

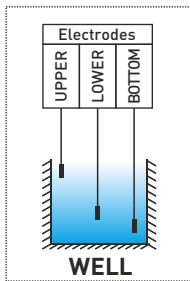
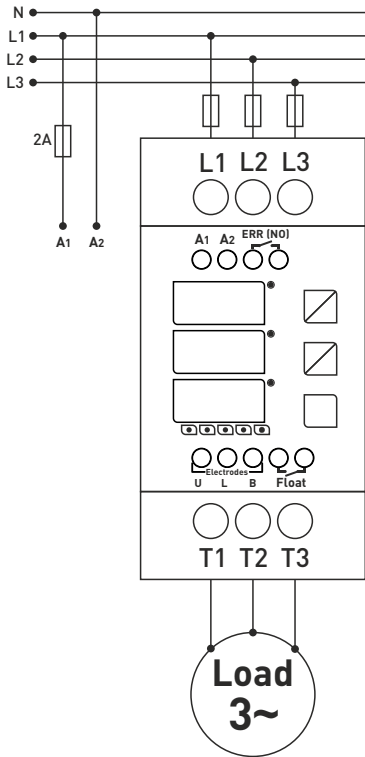


## Three-phase Submersible Pump Controller TDK-30

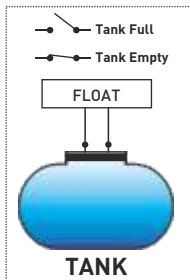


- ✦ 3x3 Digit 9mm LED Display
- ✦ It Shows 3 Phase Voltage
- ✦ It Shows 3 Phase Current
- ✦ High and Low Current Value Adjustable
- ✦ High and Low Voltage Value Adjustable
- ✦ Current and Voltage Asymmetry Value Adjustable
- ✦ Upper Electrode Waiting Time Adjustable
- ✦ It can be Reset Manually, Semi-automatic And Automatic
- ✦ ERR (NO) Fault Contact
- ✦ Phase Sequence Control
- ✦ Use with 2 or 3 Electrodes
- ✦ It Shows Number of Using Contacts
- ✦ It Shows Total Hours Worked
- ✦ Extends Electrode Life
- ✦ Liquid Sensitivity Adjustable.

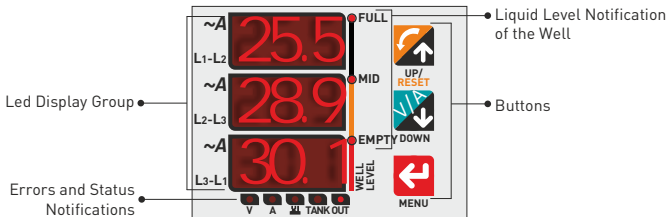
# 1. Connection Diagram:



**NOT:** For two-electrode use, make do short circuit the upper and lower electrodes use with the bottom electrode.



## 2. Introduction of Display and Buttons:



### Led Display Group:

In the upper display, current of L1 phase and phase-phase voltage values of L1-L2 phases are shown. Shows the number of the parameter while in the menu. In the middle display, current of L2 phase and phase-phase voltage values of L2-L3 phases are shown. In the lower display, current of L3 phase and phase-phase voltage values of L3-L1 phases are shown. Shows the value of the parameter while in the menu. When V / A button is pressed; The voltage values of the phases L1-L2 on the upper display, L2-L3 on the middle screen and L3-L1 on the lower screen are shown. It shows the currents when pressed again.

**Note:** In case of error, the phase/phases of the error flashes.

### Errors and Status Notifications:

**V LED:** This LED lights up for high/low voltage and voltage asymmetry errors.

**A LED:** This LED lights up for high/low current and current asymmetry errors.

**⚡ LED:** If the phase sequence is reversed, this led lights up.

**TANK LED:** If the tank is full, this led lights up.

**OUT:** If the device is outputting to the motor, this led will light.

### Liquid Level Notification:

If the liquid in the well only touches the bottom electrode, the "EMPTY" led will light up.

Liquid lower and bottom If it touches the electrodes, both the "EMPTY" and "MIDDLE" LEDs

will light up. If the liquid touches the bottom, lower and upper electrodes, the "EMPTY", "MIDDLE" and "FULL" leds all three light up.

### Buttons:



**Menu Button:** Entering the menu and parameters, saving the parameter value and used to exit the menu.



**Up and Reset Button:** Navigating between parameters while in the menu, It using for changing values while in the parameter. When out of menu, in case of error allows to reset the device manually. When this button is pressed while the device is counting the first opening time, the device turns on without waiting for the time.



**Down and V/A Button:** Navigating between parameters while in the menu, It using for changing values while in the parameter. When pressed during normal operation, Switches between voltage and current values.

