



- For the intrinsically safe operation of a wide range of devices, such as HART transmitters, solenoid valves, sensors, zero-potential contacts and many more
- Compact, space-saving devices that are easy to install on a DIN rail
- Quick and efficient installation as barriers can be simultaneously snapped onto DIN rail and connected to ground (ISA - RPI12.06)
- Convenient maintenance and repair through back-up fuse feature

08 b

MY R. STAHL 9001A



The 9001 series INTRINSPAK single-channel zener barriers enable the intrinsically safe operation of virtually all field devices. The comprehensive portfolio and the combination of zener barriers cover a wide variety of signals. The devices are incredibly robust and require little space. The back-up fuse is a convenient feature as it is standardized for all variants.

	NEC® 500 CE Code Appendix J						CE Code Section 18 NEC® 505 NEC® 506						IECEX / ATEX						
	Class I		Class II		Class III		Class I			Class I			0		20		21		22
Division	1	2	1	2	1	2	0	1	2	20	21	22	0	1	2	20	21	22	
Ex interface	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	
Installation in		•		•		•		•							•				

Selection Table									
Series 9001/00, single-channel safety barrier for negative potential									
Product variant	Nominal voltage V_{nom}	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_j/V_{oc}	Max. current I_j/I_{sc}	Max. power P_o	Product Type	Art. No.	Weight
6 V DC	24 Ω	29 Ω	8.3 V	442 mA	917.2 mW	9001/00-083-442-101	158333	110 g	
	28 Ω	33 Ω	8.6 V	390 mA	839 mW	9001/00-086-390-101	158434	110 g	
24 V DC	287 Ω	320 Ω	28 V	100 mA	700 mW	9001/00-280-100-101	158356	110 g	
	340 Ω	375 Ω	28 V	85 mA	595 mW	9001/00-280-085-101	158344 ▲	110 g	
	599 Ω	666 Ω	28 V	50 mA	350 mW	9001/00-280-050-101	158660	110 g	
	1435 Ω	1590 Ω	28 V	20 mA	140 mW	9001/00-280-020-101	158650	110 g	
Series 9001/01, single-channel safety barrier for positive potential									
Product variant	Nominal voltage V_{nom}	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_j/V_{oc}	Max. current I_j/I_{sc}	Max. power P_o	Product Type	Art. No.	Weight
6 V DC	24 Ω	29 Ω	8.3 V	442 mA	917.2 mW	9001/01-083-442-101	158338 ▲	110 g	
	28 Ω	33 Ω	8.6 V	390 mA	839 mW	9001/01-086-390-101	158439	110 g	
	39 Ω	45 Ω	8.6 V	270 mA	580.5 mW	9001/01-086-270-101	158428	110 g	
	65 Ω	73 Ω	8.6 V	150 mA	322.5 mW	9001/01-086-150-101	158418 ▲	110 g	
	129 Ω	145 Ω	8.6 V	75 mA	161.3 mW	9001/01-086-075-101	158391 ▲	110 g	
8 V DC	93 Ω	106 Ω	12.6 V	150 mA	473 mW	9001/01-126-150-101	158502	110 g	

