ETNA®

Diesel Driven Portable Pump Control Panel
Operation & Maintenance Manual

Caution

Please read this manual carefully before using the control panel.

Figure 1. Front View of Diesel Driven Portable Pump Panel

1. Product Information

Diesel driven portable pump control panel enables on-screen monitoring of the operation of pumps and the error details as well as controlling these pumps in an diesel driven portable pump system. The panel is composed of a specially designed mainboard, control buttons, warning LEDs, a display screen, a control panel for diesel pump, a locked start button and other equipments. The system's operating status is displayed on this panel.

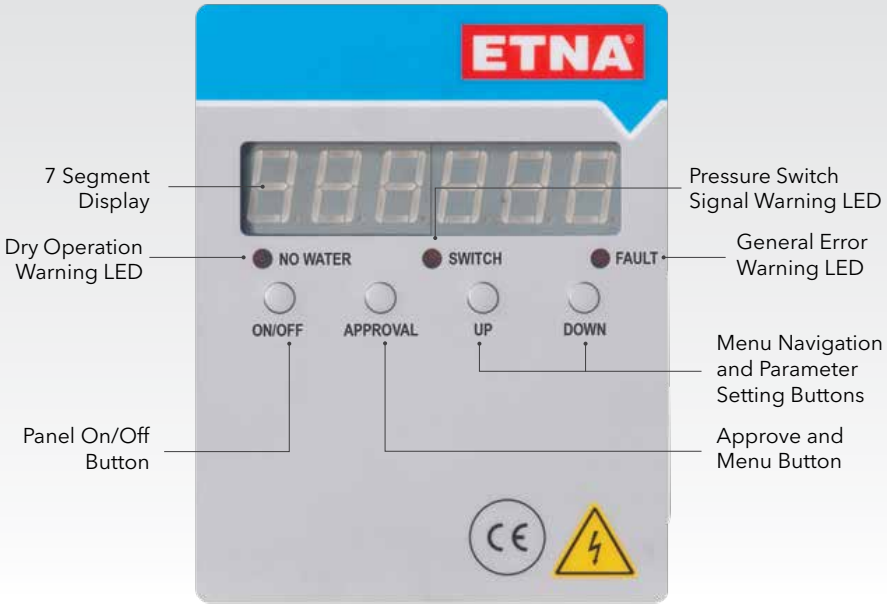


Figure 2. Descriptions of Buttons and Warning LEDs of Electric Pump Control Screen on Diesel Driven Portable Pump Panel

