

SUMEC

Phono® Solar

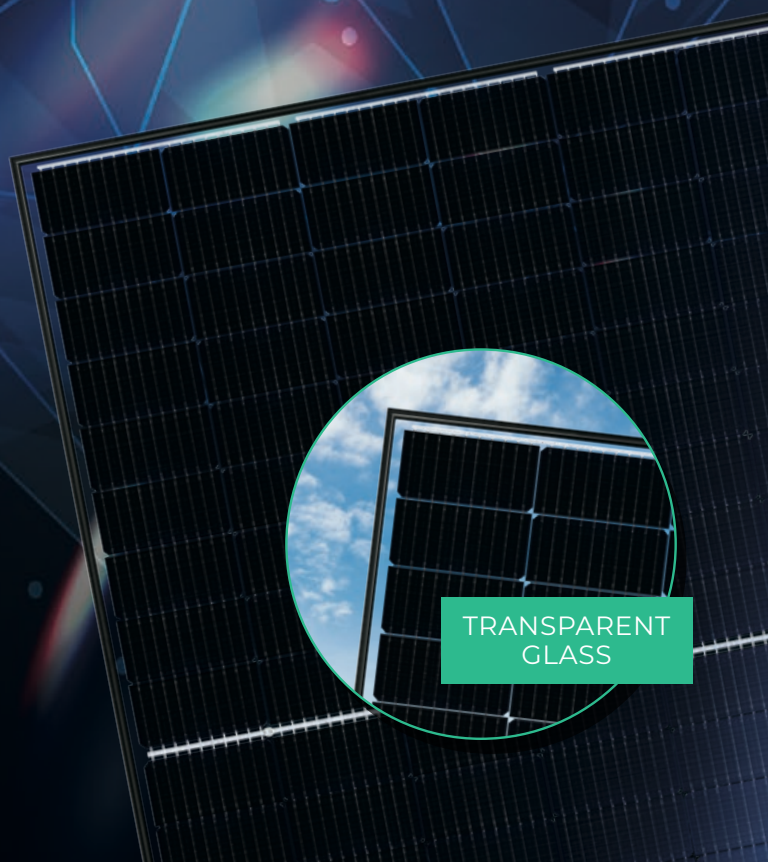
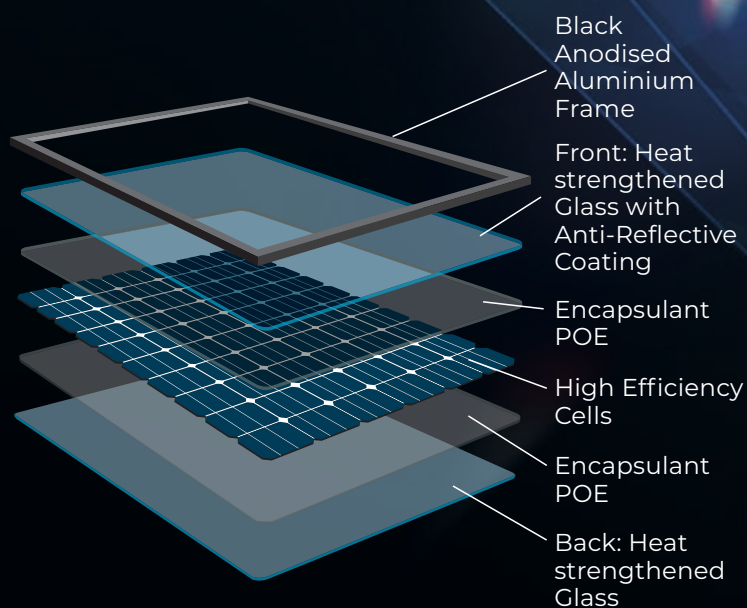
AUSTRALIA

390W
BIFACIAL

DIAMOND DUAL GLASS

THE DIFFERENCE IS CLEAR

BUILT TOUGH TO PERFORM
IN AUSTRALIA



WHY DUAL GLASS MATTERS

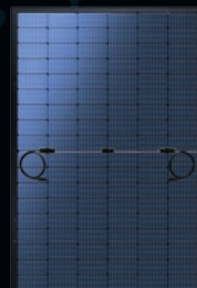
LOWER GRADE, PLASTIC BACKSHEETS

Under harsh conditions, the plastic back sheet has been a common failure point of solar panels in Australia.



