

Photovoltaic Modules AP 48 48 cells – Multicrystalline silicon

Silver Wp: 170 - 175 - 180 - 185 - 190 - 195 - 200 - 205 - 210

Black: Wp: 170 - 175 - 180 - 185 - 190 - 195 - 200

Output Power exceeds nominal value



Characteristics & Performance

Available in Silver and Black versions

- **Quality and Robustness**
 - High Quality raw materials
 - Advanced production technology
 - Deep quality and process control
- **Resistance to critical environment**
 - Static load at 600 kg/m² (6000 Pa)
 - Dynamic load at 300 kg/m² - wind 150 km/h
 - Hail with diameter of 25mm and speed of 83 km/h
- **High productivity**
 - Special anti-reflective glass for higher energy yields: up to 4% more
 - Current/power range strictly classified

Product Warranty

- 10 years warranty on manufacturing defects

Performance Warranty

- 12 years warranty on 90% of the nominal power
- 25 years warranty on 80% of the nominal power

Disposal Warranty and Recycling

- COBAT (for Italy)

cobat

System Certifications

Integrated Management System

- Quality - UNI EN ISO 9001:2008
- Environment - UNI EN ISO 14001:2004
- Health & Safety - OHSAS 18001:2007
- Certiquality Certificate of Excellence



Product Tests and Certifications



Safety Class II

- **Conformity and Factory Inspection**
- **"MADE IN EU" Attestation for Italy**
- **Type Approval**
IEC 61215 - Quality and Robustness
IEC 61730 - 1 / 2 - Safety



EUROTEST
Laboratori

- **Salt Mist Fog Resistance Test-IEC 61701:2011**
Resistance in seaside areas
- **Ammonia Resistance Test-IEC 62716:2013**
Resistance in farms
- **Special Component mechanical test**
Mechanical load test for BIPV
- **PID Free (Potential Induced Degradation)**
- **Ageing Resistance Test**
2000h Heat-Dump Test (85°C/85%R.H.)
40 years ageing in average environmental conditions
- **Fire Reaction Class (Class I)**
UNI 9177

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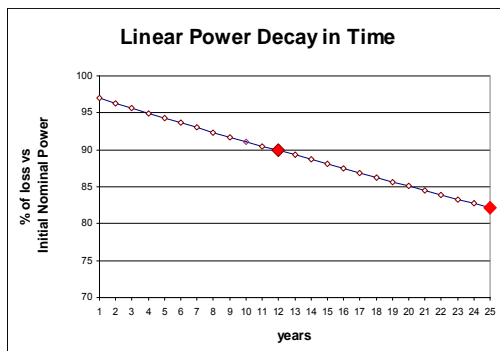
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CERTIFICAZIONE E TESTING

