SOLARtec

PV photovoltaic electrical components and connection boxes

Gewe
low voltage equipment manufacturer


Gave

Company

Gave Electro presents an extensive professional record since 1944 showing up on low voltage **breaking and protection** specialist fields.

Since 2005 Gave has strengthen its market presence with the new brand **Solartec** that offers complete solutions integrating multiple components on photovoltaic system disconnection boxes.

Gave leading **engineering and development** team brings together experience and innovation in order to offer adequate product solutions to specific user requirements.

With guidance and support we are a valued service partner offering a complete range of components to built complete system. Market orientated approach aims at customer satisfaction.



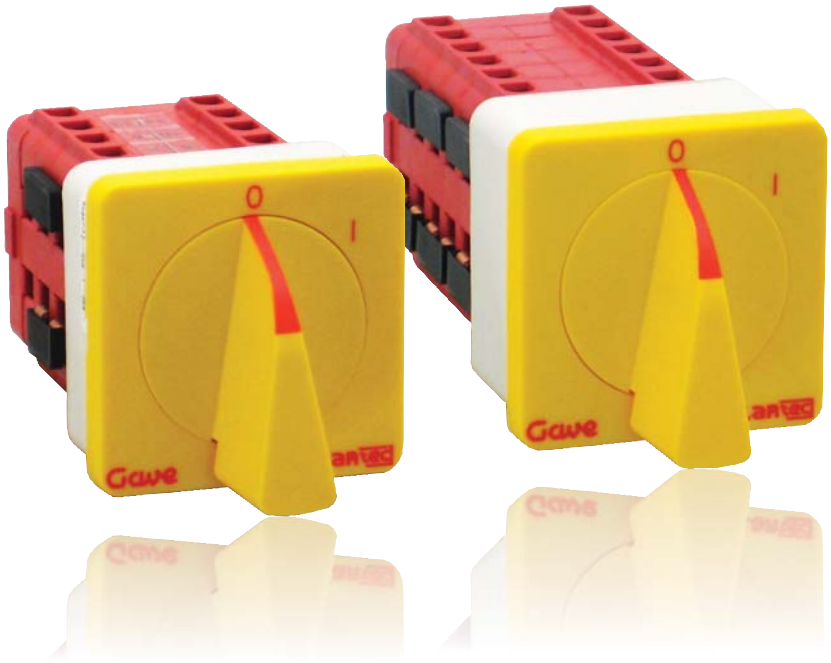
Photovoltaic

Solar-photovoltaic power sector is strongly developing among instituional increasing interest on clean renewable energies. Diverse incentives from national to regional governments and municipalities promote PV generation as a profitable investment.

Photovoltaic current is generated by light excitement on the semiconductor diodes present on solar cells.

Electricity is generated in a DC circuit which is characterized for difficulties on arc interruption. Gave has an engineering specialist team that has developed a complete range of components able to operate under highly demanding DC currents ensuring safe system operation.

PV Switch-disconnectors



Solartec switches are manual operated multipole load break switch disconnectors.
They ensure safe on load opening and closing photovoltaic circuits on small and medium photovoltaic systems.

According to standards

- IEC 60947-3
- EN 60947-3
- IEC 60364-712
- UNE 20460-7-712

General characteristics

- Quick and independent operation mechanism.
- Contacts in series to optimise electrical characteristics.
- External series links mounted from origin.
- Connection by protected cable clamps.
- Silver alloy contacts.
- Contact decks made of selfextinguishing polyester reinforced with glass fiber.
- Switch degree of protection IP20.
- High temperature withstanding.

Quick and INDEPENDENT operation mechanism

Released continuous operation, such that the speed and force are independent of the action of the operator (IEC 947-3 §2.12).

1200V - 25A PV Switch-disconnectors

Advanced technological developments on breaking mechanism altogether with an increased number of contacts have lead to a new stone mark on DC switch disconnection. A compact unit able to operate 1200VDC 25A currents.

Factory assembled series bridges

Contacts in series to optimise electrical characteristics.

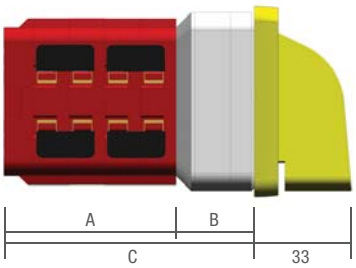
Technical characteristics

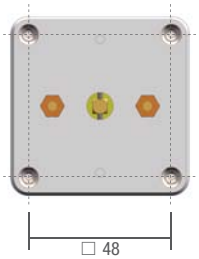
Reference		A-5342PV0	A-5362PV0	A-5382PV0	A-5102PV0	A-5122PV0 NEW
Connecting screw		M5	M5	M5	M5	M5
Stranded wire	mm^2	10 - 25	10 - 25	10 - 25	10 - 25	10 - 25
Flexible wire	mm^2	10 - 16	10 - 16	10 - 16	10 - 16	10 - 16
Impulse voltage	Uimp kV	4	4	4	4	4
Cable cross section	AWG	6	6	6	6	6
Tightening torque	Nm	2,5	2,5	2,5	2,5	2,5
Load duty category DC-21	300V	35 A	-	-	-	-
	400V	-	25 A	-	-	-
	500V	-	20 A	-	-	-
	600V	-	15 A	25 A	-	-
	800V	-	-	16 A	-	-
	1000V	-	-	-	25 A	-
	1200V	-	-	-	-	25 A

Dimensions

Reference	Contacts	Cells	A	B	C
A-5342PV0	2+2	2	33,0	26,0	60,0
A-5362PV0	3+3	3	45,0	26,0	72,0
A-5382PV0	4+4	4	57,0	26,0	83,0
A-5102PV0	5+5	5	69,0	26,0	95,0
A-5122PV0	6+6	6	81,0	38,0	107,0

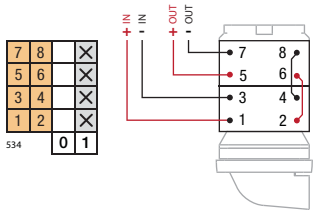
values in mm



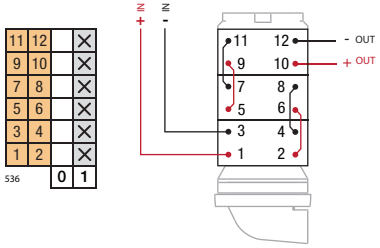


Standard electrical schemes

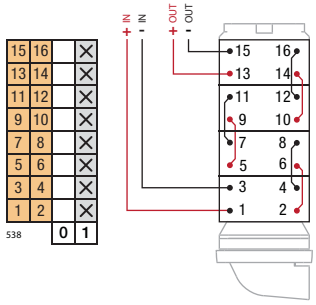
534 4 contacts in series



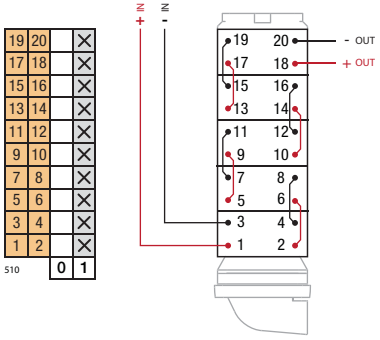
536 6 contacts in series



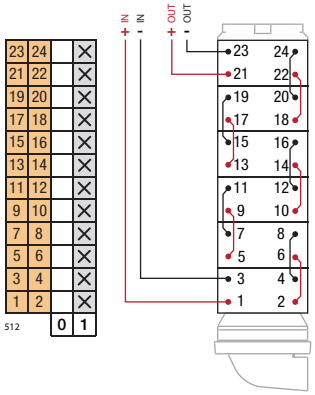
538 8 contacts in series



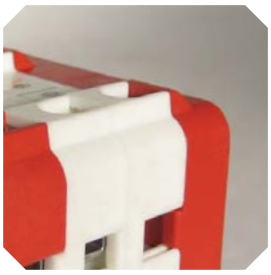
510 10 contacts in series



512 12 contacts in series



Auxiliary contacts (optional)



Signaling auxiliary contact mounted from origin.
They can be mounted in all references and they are in white color to differentiate from main contacts.

Indicated on the 3rd digit switch code.

Accesories

Padlockable operation handle

References	In
AK1200523	25 A
AK1200526	40 A

DIN rail mounting plate

References	Description	In
AK0000003	DIN rail mounting plate.	25 A - 40 A
AK0100007	Rear panel mounting plate.	25 A - 40 A

Clutches

References	Description
AK174003	Prolongued shaft plus interlock and rear mounting plate for external operation.

Enclosed PV Switch-disconnectors

Photovoltaic installations are normally projected with multiple local disconnection points in order to minimise the cost of not generating during maintenance operations. The IS-PV series has been designed in order to offer optimum performance on this kind of application.

The existing range has been extended with a collection of prewired enclosed switch disconnectors that use standard MC4 connectors, creating an extremely easy to install and connect solution. The set is equipped with two input strings per pole and one output string per pole.

General characteristics

- Original and compact design.
- Enclosure UV resistant.
- Protection degree IP65.
- Base mounting.
- Auxiliary contacts option.
- Up to 25A – 1000V.