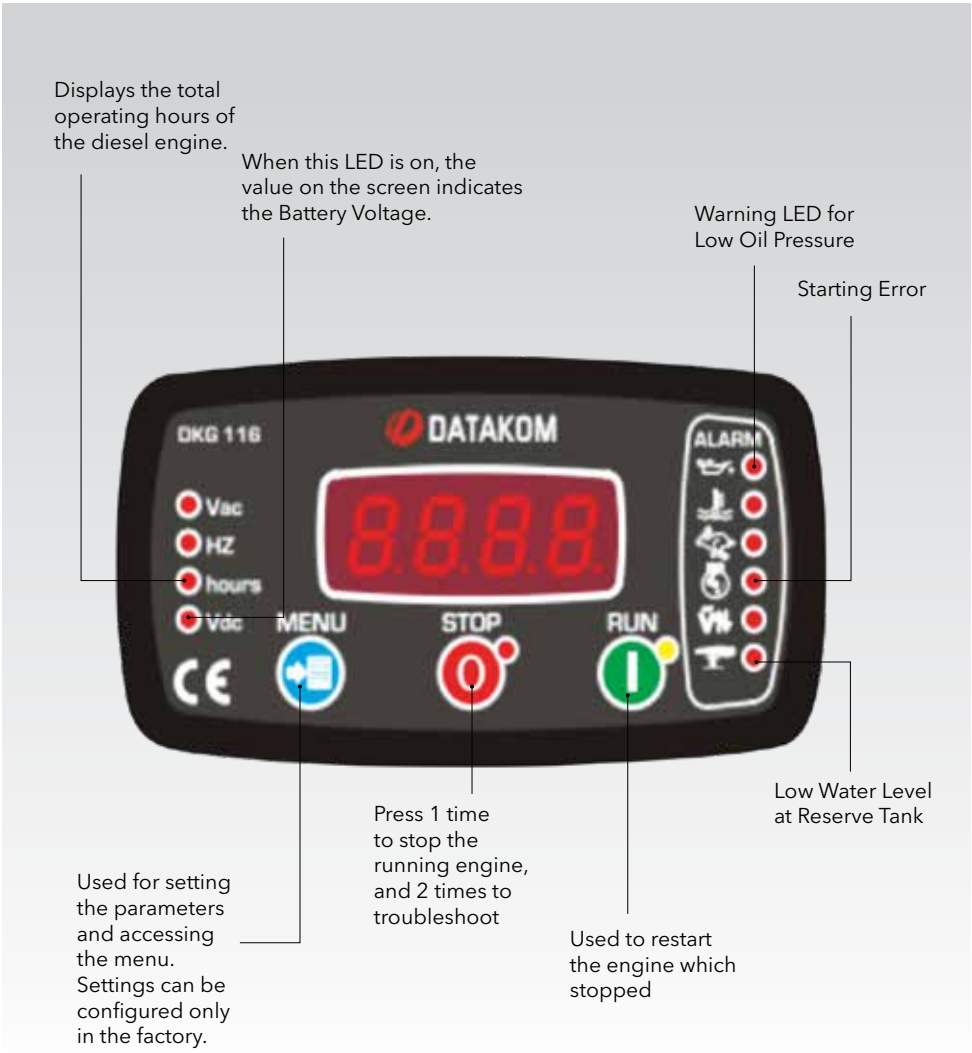


Figure 3. Descriptions of Buttons and Warning LEDs of Diesel Pump Control Screen on Diesel Driven Portable Pump Panel

