

THE NEW POWER TO FUEL OUR FUTURE





The POWER COLLECTOR[®]

HELLO WE ARE SOLARUS. WE ARE A NEW KIND OF COMPANY

We are an innovative renewable energy company. We develop and market the PowerCollector[™]. A hybrid concentrated photovoltaic (C-PVT) and a thermal (C-T) collector. Our PowerCollector™ supplies clean and affordable heat and electricity for residential and industrial customers.

Solarus PowerCollectors[™] are capable of harnessing up to three times more solar energy compared to conventional photovoltaic products on the market. This increased efficiency allows Solarus to displace more fossil fuel based energy.

And here is how it works in detail...

Enjoy!



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PowerCollector™

POWER COLLECTOR C-PVT



PowerCollector C-PVT

- Hybrid collector
- Produces heat and electricity
- 1350W_{th} + 270W_{el}

POWER COLLECTOR C-T



PowerCollector C-T

- Thermal collector
- Produces heat
- 1500W_{th}

Solarus offers a hybrid PV-thermal PowerCollector producing heat and electricity, and a thermal PowerCollector producing only heat. Unlike other concentrators Solarus PowerCollectors perform well under cloudy conditions due to an optimised mirror technology. Solarus PowerCollectors also perform well in a stationary non-tracking mode due to a low concentration ratio. This reduces the complexity in the system and hence the maintenance.





Technical specifications

POWER COLLECTOR C-PVT

General specifications C-PVT

Dimension (L x W x H) :	1054 x 2443 x 241 mm
Weight :	65 KG
Aperture area :	2.31 m ²
Gross area :	2.57 m ²
Cover :	4 mm anti-reflective coated glass,
	super transparent, hailstone safe

Thermal properties C-PVT

Heat loss coefficient :	3.47 W / m² - K
Peak power :	1350 W (C-PVT)
Capacity antifreeze :	1,4 L / module
Max working pressure :	10 bar
Stagnation temperature :	180°C

Electrical properties per side C-PVT

Number of cells :	152
Cell dimension :	52 x 156 x 0,2 mm
Peak electrical power :	$270 W_{P} \pm 5\%$





Dimension (L Weight : Aperture area Gross area : Cover :

Heat loss coe Peak power : Capacity antif Max working Stagnation te



6



General specifications C-T

$\times W \times H$):	1054 x 2443 x 241 mm
	60 KG
a:	2.31 m ²
	2.57 m ²
	4 mm anti-reflective coated glass,
	super transparent, hailstone safe

Thermal properties C-T

efficient :	3.47 W / m² - K
	1500 W (C-T)
freeze :	1,4 L / module
pressure :	10 bar
emperature :	180°C

G Electrical specifications







Design

The PowerCollector C-PVT has a very robust design which combines Swedish creativity with Dutch industrial design.

MaReCo

Each PowerCollector consists of two identical halves. Electrically, the two halves are connected to each other in series to produce 40V at maximum power point operation. Thermally, the two halves can be connected in series or in parallel. Concentration of the sunlight is achieved by aluminium reflectors with the Maximum Reflector Concentration (MaReCo) geometry which is a patented technology. This enables collection of more of the available sunlight onto the cells and thermal receivers, throughout the day.

Each receiver is an aluminum thermal absorber sandwiched between two PV modules. The front side of the receiver receives direct sunlight, while the back side receives reflected and concentrated sunlight. The low concentration ratio eliminates sun tracking requirements and ensures a better collection of reflected sunlight under cloudy conditions.

Active Cell Cooling

The highly efficient aluminium receiver absorbs and transports the heat and uniformly cools the cells at the same time. Active Cell Cooling (ACC) is part of the secret behind the superior performance. PV cells do not like heat; for every 10°C they heat up, their electrical output goes down by 5%. Our ACC-technology counters that negative effect ensuring that the PV cells on Solarus PowerCollector C-PVT show a steady performance. While most PVT panels use EVA lamination of solar cells, Solarus uses its own transparent silicon gel recipe for solar cell encapsulation which is a result of many years of research and development. This enables the Solarus PowerCollector to operate at temperatures well above 80°C without any material degradation. On the other hand, the PowerCollector C-T consists of only the aluminium thermal receivers with a high absorbtion coefficient.



Whether it is on a 50 storeys high hotel or "just" on a 2 floors house, we understand that you want to minimize installation and maintenance time on the roof. Solarus optimised the thermal connections for quick and easy installation. Bellows and bushings are connected within seconds to our quick-connect fittings. The Solarus thermal fittings are guaranteed watertight, and can take high temperature differences and fluid pressures.

PowerCollector dedicated thermal auxiliaries





U-bend Pre-insulated U-bend is used to connect the two receivers within the same PowerCollector.

Bellows Bellows are used to connect to the next receiver left or right of the PowerCollector.

Adaptor The adaptor fits directly on to the receiver. No Teflon tape needed. Watertight up to 10 bar.



PowerCollector dedicated thermal auxiliaries installed



Adaptor



U-bend

The POWER COLLECTOR™

Bushings

Bushings are used to connect to the heat infrastructure (available in 1/2" and 3/4").

Connecting bellow / U-bend / Bushing Press the fitting into the coupling until the edge moves in between the two grooves. Watertight up to 10 bar.



Bellow



Bushing



Reducing installation time means satisfied installers and increased economic value of the entire system. Solarus has carefully studied the practicalities of projects around the globe, and we offer best in class installation material to make electrical connections. All materials are certified according to international standards on outdoor installation.

