



# Hydroman Single Operation And Maintenance Manual



## **Attention**

Before using the control panel, you must read the information in this manual carefully.

## **1. Product Information**

Hydropan single control panel is a panel that can control and protect up to one 7.5 kW pump, display the operating status of the pump and error details on the screen. The panel includes a specially designed main board and a 7 segment led display. In addition to this, it is user friendly with its specially developed comprehensive software, status LEDs, and control buttons.

## **2. General Features**

- Compatible with booster, deep well and waste water applications
- User friendly interface
- 8 bit microcontroller based design
- 7 Segment display
- Measures and displays three phase voltage values
- Phase loss and phase sequence protection
- Ability to set high and low voltage protection values
- Displays pump ready, active, and error status on the screen
- Displays pump current on-screen during operation
- Ability to set pump low and high current protection values
- Ability to set pump low and high current protection time
- Automatic reset on low current faults
- Float switch to guard against dry operation
- Additional low current protection against dry operation
- Displays all error statuses on screen
- Audible error status alarms
- Password protection against unauthorized interventions
- Error record memorizes the last 85 errors
- Pump running and fault dry contacts
- 220V siren output activated when error occurs
- Compatible with deep well pump applications
- Ability to set max limit for number of switches allowed in 1 hour
- General Fault / No Water and Pressure Switch signal warning leds
- Booster and discharge operating modes
- IP65 protection class

### 3. Commissioning and Considerations

1. Proper and reliable transportation, storage, operation, and maintenance are essential for smooth and safe operation of the panel. Only certified electricians are authorized to install or operate this equipment.
2. Occupational health and safety rules must be observed to prevent injuries.
3. Rotating shafts and electrical equipment are dangerous. All electrical work must comply with national and local electrical codes. Installation, start-up, and maintenance must be carried out by trained and qualified personnel. Failure to follow these instructions may result in serious injury.
4. Check the board for any damaged or missing items.
5. Before starting on the electrical connections, disconnect the mains power and make sure that the power is disconnected using measuring instruments.
6. Before energizing the panel, make sure that the mains voltage is balanced between the phases and complies with the permissible voltage values for the panel.
7. Make sure that the mains supply and the electric motor have the same voltage.
8. Make sure that the cross-section of the main power cable coming to the panel is selected in accordance with the total motor power to be operated. The use of low cross-section cables can cause injuries, faults, and fire.
9. Before opening the plastic cover, check that there is no liquid, dust, etc. around the unit.
10. When the screws on the four corners of the front plastic cover are removed, be careful not to let the front cover fall to the ground and not to strain the cable in between. After opening the front cover, continue working safely by sliding the cover up and fixing it to the upper screw slots of the back box with the lower screws of the front cover.
11. After opening the front plastic cover, feed all cables through the appropriate sleeves and make sure that any unused sleeves are properly closed.
12. The appliance must be properly grounded. Connect the main earthing cable and the electric motor housing earthing cables with an earthing resistance value that meets international standards to the ground bus.
13. Before the electric motor is energized via the panel, the motor must be checked according to international standards. Ensure that the electric motor windings are intact, the motor is ready to operate safely, and the terminal connections are made correctly. Energizing a malfunctioning electric motor via the panel will also cause panel malfunction.
14. The cable between the panel and the electric motor must be carefully checked for any damage or defect before energizing. Use of unsuitable cables may result in personal injury or panel malfunction.
15. After connecting the electrical cables to the appropriate terminal blocks, make sure that the terminal block screws are properly tightened (tighten to a maximum torque of 0.7 Nm) and that the cables do not come out of the terminal block when pulled lightly.
16. After the electrical connections are made, remove the front cover again and slide it down to replace it. Make sure that the plastic cover is closed properly after the electrical connections have been made. Hydropan can be damaged by pollution. Never leave the Hydropan with the cover open.
17. After energizing the Hydropan, set low and high current limit values from the menu for electric motor protection for each motor separately according to the motor power. For current settings, please refer to the current settings menu descriptions on the following pages.

