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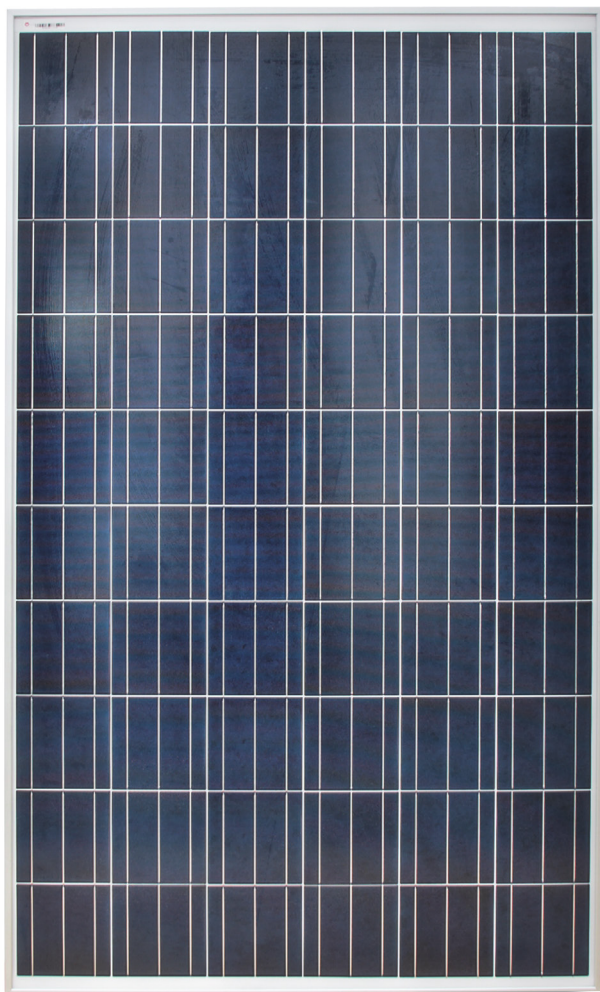
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EnergyPal

Solar Panel Guide Specification Data Sheet

**Waris S.r.l.
WRS 60 Cells
WRS245F-ST60F**

Also available on the web at
EnergyPal.com/waris-s-r-l-solar-panels/wrs245f-st60f



SERIES WRS ST 60 CELLS

Thanks to the use of the best components, they are all certified according to European standards.

Features

The solar cells used in our modules offer a high conversion efficiency of the sunlight. These property guarantee high yields. Our solar modules have only positive power tolerance of 0 + 5 W. These pledge a more stable production. The modules resist at the worst meteorological conditions and at extreme temperature.

Applications

All Waris solar modules are optimized for every type of PV system, from residential to industrial and PV plant.

Warranty and Certification:

Waris solar modules have a 12 years on product defects and a linear power output warranty:
97% towards the nominal power during the first life year and afterwards a maximum degradation not up at an annual 0,6%
92% towards the nominal power within the first 10 years from the purchase
85% towards the nominal power between the 11th and the 20th year from the purchase
83% towards the nominal power between the 21st and the 25th year from the purchase

All the modules are certified under IEC 61215:2005 and IEC 61730-1 IEC 61730-2 PID FREE



SERIES WRS ST 60 CELLS

STC: Standard test conditions - 1000 W/m² - AM 1,5 - 25°C

MODULE TYPE		WRS230 ST60F	WRS235 ST60F	WRS240 ST60F	WRS245F ST60F	WRS250 ST60F	WRS255 ST60F	WRS260 ST60F
NOMINAL CAPACITY (P _{MAX})	W	230	235	240	245	250	255	260
POWER TOLLERANCE	W	0 + 5	0 + 5	0 + 5	0 + 5	0 + 5	0 + 5	0 + 5
EFFICIENCY	%	14,05	14,36	14,66	14,70	15,27	15,58	15,88
NOMINAL VOLTAGE (V _{MPP})	V	28,96	29,20	29,43	29,66	29,89	30,11	30,33
NOMINAL CURRENT (I _{MPP})	A	7,94	8,05	8,15	8,26	8,36	8,46	8,57
OPEN CIRCUIT VOLTAGE (V _{OC})	V	36,46	36,76	37,05	37,34	37,62	37,90	38,18
SHORT CIRCUIT CURRENT (I _{SC})	A	8,55	8,67	8,78	8,90	9,01	9,12	9,23
MAX SYSTEM VOLTAGE	V	1000	1000	1000	1000	1000	1000	1000

