

# TKM-ENERSOL-TP4

Changes in weather  
alteration of the collectors

Thermodynamics on the one  
and  
photovoltaics on the other



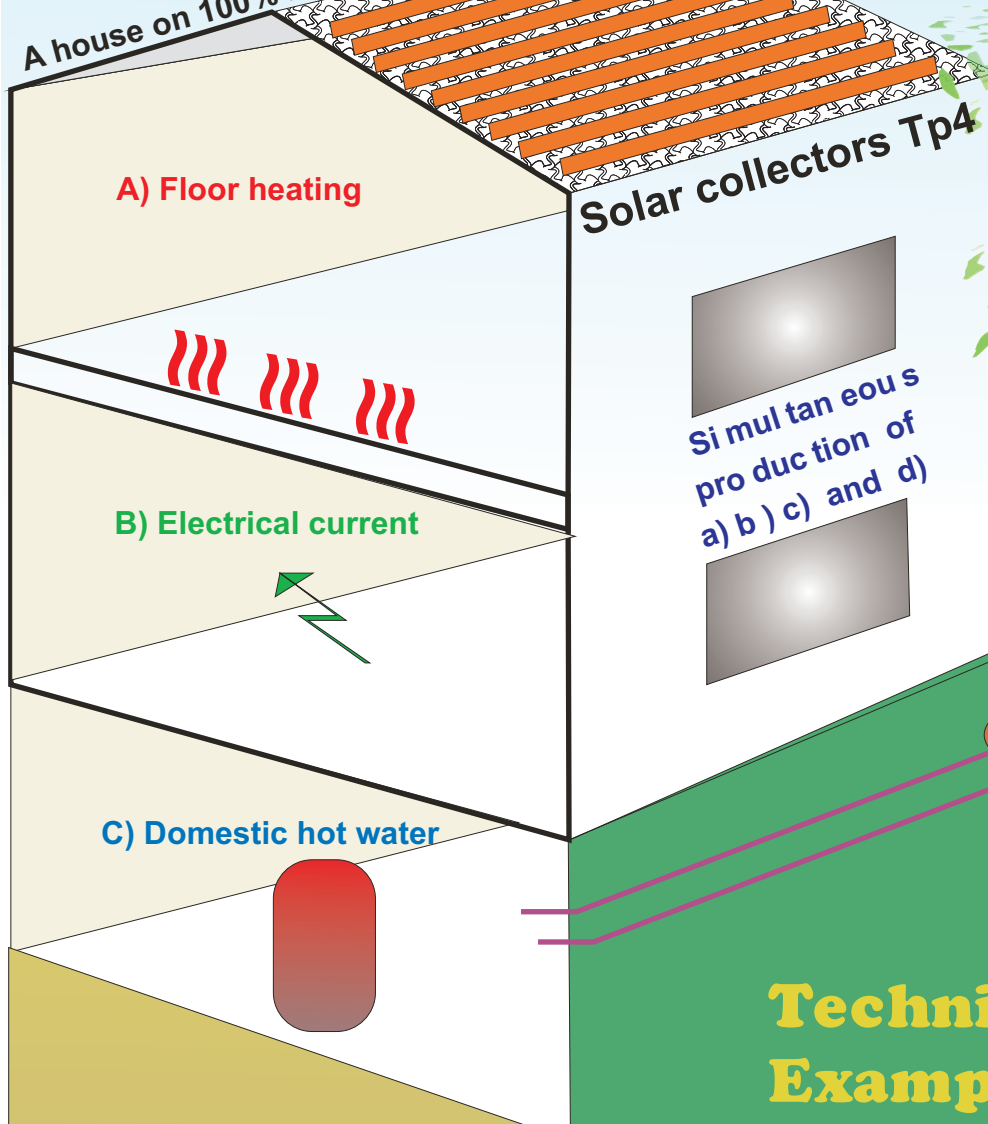
A double installation in one and the same area

## SOLAR-ENERGY REVOLUTION !!!

Double faced hybrid  
solar collectors TP4

- \* thermodynamics for floor heating systems
  - \*\* photovoltaics with hybrid cooling effect
  - \*\*\* domestic hot water
  - \*\*\*\* swim-pool heating
- Automatic rotation by requirements & season

