

## Heliostar 252

### SPECIFICATION FOR SOLAR COLLECTORS

#### Performance Specification for Complete Thermal Solar Hot Water Generation System

The solar system shall comprise of a fully integrated system which shall include but not limited to the calorifier(s), solar panels, pumps, all interconnecting pipe work (other than domestic hot water distribution and return pipework to and from sanitary / kitchen appliance) and controls. The Mechanical contractor shall install the primary flow and return pipework between calorifiers and to / from main LTHW boilers and also the domestic hot water distribution and secondary return pipework sanitary / kitchen appliances.

The entire solar collector system shall be designed and supplied by a specialist manufacturer and installed by a specialist contractor who has been approved and vetted by the supplier and consultant engineer. The specification, as detailed below, is based on details supplied by Roth UK, Higher Ford, Wiveliscombe, Taunton, Somerset, TA4 2RL. Tel 01984 623982 Fax: 01984 62391 Email: [sales@roth-uk.com](mailto:sales@roth-uk.com) Alternative manufacturers / specialists will be considered, subject to being equal and approved.

Within any technical submittal presented, all key components (equal to those listed below) shall be detailed, together with comprehensive system performance data to include, but not limited to the following:

- Graphical results of efficiency model for annual solar energy consumption as percentage of total consumption (in kWh)
- Graphical results of maximum daily collector temperature (in °C) during a typical annual period.

Tabulated results of annual simulation to include:

- Collection surface area irradiation
- Energy produced by collectors
- Energy produced by collector loop
- DHW heating energy supply
- Solar system energy to hot water
- Energy from auxiliary heating
- Natural gas savings in m<sup>3</sup>
- CO<sub>2</sub> emissions avoided in kg CO<sub>2</sub> Pa
- DHW Solar Fraction in percentage
- System efficiency

Below is scheduled the equipment, based on a Roth system. This list the key components and may not state all necessary ancillaries etc. which shall be included within the supplied system to ensure an efficient solar hot water generation system is formed to operate at an optimum efficiency, making the best use of the available Solar energy wherever possible.

The solar system shall comprise of the following key components:

- Roth Heliostar - flat solar collector panels
- Installation assembly
- Controller
- All interconnecting pipes, collector flexi-pipes and connection sets
- All sensor pockets
- Roth Solar Station
- Auto air vent
- Flush and Drain kit
- Heating medium – Glycol Fluid mix
- Energy meter incorporated in the controller
- Cylinder temp sensor
- Solar radiation sensor
- Pre assembled and sealed valves and safety assembly
- Flow regulating valve to control the solar heating system during commissioning and operation
- Integral check valves
- Solar system expansion vessels
- Pipework, charging vessel and cylinder insulation

The detailed solar specification for the main components is as follows:

### **Roth Heliostar flat collector**

Made of a closed polycarbonate case construction, the Roth Heliostar unites high-tech material and mature technology. The polycarbonate case of the Roth Heliostar assures optimal heat storage, in combination with the high performance absorber, the Roth Heliostar guarantees highest efficiency.

The material is characterised by its special durability, impact strength and temperature resistance and is perfectly suitable for outside usage due to its UV-resistant construction.

### **Solar panel specification (single flat plate panel) 252 collector**

Length	2100 mm
Width	1200 mm
Height	109 mm
Gross surface area	2.52 m <sup>2</sup>
Aperture surface area	2.30 m <sup>2</sup>
Weight	43 kg
Collector case	highly stressable polycarbonate case construction, tight all around due to deep-drawn manufacturing process of one piece, permanently corrosion resistant
Glass cover	low-iron solar safety glass transmission $\tau = 91 \%$
Absorber	vacuum, high selectively coated full area absorber
Absorption	$\alpha = 95 \%$
Emission	$\epsilon = 5 \%$
Fluid capacity	1.46 l
Heat transfer medium	solar fluid Heliostar® and F2
Operation pressure	15 bars
Solar sensor sleeve	inside $\varnothing = 6 \text{ mm}$
Collector connection	1/2" MT flat sealing
Collector yield, per annum	over 525 kWh/m <sup>2</sup> a
Area of application	domestic water heating and heating support

### **Regulation unit:**

For systems with dual DHW heating using solar panels and oil/gas fired boilers - with digital temperature display; energy statement; reloading suppression for the boiler; and heating up of the pre-heat stage and diagnostic system

For wall mounting with optional connection of heat meters and solar cell -the regulation unit offers terminals for the connection of a mains power supply, solar or bypass circuit pump, circulation pump for heating up the pre-heat stage, switched output for suppressing reheating by the boiler, thermostat function and central fault messages.

Function - The regulation unit starts the solar circuit pump for DHW as soon as the set differential temperature has been reached.

The electronic temperature limiter in the regulation unit will limit the temperature inside the DHW cylinder. This device switches the solar circuit pump off when the set temperature is exceeded. Measuring the temperature differential and entering the volume flow can create an energy statement.

Display of the hours run by the solar circuit pump.

### **Controlling temperature sensors:**

As required by specialist installer to ensure the system operates efficiently and safely.

### **Solar – Station:**

To simplify the installation and selection of the pumps and safety equipment, the Solar – station comprises:

- Pre assembled and sealed valves and safety assembly
- Flow regulating valve to control the solar heating system during commissioning and operation
- Integral check valves.

### **Diaphragm expansion vessels:**

A diaphragm expansion vessel is a closed expansion vessel whose gas chamber (nitrogen filling) is separated from the liquid chamber (heat transfer medium) by a diaphragm and whose inlet pressure is subject to the system head.

### **Miscellaneous Components:**

All other necessary components such as connection pipes, air separators, quick acting air vent valve, filling vales, plate heat exchangers, circulating pumps, safety valves and solar manual filling pump shall be supplied and install by the specialist installer as necessary to allow a fully functional, efficient and safe system to operate in accordance with good industry standards.

The Roth system shall be generally configured in accordance with the controls and installation diagrammatic for this particular application as detailed in the technical guide.