

Class I surge protection with sparkover gaps

Lightning conductors with sparkover gap for lightning protection or equipotential bonding providing Surge protection class I

According to the requirements of class B (DIN VDE 0675 part 6, draft: Nov. 1989/A1: Mar 1996) and class I to IEC 61643-1 (Jan 2002), the lightning conductor at the transfer from interface 0 to 1 (to IEC 1312-1) is used as the lightning protection providing equipotential bonding. In combination with several lightning protectors, the surge protection is used in the mains forms TN, TT and IT. When lightning strikes, the triggered air gap protector provides the necessary equipotential bonding between the building lightning protection and the earthing system of the power supply. The use of a sparkover gap satisfies the inspection requirements for class B surge protection systems according to the VDEW (Association of German Power Stations) directive (1st ed., 1998).



Electrical connection for building installation

The PU 1 TSG 35 kA class I lightning arrester is connected between the phase conductors (L1, L2, L3) and N/PE. A Weidmüller PU 1 TS G 50 kA is used to provide the N-PE sparkover gap. The lines for this should be kept as short as possible. The triggered and non-blowout PU 1 TSG devices can be clipped to TS 35 rails in electrical cabinets or distribution boards. The maximum permissible operating voltage U_c is 260 V AC. Decoupling from downstream class II (C) arresters is unnecessary because triggered sparkover gaps with a low sparkover voltage are used.

Please follow the installation instructions.

Electrical connection for industrial installations

The PU 1 TSG+ 50 kA/330 V or 440 V class I lightning arrester is connected between the phase conductors (L1, L2, L3) and N/PE. A Weidmüller PU 1 TSG 50 kA is used to provide the

N-PE sparkover gap. The lines for this should be kept as short as possible.

The triggered and blowout PU 1 TSG+ 50 kA devices can be clipped to TS 35 rails in electrical cabinets or distribution boards. Owing to the emissions given off when the sparkover gap is tripped, a safety clearance of min. 100 mm must be maintained between this and any current-conducting components.

Coordination

The maximum permissible operating voltage U_c is 330 or 440 V AC. Decoupling from downstream class II (C) arresters is unnecessary because triggered sparkover gaps with a low sparkover voltage are used.

Important: for U_c 330 V, PU II is used with 280 V and for U_c 440 V, the PU II with 470 V.

Please follow the installation instructions.

Checking operation, maintenance and approvals

A visual check is necessary to ensure that PU 1 TSG and PU 1 TSG+ surge protection components are operating correctly. Besides signalling a mains power failure, the LED illuminates above 120 V AC to indicate the failure of the firing electronics. It is advisable to check frequently during stormy weather.

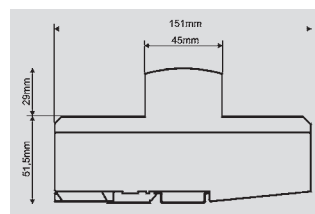
The use of triggered sparkover gaps achieves a very low protection level of < 1.5 kV with high discharge currents. Depending on the cross-section of the line, the PU 1 TSG must be protected with a fuse of max. 125 A gL, the PU 1 TSG+ max. 250 A gL.

The connection is designed for the following cross-sections:

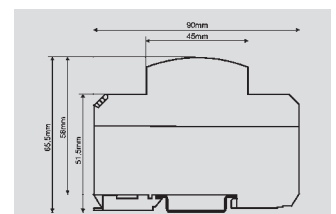
- solid wire: 10 ... 35 mm²
- stranded wire: 10 ... 25 mm²

The operating temperature range is -40 °C ... $+85$ °C.

The PU 1 TSG lightning arresters have UL and KEMA approval and are hence suitable for use worldwide.