Other options

Padlockable disconnection handle

Designated on the second digit of the reference

1	2	3 4 5	6	7 8	9
	B			PV	7

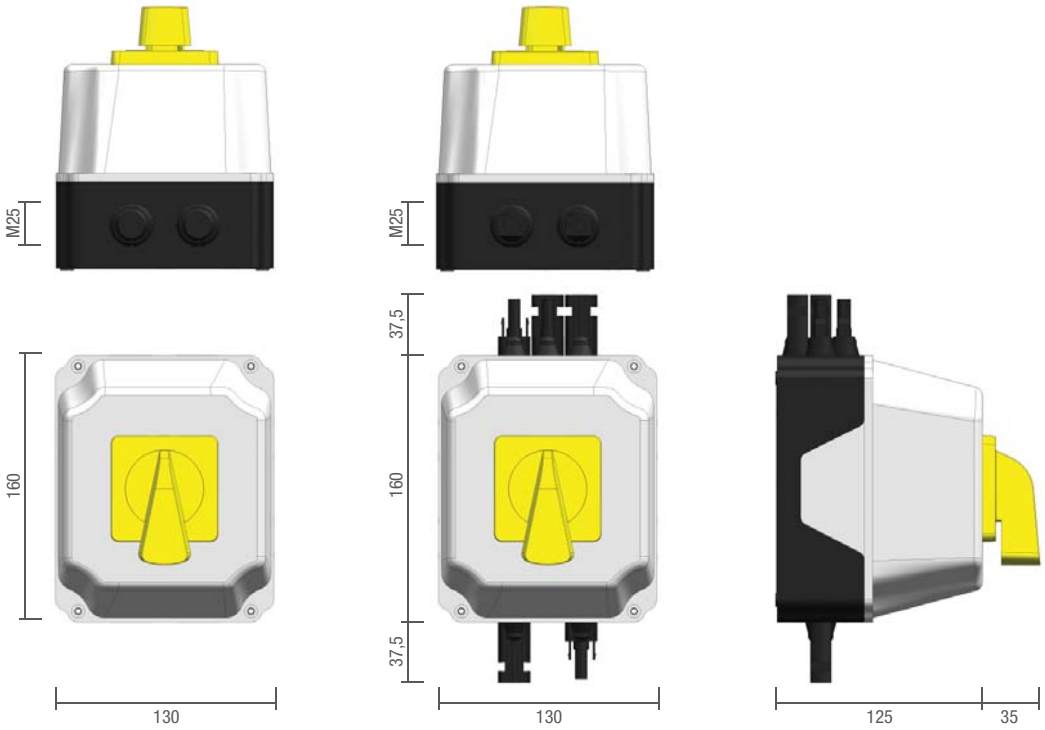
Photovoltaic MC4 connectors

Designated on digits seven and eight of the reference

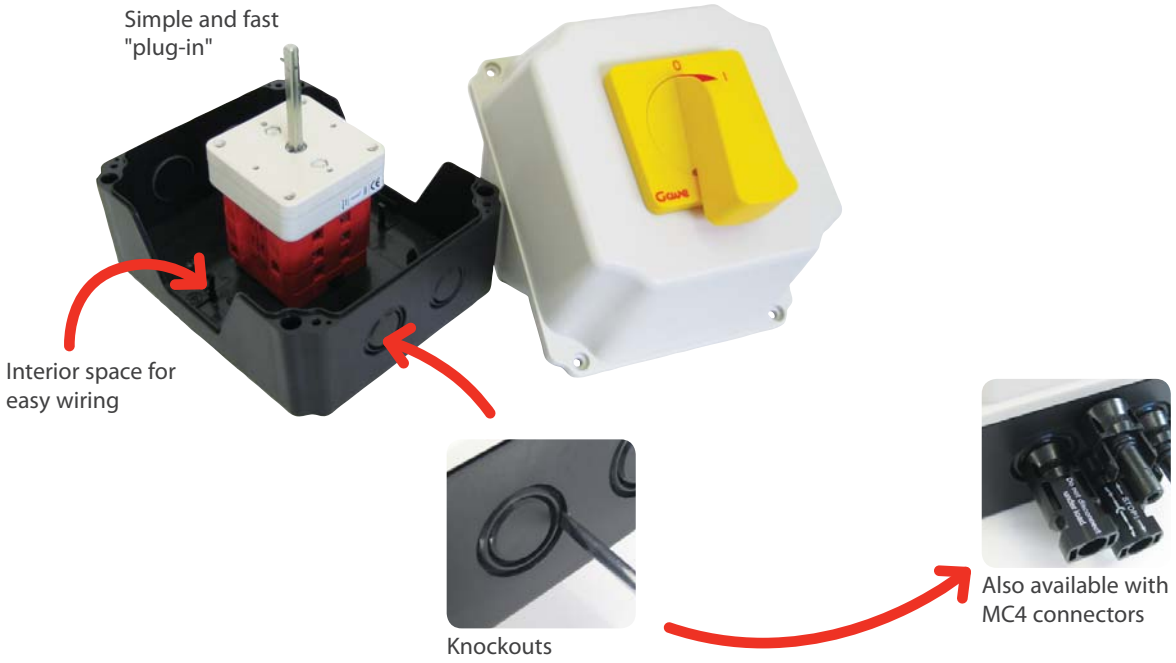
1	2	3 4 5	6	7 8	9
				MC	7

NOTE: digit 3,4,5 indicate electrical scheme (acc. page 8), maximum 10 contacts.

Dimensions



Installation



High-rating switch disconnectors

Serie 55DC/55PV switch-disconnectors are manually operated load break switches that provide safety isolation for any low voltage circuit on photovoltaic applications.

According to standards

- IEC 60947-3
- EN 60947-3
- VDE 0660-107 (1992)
- IEC 60364-4-410 (Protection to ensure the safety against electrical schocks).
- IEC 60364-7-712 (Standard for photovoltaic installations).
- DIN VDE 0126

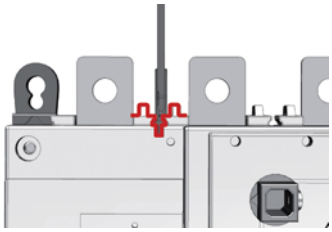
General characteristics

- Fully visible breaking.
- High thermal and dynamic withstand.
- Operational load duty categories DC-21.

Advanced contact technology

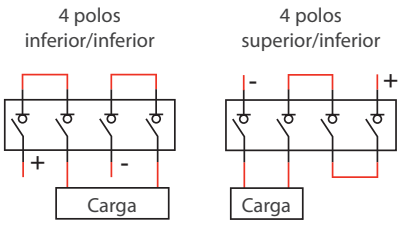
The innovative switching concept allows the fast extinction of the electrical arc and interruption of the current.

Switch contacts are encapsulated in a glass reinforced poliéster which provides mechanical and electrical arc containment properties. Thus enabling the switch to be used in industrial applications as well as harsh operating environments.



Specific design to work under pollution degree 3 environments

Facilities with environments where temperature changes produce condensation or where there is a high presence of airborne particles, require products that withstand these conditions without affecting isolation safety.



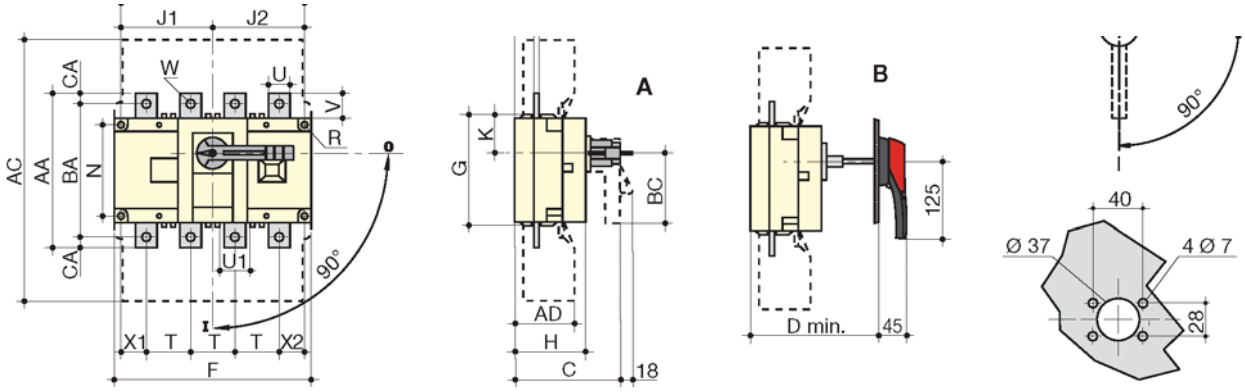
Series connection and heat transfer

In AC applications cables act as a heat sink reducing thermal effect on the assembly, however in direct current bridges connecting terminals become a heating generation point that significantly increases temperature. Proper design and dimensioning of connecting bridges is necessary to ensure correct operation of the installation.

