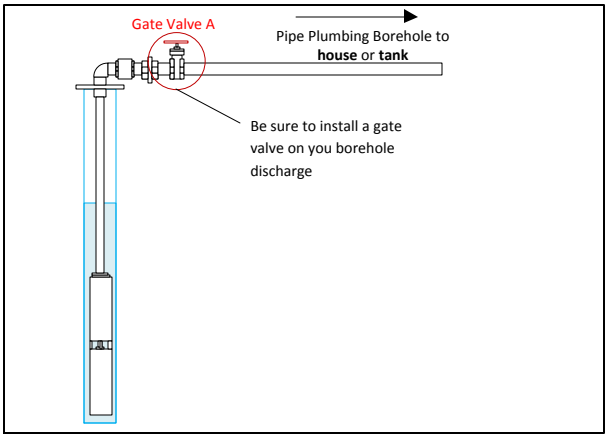
Tesla Guardian
Installation Manual

Congratulations on purchasing your new Tesla Guardian, Digital Motor Protections Unit. Please follow the below installation steps to ensure that the unit gives you complete protection. This manual can also be found on our website, **www.driptech.co.zw/resources**.

Step 1: Plumbing of Motor and Pump into existing system

Drop the borehole and connect the discharge of the borehole to either your tank or existing house system through the normal procedure (ie. Non return Valve, Socket Union, etc).

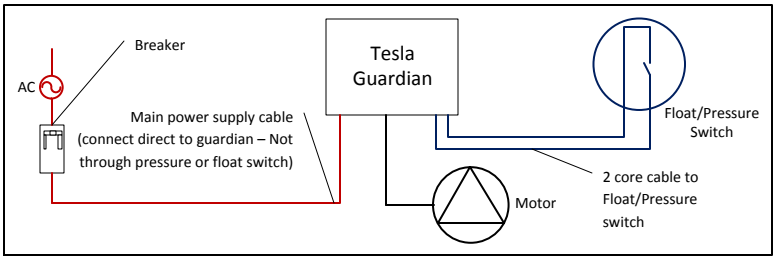
NB (Important) – Please install a gate (or ball cock) on the borehole discharge as shown in the diagram. This will be necessary in the following steps of installing your TESLA Guardian.



Step 2: Connecting Your Motor to the TESLA Guardian

Connect your guardian to the main power supply, motor and your pressure/float switch according to the diagram

For the correct wiring connection follow steps A and B below

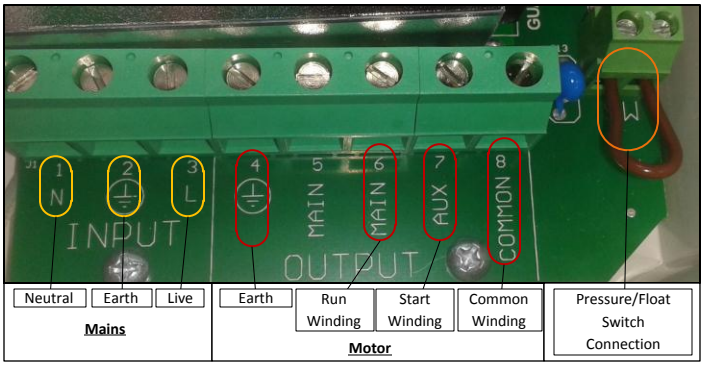


A: Single Phase (ME)

a: Plug in the correct size capacitor for your size motor (in the two black wires extruding from the circuit board). This should have been sold to you with your Guardian.

b: Connect your Mains and Motor and Pressure/Float switches to the Guardian as shown in the diagram.

c: (Important) – If using a pressure or float switch, connect the switch to the SW port as shown in the diagram. Do not connect the switch in the main circuit as the box needs constant power.



To determine which windings are which use the method described below

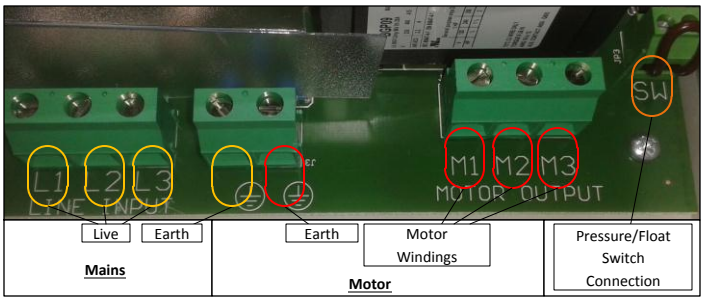
Measure the resistance between all 3 windings, (1-2, 2-3, 3-1). The pair of cables that give the highest resistance reading between them are the run and start windings, the other cable is the common. The next highest reading will be between the common and start winding. The lowest reading will be between the common and run winding

Standard Tesla/Brisan Wiring Colours – Run Winding (Grey), Start Winding (Brown) & Common (Black)

B: Three Phase (1E/2E)

a: Connect your Mains and Motor to the Guardian as shown in the diagram.

b: (Important) - If using a pressure or float switch, connect the switch to the SW port as shown in the diagram. Do not connect the switch in the main circuit as the box needs constant power.



