

1 SUNTUBE Specifications

Type	MP6 3000
External Dimensions, L x W x H [mm]	2972 x 897 x 165
Gross Weight, excluding fluid [kg]	59
Heat Conduction Fluid Capacity [ltr]	3
Circulation Flow Rate [ltr/min]	6.0 – 9.0
Number of Collector Tubes	6
Pitch of Collector Tubes [mm]	145
Gross Area [m ²]	2.67
Absorber Area [m ²]	2.06
Selective Absorber Characteristics:	
Absorptivity:	0.91
Emissivity:	0.15
Maximum Operating Pressure [kPa]	490
Connection Pipe Material & Size [mm]	Brass tube, 22.2 dia
Component Materials:	
Absorber plate	Copper sheet with wavelength-selective coating
Collector tube	Copper tube
Glass tube [mm]	126 [dia] x 2 [thickness] soda-lime glass
Enclosure	Fluorine film laminated steel
Insulation:	
Header [mm]	50 [thickness] rubber
Absorber plate	Vacuum less than 10 ⁻² Pa

DESIGNED-IN RELIABILITY

The Riomay Suntube holds certification from the Japan Quality Assurance Organisation, JQA, recognised in the UK as BS EN12975 and by the Carbon Trust for the ECA (Enhanced Capital Allowance) – INTA 610,000.



suntube specifications and technical details

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2 SAFETY AND DURABILITY OF NEG SOLAR TUBE COLLECTOR

Parameter	Test Method	Result
Pressure (Leak) Test	11.2kg/cm ² for 2 min*	No leaks
Exposure Test without Fluid	Exposed outside for one year	No damage, no leaks
Boiling	Boiling test	No damage, no leaks
Resistance of Exterior to Weathering	Adhesion test* Salt-water spray test*	No peeling No rusting
Water Pollution	Japan Water Works Association Pollution Test	No pollution
Vibration Resistance	Vibration at 1G	No damage
Heat Shock	Water spray test* Flushing test*	No damage No damage

* Standard test method of Japan Solar System Development Association

3 RELATIONSHIP BETWEEN INSTALLATION HEIGHT, WIND PRESSURE AND SAFETY FACTOR

Installation height [m]	10	20	30	40	50
Wind pressure [kg/m ²]	304	406	449	483	511
Safety factor	2.5	1.9	1.7	1.6	1.5

4 STRENGTH

Glass Tube

No	Item	Permitted loading	Safety factor	Remarks
1	Bending load	150 kg	2.5	Load concentrated at tube centre. Fulcrum space is 1973mm
2	Impact load	55 cm	5	280g steel ball drop test
3	Compression load	143 kg	2.5	Tested using 10x10x5 cm wooden block

MP6 – 3000

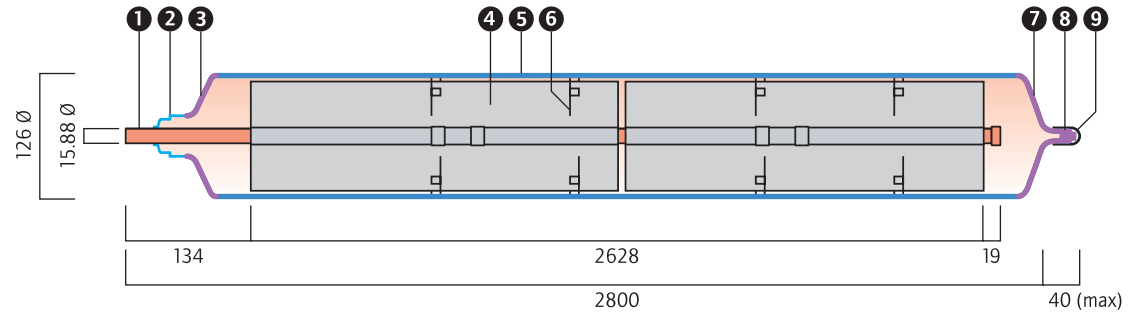
No	Item	Permitted Loading	Safety factor	Remarks
1	Water pressure resistance	See Table 3	–	
2	Snow load	100 cm	2	3kg/m ² was assumed for the unit weight of snow 1cm deep
3	Wind pressure	5.0 kg/cm ²	12	Tested by the inner water pressure resistance in the copper tube.