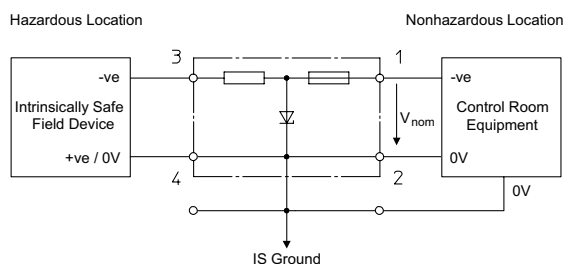
▲ Preferred products – in stock or available at short notice
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Selection Table								
Series 9001/01, single-channel safety barrier for positive potential								
Product variant	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_0/V_{oc}	Max. current I_0/I_{sc}	Max. power P_0	Product Type	Art. No.	Weight
12 V DC	50 Ω	57 Ω	15.8 V	390 mA	1541 mW	9001/01-158-390-101	158509 ▲	110 g
	120 Ω	135 Ω	15.8 V	150 mA	593 mW	9001/01-158-150-101	158535 ▲	110 g
	235 Ω	262 Ω	16.8 V	75 mA	315 mW	9001/01-168-075-101	158568	110 g
	871 Ω	966 Ω	16.8 V	20 mA	84 mW	9001/01-168-020-101	158555	110 g
16 V DC	216 Ω	241 Ω	19.9 V	100 mA	498 mW	9001/01-199-100-101	158632 ▲	110 g
	415 Ω	462 Ω	19.9 V	50 mA	249 mW	9001/01-199-050-101	158616	110 g
20 to 35 V DC	259 Ω	268 Ω	25.2 V	100 mA	630 mW	9001/01-252-100-141	158697 ▲	110 g
	455 Ω	506 Ω	25.2 V	60 mA	378 mW	9001/01-252-060-141	158693 ▲	110 g
24 V DC	115 Ω	128 Ω	28 V	280 mA	1960 mW	9001/01-280-280-101	158722 ▲	110 g
	177 Ω	198 Ω	28 V	165 mA	1155 mW	9001/01-280-165-101	158392	110 g
	263 Ω	294 Ω	28 V	110 mA	770 mW	9001/01-280-110-101	158380 ▲	110 g
	287 Ω	320 Ω	28 V	100 mA	700 mW	9001/01-280-100-101	158365 ▲	110 g
	340 Ω	375 Ω	28 V	85 mA	595 mW	9001/01-280-085-101	158351	110 g
	415 Ω	462 Ω	28 V	75 mA	525 mW	9001/01-280-075-101	158339	110 g
	599 Ω	666 Ω	28 V	50 mA	350 mW	9001/01-280-050-101	158665 ▲	110 g
	1435 Ω	1590 Ω	28 V	20 mA	140 mW	9001/01-280-020-101	158655	110 g
Series 9001/02, single-channel safety barrier for alternating potential								
Product variant	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_0/V_{oc}	Max. current I_0/I_{sc}	Max. power P_0	Product Type	Art. No.	Weight
± 0.7 V AC+DC	19.9 Ω	20.1 Ω	1.6 V	150 mA	60 mW	9001/02-016-150-111	158685 ▲	110 g
	37 Ω	40 Ω	1.6 V	50 mA	20 mW	9001/02-016-050-111	158677	110 g
	120 Ω	134 Ω	1.6 V	15 mA	6 mW	9001/02-016-015-101	158669	110 g
± 6 V AC+DC	31 Ω	36 Ω	9.3 V	390 mA	906.8 mW	9001/02-093-390-101	158755 ▲	110 g
	319 Ω	355 Ω	9.3 V	30 mA	69.8 mW	9001/02-093-030-101	158743 ▲	110 g
	3141 Ω	3473 Ω	9.3 V	3 mA	6.975 mW	9001/02-093-003-101	158741	110 g
± 10 V AC+DC	102 Ω	115 Ω	13.3 V	150 mA	498.8 mW	9001/02-133-150-101	158758	110 g
± 12 V AC+DC	198 Ω	223 Ω	17.5 V	100 mA	437.5 mW	9001/02-175-100-101	158301 ▲	110 g
± 24 V AC+DC	320 Ω	357 Ω	28 V	90 mA	630 mW	9001/02-280-090-101	158317	110 g
Series 9001/02, Single-channel safety barriers for alternating polarity								
Product variant	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_0/V_{oc}	Max. current I_0/I_{sc}	Max. power P_0	Product Type	Art. No.	Weight
± 6 V AC+DC	148 Ω	166 Ω	9.3 V	75 mA	174.4 mW	9001/02-093-075-101	158749	110 g
Series 9001/03, single-channel evaluation barrier for positive potential								
Product variant	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_0/V_{oc}	Max. current I_0/I_{sc}	Max. power P_0	Product Type	Art. No.	Weight
16 V DC	–	–	19.9 V	–	–	9001/03-199-000-101	158475	110 g
24 V DC	–	–	28 V	–	–	9001/03-280-000-101	158486	110 g
Series 9001/51, single-channel safety barrier for transmitters								
Product variant	Min. resistance R_{min}	Maximum resistance R_{max}	Max. voltage U_0/V_{oc}	Max. current I_0/I_{sc}	Max. power P_0	Product Type	Art. No.	Weight
20 to 35 V DC	–	–	28 V	91 mA	637 mW	9001/51-280-091-141	158524 ▲	110 g
	–	–	28 V	110 mA	770 mW	9001/51-280-110-141	158530 ▲	110 g