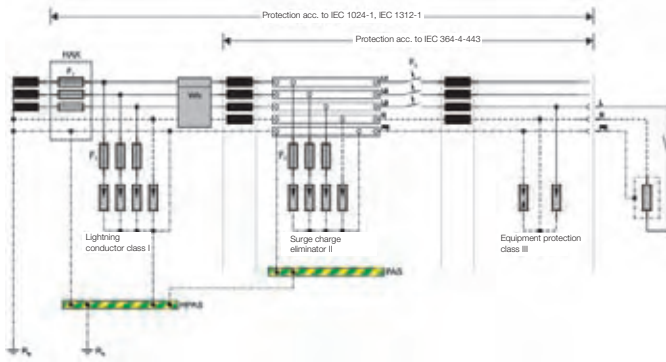


Dimensions PU 1 TSG+
Overall width 36 mm

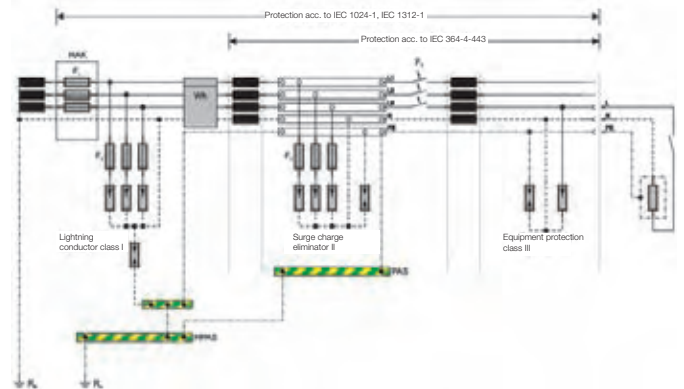


Dimensions PU 1 TSG
Overall width 18 mm

Protection in the TN-S-system

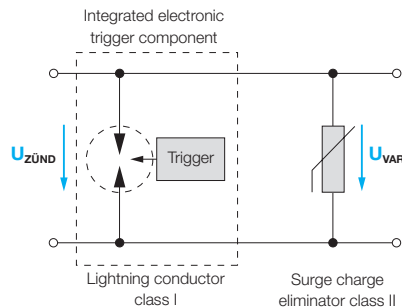
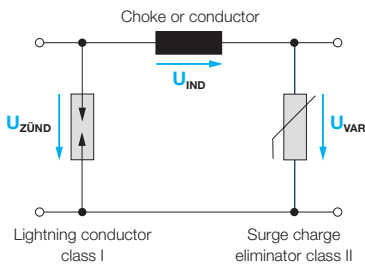


Protection in the TT-system



In contrast to conventional sparkover gaps, the Weidmüller PU 1 TSG+ and PU 1 TSG sparkover gaps operate with electronic triggering. This fires the sparkover gap at such an early point that the downstream class II (PU II series) arresters are relieved. Decoupling from downstream class II (C) arresters is unnecessary because triggered sparkover gaps with a low sparkover voltage are used.

The PU 1 TSG+ and PU 1 TSG differ in terms of the follow current extinction. The PU 1 TSG+ distributes the arc drop voltage over several chambers. As soon as the total arc drop voltage exceeds the mains voltage flowing, the follow current is extinguished. In the PU 1 TSG the follow current extinction takes place at the next current zero of the mains voltage.



Accessories for PU BC / BCR

	Type	Qty.	Order No.
N-PE Arrestor	PU1TSG	1	8561230000
Cross-connection for 3 units PU BC	QB 36-3	1	8816090000
Cross-connection for 4 units PU BC	QB 36-4	1	8816100000
Cross-connection for 3 units PU BCR	QB 54-3	1	8821720000
Cross-connection for 4 units PU BCR	QB 54-4	1	8821710000
Cross-connection for 3 units PU BC+PU1TSG	QB 36-3+1	1	8858360000
Cross-connection for 3 units PU BCR+PU1TSG	QB 54-3+1	1	8858340000
Cross-connection for 1 unit PU BC/R+PU1TSG	QB 36-1+1	1	8858350000

Surge protection for low-voltage supplies

Class I with triggered sparkover gap

- Class I lightning arrester
- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable for networks with high short-circuit currents
- suitable for lightning protection classes I, II, III, IV

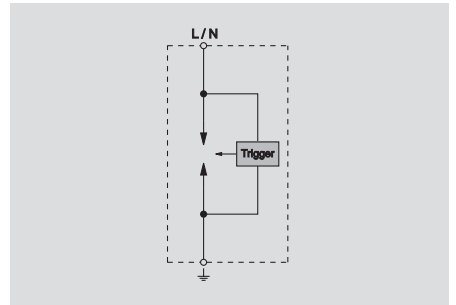
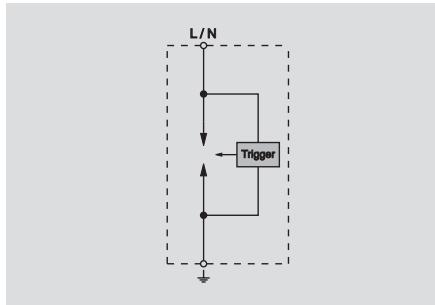
PU 1 TSG+ 50 kA / 0.9 kV-330 V