A house on 100% renewable energy



A) Floor heating

B) Electrical current

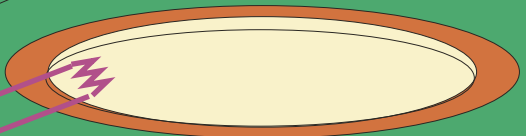
C) Domestic hot water

Solar collectors Tp4

Simultaneous  
production of  
a) b) c) and d)



Solar pergola



d) Swimming pool heating

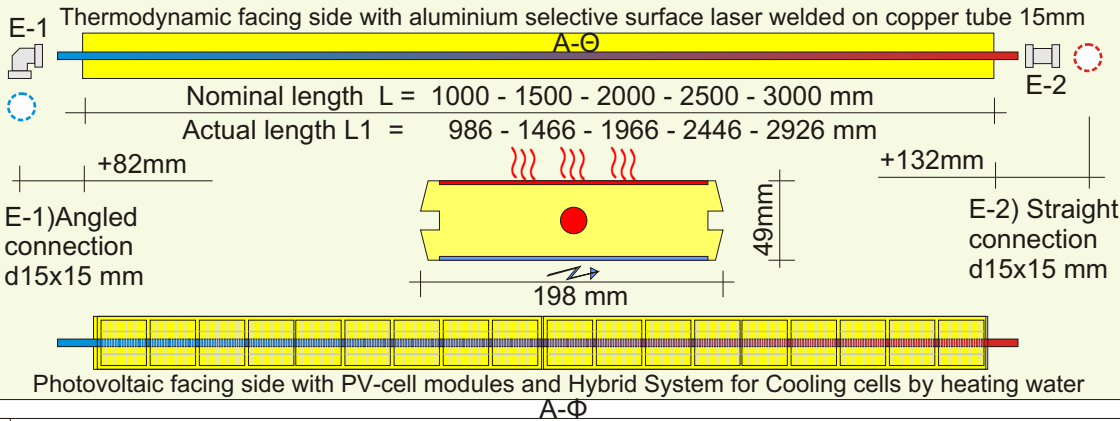
**Technical leaflet TP4**  
**Example of ordering**  
**Mounting instructions**

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Thermic Ltd, 26 km Old National Road, Athens-Thiva, 19600 Mandra Attikis, Greece  
Tel 30-210-5555523 Fax 30-210-5555668 mobil. 30-693-2231959  
www.thermicsol.com Email:lars.f@thermicsol.com www.tp4-enersol.com

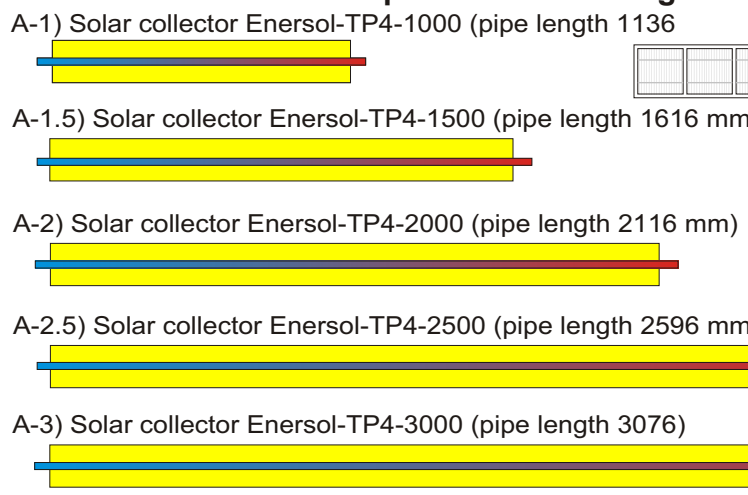
# 1 Double faced Solar Collector Tp4 and connection accessories etc. (E)



# Construct your own Solar panel system

- 1) Select the type
  - a) Thermodynamics
  - b) Photovoltaics or
  - c) Double function (1)
- 2) Select the length of the collectors and the number of panels required (2)
- 3) Select the distance between the panels depending on the shadowing effect (9)
- 4) Select the single or double structure of solar panels (11/12)
- 5) Choose the suitable distribution pipes with the right distance (3-5)
- 6) Select all necessary connection couplings for panels and distributing pipes (6-8).
- 7) select rotation-device
  - a) fixed position
  - b) 120' single faced
  - c) 360' double faced.
- 8) Install it by yourself or with our support.
- 9) See our PV-leaflet for more information about photovoltaic specifications etc.