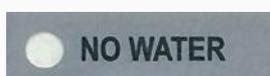
18. In electric motors, having more than the maximum number of switches allowed by the electric motor manufacturers according to the motor power may cause a malfunction. For this reason, the maximum number of switches to be allowed according to the motor power connected to the panel must be set in the menu. To set the number of switches, please refer to the switch count settings menu descriptions on the following pages.
19. After the necessary settings have been made, the system should be put into automatic mode and checked that it is working properly. When operating under full load, ensure that no more than 10% more current is drawn than the nominal current indicated on the motor nameplate, and when the suction valve is closed, the panel switches to low current error and stops the motor.
20. If the system is to operate with a pressure switch, the pressure switch settings should be made according to the system's operating curve. In automatic mode, confirm in practice that the pumps can start and stop according to the pressure switches.
21. After all checks are completed, check that the suction and discharge valves are open, bleed any air in the pump, reset the panel, and ensure that it works properly in automatic mode.
22. Please contact our authorized technical services for all your questions.
23. Malfunctions that may occur if the above items are not complied with will not be covered by the warranty.

## 4. Panel Descriptions

### 4.1. Front Panel Descriptions and Dimensions



Figure 1. Hydropan Single Control Panel - Exterior View



**No water error notification light:** This LED lights up when the water level is low. The no water error is given when the float or level electrodes connected to the panel's float terminals are open circuit when the water level decreases. When the tank or well is full of water, the no water error disappears automatically.


**SWITCH**

**Pressure switch 1 signal notification LED:** When the line pressure drops to the pressure at which the pump will be activated, the run command comes from pressure switch 1 and this LED lights up. When the run command comes from pressure switch 1, the pressure switch 1 terminals on the panel are short-circuited between themselves and the switch 1 LED lights up. If the panel is in automatic mode (automatic LED is on) and there is no error preventing operation, the pump is activated when the switch 1 LED is on. The pressure switch setting must be made in practice according to the system operating point.


**FAULT**

**General error notification LED:** When any error condition occurs in the system (low current, high current, phase loss, no water, etc.) this LED lights up and the error detail is displayed on the main screen.


**ON/OFF**

**On / Off button:** This button is used to start-up or switch-off the panel. If OFF is written on the screen when this button is pressed, the panel will be disabled and the pump will not be activated even if needed. In the OFF position, this button must be pressed again to activate the panel.


**APPROVAL**

**Approval button:** Used to enter the menu and save the settings. After the setting is made in the menu, the setting must be saved by pressing the confirm button.


**UP**

**Up button:** It is used to navigate the menu and make parameter settings. Also, in case of a fault, press the UP and DOWN keys simultaneously for 3 seconds to reset the fault. When a malfunction occurs in the panel, the situation causing the malfunction is eliminated, necessary controls are made and the malfunction is reset by pressing the Up-Down buttons for 3 seconds. After the fault is reset, the system must be monitored for proper operation. A fault reset should not be performed by repeatedly pressing the reset button while the condition causing the fault is still present. Otherwise, damage to the electric motor or pump system will occur.


**DOWN**

**Down button:** It is used to navigate the menu and make parameter settings. If the Up and Down buttons are pressed simultaneously for 3 seconds, the fault is reset.