Technical characteristics and types

Reference	Load duty category DC-21 at Ue					R. insulation voltage (Ui)	R. impulse voltage (Uimp)	Min. tightening torque
	220 V	400 V	600 V	800 V	1000 V			
55DC4014	125 A	125 A	80 A	63 A	-	1000 V	8 kV	9 Nm
55PV4012	-	-	-	-	125 A	1200 V	12 kV	20 Nm
55PV4016	-	-	-	-	160 A	1200 V	12 kV	20 Nm
55PV4020	-	-	-	-	200 A	1200 V	12 kV	20 Nm
55PV4025	-	-	-	-	250 A	1200 V	12 kV	20 Nm

Dimensions



Size (A)	Overall		Term. shrouds			Switch body						Switch mounting							Connection							
	C	D min	AC	AD	F	G	H	J1	J2	K	BC	M	N	R	T	U	U1	V	W	X1	X2	Y	Z	AA	BA	CA
63-125A <1000V	120	125	235	50	170	93	65	75	75	31,5	80	150	65	5,5	36	20	20,5	25	9	22	20	3,5	20,5	135	115	10
125-250A 1000V	130	135	280	60	230	108	75	105	105	34	115	210	80	5,5	50	25	20,5	30	11	33	27	3,5	22,5	160	130	15

Accessories

Direct handle

Easy mounting with frontal access screw.
Lockable with padlocks.

References	Size 1	Size 2
26995042	●	
26995052		●

Exterior handle

Easy to mount from the exterior or the interior of the panel.
Highly resistant material against UV and agressive environments
Built-in interlock facility.
Padlockable handle.

References	Size 1	Size 2
1G212118	●	●

Prolongued shaft

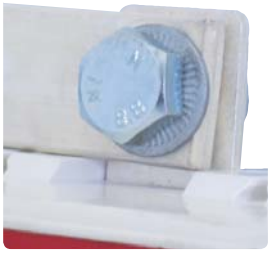
Interlocking bit in Zamac material provides high strength.
Shafts surface treated against corrosion.
Multiple length choices.

References	Length
14001020	200 mm
14001025	250 mm
14001032	320 mm
14001050	500 mm

Auxiliary contacts

Early break and signalling functions.
Easy to install "plug-in".

References	Function
26990031	1st contact
26990032	2nd contact



Standard series bridging

Electrolitic treatment against oxidation.
Supplied 2 bridges by reference.

References	Use	In
41DC4014	Top/bottom	125 A

Advanced series bridging

Electrolitic treatment against oxidation.
Special shape and increased thickness.
Supplied 2 bridges

References	Uso	In
26092025	Superior/inferior	125 A - 250 A

Inter phase barriers

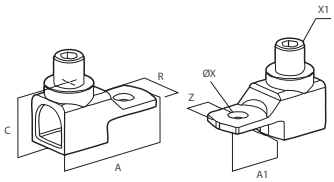
Easy to install (slide on the switch built-in slot).
Highly insulating material.

References	Poles
29980023	3 poles
29980024	4 poles

Terminal screen

Easy to install.
Transparent plastic material permits to check connections visually.
Fits on top or bottom.

References	Size 1	Size 2
26984012	●	
26984020		●



Terminal shrouds

Connection of bare copper cables onto the terminals (without lugs).

References	Current	Poles	A	A1	C	R	ØX	X1	Z
54003016	160 A	3 P	47,5	22,5	25	20	8,5	M12	10
54004016	160 A	4 P	47,5	22,5	25	20	8,5	M12	10
54003025	200...250 A	3 P	62	31,5	31,5	25	10,5	M16	15
54004025	200...250 A	4 P	62	31,5	31,5	25	10,5	M16	15

Overvoltage surge protection devices

Photovoltaic installations typically require extended surface areas therefore being particularly exposed to lightning effects and consequent occasioned surges. Damages caused by lightning surges will diminish system performance and shorten equipment live. Using surge protection devices we avoid system failures and take full advantage on the system operation thus maximising production and profitability.

Function

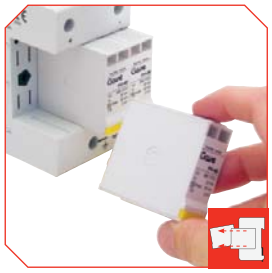
Surge protector devices discharge peak transient overvoltages that travel on the line cable conductors originated by atmosphere lightning.

According to standards

- IEC 61643-1
- EN 61643-11

General characteristics

- Protections Class II and Class I+II.
- Modular DIN rail mounting.
- Voltages 560VDC and 1000VDC.
- High discharge capacity.
- Visual indicator on the module.
- Replaceable module.
- Optional remote signalling.



Easy to replace modules

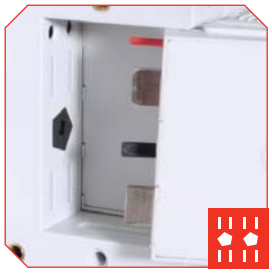
Easy replacement of protection module with smooth plug-in system.

Window state indicator

Green colour indicates correct operation and red colour indicates module replacement.

Remote signalling

Remote control on the protection with changeover signalling contact operated when module changes state.



Mechanical coding

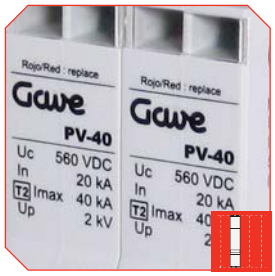
Plug-in bases and modules have mechanical coding that prevent from installing the wrong module during replacement operations.

DIN rail mounting

Direct mounting on 35mm symmetrical DIN rail.

Marking

Terminals marked in order to permit easy wiring. Modules with all relevant information marked and reference easy to identify.



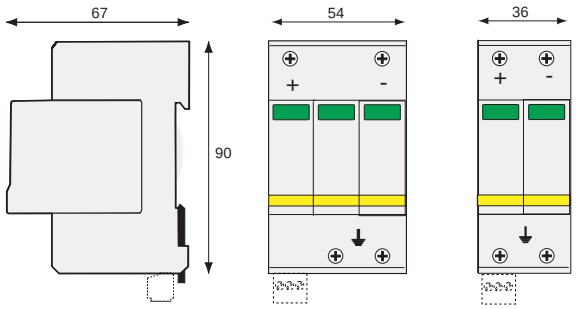
Modular

Designed to fit on modular enclosures with 45mm front cut out and 17,5mm module width.

Overvoltage surge protection devices
Class II

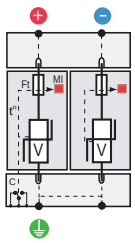
Class II surge protection devices are developed to meet overvoltage protection needs for PV photovoltaic networks against atmosphere lightning. These units must be installed in parallel on the DC networks to provide common and differential modes protection.
The electrical diagram is based on high energy MOVs equipped with specific thermal disconnectors and related failure indicators.

Dimensions

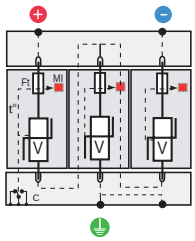


Conexión

PST25PV



PST31PV



V : High energy MOV
Ft : Thermal fuse
t° : Thermal disconnection mechanism
C : Contact for remote signal (Optional)

Technical characteristics

Description		PST25PV	PST31PV
Max. Operating voltage	Uc	550VDC	1000VDC
Nominal discharge current	In	20 kA	20 kA
Maximum discharge current	Imax	40 kA	40 kA
Protection level (at In)	Up	2,2 kV	3 kV
Remote signalling		Ref. PST25PVT	Ref. PST31PVT

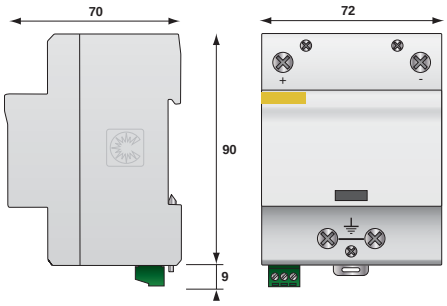
Mechanical characteristics

Description	PST25PV / PST31PV
Dimensions	see scheme
Connection	by screw terminals: 1,5-10mm^2 (L/N) o 2,5-25mm^2 (PE)
Disconnection indicator	2 mechanical indicators
Mounting	symmetrical rail 35mm
Operating temperature	-40/+85ºC
Protection degree	IP20
Material	thermoplastic UL94-V0

Overvoltage surge protection devices
Class I + II

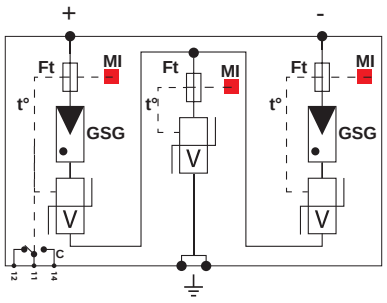
Class I surge protector devices are recommended at both end of the DC power supply line. Due to its extraordinary high discharge capacity they are recommended to be used on installations with elevated risk of direct lightning strikes. The protection is based on high energy MOVs and equipped with specific thermal disconnectores achieving a superior protection level and a lack of follow-up current.

Dimensions



Conexión

GSG: Descargador con gas
V : Red de varistores
Mi : Indicador de desconexión
Ft : Fusible térmico
t° : Sistema de desconexión térmica
C : Contacto para remoto

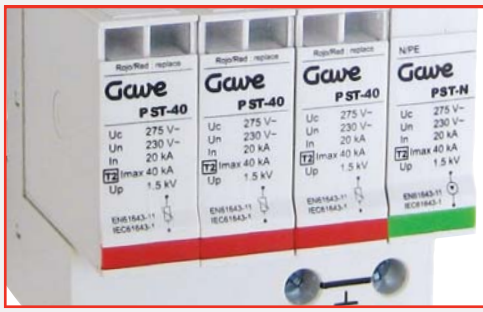


Technical characteristics

Description		PST41PV
Max. operating voltage	Uc	1000VDC
Nominal discharge current (15 impulses 8/20 µs)	In	40 kA
Max. lightning current by pole (1 impulse 10/350 µs)	limp	12,5 kA
Residual voltage (at limp)	Ures	1.9 kV
Protection level (at In)	Up	2,4 kV
Remote signalling		Yes

Related products

Products for alternative current installation



Surge protector devices

- *Class II*
- *Class I + II*

Consult on further information

Protección fusible gPV

A range of fuse links in a 10x38mm package specifically designed for protection and isolation of photovoltaic strings. The fuse links are capable of interrupting low overcurrents associated with faulted PV (reverse current, multi-array fault) string arrays.

