

SunSwitch

Automatic Solar Level Switching Device

Application

The LORENTZ SunSwitch is designed for use with the LORENTZ pump controllers. It can also be used for any application where you need to switch depending on solarlight intensity. It is an autonomous working unit that supplies itself with power from the solar cells on its rear side. It is environmentally protection rated to IP54.

The Problem

Some solar pumps (e.g. centrifugals) are only effectively pumping water when a minimum solar irradiation is available. When there is not enough irradiation, the pump starts to rotate but does not deliver any water. In this case the pump can heat up and wear off prematurely.

The SunSwitch can also be used with appropriate relays to switch on a mains power pack to provide a constant power source in pumping applications where minimum flow requirements need to be met 24 hours per day. An example of this would be for commercial swimming pools where constant turnover of water is required 24 hours per day. The SunSwitch will activate a power supply when the solar energy is not sufficient to provide the required water flow rate.



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The Solution

A LORENTZ SunSwitch is installed outside close to the solar array and is adjusted to switch at a required irradiation level.

The Advantages

- reduced wear on the pump and motor since the pump only starts when it will continue to run;
- no water heat up inside the pump due to too insufficient power in low light situations where the pump spins but cannot produce a flow up to the delivery point; and
- pump will only run when minimum flow rates or pressure levels can be achieved which are required by certain applicators.

Typical Scenario

In a drip irrigation system a minimum flow rate is required to ensure that all plants along the watering string receive the required uniform amount of water.

A solar pump starts with a low flow because of low morning irradiation levels. This results in the first plants on the irrigation string receiving water but not those further along the string.

Adding a SunSwitch means that the pump will only start when sufficient power is available to provide a flow level to water all of the plants in the irrigation string.

Installation



WARNING – This device is to be installed, connected and serviced by qualified personnel only. Never use this device in connection with AC Power.

Mounting

Mount the SunSwitch light-sensor close to the solar panel. The device must stay in the same orientation as the solar panels. For mounting the SunSwitch light-sensor on the frame of the solar panel you can use the provided C-bracket to clamp it to the frame. Alternatively you can drill two holes into the frame and fix the SunSwitch light-sensor with machine screws.

Connecting

The SunSwitch has two potential-free double throw contacts. The contacts are in the OFF-state in the drawing (fig. 2).

To operate the SunSwitch with a PS Controller, connect one COM and NO to the terminals 4 and 5 of the PS-Controller (COM and NC). The polarity does not matter. In this case, the PS controller will start the pump when the irradiation is sufficient (fig. 3).

It is also possible to connect a tank float switch in a storage tank. In the following example the float is closed when up (i.e. tank full, fig. 4). Both, the SunSwitch and the float switch can stop the PS controller. In other words, the pump will only run if the irradiation is sufficient and the tank is not full.

The SunSwitch can also be used to switch on a LORENTZ PowerPack by use of a suitably rated relay (fig. 5). The relay must meet local safety codes and standards.

A lot of other combinations to start or stop the pump are possible with series or parallel connections with pressure switches, remote switches etc. With the second switch it is for example possible to start a generator when the irradiation is not sufficient.

Wiring

Use at least 0.5 mm² cable. For long wiring (<10 m) use shielded cable. Refer to the pump manual for additional information about this.

Contact rating

Max. voltage	250VAC / 220VDC
Max. current	2A
Max. power	60W / 62.5VA

Fig 1: Mounting example



Fig 2: Contacts

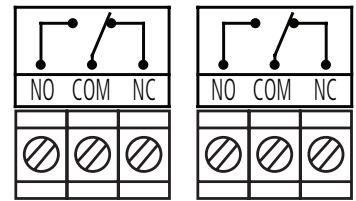


Fig 3: Connecting SunSwitch to a PS controller (with low light = OFF)

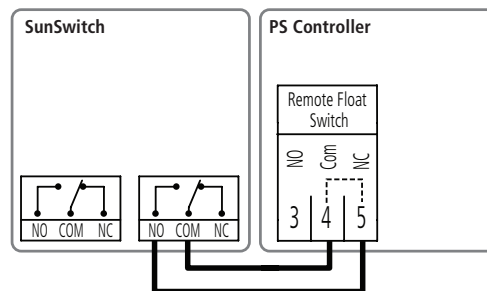


Fig 4: Connecting SunSwitch to a PS controller with tank float switch (with low light = OFF)

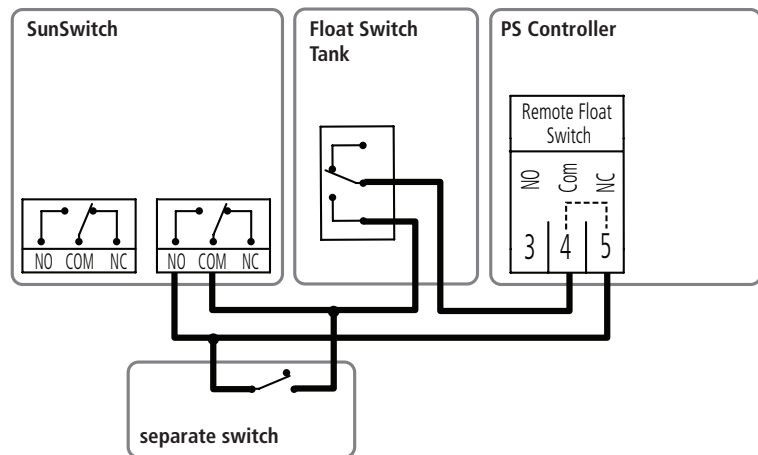
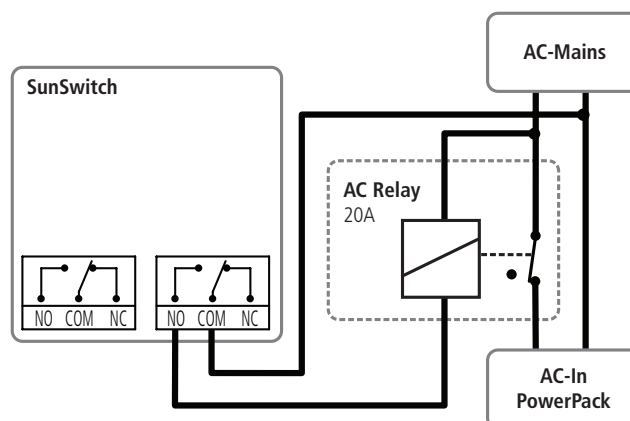


Fig 5: Connecting SunSwitch to a LORENTZ PowerPack with a relay (with low light = OFF)



Operation

- Connect SunSwitch to the PS controller and mount it at the PV modules.
- The scale of the adjustment ranges from 15% to 55%. 100% is equivalent to 1,000W/m²; accordingly the SunSwitch light sensor can set the pump startup point between 150W/m² to 550W/m². The hysteresis of the SunSwitch light-sensor is approx. 40W/m².
- Adjustment should be done in the afternoon as irradiation levels reduce.
- Set the level to minimum (15%) and watch the flow rate of the pump.
- When the flow reduces to below a useful level increase the setting until the pump stops. Due to the hysteresis, the pump will now start with slightly more power and stops at the set irradiation.
- When the SunSwitch light-sensor allows the pump to operate, the "ACTIVE" LED lights up.
- If the pump starts too early or too late it is possible to modify the startup value at any time during operation.

Dimensions

- 230 × 115 × 87mm³
- weight: 1.2 kg / 0.54 lbs

Warranty

Warranted to be free from defects in material and workmanship for TWO years from date of purchase.