Figure 2. Panel Dimensions

#### 4.2. Panel Interior View and Terminal Block Descriptions



Figure 3. Hydropan Control Panel-Interior View

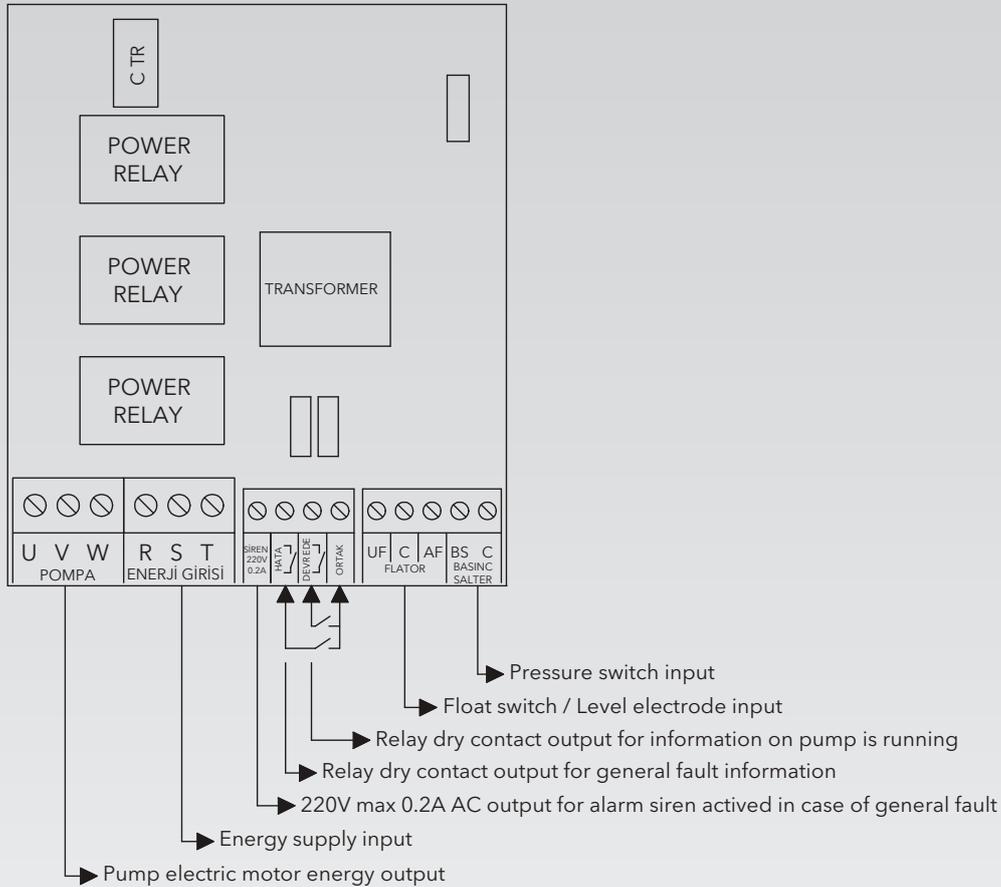


Figure 3.1. Hydropan Control Panel - Terminal block descriptions

**Note:** Floater terminals are used for water level measurement. When closed type floaters are used, AF and UF terminals should be short-circuited with the help of a cable, one end of the floater should be connected to the C terminal and the other end to the AF terminal. Floater adjustment should be applied according to the tank used.

If level electrodes are to be used for water level measurement in deep wells, 3 level electrodes should be connected to UF (upper float), C (com-common, bottom float), AF (lower float) terminals. The bottom level floater connected to the C terminal should be connected at least half a meter above the top of the pump, the low level electrode connected to the AF terminal should be connected at least half a meter above the bottom level electrode, and the upper level electrode connected to the UF terminal should be connected to the upper level where the water is required to be filled and rerun after the pump stops. While the pump is running, when the water level drops to the level electrode connected to the AF terminal, the pump stops, and starts again when the water is filled again and comes into contact with the level electrode connected to the UF terminal. The settings of the level electrodes should be applied according to the tank. Improper adjustment of the level electrodes may result in failure of the pump or electric motor, which is not covered by the warranty.

Examine the connection types that need to be made according to various applications from the circuit diagrams section on the following pages.

## 5. Menu



Figure 4. Panel Main Operating Screen

When the panel is energized, software and operating mode codes (HID: booster, BOS: discharge) are displayed. Voltage values between L1-L2-L3 phases and neutral are displayed sequentially on the main screen below. When the start command is received from the pressure switch and the system starts to operate, the motor current is displayed.

### 5.1. Password Menu



Figure 5. Password Menu

When the "Approval" button is pressed in the main operation screen, the password menu on the left appears. In the password menu, "132" is entered as the password with the "Up / Down and Approval" buttons, and the menu is entered by pressing the confirm button again. The password is valid for 2 minutes.

### 5.2. Event Log Menu



Figure 6. Event Log Menu

After the password is entered correctly, the Event Logs Menu image will appear on the screen. By pressing the "Approval" button again, the menu is entered and the fault history can be examined with the "Up/Down" buttons. 85 event logs are stored and the latest fault is always moved to line 1.

### 5.3. High Current Protection Setting Menu



Figure 7. High Current Limit Setting Menu

Use this menu to set the current upper limit value for pump. The high current protection function protects the electric motor against high current. When the current drawn by the electric motor during operation exceeds the value set in this menu, it is stopped and a high current error is given. After the fault that caused the high current draw in the pump system is eliminated, press and hold the up and down button for 3 seconds to reset the fault then make sure that the system is operating correctly.

The high current protection limit value must be set a maximum 10% higher than the rated operating current indicated on the motor nameplate. For example, if the rated current on the motor nameplate is 10 A, the high current protection value should be set to 11 A in this menu. Make sure that the set high current limit value does not exceed the nominal operating current written on the motor nameplate by more than 15%. It is recommended to set the high current limit value in practice according to the operating values of the electric motor in the pump system.