Micro-inverter / power optimiser mounting

Can be mounted on the side of the mounting structure or behind it.





Dual MPPT micro-inverter

The PowerCollectors can be electrically connected in three different ways



Spider cable

Micro-inverter connection





The POWER COLLECTOR™



DC-DC power optimiser

PV connections - 3

Power optimiser connection

Solarus systems

Solarus PowerCollectors do not stand on their own, they are part of a system. Our engineers have installed various types of systems tailored to meet the customers' needs. Ranging from a grid-tied heating system to a fully off-grid cooling system and other systems in between. Depending on your needs, a combination of electrical and thermal systems can be chosen. The Solarus system can also be integrated with other renewable energy sources, like PV or heat pumps.



U Solar thermal heating combined with other heat source



In situations where continuous heating is required, a solar thermal heating combined with other heat source is the optimal solution to make use of the suns free energy. Some of the examples are heating as a gas heater.

Solar thermal pre-heating system



Solarus PowerCollectors are suitable for heating water up to 70 °C for domestic hot water as well as for industrial processes. Some of the examples are hot water for shower, process water in food industry and cleaning water for industrial equipment.

Especially in processes where demand is not continuous, the best solution is to pre-heat the water with energy from the sun and then, if needed, boost it up with an auxiliary source.





of a room or storage. Solarus PowerCollectors heat up the tank, with supplementary heat provided to the tank by an auxiliary source such



Ask for our leaflet for more information





Ask for our leaflet for more information

Solar thermal cooling system



Around the world, big volumes of fruit and vegetables and medicines are wasted because of the lack of cooling. Solarus offers a solar thermal cooling system to store fresh products. The Solarus PowerCollectors can drive your cooling system.

Temperatures around 60-70 °C are required for adsorption / absorption cooling. PowerCollectors heat the tank and an additional auxiliary maintains the tank temperatures in situations when no sun is available.



Ask for our leaflet for more information

6 Electrical system with grid-connected central inverter



With smart string inverters self consumption of the electricity produced can be promoted. User can define the control parameters with regards to the

Electrical off-grid system **G**



For off-grid sites off-grid inverters in combination with different battery technologies are used. This solution promotes self-consumption while maximising the solar production. Surplus electricity produced is stored in the battery.





PowerCollectors can be connected directly to the grid via micro-inverters. Electricity produced is self consumed or fed into the grid, which reduces the net electricity consumption of the user.



self-consumption and the grid export. This is the preferable solution for larger installations.





Mounting set-ups

Solarus PowerCollectors can be mounted on rooftops, in the open field, on facades of buildings and as an in-roof system. For all these situations, mounting systems have been designed, and are available for local installations.

PowerCollector ideal configurations

Sets of 4



4 in a row



4 in a column, for an in-roof or tilted roof set-up



4 in a rectangle



Mounting systems

- Dedicated Solarus mounting for flat roof and for in-roof system.
- · In addition to standard flat roof stationary mounting, a special mounting with seasonal adjustment feature, meaning that PowerCollectors can be easily tilted to maximise the energy production throughout the year.
- The in-roof system is designed to give a homogeneous aesthetic look to the roof.



Mounting flat roof / ground



Mounting wall



Mounting in-roof

Mounting tilted roof



EasyConnect installation

To improve ergonomics and on-site handling time, the entire system is optimised for quick and easy connections. This includes the mounting set-up, thermal connections and heat infrastructure.



Maintenance alerts

For optimal performance, we advice timely maintenance on the PowerCollectors. Our remote maintenance and monitoring system has the option to guide in this process every 6 months and in case of deviations in the output of the system.



The POWER **COLLECTOR**

EasyConnect system The piping sections are pre-assembled in the factory, then placed on the roof and connected to each other and to the PowerCollector rows on site.

System monitoring

Electrical and thermal system parameters are monitored, which provides valuable information regarding the system performance and also reflects the health of the system.

Temperatures and flow rates at different locations in the system can be monitored. The electrical output is monitored per two PowerCollectors. The behaviour and the output of our system can be easily accessed and monitored by customers.

Why choose Solarus?



SOLARUS AGAINST PV

- More output per sq meter due to thermal energy harvesting (active cell cooling)
 - More net surface area available due to lower mounting angle
 - No degradation due to silicon encapsulation
 - Better roof-insulation value due to the air-chamber in the PowerCollector

SOLARUS AGAINST THERMAL

- More net surface area available due to lower mounting angle
- Self-supported pump operation due to solar electricity generation
- No tanks on individual collectors due to centralised heat storage
- Better roof-insulation value due to the air-chamber in the PowerCollector
 - No heat loss by wind due to the air-chamber

SOLARUS AGAINST PVT

- Designed to handle high temperatures and pressures
- Highest stagnation temperature in the market, no need to cover our PowerCollector
 - Highest thermal output in the 35°C to 65°C temperature range
 - More net surface area available due to lower mounting angle
 - Better roof-insulation value due to the air-chamber in the PowerCollector
 - No heat loss by wind due to the air-chamber



• Generates more than 3 times the energy of conventional solar PV panels • Substantially lower pay back time than other solar PV panels • Performs well under cloudy conditions due to lower concentration ratios • On average 35% less m² needed compared to traditional PV & T panels

LEADING IN NEXT GENERATION SOLAR

• Unique third generation hybrid collector, generating both heat and electricity • Built on 20 years of experience in solar thermal collector and PVT technology





SUNPOWER FOR THE PEOPLE



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