5 PERFORMANCE

No	Item	Performance
1	Instantaneous energy collection efficiency	See Fig. 1, p. 18
2	Daily energy collection efficiency	See Fig. 2, p. 18
3	Pressure loss	See Fig. 3, p. 18
4	Characteristics of selective absorber	Absorptivity a : more than 0.91 Emissivity e : less than 0.15
5	Durability of selective absorber	After exposure to the sunshine weathermeter for 1500 hours, the difference of a and e are less than 0.01
6	Heat resistance of selective absorber	After heating at 400°C for five hours in vacuum, the difference of a and e are less than 0.01
7	Durability of enclosure	No rusting observed after salt-water spray test for 96 hours
8	Vibration resistance	No leakage and no defect observed after vibrating at 1G
9	Stagnation resistance	No leakage and no defect observed after exposing to the sun for one year (see Fig. 4, p. 18)
10	Vacuum stability	No deterioration observed after exposing to the sun for 10 years

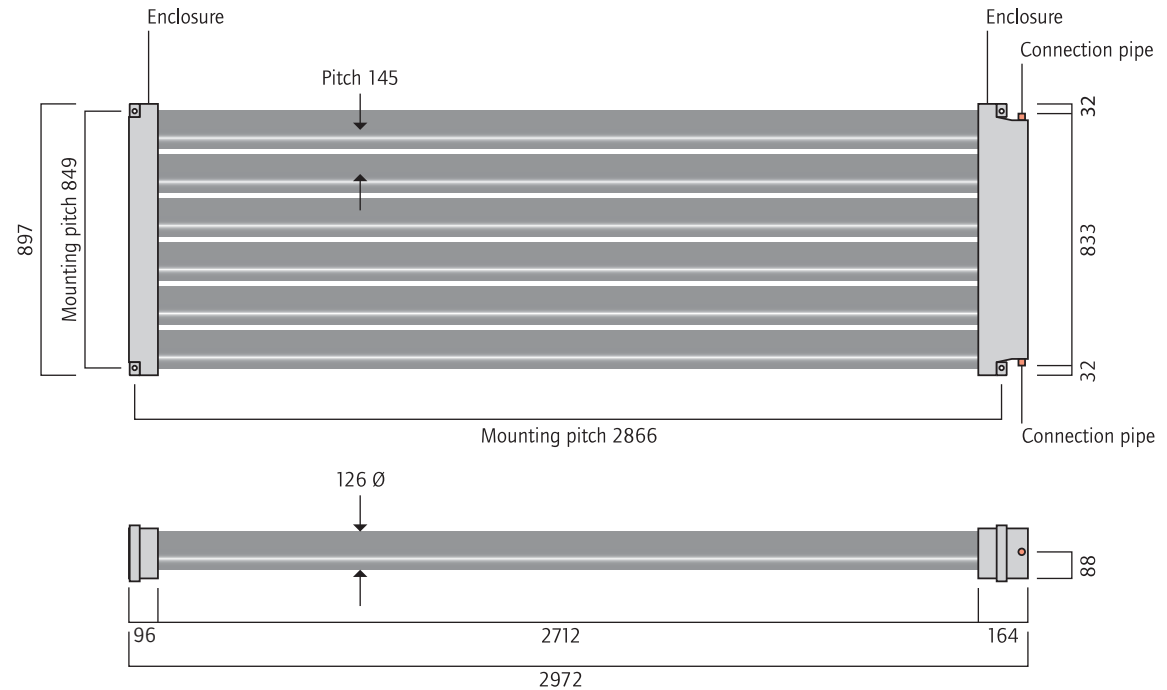
SUNTUBE STRUCTURE

- 1 Copper tube
- 2 Sealing metal
- 3 Glass cap
- 4 Absorber plate
- 5 Glass tube
- 6 Retainer
- 7 Glass cap
- 8 Exhaust tube
- 9 Rubber cap



