



PV Performance / Operation Temp.

All photovoltaics are tested under standard test conditions: at an irradiance level of 1000W/m² and a temperature of 25°C.

PV performance and temperature are inextricably linked. For every 1°C rise temperature there is a drop of 0.5% of electrical output.

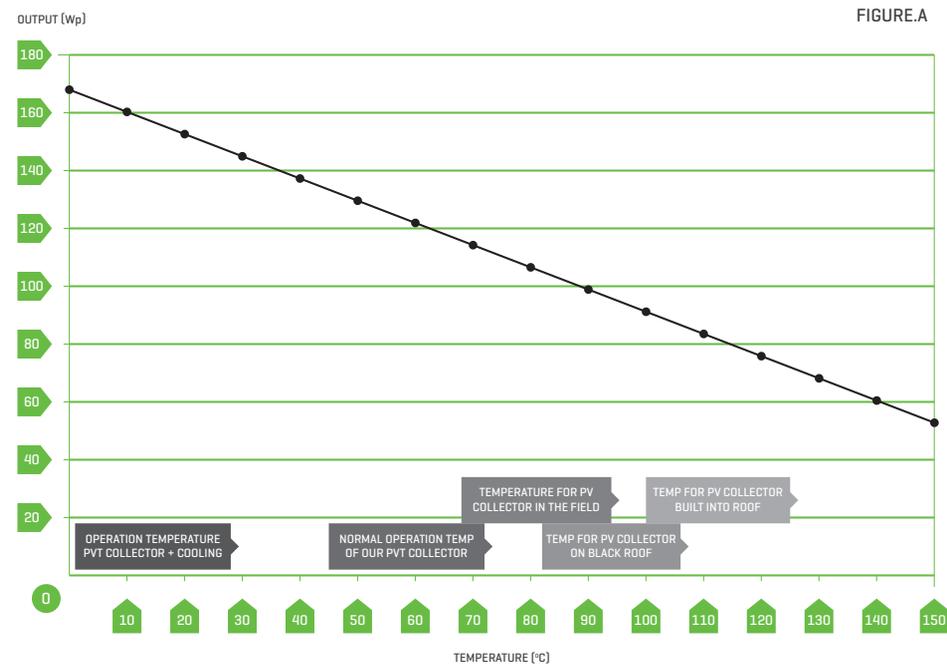
When under direct sunlight, the temperature of a standard PV module may be as high as 110°C, resulting in a 43% loss in efficiency due to heat, leading to a subsequent reduction in annual performance.



See – FIGURE.A

Source ISPA & IEA. Produced for Nord West Europe.

Effective PV Performance / Operation Temperature.



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The benefits of cooling a PV module.

When the PV module is actively cooled, reducing its nominal temperature closer to that of standard test conditions, the overall annual output of the module will

be improved. A Volther Hybrid PVT panel, stabilised at an average of 45°C, will produce roughly 20% more output over a 12 month period [when compared to a PV system with the same peak output].

PVT collector types and selecting the right product.

What are the product differences?

There are two types of Volther PVT collector, PowerVolt and PowerTherm. The project will determine the correct panel selection.

What is PowerVolt?

The PowerVolt collector has been developed to maximise the electrical return of the panel, making it an enhanced PV collector, capable of producing a reasonable amount of heat production in the summer.

The peak outputs of this panel are 190/460 watts electrical/thermal respectively.

When correctly installed the collector produces approximately 11-12% more electricity than conventional PV and provides a contribution to the thermal requirements of a building.

This is perfect for customers wishing to maximise the electrical energy returns from a given area.

A UK house with 16m² of available south facing roof area, can use PowerVolt panels

to produce the equivalent annual output of 18m² of conventional monocrystalline photovoltaics. The same area of PowerVolt collectors will offset approximately the same amount of thermal energy as 4m² of conventional solar thermal collectors. Using separate PV plus solar thermal would therefore require 22m² to generate the same electrical and thermal energy of 16m² of PowerVolt thermal collectors.

In conjunction with our new heat pump technology we are able to optimise the available energy provided by the sun during winter months, producing enough heat to satisfy most of the hot water and heating needs of an average sized house, except in the most extreme weather conditions.

What is PowerTherm?

The PowerTherm collector has been developed to maximise the thermal return of the panel, making it a thermally focused collector with useful electrical production.

The peak outputs of this panel are 175/680 watts electrical/thermal respectively.

It will produce roughly 80% of the output of the equivalent area of solar thermal and approximately 80% of the PV output of the equivalent area. Perfect for a project with restricted space, where maximum energy returns are sought, this product is very well-suited to the social housing market.

At the other end of the scale, it's also ideal for use with swimming pools. The collector operates at lower temperatures, supplying year round heat to the pool and the electrical energy needed to offset the running of the pool's equipment.

Life Expectancy and Warranty?

Our PowerVolt and PowerTherm collectors come with a 10 year manufacturer's warranty, and a guaranteed output of at least 80% after 20 years.

