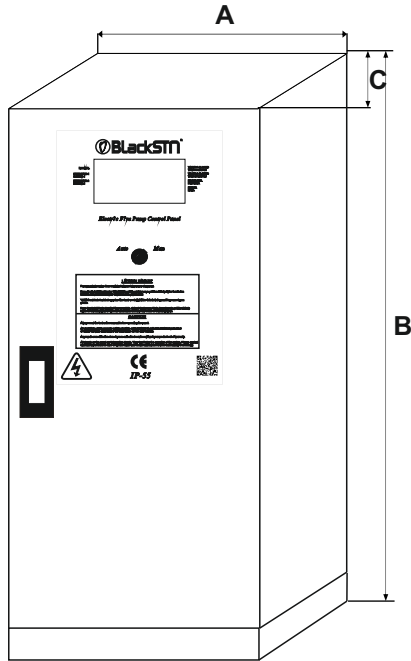


Figure-31: NFPA Panel Outer View

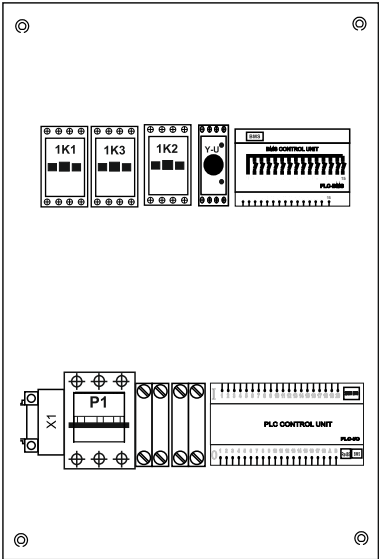


Figure-32: NFPA Panel Inside View

NFPA-20 PANEL DIMENSIONS

POWER	A	B	C
7,5-11kW	450mm	500mm	170mm
15kW	450mm	500mm	170mm
18,5kW	450mm	500mm	170mm
22kW	450mm	500mm	170mm
30kW	550mm	600mm	170mm
37kW	550mm	600mm	170mm
45kW	550mm	600mm	170mm
55kW	550mm	600mm	170mm
75kW	700mm	1000mm	320mm
90kW	700mm	1000mm	320mm
110kW	700mm	1000mm	320mm
132kW	1000mm	1300mm	380mm
160kW	1000mm	1300mm	380mm
200kW	1000mm	1300mm	380mm
250kW	1400mm	1500mm	400mm
315kW	1400mm	1500mm	400mm

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	4X20LCD screen and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



TRF series transfer panel has been specially designed for the purpose of keeping the fire panels in continuous operation by monitoring the mains and generator supply. The transfer board has automatic - manual operation selection. Man-auto switch in the panel for manual operation The switch must be set to the man position. System mains and generator voltages for automatic operation. constantly checks and can provide appropriate voltage values redirects the source to the output. Mains voltage values are suitable priority is to transfer the mains line to the output. Adjustable delay time for mains and generator transitions available.

When a generator is wanted to be added to an existing network, it is necessary for the network and the generator to work in harmony. transfer board is used for Pano, which directs the energy from the generator based on the load output and it is a system that switches energy. By opening the mains contacts, it prevents the overlapping of 2 powers. With this system, mains and generator energy are controlled by switches and their transfer is carried out safely.

While there is electricity in the grid, loads are fed from the active grid. However, if the mains power is interrupted or dropped, when it stops, the generator starts and continues to feed the load. After the electric current returns to its normal course, this energy is transferred back to the grid and the generator is deactivated. A typical switchboard power should be at least as strong as the generator, according to the power that the generator will perform.

General Information

- *220V Single Phase or 380V Three Phase design.*
- *It is compatible with all generator models.*
- *Network under voltage setting.*
- *Network over voltage setting.*
- *Network delay time setting..*
- *Generator under voltage setting.*
- *Generator over voltage setting.*
- *Generator delay time setting..*
- *Neutral line separation with 4-pole transfer.*
- *Does not require DC supply.*
- *Network-generator output indicator.*

Connection Diagram

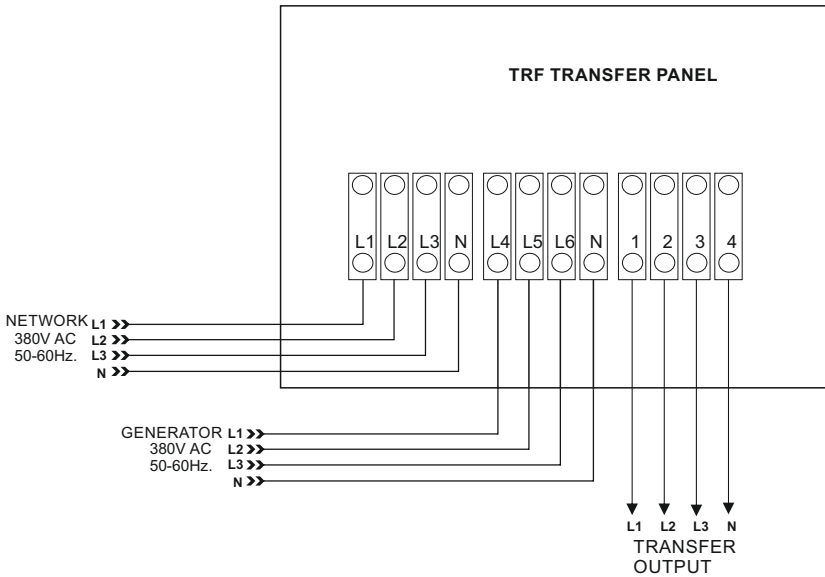


Figure-33: TRF Transfer Panel Connection Diagram

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<10VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	22mm Signal Light
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



TRF.OT series internal transfer automatic test fire control panel commissioning and disconnecting pumps in fire systems and automatic testing and automatic transfer between mains and generator. It has been specially designed for.

The control panel has automatic - manual operation selection. Man-auto switch on the panel for manual operation must be set to man. Information received from the system pressure switch for automatic operation Activates and deactivates the pumps accordingly. A specially designed PLC is used to perform these operations. On the PLC unit screen on the front panel, the system is ready-circuited and fault conditions can be monitored. All fault information is shown on the PLC screen.

Automatic test and pump delay times can be adjusted via PLC.

Fire pump control panels which serve as the heart of fire installations are designed to control and monitor electrical or diesel engines of fire pumps, for many years in accordance with international standards. Fire pump control panels generally monitor the status of the line and start the fire pump when it receives a signal from the pressure switch. They cannot be used to meet the other water needs of their facility.

Pump jams and malfunctions in electrical or mechanical parts may occur due to long periods of inactivity. It is important to be able to see and intervene on time. It is important to be able to anticipate these malfunctions and take action in a timely manner. For this reason, they should be tested by running once a week. Test system is available in all our fire panels.

General Information

- Fully automatic internally installed network-generator transfer unit.
- Microprocessor based design.
- 48Mhz operating frequency.
- 64 Kb Program memory.
- 3936 byte SRAM
- 1024 byte EEPROM.
- 1,000,000 read/write data capacity.
- 100 years data retention life.
- Design with nanowatt technology.
- Automatic test feature.
- Automatic test solenoid valve output.
- Voltage protection active-passive option.
- Voltage protection high-low values possibility of adjustment.
- Floater protection against run without water.
- Ability to select active-passive float protection
- Measuring pump current values.
- Current protection active-passive option.
- Possibility to set error delay time.
- Auto Manual selection switch.
- Record of 20 events that occurred in the past.
- Ability to see all error states on the screen
- Reporting fault conditions by relay contact.
- Ability to monitor the number of pump switchgears on the screen.
- 2X16 character LCD display.
- Ability to monitor pump operating hours on the screen.
- Pump stop delay setting.
- Turkish-English language support.