for use in industrial systems



PU 1 TSG+ 50 kA / 1.5 kV-440 V

for use in industrial systems



F

Technical data

Technical data	
Rated voltage (AC)	330 V
max. continuous current, Uc (AC)	330 V
Requirements class to IEC 61643-1	Class I
Lightning test voltage I imp (10/350 μs)	50 kA with 25 As charge
Specific energy, per path	625 kJ/Ω
Short-circuit current extinction without back-up fuse	50 kA / 50 Hz
Short-circuit strength with max. back-up fuse	25 kA _{eff}
Response time	≤ 150 ns
Fuse, max.	250 A gL
Protection level Up (typical)	900 V
Optical function indicator	green LED
Colour	black
Operating temperature, min./max.	-40 °C/85 °C
Storage temperature, min./max.	-40 °C/85 °C
Approvals	cURus;File E198315;KEMA

330 V
330 V
Class I
50 kA with 25 As charge
625 kJ/Ω
50 kA / 50 Hz
25 kA _{eff}
≤ 150 ns
250 A gL
900 V
green LED
black
-40 °C/85 °C
-40 °C/85 °C
cURus;File E198315;KEMA

440 V
440 V
Class I
50 kA with 25 As charge
625 kJ/Ω
50 kA / 50 Hz
25 kA _{eff}
≤ 150 ns
250 A gL
1500 V
green LED
black
-40 °C/85 °C
-40 °C/85 °C
cURus;File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.)	mm ²	35 / 10 / 35
Length x width x height	mm	150 x 35 x 80

35 / 10 / 35
150 x 35 x 80

35 / 10 / 35
150 x 35 x 80

Note

Ordering data

Version
without telecomm. contact

Type	Qty.	Order No.
PU1 TSG Plus 330 VAC 0,9kV	1	8561220000

Type	Qty.	Order No.
PU1 TSG Plus 440 VAC 1,5kV	1	8561250000

Note

Cross-connection QB 18-4 order No. 8619440000
 Cross-connection QB 18-6 order No. 8619450000

Cross-connection QB 18-4 order No. 8619440000
 Cross-connection QB 18-6 order No. 8619450000

Accessories

Note
 Designation BZ18, PE PE PE PE PE, Order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Designation BZ18, PE PE PE PE PE, Order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Designation BZ18, PE PE PE PE PE, Order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

Class I with triggered sparkover gap

Class I lightning arrester

- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable for lightning protection classes I, II, III, IV

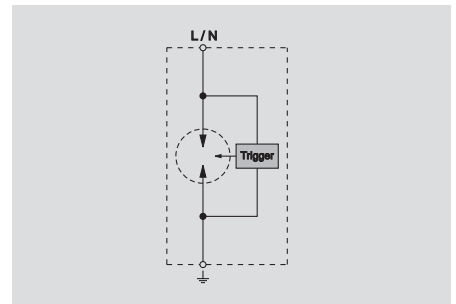
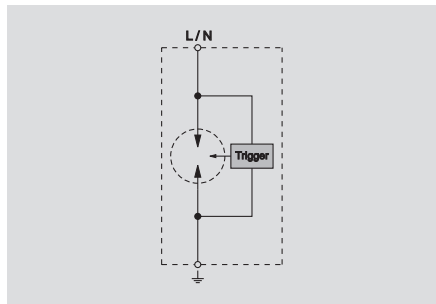
PU 1 TSG 35 kA / 0.9 kV-260 V

for use in building systems (L-N/PE)



PU 1 TSG 50 kA / 1.5 kV-260 V

for use in building systems (N-PE)



Technical data

Technical data

Rated voltage (AC)
 max. continuous current, I_c (AC)
 Requirements class to IEC 61643-1
 Lightning test voltage I_{imp} (10/350 μ s)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 260 V
 Class I
 35 kA with 17.5As charge
 305 kJ/ Ω
 3 kA / 50 Hz
 25 kA_{eff}
 $\leq 1 \mu$ s
 125 A gL
 900 V
 green LED
 grey
 -40 °C/85 °C
 -40 °C/85 °C
 cURus:File E198315;KEMA