NOCT: Nominal operating cell temperature conditions - 800 W/m² - AM 1,5 - Wind speed 1 m/s

NOMINAL CAPACITY (P _{MAX})	W	178,55	182,68	186,56	190,72	194,68	198,61	202,87
NOMINAL VOLTAGE (V _{MPP})	V	28,34	28,61	28,86	29,12	29,37	29,62	29,86
NOMINAL CURRENT (I _{MPP})	A	6,30	6,39	6,46	6,55	6,63	6,71	6,79
OPEN CIRCUIT VOLTAGE (V _{OC})	V	34,04	34,34	34,63	34,92	35,20	35,48	35,76
SHORT CIRCUIT CURRENT (I _{SC})	A	6,91	7,01	7,09	7,19	7,28	7,37	7,45

Thermal properties

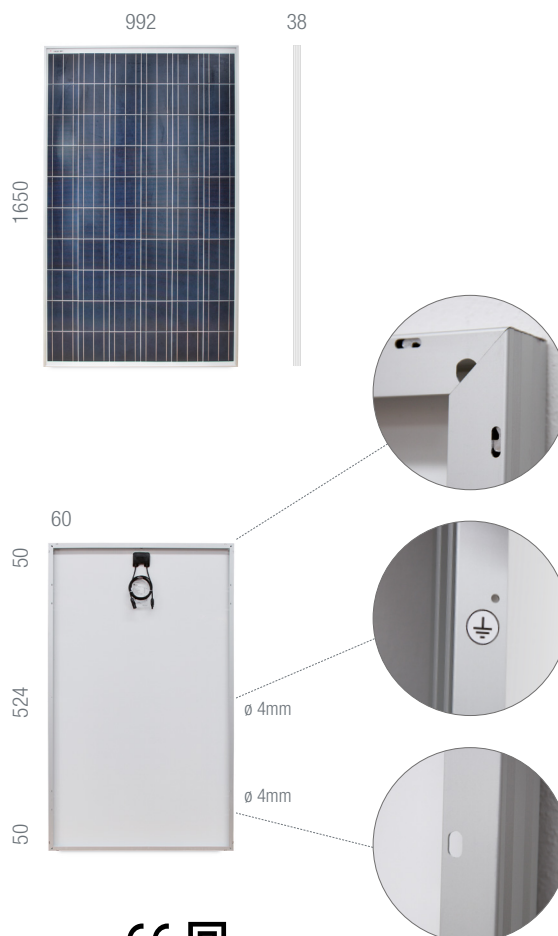
Noct - nominal operating cell temperature		45 ± 2°C
COEFF. TEMP. I _{SC}	mA / K	4.71
COEFF. TEMP. V _{OC}	mv / K	-121.2
COEFF. TEMP. P _{MAX}	% / K	-0.41

General data

DIMENSIONS	mm 1650 x 992 x 38
WEIGHT	kg 18,0
SOLAR CELLS	60 multicrystalline solar cells 156 x 156 mm - 3BB
COVER MATERIAL	High transparent solar glas (tempered) 3,2 mm
ENCAPSULATION	EVA
BACK MATERIAL	Multy layer polymer sheet in black, white colour or trasparent
FRAME	Anodized aluminium
JUNCTION BOX	IP65 with 6 bypass diode
CONNECTORS	MC4 - IP67

Operative conditions

TEMPERATURE	°C -40 a +90
MECHANICAL RATINGS	Approved for loads up to 5400 Pa (550 kg/m ²)



Waris reserves the right to make changes to product specifications. Rev.04 of 02/12/2013



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