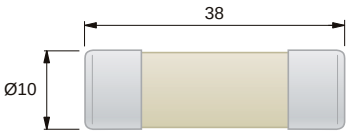
According to standards

- IEC 60269-1
- IEC 60269-6

Características

- Rated voltage: 1000Vdc.
- Amps: 2A, 4A, 6A, 8A, 10A, 12A, 15A and 20A.
- Rated breaking capacity: 33kA dc.
- Minimum interrupting rating:1.3 x In.
- Time Constant (L/R): under 1ms.

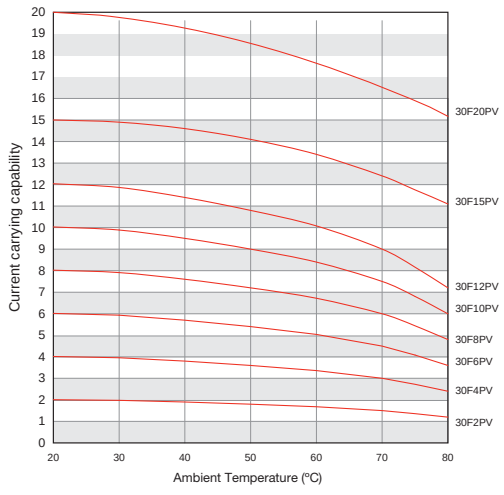
Dimensions



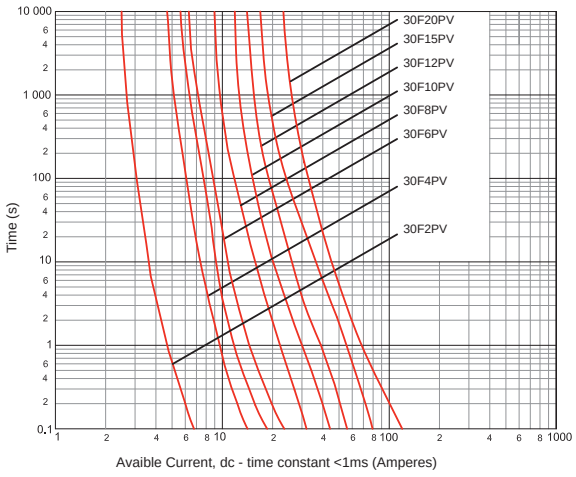
Technical characteristics

Reference	Current Rating (A)	Energy Integrals I2t (A2s)		Power loss (W)	
		Pre-Arc	Total a 1000V	0.8In	In
30F2PV	2	1.2	3.4	0.6	1.0
30F4PV	4	9.5	26	1.0	1.3
30F6PV	6	30	90	1.1	1.8
30F8PV	8	3	32	1.2	2.1
30F10PV	10	7	70	1.3	2.3
30F12PV	12	12	120	1.5	2.7
30F15PV	15	22	220	1.7	2.9
31F20PV	20	34	240	2.1	3.5

Temperature derating



Time-current characteristics



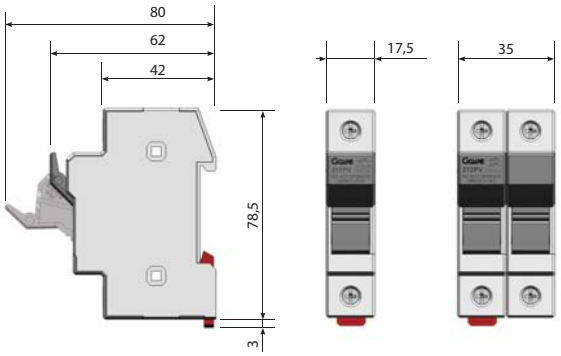
Fuseholders

- 1000V DC-20B.
- Modular 45mm cut out - 1 module (17,5mm) X pole.
- Mounting 35mm DIN rail.
- High temperature resistant plastics.
- Elevated insulation characteristics.

According to

- IEC 60947-1
- IEC 60947-3

Dimensions



Technical characteristics

References	Thermal rating	Fuse size	Poles	Modules	Package
211PV	20 A	10 x 38	1P	1	12
212PV	20 A	10 x 38	2P	2	6

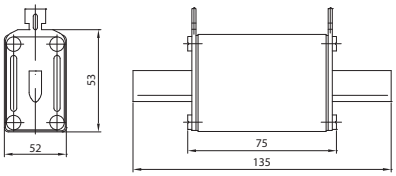
NH Fuse protection

When designing level 2 array junction connection boxes higher currents appear requiring NH knife fuse protection. We can use ultrarapid gR-1000Vdc curve fuses that will protect against overload.

According to standards

- IEC 60269-1
- IEC 60269-6

Dimensions



Technical characteristics

Reference	Current rating (A)	Power loss (W)	Package
671PV050	50A	11	3
671PV063	63A	12	3
671PV080	80A	15,5	3
671PV100	100A	16,5	3
671PV125	125A	17,5	3
671PV160	160A	22	3

PV generator disconnection boxes

Generator disconnection boxes are enclosures where PV arrays are electrically connected and where the isolation function is performed in order to permit maintenance procedures. Overvoltage and overload protection can beadded to these boxes if necessary.

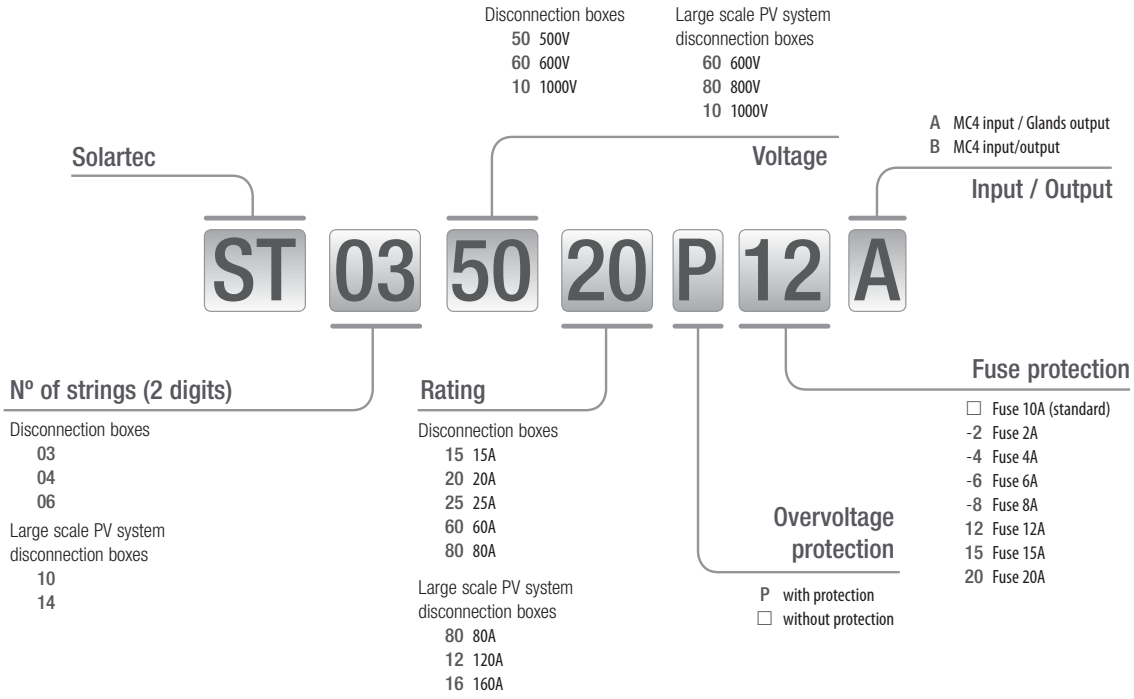
According to standards

- IEC 60634-7-712
- UNE 2460-7-712
- IEC 943-7-3
- IEC 61643-11
- EN 60439-1

General characteristics

- GRP Enclosures highly resistant to hard weather and environment conditions.
- Easy installation and highly accessible on maintenance works.
- Transparent cover for inspection purposes. PC material.
- Load break switches with interlockable exterior handle.
- Voltages up to 1000V.
- Overvoltage protection Class II 1000VDC.
- Fuse protection against overloads (10A fuse for standard references).

Reference system



Design options

MC4 connectors

Disconnection boxes with PV connectors avoid problems on wiring. MC3 or Sunclix connectors also possible.