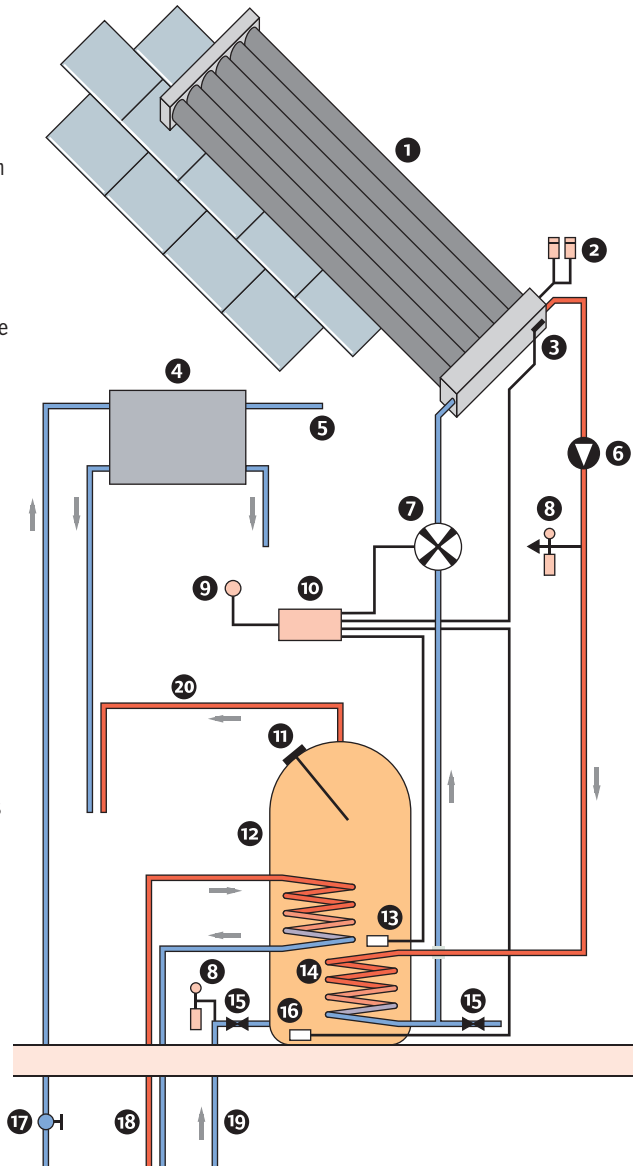
SUNTUBE MODULE

Scale approx. 1 : 25
All measurements: mm



INDIRECT PRESSURISED SOLAR SYSTEM WITH TWIN COIL SOLAR CYLINDER

- 1 Suntube solar collector
- 2 Automatic air vent and pressure relief valve
- 3 High sensor
- 4 Existing cold water cistern
- 5 Existing overflow
- 6 One-way valve
- 7 Solar circulating pump
- 8 Pressure vessel, relief valve and gauge
- 9 Power supply
- 10 Solar controller
- 11 Immersion heater and thermostat (optional)
- 12 Twin coil insulated solar cylinder
- 13 Auxiliary sensor
- 14 Solar coil
- 15 Drain cock
- 16 Low sensor
- 17 Existing stopcock – mains cold water
- 18 To existing boiler
- 19 Mains in
- 20 Hot water to taps



INDIRECT SOLAR HEATING SYSTEM TO SWIMMING POOL USING EXISTING FILTRATION PLANT

- 1 Automatic air vent and pressure relief valve
- 2 High sensor
- 3 Suntube solar collector
- 4 Pressure vessel, relief valve and gauge
- 5 Time clock
- 6 Power supply
- 7 Solar circulating pump
- 8 Heat exchanger
- 9 Filtration
- 10 Solar controller
- 11 Low sensor
- 12 Relay
- 13 Filtration pump
- 14 From pool
- 15 Return to pool
- 16 One-way valve

NB: One solar panel is shown here for diagrammatic purposes. More than one panel would be required to heat an average swimming pool.