### 3. First Operation of the Device.:

Read the warnings section before making the connections of the device. Make the connections of the device according to the connection diagram. Then energize the device. In accordance with the engine you use, change the values (working current and voltage range, liquid conductivity, etc.) from the relevant parameters. After making the necessary changes, you can exit the menu. The device checks the status of the system at startup. Phase sequence, voltage values, well and tank status are checked, then the first opening time begins to count. After the time is up, the device gives an error or output to the engine according to the set values, well and tank situation.

### 4. Operating on the Menu:

Press the Menu key to enter the menu, up and down to switch between parameters Use keys. After reaching the parameter whose value you want to change, press the menu button. After the parameter number starts to flash, using the up and down keys change the value. After making the change, press the menu button to save. Exiting the menu for; Scroll to P.27 [Out] pressing the up and down keys, and then press the menu key.

**Note:** If the keys are not pressed for 60 seconds while in the menu, the device will automatically exit the menu.

### 5. Warnings:

-Make the connections of the device according to the connection diagram.

-Connect the body of the pump to the ground.

**-Make sure that the liquid is not flammable and explosive.**

-For use with two electrodes, make do short circuit the upper and lower electrodes and use with the bottom electrode.

-Make sure that the temperature is not below -5°C where the device is mounted.

-Make sure that sunlight does not come directly to the front panel of your device.

-Never energize the float and electrode inputs of your device.

### 6. Maintenance of the Device:

Turn off the power of the device and disconnect it from the connections. Clean the body of the device with the help of a slightly damp cloth. Do not use conductive or other chemicals that can damage the device as a cleaning agent. After the device is finished cleaning, make the connections and make sure the device is energized and working.

### 7. Error Conditions.:

**Normal Operation (No Error):** When the device is powered; voltage at normal values, phase sequence is correct, If the well is full and the tank is empty, the engine starts.

**High Current (To enter the error state).** If the current drawn from any phase exceeds the high current set value (P.1), the device counts up to the high current delay value (P.2) then stops the engine. During the error, the display group of the phase/phases causing the error will flash. You can prevent high current error by increasing the set value. Increase this parameter to the maximum current that the engine can run. Otherwise, your engine may be damaged.

**High Current (Exiting the error state):** When the device is at high current fault; If the high current reset time (P.3) parameter is on (there is a number value), the device counts up to this value and then starts the engine automatically. The device continues automatic reset until it reaches the number of high current reset (P4). After reaching this value, the device must be reset manually. If the value is "Off" in P.4, automatic reset number is unlimited.

**Low Current (To enter the error state):** If the current drawn from any phase goes below the low current set value (P.5), the device counts up to the low current delay value (P.6) then stops the engine. During the error, the display group of the phase/phases causing the error will flash. You can prevent low current error by decreasing the set value. Decrease this parameter to the minimum current that the engine can run. Otherwise, your engine may be damaged.

**Low Current (Exiting the error state):** When the device is at low current fault; If the low current reset time (P.7) parameter is on (there is a number value), the device counts up to this value and then starts the engine automatically. The device continues automatic reset until it reaches the number of low current reset (P.8). After reaching this value, the device must be reset manually. If the value is "Off" in P.8, automatic reset number is unlimited.

**Current Asymmetry (To enter the error state):** If the difference between the currents drawn from the phases connected to the device is above the current asymmetry set value (P.9), the device counts the current asymmetry delay (P.10) and then stops the engine. During the error, the display group of the phases causing the error will flash.

**Current Asymmetry (Exiting the error state):** When the device is at current asymmetry fault; If the current asymmetry reset time (P.11) parameter is on (there is a number value), the device counts up to this value and then starts the engine automatically. The device continues automatic reset until it reaches the number of current asymmetry reset (P.12). After reaching this value, the device must be reset manually. If the value is "Off" in P.12, automatic reset number is unlimited.

**High Voltage (To enter the error state):** If any phase exceeds the high voltage set value (P.16), the device waits for 3 seconds and then stops the engine. During the error, the display group of the phase/phases causing the error will flash. You can prevent high voltage error by increasing the set value. Increase this parameter to the maximum voltage that the engine can run. Otherwise, your engine may be damaged.

**High Voltage (Exiting the error state):** When the voltages decrease about 10V below the High Voltage Set value, the device waits for 3 seconds and then starts the engine automatically. The reset count is unlimited by default in this parameter.

**Low Voltage (To enter the error state):** If any phase goes below the low voltage set value (P.17), the device waits for 3 seconds and then stops the engine. During the error, the display group of the phase/phases causing the error will flash. You can prevent low voltage error by decreasing the set value. Decrease this parameter to the minimum voltage that the engine can run. Otherwise, your engine may be damaged.