Figure-34: TRF.OT Panel Inside View

Connection Diagram

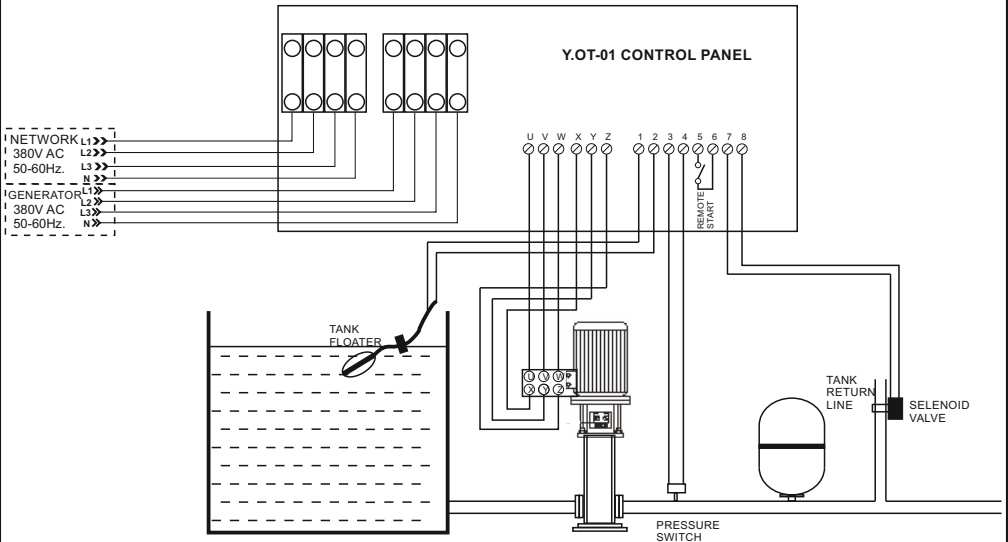


Figure-35: TRF.OT Panel Connection Diagram

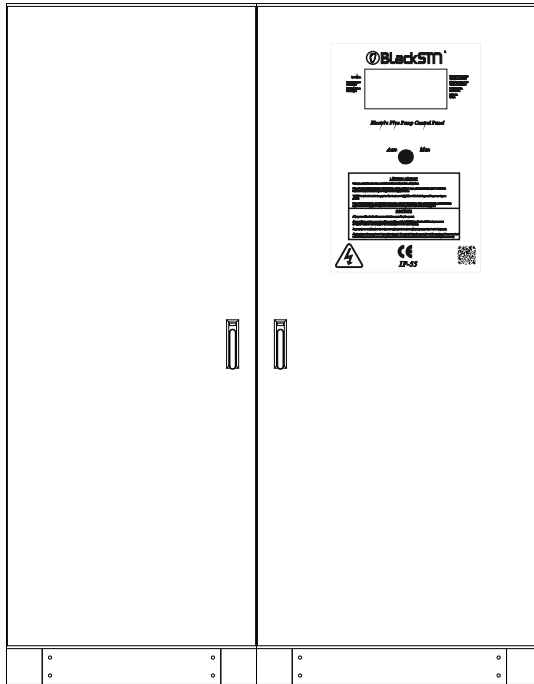


Figure-36: TRF.OT Panel Outer View

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	2X16LCD screen and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



DZY series diesel pump control panel in fire systems to control, monitor and specially designed for continuous operation. was designed.

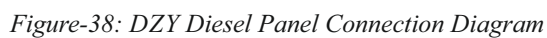
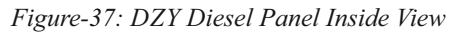
Diesel panel has automatic - manual operation selection. Man-oto switch on the front panel for manual operation The switch must be set to the man position.

taken over the system pressure switch for automatic operation activates and deactivates the diesel engine according to the information.

Diesel panels can be used with pressure sensors. In this case the line pressure can be monitored on the screen and the on-off pressures can be adjusted. Diesel panels all malfunction and operation reports their status with a relay. Special for these operations PLC designed is used. On the PLC unit screen located on the front panel, the ready-circuit and fault conditions of the system can be monitored. Automatic test and pump delay times can be adjusted via PLC.

General Information

- ✦ Microprocessor based design.
- ✦ 64Mhz operating frequency.
- ✦ 128 Kb Program memory.
- ✦ 3936 byte SRAM
- ✦ 1024 byte EEPROM.
- ✦ 1.000.000 read/write data capacity.
- ✦ 100 years data retention life.
- ✦ Design with nanowatt technology.
- ✦ 128x64 pixel graphic screen.
- ✦ Password protection.
- ✦ Maintenance settings menu.
- ✦ Programmable digital input.
- ✦ Programmable battery selection.
- ✦ Programmable starter cut setting.
- ✦ Measuring the temperature value.
- ✦ Measuring the oil pressure value.
- ✦ Measuring the fuel value.
- ✦ Ability to limit the number of starter.
- ✦ Low battery (charge fault) reporting.
- ✦ Measuring battery voltage values and displaying on the screen.
- ✦ Diesel revolution (RPM) measurement.
- ✦ Reel time clock.
- ✦ Select of closed-open type pressure switch.
- ✦ Starting the pump with remote start.
- ✦ Possibility to set error delay time.
- ✦ Auto Manual selection switch.
- ✦ Past 50 fault records
- ✦ Reel time clock automatic test.
- ✦ Automatic test solenoid valve output.
- ✦ Exchanger (cooling) outlet.
- ✦ Adjustable stop delay time.
- ✦ Memorizing the commissioning date.
- ✦ Turkish English language support.
- ✦ Ability to display running time on the screen
- ✦ Ability to display number of switchgear.
- ✦ Ability to monitor working hours on the screen
- ✦ Ability to use with pressure transmitter
- ✦ Ability to se the pressure value.
- ✦ Adjustment of set pressure value.



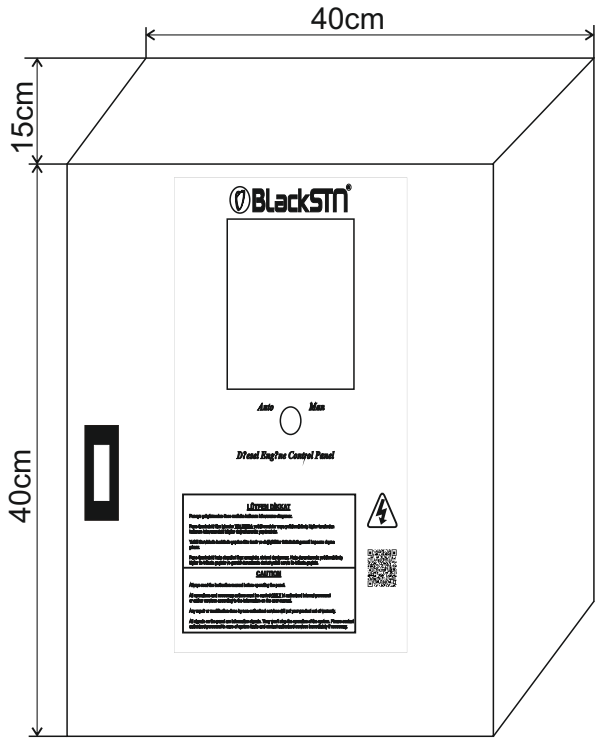


Figure-39: DZY Panel Outer View

Technical Details

Operating Voltage (Un)	230V – 12/24V DC
Operating Frequency	50/60Hz.
Working Power	<10VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	128X64 pixel LCD and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



Diesel + fire control panel, pumps in fire systems to monitor operating status and error details on the screen and special equipment to allow control of these pumps was designed as. Diesel engine and electric on the panel The fire pump has the option of automatic and manual operation. For manual operation the system is put into manual mode with the auto/man button. With the test button on the panel in manual mode selection pumps are started. In automatic mode selection, the panel is diesel and from separate pressure switches for electrical fire. It starts and stops pumps with information. The panel consists of a specially designed main board for the electric pump, control buttons, warning lights and LCD screen, a control panel for the diesel pump, automatic manual selection button and other equipment. System operating statuses are displayed on these panels is displayed

General Information

- 16 bit microprocessor based design.
- 48 Mhz operating frequency.
- 4x20 Character Blue Screen LCD.
- Displaying the date and time information on the screen.
- Ability to automatically self-test 2 days a week (real time clock).
- Automatic test solenoid valve output.
- Measuring 3 phase voltage values and displaying them on the screen.
- Ability to set voltage protection upper and lower values.
- Ability to display pump currents from the screen.
- Ability to set pump upper and lower current values.
- Automatic calculation of pump current values with recognition mode.
- Automatic resetting of current errors.
- Ability to set automatic reset waiting time and number.
- Automatic and manual operation selection.
- Operation as you press the test button in manual operation.
- Protection against dry running by floater or electrode.
- Undercurrent protection against dry running.
- Ability to see all error conditions on the screen.
- Notifying error conditions with audible buzzer and relay contact.
- Ability to use with pressure transmitter.
- Ability to see the pressure value on screen when using with pressure transmitter.
- Adjustment of set pressure value when using pressure transmitter.
- Ability to display the pump running times on the screen.
- Real-time co-aging.
- PTC (temperature) protection of all pumps.
- Password protection against unauthorized access.
- Turkish-English Usage Menu.
- Failure record-The device stores the last 20 faults with date and time.
- Ability to limit the number of pumps engaged (switchgear) within 1 hour.
- Ability to monitor pump error conditions from the screen.