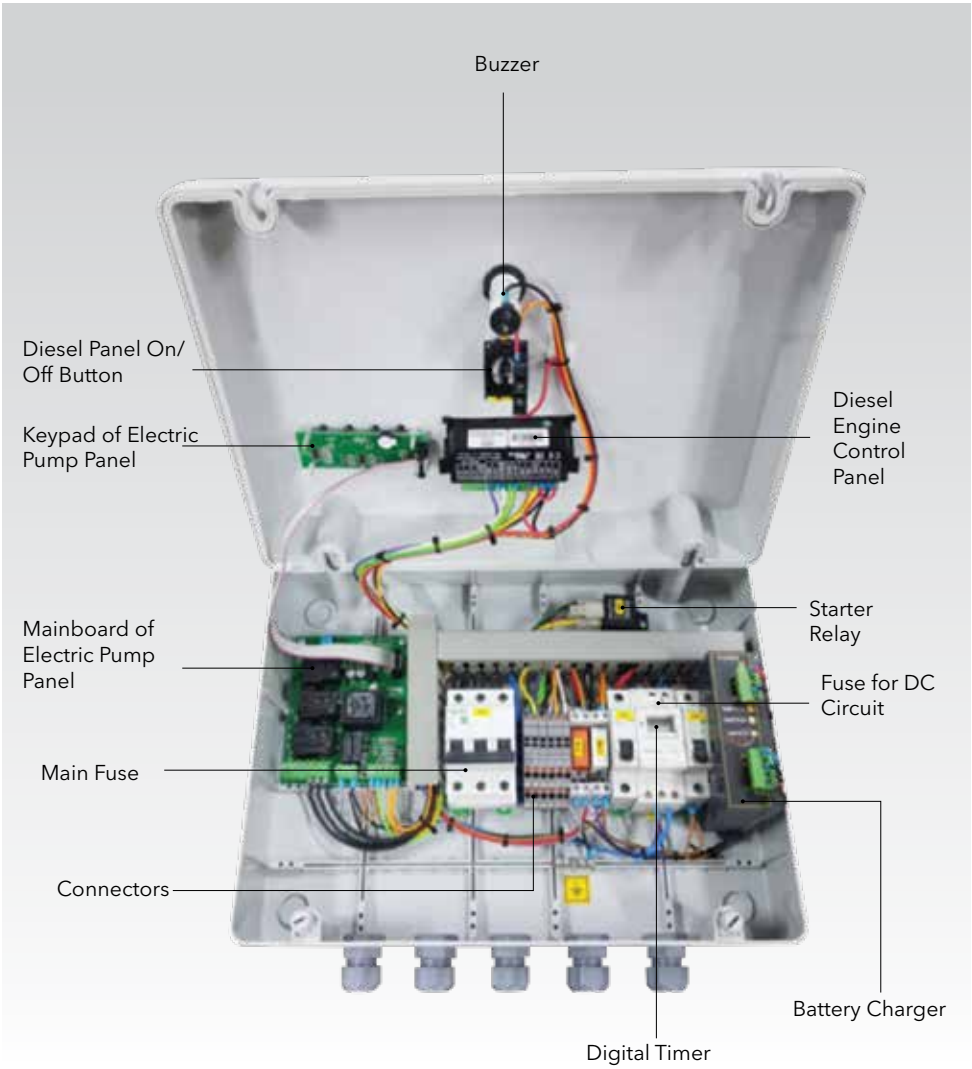


Figure 4. Inner View of Diesel Driven Portable Pump Panel

Figure 5. Panel Dimensions

2. General Properties

For electric pump controller;

- 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
- Ability to set max limit for number of switches allowed in 1 hour
- General Fault / No Water and Pressure Switch signal warning leds

For diesel pump controller;

- Microprocessor-based design
- 7 Segment Display
- Protection against dry operation with a float switch
- Display of error statuses on screen LEDs
- Audio notification of error statuses
- Irreplaceable engine operating hours
- Weekly Test
- Manual start-stop
- Display of battery voltage

3. Front of Control Panel

For electric pump controller;

- **Failure Notification LED:** When activated protections such as Low Current, High Current, High Voltage etc. are triggered, this LED flashes along with the error code shown on the 7 segment display.
- **Up / Down Button:** Used to navigate in the menu on 7 segment display and to increase/decrease the numerical values. When both buttons are held pressed for 5 seconds, the system is reset if there is any failure.
- **Approve Button:** Used to access the sub-menu of the menu on the 7 segment display and to save the changes.
- **Switch LED:** Used to indicate that the start command has been triggered from the pressure switches of the system.
- **On/Off Buttons:** Used to enable/disable the panel. 7 segment display shows the phrase 'OFF' when the panel is disabled while there is still power in the system.

For diesel pump controller;

Figure 6. Screen of Diesel Control Panel

Figure 7. On-Off Button of Diesel Control Panel

- Button on Figure 7 is switched to position 1 to power the diesel control panel. Otherwise, the diesel engine does not start since there is no power in the diesel panel.
- After powering the panel by switching the button to position 1, press RUN to pressurize the system if there is no pressure in the system and start the diesel engine. When the system is pressurized, press STOP once. The diesel engine stops at the end of the cooling period. Press STOP twice for emergency stop of the diesel engine.
- Press STOP to reset any permanent error in the diesel panel.
- If the diesel engine is manually stopped or reset with the STOP button on the control panel and there is not enough pressure in the system at that time, press RUN once to pressurize the system. Then press STOP again to switch the system to stand-by mode.
- When the water level drops to zero in the reserve tank, the diesel engine switches to emergency stop mode and stops. Even if the pressure drops during that period, the system cannot detect it. The water level in the reserve tank should be restored to the normal level, the diesel engine should be started manually and the system should be pressurized.

4. Menu and Descriptions

4.1 Control Unit of Electric Pump

Figure 8. 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.

4.2. Password Menu

Figure 9. 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.