**Low Voltage (Exiting the error state):** When the voltages increase about 10V above the Low Voltage Set value, the device waits for 3 seconds and then starts the engine automatically. The reset count is unlimited by default in this parameter.

**Voltage Asymmetry (To enter the error state):** If the difference between the voltages from the phases connected to the device is above the current asymmetry set value (P.18), the device waits for 3 seconds and then stops the engine. During the error, the display group of the phases causing the error will flash.

**Voltage Asymmetry (Exiting the error state):** When the difference between voltages decreases 3% below the voltage asymmetry set value (P.18), the device waits for 3 seconds and starts the engine automatically. The reset count is unlimited by default in this parameter.

## 8. Parameters

**P.1 High Current Set Value:** It determines the maximum operating current (overload) of the engine.  
**Setting Range:** 1 - 30A **Factory Value:** 15A

**P.2 High Current Error Delay Time:** When the device enters high current error, before stopping the engine determines the time to wait.  
**Setting Range:** 0 - 30 sec. **Factory Value:** 5 sec.

**P.3 High Current Reset Time:** After the device enters high current error, it determines how many minutes after the engine will be restarted automatically.  
**Setting Range:** 0,1 - 99 min. **Factory Value:** 1 min.

**P.4 High Current Reset Count:** After the device enters high current error, it automatically determines how many times it can be restarted.  
**Setting Range:** 1 - 20 times **Factory Value:** Off (unlimited times)

**P.5 Low Current Set Value:** It determines the minimum operating current of the engine.  
**Setting Range:** 0 - 30A **Factory Value:** 0 A

**P.6 Low Current Error Delay Time:** When the device enters low current error, before stopping the engine determines the time to wait.  
**Setting Range:** 0 - 30 sec. **Factory Value:** 5 sec.

**P.7 High Current Reset Time:** After the device enters low current error, it determines how many minutes after the engine will be restarted automatically.  
**Setting Range:** 0,1 - 99 min. **Factory Value:** 1 min.

**P.8 Low Current Reset Count:** After the device enters low current error, it automatically determines how many times it can be restarted.

**Setting Range:** 1 - 20 times **Factory Value:** Off (unlimited times)

**P.9 Current Asymmetry Set Value:** It determines the percentage of the maximum difference between the currents drawn from the phases connected to the device.

**Setting Range:** %10 - %100 **Factory Value:** %50

**P.10 Current Asymmetry Error Delay Time:** When the device enters current asymmetry error, before stopping the engine determines the time to wait.

**Setting Range:** 0 - 30 sec. **Factory Value:** 5 sec.

**P.11 Current Asymmetry Reset Time:** After the device enters current asymmetry error, it determines how many minutes after the engine will be restarted automatically.

**Setting Range:** 0,1 - 99 min. **Factory Value:** 1 min.

**P.12 Current Asymmetry Reset Count:** After the device enters current asymmetry error, it automatically determines how many times it can be restarted.

**Setting Range:** 1 - 20 times **Factory Value:** Off (unlimited times)

**P.13 Demurrage Multiplier:** The maximum that the engine connected to the device can pull in when in the demurrage (take off) determines the current.

(Demurrage current = P.13 Demurrage Multiplier x P.1 High Current Set Value)

If the engine draws more than this value when inrush, the device stops the engine without waiting.

**Setting Range:** 1.0 - 5.0 **Factory Value:** 2.0

**P.14 Demurrage Time:** It determines the time after the engine is energized until it reaches the normal current level.

**Setting Range:** 0 - 30 sec. **Factory Value:** 5 sec.

**P.15 Fuse Protection:** It determines the instantaneous maximum current that the engine can draw after demurrage. The fuse current is at the same value as the demurrage current.

When instantaneous current exceeds this value, the device stops the engine without waiting.

If the parameter is set to "off", the fuse protection current control is disabled.

**Setting Range:** On - Off **Factory Value:** On

**P.16 High Voltage Set Value:** It determines the maximum operating voltage of the engine.  
**Setting Range:** 400 - 460V **Factory Value:** 430V

**P.17 Low Voltage Set Value:** It determines the minimum operating voltage of the engine.  
**Setting Range:** 200 - 360V **Factory Value:** 300V

**P.18 Voltage Asymmetry Set Value:** It determines the maximum voltage difference that can occur between the phases connected to the device.  
**Setting Range:** %5 - %50 **Factory Value:** %20

**P.19 Electrode Set Value:** Determines the conductivity of the liquid. This value; As a low value in liquids with high conductivity, It should be set as a high value in liquids with low conductivity.  
**Setting Range:** %1 - %100 **Factory Value:** %70

**P.20 Electrode Reading Value:** It shows the conductivity value of the liquid. Electrode reading value if it is lower than electrode set value, the electrodes are in contact with the liquid. Electrode reading value if it is higher than electrode set value, the electrodes are not in contact with the liquid. The value shown on the middle display belongs to the upper electrode. The value shown on the lower display belongs to the lower electrode.