Photovoltaic Modules AP 48

Electrical Features

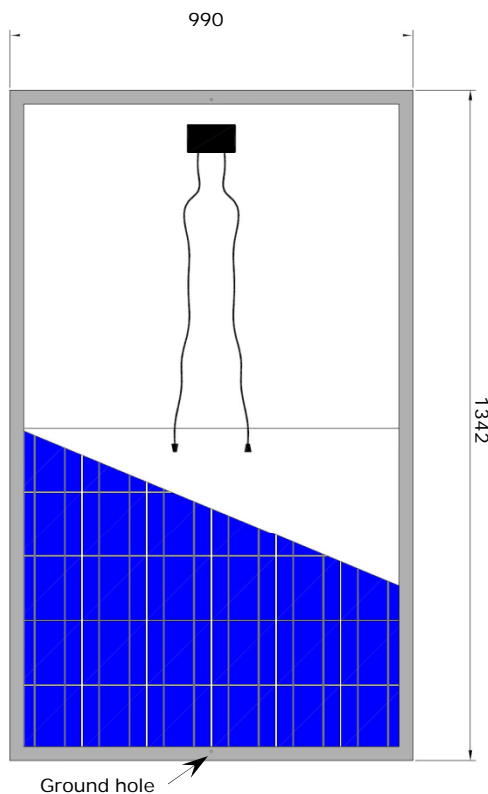
Type		AP 48-170	AP 48-175	AP 48-180	AP 48-185	AP 48-190	AP 48-195	AP 48-200	AP 48-205	AP 48-210
Performance at Standard Conditions (STC): Irradiance 1000W/m²; Module temperature 25°C; AM 1.5										
Model	Color	Silver/Black	Silver/Black	Silver/Black	Silver/Black	Silver/Black	Silver/Black	Silver/Black	Silver	Silver
Nominal Power	P _{mpp} (W)	170	175	180	185	190	195	200	205	210
Maximum Power Voltage	V _{mpp} (V)	22,52	22,81	23,00	23,08	23,20	23,40	23,55	23,70	23,87
Maximum Power Current	I _{mpp} (A)	7,56	7,70	7,83	8,05	8,20	8,35	8,50	8,65	8,82
Open Circuit Voltage	V _{oc} (V)	28,87	29,05	29,22	29,41	29,60	29,80	29,95	30,10	30,26
Short Circuit Current	I _{sc} (A)	8,32	8,47	8,60	8,75	8,89	9,00	9,05	9,20	9,34
Fill Factor	%	70,8	71,1	71,6	71,9	72,2	72,7	73,8	74,0	74,3
Module efficiency	%	12,80	13,17	13,55	13,92	14,30	14,68	15,05	15,43	15,81
Power Tolerance	%	0 / +3%	0 / +3%	0 / +3%	0 / +3%	0 / +3%	0 / +3%	0 / +3%	0 / +3%	0 / +3%
Working Temperature	(°C)	-40 / 85	-40 / 85	-40 / 85	-40 / 85	-40 / 85	-40 / 85	-40 / 85	-40 / 85	-40 / 85
Maximum Voltage	(V _{oc})	1000	1000	1000	1000	1000	1000	1000	1000	1000
NOCT (Silver)	(°C)	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2	43 +/- 2
NOCT (Black)	(°C)	44 +/- 2	44 +/- 2	44 +/- 2	44 +/- 2	44 +/- 2	44 +/- 2	44 +/- 2	\	\
Performance at NOCT: Irradiance 800W/m²; Module temperature 43°C Silver/45°C Black; AM 1.5										
Maximum Power	P _{max} (W)	125	129	133	136	140	144	148	151	155
Maximum Power Voltage	V _{mpp} (V)	21,44	21,62	21,83	22,05	22,29	22,43	22,63	22,82	22,99
Maximum Power Current	I _{mpp} (A)	5,83	5,98	6,05	6,15	6,22	6,45	6,53	6,60	6,76
Open Circuit Voltage	V _{oc} (V)	26,81	26,98	27,17	27,35	27,53	27,73	27,92	28,10	28,39
Short Circuit Current	I _{sc} (A)	6,52	6,62	6,73	6,85	6,95	7,11	7,15	7,19	7,25

All electrical measures ±10% tolerance (but P_{mpp} and NOCT)



Temperature Coefficients

of I_{sc} (α) = 0.06 % / °C // 5.429 mA / °C
of V_{oc} (β) = -0.31 % / °C // -0.116 V / °C
of P_{max} (γ) = -0.43% / °C // 0.969 W / °C



Design

Front	3.2 mm tempered glass
Cells	48 cells – Multicrystalline Silicon - 156 x 156 mm
Encapsulant	EVA (Etylene - Vinyl Acetate co/polymer)
Backsheet	Polymeric laminate - white backside white sunny side for silver modules black sunny side for black modules
Profile	Anodized Aluminium in silver and black versions
Junction Box	IP 65 - Class II - 3 by-pass diodes
Cables	2 unipolar. 4 mm ² wires - 1 m lenght
Connectors	MC4 compatible - rapid clutch

Dimensions

Lenght	(mm)	1342
Width	(mm)	990
Profile Thickness	(mm)	34
Weight	(kg)	14

Holes

Ground Hole	1 hole with identification label
Drain Holes	2 drain holes on each side



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