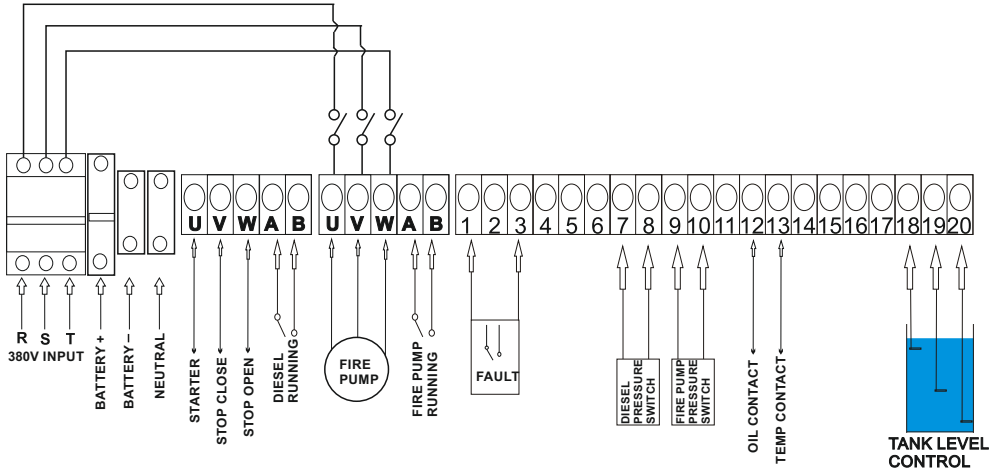


Figure-40: BDY-01 Panel Connection Diagram

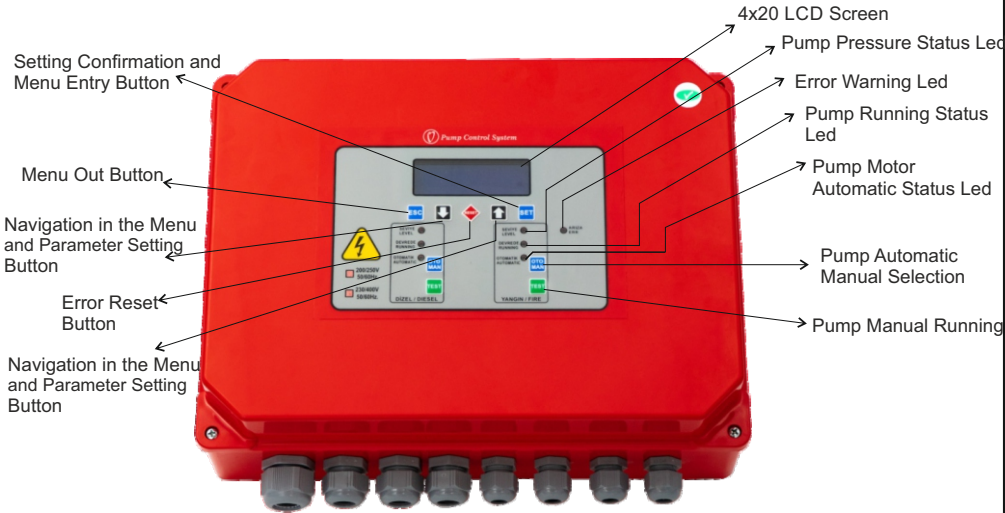


Figure-41: BDY-01 Panel Outer View

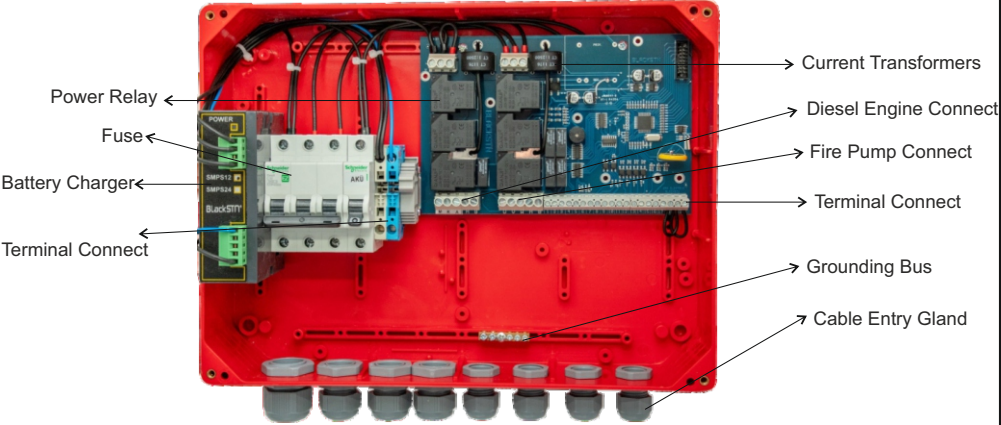


Figure-42: BDY-01 Panel Inside View

Technical Details

Operating Voltage (Un)	380V AC - 12/24V DC
Operating Frequency	50/60Hz.
Working Power	<10VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Current Measurement Range	0,5 - 25A AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	4X20 LCD and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



The BKP Joker series control panel is a panel that has the opportunity to monitor and control the operating status and error details of the pumps in three-pump booster systems. The Panel includes a specially designed mainboard and 2x16 LCD display. It includes General Error / No Water / Phase Error LEDs and Up / Down buttons that allow you to navigate and adjust the menu. Moreover, There are SET/RESET/ ESC buttons as well as switch, pump running and automatic operation warning leds. System parameters can be easily adjusted from the setting menu with the Set / Esc / Up / Down buttons.

Specifications

- Microprocessor based design.
- 48 Mhz operating frequency.
- 2x16 LCD (Liquid Crystal Display).
- Displaying the date and time information on the screen.
- Ability to automatically self-test.
- Automatic test solenoid valve output.
- Measuring 3 phase voltage values and displaying them on the screen.
- Ability to set voltage protection upper and lower values.
- Ability to monitor pump error conditions from the screen.
- Ability to display pump currents from the screen.
- Ability to set pump upper and lower current values.
- Automatic calculation of pump current values with recognition mode.
- Ability to limit the number of pumps engaged (switchgear) within 1 hour.
- Automatic resetting of current errors.
- Ability to set automatic reset waiting time and number.
- Automatic and manual operation selection.
- Operation as you press the test button in manual operation.
- Protection against waterless operation by floater or electrode.
- Undercurrent protection against dry running
- Ability to see all error conditions on the screen.
- Notifying error conditions with audible buzzer and relay contact.
- Ability to use with pressure transmitter.
- Ability to see the pressure value on screen when using with pressure transmitter.
- Adjustment of set pressure value when using pressure transmitter.
- Ability to display the pump running times on the screen.
- Real-time warehousing.
- PTC (temperature) protection of all pumps.
- Ability to use as a waste water panel (menu option).
- Awater leakage connection in the selection of waste water panel.
- Password protection against unauthorized access.
- Turkish and English Usage Menu.
- Failure record-The device stores the last 20 faults.

CONNECTION DIAGRAM

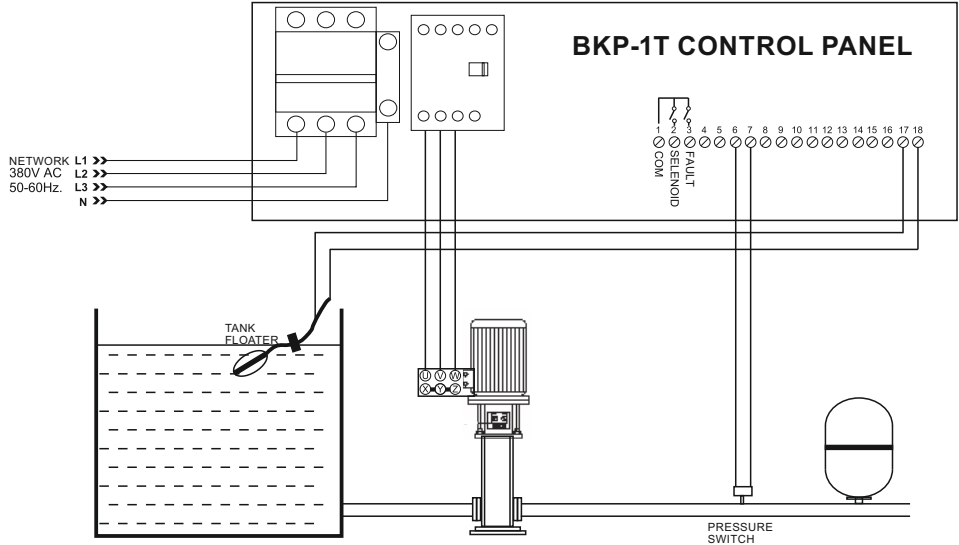


Figure-43: BKP-1T Panel Connection Diagram

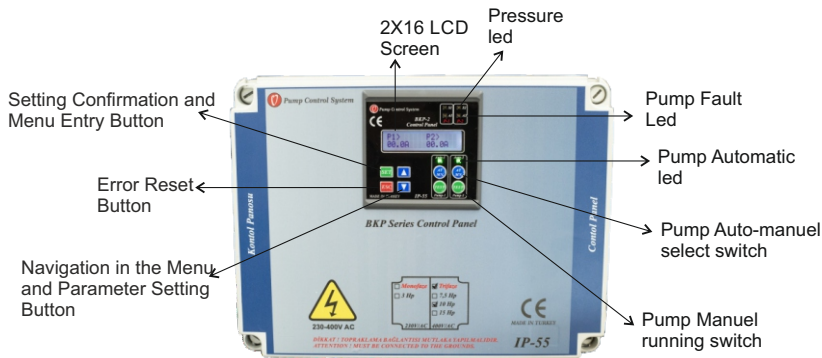


Figure-44: BKP-1T Panel Outer View

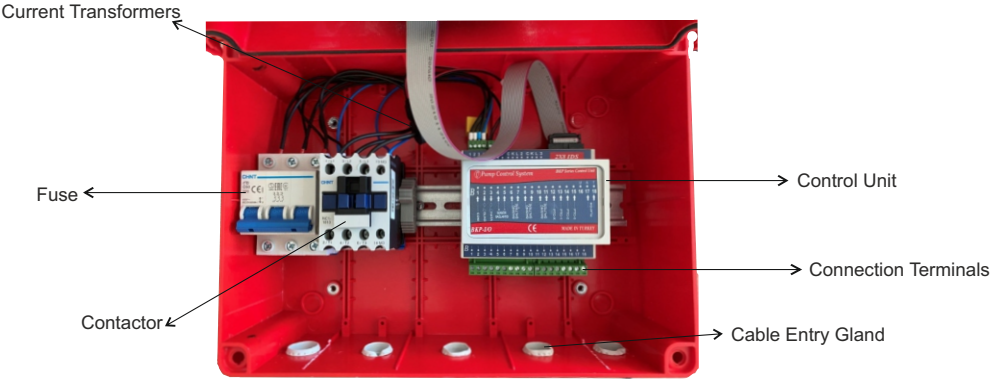


Figure-45: BKP-1T Panel Inside View

Technical Details

Operating Voltage (Un)	380V AC
Operating Frequency	50/60Hz.
Work?ng Power	<10VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Current Measurement Range	0,5 - 25A AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	2X16 LCD and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter



PMK Series control panel; It has been specially designed to provide direct or star delta operation of pumps and protection of pumps in booster systems.