Ventilation

Extreme temperatures and condensation conditions might require ventilation systems. IP44 protection degree is guaranteed

Remote signalling

Changeover signalling contact permits remote control on the overvoltage protection

Auxiliary contact

Switch disconnector position can be remotely supervised integrating an auxiliary contact

General characteristics

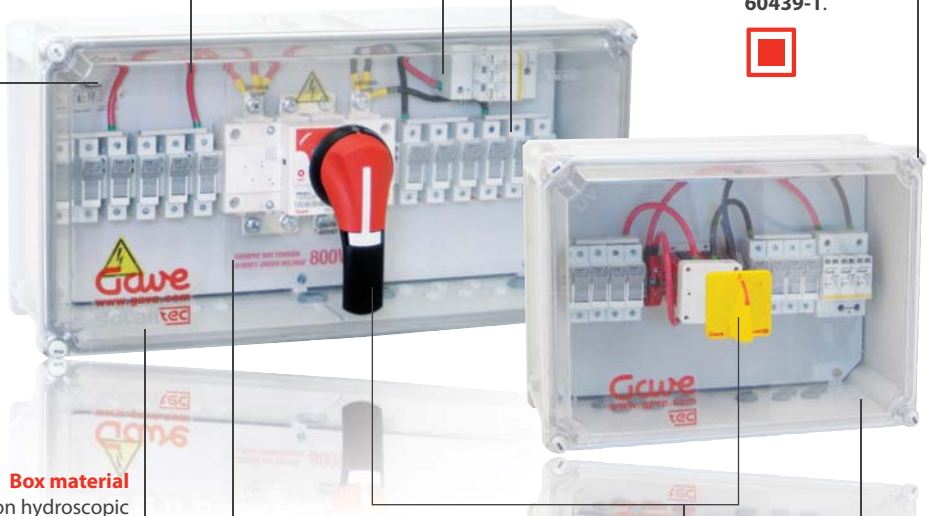
Cabling
Flexible double insulated PV cables. Precision termination prevents leakage.

Overvoltage SPD
Surge protector device Class II. Phases connection on top and earthing on bottom. Remote indication optional.

Fuse protection
Positive and negative polarities protected. Increased thermal dissipation and comfortable wiring access space.

Enclosure Safety
Double insulation according to **60439-1**.

Product ID
Shows electrical product information according to **IEC 60439-1** permitting individual test tracking.



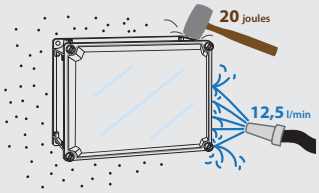
Box material
Non hydroscopic self-extinguishing material adequate for outdoor and indoor installation. High resistance to corrosion and pollution.

Protection screens
Prevent direct contact and display electrical alarm signs.

External handle
Direct access to box disconnection.

Transparent polycarbonate cover
Unit interior always visible for component and SPD module status visual inspection.

Protection and impact degree IP55 - IK10



Enclosure Resitance
High impact strength IK10 (IEC 62262) and protection degree IP66 for original enclosure and IP55 for completed unit (IEC 60529).

- ✓ Large scope of sizes
- ✓ Light weight
- ✓ Easy transport
- ✓ Friendly fitting

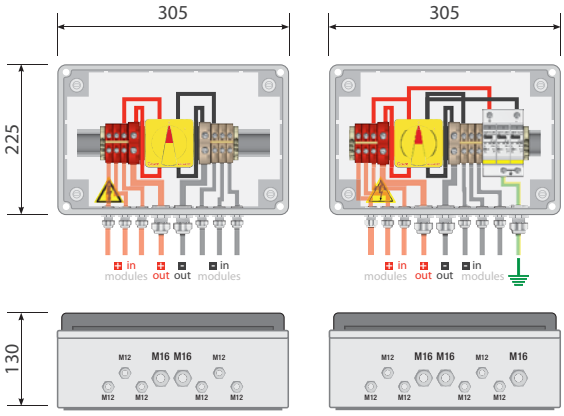
3 strings boxes

ST031025

ST031025P

Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST031025	3	1000	25A	No	IP65	ABS/PC	Glands
ST031025A	3	1000	25A	No	IP65	ABS/PC	MC4
ST031025P	3	1000	25A	PST31PV	IP65	ABS/PC	Glands
ST031025PA	3	1000	25A	PST31PV	IP65	ABS/PC	MC4

Dimensions

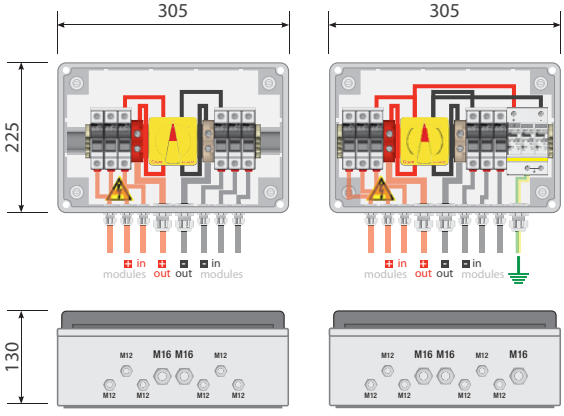


ST031025-10

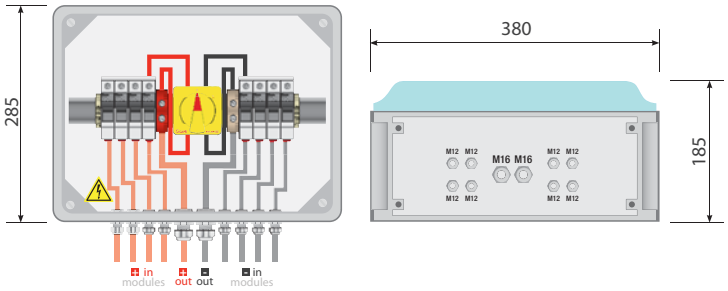
ST031025P10

Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST031025-10	3	1000	25A	No	IP65	ABS/PC	Glands
ST031025-10A	3	1000	25A	No	IP65	ABS/PC	MC4
ST031025P10	3	1000	25A	No	IP65	ABS/PC	Glands
ST031025P10A	3	1000	25A	No	IP65	ABS/PC	MC4

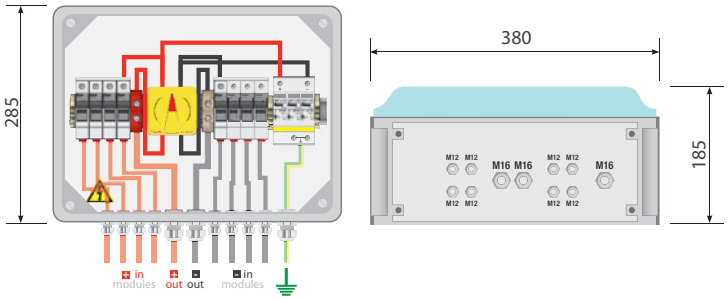
Dimensions



4 strings boxes

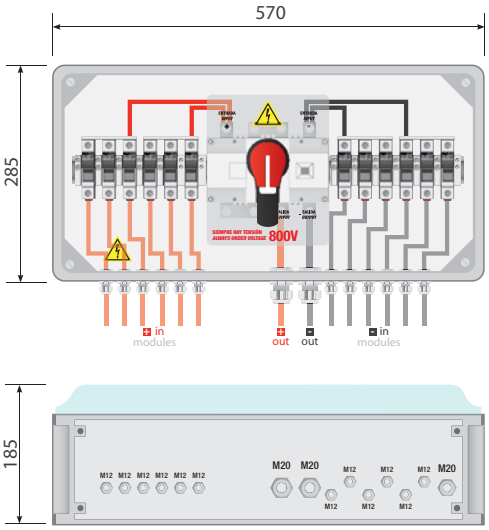


Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST041025	4	1000	25 A	No	IP55	GRP/PC	Glands

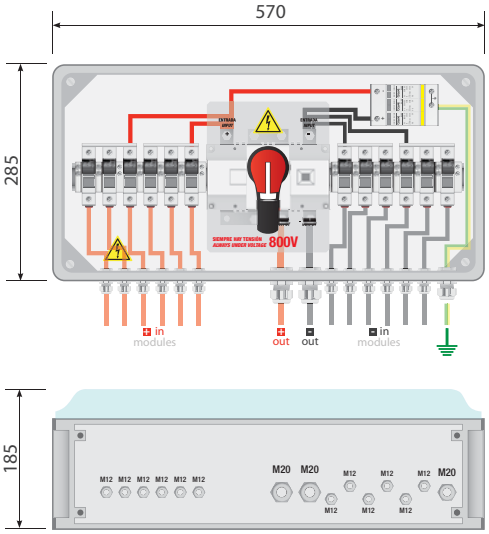


Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST041025P	4	1000	25 A	PST31PV	IP55	GRP/PC	Glands