230 V
 260 V
 Class I
 50 kA with 25 As charge
 625 kJ/ Ω
 500 A / 50 Hz
 25 kA_{eff}
 $\leq 1 \mu$ s
 125 A gL
 1500 V
 no
 grey
 -40 °C/85 °C
 -40 °C/85 °C
 cURus:File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.) mm²
 Length x width x height mm

35 / 10 / 35
 91 x 18 x 63

35 / 10 / 35
 91 x 18 x 63

Note

Ordering data

Version
 without telecomm. contact

Type	Qty.	Order No.
PU 1 TSG 35kA / 0,9kV	1	8561260000

Type	Qty.	Order No.
PU 1 TSG 50kA / 1,5kV	1	8561230000

Note

Cross-connection QB 18-4 order No. 8619440000
 Cross-connection QB 18-6 order No. 8619450000

Cross-connection QB 18-4 order No. 8619440000
 Cross-connection QB 18-6 order No. 8619450000

Accessories

Note

Designation BZ18, PE PE PE PE PE, Order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

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Surge protection for low-voltage supplies

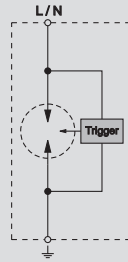
Class I with triggered sparkover gap

Class I lightning arrester

- encapsulated version
- no decoupling necessary thanks to trigger electronics
- suitable as N-PE arrester
- suitable for lightning protection classes I, II, III, IV

PU 1 TSG+ 100 kA / 1.5 kV-260 V

for use as N-PE arrester



Technical data

Technical data

Rated voltage (AC)
 max. continuous current, I_c (AC)
 Requirements class to IEC 61643-1
 Lightning test voltage I_{imp} (10/350 μ s)
 Specific energy, per path
 Short-circuit current extinction without back-up fuse
 Short-circuit strength with max. back-up fuse
 Response time
 Fuse, max.
 Protection level Up (typical)
 Optical function indicator
 Colour
 Operating temperature, min./max.
 Storage temperature, min./max.
 Approvals

230 V
 260 V
 Class I
 100 kA with 50 As charge
 2500 kJ/ Ω
 100 A 260 V/50 Hz

$\leq 1 \mu$ s
 100 A gL
 1500 V
 no
 grey
 -40 °C/85 °C
 -40 °C/85 °C
 cURus:File E198315;KEMA

Dimensions

Clamping range (rating- / min. / max.) mm² 50 / 6 / 50
 Length x width x height mm 90 x 36 x 63

Note

Ordering data

Version without telecomm. contact

Type	Qty.	Order No.
PU 1 TSG 100kA/1,5 kV	1	8762020000

Note

Cross-connection QB 18-4 order No. 8619440000
 Cross-connection QB 18-6 order No. 8619450000

Accessories

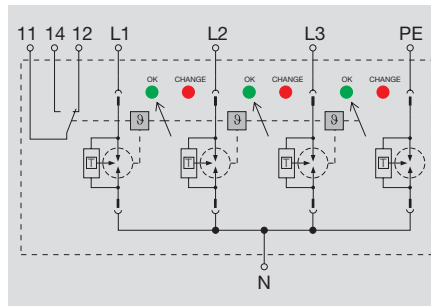
Note Designation BZ18, PE PE PE PE PE, Order No. 8619470000
 Designation BZ18, L1 L2 L3 N PE, order No. 8619460000

PU 1 TSG+

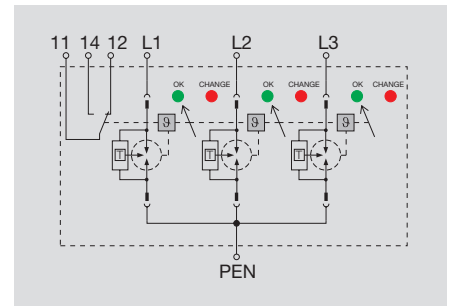
Class I lightning arrester

- This space-saving, encapsulated lightning arrester can switch mains follow currents and discharge currents of max. 50 kA (10/350 µs). It enables installations in protective classes I and II.
- High degree of protection against short circuits, with max. back-up fuse of 50 kA. This ensures safe installations anywhere around the globe.
- The pluggable arrester always guarantees proper readability. It also ensures that the shortest path is taken to the system's earth potential.
- The arrester's status display enables defective modules to be quickly located and replaced. The status can also be forwarded on to the control room by means of the remote alarm signals.
- The low protection level (1.5 kV) increases the dielectric strength in the main distributor; as a result, the connected devices are not damaged.