DIAMOND GLASS

A second layer of tempered glass in replacement of the plastic back sheet allows **Zero Vapour Penetration**. This change and the addition of POE means you can install next to the coastline or in Australia's harshest climates.



20

20 YEAR
PRODUCT
WARRANTY*



30 YEAR
PERFORMANCE
WARRANTY



SUMEC

Phono[®] Solar
AUSTRALIA

The Engineers' Choice

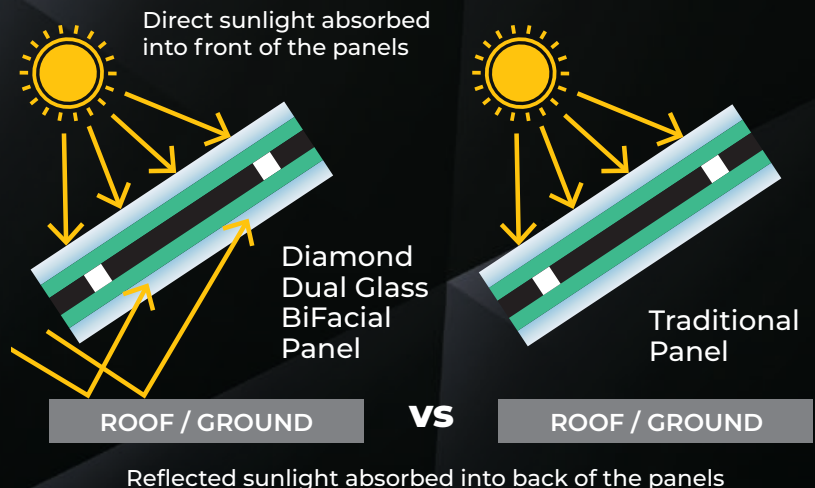
THE CLEAR DIFFERENCE

Working within Australia's harsh environment, Sumec Phono Solar manufacture a beautifully tough panel that's **CLEARLY DIFFERENT**.

BIFACIAL TECHNOLOGY

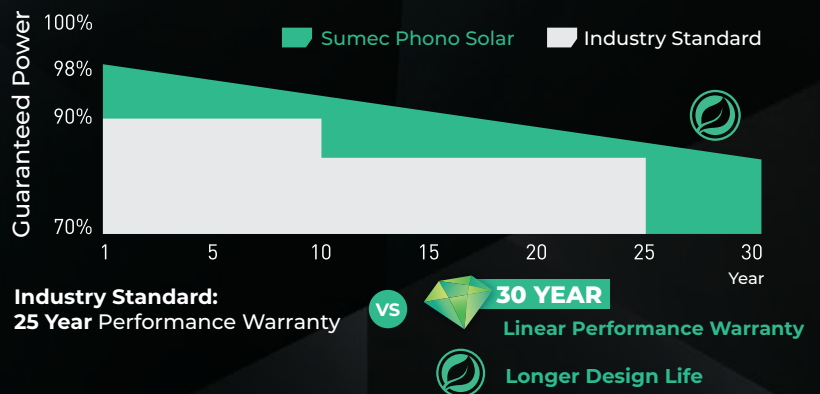
MORE POWER, PER PANEL

The Diamond Dual Glass solar panel can absorb power from both sides of the panel. In optimal install conditions, **up to 25% additional power yield can be gained** thanks to its Bifacial design.



20% MORE WARRANTED POWER

The enhanced build quality of the Diamond Dual Glass Panel gives us the confidence to warrant its performance for three decades. **A longer lasting panel is the better choice for the environment.**



ROBUST DESIGN FOR HARSH AUSTRALIAN CONDITIONS

The Diamond Dual Glass Series is thoroughly tested and built for the extremes. From the high humidity of North Queensland to the Coastal regions where over 80% of Australian's live.



Increased Hail Testing
Normal Hail Testing uses 25mm hailstones at a speed of 80km/h. Due to this panel's robust design, **we upgraded to test 45mm at a speed of 110km/h and it passed. That's bigger than a golf ball.**



BLOOMBERG
TIER 1 BRAND



OWNED BY
FORTUNE 500
GLOBAL COMPANY



2021 TOP
PERFORMING
PANEL



SALT MIST
CERTIFICATION TO TOP
SEVERITY LEVEL.