The control panel has automatic - manual operation selection. For manual operation, it is started with the start-stop buttons on the front panel. For automatic operation, the system activates and deactivates the pumps with the signal it receives from the pressure switch. With a specially designed multimeter on the panel, 3-phase voltage and 3-phase current are measured and displayed on the display screen.

measured values can be monitored. Protection is done by setting the upper and lower voltage/current values with a multimeter.

General Information

- ☛ The system can recognize the pump with a single button and set the lower and upper current values
- ☛ Microprocessor based design
- ☛ Auto Manual selection key.
- ☛ Manuel start-stop.
- ☛ 6 x 9.2mm 3digit 7 segment displays.
- ☛ Ability to monitor pump operating hours on the screen.
- ☛ Being able to see the voltage values on the screen.
- ☛ Phase sequence error protection.
- ☛ Being able to set High Voltage and Low Voltage protection values.
- ☛ Seeing the pump current values on the screen.
- ☛ Ability to set high current and low current protection value
- ☛ Possibility to set error delay time.
- ☛ General Error / Waterless Operation signal warning leds
- ☛ Protection against waterless operation with float
- ☛ Additional low current protection against running without water.
- ☛ All fault conditions can be seen on the screen.
- ☛ Reporting fault conditions with relay contact.
- ☛ Separate digital thermal protection for each pump in multiple pumps.
- ☛ Co-aging feature in multiple pumps (optional).
- ☛ 1 programmable dry contact output.
- ☛ Adjust the star-delta transition time

