

## Crystalline module with MONO cells



**SCHOTT MONO®**  
**180/185/190**

### At a glance

- Monocrystalline high efficiency cells >17.6 %
- High annual energy yield
- Positive power tolerance
- Elegant design
- Thorough SCHOTT quality control with German engineering

SCHOTT MONO® 180/185/190

The long-established German company SCHOTT Solar operates worldwide and started with the development and manufacturing of components for the solar industry in 1958.

SCHOTT Solar crystalline modules are specifically designed for both roof- and ground-mounted applications. Due to strict internal quality standards, all modules benefit from exceptionally long durability, which results in maximised profitability. The crystalline cells within each module are sorted to particularly narrow performance tolerances, thereby allowing series interconnections with minimal mismatch losses.

**Monocrystalline high efficiency cells >17.6 %:** The exceptional high cell efficiency indicates a high module power. Module efficiencies of up to 14.5 % will be generated.

**High annual energy yield:** The particular high module efficiencies deliver optimum yields for small areas. More power per module ensures high return on investment.

**Positive power tolerance:** The SCHOTT Solar modules hold a positive power tolerance of the nominal rating. This implies a high energy output and stable investment for the coming years.

**Elegant design:** The dark mono cells in relation with the black Aluminum frame look esthetically with excellent efficiency. The solid module frame secures superior torsional resistance. Therefore the elegant design reassures also a high degree of security for your investment.

**Thorough SCHOTT quality control with German engineering:** Stringent SCHOTT Solar quality standards mean internal tests twice as long as is required by the IEC. In connection with long-term performance guarantee German engineering offers long-term reliability for the owner of a SCHOTT Solar module.

## Technical Data

### Data at standard test conditions (STC)

Module type		SCHOTT MONO® 180	SCHOTT MONO® 185	SCHOTT MONO® 190
Nominal power [Wp]	$P_{mpp}$	$\geq 180$	$\geq 185$	$\geq 190$
Voltage at nominal power [V]	$U_{mpp}$	36.2	36.3	36.4
Current at nominal power [A]	$I_{mpp}$	4.97	5.10	5.22
Open-circuit voltage [V]	$U_{oc}$	44.8	45.0	45.2
Short-circuit current [A]	$I_{sc}$	5.40	5.43	5.46
Module efficiency (%)	$\eta$	13.7	14.1	14.5

STC (1000W/m<sup>2</sup>; AM 1.5; cell temperature 25°C)

Power tolerance (as measured by flasher): -0 W / +4.99 W

### Data at normal operating cell temperature (NOCT)

Nominal power [Wp]	$P_{mpp}$	130	134	137
Voltage at nominal power [V]	$U_{mpp}$	32.9	32.8	32.9
Open-circuit voltage [V]	$U_{oc}$	39.3	40.2	41.0
Short-circuit current [A]	$I_{sc}$	4.30	4.32	4.35
Temperature [°C]	$T_{NOCT}$	46.0	46.0	46.0

NOCT (800 W/m<sup>2</sup>, AM 1.5, windspeed 1 m/s, ambient temperature 20°C)

### Data at low irradiation

At a low irradiation intensity of 200 W/m<sup>2</sup> (AM 1.5 and cell temperature 25°C) 96 % of the STC module efficiency (1000 W/m<sup>2</sup>) will be achieved.

### Temperature coefficients

Power [%/K]	$P_{mpp}$	-0.44
Open-circuit voltage [%/K]	$U_{oc}$	-0.33
Short-circuit current [%/K]	$I_{sc}$	+0.03

### Characteristic data

Solar cells per module	72
Cell type	monocrystalline (pseudo-square, 125 mm x 125 mm)
Junction box	IP65 with three bypass diodes
Connector	Tyco-Connector IP67
Dimensions junction box [mm]	110 x 115 x 25
Front panel	low iron solar glass 3.2 mm
Backside panel	foil
Frame material	anodised aluminium, black

### Dimensions and weight

Dimensions [mm]	1,620 x 810
Thickness [mm]	50
Weight [kg]	15.5

### Limits

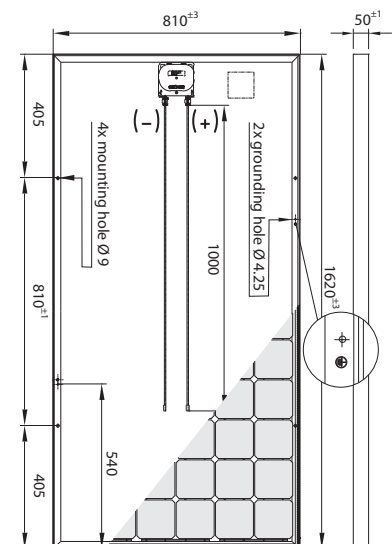
Maximum system voltage [ $V_{DC}$ ]	1000
Maximum reverse current $I_R$ [A]*	17
Operating module temperature [°C]	-40 ... +85
Maximum load (to IEC 61215 ed. 2)	pressure: 5,400 N/m <sup>2</sup> or 550 kg/m <sup>2</sup> suction: 5,400 N/m <sup>2</sup> or 550 kg/m <sup>2</sup>
Application classification (to IEC 61730)	A
Fire classification (to IEC 61730)	C

\* No external voltage in excess of  $U_{oc}$  shall be applied to the module.

### Permission and certificates

The modules are certified to IEC 61215 ed. 2 and IEC 61730, Electrical Protection Class II and the CE-guidelines. Moreover SCHOTT Solar is certified and registered to ISO 9001 and ISO 14001.

The **installation manual** contains additional information on installation and operation. Power measurement accuracy:  $\pm 4 \%$   
All information complies with the requirements of the standard EN 50380.



frame section

all dimensions in mm



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