# Installation and Operation Manual

# ITS pump kit 2E

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## OVERVIEW

Pump kit 2E is the most simplistic pumped kit for ITS evacuated and flat plate collectors. It consists of our 12V pump running directly from a PV (solar electric panel). This configuration does not make use of a solar controller. The PV panel is simply mounted above the solar collector and when the sun shines on the solar collector it also shines on the PV panel causing the pump to work. This makes the installation very simple since no 220V electrical connection need to be made and no controller need to be wired in. The system is also immune to Eskom power failures. The disadvantage of this system is that it has no control. Therefore there is no pipe freeze protection, over temp protection and also under heavy cloud conditions the pump might not be able to run while the solar thermal collector might still generate a bit of heat. The overall system efficiency is slightly lower due to the constant pumping and slight cooling might take place if the geyser is relatively hot when the early morning sun causes the pump to run.

**Where to use**: This kit is ideal for clients looking for a cost effective installation. It features easy installation, trouble free operation and immunity to power outages. Due to the fact that it runs directly from solar electricity it cannot provide freeze protection and should not be used with flat plate collectors in frost areas.

**This kit consists of:**

1. ITS-12Vdc pump with integrated CtrlLite 1sense controller
2. 15mm spring type non-return (check) valve
3. 10W PV solar electric panel

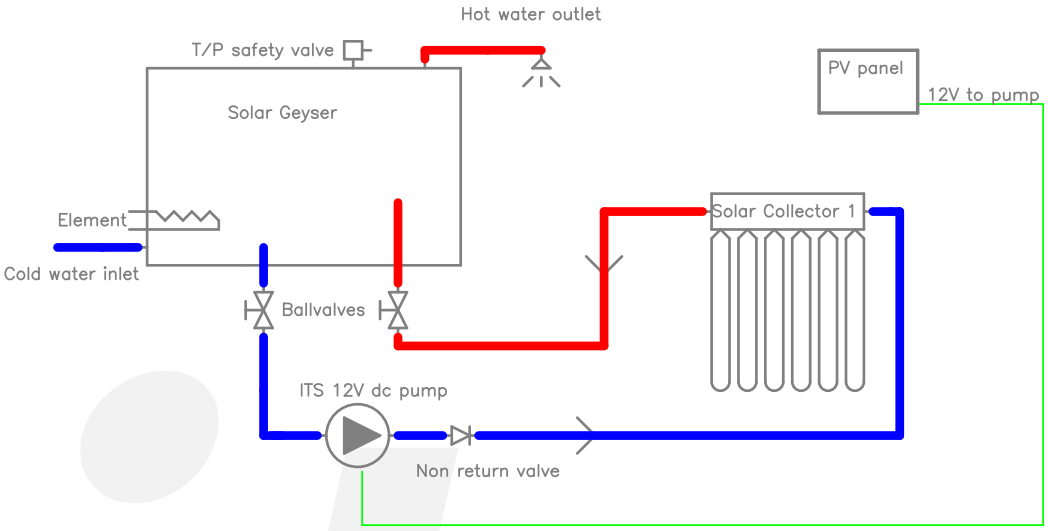
Fig 1. Pump with lever ball valve and non return valve connected

Fig 2. 10W PV panel

## INSTALLATION

Below is shown the system diagram of a typical installation using this pump kit. ITS recommends the use of a lever ball valve before the pump for easy servicing of the solar system as well as a air release valve on the solar collector to ensure that trapped air does not restrict the flow rate. The pump must always be installed on the solar send (cold solar port) as close to the geyser as possible. The pump must also be under the water level of the geyser so that if the water supply to the geyser falls away the pump will not run dry. Always install anti-siphoning traps at the geyser to prevent heat from siphoning away from the geyser at night. Always install a non-return valve (check valve) after the pump to prevent superheated water from pushing back past the pump during collector stagnation.

Install the PV panel so that it has the same solar facing as the solar thermal collector (directly above the solar collector is normally the easiest). Also ensure that there is no form of shading on the PV panel. The power connection from the PV panel to the solar pump can be made with standard 1.5mm ripcord. Please note that it is a 12Vdc system and therefore there is a positive (red) and negative (black) connection. If the polarity is connected the wrong way around it might result in the pump being damaged.



## BASIC TECHNICAL SPECS

| | |
|---|---|
| **Product name** | ITS 12Vdc pump |
| **Power** | ±6W |
| **Voltage** | 12Vdc |
| **Max Temp** | 90°C |
| **Max Pressure** | 600kPa |
| **Head** | 2m |
| **Flow rate** | 4 – 8 L/min |
| **Port connections** | 15mm male |

| | |
|---|---|
| **Product name** | 10W PV panel |
| **Type** | Poly crystalline |
| **Voltage (Vmp)** | 16.5Vdc |
| **Power** | 10 Wp |
| **Current (Isc)** | 0.78A |

| | |
|---|---|
| **Product name** | Non return valve |
| **Type** | springloaded |
| **Pressure drop** | |
| **Port connections** | 15mm female |
| **Max Temp** | 90°C |