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Step 3: Setting Your Tesla Guardian

Once you have connected all the necessary wiring follow the below steps to ensure your guardian is set correctly.

A: Check the plumbing system and ensure that all valves are set for normal operation. Ie if the submersible is pumping to a tank, ensure all valves leading to the tank are open. If you are pumping to a house ensure that enough taps and valves are open to simulate normal daily water usage.

B: **(Very Important)** Check that the voltage at your control box is correct (single phase - **220-230V**, 3 phase – **380-400V**). If not in range wait for voltage to fall into range before setting box. If voltage does not return to safe range, check the wiring of the supply lines to the main switch board and cable size. If all this is correct and voltage does not return into operating range, report a fault to ZETDC.

C: Place a clamp meter (to measure running current) on the Live input wire to the control box.

D: Turn on your Tesla guardian using the switch in the side of the control box. Before starting the motor, the box will perform some pre-start checks. During this time the digital display will read 50.

E: Check motor is running correctly **(Very Important)** - After the pre-start checks the Guardian will start the motor (click can be heard in control box). The digital display will show the motor's running current. Using both the digital display and your clamp meter, check the running current of the motor after 2 minutes of pumping. If the motor and pump are correctly installed the running current should match or be slightly below full load current ratings for your motor (shown below). If your **motor drawing more than the full load current rating**, check the **wiring of the motor to the Guardian**, the **motor down cable size** and the **joint between the down cable and the motor**.

Tesla Factory Full Load Current Ratings	
Single Phase Motors	**3 Phase Motors**
½ Hp – 3.5 A ¾ Hp – 4.5 A 1 Hp – 6.3 A 1½ Hp – 8.5 A 2 Hp – 10.8 A 3 Hp – 14 A	½ Hp – 1.6 A ¾ Hp – 2.2 A 1 Hp – 2.6 A 1½ Hp – 3.6 A 2 Hp – 4.6 A 3 Hp – 6.3 A 4 Hp – 7.9 A 5.5 Hp – 10.2 A 7.5 Hp – 13.1 A 10 Hp – 16.9 A

Digital LED Display

These full load current ratings are found stamped into each motor's data plate.

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E: **Setting of the Potentiometer's**

The Guardian has two potentiometers which need to be set correctly for the box to protect your motor. These are shown in the picture below. To ensure the guardian functions correctly, both these potentiometer's need to be set accurately.

i: Setting the Ampere Potentiometer

Once you have ensured the motor is running according to the factory specified running currents, the ampere potentiometer can be set. This is done by rotating the potentiometer anticlockwise slowly until the LED display showing the current begins to flash. Once the display flashes, rotate the potentiometer clockwise very slightly till the display stops flashing (ie you want to find the setting that is just before the display starts flashing).

ii: Setting the Cosphi Potentiometer

Once the Ampere potentiometer is set, the cosphi potentiometer can be set. This is done by rotating the potentiometer clockwise until the LED display flashes Sb. Once the display flashes Sb, rotate the potentiometer slightly anticlockwise very slighlty until the display shows the running current (ie you want to find the setting that is just before the display starts flashing Sb). This should be done quickly as the motor will turn off after 3-4 seconds of flashing Sb. If this occurs, reset the control box and repeat entire step.

Guardian Potentiometer's in their factory pre-set positions

Step 4: Test if Control Box is Set Correctly

Once both potentiometers are set, the final step of the installation is to check if the box is set correctly. To do this, close the gate valve (Gate Valve A from step 1) at the top of the borehole. At this point the pump will be running but moving no water. This will simulate the pump running in a run dry situation and if the Guardian is set correctly, it will register this and automatically switch off giving an Sb error.

If this occurs, then the box is set correctly. You can now open Gate valve A and reset the Guardian by turning the switch off and on.

(Very Important) If the box fails to register the Sb error with a closed valve then Step 3E must be repeated to get a more accurate setting on the potentiometers. Continue repeating Step 3E until the box registers an Sb Error against a closed valve.

If you have any further problems, please contact us on the below numbers and we will assist you.

Avondale Branch
Tel: 0772 158 310/1
Email: avondale@driptech.co.zw

Glenara Branch
Tel: 0772 187 421/2
Email: glenara@driptech.co.zw

Workshop
Tel: 0782 705 557
Email: workshop@driptech.co.zw

Borrowdale Branch
Tel: 04 882419/885387
Email: borrowdale@driptech.co.zw

Southerton Branch
Tel: 0772 143 996/7/8
Email: southerton@driptech.co.zw