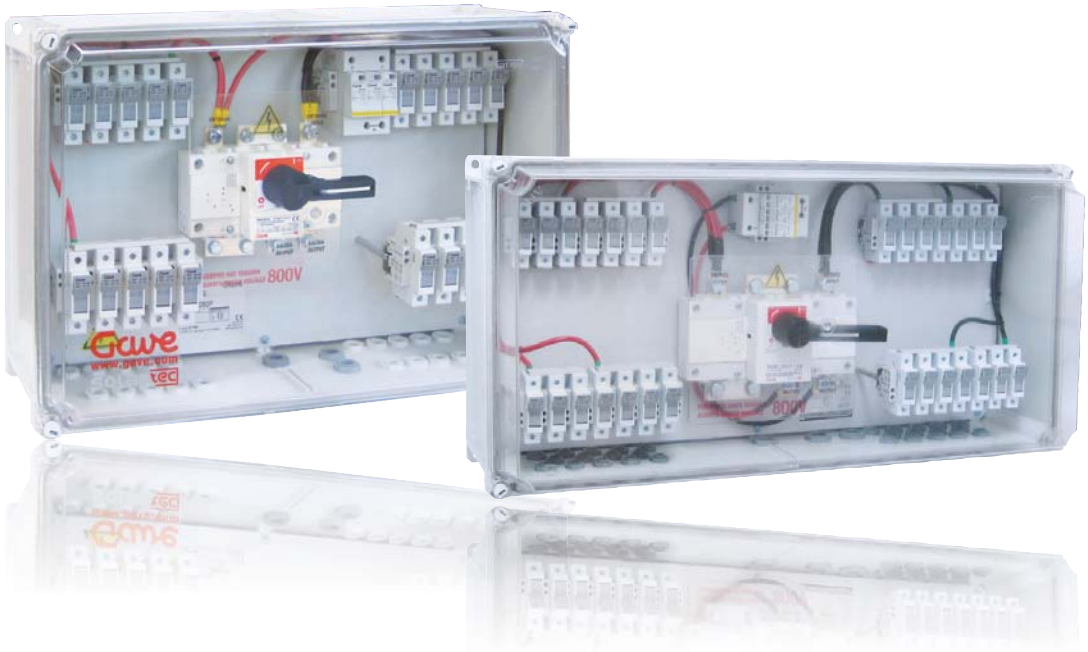
6 strings boxes



Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST068060	6	800	63 A	No	IP55	GRP/PC	Glands



Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST068060P	6	800	63 A	PST31PV	IP55	GRP/PC	Glands



Solar park PV disconnection boxes

Generator disconnection boxes for solar parks are large enclosures where PV arrays are electrically connected and where the isolation function is performed in order to permit maintenance procedures. Overvoltage and overload protection can be added to these boxes if necessary.

According to standards

- IEC 60634-7-712
- UNE 2460-7-712
- IEC 943-7-3
- IEC 61643-11
- EN 60439-1

General characteristics

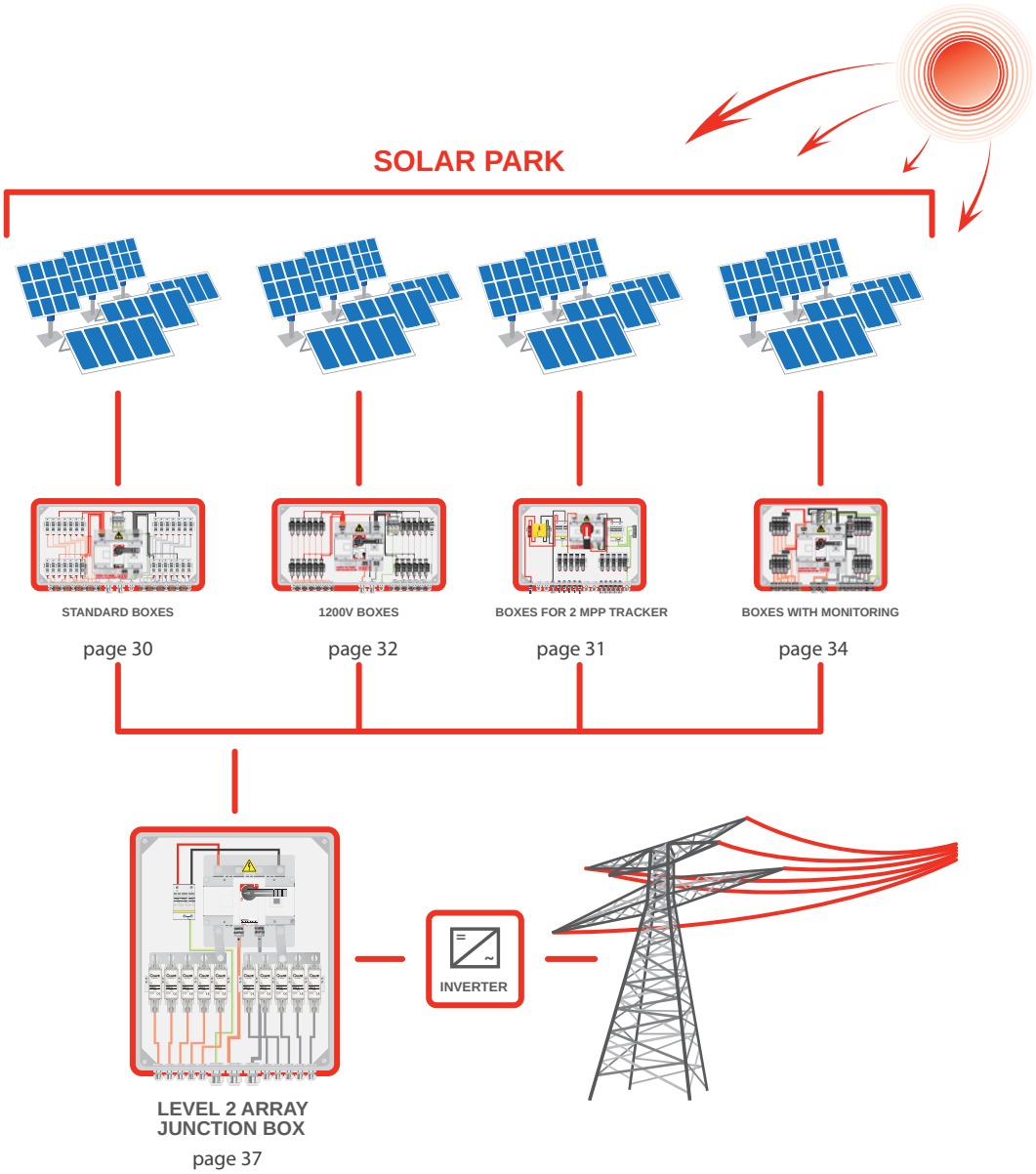
- GRP Enclsoures highly resistant to hard weather and environment conditions.
- Easy installation and highly accessible on maintenance works.
- Transparent cover for inspection purposes. PC material.
- Load break switches. Voltages up to 1000V.
- Overvoltage protection Class II 1000VDC
- Fuse protection against overloads.

Solar park PV disconnection boxes

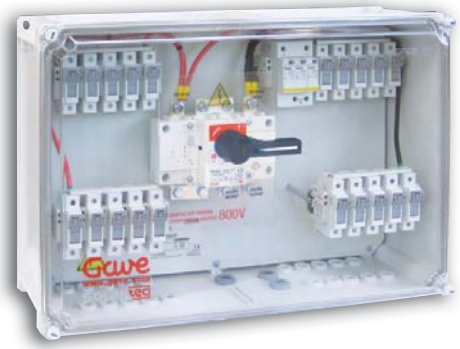
Solar parks are typically designed with central inverter systems. A large range of standard boxes is currently offered as ordinary production on the Solartec range. This range might often combine with other options available in our catalogue.

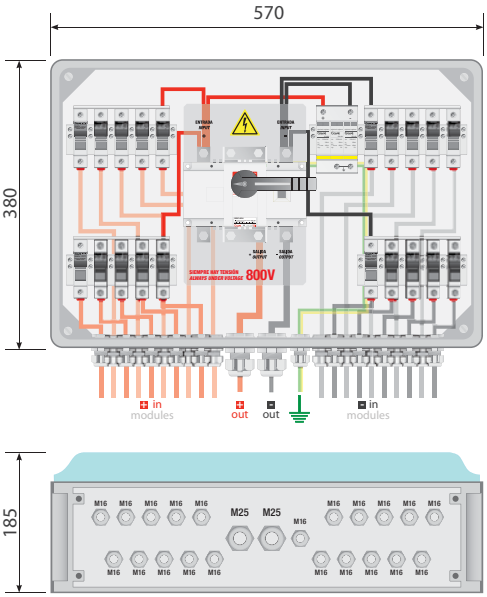
The current scope of production includes new technological trends such as high insulation/operational voltages, monitoring systems, multiple MPP trackers,...
Products are conceived to last for a long lifetime thus using specially enduring materials.

Fuse protection is used to safeguard cable and solar panels. Overvoltage protection is mostly used ensuring inverter life. Safety is the most important element, thus disconnection switch is present in all boxes permitting circuit isolation at any time.