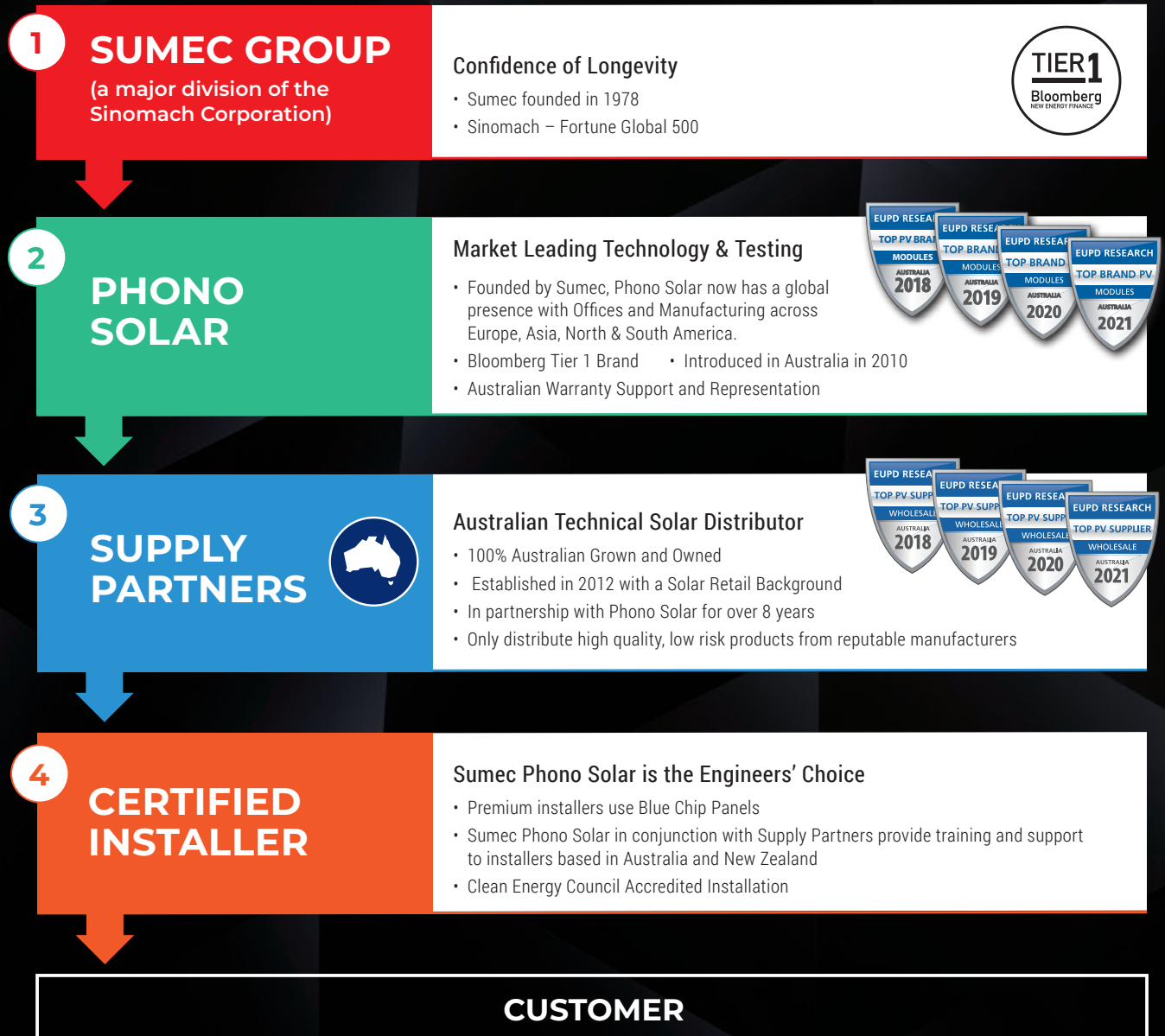
MAKE A SECURE INVESTMENT

4 LAYERS OF PROTECTION

In 2013 there were more than 400 Solar Panel Manufacturers approved for install in Australia and today there are fewer than 100.

SUMEC were founded over 40 years ago. We understand a warranty is only as strong as the company behind it.