PU I 3+1 TSG+ 350 V 1,5 kV



PU I 3 TSG+ 350 V 1,5 kV



Technical data

Control side	
Rated voltage (AC)	240 V
Max. continuous voltage, U _c (AC)	350 V
Temporary surge - U _{Tov}	415 V
Requirement category acc. to IEC 61643-1	Class I
Rated discharge current I _{imp} (10/350 µs) [L-PE]	25 kA
Rated discharge current I _{imp} (10/350 µs) [N-PE]	100 kA
Specific energy, per path	160 kJ/Ohm
Short-circuit strength with max. back-up fuse	50 kA
PE current I _{FE} at U _c	< 0,01 mA
Response time	≤ 100 ns
Fuse, max.	315A gl
Protection level Up (typical)	1,5 kV
Optical function indicator:	green = OK; red = arrester faulty, replace
Signalling contact	1 CO 250 V AC, 1 A / 125 V DC, 30 mA
Connection torque range	4...4,5 Nm
Design	Insta
Ambient temperature (operational)	-40 °C...+80 °C
Storage temperature	-40 °C...+80 °C
Standards	IEC61643-1, EN61643-11

Dimensions	
Clamping range (rating- / min. / max.)	mm ² 25 / 2.5 / 35
Length x Width x Height	mm 97 x 144 x 72.5

Rated voltage (AC)	240 V
Max. continuous voltage, U _c (AC)	350 V
Temporary surge - U _{Tov}	415 V
Requirement category acc. to IEC 61643-1	Class I
Rated discharge current I _{imp} (10/350 µs) [L-PE]	25 kA
Rated discharge current I _{imp} (10/350 µs) [N-PE]	100 kA
Specific energy, per path	160 kJ/Ohm
Short-circuit strength with max. back-up fuse	50 kA
PE current I _{FE} at U _c	< 0,01 mA
Response time	≤ 100 ns
Fuse, max.	315A gl
Protection level Up (typical)	1,5 kV
Optical function indicator:	green = OK; red = arrester faulty, replace
Signalling contact	1 CO 250 V AC, 1 A / 125 V DC, 30 mA
Connection torque range	4...4,5 Nm
Design	Insta
Ambient temperature (operational)	-40 °C...+80 °C
Storage temperature	-40 °C...+80 °C
Standards	IEC61643-1, EN61643-11

Clamping range (rating- / min. / max.)	mm ² 25 / 2.5 / 35
Length x Width x Height	mm 97 x 144 x 72.5

Rated voltage (AC)	240 V / 415 V
Max. continuous voltage, U _c (AC)	350 V
Temporary surge - U _{Tov}	415 V
Requirement category acc. to IEC 61643-1	Class I
Rated discharge current I _{imp} (10/350 µs) [L-PE]	25 kA
Rated discharge current I _{imp} (10/350 µs) [N-PE]	100 kA
Specific energy, per path	160 kJ / Ohm
Short-circuit strength with max. back-up fuse	50 kA
PE current I _{FE} at U _c	< 0,01 mA
Response time	≤ 100 ns
Fuse, max.	315 A gl
Protection level Up (typical)	1,5 kV
Optical function indicator:	green = OK; red = arrester faulty, replace
Signalling contact	1 CO 250 V AC, 1 A / 125 V DC, 30 mA
Connection torque range	4...4,5 Nm
Design	Insta
Ambient temperature (operational)	-40 °C...+80 °C
Storage temperature	-40 °C...+80 °C
Standards	IEC61643-1, EN61643-11

Clamping range (rating- / min. / max.)	mm ² 25 / 2.5 / 35
Length x Width x Height	mm 97 x 108 x 72.5

Ordering data

Type	Qty.	Order No.
PU I 3+1 TSG+ 350V 1.5kV	1	8960510000

Type	Qty.	Order No.
PU I 3 TSG+ 350V 1.5kV	1	8960490000

Type	Qty.	Order No.
PU I 3 TSG+ 350V 1.5kV	1	8960490000

Accessories

Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV - 8960520000
Plug-in spare arrester: PU I 0 N/PE TSG+ 350V - 1066040000

