

SDS[®] Surge Defence System

innovative electronic surge
protection
for PV power plants

- ❑ *More protection*
- ❑ *Higher efficiency*
- ❑ *Increasing life cycle*



Costruzioni Elettromeccaniche P. Torresan
<http://www.torresansrl.it/>

- ❑ **Unmatched protection levels compare to varistor technology**
- ❑ **Increasing of plant efficiency: returns of PV plants and other renewable energies increase because:**
 - ✓ ***Strong reduction of out of service:***
 - Number of faults 4 times lower than the varistor devices
 - Instantaneous auto resetting
 - The monitoring system (visual and remote) allows preventive maintenance (instead of varistor devices)
 - ✓ ***The SDS® device is inserted only when the surge occurs, contrary to the varistor device that is inserted permanently and in a continuous dissipate power***
 - ✓ ***SDS® returns to the line part of the surge energy***
- ❑ **Cost reduction:**
 - ✓ ***life cycle 4 times higher than the varistor devices***
 - ✓ ***Auto reset w/o operator***

SDS® Surge Defence System

More protection

Higher efficiency



SDS[®] Surge Defence System

More protection
Higher efficiency



- ❑ The SDS is the only system that can detect the operating status and faults in short-circuit and open circuit, ensuring full compliance with CEI 82-25 for photovoltaic
- ❑ Programmable trip threshold on request
- ❑ No maintenance. The replacement frequency is cut down drastically due to the strong reduction of leakage currents that instead trigger overheating and the aging of the varistor
- ❑ Diagnostic device and network quality (optional)
- ❑ LED display for proper operation, thermal fault, open circuit failure, degree of aging
- ❑ SPDT contacts for remote information
- ❑ Bi-directional protection

Surge in PV plants

- ❑ Photovoltaic systems are exposed to surges caused by direct (structure struck by lightning) and indirectly (lightning strikes nearby) lightning
- ❑ Besides, voltage surges can be caused by closure and opening of contacts or by fuses operation. These events have high frequency in industrial environment, and it could be happen in AC section of the PV plants, while the lightning affecting both the section CC and AC.
- ❑ The trigger surges voltage spikes on power lines (single / three phase) or transmission, with durations of less than 1 ms and amplitudes but it reach more than 20 times the nominal supply voltage



Standards references

- As requested by CEI 82-25, the risk exposure assessment of lightning strikes is executed according to CEI EN 62305.
- To improve the protection system of the CEI 82-25 provides the installation of surge suppressors with diagnostics. Depending on the area should also include a first barrier the inverter or immediately after the PV field
 - ✓ *IEC 82-25: 2007 Guide to the realization of photovoltaic power generation systems connected to networks of medium and low voltage*
 - ✓ *IEC 62305-1 Protection against lightning. General principles*
 - ✓ *IEC 62305-2 Protection against lightning. Risk assessment*
 - ✓ *IEC 62305-3 Protection against lightning. Physical damage to structures and danger to persons*
 - ✓ *IEC 62305-4 Protection against lightning. Electrical and electronic internal structures*



The new technology SDS[®] Surge Defence System

- Onset of lightning or surge voltage, a detector circuit activates that closes an high-energy switch non-linear load can withstand high energies. The values of capacity and parasitic inductance resonant in the circuit helping off-line and recovering this energy.
- Ability to monitor the operation and life cycle (remotely or visually led) to make a reasonable maintenance.
- Monitoring of interventions with transient measurement of network quality.

SDS[®] protection can be used to protect all types of lines: from energy to broadcasting. The lowest insertion loss (*a few microamps of current internal dissipation against varistors calculable in milliamps*) SDS[®] can be used also to the midrange, with a protection far higher than the devices currently used