CONNECTION DIAGRAM

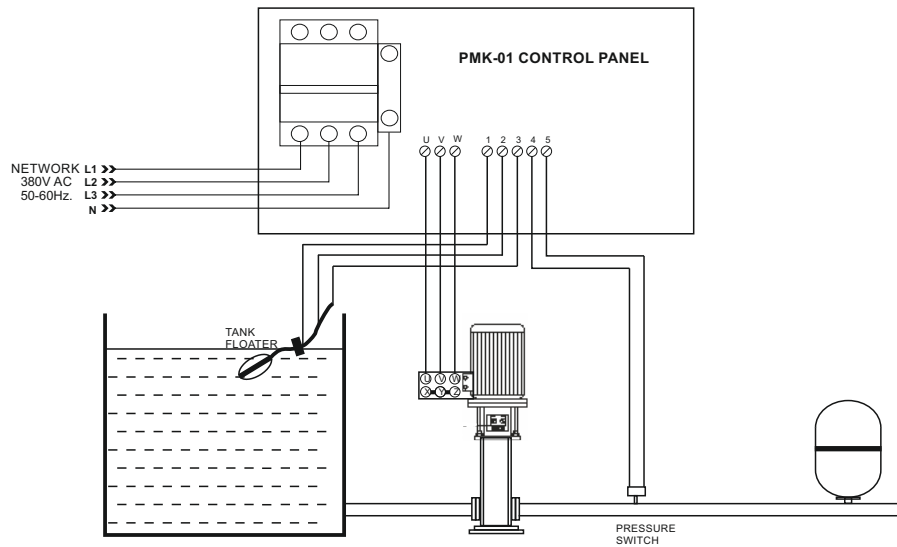


Figure 46: PMK-01 Panel Direct Start Connection Diagram

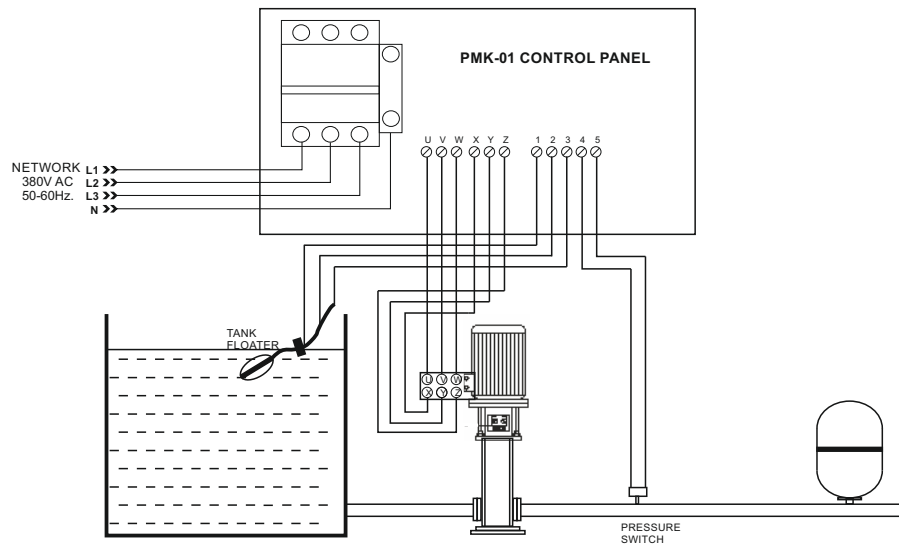


Figure 47: PMK-01 Panel Star Delta Start Connection Diagram

CONNECTION DIAGRAM

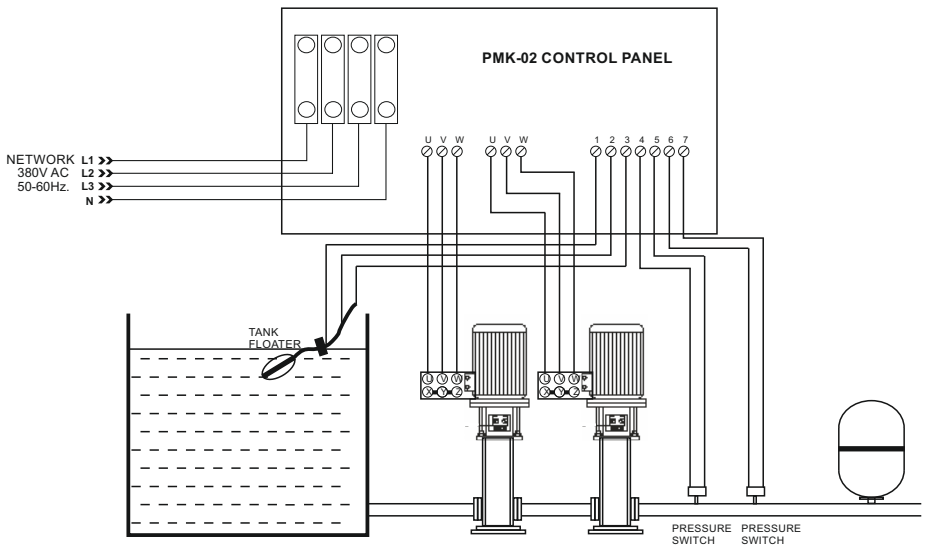


Figure 48: PMK-02 Panel Direct Start Connection Diagram

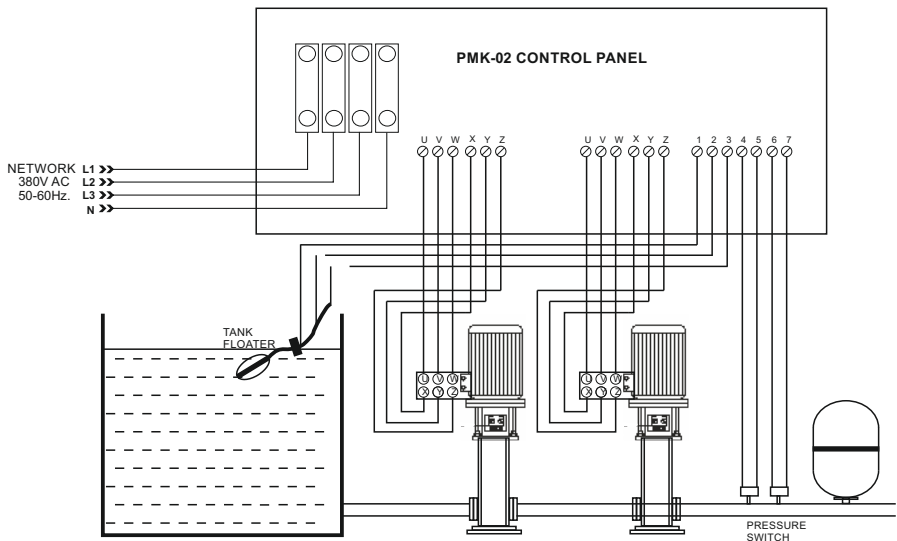


Figure 49: PMK-02 Panel Star Delta Start Connection Diagram

Technical Drawings

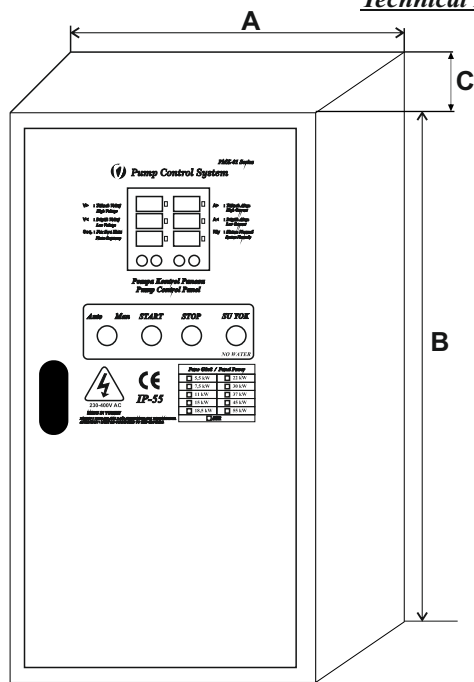


Figure 50: PMK-01 Panel Outer View

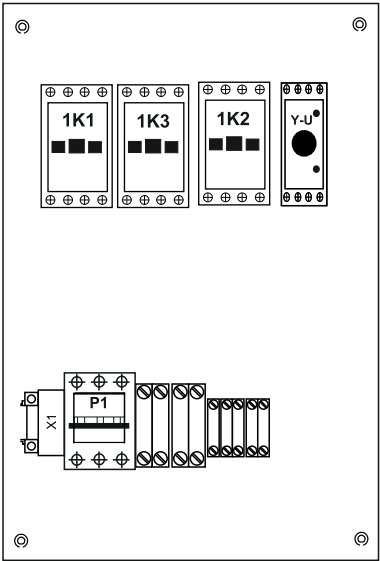


Figure 51: PMK-01 Panel Internal View

PMK-01 Panel Dimensions

POWER	A	B	C
7,5kW	300mm	400mm	200mm
11kW	400mm	500mm	200mm
15kW	400mm	500mm	200mm
18kW	400mm	500mm	200mm
22kW	400mm	500mm	200mm
30kW	400mm	600mm	200mm
37kW	400mm	600mm	200mm
45kW	500mm	700mm	260mm
55kW	500mm	700mm	260mm
75kW	500mm	700mm	260mm
90kW	700mm	1000mm	320mm
110kW	700mm	1000mm	320mm

Technical Drawings

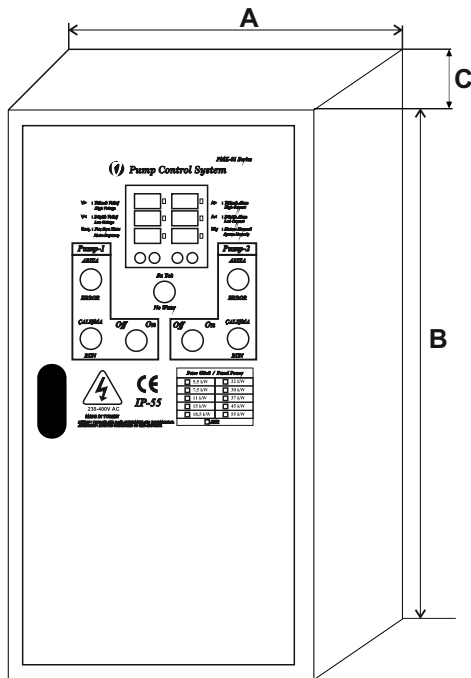


Figure 52: PMK-02 Panel Outer View

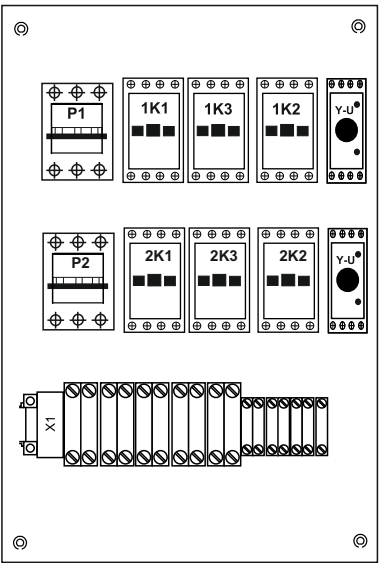


Figure 53: PMK-02 Panel Internal View

PMK-02 Panel Dimensions

POWER	A	B	C
5,5kW	300mm	400mm	200mm
7,5kW	400mm	500mm	200mm
11kW	400mm	600mm	200mm
15kW	400mm	600mm	200mm
18kW	400mm	600mm	200mm
22kW	400mm	600mm	200mm
30kW	700mm	1000mm	320mm
37kW	700mm	1000mm	320mm
45kW	700mm	1000mm	320mm
55kW	700mm	1000mm	320mm
75kW	700mm	1000mm	320mm
90kW	1000mm	1300mm	380mm



Submersible control panel; It is specially designed for direct or star-delta operation of pumps in Waste Water systems and to protect the pumps. The control panel has automatic - manual operation selection. For manual operation, it is started with the start-stop buttons on the front panel. For automatic operation, the system activates and deactivates the pumps with the signal it receives from the pressure switch. With a specially designed multimeter on the panel, 3-phase voltage and 3-phase current are measured and displayed on the display screen. measured values can be monitored. Protection is done by setting the upper and lower voltage/current values with a multimeter. The system can recognize the pump with a single button and set the lower and upper current values

General Information

- ☛ Microprocessor based design
- ☛ Auto Manual selection key.
- ☛ Manuel start-stop.
- ☛ 6 x 9.2mm 3digit 7 segment displays.
- ☛ Ability to monitor pump operating hours on the screen.
- ☛ Being able to see the voltage values on the screen.
- ☛ Phase sequence error protection.
- ☛ Being able to set High Voltage and Low Voltage protection values.
- ☛ Seeing the pump current values on the screen.
- ☛ Ability to set high current and low current protection value
- ☛ Possibility to set error delay time.
- ☛ General Error / Waterless Operation signal warning leds
- ☛ Protection against waterless operation with float
- ☛ Additional low current protection against running without water.
- ☛ All fault conditions can be seen on the screen.
- ☛ Reporting fault conditions with relay contact.
- ☛ Separate digital thermal protection for each pump in multiple pumps.
- ☛ Co-aging feature in multiple pumps (optional).
- ☛ 1 programmable dry contact output.
- ☛ adjust the star-delta transition time
- ☛ PTC and Water leakage protection are standard.

Connection Diagram

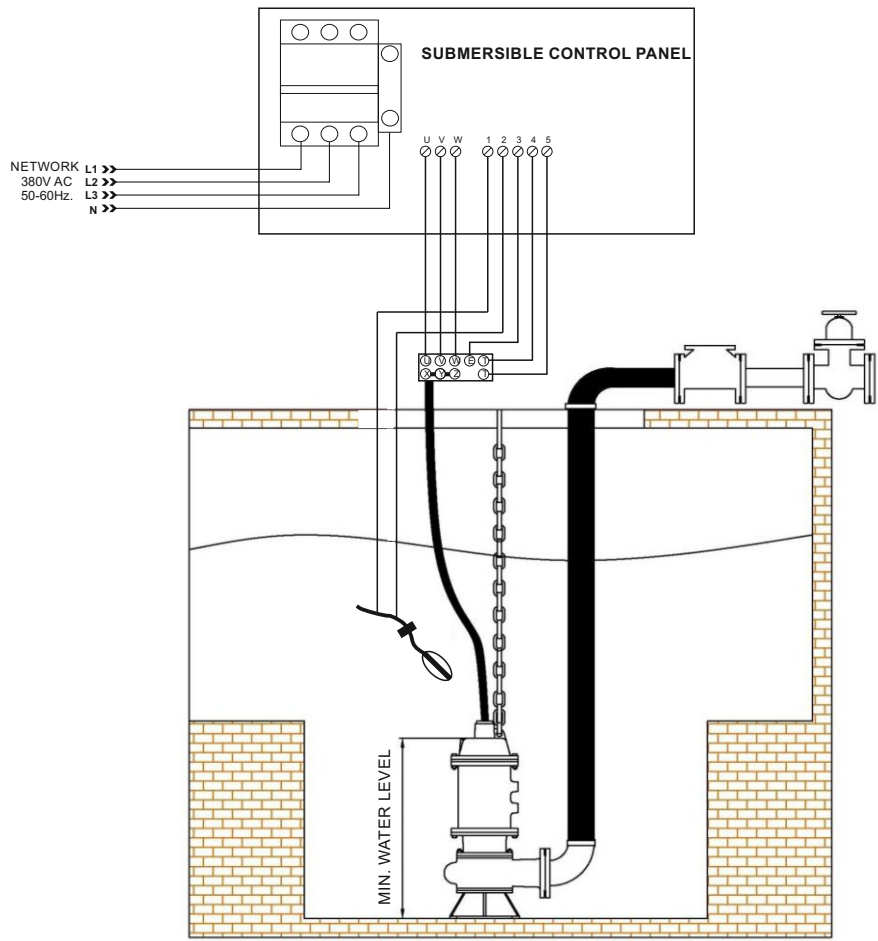


Figure 54: Submersible Panel Connection Diagram

Technical Drawing of the Pump Control Panel

Dimensions:

- A:** Total width of the panel.
- B:** Total height of the panel.
- C:** Height of the top section.

