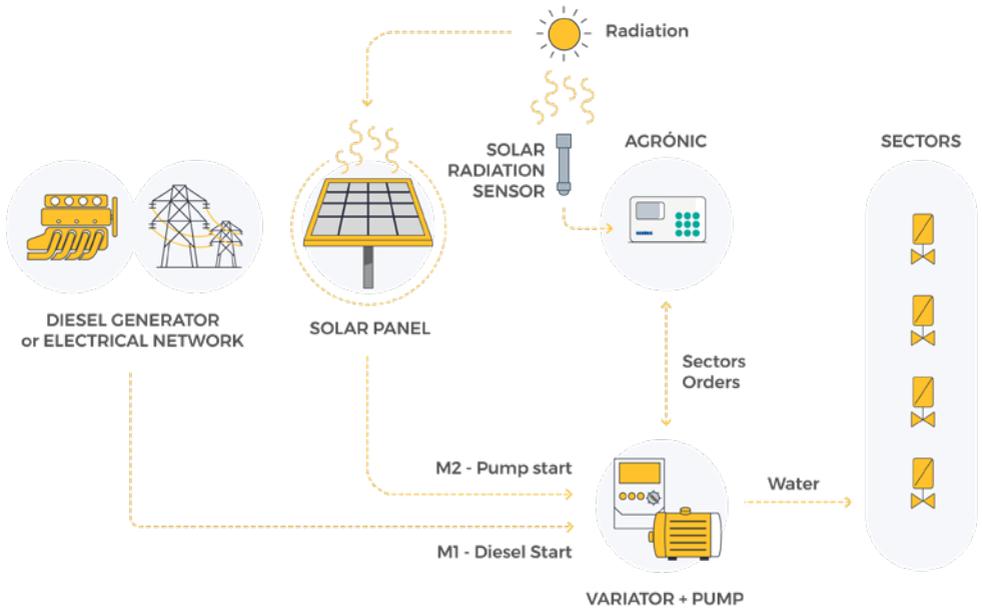## Agrónic 2500 Manual
# Solar Irrigation

Irrigation control in installations where solar cells are directly connected to a variable frequency drive to activate an irrigation pump. It also allows hybrid energy of the power grid or generating set.

In many cases, irrigation installations are not connected to the power grid; diesel engines are normal-ly used when pumping is required. Nowadays there is another increasingly used possi-bility, direct solar pumping.

With **direct solar pumping**, batteries to power the pumping engine are not needed, as it is directly powered from the energy supplied by solar cells.
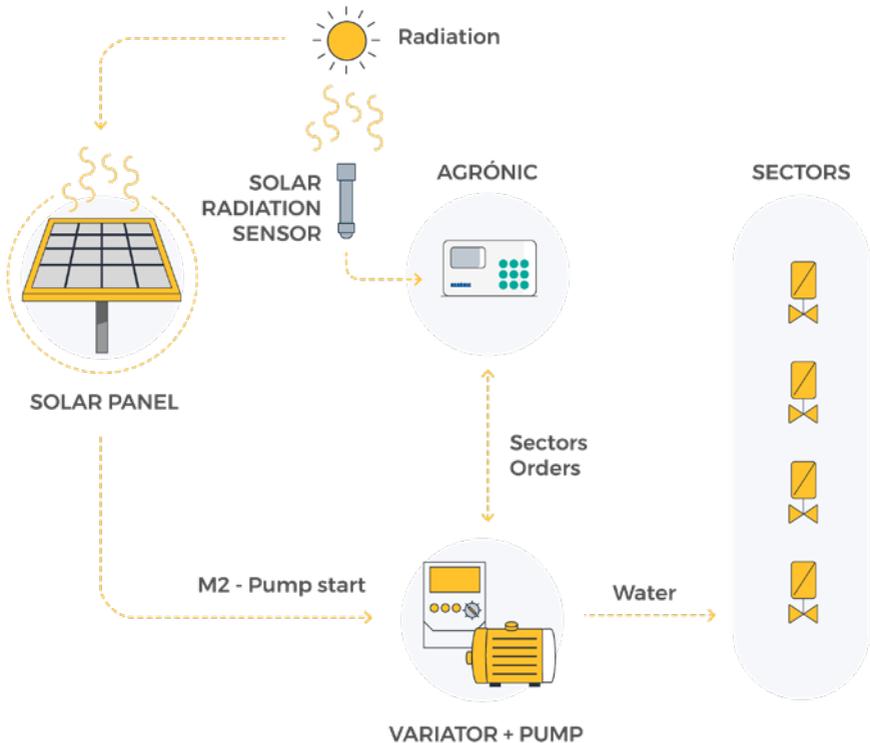
If irrigation is needed when there is insufficient solar energy, a **hybrid system** can be used (solar energy and power grid or diesel). This system allows harnessing solar energy, and irrigates at a low cost, and ensures that you can always irrigate with power grid or diesel.



To be able to use the solar irrigation, the Agrónic 2500 must have the option PLUS and the option of analog inputs activated and there must be the solar radiation sensor.