As a **Blue Chip brand**, Sumec Phono Solar has **longevity, commitment and stability** at every layer of protection. From the Fortune 500 Founding Corporation, through to the experienced Australian Distributor, **you can feel secure in your solar investment** for decades to come.



**AUSTRALIAN
OFFICE AND
REPRESENTATION**

SUMEC PHONO SOLAR AUSTRALIA
Level 35, Tower One, 100 Barangaroo Ave, Sydney, AUSTRALIA
TEL: 02 8114 4516 www.phonosolar.com.au

PHONO SOLAR INTERNATIONAL (SUMEC)
No. 1 Xinghuo Rd., Nanjing Hi-tech Zone, Nanjing, CHINA
www.phonosolar.com

DIAMOND DUAL GLASS MODULE

ELECTRICAL TYPICAL VALUES

Model	PS390M7GF-18/VH PS390M7GFH-18/VH	
Testing Condition	STC	NOCT
Rated Power (P _{mp}) ²	390W	287
Rated Current (I _{mp})	12.65	10.12
Rated Voltage (V _{mp})	30.84	28.36
Short Circuit Current (I _{sc})	13.49	10.87
Open Circuit Voltage (V _{oc})	36.87	34.10
Module Efficiency (%)	19.90	

TEMPERATURE CHARACTERISTICS

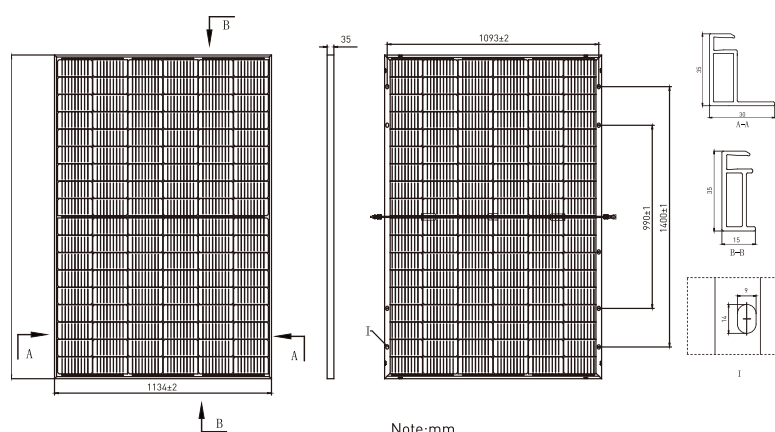
Voltage Temperature	-0.28%/°C
Coefficient Current Temp	+0.048%/°C
Coefficient Power Temp	-0.35%/°C
Power Tolerance	0~+5w
NOCT	42±2-C:
Bifaciality	70±5%

MECHANICAL CHARACTERISTICS

Cell Type	Monocrystalline 182mm x 91 mm
Dimensions	Length: 1724mm, Width: 1134mm Height: 35mm
Weight	24.7kg
Front/Back Glass	2.0/2.0 Toughened Glass
Frame	Black anodised aluminium alloy
Cable	4mm ² (IEC), 1150mm cable length
Junction Box	IP 68 rated
Connectors	MC4-EVO 2 (1500V)

PACKING CONFIGURATION

Container	Pieces per container	Per Pallet
40'GP	806	31



BIFACIAL ELECTRICAL VALUES

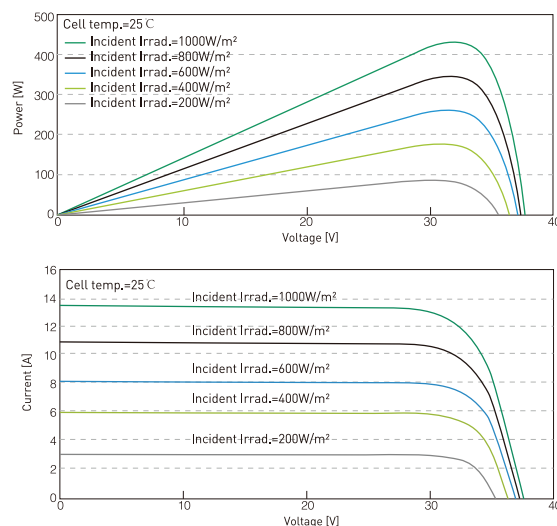
Back Power Gain	5%	10%	15%	20%	25%	30%
P _{max} /W	404	417	431	445	458	472
Module Efficiency	20.7	21.3	22.0	22.8	23.4	24.1
V _{oc} /V	36.87	36.87	36.87	36.97	36.97	36.97
I _{sc} /A	13.96	14.43	14.91	15.38	15.85	16.32
V _{mp} /V	30.84	30.84	30.84	30.94	30.94	30.94
I _{mp} /A	13.09	13.54	13.98	14.42	14.86	15.31