# 2 View of solar collectors Tp4 in standard lengths



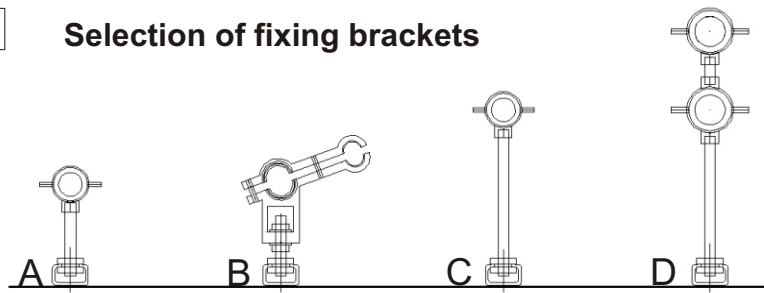
**Photovoltaic modules**  
Preconstructed weatherproofed panels of photovoltaic cells

9x'156' cells = length 1460 mm

6x'156' cells = length 980 mm

Incorporated by order or later additive mounting on request.

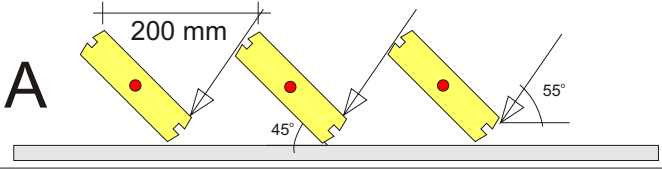
# 10 Selection of fixing brackets



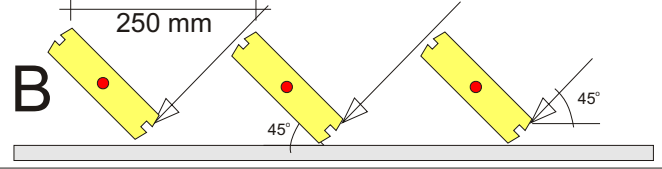
- A) Single Inlet pipe bracket suitable for fixed position and 120' single faced
- B) Double Inlet pipe bracket suitable for 360' rotation device
- C) Single outlet pipe bracket Suitable for single panel set structure
- D) Double outlet pipe bracket suitable for double panel set structure

# 9 Selection of distribution pipes and panel distance due to shadowing effects

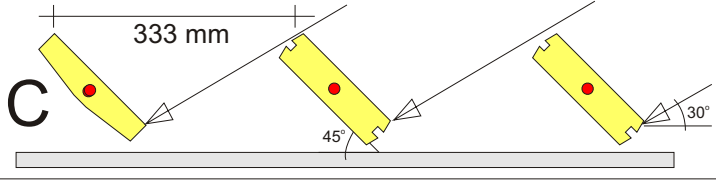
With distributor pipe (1) and c/c 200 mm it is possible to connect 5 panels per meter at an shadowing angle of 45° which makes it suitable for summer hot water heating and shadowing purpose for balconys, swim-pools or gardens.



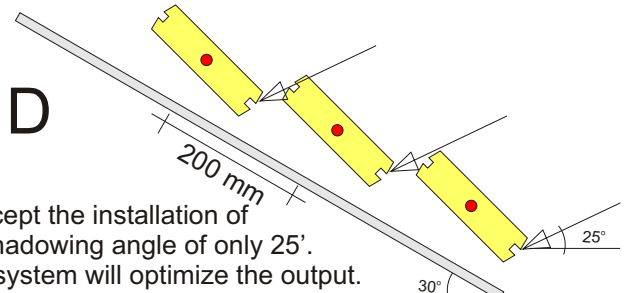
With distributor pipe (2) and c/c 250 mm it is possible to connect 4 panels per meter at an shadowing angle of 45° which makes it suitable for year around hot water heating, space floor heating and summer photovoltaic (PV) function.



With distributor pipe (3) and c/c 333 mm it is possible to connect 3 panels per meter at an shadowing angle of 30° which makes it suitable for vinter hot water heating, space floor heating and winter photovoltaic (PV) function.



If a declining surface is available to the south, then all distributor pipes 1, 2 or 3 can be selected depending on the their angle combined with the surface angle, which covers all kind of applications.



For example a declining roof at an angle of 30' can accept the installation of c/c 200 mm distributor pipes resulting in a final solar shadowing angle of only 25'. Selection of a auto rotating device and a solar tracker system will optimize the output.