4.3. Event Log Menu

Figure 10. 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.

4.4. High Current Protection Setting Menu

Figure 11. 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.

4.5. Low Current Protection Setting Menu

Figure 12. 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.

4.6. Permitted Number of Maximum Switches Menu

Figure 13. 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 – 3	4 – 7.5	11 – 15	18.5 – 22	30 – 37	45 – 75	90 – 160
Recommended maximum number of switches per hour	60	40	30	24	16	8	4

Table 1. Number of switches setting table

4.7. Operation Mode Selection Menu

Figure 14. 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.

4.8. High Voltage Protection Setting Menu

Figure 15. 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.

4.9. Low Voltage Protection Setting Menu

Figure 16. 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

4.10. Delay Time Setting Menu

Figure 17. 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

4.2 Weekly Digital Timer Screen, Button Descriptions and Setting Program Time

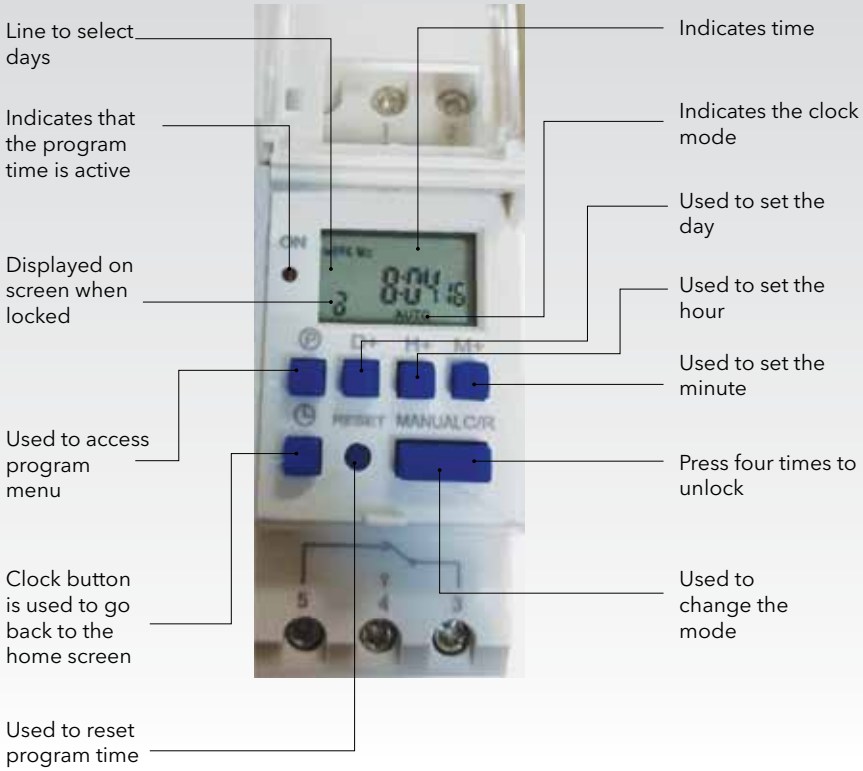


Figure 18. Program Time Screen and Button Descriptions

1. ⍟ symbol on the screen indicates that the key lock is off. Press C/R four times.
2. Press RESET at initial setup of the device.
3. Set the minute by pressing M+.
4. Set the hour by pressing H+.
5. Set the hour by pressing D+.
6. Go to program menu by pressing P.
7. Select the time and date that you want the test to start on the setting 1^{ON} 0:00, using the buttons H+ and M+. Select the day of the test using the button D+ (WEEK: Mo Tu We Th Fr Sa Su). Let's say the test is requested to start at 15:00 on Monday. The day should be set as Mo using the button D+, and the start time should be set as 1^{ON} 15:00 using the buttons M+ and H+.
8. After setting the test starting day and time, press P once. The test ending time should be set on the setting 1^{OFF} 0:00. Select the day selected for the previous parameter using the button D+. Using the buttons H+ and M+, set the time that is one minute later than the time selected for the previous parameter. Let's say the test is requested to start at 15:00 on Monday. The day should be set as Mo using the button D+, and the end time should be set as 1^{OFF} 15:01 using the buttons M+ and H+.
9. Exit Program Menu by pressing the clock button at the left of RESET. Press P again to check the test start and end time. The Day setting on 1^{ON} and 1^{OFF} menus should be the same. Time set on 1^{OFF} should be 1 minute later than the time set on 1^{ON}. WARNING: The test start and end time settings mentioned above are very important. If they are set wrong, test time will be incorrect causing the pump to run with a closed valve during the test and get damaged.
10. After setting the test time, the mode of the program time should be selected. When MANUAL is pressed, the ON, AUTO or OFF appears below the time. The correct mode is selected when ON LED is not activated and AUTO text appears on the screen upon pressing MANUAL again after seeing OFF on the screen. ON LED must be activated as long as the automatic test is enabled.

5. Maintenance

Cut off the power before starting any maintenance work. Disconnect the + pole of the battery.

- Ensure there is no loose electrical connections in the control panel and the grounding line is secure.
- Ensure there is no abrasion, puncture or color change resulting from heating in the electrical cables.
- Ensure the batteries are charged (that the battery voltage is 13.6V).