System works at different priority levels for irrigation processes at different pressures. It also allows automatic irrigation starts in accordance with energy availability. Radiation sensor determines irrigation until energy is enough to generate working pressure.
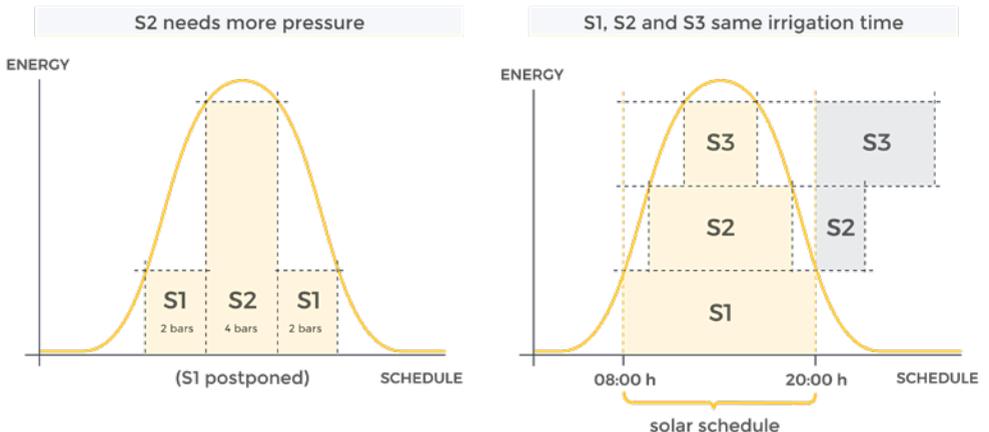
## Operating process

There are two types of solar installations:
- Solar system with solar energy (direct solar pumping).
- Hybrid installation, with solar energy and power grid or diesel.

### SOLAR ENERGY

If the installation is only with solar energy, follow these steps:

1. Assign Pump 2 to the sectors and connect it to the pump.

2. Prepare the determining factors of "Conditional stop" with radiation sensor origin needed for different working pressures; in each of them assign a radiation value high enough to generate the irrigation pressure.

3. Assign to the programs the relevant determining factor for the working pressure of their irrigation sectors.

4. In each of the sectors operating at the same pressure, the same auxiliary output is assigned to in-dicate the working pressure to the variable drive.

5. Limit the number of programs that can be started all at once by the priority system (configured in parameters - programs). In this way, pressure drop is avoided if too much flow is demanded. Usu-ally, higher priority is given to the program that needs higher pressure.

### HYBRID INSTALLATION

If the installation is hybrid, solar energy and power grid or diesel, follow these steps:

1. Assign Pump 2 to the sectors that only uses solar energy. Assign Pump 1 to the sectors that only uses power grid or diesel. If one sector is able to use both, assign Pump 1 and 2.

2. Prepare the determining factors of "Conditional stop" with radiation sensor origin needed for different working pressures, in each of them assign a radiation value high enough to generate the irrigation pressure.

3. Assign to the programs the relevant determining factor for the working pressure of their irrigation sectors.

4. In each of the sectors operating at the same pressure, the same auxiliary output is assigned to indicate the working pressure to the variable drive.

5. Limit the number of programs that can be started all at once by the priority system (configured in parameters - programs). In this way, pressure drop is avoided if too much flow is demanded. Usu-ally, higher priority is given to the program that needs higher pressure.

6. In the Parameters - Solar irrigation, activate solar hybrid irrigation. Select the timetable that will be exclusively solar irrigation. The "Conditional Stop" conditions assigned to the programs are also assigned.

Within the solar hours use P2 (solar irrigation) whenever there is enough energy.
Outside the solar hours:

- The program must have a determining factor assigned, which affects solar irrigation and sectors need to be assigned to P1 and P2.
- When starting the program check the solar determining factor: activate P2 if you have enough solar energy to irrigate, otherwise activate P1.
- During irrigation you may change the pump when solar energy becomes available.

**NOTE**    All sectors of a program must be assigned to the same pumps.
Solar hours only affect programs that use P1 and P2.

## Parameters

The solar irrigation is used when the installation has a hybrid energy system: power grid or diesel and solar cells.

With the solar irrigation activated, Agrónic selects where it has to take the energy from via the engines:

- P1: activates when energy is from the grid or diesel.
- P2: activates when energy is solar.

> PARAM. SOLAR IRRIGATION
>
> Activated: yes
> Schedule: 00:00 – 00:00
>
> Deter. factors:
> 00 00 00 00 00
> 00 00 00 00 00

The sectors that use the hybrid system must be assigned to both pumps. The Agrónic will decide whether to activate P1 (grid or diesel) or P2 (solar) depending on the configured parameters. It will never activate the two pumps at once.

Activated
- "Yes": the installation has a hybrid energy system.
- "No": the installation has only one energy system. Normal use of Agrónic.

Schedule   only solar energy will be used within the time set. Outside these hours, you can use the two types of en-ergy. If left to 0 all day, it will use both types of energy.

Determining factors  you can configure up to ten determining factors that affect the solar irri-gation. The numbers are entered here, from 0 to 50. When leaving 0, there are no determining factors. The determining factors are a condi-tional stop and are usually linked to a radiation sensor. Radiation indicates whether there is enough energy for solar irrigation. These determi-ning factors are used to decide whether to use solar energy or grid energy or diesel. The condi-tions must be assigned to the programs.