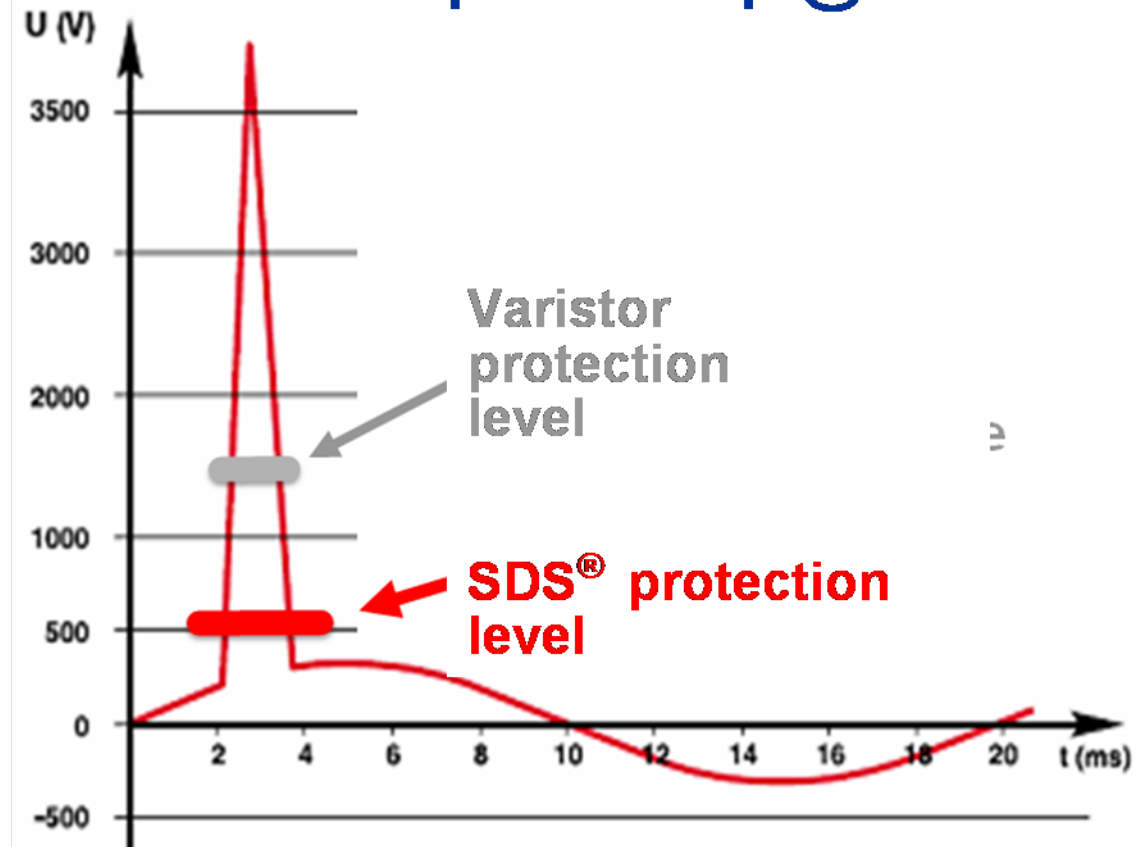


SDS[®] - Surge Defence System[®]

Today's systems are still based on the varistor technology, with highest protection tolerances and w/o diagnostic systems.

SDS[®] technology is able to offer a double protection levels compare to varistor one, with an integrate diagnostic system.

Protection level comparison Up @5kA



A full range of products for each needs

Broadcasting
Industrial
PV
Rail
MIL



- Load voltages ranges from 500 to 1200 PV
- Programmable protection level in a range from 1.2 KV to 2.5 KV
- Integrated diagnostic system with visual and/or free contact
- DIN rail application
- 3 protection levels : two common mode and a differential

