The reasons and solutions of burned all Electic Pumps especially submersible pumps

How do the water pumps and submersible pump burn? What is the cause? The reasons for the problems and solutions are summarized as follows:

1. **Grounding fault power supply: There are four core cable of the submersible pump, careful not to take the wrong power line as grounding wire.**
   In this case, if it is connected to the network power, the electric motor pump will have difficulty moving at a slow speed and will consume too much amps, and most importantly, one phase is mistakenly connected to the earth pump and there is a risk of electric shock to humans
   And if there is no suitable panel, the pump will burn in less than two minutes

   It can be checked the consumption Ampere with Clamp Meters Tools on start time only



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2. **Cable damaged: Always check the insulation resistance of the submersible pump.**

   The resistance of all wires must be checked with Ohmmeter.
   In this case, if it is connected to the network power, the electric motor pump will have difficulty moving at a slow speed and will consume too much amps



3. The mains voltage is lower than the proper voltage for the pump

First, the registered voltage must be checked from the name plate of pump

Next we need to control the network voltage with a voltmeter

The maximum less or increase of voltage can be up to 10% of the voltage recorded in the pump plate.

Otherwise, if the pump operates at a lower or higher voltage, it will increase depending on the low or high voltage of the consumed amp and will burn after a short time.

Having a proper control panel in this case checks the voltage and immediately cuts off the network.



4: The impeller stuck. The impeller stuck to the fixed, than the rated current value increases, for a long time, the stator winding of submersible pump will soon burn.

In this case, if it is connected to the network power, the electric motor pump will have difficulty moving at a slow speed and will consume too much amps

5: Submersible pump "start", "stop" is too frequent.

The number of times the pump is turned on and off usually 4 times per hour and rest one hour and in case of need maximum six times and with 2 hours rest .

Unless it can be turned on and off many times with the Inverter control panel or soft starter.

If the pump is turned on and off more than 6 times without the inverter, the heat generated inside it will damage the winding insulation and after the insulation is damaged and wires connected to the pump body, the pump will be burned if it does not have a suitable digital panel.

6: Open phase : The input power is two-phase:

6-1 if it is at the time of turning on the pump,

The Electric Pump will not be able to rotate and the consumption amp will increase tremendously and intense heat will be generated in the winding and it will burn in less than two minutes.

To prevent it from burning, there must be a reliable control panel in the input power path that cuts off the mains power by increasing the consumption ampere by more than ten percent of the permissible ampere of the pump, which is listed on the pump plate.

6-2 If it is at the time of Running the pump,

if it is at the time of running the pump, the pump will rotate But the consumption amp will be increase some more but intense heat will be generated in the winding.

In this case the part of the coil whose phase is disconnected, unwanted voltage is generated in the coil, and due to the time of more than 30 minutes, the same coil cut off from the network saliva will burn at high heat.

Having a suitable digital control panel will immediately cut off the power and prevent the pump from burning.

This phase outage is either in the network or the pump wire is ruptured, Digital panels will be able to control both if very reliable, and *professional non-digital panels* do not detect the pump wire disconnection at all.

7: Dry Running

Submersible pump running time without water is too long, while it cannot working more than one minute without water,

To control dehydration, mechanical floaters or a water detection sensor attached to the control panel must be used.

8. Phase comparison

The phases are changed and the rotation of the pump will be reversed .

After purchasing the pump and before installing it, the cable should be added to the main cable of the pump with a special clamp and special materials that are resistant to water penetration,

For choice the additional cable must be attentioned to diameter appropriate to the consumed amps and also proportional to its distance to the mains power.

After adding the cable, the cable must be connected to the terminal of control panel and the direction of rotation of the pump impellers must be specified.

