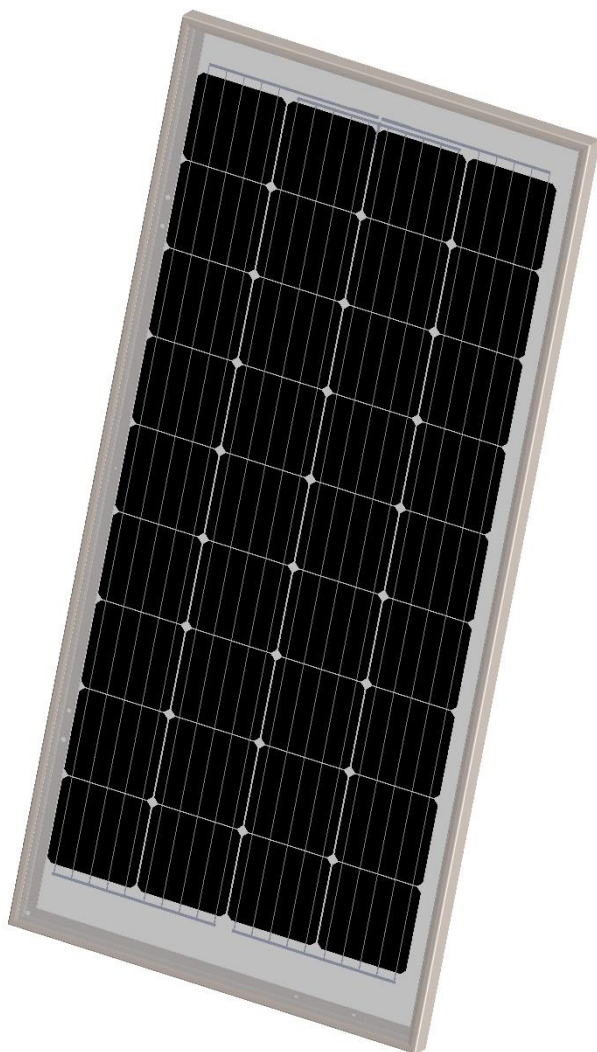


TSM190EX Solar Module

Ensuring safety requirements in your hazardous areas (Zone 1 and Zone 2), while providing high performance and durability, that's what the TSM190EX Solar Modules are built for. The TSM190EX solar module designed by TSS has highly efficient 36 monocrystalline PERC cells generating maximum energy.



ATEX/IECEX certified

For applications in hazardous areas, (i.e. LNG, Oil & Gas installations), we offer explosion proof solar modules. Fully certified according latest ATEX and IECEX guidelines.

Cost Effective Design

Provided with a junction box for both parallel and serial connections inside.

5 Busbar Technology

Incorporates 5 busbar technology which enhances the efficiency of the module by lowering the electrical losses

Ex-proof

The TSM190EX has been developed with your explosive environment in mind providing maximum protection in the most extreme conditions.

Glass-glass

Tempered glass is used to guarantee safety and strength.

IP66 junction box

The junction box contains diodes in a moulded terminal block. With 2 polyamide ATEX M25 cable glands for cables with a maximum diameter of 19mm you can connect solar modules in series and/or parallel.

Quality and Durability

Extremely solid extruded anodized aluminium frame leading to high stability.

Creating a solid and high performing solar energy system to keep you going ...Always!

TSM190EX Solar Module

Electrical Characteristics (*STC)

Max. power(P_{mpp})	190 W
Power tolerance	± 5 W
Voltage at P_{mpp} (V_{mpp})	20.96 V
Current at P_{mpp} (I_{mpp})	9.06 A
Open circuit voltage (V_{oc})	24.37 V
Short circuit current (I_{sc})	9.59 A
Module efficiency	16.0 %
Nominal voltage	12 V

* Standard testing conditions (STC): 1,000W/m² irradiation level, AM 1.5 spectrum at 25 °C cell temperature.


Thermal characteristics

TC P	-0.42 %/ °C
TC V_{oc}	-0.32 %/ °C
TC I_{sc}	0.047 %/ °C

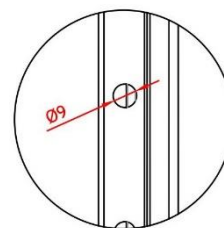
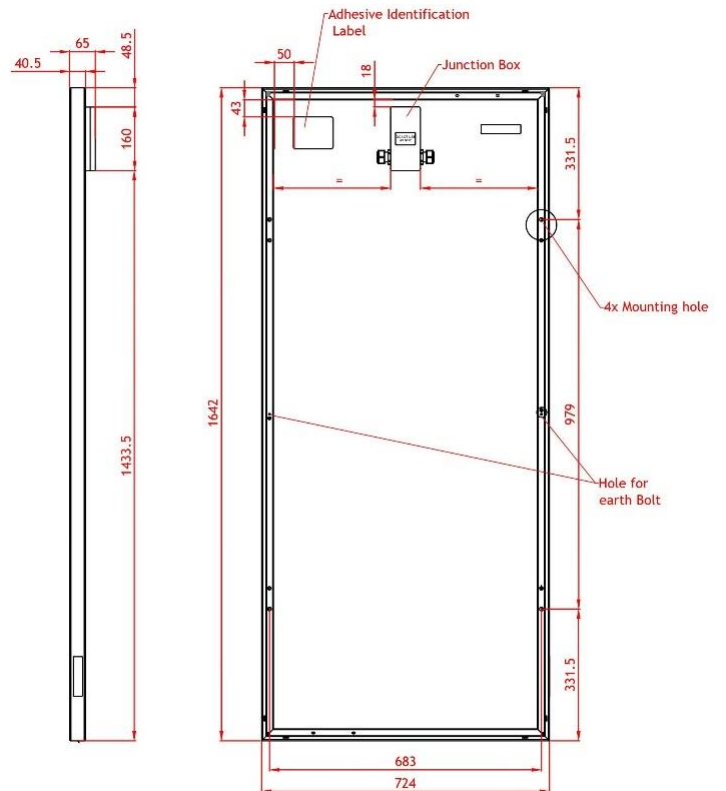
Additional data

Max. system voltage	320 Vdc
Junction box	GRP Ex e
Bypass diodes	2
Junction box	IP 66
Ambient temperature	-20 °C - +55 °C
Operational Temperature	-40 °C - +85 °C
Cells	156.75 x 156.75 mm
Frame	Anodized aluminium
Dimensions (L x W x D)	1642 x 724 x 65 mm
Weight	15 kg

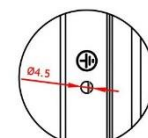
ATEX/IECEX certification

ATEX Protection	 II 2 G Ex eb mb IIC T4 Gb
ATEX Certificate	TÜV 12 ATEX 7148 X
IECEX Protection	Ex eb mb IIC T4 Gb
IECEX Certificate	IECEX TUR 12.0012X

Hazardous area certification by TÜV according NEN-EN-IEC 60079-0, 60079-7 and 60079-18 for Zone 1. Solar modules are produced according to IEC 61215/2 and IEC 61730.



Mounting Hole



Hole for Earth Bolt