#### 5.4. Low Current Protection Setting Menu



Figure 8. Low Current Limit Setting Menu

Use this menu to set the current lower limit value for pump. The low current protection function gives the pumps extra protection in cases such as no water coming to the pump suction, operating at maximum pressure for a long time due to pressure switch malfunction, etc. The electric motor is stopped and

a low current error is given when the current it draws during operation falls below the value set in this menu.

When low current protection occurs in booster systems, it is generally desired that the system is restarted automatically and periodically. The Hydropan panel has an automatic restart feature in low current protection. The standby period following low current protection caused by repetitions is periodically extended. This time, which was 2 minutes in the first trial, is adjusted to 50 minutes in the 5th trial. If the low current condition persists after repetitions, the system is blocked. After the system is blocked, make the necessary checks and reset the error by pressing and holding the up and down button for 3 seconds then make sure that the system is working correctly.

To set the low current limit value, bleed the pump and close the valve on the discharge line then start the pump. When the pump operates with the discharge valve closed, use the pressure gauge to confirm the pressure in the line. While the pump is running, the current drawn by the relevant pump motor is displayed on the main screen. The low current protection value must be saved by entering 0.2 A less than the value shown on the display. For example, if the current shown on the screen is 5 A when the discharge line valve is closed and the pump runs, the undercurrent protection value should be set to 4.8 A. After the low current protection value is set, you must open the valve in the discharge line. It is recommended that the current settings are made in practice according to the values at which the pump set will operate. Damage to the pump group due to incorrect settings is not covered under warranty.

#### 5.5. Permitted Number of Maximum Switches Menu

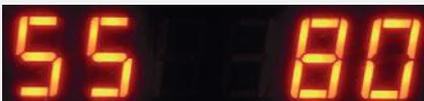


Figure 9. Max Switch/Hour Menu

This menu is used to set the maximum number of switches allowed in 1 hour. To prevent malfunctions that may occur due to too frequent switching in electric motors, the maximum number of switches allowed in 1 hour should be set according to the power of the electric motor. Set the switching limit

according to the table below then press the confirm button to save the maximum number of switches allowed in 1 hour. The time to wait between 2 sequential starts is set by dividing 1 hour (60 minutes) by this set value. For example, if the maximum switching/hour value is set to '10' in this program, the time between starts will be 6 minutes, so a maximum of 10 starts per hour is possible. If an attempt is made to start the electric motor earlier, a switching error will be given and the motor will not start. After the set time, the switching error will clear automatically and the motor will continue to run safely. The switch count limit program can be set between 0 and 80 according

to the electric motor power. When set to '0', the switch count protection program is disabled. The maximum permissible number of switches must be set according to the motor power. Malfunctions caused by making more switches than permitted will not be covered by the warranty.

Motor power (kW)	0.25 -	4 -	11 -	18.5 -	30 -	45 -	90 -
	3	7.5	15	22	37	75	160
Recommended maximum number of switches per hour	60	40	30	24	16	8	4

Table 1. Number of switches setting table

## 5.6. Operation Mode Selection Menu



Figure 10. Operation Mode Selection Menu

Operating mode can be selected from this menu. When "0" is selected, "booster mode" becomes active and when the panel is energized for the first time, the active mode is shown as "hid" at startup. In this mode, the panel can be used in booster, wastewater and deep well applications. The pump

is started and stopped by the pressure switch connected to the "SALTER (switch)" terminal. The water level of the reservoir is controlled with the help of the floater connected to the "FLATOR (float switch)" terminal and when the water decreases and the float switch goes down, the pump is stopped by giving a "No Water (SY)" alarm. When "1" is selected in the CS menu, "discharge mode" becomes active and when the panel is energized for the first time, the active mode is shown as "bos" at startup. "1", the discharge mode, is used in deep chambers, in applications where it is desired to drain all the water in the chamber. With the help of float switch connected to the "FLATOR (float switch)" terminals, the pump, which is operated when the reservoir is filled with water up to the maximum level, is stopped when the water drops to the minimum level and no alarm is given. When the water reaches the maximum level again, the pump starts automatically and this cycle continues. Overflow control can be done with the help of an overflow level switch connected to the "SALTER (switch)" terminal. In this mode, when the "SALTER (switch)" input is short circuit, "Overflow Error (th)" is given for warning purposes, but the pump is not prevented from running.