Schematics of the zener barriers available at r-stahl.com

Technical Data	
Variant	Single-channel safety barriers Series 9001
Explosion Protection	
FMus certificate	3011002
Certificate ULus	E81680V1S3
cCSA certificate	1284547
Marking FMus	NONINCENDIVE FOR, Class I, Div. 2, Groups A,B,C,D; T4, Class I, Zone 2, Group IIC T4 IS connections for Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; Class I, Zone 0, Groups IIC/IIB Hazardous location when inst. per doc. 90 016 11 31 1
Marking ULus	For use in Hazardous location, Class I, Div. 2, Groups A,B,C,D; T4 Providing IS circuits for Class I,II,III, GROUPS A,B,C,D,E,F,G; per doc. 90 016 11 31 3
Marking cCSA	Associated equipment [Ex ia], Class I, Div. 2, Groups A,B,C,D; Provides IS circuits for Class I,II,III, Class I, Zone 0, Groups IIC/IIB For applicable grps per inst. doc. 90 016 11 31 2
IECEx gas explosion protection	Ex ec [ia Ga] IIC T4 Gc
IECEx dust explosion protection	[Ex ia Da] IIIC
Certificates	ATEX (PTB), Brazil (ULB), Canada (CSA), China (NEPSI), IECEx (PTB), India (PESO), Japan (CML), Korea (KGS), USA (FM), USA (UL)
Installation	in Zone 2, Class I, Div. 2, and Class I, Zone 2 and in safe area
Further information	see respective certificate and operating instructions
Electrical Data	
I_{res} leakage current for U_n	$\leq 2 \mu\text{A}$
Ambient Conditions	
Ambient temperature °F	-4°F ... +140°F
Ambient temperature °C	-20 °C ... 60 °C
Storage temperature °F	-4°F ... +167°F
Storage temperature °C	-20 °C ... 75 °C
Max. relative humidity	95% average, no condensation
Temperature influence	$\leq 0,25 \%/10\text{K}$
Mechanical Data	
Degree of protection (IP)	IP40
Degree of protection note	according to IEC 60529
Degree of protection (IP) terminals	IP20
Enclosure material	Polyamide 6GF
Number of connection terminals	4
Type of connection cable	Finely stranded Solid
Max. conductor cross section AWG	16 AWG
Connection cross-section max.	1,5 mm ²
Weight	110 g
Mounting / Installation	
Connection type	2 PA
Earthing conductor cross-section AWG	12 AWG
Earthing connection cross-section	4 mm ²
Min. torque, lb/in	4.43 lb/in
Min. torque, Nm	0.5 Nm
Max. torque, lb/in	5.31 lb/in
Max. torque, Nm	0.6 Nm

Negative Polarity



- Grounded circuit
- Allows the connection of regulated power supplies, V_{nom} , as listed in the table below
- Various safety and operational characteristics as listed in the table below
- Approved for installation in hazardous areas (refer to certificate).