If it rotates in the opposite direction of the pump (shown on the pump body) , it is necessary to obtain the correct rotation by changing two wire of the phases together and to remember the color of the wires installed to the panel terminal

After proper installation, the wires of the pump must be connect to terminal of control panel to create a proper circulation of the pump

Now, if after installing the input power of the control panel is changed and there is a change in the symmetry of the phases, the rotation of the pump is reversed and the delivery of the pump is reduced, and this wrong rotation causes damage to the mechanical equipment and Hydrolic equipment of the pump.

Due to the failure of some parts, the consumption of the pump will increase and the above pump will burn after few hours

Having a digital Control panel will immediately cut off the power to the grid when phase asymmetry occurs.

9: Lack of Electric pump rotation

Lack of pump rotation can be due to the clogging and Lock of the pump impellers by a foreign solid, or the failure of the impellers or the failure of a part of the pump alternator

By connecting the electric pump to the power supply, for whatever reason the pump does not rotate, the Amp consumption of the pump will increase tremendously, and if the system does not have a proper protection, it will burn in less than one minute.

10: No return Valve

When installing the floating pumps, the one-way valve must be closed before closing the outlet pipes, If this no return Valve is not install unilaterally, after the pump is turned off, all the water inside the outlet pipe returns to the well, and because it passes through the pump, the reverse rotation by the return water causes will be do two significant damages to the pump.

First, reverse rotation may damage the pump and alternator components, especially the trans Bearing of Motor.

Secondly, this reverse rotation causes the electro motor rotor to rotate and generates electricity like a turbine and Generator.

The electricity generated through the cables will enter the control panel and due to the intensity of the rotation and its duration, it may damage the panel.

Note : Be careful when choosing a one-way valve in submersible pumps

If these pumps are used for irrigation and agriculture, it is better to make a hole on no return valve bladder, so that the water inside the pipe is gently drained into the well after the pump is turned off.

With this method, the water drain pressure of the pipe is so low that it is not able to rotate the pump impeller, and when the pump needs to be repaired, if no water inside the pipe makes it is light and easy to get out the Submersible pump from the well.

Note : Which Control panel is suitable for controlling the water pump?

1- Good analog panels are those that have the following equipment to turn on and off and control the pump:

Stop and Start chassis - Contactor and bimetal proportional to pump power - Phase control - Communication terminals - Terminal for float switch

Analog Control Panel

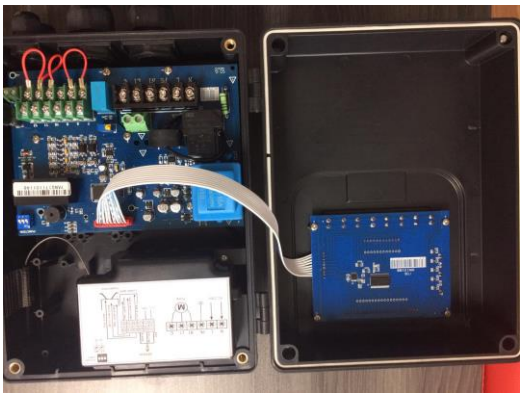






2- Good digital Control Panels should have the following accessories

Start and Stop chassis - Manual or Auto Start chassis - Contactor - Main control board - Digital display Touch screen - Internal data storage chassis - Main power communication terminals - Terminal for float switch.







The difference between analog and digital control Panel:

In Analog control panel, the power supply of the network will always be cut off with increasing ampere consumption and heating of bimetallic blades, and depending on the increase of consumption ampere with a time delay of 20 seconds to a few minutes, its settings will be adjusted by changes in Volume of on bimetal and Phase control is performed and the accuracy of settings and its operation is about 80%

In digital panels, according to the tolerance and the settings of amps, voltages and other options , can control over and under Voltage , Dry running , overload , show fault and history , working time ,

The control of the operation of the pump, which is already stored in its memory,

The indicator indicates the amp consumption, voltage consumption and fault, and other items

The working accuracy of these control panels are almost 95%.

In this case, which panel is suitable?

The panel is suitable to prevent any malfunction of the pump to prevent the pump from burning.

Digital panels with good international standards can insure your electric pump from burning