Additional back power gain will vary according to the ground clearance and surface reflectivity at the installation location. Higher ground clearance and surface albedo will provide better results.

ABSOLUTE MAXIMUM RATING

Operating Temperature	From -40 to +85°C
Hail Diameter @ 110km/h	Up to 45mm
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Maximum Series Fuse Rating	30A
PV Module Classification	II
Module Rating (IEC 61730)	C
Maximum System Voltage	DC 1000V/1500V

ELECTRICAL CHARACTERISTICS



1. In compliance with our warranty terms and conditions.
2. Measurement conditions under irradiance level of Standard Test Conditions (STC): Irradiance 1000W/m², AM 1.5, Cell Temperature 25°C.

SUMEC
Phono Solar
AUSTRALIA



30-year linear performance warranty to 84.95% at year 30.
This amounts to 2% degradation in the first year, 0.45% annually.

*** 20 year Product Warranty applies to Residential System Installations.**
Commercial System Installations are eligible for 15 year Product Warranty.
Please see our warranty document for full terms, conditions and details.

NOTE: This datasheet is not legally binding. Phono Solar reserves the right to make specifications changes without notice.
Further information can be found on our website: www.phonosolar.com.au

Sumec Phono Solar modules are proudly manufactured in our facility in Nanjing, China.

FRONIUS PRIMO

The communicative inverter for optimised energy management.



SnapINverter Technology



Integrated data communication



SuperFlex Design



Dynamic Peak Manager



Smart Grid Ready



Zero feed-in

The Fronius Primo in power categories from 3.0 to 8.2 kW perfectly completes the SnapINverter generation. This single-phase, transformerless device is the ideal inverter for private households.

Its innovative SuperFlex Design provides maximum flexibility in system design, while the SnapINverter mounting system makes installation and maintenance easier than ever before. The communication package included as standard, with WLAN, energy management, several interfaces and much more besides, makes the Fronius Primo a communicative inverter for owner-occupiers.

TECHNICAL DATA FRONIUS PRIMO (3.0-1, 3.5-1, 3.6-1, 4.0-1, 4.6-1)

INPUT DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Number of MPP trackers	2				
Max. input current ($I_{dc \max 1} / I_{dc \max 2}$)	12.0 A / 12.0 A				
Max. array short circuit current (MPP1/MPP2)	18.0 A / 18.0 A				
DC input voltage range ($U_{dc \min} - U_{dc \max}$)	80 - 1000 V				
Feed-in start voltage ($U_{dc \text{ start}}$)	80 V				
Usable MPP voltage range	80 - 800 V				
Number of DC connections	2 + 2				
Max. PV generator output ($P_{dc \max}$)	4.5 kW _{peak}	5.3 kW _{peak}	5.5 kW _{peak}	6.0 kW _{peak}	6.9 kW _{peak}

OUTPUT DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
AC nominal output ($P_{ac,n}$)	3,000 W	3,500 W	3,680 W	4,000 W	4,600 W
Max. output power	3,000 VA	3,500 VA	3,680 VA	4,000 VA	4,600 VA
AC output current ($I_{ac \text{ nom}}$)	13.0 A	15.2 A	16.0 A	17.4 A	20.0 A
Grid connection (voltage range)	1 - NPE 220 V / 230 V (180 V - 270 V)				
Frequency (frequency range)	50 Hz / 60 Hz (45 - 65 Hz)				
Total harmonic distortion	< 5 %				
Power factor ($\cos \phi_{ac,n}$)	0.85 - 1 ind. / cap.				

