

Overvoltage protection for Photovoltaic systems

Photovoltaic systems, abbreviated as PV systems, are a considerable investment that must be protected from failure and damage. As these systems are installed outdoors, they are exposed to the danger of overvoltage from lightning strikes.

Overvoltage protection in the DC circuit with central inverters

The generator circuit (the PV modules) produces a direct current. Connecting the PV modules and arrays in series allows voltages of 1000 V to be reached. This combination with the fact that the generator circuit can continue to supply energy after overvoltage requires sophisticated technology for the overvoltage arrester.

DC overvoltage protection:

The PV/DC overvoltage arresters are specially designed for use in PV systems.

Both the housing technology and the connections are designed for the requirements of a PV systems high voltages and conductor cross-sections. With a width of only 36 or 48mm, the units are easily installed inside distribution panels, requiring the minimum of space.

- High discharge capacity due to powerful zinc-oxide varistor
- No fire hazard caused by permanent electric arc due to combined disconnect and short-circuit facility. Overload indicated in display window
- Signaling contacts for remote monitoring in all remote signaling types

AC overvoltage protection:

On the AC side of the inverters overvoltage protection must also be installed. The arresters listed here are the most commonly used versions.

Suitable units can be found inside the chapters **wietap** IEC and **wietap** UL/CSA.

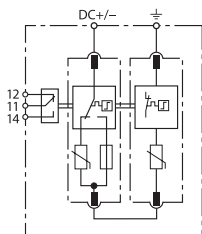


Surge protection for solar modules

To be used in photovoltaic DC circuits

wietap GS PV SCI 600 (FM)

- DC solar arrester for 600 V string voltage
- For DC grounded solar systems
- No fire hazard during overload due to combined disconnection and short-circuit device
- Safe, arc-free replacement of protection modules due to integrated DC fuse
- High discharge capacity
- Function/failure indication
- **wietap** GS PV SCI 600 FM with remote signaling contact (FM)



Type	Part No.
wietap GS PV SCI 600	84.995.2550.0
wietap GS PV SCI 600 FM	84.995.2555.0

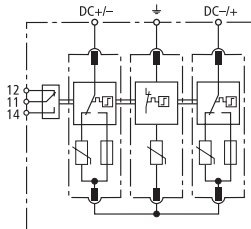
Technical Data	
Connection between	DC – Grnd
SPD accord. to EN 50539-11	Type 2
Maximum PV voltage [U _{CPV}]	≤ 600 V
Short-circuit resistance (I _{SCPV})	1 kA
Nominal discharge current (8/20) [(DC+/DC-) → PE] [I _n]	12.5 kA
Max. discharge current (8/20) [(DC+/DC-) → PE] [I _{max}]	25 kA
Protection level [U _p]	≤ 2.5 kV
Protection level at 5 kA [U _p]	≤ 2 kV
Operating time [t _A]	≤ 25 ns
Temperature range [T _U]	-40 ... +80 °C
Function/failure indication	green / red
Wire range (min.)	1.5 mm ² (AWG 14) solid/fine-stranded
Wire range (max.)	35 mm ² (AWG 2) stranded / 25 mm ² (AWG 4) fine-stranded
Mounted on DIN rail acc. to EN 60715	35 mm
Housing material	Thermoplast, UL 94 V-0
Degree of protection	IP 20
Dimensions	2 TE, DIN 43880 (36 mm)
Remote signaling contacts (FM)	Change-over contact
Switching capacity AC (FM)	250 V/0.5 A
Switching capacity DC (FM)	250 V/0.1 A; 125 V/0.2 A; 75 V/0.5 A
Wire range for remote signaling terminals	max. 1.5 mm ² (AWG 14) solid/fine-stranded
Approvals	CE, TÜV, VDE

Surge protection for solar modules

To be used in photovoltaic DC circuits

wietap GM YPV SCI 600 (FM)

- DC solar arrester for 600 V string voltage
- No fire hazard during overload due to combined disconnection and short-circuit device
- Safe, arc-free replacement of protection modules due to integrated DC fuse
- High discharge capacity
- Function/failure indication
- **wietap** GM YPV SCI 600 FM with remote signaling contact (FM)



Type	Part No.
wietap GM YPV SCI 600	84.995.2511.0
wietap GM YPV SCI 600 FM	84.995.2516.0
Repl. module "+" or "-" against int. neutral point	84.995.2053.0
Repl. module int. neutral point against \perp	84.995.2010.0
Technical Data	
Connection between	DC+ – Grnd – DC-
SPD accord. to EN 50539-11	Type 2
Maximum PV voltage [U _{CPV}]	≤ 600 V
Short-circuit resistance (I _{SCPV})	1 kA
Total discharge current (8/20) [I _{total}]	40 kA
Nominal discharge current (8/20) [(DC+/DC-) → PE] [I _n]	12.5 kA
Max. discharge current (8/20) [(DC+/DC-) → PE] [I _{max}]	25 kA
Protection level [U _p]	≤ 2.5 kV
Protection level at 5 kA [U _p]	≤ 2 kV
Operating time [t _A]	≤ 25 ns
Temperature range [T _U]	-40 ... +80 °C
Function/failure indication	green / red
Wire range (min.)	1.5 mm ² (AWG 14) solid/fine-stranded
Wire range (max.)	35 mm ² (AWG 2) stranded / 25 mm ² (AWG 4) fine-stranded
Mounted on DIN rail acc. to EN 60715	35 mm
Housing material	Thermoplast, UL 94 V-0
Degree of protection	IP 20
Dimensions	3 TE, DIN 43880 (54 mm)
Remote signaling contacts (FM)	Change-over contact
Switching capacity AC (FM)	250 V/0.5 A
Switching capacity DC (FM)	250 V/0.1 A; 125 V/0.2 A; 75 V/0.5 A
Wire range for remote signaling terminals	max. 1.5 mm ² (AWG 14) solid/fine-stranded
Approvals	CE, VDE, TÜV