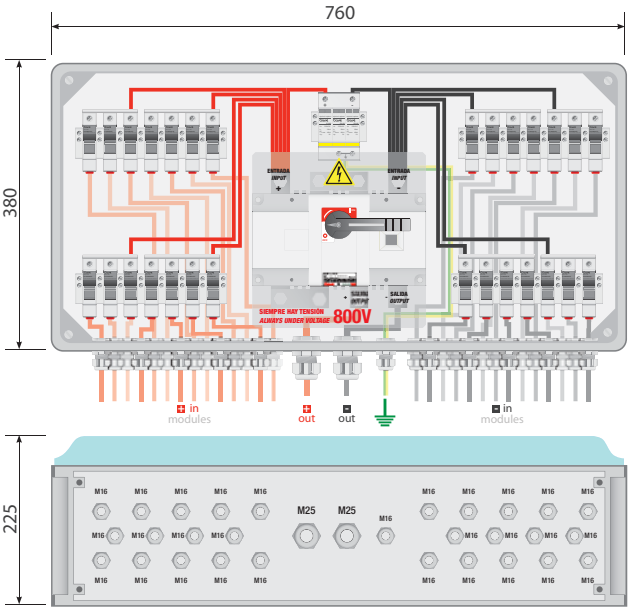


10-14 strings boxes





Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST106080	10	600	80 A	No	IP55	GRP/PC	Glands
ST106080P	10	600	80 A	PST31PV	IP55	GRP/PC	Glands



Reference	Strings	V	Isc	Overv. protection	Prot. Degree	Material (housing/cover)	Input conn.
ST148012	14	800	125A	No	IP55	GRP/PC	Glands
ST148012P	14	800	125A	PST31PV	IP55	GRP/PC	Glands

2 MPP tracker boxes

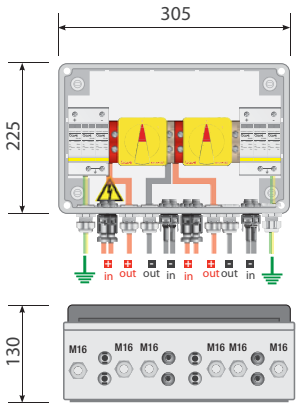
Some latest generation inverters are constructed with multiple Maximum Power Point trackers thus optimising PV production. A standard range of 2MPP boxes is available offering an integrated product designed to manage these installations with simplicity and safety. On this application overvoltage protection becomes critical.
Standard boxes are particularly easy and quick to install provided with MC4 input connectors that safe significant wiring time. Sunclix and cable gland connectors are also available.

General characteristics

- Operating voltage 1000VDC.
- Switch ratings 25A and 63A.
- Standard connector MC4 - Cable gland or Sunclix optional.
- Overvoltage Class II.
- Enclosures highly resistant to hard weather and environment conditions.
- Direct disconnector access.
- Transparent cover and padlockable handle (optional) adequate for maintenance works.

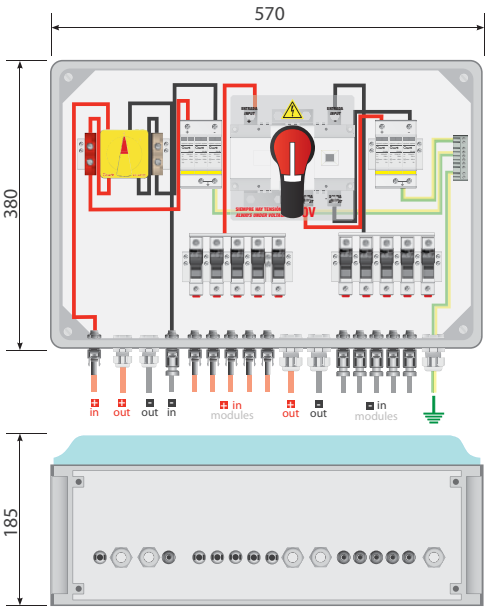
2MPP 2+2 strings

Dimensions



2MPP 1+5 strings

Dimensions



Ui-1200Vdc disconnection boxes

«Increasing voltage and maintaining safety»

Increasing operating voltage on photovoltaic installations leads to significant economies on generator plants creating savings on cabling, inverter and installation time. However voltage increase carries an important raise on electrical risk. This particularity requires specific equipment design that does guarantee personal safety on installation operators.

Gave has designed a new range of generator disconnection boxes that offer an outstanding 1200V insulation voltage that warrants user safety. These equipment are conceived to maintain safety under difficult environment conditions, complying with insulation and creepage distances considering a pollution degree grade III on a non homogeneous field. This category considers mircroenvironments with conductive particles and the effects of condensation on air conductivity.

The set benefits 1000V operating voltage and provides high dielectric strength with Uimp value of 8kV that is increased on the critical switch disconnector element up to 12kV by using inter phase barriers.

References

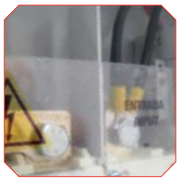
References	Strings	Ui	Ie 1000V	Uimp 8kV	Uimp 12kV	Pollution degree III
ST081012P	8	1200Vdc	125 A	✓	✓	✓
ST121012P	12	1200Vdc	125A	✓	✓	✓
ST161016P	16	1200Vdc	160A	✓	✓	✓

Main characteristics

Cabling
Flexible double insulated PV cables. Precision termination prevents leakage.

Overvoltage SPD
Surge protector device Class II. Phases connection on top and earthing on bottom. Remote indication optional.

Fuse protection
Increased insulation and creeping distance according to pollution degree III.



Phase barriers
Special shape and phase barriers for increased switch insulation and dielectric strength.

Box material
Non hydroscopic self-extinguishing material adequate for outdoor and indoor installation.
High resistance to corrosion and pollution.

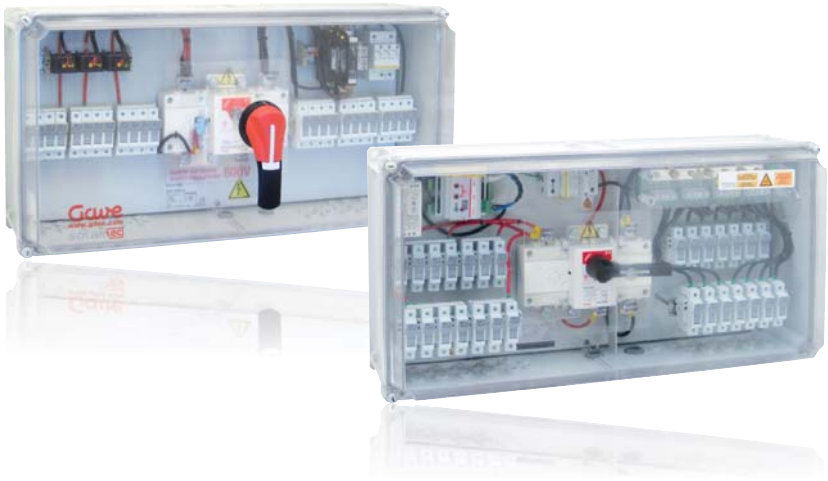
Protection screens
Prevent direct contact and display electrical alarm signs.

Product ID
Shows electrical product information according to **IEC 60439-1** permitting individual test tracking.

- ✓ **Pollution degree III:** suitable for industrial installations: according to 6.1.2.3.
- ✓ **Uimp 8kV - Insulation:** rated impulse withstand voltage according to table 14 pollution degree 3.
- ✓ **Uimp 12kV - Increased safety:** +75% insulation distance on switch.
- ✓ **Ui – Rated insulation voltage:** creepage distance according 7.1.2.3.5 table 16.

Connection boxes with monitoring

«Efficient monitoring to maximise your profits»



Small installation

On residential and small industrial installations user friendliness is a main concern and that requires an easy interface with non expert operators avoiding risks of involuntary unprogramming.

Solar parks

Monitoring solar parks must rely on a good system scalability that manages multiple parameters controlled through digital and/or analogue input signals.

References

Type
- SM Solartec hall
- SH Solartec shunt

Operating voltage
- 80 800V
- 10 1000V

Rating
- standard
- 40A
- 125A

SM 04 80 20 2 12

Nº of strings (2 digits)
- standard
- 04
- 08
- 12
- 16

Number of string x sensor
- 1 1 strings x sensor
- 2 2 strings x sensor
- 3 3 strings x sensor
- ☐ standard 4 strings x sensor (type SM)
- ☐ standard 1 string x sensor (type SH)

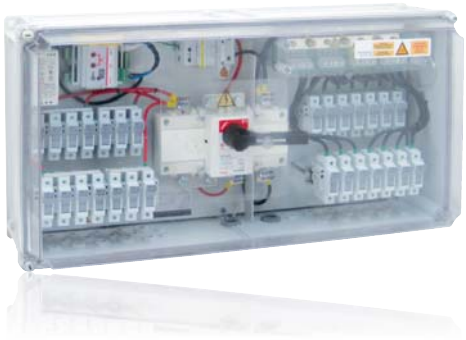
Fuse protection
- -8 Fuse 8A
- ☐ Fuse 10A (standard)
- 12 Fuse 12A

