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# WAGO-PROTECT

• Non-Degrading Silicon Surge Suppression

# Non-Degrading Silicon Surge Suppression

The WAGO-PROTECT series DIN rail mount surge suppressors are high speed, high current, solid state devices designed to protect sensitive electronic equipment (PLCs, PCs, etc.) from transient over voltages present on AC/DC power lines. Powered by patented Silicon Avalanche Suppressor Diode technology from Transtector, these suppressors provide the utmost in protection without degradation - unlike MOV based technology.

## Features:

- Pluggable surge function module for easy maintenance and replacement
- Fast, vibration-proof, and maintenance-free wiring with CAGE CLAMP®
- LED fail mode indication as well as relay alarm output connection
- Built-in test points for easy troubleshooting and maintenance

Ordering Data:	WAGO Protect 120	WAGO Protect 240	WAGO Protect 24
Part Number (includes base and module)	51018058	51018059	51017375
Standard Pack Quantity	1	1	1
Technical Data:			
Nominal Voltage	120 Vac	240 Vac	24 Vdc
Max. Continuous Operating Voltage	140 V RMS	280 V RMS	36 V RMS
Max. Nominal Current	20 A	20 A	20 A
Leakage Current	None	None	None
Voltage Protection Level (min./max. V Peak)	220/330 Vp	440/660 Vp	60 Vp
Power Dissipation (based on IEEE ANSI c62.41-1991) at 20/80µs (transient waveform lightning induced)	1.3 kA	1.3 kA	2 kA
at 10/1000µs (transient waveform other source induced)	400 A	400 A	600 A
Response Time (nano seconds)	< 5 ns	< 5 ns	< 5 ns
Temperature Range	- 40°C to + 85°C	- 40°C to + 85°C	- 40°C to + 85°C
Ingress Protection Level (IEC)	IP 20 (touch safe)	IP 20 (touch safe)	IP 20 (touch safe)
Insulating Housing	PA	PA	PA
Wire Termination Type	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®
Wire Strip Length	8-9 mm	8-9 mm	8-9 mm
Wire Range	28-12 AWG	28-12 AWG	28-12 AWG
Wiring Configurations	L-L, L-N	L-L, L-N	L-L, L-N
Dimensions (mm)	82.5 H x 73 L x 22 W	82.5 H x 73 L x 22 W	82.5 H x 73 L x 31 W
Standards	UL 1449 2 <sup>nd</sup> Edition CSA C22-2	UL 1449 2 <sup>nd</sup> Edition CAS C22-2	Less than 50 VDC N/A
Accessories:	Item No.	Item No.	Item No.
35 mm DIN mounting rail (2 meter length)			
- Slotted Rail	210-112	210-112	210-112
- Solid Rail	210-113	210-113	210-113
End Stops			
- 6 mm wide	249-116	249-116	249-116
- 8 mm wide	249-117	249-117	249-117
Screwdriver	210-620	210-620	210-620
Wire Stripper & Cutter (28-8 AWG)	206-101	206-101	206-101

## The myth of multi-stage (diode, gas-tube, and MOV) protection

Multi-stage protection designs are products that utilize SASD (Silicon Diode), MOV (Metal Oxide Varistor) and/or GDT (Gas Tube) components in the design. These designs tend to be misleading due to the fact that they use individual components that have good performance characteristics but are not the primary components that are being utilized. For example, SASD circuits may be utilized to take advantage of superior response times and stable voltage protection levels, while the MOV and GDT components are used to handle high power dissipation requirements. However, premature suppressor failure is realized by the SASD components because they simply do not incorporate enough SASD components to dissipate proper levels of transient energy. The MOV & GDT components continue to function, but they are still plagued with the same deficiencies of the pure MOV or GDT based products. Properly designed surge suppressors utilizing 100% SASDs (multiple stacked SASD designs) preclude the need for hybrid designs. Contact WAGO for white paper.

## Common Mode (Ground Suppressing) Suppressor Hazards

Common mode suppression devices utilize suppression paths to the Ground circuit through the suppression components. The sole function of the AC Ground is to provide a low impedance safe path for energy to return to its source during a "fault" condition. If the suppression components that are connected to the Ground fail short circuit, a bond would be created between the Neutral and Ground causing a touch safety hazard and violation to the NEC Article 250 safety requirements. Another issue that is caused by suppression devices that are configured in this manner is that suppression components such as MOV's and GDT's tend to leak current as the components degrade. This causes small amounts of leakage currents to "bleed" to Ground causing microprocessor based equipment that references Ground to become corrupt and damage the equipment you are protecting. Contact WAGO for white paper.

## Comparing Silicon Avalanche Diodes vs. MOVs

Silicon Avalanche Diode	MOVs
Non-Degrading, clamping voltage provides same level of protection for many years.	Degrade with every surge; as a result the clamping voltage increases each time.
Fastest elimination of transient over voltage (< 5 nanoseconds).	Slow response to transient over voltages (25 – 50 nanoseconds).
Lowest voltage protection level available - 220 volts for 120 VAC	Very high clamping voltages - 300-500 Volts for 120 VAC.
Provides protection against short (20/80µs waveform) and long impulses (10/100 µs waveform).	Provides limited protection against short duration impulses (20/80µs waveform). Not rated for long duration impulses.
Normal mode suppression only (L-N, L-L).	Typically normal mode (L-N, L-L) and common mode (L-G, N-G). Common mode is not necessary in properly wired facilities and may cause NEC code violations.
5-year unconditional warranty with and expected useful life of more than 20 years.	1-year limited warranty with a limited useful life expectancy.