Replacement module for wietap GM YPV SCI 600 (FM)

wietap G MOD PV SCI 300

"+" or "-" against internal neutral point

wietap G MOD PV 300

Internal neutral point against PE

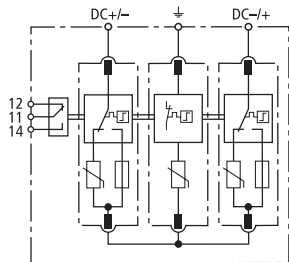
Type	Part No.
wietap G MOD PV SCI 300	84.995.2053.0
wietap G MOD PV 300	84.995.2043.0

Surge protection for solar modules

To be used in photovoltaic DC circuits

wietap GM YPV SCI 1000 (FM)

- DC solar arrester for 1000 V string voltage
- No fire hazard during overload due to combined disconnection and short-circuit device
- Safe, arc-free replacement of protection modules due to integrated DC fuse
- High discharge capacity
- Function/failure indication
- **wietap** GM YPV SCI 1000 FM with remote signaling contact (FM)



Type	Part No.
wietap GM YPV SCI 1000	84.995.2510.0
wietap GM YPV SCI 1000 FM	84.995.2515.0
Repl. module "+" or "-" against int. neutral point	84.995.2051.0
Repl. module int. neutral point against \neq	84.995.2015.0
Technical Data	
Connection between	DC+ – Grnd – DC-
SPD accord. to EN 50539-11	Type 2
Maximum PV voltage [U _{CPV}]	≤ 1000 V
Short-circuit resistance [I _{SCPV}]	1 kA
Total discharge current (8/20) [I _{total}]	40 kA
Nominal discharge current (8/20) [(DC+/DC-) → PE] [I _n]	12.5 kA
Max. discharge current (8/20) [(DC+/DC-) → PE] [I _{max}]	25 kA
Protection level [U _P]	≤ 4 kV
Protection level at 5 kA [U _P]	≤ 3.5 kV
Operating time [t _A]	≤ 25 ns
Temperature range [T _U]	-40 ... +80 °C
Function/failure indication	green / red
Wire range (min.)	1.5 mm ² (AWG 14) solid/fine-stranded
Wire range (max.)	35 mm ² (AWG 2) stranded / 25 mm ² (AWG 4) fine-stranded
Mounted on DIN rail acc. to EN 60715	35 mm
Housing material	Thermoplast, UL 94 V-0
Degree of protection	IP 20
Dimensions	3 TE, DIN 43880 (54 mm)
Remote signaling contacts (FM)	Change-over contact
Switching capacity AC (FM)	250 V/0.5 A
Switching capacity DC (FM)	250 V/0.1 A; 125 V/0.2 A; 75 V/0.5 A
Wire range for remote signaling terminals	max. 1.5 mm ² (AWG 14) solid/fine-stranded
Approvals	CE, TÜV, VDE

Replacement module for wietap GM YPV SCI 1000 (FM)

wietap G MOD PV SCI 500

"+" or "-" against internal neutral point

wietap G MOD PV 500

Internal neutral point against PE

Type	Part No.
wietap G MOD PV SCI 500	84.995.2051.0
wietap G MOD PV 500	84.995.2041.0

Surge protection for solar modules

To be used in photovoltaic DC circuits

AC arrester on mains for Class 1/2/3



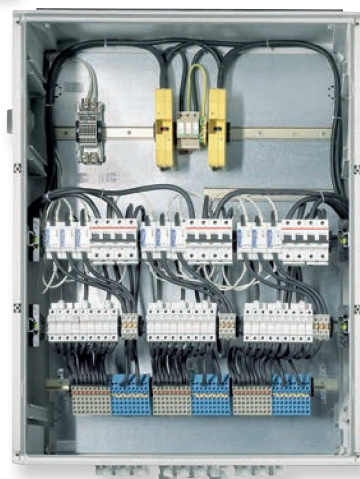
The used arrester type of the AC side is depending on the mains system.

A suitable arrester with the relevant certifications can be found in the previous chapters.

The suitable distribution for your project



AC combiner box



DC combiner box

Housing

Protection	Class II
UV-resistant	yes
Material	polycarbonate
Cable connection	pluggable or gland

Build in components

- Termination points for solar connectors
- Big termination points for inverter connection
- PE connection
- String fusing
- Reverse current diodes
- String monitoring
- Main switch
- Circuit breaker
- Overvoltage protection and many more

Wieland will support you during the planning phase. High product quality and documentation are a standard for us.

More information and a planning tool can be found in the brochure **gesis**[®] SOLAR, Part No. 0710.1.