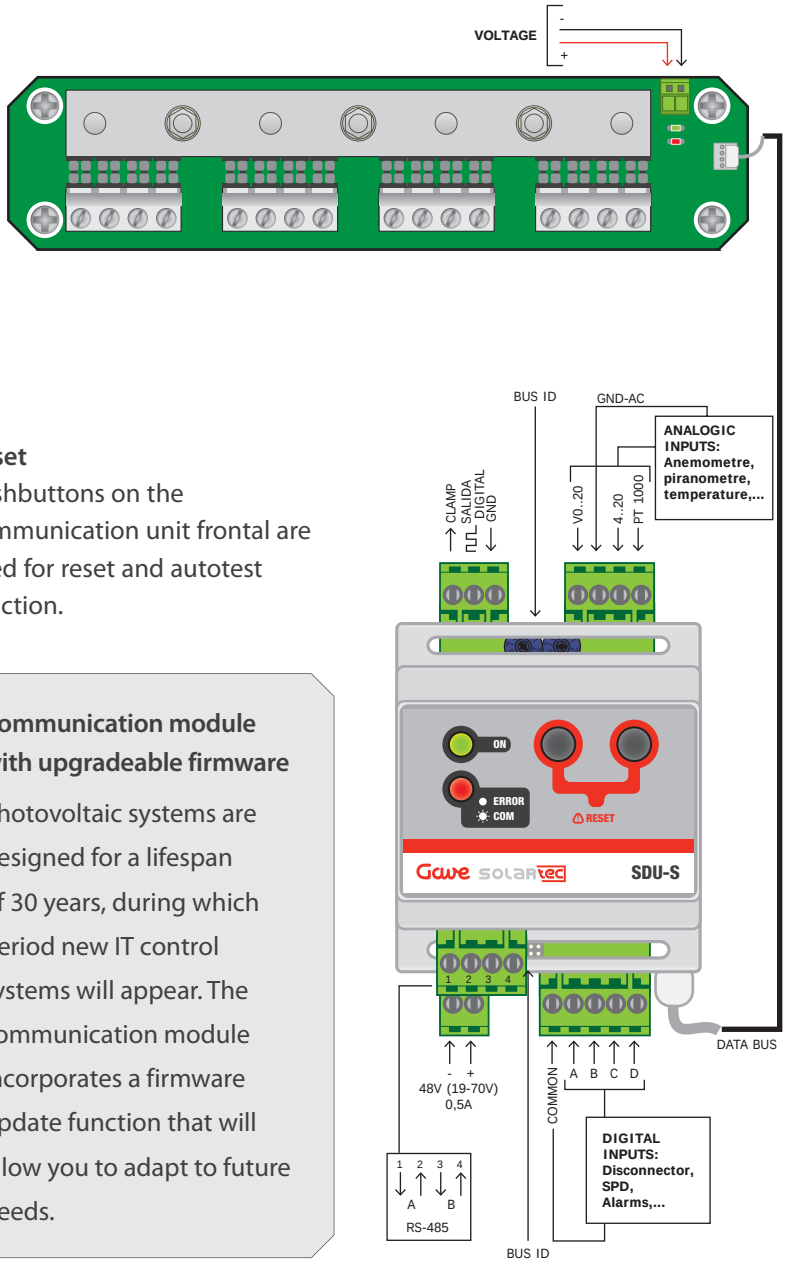
Why monitoring?

Photovoltaic installations are important investments that require continuous follow up to guarantee expected return on investment. An independent control and monitoring system is the necessary tool to optimise investment return.

Gave introduces its new monitoring system that is complies with reliablity, flexiblity, competitiveness and user friendly requirements of modern installations.

Solar park monitoring





- **Current sensor module independent from communication**
  Maximum PV combiner design with current sensor modules (8, 12 or 16 strings) independent from communication module. Two current sensor modules can be connected in series. In case of communication module failure production is not interrupted. Bus supports up to 240 connected devices.
- **Digital inputs**
  Enable monitoring of the switch disconnector, surge protector status, alarms, ...
- **Analogue inputs**
  For the control of temperature, wind, radiation, ...
- **Reset**
  Pushbuttons on the communication unit frontal are used for reset and autotest function.

Communication module with upgradeable firmware

Photovoltaic systems are designed for a lifespan of 30 years, during which period new IT control systems will appear. The communication module incorporates a firmware update function that will allow you to adapt to future needs.

More information

Also are available individual string monitoring units using hall sensor in modular casing of 5 or 12 strings.
Information about sizes and main electrical characteristics.

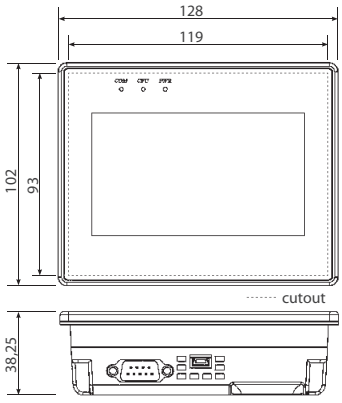
Small installation monitoring

Monitor Control Units easy to interface via touch screens that display main parameters. Software loaded from origin avoiding typical installation start up problems. Hall sensors support up to 40A allowing to group strings and enabling efficient designs on installation monitoring.

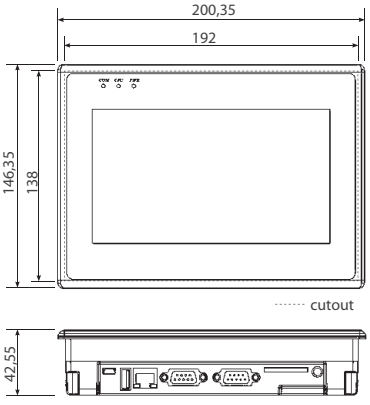
Touchpad screen

- TFT LCD backlight screens 4 wires resistive type with high brightness and resolution.
- 30.000h LED backlight lifetime
- 65536 colorus with high contrast ratio 600:1 (4.3") and 500:1 (7").
- Communication port RS232/RS485, 2W/4W.
- Resolution (WXH): 4.3" 800x480
  7" 480x272
- Brightness (cd/m2): 4.3" 500
  7" 375

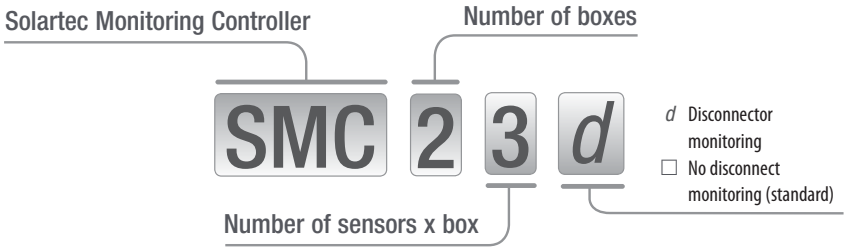
Up to 8 inputs (4.3" screen)



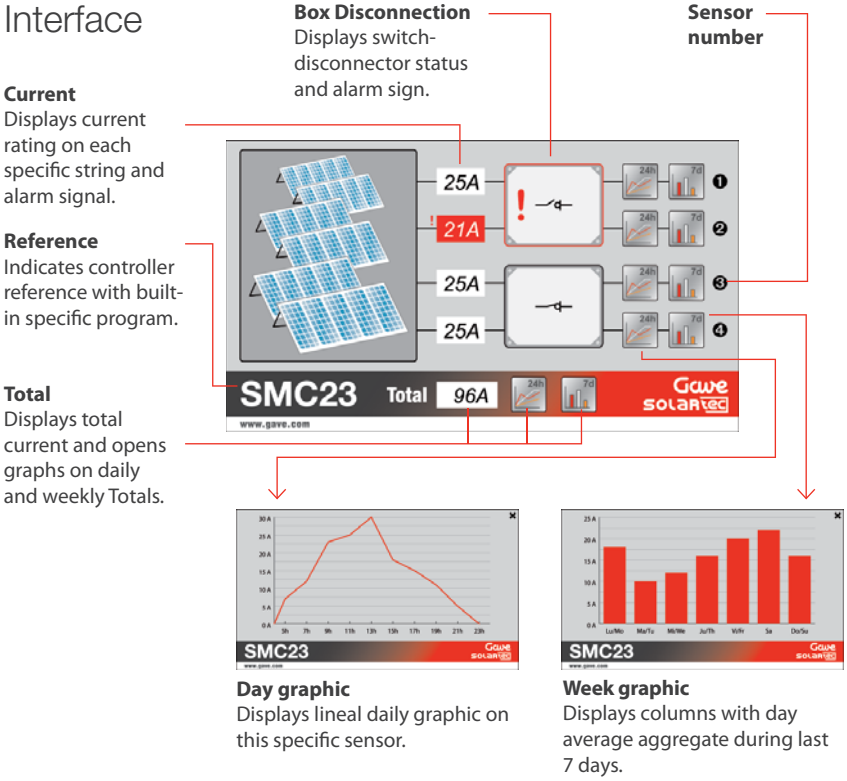
From 9 to 16 inputs (7" screen)



Reference system



Interface



Communication accessories

Reference	Description
RSU01	RS485/USB converter
RSE02	ModBus/Ethernet converter (TCP/RTU operating modes)

Level 2 array junction connection boxes

Large scale photovoltaic plants with centralised inverters use array junction boxes also called level 2 connection boxes.
These connection boxes are featured by integrating a disconnection element and a fuse protection against overloads. High power carried on these boxes require NH fuses and large load break switch disconnectors. When distance between junction boxes and array connection boxes is higher than 10m it is advisable to include overvoltage surge protection. If the plant installation also has lightning rod then Class I surge protectors must be used.

Due to the large variety of requirements related to specific power plant designs altogether with the significant cost of components on this kind of boxes, it is suitable to work on customised solutions. Our long standing experience and high components stock level we can offer good response on product deliveries. Array junction connection boxes can also be designed to integrate monitoring function.

Customised equipment

Contact data

Contact person _____ Telephone _____

Company _____ Fax _____

Street _____ E-mail _____

Postcode/Town _____ Country _____ Web _____

Product characteristics

Quantity _____

PV current (Isc): ☐ 15A ☐ 20A ☐ 25A
☐ 40A ☐ 50A
☐ 80A ☐ 125A

Nº strings _____

Maximum voltage ☐ 500V ☐ 600V
☐ 800V ☐ 900V

Exterior handle operation on isolator:
☐ Yes ☐ No

☐ MC connectors

☐ Overvoltage protectors
☐ Class II
☐ Class I

☐ Fuse protection

Comments: _____

For string monitoring, please contact with technical department.

Contact our technical department on customised solutions

info@solartec.gave.com

099099CA00128.03EN

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