## 5.7. High Voltage Protection Setting Menu



Figure 11. High Voltage Limit Setting Menu

By pressing the "Up" button while in the menu, the High Voltage Limit Setting Menu (YG) seen on the left is accessed. By pressing the "Approval" button again, it is entered into the menu and the high voltage protection limit value is set with the "Up / Down" buttons. Use the YG value menu to set the upper limit value for protection against over voltage. The limit value is set at the factory and changing this value is not recommended.

## 5.8. Low Voltage Protection Setting Menu



Figure 12. Low Voltage Limit Setting Menu

By pressing the “Up” button while in the menu, the Low Voltage Limit Setting Menu (dG) seen on the left is accessed. By pressing the “Approval” button again, the menu is entered and the low voltage protection limit value is set with the “Up / Down” buttons. Use the LV value menu to set the lower limit at which the protection against low voltage will be triggered. The limit value is set at the factory and changing this value is not recommended

## 5.9. Delay Time Setting Menu



Figure 13. Error Delay Time Setting Menu

By pressing the “Up” button while in the menu, the Error Delay Time Setting Menu (GS) seen on the left is accessed. Error delay time, is the time until the panel gives a warning after detecting an error in the system. It is entered into the menu by pressing the “Confirm” button, and adjusted as with the “Up / Down” buttons. It is set to 3 seconds in the factory settings, it is not recommended to change it except for special applications

## 6. Operation and Maintenance



**Disconnect electrical power and use the necessary protective equipment before performing any service or maintenance.**

- The Hydropan panel energy input should use a residual current relay and appropriately rated circuit breaker. Check all terminal connections and functions during maintenance.
- Check that the electrical connections on the control panel are not loose and that the grounding wire is intact.
- Ensure there is no abrasion, puncture, or color change resulting from heating in the electrical cables.
- Always follow the pump and motor control instructions.
- You can view the product’s history from the error history.
- Contact the authorized technical service for more detailed information.

## 7. Diagnostics and Troubleshooting

ERROR CODE	FAULT	ACTION
htA YG	<b>HIGH VOLTAGE FAULT</b>	<ul style="list-style-type: none"> <li>• Measure the mains voltage with a calibrated voltmeter and compare it with the voltage values written on the panel display.</li> <li>• Check the cable connections.</li> <li>• The mains voltage values must be less than the limit value set in the high voltage value (YG) menu.</li> <li>• This fault will automatically disappear when the mains voltage value drops below the limit value set in the high voltage value menu.</li> </ul>
htA dG	<b>LOW VOLTAGE FAULT</b>	<ul style="list-style-type: none"> <li>• Measure the mains voltage with a calibrated voltmeter and compare it with the voltage values written on the panel display.</li> <li>• Check the cable connections.</li> <li>• The mains voltage values must be greater than the limit value set in the low voltage value (dG) menu.</li> <li>• This fault will automatically disappear when the mains voltage value is above the limit value set in the low voltage value menu.</li> </ul>
htA FS	<b>PHASE SEQUENCE FAULT</b>	<ul style="list-style-type: none"> <li>• Disconnect the electrical power to the panel.</li> <li>• When the phase sequence is reverse, the phase sequence error code "htA FS" is written on the screen and the system does not work. Change the phase sequence from the input and make sure that the motor rotates in the correct direction.</li> </ul>
htA FY	<b>PHASE LOSS FAULT</b>	<ul style="list-style-type: none"> <li>• One or more of the phases do not come to the energy supply terminals.</li> <li>• Check the mains input voltage, phase-neutral values for all phases.</li> <li>• Check whether there is any imbalance or phase loss between phases.</li> <li>• Check that the terminals are not loose, tighten if loose.</li> <li>• This error will automatically disappear when the missing phase arrives.</li> </ul>
htA YA	<b>HIGH CURRENT FAULT</b>	<ul style="list-style-type: none"> <li>• Check past faults in the event log menu to understand the cause of the error.</li> <li>• Disconnect the electrical power to the panel.</li> <li>• Check the coupling connection of the electric motor and pump system.</li> <li>• Make sure that the pump rotates smoothly.</li> <li>• Check that the valves on the suction and discharge side are open.</li> <li>• Check panel power supply, panel electric motor terminal connections, electric motor terminal connections and cables.</li> <li>• Energize the panel.</li> <li>• Check the current drawn by the motor with a calibrated clamp ammeter. Press and hold the test button on the panel and compare the current value written on the panel screen with the current value written on the clamp ammeter.</li> <li>• The current drawn by the motor when running at load must not be greater than the value set in the high current value (YA) menu.</li> <li>• For high current setting, refer to the description of the high current setting (YA) menu on the previous pages.</li> <li>• Check that the current drawn by the electric motor at full load is not more than 10% more than the rated operating current indicated on the electric motor nameplate.</li> <li>• Check that the mains voltage was at a normal level when the measurement was taken.</li> <li>• If the electric motor is three-phase, check with measuring instruments that all 3 phases are supplied to the electric motor.</li> <li>• Put all engines in automatic mode and observe that the system is working properly.</li> </ul>