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for A, B, E or IIC	C_0/C_s for A, B, E or IIC	L_0/L_s for C, D, F, G or IIB, IIA	C_0/C_s for C, D, F, G or IIB, IIA	
9001/00-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.12 mH	7.2 μ F	0.5 mH	73 μ F	158333
9001/00-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	6.2 μ F	0.89 mH	55 μ F	158434
9001/00-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μ F	50 mH	0.65 μ F	158650
9001/00-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μ F	25 mH	0.65 μ F	158660
9001/00-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μ F	16 mH	0.65 μ F	158344 ▲
9001/00-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μ F	11 mH	0.65 μ F	158356

CSA Information – Ex Interface to Class I, II, III, Division 1

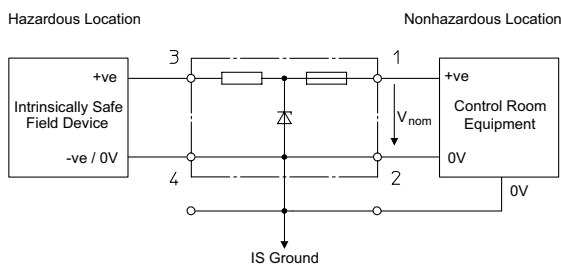
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for A, B, E	C_0/C_s for A, B, E	L_0/L_s for C, D, F, G	C_0/C_s for C, D, F, G	
9001/00-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.19 mH	6.9 μ F	0.8 mH	20.8 μ F	158333
9001/00-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	5.9 μ F	1 mH	17.6 μ F	158434
9001/00-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	85 mH	0.14 μ F	306 mH	0.43 μ F	158650
9001/00-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	15.1 mH	0.14 μ F	57 mH	0.43 μ F	158660
9001/00-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	5 mH	0.14 μ F	19.3 mH	0.43 μ F	158344 ▲
9001/00-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	3.6 mH	0.14 μ F	13.9 mH	0.43 μ F	158356

CSA Information – Ex Interface to Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for IIC	C_0/C_s for IIC	L_0/L_s for IIA, IIB	C_0/C_s for IIA, IIB	
9001/00-083-442-101	6 V DC	22 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.12 mH	7.2 μ F	0.5 mH	73 μ F	158333
9001/00-086-390-101	6 V DC	24 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	6.2 μ F	0.89 mH	55 μ F	158434
9001/00-280-020-101	24 V DC	1500 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μ F	50 mH	0.65 μ F	158650
9001/00-280-050-101	24 V DC	620 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μ F	25 mH	0.65 μ F	158660
9001/00-280-085-101	24 V DC	349 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μ F	16 mH	0.65 μ F	158344 ▲
9001/00-280-100-101	24 V DC	300 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μ F	11 mH	0.65 μ F	158356

ATEX Information – Ex Interface to Zone 0												
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_0	L_0/L_0 for IIC	C_0/C_0 for IIC	L_0/L_0 for IIB	C_0/C_0 for IIB	
9001/00-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.1 mH	7.2 μ F	0.5 mH	73 μ F	158333
9001/00-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	839 mW	0.16 mH	6.2 μ F	0.89 mH	55 μ F	158434
9001/00-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μ F	50 mH	0.65 μ F	158650
9001/00-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μ F	25 mH	0.65 μ F	158660
9001/00-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μ F	16 mH	0.65 μ F	158344 ▲
9001/00-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μ F	11 mH	0.65 μ F	158356

Positive Polarity Passive



- Grounded circuit
- Allows the connection of regulated power supplies, V_{nom} , as listed in the table below
- Various safety and operational characteristics as listed in the table below
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- $T_a = 140\text{ °F}$ (60 °C) except for 9001/01-280-165-101 in FM / UL installations where $T_a = 122\text{ °F}$ (50 °C)
- 9001/01-280-165-101 is not allowed to interface to field devices in Gas Groups A, B, E and IIC