TECHNICAL DATA FRONIUS PRIMO (3.0-1, 3.5-1, 3.6-1, 4.0-1, 4.6-1)

GENERAL DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Dimensions (height x width x depth)	645 x 431 x 204 mm				
Weight	21.5 kg				
Degree of protection	IP 65				
Protection class	1				
Overvoltage category (DC / AC) ¹⁾	2 / 3				
Night time consumption	< 1 W				
Inverter design	Transformerless				
Cooling	Regulated air cooling				
Installation	Indoor and outdoor installation				
Ambient temperature range	-40 - +55 °C				
Permitted humidity	0 - 100 %				
Max. altitude	4,000 m				
DC connection technology	4x DC+ and 4x DC- screw terminals 2.5 - 16 mm ²				
AC connection technology	3-pole AC screw terminals 2.5 - 16 mm ²				
Certificates and compliance with standards	DIN V VDE 0126-1-1/A1, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 4777-2, AS 4777-3, G83/2, G59/3, CEI 0-21, VDE AR N 4105				

EFFICIENCY	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Max. efficiency	98.0 %	98.0 %	98.0 %	98.1 %	98.1 %
European efficiency (η _{EU})	96.1 %	96.8 %	96.8 %	97.0 %	97.0 %
MPP adaptation efficiency	> 99.9 %				

PROTECTIVE DEVICES	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
DC insulation measurement	Yes				
Overload behaviour	Operating point shift. Power limitation				
DC disconnect	Yes				
Reverse polarity protection	Yes				

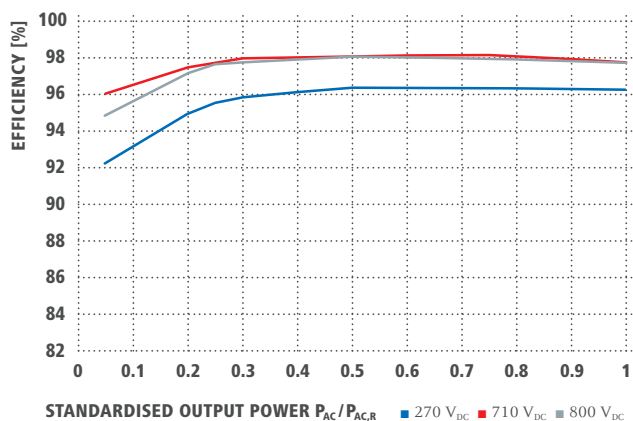
INTERFACES	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)				
6 inputs and 4 digital in/out	Interface to ripple control receiver				
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive				
2x RS422 (RJ45 socket) ²⁾	Fronius Solar Net				
Signalling output ²⁾	Energy management (potential-free relay output)				
Datalogger and Webserver	Included				
External input ²⁾	S0-Meter Interface / Input for overvoltage protection				
RS485	Modbus RTU SunSpec or meter connection				

¹⁾ According to IEC 62109-1.

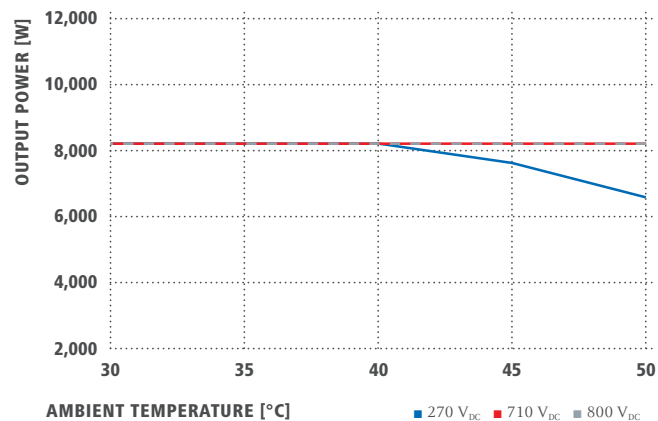
²⁾ Also available in the light version.