HATA KODU	ARIZA	ARIZAYI GİDERME
htA dA	<b>LOW CURRENT FAULT</b>	<ul style="list-style-type: none"> <li>• Check past faults in the event log menu to understand the cause of the error.</li> <li>• Disconnect the electrical power to the panel.</li> <li>• Check that there is water in the tank.</li> <li>• Check if there is a strainer valf and clean it if it is clogged.</li> <li>• Make sure that water is entering the suction part of the pump.</li> <li>• Make sure that there is no air in the pump. If there is air, bleed the pump.</li> <li>• Check the coupling connection of the electric motor and pump system.</li> <li>• Make sure that the pump rotates smoothly.</li> <li>• Check that the valves on the suction and discharge sides are open.</li> <li>• Energize the panel.</li> <li>• Check the current drawn by the motor with a calibrated clamp ammeter. Press and hold the test button on the panel and compare the current value written on the panel screen with the current value written on the clamp ammeter.</li> <li>• The current drawn by the motor when running at load must not be less than the value set in the low current value (dA) menu.</li> <li>• For low current setting, refer to the description of the low current setting (dA) menu on the previous pages.</li> <li>• Close the suction valve while the engine is running and note how many amperes of current are drawn. The low current set point must be at least 10% greater than this value. Check that the mains voltage was at a normal level when the measurement was taken.</li> <li>• Open the suction valve, put all motors in automatic mode and observe that the system is working properly.</li> </ul>
htA SY	<b>NO WATER</b>	<ul style="list-style-type: none"> <li>• Make sure that there is water in the tank.</li> <li>• Make sure that the float switch (float) or level electrodes level is adjusted properly.</li> <li>• Make sure that the float switch works correctly by checking the float switch cable and terminal connections.</li> </ul>
htA th	<b>OVERFLOW FAULT</b>	<ul style="list-style-type: none"> <li>• Check whether there is overflow. If there is overflow, drain the excess water in a controlled manner.</li> <li>• This error is given when the "CS" parameter is "1", that is in the discharge mode, if the "SALTER (switch)" terminals are short-circuited.</li> <li>• Check the overflow float switch cable and terminal connections and make sure that it works properly.</li> </ul>
htA bL	<b>BLOCKAGE FAULT</b>	<ul style="list-style-type: none"> <li>• The system is blocked because a low current error has occurred and the low current error continues even after software-defined automatic reset attempts.</li> <li>• Repeat the checks in the "htA dA" part.</li> <li>• Reset the error manually by holding down the Up / Down buttons and make sure that the system works correctly.</li> </ul>
htA Sh	<b>PERMITTED NUMBER OF MAXIMUM SWITCHES ERROR</b>	<ul style="list-style-type: none"> <li>• Attempts were made to switch more frequently than the maximum number of switches allowed in 1 hour set in the number of switches (SS) menu.</li> <li>• The electric motor receives commands to switch on more frequently than the set switching limit.</li> <li>• Check the expansion tank and observe that there is compressed air inside. If there is a fault, contact an authorized service center.</li> <li>• Check the number of switching limit value (SS) in the menu.</li> <li>• Check that the set limit value for the number of switches is set correctly according to the electric motor power.</li> <li>• Make sure the system is working correctly.</li> <li>• At the end of the time of the limit value set in the switch count menu, the switch error will clear automatically.</li> </ul>