Panel Features:

- Display:** 4-digit LED display.
- Buttons:** Stop, Start, Run, and a small button for the status indicator.
- Status Indicator:** A small LED indicator for the status of the pump.

Panel Layout:

The panel is divided into two main sections. The top section contains the digital display and the keypad. The bottom section contains the status indicator and the main control buttons.

Panel Dimensions Table:

Item	Width (mm)	Height (mm)
1. Digital Display	100	20
2. Stop Button	30	20
3. Start Button	30	20
4. Run Button	30	20
5. Status Indicator	10	10
6. Panel Frame	10	10
7. Total Width	180	100
8. Total Height	100	100



POWER	A	B	C
7,5kW	300mm	400mm	200mm
11kW	400mm	500mm	200mm
15kW	400mm	500mm	200mm
18kW	400mm	500mm	200mm
22kW	400mm	500mm	200mm
30kW	400mm	600mm	200mm
37kW	400mm	600mm	200mm
45kW	500mm	700mm	260mm
55kW	500mm	700mm	260mm
75kW	500mm	700mm	260mm
90kW	700mm	1000mm	320mm
110kW	700mm	1000mm	320mm

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating Temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	5X3digit 9.2mm display and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter

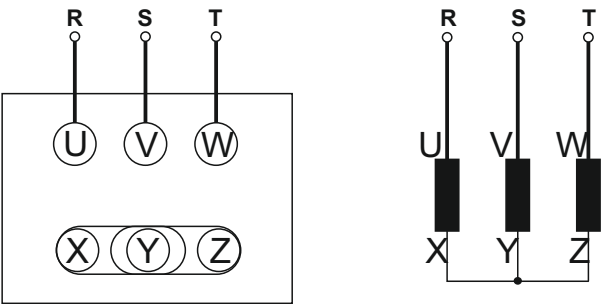


Figure 57: Motor Star (Λ) Connection Diagram

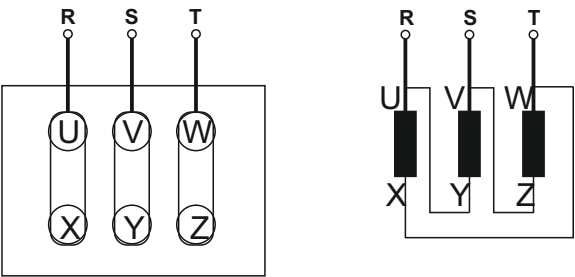


Figure 58: Motor Star (Δ) Connection Diagram

Star delta starting is the most economical system applied to reduce the starting current in motors. Electric motors draw 5-7 times the rated current from the network at the first start. In order to prevent this, the star-delta starting method is applied to the 3-phase asynchronous motor. In this way, it is prevented that the motors draw high current from the network at the first start-up.

Star delta starting is a combination of 3 contactors and 1 timer. . In order to use this method, the delta-connected operating voltage of the motor must be equal to the mains voltage. For example, the mains voltage in our country is 380V. 380V on the motor nameplate must be in writing.

Star delta started motor works in star connection at the moment of start. The voltage applied to the motor windings drops to $U/\sqrt{3}$ (voltage/root3). The current drawn by the motor decreases to $I/\sqrt{3}$ value.

As the voltage applied to the windings decreases, the motor torque decreases.

For perfect star delta starting, the load torque of the motor must not be greater than the motor torque in the star connection.

When the star-operated engine speed approaches the rated speed, delta connection should be started. For this reason, a certain period of time is required for the engine to approach its normal speed in star connection.

This time varies according to the engine power and is a maximum of 8-10 seconds. When the motor reaches its normal speed in star connection, if the delta connection is not switched, it works with a torque of 1/3 of the normal operating torque, and if it is loaded with rated load, the motor becomes unable to meet the load torque.

!!! The motor that needs to be connected in delta from the mains can be operated in star connection. In this case, the power and torque of the motor decreases.

ATTENTION: If the motor that should be run in star connection in the network is accidentally started in delta connection,

$\sqrt{3}$ times greater voltage is applied to the windings and the heat in the motor windings starts to increase after a while, the windings burn out.

Contactor selection is important in star delta starting. A high selected contactor is not economical. The calculation methods while making the selection are as follows.

Energy (main) and current through the delta contactor; It is found by dividing the motor rated current by $\sqrt{3}$.

For example, for a motor with a nominal current of 100A: $100/\sqrt{3} = 100/1.732 = 57.7A$. Accordingly, a contactor above 57.7A should be selected.

The current passing through the star contactor; 1/3 of the motor rated current. For a motor with a nominal current of 100A: $100/3 = 33.3A$. Accordingly, a contactor above 33A should be selected.

According to these results, 65A-65A-40A contactor should be used for the motor with 100A nominal current.



Activate the pumps with the frequency converter of the FLK series control panel. specially for the purpose of taking and removing and protecting was designed.

The control panel has automatic - manual operation selection. Man-auto switch in the panel for manual operation. The switch must be set to the man position. Manual pumps pressure is activated and deactivated with the information received from the switches. Received via system pressure transmitter for automatic operation. It activates and deactivates the pumps according to the analog information. A specially designed PLC is used to perform these operations. System pressure and active on the PLC unit screen on the front panel pumps can be monitored. All fault information is shown on the PLC screen. Set pressure value and pump numbers can be adjusted via PLC. Up to 4 pumps with standard I/O cards for up to 8 pumps control can be made.

General Information

- Rs485 MODBUS RTU communication.
- 13 piece isolated inputs.
- 4 piece Analog input.
- 3 piece Analog output.
- 25 piece relay output.
- Real time dating.
- Soft work. Engagement with each pump driver.
- Remote set switching feature.
- Remote on-off digital input.
- Auto Test Settings.
- Reel Time Clock.
- Gün içerisinde 2 farklı çalışma zamanı ayarlayabilme.
- Pump active - passive selection.
- Pump backup. Number of pumps + Incorporation of spare pump with maximum pump selection.
- Automatic deactivation of the system from the network in the event of a drive failure. Continue by set pressure.
- Encrypted Access to Menus.
- PID control.
- Hydrofor + Circulation + Heating + Cooling operation mode selection.
- Over Pressure Low Pressure Protection.
- BMS dry contact working status information.
- 3,1 inç (128x64 pixel) Graphic Screen.
- Real time and dated fault information.
- Operation and Fault Conditions on the Screen
- Monitoring the operation, standby, breakdown and cancellation of the pumps in the simulation position on the screen.
- Monitoring of set pressure and working pressure on the screen
- Pump running time monitoring.
- Pump transition time settings can be set.
- Sleep active passive option and sleep time adjustment
- Turkish- English language Select.
- Providing sleep transition by increasing frequency to prevent constant pressure instability in sleep.
- Control panel temperature with thermostatic fan.
- Operation and Fault Conditions with LED.
- Phase sequence protection
- Being able to see the pump current values.
- Possibility to set error delay time.
- Auto Manual selection switch.

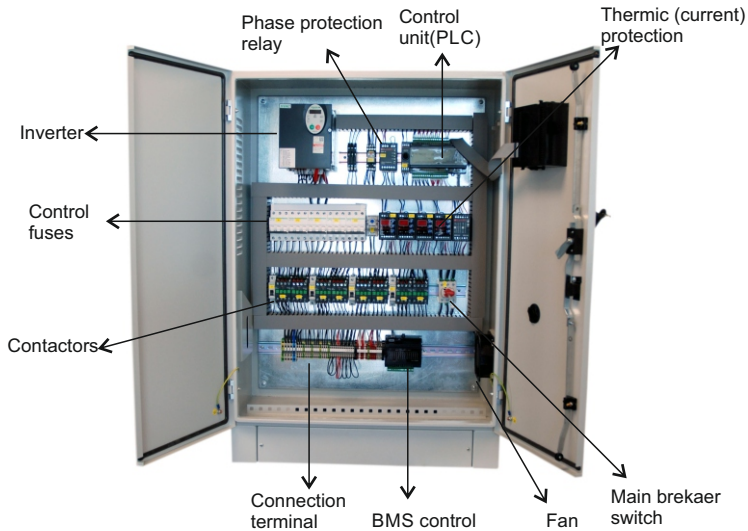


Figure 59: Frequency Panel Inside View

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<10VA
Operating Temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	2X16 LCD and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter

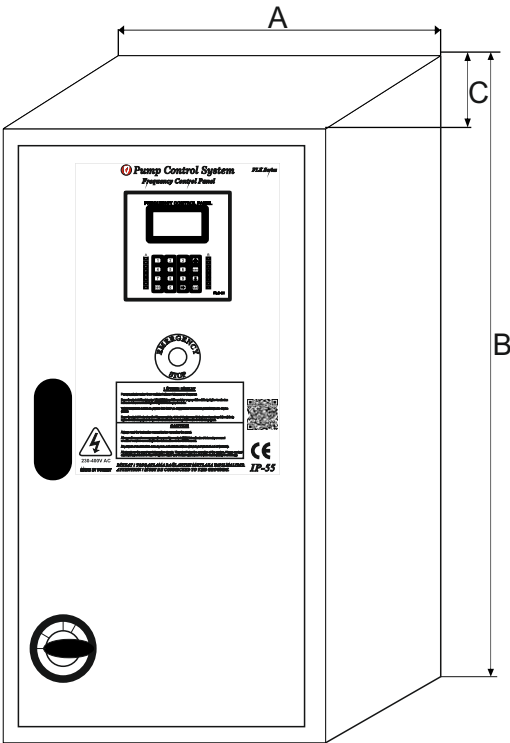


Figure 60: FLK-01 Panel Outer View

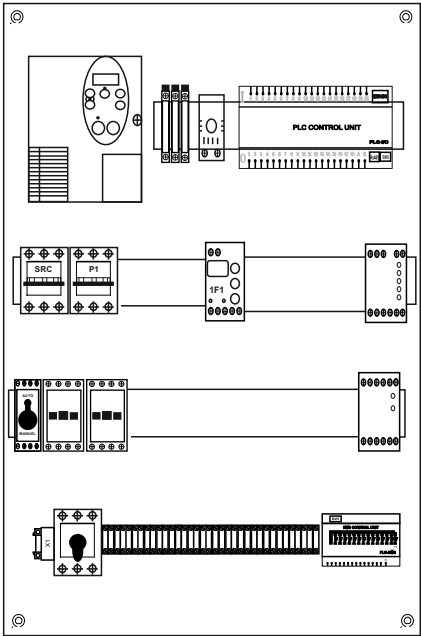


Figure 61: FLK-01 Panel Inside View

FLK-01 Panel Dimensions

POWER	A	B	C
0,75kW	550mm	750mm	280mm
1,5kW	550mm	750mm	280mm
2,2kW	550mm	750mm	280mm
3kW	550mm	750mm	280mm
4kW	550mm	750mm	280mm
5,5kW	550mm	750mm	280mm
7,5kW	550mm	750mm	280mm
11kW	550mm	750mm	280mm

POWER	A	B	C
15kW	700mm	100mm	320mm
18kW	700mm	100mm	320mm
22kW	700mm	100mm	320mm
30kW	700mm	100mm	320mm
37kW	1000mm	1300mm	380mm
45kW	1000mm	1300mm	380mm
55kW	1000mm	1300mm	380mm
75kW	1000mm	1300mm	380mm
90kW	1000mm	1300mm	380mm
110kW	1000mm	1300mm	380mm
132kW	1000mm	1300mm	380mm

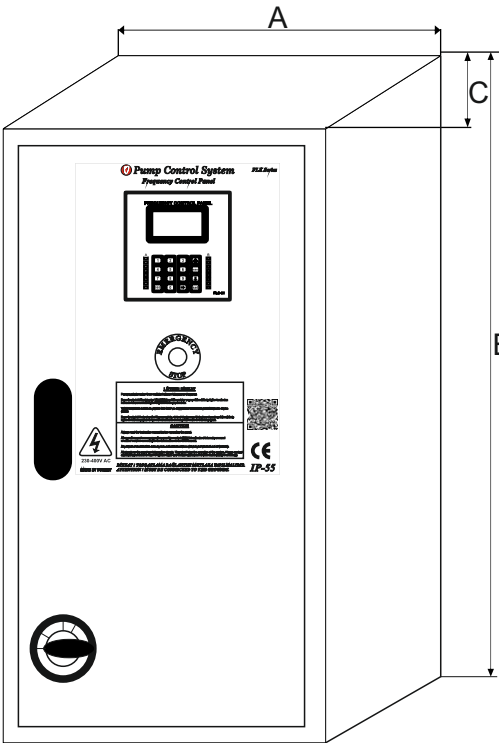


Figure 62: FLK-02 Panel Outer View

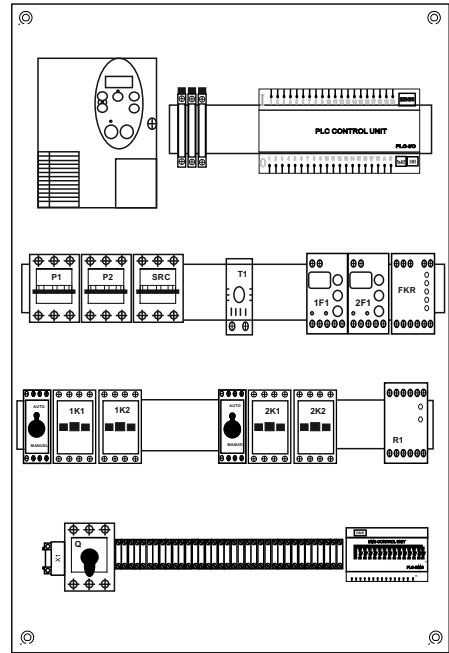


Figure 63: FLK-02 Panel Inside View

FLK-02 Panel Dimensions

POWER	A	B	C
0,75kW	550mm	750mm	280mm
1,5kW	550mm	750mm	280mm
2,2kW	550mm	750mm	280mm
3kW	550mm	750mm	280mm
4kW	550mm	750mm	280mm
5,5kW	550mm	750mm	280mm
7,5kW	550mm	750mm	280mm
11kW	550mm	750mm	280mm

POWER	A	B	C
15kW	700mm	100mm	320mm
18kW	700mm	100mm	320mm
22kW	700mm	100mm	320mm
30kW	700mm	100mm	320mm
37kW	1000mm	1300mm	380mm
45kW	1000mm	1300mm	380mm
55kW	1000mm	1300mm	380mm
75kW	1000mm	1300mm	380mm

It is the process for the rotor speed of the motor to reach its rated speed from zero. The stator of the motor at stand still. When voltage is applied to its windings, the induced back emf is zero. Because the rotor is stationary. The current drawn at the first moment is short-circuit current and this current is very high. The force created by this current in the rotor windings and the starting moment produced and the rotor starts to rotate with the effect of this moment. The short-circuit current drawn over time causes the motor to rotate, gets smaller as it starts. The opposite of the machine or system connected to the shaft of the engine and driven by the engine. When the torque is equal to the torque produced by the motor, the motor and the motor drive this system at constant speed, continues to rotate. This operation is called starting operation. Starting methods create a starting torque, which is applied to the motor in order to bring the motor to its speed at rated load, used to provide sufficient current. Advantages and disadvantages of each method are available. Among them, frequency converters provide the greatest energy savings.

The speed of a motor is directly proportional to the frequency of the AC mains. Possible to adjust the frequency of the network. If it were possible, it would be possible to control the speed of the engine. Frequency converter to control the speed of the motor. It is a method used for giving way. Frequency converters include the input of fixed frequency AC power, variable frequency. It is electronic devices that convert the alternating current to an output by controlling the frequency of the electrical power supplied to the motor. They are used to control the rotating speed, thus the speed of the engine.

In order for a three-phase asynchronous motor to rotate at various speeds or at the same speed in different conditions, a frequency inverter is needed to be used. There are some advantages of using frequency inverters to control the speed of asynchronous motors. Big, strong motors consume high energy. Therefore, to prevent this high energy consumption and to make the motors rotate at desired speed in every condition, panels with frequency inverters that generate various frequencies and make the motor work at a stable speed are produced. These panels work by adjusting the speed at optimum conditions as the load requires. Even the tiniest change in the speed can decrease energy consumption at significant levels. The pump runs at maximum speed at every condition when a motor driver is not used. However, when a panel with frequency control is used, energy can be saved by decreasing the speed of the pump motor in the case of water and need is decreased.

