Institut für Solarenergieforschung GmbH
Hameln / Emmerthal

Test Centre for Solar Thermal Components and Systems

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1. Summary

Company:	**Thermomax Ltd.** Balloo Crescent Bangor, BT 19 7UP United Kindom	Report no.: Report date:	110-06/D 03.11.2006
Type:	**HP 200 30**	Serial no.: Year of production:	MB 08617 2006

The following results were obtained from a test of the thermal performance of a solar collector according to **EN 12975-2:2006**. They apply to the collector described more precisely in the test report no. 110-06/D and to the tests and procedures described herein.

Description of the collector

Type	Evacuated tubular collector	Aperture area	3.229 m²
Length/Width/Height	2005 / 2127 / 97 mm	Absorber area	3.021 m²
Max. operation pressure	8 bar	Gross area	4.265 m²
Weight, empty	75.1 kg	Recommended flow rate	60..150 kg/m²h
Heat transfer fluid	Polypropylene	Thickness of absorber sheet	0.12 mm
		Number of tubes	30

Test results

Coefficients of efficiency
(determined outdoor)

$$\eta = \eta_0 - a_1 \cdot (t_m - t_a)/G - a_2 \cdot (t_m - t_a)^2/G$$

Based on:	aperture area	absorber area
η_0 =	0.727	0.778
a_1 =	0.85 W/m²K	0.91 W/m²K
a_2 =	0.0093 W/m²K²	0.0100 W/m²K²

Incident angle modifier
(determined outdoor)

proj. angle of incidence θ	0°	10°	20°	30°	40°	50°	60°
$K_{\theta b,trans}(\theta_{trans})$	1.00	1.00	1.02	1.03	1.01	0.94	0.80
$K_{\theta b,long}(\theta_{long})$	1.00	1.00	0.99	0.98	0.96	0.92	0.86
$K_{\theta d}$ =				0.88			

Power output per collector unit

$T_m - T_a$	Irradiance 400 W/m²	700 W/m²	1000 W/m²
10 K	909 W	1614 W	2319 W
30 K	830 W	1535 W	2240 W
50 K	727 W	1432 W	2137 W

Peak power per collector unit **2349 W_{peak}** at G = 1000 W/m² and $t_m - t_a$ = 0 K

Pressure drop (water, 20 °C) Δp = 0.8 mbar at $\dot{m}$ = 50.3 kg/h
Δp = 4.4 mbar at $\dot{m}$ = 130.0 kg/h

Thermal capacity (calculated) c = 4.2 kJ/(m²K) C = 13.6 kJ/K

Stagnation temperature t_{stg} = 183.6 °C at G_S = 1000 W/m² and t_{as} = 30 °C

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