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS PRIMO 8.2-1 EFFICIENCY CURVE



FRONIUS PRIMO 8.2-1 TEMPERATURE DERATING



TECHNICAL DATA FRONIUS PRIMO (5.0-1, 5.0-1 AUS, 6.0-1, 8.2-1)

INPUT DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
Number of MPP trackers	2				
Max. input current ($I_{dc \max 1} / I_{dc \max 2}$)	12.0 A / 12.0 A	18.0 A / 18.0 A			
Max. array short circuit current (MPP ₁ /MPP ₂)	18.0 A / 18.0 A	27.0 A / 27.0 A			
DC input voltage range ($U_{dc \min} - U_{dc \max}$)	80 - 1,000 V				
Feed-in start voltage ($U_{dc \text{ start}}$)	80 V				
Usable MPP voltage range	80 - 800 V				
Number of DC connections	2 + 2				
Max. PV generator output ($P_{dc \max}$)	7.5 kW _{peak}	7.5 kW _{peak}	7.5 kW _{peak}	9.0 kW _{peak}	12.3 kW _{peak}

OUTPUT DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
AC nominal output ($P_{ac,n}$)	5,000 W	4,600 W	5,000 W	6,000 W	8,200 W
Max. output power	5,000 VA	5,000 VA	5,000 VA	6,000 VA	8,200 VA
AC output current ($I_{ac \text{ nom}}$)	21.7 A	21.7 A	21.7 A	26.1 A	35.7 A
Grid connection (voltage range)	1 - NPE 220 V / 230 V (180 V - 270 V)				
Frequency (frequency range)	50 Hz / 60 Hz (45 - 65 Hz)				
Total harmonic distortion	< 5 %				
Power factor ($\cos \phi_{ac,n}$)	0.85 - 1 ind. / cap.				

GENERAL DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
Dimensions (height x width x depth)	645 x 431 x 204 mm				
Weight	21.5 kg				
Degree of protection	IP 65				
Protection class	1				
Overvoltage category (DC / AC) ¹⁾	2 / 3				
Night time consumption	< 1 W				
Inverter design	Transformerless				
Cooling	Regulated air cooling				
Installation	Indoor and outdoor installation				
Ambient temperature range	-40 - +55 °C				
Permitted humidity	0 - 100 %				
Max. altitude	4,000 m				
DC connection technology	4x DC+ and 4x DC- screw terminals 2.5 - 16 mm ²				
AC connection technology	3-pole AC screw terminals 2.5 - 16 mm ²				
Certificates and compliance with standards	DIN V VDE 0126-1-1/A1, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 4777-2, AS 4777-3, G83/2, G59/3, CEI 0-21, VDE AR N 4105 ²⁾				

¹⁾ According to IEC 62109-1.

²⁾ Fronius Primo 5.0-1, Fronius Primo 6.0-1 and Fronius Primo 8.2-1 are not fully compliant with VDE AR N 4105.

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

EFFICIENCY	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
Max. efficiency	98.1 %	98.1 %	98.1 %	98.1 %	98.1 %
European efficiency (η_{EU})	97.1 %	97.1 %	97.1 %	97.3 %	97.5 %
MPP adaptation efficiency	> 99.9 %				

PROTECTIVE DEVICES	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
DC insulation measurement	Yes				
Overload behaviour	Operating point shift, power limitation				
DC disconnect	Yes				
Reverse polarity protection	Yes				

INTERFACES	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 5.0-1 SC	PRIMO 6.0-1	PRIMO 8.2-1
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)				
6 inputs and 4 digital in/out	Interface to ripple control receiver				
USB (A socket) ¹⁾	Datalogging, inverter update via USB flash drive				
2x RS422 (RJ45 socket) ¹⁾	Fronius Solar Net				
Signalling output ¹⁾	Energy management (potential-free relay output)				
Datalogger and Webserver	Included				
External input ¹⁾	S0-Meter Interface / Input for overvoltage protection				
RS485	Modbus RTU SunSpec or meter connection				

¹⁾ Also available in the light version.

Further information and technical data can be found at www.fronius.com.

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 3,800 employees worldwide and 1,242 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

v08 Aug 2017 EN

Fronius India Private Limited
GAT no 312, Nanekarwadi
Chakan, Taluka - Khed District
Pune 410501
India
pv-sales-india@fronius.com
www.fronius.in

Fronius Australia Pty Ltd.
90-92 Lambeck Drive
Tullamarine VIC 3043
Australia
pv-sales-australia@fronius.com
www.fronius.com.au

Fronius UK Limited
Maidstone Road, Kingston
Milton Keynes, MK10 0BD
United Kingdom
pv-sales-uk@fronius.com
www.fronius.co.uk

Fronius International GmbH
Froniusplatz 1
4600 Wels
Austria
pv-sales@fronius.com
www.fronius.com