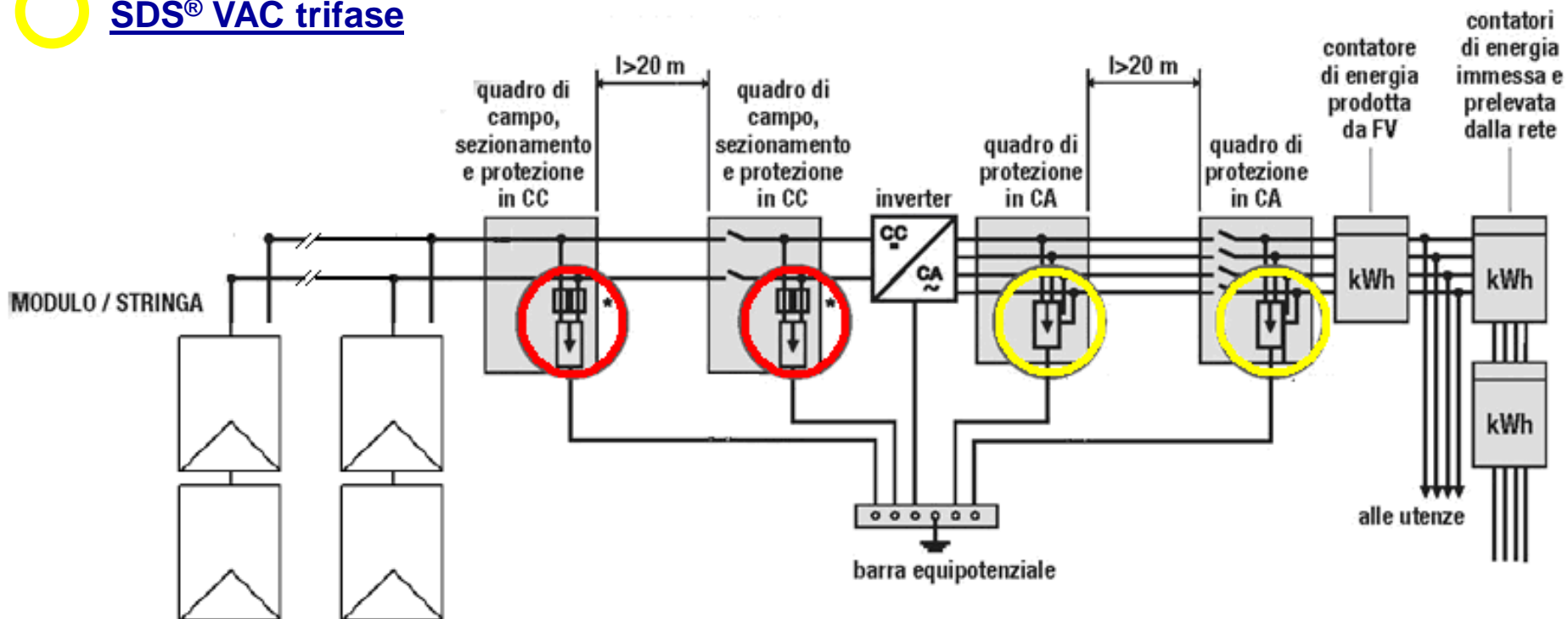


SDS[®] PV in field plants



3 phase surge protections in a PV plants...

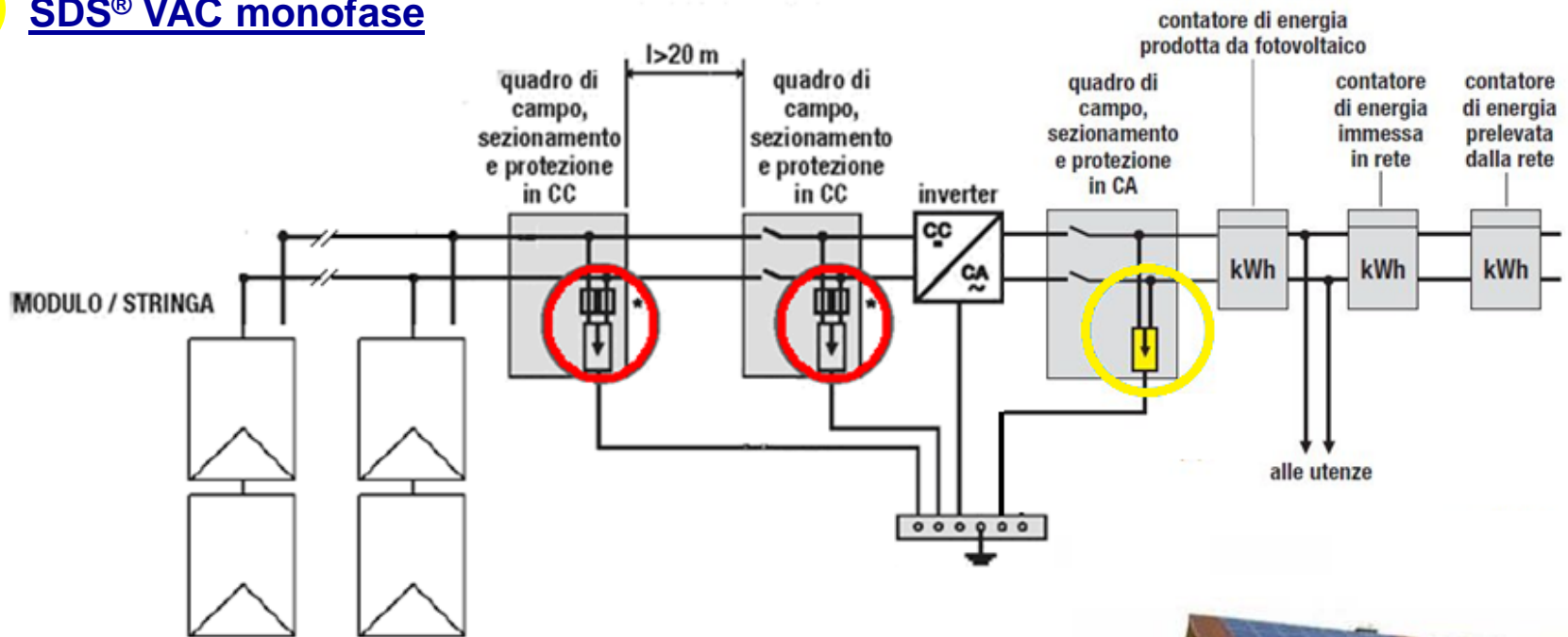
-  SDS® Fotovoltaico
-  SDS® VAC trifase



... o one phase

 SDS® Fotovoltaico

 SDS® VAC monofase



Costruzioni Elettro- meccaniche P. Torresan



Since 1955, flexibility and ability to innovate in the electromechanical and power electronics.

Production

Since 1955 we have been operating in the areas of protection and control, signal, industrial alarm and heaters manufacturing products and systems for installation in power plants, cabins, control panels in the energy, electricity and industry automation.

Engineering in power electronics

Experience of constant attention and advice to our customers' systems comes the division of research and development Tor Engineering: through international expertise of technological innovation and product and develop with a pool of young engineers we'll provide innovative solutions in power electronics

***Since 1955, flexibility and ability to innovate in
the electromechanical and power electronics***

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