6. Troubleshooting

ERROR CODE	FAULT	ACTION
htA YG	**HIGH VOLTAGE FAULT**	• Measure the mains voltage with a calibrated voltmeter and compare it with the voltage values written on the panel display. • Check the cable connections. • The mains voltage values must be less than the limit value set in the high voltage value (YG) menu. • This fault will automatically disappear when the mains voltage value drops below the limit value set in the high voltage value menu.
htA dG	**LOW VOLTAGE FAULT**	• Measure the mains voltage with a calibrated voltmeter and compare it with the voltage values written on the panel display. • Check the cable connections. • The mains voltage values must be greater than the limit value set in the low voltage value (dG) menu. • This fault will automatically disappear when the mains voltage value is above the limit value set in the low voltage value menu.
htA FS	**PHASE SEQUENCE FAULT**	• Disconnect the electrical power to the panel. • 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.
htA FY	**PHASE LOSS FAULT**	• One or more of the phases do not come to the energy supply terminals. • Check the mains input voltage, phase-neutral values for all phases. • Check whether there is any imbalance or phase loss between phases. • Check that the terminals are not loose, tighten if loose. • This error will automatically disappear when the missing phase arrives.
htA YA	**HIGH CURRENT FAULT**	• Check past faults in the event log menu to understand the cause of the error. • Disconnect the electrical power to the panel. • Check the coupling connection of the electric motor and pump system. • Make sure that the pump rotates smoothly. • Check that the valves on the suction and discharge side are open.

ERROR CODE	FAULT	ACTION
htA YA	**HIGH CURRENT FAULT**	• Check panel power supply, panel electric motor terminal connections, electric motor terminal connections and cables. • Energize the panel. • 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. • 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. • For high current setting, refer to the description of the high current setting (YA) menu on the previous pages. • 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. • Check that the mains voltage was at a normal level when the measurement was taken. • If the electric motor is three-phase, check with measuring instruments that all 3 phases are supplied to the electric motor. • Put all engines in automatic mode and observe that the system is working properly.
htA dA	**LOW CURRENT FAULT**	• Check past faults in the event log menu to understand the cause of the error. • Disconnect the electrical power to the panel. • Check that there is water in the tank. • Check if there is a strainer valf and clean it if it is clogged. • Make sure that water is entering the suction part of the pump. • Make sure that there is no air in the pump. If there is air, bleed the pump. • Check the coupling connection of the electric motor and pump system. • Make sure that the pump rotates smoothly. • Check that the valves on the suction and discharge sides are open. • Energize the panel. • 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. • 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. • For low current setting, refer to the description of the low current setting (dA) menu on the previous pages. • 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. • Open the suction valve, put all motors in automatic mode and observe that the system is working properly.