**3 Single distribution pipe d22 and connection couplings Z**

Distributor for vertical connection

B-4) Extension pipe for inlet flow L 2000 mm

B-3) Distributor pipe for inlet flow type 333x2000 mm with 6 outlets d15 at distance c/c=333 mm

B-2) Distributor pipe for inlet flow type 250x2000 mm with 8 outlets d15 at distance c/c=250 mm

B-2) Distributor pipe for inlet flow type 200x2000 mm with 10 outlets d15 at distance c/c=200 mm

**5 Double distribution pipe d28 (or d22) and connection couplings (H)**

Distributor for horizontal connection

D-4) Distributor pipe for outlet flow type 200x2000 mm with 2 x 10 outlets d15 at distance c/c=200 mm

D-3) Distributor pipe for outlet flow type 250x2000 mm with 2 x 8 outlets d15 at distance c/c=250 mm

D-2) Distributor pipe for outlet flow type 333x2000 mm with 2 x 6 outlets d15 at distance c/c=333 mm

D-1) Extension pipe for outlet flow L 2000 mm

**4 Single distribution return pipe d22 and connection couplings Z**

Distributor for horizontal connection

C-4) Distributor pipe for outlet flow type 200x2000 mm with 10 outlets d15 at distance c/c=200 mm

C-3) Distributor pipe for outlet flow type 250x2000 mm with 8 outlets d15 at distance c/c=250 mm

C-2) Distributor pipe for outlet flow type 333x2000 mm with 6 outlets d15 at distance c/c=333 mm

C-1) Extension pipe for outlet flow L 2000 mm

**6 Connection couplings d22 (F)**

F-4 F-3 F-2 F-1

**8 Connection couplings d28 (G)**

G-4 G-3 G-2 G-1

**7 Connection couplings d22 (F)**

F-1 F-2 F-3 F-4

**11 Single collector set A1, A2, A3**

A-1  
6 x  
c/c  
333  
mm

A-2  
8 x  
c/c  
250  
mm

A-3  
10 x  
c/c  
200  
mm

2000mm

**12 Double collector set 6 x A2**

A-2

A-2

A-2

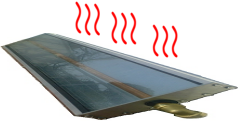

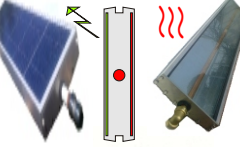



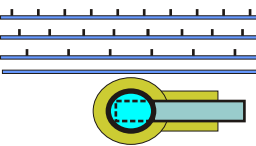
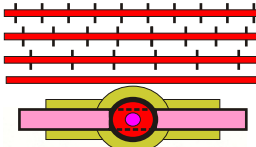


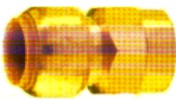


2000mm

**12 Rotating device with stainless worm gear drive with 30W 12VDC cylindric motor and quadraple solar tracker sensor**

For multiple collector-sets up to 4 x 2 = 8 m total length and up to 24 solar panels in a row