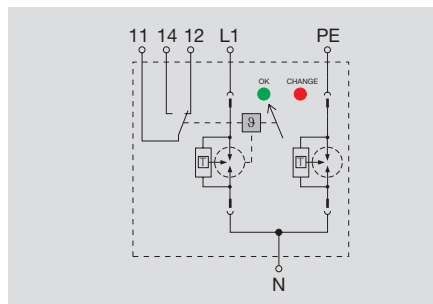
Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV - 8960520000
Plug-in spare arrester: PU I 0 N/PE TSG+ 350V - 1066040000

Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV - 8960520000

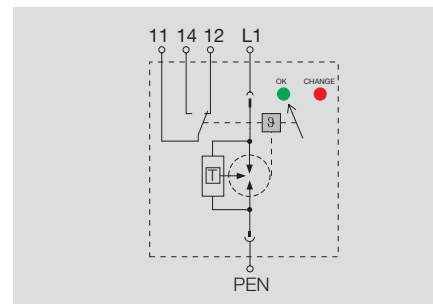
Class I lightning arrester

- This space-saving, encapsulated lightning arrester can switch mains follow currents and discharge currents of max. 50 kA (10/350 µs). It enables installations in protective classes I and II.
- High degree of protection against short circuits, with max. back-up fuse of 50 kA. This ensures safe installations anywhere around the globe.
- The pluggable arrester always guarantees proper readability. It also ensures that the shortest path is taken to the system's earth potential.
- The arrester's status display enables defective modules to be quickly located and replaced. The status can also be forwarded on to the control room by means of the remote alarm signals.
- The low protection level (1.5 kV) increases the dielectric strength in the main distributor; as a result, the connected devices are not damaged.

PU I 1+1 TSG+ 350 V 1,5 kV



PU I 1 TSG+ 350 V 1,5 kV



Technical data

Control side	
Rated voltage (AC)	240 V / 415 V
Max. continuous voltage, U _C (AC)	350 V
Temporary surge - U _{Tov}	415 V
Requirement category acc. to IEC 61643-1	Class I
Rated discharge current I _{imp} (10/350 µs) [L-PE]	25 kA
Rated discharge current I _{imp} (10/350 µs) [N-PE]	100 kA
Specific energy, per path	160 kJ/Ohm
Short-circuit strength with max. back-up fuse	50 kA
PE current I _{FE} at U _C	< 0,01 mA
Response time	≤ 100 ns
Fuse, max.	315 A gl
Protection level Up (typical)	1,5 kV
Optical function indicator:	green = OK; red = arrester faulty, replace
Signalling contact	1 CO 250 V AC, 1 A / 125 V DC, 30 mA
Connection torque range	4...4,5 Nm
Design	Insta
Ambient temperature (operational)	-40 °C...+80 °C
Storage temperature	-40 °C...+80 °C
Standards	IEC61643-1, EN61643-11

Dimensions	
Clamping range (rating- / min. / max.)	mm ² 25 / 2.5 / 35
Length x Width x Height	mm 97 x 72 x 72.5

240 V
350 V
415 V
Class I
25 kA
100 kA
160 kJ/Ohm
50 kA
< 0,01 mA
≤ 100 ns
315 A gl
1,5 kV
green = OK; red = arrester faulty, replace
1 CO 250 V AC, 1 A / 125 V DC, 30 mA
4...4,5 Nm
Insta
-40 °C...+80 °C
-40 °C...+80 °C
IEC61643-1, EN61643-11

25 / 2.5 / 35
97 x 72 x 72.5

240 V
350 V
415 V
Class I
25 kA
160 kJ / Ohm
50 kA
< 0,01 mA
≤ 100 ns
315 A gl
1,5 kV
green = OK; red = arrester faulty, replace
1 CO 250 V AC, 1 A / 125 V DC, 30 mA
4...4,5 Nm
Insta
-40 °C...+80 °C
-40 °C...+80 °C
IEC61643-1, EN61643-11

25 / 2.5 / 35
97 x 36 x 72.5

Ordering data

Type	Qty.	Order No.
PU I 1+1 TSG+ 350V 1.5kV	1	8960500000

Type	Qty.	Order No.
PU I 1+1 TSG+ 350V 1.5kV	1	8960500000

Type	Qty.	Order No.
PU I 1 TSG+ 350V 1.5kV	1	8960480000

Accessories

Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV – 8960520000
Plug-in spare arrester: PU I 0 N/PE TSG+ 350V – 1066040000

Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV – 8960520000
Plug-in spare arrester: PU I 0 N/PE TSG+ 350V – 1066040000

Plug-in spare arrester: PU I 0 TSG+ 350V 1,5kV – 8960520000