## 8. Circuit Diagrams

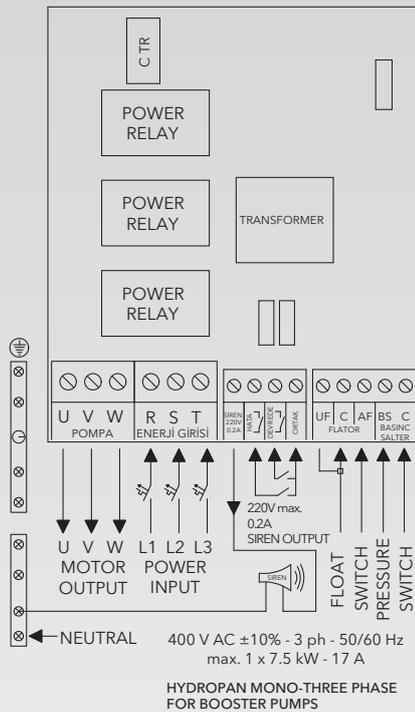


Figure 14. Three-Phase Booster System Connection Diagram

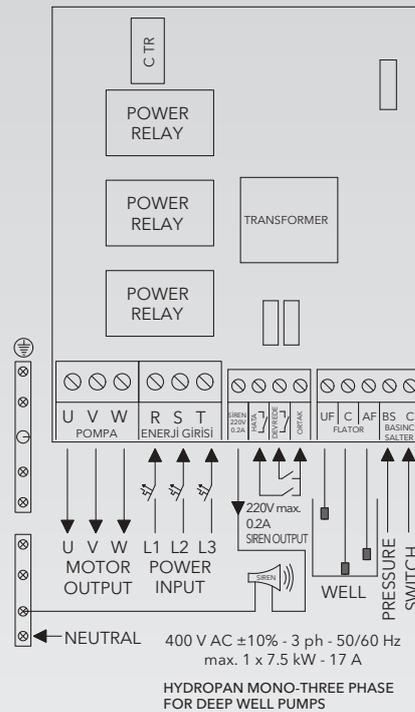


Figure 15. Three-Phase Deep Well System Connection Diagram

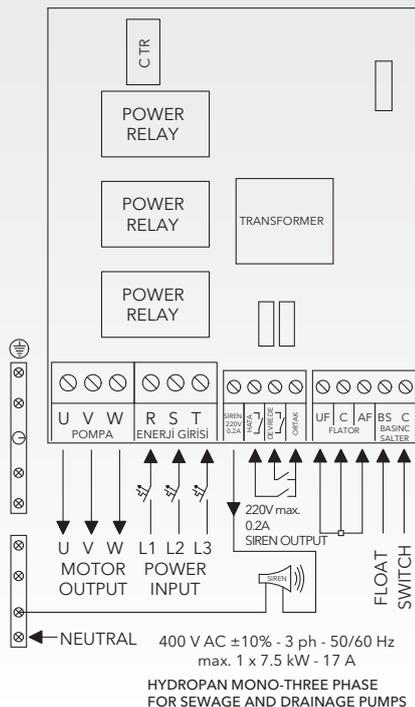


Figure 16. Three-Phase Drainage System Connection Diagram

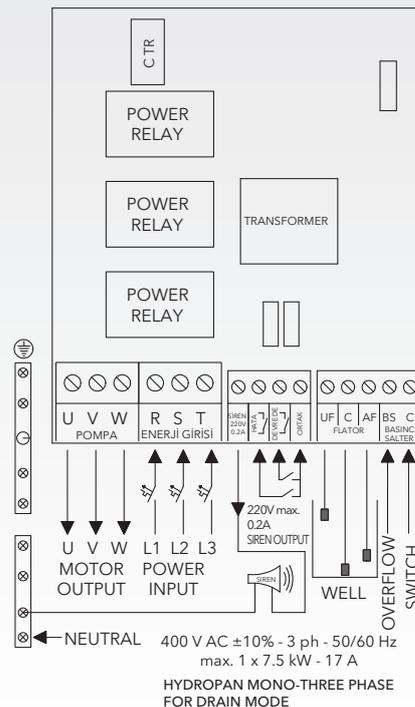


Figure 17. Three-Phase Discharge Mode Connection Diagram

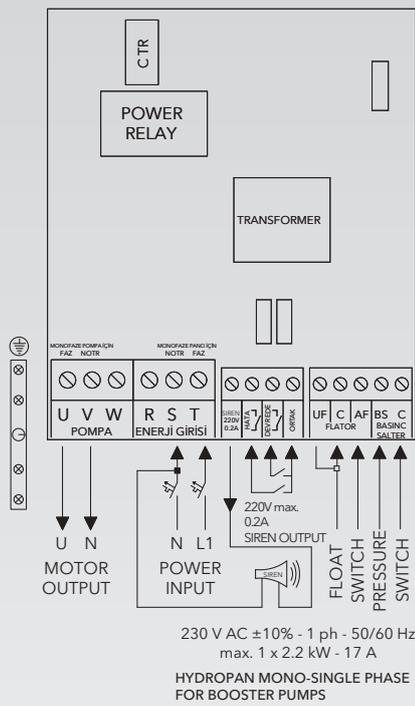


Figure 18. Single-Phase Booster System Connection Diagram

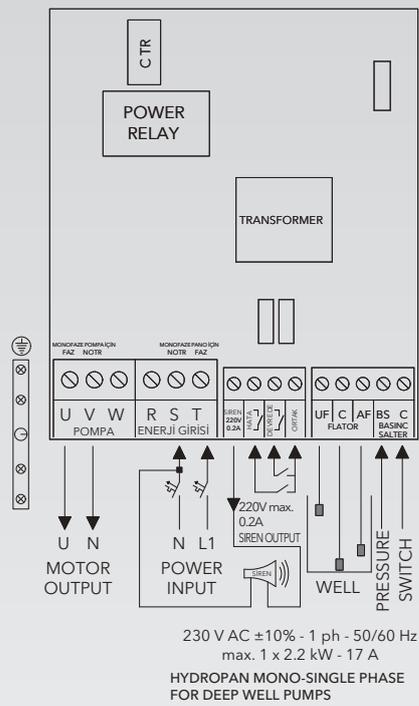