VOLTHER
HYBRID COLLECTORS
POWERTHERM
W 190 / 460

VOLTHER
HYBRID COLLECTORS
POWERVOLT
M 175 / 680

Dimensions	828 x 1655 x 90mm	860 x 1660 x 105mm
Weight	24.4kg.	34.4kg.
Liquid Content	1.2Lt.	1.2Lt.
Cell Efficiency (STC)	17.5%	17.5%
Module Efficiency (STC)	14.88%	10.9%
Ratio [e/th] at 60C	1:1	1:3
Absorber Panel	Mono-Crystalline	Mono-Crystalline
Number of Cells	72	72
Cell Dimensions	125 x 125mm	125 x 125mm
WP (W) Nominal Power	190	175
Imp (A) Nominal Current	5.2	5.2
Isc (V) Short Circuit Current	5.6	5.6
Vmp (V) Nominal Current	36.5	32.7
Voc (V) Ope Circuit Voltage	45.2	45.2
Heat Exchanger	Copper Strip	Copper Strip
Internal Piping	Copper	Copper
Flow (L/H)	65	65
Test Pressure Bar	20	20
Operating Pressure Bar	10	10
Cover Glass Hardened	Low Iron Tempered Glass	Modul Glass 4mm
Sealing	EPDM & Silicon	EPDM & Silicon
Maximum Temperature	<110°C	<110°C
Housing	Aluminium	Aluminium
Rear Side	Aluminium	Aluminium
Product Warranty	10yrs	10yrs
Quality Guarantee	90% < 10yrs 80% < 20yrs	90% < 10yrs 80% < 20yrs

RADIATION ΔT = 10°C	1000 Q = 55 1/h/m ²	W/m ²	n
POWERTHERM	T out	Wth/m ²	We/m ²
	10°C	>680	161.3
	20°C	680	153.8
	40°C	557	138.8
	60°C	475	123.8
	80°C	370	108.8
			>83%
			82%
			68%
			58%
			46%

RADIATION ΔT = 10°C	1000 Q = 55 1/h/m ²	W/m ²	n
POWERTHERM	T out	Wth/m ²	We/m ²
	10°C	>600	178.7
	20°C	510	171.2
	40°C	317	156.2
	60°C	113	141.2
	80°C	-71	126.2
			>77%
			68%
			47%
			25%
			6%

Call 08458 622 143

VOLTHER HYBRID PVT COLLECTORS



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Newform Energy™

VOLTHER – HYBRID PVT SOLAR COLLECTORS.

A VOLTHER HYBRID PVT PANEL IS A SINGLE SOLAR COLLECTOR ABLE TO PRODUCE ELECTRICITY, HEATING AND DOMESTIC HOT WATER. ALL WITH ZERO CO₂.

Photo. Awake Imaging

Photovoltaic Thermal (PVT).

What is a PVT collector?

A PVT collector is the combined assembly of a PV module, for the conversion of electrical energy, with a high efficiency flat-plate solar collector, to convert thermal energy.

Photovoltaics (PV) are semiconductors, and have one drawback - degradation in performance due to temperature. In the UK, on a sunny summer day, when one would expect maximum PV performance, the output will be significantly reduced because of the temperature of the silicon wafer in the PV.

By regulating panel temperature using a fluid cooling system, a balance can be produced, trading off between PV efficiency and thermal output. Using this principle, it is possible to obtain a higher electrical yield, coupled with enough free heat to offset a large proportion of the annual hot water requirements of a typical house.

Volther Hybrid PVT is a step-change technology which maximises the energy return from a given area. A finely balanced solution which

optimises efficiency and saves space and money relative to alternative solar systems.

What are the benefits of PVT?

PVT is a hybrid technology which combines monocrystalline photovoltaics and a high efficiency solar thermal collector. There are multiple benefits:

- A simple low cost, low maintenance energy solution capable of facilitating the government's zero-carbon strategy.
- Higher output efficiency at lower temperatures than the equivalent monocrystalline PV.
- Space saving, only one panel is required to produce both heat and electricity.
- Greatly improved paybacks over the combination of traditional PV and Solar Thermal technologies.
- Low maintenance, unlike other renewable sources of energy. Virtually fit and forget.
- Provides opportunities in combination with other renewable technologies to

most residential and light commercial buildings to reach zero-carbon.

What can be achieved with a PVT collector?

PVT collectors allow you to set-up a 'total solar energy system' for both electrical and thermal energy generation - because of its cooling effect on the PV module, this system has a higher efficiency at a much lower cost when compared to separate systems.

In combination with our **NEW** heat pump solution, we can eradicate almost all the heat related carbon and, a good proportion of the electricity related carbon used by an average house.

For more information, contact us:

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The Certification Mark for Onsite Sustainable Energy Technologies

PLEASE NOTE.
Both the PowerVolt and PowerTherm products have been classified as a 'Transition Product' under the Microgeneration Certification Scheme (MCS.)