**P.21 Upper Electrode Waiting Time:** After the liquid level in the well reaches the upper electrode the time after which the device waits before starting the engine. During this waiting period The Upper Electrode led on the device flashes.  
**Setting Range:** 0,1 - 99 min. **Factory Value:** 1 min.

**P.22 First Opening Waiting Time:** Time to wait before starting the engine to avoid being affected by voltage fluctuations after power failure.  
**Setting Range:** 1 - 999 sec. **Factory Value:** 5 sec.

**P.23 Relay On/Off Count.:** Indicates how many times the engine connected to the device is on/off.

**P.24 Relay Operating Time:**It shows the total number of hours the engine connected to the device has been running.

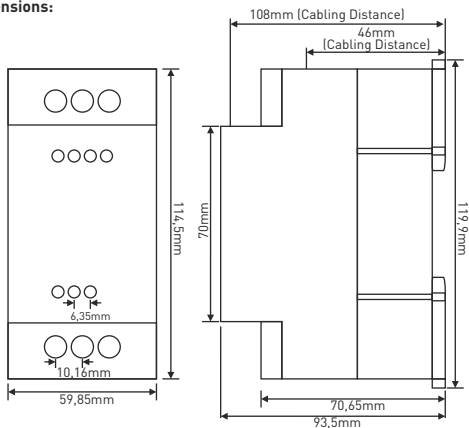
**P.25 Return to Factory Values:** Returns parameter values to factory values.  
**Setting Range:** On - Off **Factory Value:** Off

**P.26 Version:** It shows the version information of the device.

**P.27 Out:** Exits the menu.



## 9. Dimensions:



## 10. Technical Specifications:

Operating Voltage(Un)	: 100V - 240V AC 50/60Hz.
Operating Frequency	: 50/60 Hz.
Operating Power	: <10VA
Operating Temp.	: -20°C.....+55°C
Display	: 3x3 digit display, 8x LEDs
Liquid Sensitivity	: <50kΩ
High Current (Overload)	: Maks. 30A
Connection Type	: Terminal connection
Contacts	: 3A / 250V AC (Resistive Load)
Cable Diameter	: 2.5mm <sup>2</sup> 6mm <sup>2</sup> (current inputs and outputs)
Weight	: Max. 380gr.
Mounting	: Mounting on the DIN rail
Operating Altitude	: <2000m.

## 11. Menu Parameter List:

Parameter Number	Parameter Name	Minimum Value	Maximum Value	Default Value	Unit
P. 1	High Current Set Value	1	30	15	A
P. 2	High Current Error Delay Time	0	30	5	Sec.
P. 3	High Current Reset Time	Off/0.1	99	Off	Min.
P. 4	High Current Reset Count	Off/1	20	Off	-
P. 5	Low Current Set Value	1	30	0	A
P. 6	Low Current Error Delay Time	0	30	5	Sec.
P. 7	Low Current Reset Time	Off/0.1	99	Off	Min.
P. 8	Low Current Reset Count	Off/1	20	Off	-
P. 9	Current Asymmetry Set Value	%10	%100	%50	A
P. 10	Current Asymmetry Error Delay T.	0	30	5	Sec.
P. 11	Current Asymmetry Reset Time	Off/0.1	99	Off	Min.
P. 12	Current Asymmetry Reset Count	Off/1	20	Off	-
P. 13	Demurrage Multiplier	1.0	5.0	2.0	-
P. 14	Demurrage Time	0	30	5	Sec.
P. 15	Fuse Protection	On	Off	Off	-
P. 16	High Voltage Set Value	400	460	430	V
P. 17	Low Voltage Set Value	200	360	300	V
P. 18	Voltage Asymmetry Set Value	%5	%50	%20	V
P. 19	Electrode Set Value	1	100	85	-
P. 20	Electrode Reading Value	-	-	-	-
P. 21	Upper Electrode Waiting Time	0.1	99	0.1	Min.
P. 22	First Opening Waiting Time	1	999	5	Sec.
P. 23	Relay On/Off Count	-	-	-	-
P. 24	Relay Operating Time	-	-	-	Hour
P. 25	Return to Factory Values	-	-	-	-
P. 26	Software Version	-	-	-	-
P. 27	Exit the Menu	-	-	-	-

## 12. Contact:

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Mail: [info@tense.com.tr](mailto:info@tense.com.tr)

MADE IN TURKEY