Figure 19. Single-Phase Deep Well System Connection Diagram

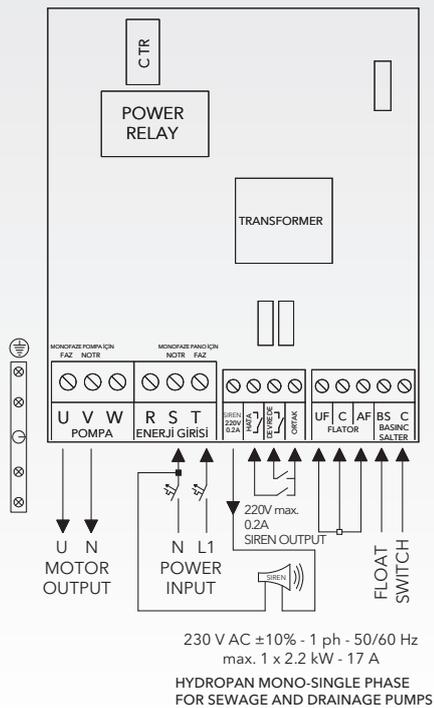


Figure 20. Single-Phase Drainage System Connection Diagram

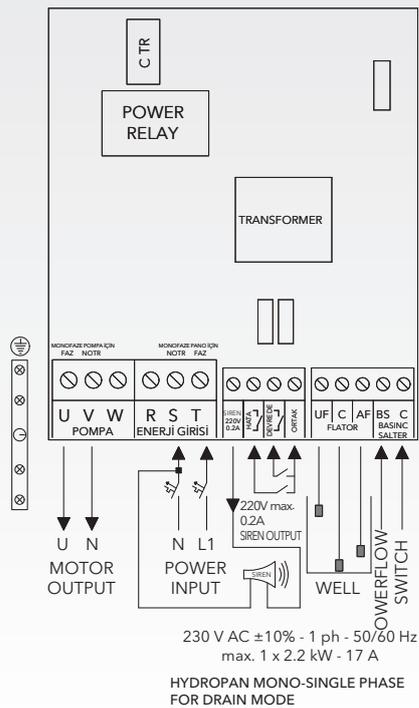


Figure 21. Single-Phase Discharge Mode Connection Diagram

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Dudullu Organize Sanayi Bölgesi 2. Cad. No: 14  
34775 Ümraniye - İstanbul / Türkiye  
Tel : +90 216 561 47 74 (Pbx) • Fax : +90 216 561 47 50  
[www.etna.com.tr/en](http://www.etna.com.tr/en) • [info@etna.com.tr](mailto:info@etna.com.tr)



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