Connection Diagram

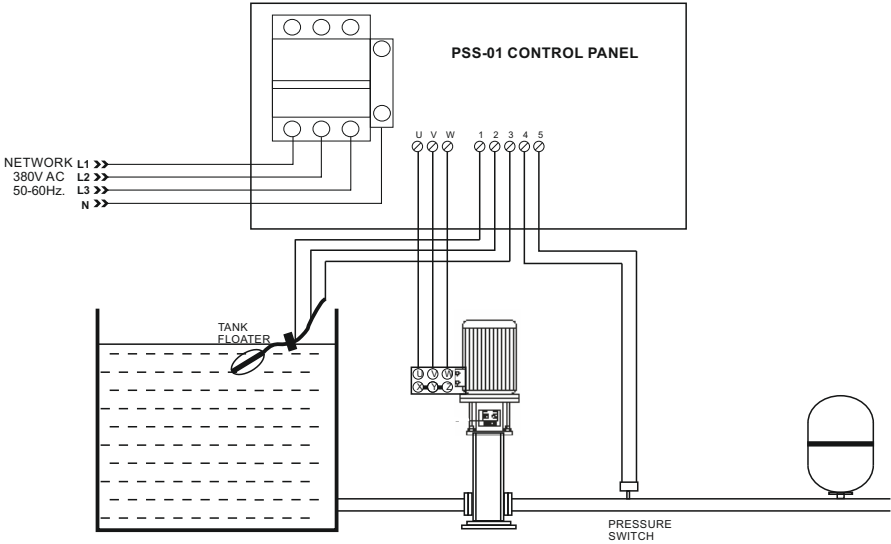


Figure 64: PSS-01 Panel Connection Diagram

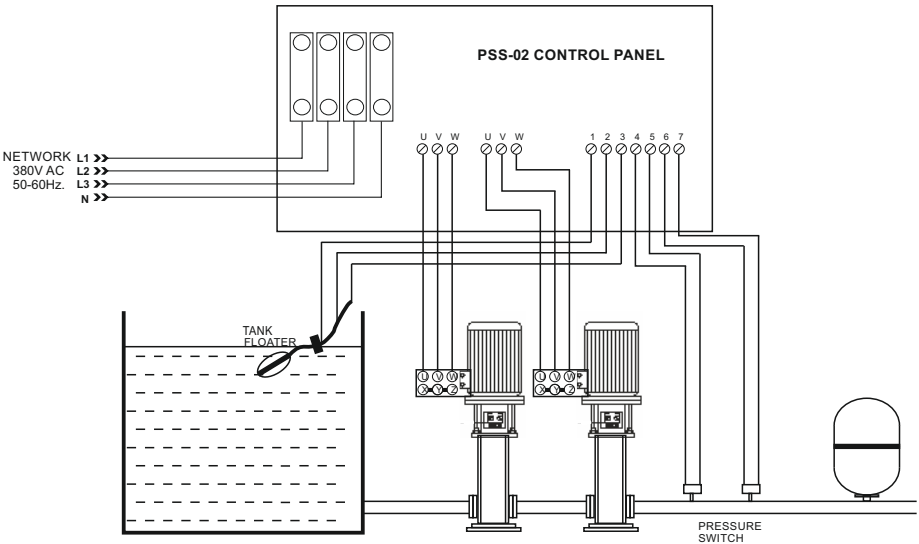


Figure 65: PSS-02 Panel Connection Diagram

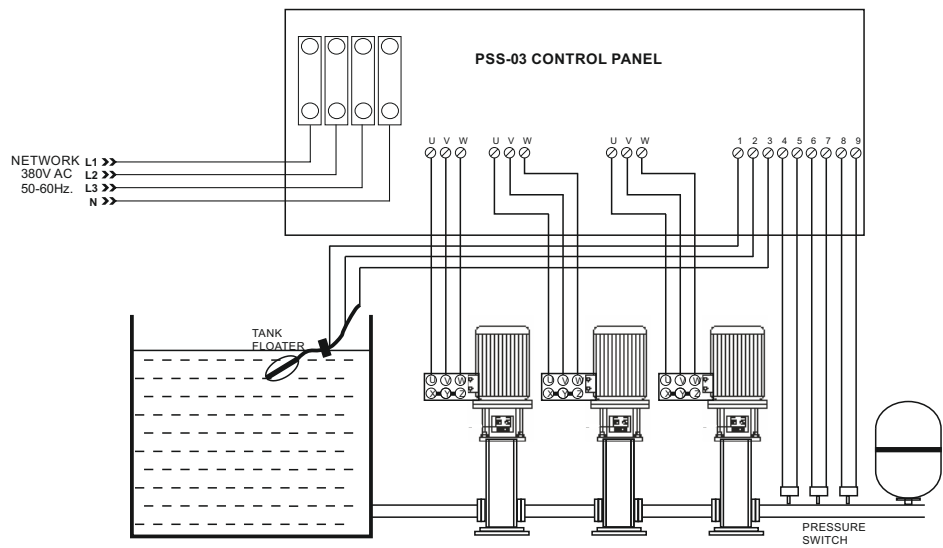


Figure 66: PSS-03 Panel Direct Start Connection Diagram

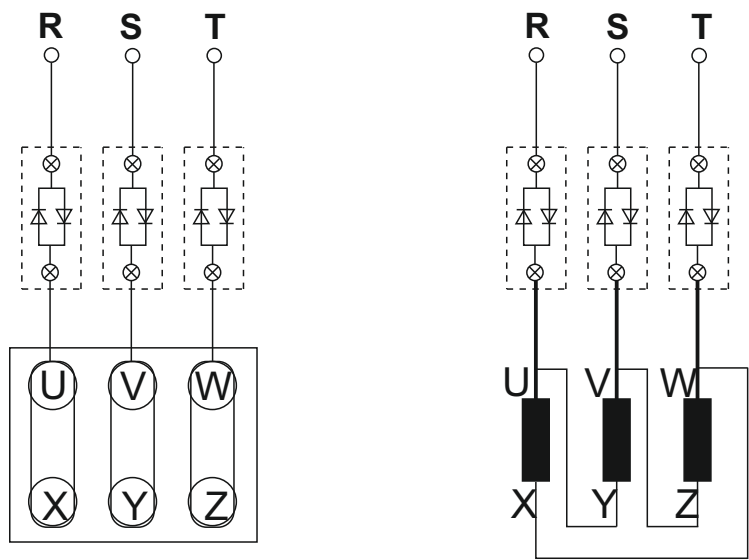


Figure 67: Soft Starter 3-Wire Direct Connection Diagram

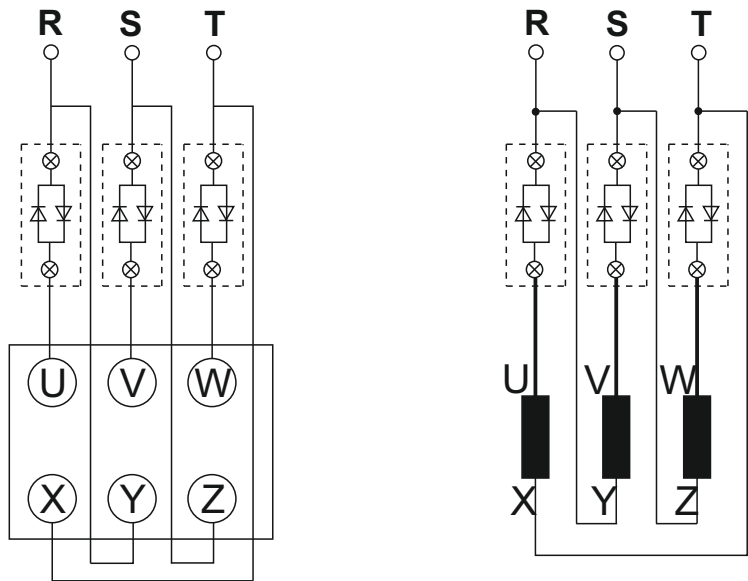


Figure 68: Soft Starter 6 Wire Triangle Connection Diagram

Technical details

Operating Voltage (Un)	230V – 380VAC
Operating Frequency	50/60Hz.
Working Power	<6VA
Operating temperature	-20°C to 55°C
Voltage Measurement Range	10-500V AC
Measurement Accuracy	%±1
DelayTime setting	1-30 sec.
Indicator	5X3digit 9.2mm display and leds
Connection style	Terminal connection
Ignition	5A/250VAC Resistive Load
Connection Insulation	2.5kV
Assembly	On the pump or on the wall
Protection Class	Ip55
Working Altitude	<2000meter

Technical Drawings

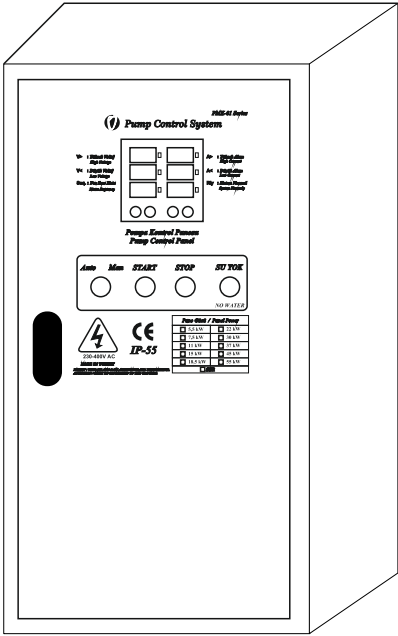


Figure 69: PSS-01 Panel Outer View

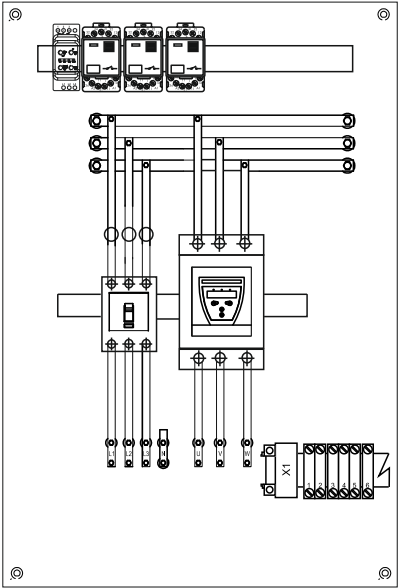
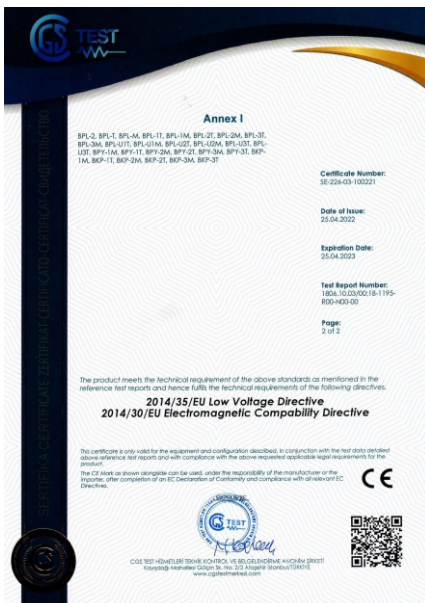


Figure 70: PSS-01 Panel Inside View



PRODUCT CATALOG

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