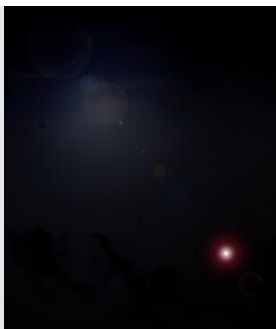




The highest technology

UNDER THE SUN

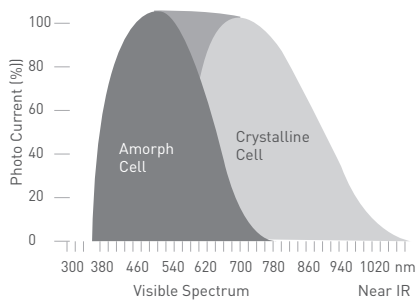
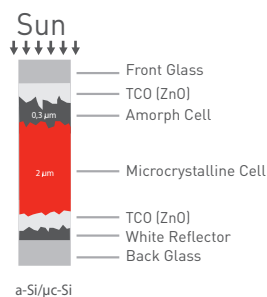


THE PRAMAC LUCE MICROMORPHOUS® MCPH MODULES ARE MANUFACTURED USING THE THIN FILM TECHNOLOGY IN DUAL SILICON LAYERS. THIS PROCESS COMBINES A TOP LAYER OF AMORPHOUS SILICON OVER A MICROCRYSTALLINE LAYER. THE SURFACE CELL ABSORBS AND CONVERTS THE VISIBLE SOLAR SPECTRUM, WHEREAS THE LOWER AREA ABSORBS AND CONVERTS THE NEAR IR AREA. THIS IS THE REASON WHY MICROMORPH® PANELS ARE EVEN MORE EFFICIENT. MOREOVER, THANKS TO THE FRAMELESS GLASS, THEY OFFER A FLAWLESS DESIGN, MAKING THESE MODULES SUITABLE FOR ARCHITECTURAL INTEGRATIONS.

THE MICROMORPH® TECHNOLOGY GUARANTEES GREATER EFFICIENCY AND FASTER ROI BECAUSE PANELS CAN ABSORB A BROADER SPECTRUM OF SOLAR RADIATIONS.

MICROMORPHOUS® PHOTOVOLTAIC MODULE

## PRAMAC LUCE MCPH



- Qualified, IEC 61646
- Safety tested, IEC 61730
- Periodic Inspection

LONG LIFETIME: 20 YEARS

HIGHLY EFFICIENT MICROMORPH®  
THIN FILM TECHNOLOGY

CEI/IEC 61646  
ED.2, 61730 CERTIFICATES

TEMPERED,  
HIGHLY TRANSPARENT,  
ANTI-REFLECTIVE SOLAR GLASS

Ø 4MM, IP67 MULTICONTACT®  
CONNECTIONS MC4

TÜV-CERTIFIED MULTICONTACT®  
PV-JB-LC, IP65 JUNCTION BOX  
WITH BY-PASS DIODE



Solar

The highest technology  
**UNDER THE SUN**



**PRAMAC SWISS SA**  
VIA CAMPAGNA 19 - 6595 RIAZZINO - SWITZERLAND  
WWW.PRAMAC.COM/SOLAR - SOLAR@PRAMAC.COM  
RELEASE 1.0 - 30.09.2009

## PRAMAC LUCE MCPH

### GENERAL FEATURES AND ELECTRICAL PARAMETERS

Cell/Module Type		Tandem-J microcrystalline and amorphous silicon (a-Si/uc-Si)							
STC specifications*		95W		105W		115W		125W	
		x	•	x	•	x	•	x	•
Maximum power	P <sub>mpp</sub> [W]	95,0	118,8	105,0	123,5	115,0	135,3	125,0	147,1
Tolerance	-- [W]	±5		±5		±5		±5	
Maximum power voltage	U <sub>mpp</sub> [V]	90,0	95,5	90,0	95,5	94,0	100,0	100,0	107,0
Maximum power current	I <sub>mpp</sub> [A]	1,06	1,17	1,17	1,29	1,22	1,35	1,25	1,38
Open circuit voltage	U <sub>oc</sub> [V]	125		126		129		133	
Short circuit current	I <sub>sc</sub> [A]	1,38		1,45		1,46		1,47	
Fill factor	FF [%]	55,31		57,63		60,89		63,93	
Module efficiency	η [%]	6,64		7,34		8,04		8,74	
Specific power	-- [W/m <sup>2</sup> ]	66,4		73,4		80,4		87,4	