## TP4-Enersol - Thermic Ltd - 19600 Mantra Attikis - Greece Net Export Price List 2013

	Solar collector Enersol-TP4-Heat extruded aluminium el/static paint selective alum. heating surface laser-welded onto copper tube dimension: collector (copper tube)	Length 1.00 m (1.10) Length 1.65 m (1.75) Length 2.00 m (2.10) Length 2.50 m (2.60) Length 3.00 m (3.10)	TP4-1000 TP4-1650 TP4-2000 TP4-2500 TP4-3000	A1 A1.5 A2 A2.5 A3	___ x 100.0 = ___ ___ x 125.0 = ___ ___ x 150.0 = ___ ___ x 175.0 = ___ ___ x 200.0 = ___
	Solar collector Enersol-TP4-PV1 incorporated PV-cell modules hybrid cooling interactiv al.-wall single incorporated copper tube dimension: collector (copper tube)	Length 1.00 m (1.10) Length 1.65 m (1.75) Length 2.00 m (2.10) Length 2.50 m (2.60) Length 3.00 m (3.10)	PV1-1000 PV1-1650 PV1-2000 PV1-2500 PV1-3000	PV1 PV1.5 PV2 PV2.5 PV3	___ x 200.0 = ___ ___ x 250.0 = ___ ___ x 300.0 = ___ ___ x 350.0 = ___ ___ x 400.0 = ___
	Solar collector Enersol-TP4-PV2 double faced, double functioning side A) see Enersol-TP4-Heat side B) see Enersol-TP4-PV1 dimension: collector (copper tube)	Length 1.00 m (1.10) Length 1.65 m (1.75) Length 2.00 m (2.10) Length 2.50 m (2.60) Length 3.00 m (3.10)	PV2-1000 PV2-1650 PV2-2000 PV2-2500 PV2-3000	TV1 TV1.5 TV2 TV2.5 Tv3	___ x 250.0 = ___ ___ x 315.0 = ___ ___ x 375.0 = ___ ___ x 450.0 = ___ ___ x 525.0 = ___
	Connector of solar panel to pipe Straight Coupling in SS-316	d 15 x $\Phi$ 15 mm $\frac{1}{2}$ " x $\Phi$ 15 mm	CON-15/15 CON-15/1/2	E2 E3	___ x 9.0 = ___ ___ x 8.0 = ___
	Connector of solar panel to pipe Angled Coupling in SS-316	d 15 x $\Phi$ 15 mm	ANG-15/15	E1	___ x 12.0 = ___
	Connector of solar panel to pipe Tee Coupling in SS-316 for twin connection to single pipe	d 15x15x15 mm	TEE-15/15/15	T1	___ x 20.0 = ___
	Distributor pipe 6-8-10 panels Single type in SS 304 or 316 vertical inlet - horizontal outlet Isolation 13mm UV-stabilized	10 exits c/c 200 mm 8 exits c/c 250 mm 6 exits c/c 333 mm 0 exits pipe 22 mm	SIN-22/200 SIN-22/250 SIN-22/333 SIN-22/000	B1 B2 B3 B4	___ x 140.0 = ___ ___ x 120.0 = ___ ___ x 100.0 = ___ ___ x 25.0 = ___
	Distributor pipe 6-8-10 panels Double type in SS 304 or 316 horizontal outlet connections Isolation 13mm UV-stabilized	10 exits c/c 200 mm 8 exits c/c 250 mm 6 exits c/c 333 mm 0 exits pipe 28 mm	DIP-28/200 DIP-28/250 DIP-28/333 DIP-28/000	D1 D2 D3 D4	___ x 170.0 = ___ ___ x 150.0 = ___ ___ x 130.0 = ___ ___ x 30.0 = ___
	Connector of distributor pipes Straight Coupling in SS-316	22 x 22 mm 28 x 28 mm	CON-22-22 CON-28-28	Z1 H1	___ x 12.0 = ___ ___ x 13.0 = ___
	Connector of distributor pipes Male Coupling in SS-316	22 x 1/2" A 22 x 3/4" A  28 x 1" A	MAL-22-1/2A MAL-22-3/4A  MAL-28-1A	Z2 G2  J2	___ x 20.0 = ___ ___ x 21.0 = ___  ___ x 27.0 = ___
	Connector of distributor pipes Female Coupling in SS-316	22 x 1/2" F 22 x 3/4" F  28 x 1" F	FEM-22-1/2F FEM-22-3/4F  FEM-28-1"F	Z3 G3  J3	___ x 20.0 = ___ ___ x 23.0 = ___  ___ x 37.0 = ___
	Disconnection-tool type 305 suitable for click-couplings with metallic handles	$\Phi$ 15 mm $\Phi$ 22 mm $\Phi$ 28 mm	ERG-15 ERG-22 ERG-28		___ x 5.0 = ___ ___ x 7.0 = ___ ___ x 12.0 = ___
	Disconnection-tool type 405 suitable for click-couplings with plastic handle	$\Phi$ 15 mm $\Phi$ 22 mm $\Phi$ 28 mm	PLA-15 PLA-22 PLA-28		___ x 2.0 = ___ ___ x 2.0 = ___ ___ x 3.0 = ___
	120' motorized tilting device Single side solar tracker with 2 solar sensors	per set up to 16 panels linear motor	MTD-120		___ x 600.0 = ___
	Tilting device accessories	per panel	TIL2x60		___ x 20.0 = ___
	360' motorized rotation device Double side solar tracker with 4 solar sensors	per set up to 24 panels rotation motor	MRD-360		___ x 900.0 = ___
	Worm drive, screw and wheel	per panel	Wd32x60		___ x 40.0 = ___

The prices are indicative and may change without previous notice. VAT not included

**TOTAL:**