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_c for A, B, E or IIC	C_0/C_c for A, B, E or IIC	L_0/L_c for C, D, F, G or IIB, IIA	C_0/C_c for C, D, F, G or IIB, IIA	
9001/01-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.12 mH	7.2 μF	0.5 mH	73 μF	158338 ▲
9001/01-086-050-101	6 V DC	196 Ω	218 Ω	27 mA	8.6 V	50 mA	107.5 mW	15 mH	6.2 μF	56 mH	55 μF	158379
9001/01-086-075-101	6 V DC	129 Ω	145 Ω	41 mA	8.6 V	75 mA	161.3 mW	6.7 mH	6.2 μF	25 mH	55 μF	158391 ▲
9001/01-086-150-101	6 V DC	65 Ω	73 Ω	82 mA	8.6 V	150 mA	322.5 mW	1.3 mH	6.2 μF	7 mH	55 μF	158418 ▲
9001/01-086-270-101	6 V DC	39 Ω	45 Ω	110 mA	8.6 V	270 mA	580.5 mW	0.23 mH	6.2 μF	2.2 mH	55 μF	158428
9001/01-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	6.2 μF	0.89 mH	55 μF	158439
9001/01-126-150-101	8 V DC	93 Ω	106 Ω	75 mA	12.6 V	150 mA	472.5 mW	1.3 mH	1.15 μF	7 mH	7.4 μF	158502
9001/01-158-150-101	12 V DC	120 Ω	135 Ω	88 mA	15.8 V	150 mA	592.5 mW	1.3 mH	0.478 μF	7 mH	2.88 μF	158535 ▲
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μF	0.89 mH	2.88 μF	158509 ▲
9001/01-168-020-101	12 V DC	871 Ω	966 Ω	12 mA	16.8 V	20 mA	84 mW	90 mH	0.39 μF	330 mH	2.29 μF	158555
9001/01-168-075-101	12 V DC	235 Ω	262 Ω	45 mA	16.8 V	75 mA	315 mW	6.7 mH	0.39 μF	25 mH	2.29 μF	158568
9001/01-199-050-101	16 V DC	415 Ω	462 Ω	34 mA	19.9 V	50 mA	248.8 mW	15 mH	0.223 μF	56 mH	1.42 μF	158616
9001/01-199-100-101	16 V DC	216 Ω	241 Ω	66 mA	19.9 V	100 mA	497.5 mW	4 mH	0.223 μF	15 mH	1.42 μF	158632 ▲
9001/01-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μF	50 mH	0.65 μF	158655
9001/01-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μF	25 mH	0.65 μF	158665 ▲
9001/01-280-075-101	24 V DC	415 Ω	462 Ω	51 mA	28 V	75 mA	525 mW	3.3 mH	0.083 μF	21 mH	0.65 μF	158339
9001/01-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μF	16 mH	0.65 μF	158351
9001/01-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μF	11 mH	0.65 μF	158365 ▲
9001/01-280-110-101	24 V DC	263 Ω	294 Ω	81 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μF	9 mH	0.65 μF	158380 ▲
9001/01-280-165-101	24 V DC	177 Ω	198 Ω	110 mA	28 V	165 mA	1155 mW			3.5 mH	0.65 μF	158392