\* stabilised value • initial value

\*STC: 1000 W/m<sup>2</sup>, cell temperature 25°C, AM 1.5 - Module certifications: CEI/IEC 61646, Safety Class II / IEC 61730  
The rated power may by ±5W and all other electrical parameters by ±5%

### TEMPERATURE COEFFICIENTS

Temperature coefficient of P <sub>mpp</sub>	αP <sub>mpp</sub> [% / °C]	-0,29
Temperature coefficient of U <sub>oc</sub>	αU <sub>oc</sub> [% / °C]	-0,39
Temperature coefficient of I <sub>sc</sub>	αI <sub>sc</sub> [% / °C]	+0,14
Temperature coefficient of I <sub>mpp</sub>	αI <sub>mpp</sub> [% / °C]	+0,14
Temperature coefficient of U <sub>mpp</sub>	αU <sub>mpp</sub> [% / °C]	-0,41
Noct	[°C]	47

### MECHANICAL FEATURES

Height	[mm]	1300
Width	[mm]	1100
Thickness of glass	[mm]	6,8
Height of active layer	[mm]	1270
Width of active layer	[mm]	1070
Depth	[mm]	26
Weight	[kg]	26
Area	[m <sup>2</sup> ]	1,43
Coating	[Type/material]	polyvinyl butyral
Thickness of front glass	[mm]	3,2
Thickness of back tempered glass	[mm]	3,2
IP65 J-box with by-pass diodes and MultiContact®MC4 connectors		yes, TÜV-certified
Connections		flex-sol 2,5 mm <sup>2</sup> X 80 cm

### MAXIMUM VALUES

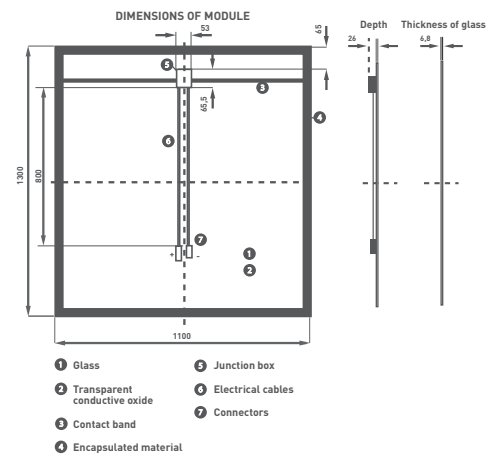
Maximum system voltage	U <sub>sis</sub> [V <sub>dc</sub> ]	1000
Operational temperature range	t [°C]	-40°/+85°
Wind loading or surface pressure	p [kPa]	2,4
Hailstone impact resistance		up to 25 mm at 80 km/h

### WARRANTY

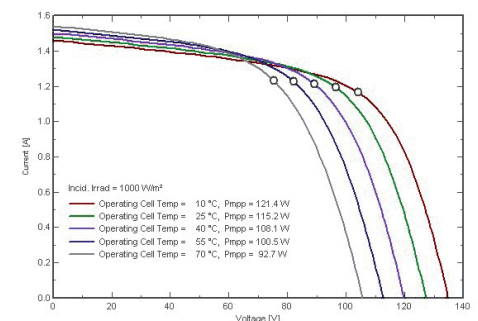
Guaranteed energy capability 80% P <sub>mpp</sub>		20 years
Guaranteed energy capability 90% P <sub>mpp</sub>		10 years
Warranty against manufacturing defects		2 years

### PERFORMANCE AT LOW IRRADIANCE

Irradiance (W/m <sup>2</sup> )	P(W)	P(W)	P(W)	P(W)
1000	95	105	115	125
800	76,6	84,4	92,7	100,8
600	57,3	63,4	69,4	75,5
400	37,3	41,2	45,2	49,1
200	17,5	19,3	21,1	23,0



**I-U CURVE IN VARIOUS TEMPERATURE**  
PV module: Pramac Swiss, Pramac Luce MCPH 115W



**I-U CURVE IN VARIOUS IRRADIANCE**  
PV module: Pramac Swiss, Pramac Luce MCPH 115W