ERROR CODE	FAULT	ACTION
htA SY	**NO WATER**	• Make sure that there is water in the tank. • Make sure that the float switch (floater) or level electrodes level is adjusted properly. • Make sure that the float switch works correctly by checking the float switch cable and terminal connections.
htA th	**OVERFLOW FAULT**	• Check whether there is overflow. If there is overflow, drain the excess water in a controlled manner. • This error is given when the “CS” parameter is “1”, that is in the discharge mode, if the “SALTER (switch)” terminals are short-circuited. • Check the overflow float switch cable and terminal connections and make sure that it works properly.
htA bL	**BLOCKAGE FAULT**	• The system is blocked because a low current error has occurred and the low current error continues even after software-defined automatic reset attempts. • Repeat the checks in the “htA dA” part. • Reset the error manually by holding down the Up / Down buttons and make sure that the system works correctly.
htA Sh	**PERMITTED NUMBER OF MAXIMUM SWITCHES ERROR**	• 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. • The electric motor receives commands to switch on more frequently than the set switching limit. • Check the expansion tank and observe that there is compressed air inside. If there is a fault, contact an authorized service center. • Check the number of switching limit value (SS) in the menu. • Check that the set limit value for the number of switches is set correctly according to the electric motor power. • Make sure the system is working correctly. • At the end of the time of the limit value set in the switch count menu, the switch error will clear automatically.

7. Descriptions of Diesel Panel Error LEDs and Troubleshooting

Oil Pressure Error: The shown LED flashes on the panel when the oil pressure is low. Follow these steps for troubleshooting:

- Press STOP twice to reset the error.
- Check the cable connection of the oil pressure gauge.
- Check the oil level.
- Disconnect the oil gauge, check for any dirt at the connection point of the gauge.

Oil Gauge Reading Error: If the oil gauge disconnects while the device is in stand-by mode and the device enters into operating cycle, the oil warning appears on the screen.

- Press STOP twice to reset the error.
- Check the cable connection of the oil pressure gauge.
- Check the oil level.
- Disconnect the oil gauge, check for any dirt at the connection point of the gauge.

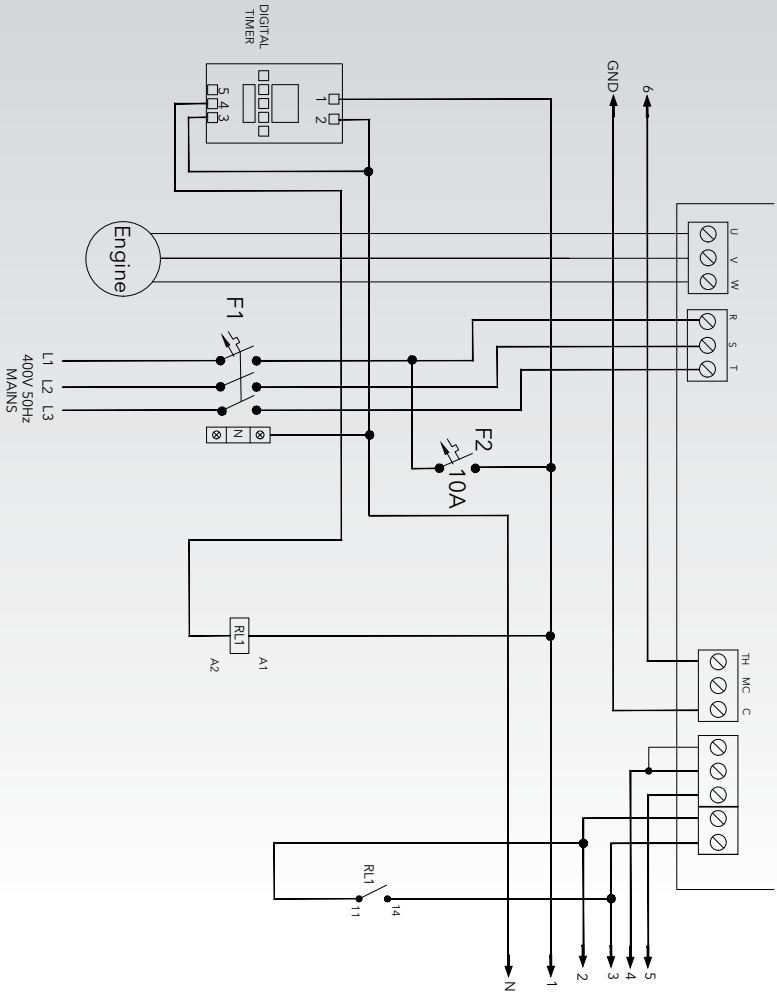
Starting Error: The shown LED flashes on the panel when the diesel engine does not start despite of 3 attempts. Follow these steps for troubleshooting:

- Press STOP twice to reset the error.
- Check the fuel level.
- Air pocket may have formed in the fuel pump. Ensure that there is no air pocket in the fuel path.
- Check the starter system. Ensure that the pump is started properly.

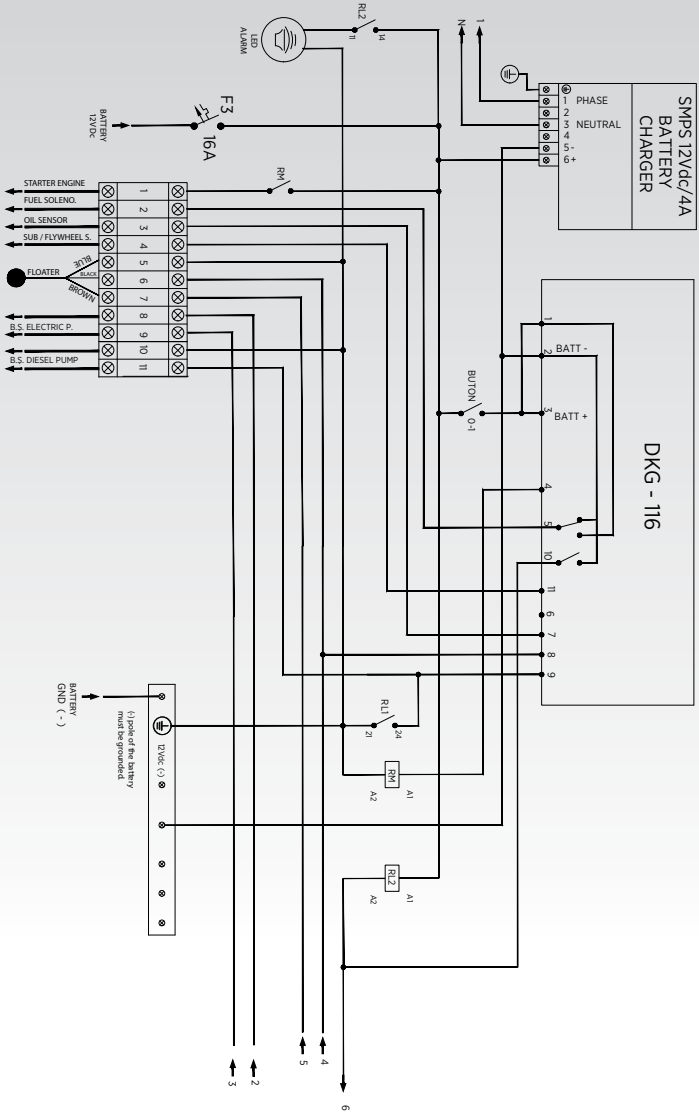
'No Water' Error: The shown LED flashes on the screen based on the 'no water' signal received from the floater resulting from the drop in the water level in the reserve tank. Follow these steps for troubleshooting:

- Ensure that there is water in the reserve tank.
- Ensure that the floater level is set properly.
- Check the floater cable and terminal connections.

Circuit Diagram - 1



Circuit Diagram - 2



Notes

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