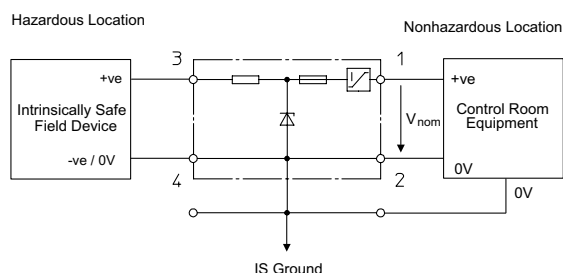
CSA Information – Ex Interface to Class I, II, III, Division 1												
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_o/V_{oc}	I_o/I_{sc}	P_o	L_o/L_c for A, B, E	C_o/C_c for A, B, E	L_o/L_c for C, D, F, G	C_o/C_c for C, D, F, G	
9001/01-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.19 mH	6.9 μF	0.8 mH	20.8 μF	158338 ▲
9001/01-086-050-101	6 V DC	196 Ω	218 Ω	27 mA	8.6 V	50 mA	107.5 mW	18 mH	5.9 μF	67.6 mH	17.6 μF	158379
9001/01-086-075-101	6 V DC	129 Ω	145 Ω	41 mA	8.6 V	75 mA	161.3 mW	7.2 mH	5.9 μF	27.5 mH	17.6 μF	158391 ▲
9001/01-086-150-101	6 V DC	65 Ω	73 Ω	82 mA	8.6 V	150 mA	322.5 mW	1.7 mH	5.9 μF	6.7 mH	17.6 μF	158418 ▲
9001/01-086-270-101	6 V DC	39 Ω	45 Ω	110 mA	8.6 V	270 mA	580.5 mW	0.26 mH	5.9 μF	2.4 mH	17.6 μF	158428
9001/01-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	5.9 μF	1 mH	17.6 μF	158439
9001/01-126-150-101	8 V DC	93 Ω	106 Ω	75 mA	12.6 V	150 mA	472.5 mW	1.3 mH	1.4 μF	6.8 mH	4.1 μF	158502
9001/01-158-150-101	12 V DC	120 Ω	135 Ω	88 mA	15.8 V	150 mA	592.5 mW	1.6 mH	0.67 μF	7.5 mH	2 μF	158535 ▲
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.15 mH	0.67 μF	0.9 mH	2 μF	158509 ▲
9001/01-168-020-101	12 V DC	871 Ω	966 Ω	12 mA	16.8 V	20 mA	84 mW	93.9 mH	0.55 μF	337 mH	1.7 μF	158555
9001/01-168-075-101	12 V DC	235 Ω	262 Ω	45 mA	16.8 V	75 mA	315 mW	6.4 mH	0.55 μF	24.8 mH	1.7 μF	158568
9001/01-199-050-101	16 V DC	415 Ω	462 Ω	34 mA	19.9 V	50 mA	248.8 mW	14.4 mH	0.34 μF	54.4 mH	1 μF	158616
9001/01-199-100-101	16 V DC	216 Ω	241 Ω	66 mA	19.9 V	100 mA	497.5 mW	3.9 mH	0.34 μF	15.2 mH	1 μF	158632 ▲
9001/01-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	85 mH	0.14 μF	306 mH	0.43 μF	158655
9001/01-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	15.1 mH	0.14 μF	57 mH	0.43 μF	158665 ▲
9001/01-280-075-101	24 V DC	415 Ω	462 Ω	51 mA	28 V	75 mA	525 mW	7.4 mH	0.14 μF	28.4 mH	0.43 μF	158339
9001/01-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	5 mH	0.14 μF	19.3 mH	0.43 μF	158351
9001/01-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	3.6 mH	0.14 μF	13.9 mH	0.43 μF	158365 ▲
9001/01-280-110-101	24 V DC	263 Ω	294 Ω	81 mA	28 V	110 mA	770 mW	3.6 mH	0.14 μF	11.7 mH	0.43 μF	158380 ▲
9001/01-280-165-101	24 V DC	177 Ω	198 Ω	110 mA	28 V	165 mA	1155 mW	-	-	5.4 mH	0.43 μF	158392

CSA Information – Ex Interface to Class I, Zone 0

Product Type	Operational Characteristics			Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V _{nom}	R _{min}	R _{max}	I _{max}	U ₀ /V _{oc}	I ₀ /I _{sc}	P ₀	L ₀ /L ₀ for IIC	C ₀ /C ₀ for IIC	L ₀ /L ₀ for IIA, IIB		C ₀ /C ₀ for IIA, IIB
9001/01-083-442-101	6 V DC	22 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.12 mH	7.2 μF	0.5 mH	73 μF	158338 ▲
9001/01-086-050-101	6 V DC	200 Ω	218 Ω	27 mA	8.6 V	50 mA	107.5 mW	15 mH	6.2 μF	56 mH	55 μF	158379
9001/01-086-075-101	6 V DC	130 Ω	145 Ω	41 mA	8.6 V	75 mA	161.3 mW	6.7 mH	6.2 μF	25 mH	55 μF	158391 ▲
9001/01-086-150-101	6 V DC	62 Ω	73 Ω	82 mA	8.6 V	150 mA	322.5 mW	1.3 mH	6.2 μF	7 mH	55 μF	158418 ▲
9001/01-086-270-101	6 V DC	36 Ω	45 Ω	110 mA	8.6 V	270 mA	580.5 mW	0.23 mH	6.2 μF	2.2 mH	55 μF	158428
9001/01-086-390-101	6 V DC	24 Ω	33 Ω	110 mA	8.6 V	390 mA	838.5 mW	0.16 mH	6.2 μF	0.89 mH	55 μF	158439
9001/01-126-150-101	8 V DC	91 Ω	106 Ω	75 mA	12.6 V	150 mA	472.5 mW	1.3 mH	1.15 μF	7 mH	7.4 μF	158502
9001/01-158-150-101	12 V DC	120 Ω	135 Ω	88 mA	15.8 V	150 mA	592.5 mW	1.3 mH	0.478 μF	7 mH	2.88 μF	158535 ▲
9001/01-158-390-101	12 V DC	43 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μF	0.89 mH	2.88 μF	158509 ▲
9001/01-168-020-101	12 V DC	909 Ω	966 Ω	12 mA	16.8 V	20 mA	84 mW	90 mH	0.39 μF	330 mH	2.29 μF	158555
9001/01-168-075-101	12 V DC	240 Ω	262 Ω	45 mA	16.8 V	75 mA	315 mW	6.7 mH	0.39 μF	25 mH	2.29 μF	158568
9001/01-199-050-101	16 V DC	430 Ω	462 Ω	34 mA	19.9 V	50 mA	248.8 mW	15 mH	0.223 μF	56 mH	1.42 μF	158616
9001/01-199-100-101	16 V DC	220 Ω	241 Ω	66 mA	19.9 V	100 mA	497.5 mW	4 mH	0.223 μF	15 mH	1.42 μF	158632 ▲
9001/01-280-020-101	24 V DC	1500 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μF	50 mH	0.65 μF	158655
9001/01-280-050-101	24 V DC	620 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μF	25 mH	0.65 μF	158665 ▲
9001/01-280-075-101	24 V DC	430 Ω	462 Ω	51 mA	28 V	75 mA	525 mW	3.3 mH	0.083 μF	21 mH	0.65 μF	158339
9001/01-280-085-101	24 V DC	349 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μF	16 mH	0.65 μF	158351
9001/01-280-100-101	24 V DC	300 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μF	11 mH	0.65 μF	158365 ▲
9001/01-280-110-101	24 V DC	270 Ω	294 Ω	81 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μF	9 mH	0.65 μF	158380 ▲
9001/01-280-165-101	24 V DC	180 Ω	198 Ω	110 mA	28 V	165 mA	1155 mW	-	-	3.5 mH	0.65 μF	158392

ATEX Information – Ex Interface to Zone 0												
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_o/V_{oc}	I_o/I_{sc}	P_o	L_o/L_{sc} for IIC	C_o/C_{sc} for IIC	L_o/L_{sc} for IIB	C_o/C_{sc} for IIB	
9001/01-083-442-101	6 V DC	24 Ω	29 Ω	110 mA	8.3 V	442 mA	917.2 mW	0.1 mH	7.2 μF	0.5 mH	73 μF	158338 ▲
9001/01-086-050-101	6 V DC	196 Ω	218 Ω	27 mA	8.6 V	50 mA	107.5 mW	15 mH	6.2 μF	56 mH	55 μF	158379
9001/01-086-075-101	6 V DC	129 Ω	145 Ω	41 mA	8.6 V	75 mA	161.3 mW	6.6 mH	6.2 μF	25 mH	55 μF	158391 ▲
9001/01-086-150-101	6 V DC	65 Ω	73 Ω	82 mA	8.6 V	150 mA	322.5 mW	1.3 mH	6.2 μF	7 mH	55 μF	158418 ▲
9001/01-086-270-101	6 V DC	39 Ω	45 Ω	110 mA	8.6 V	270 mA	580.5 mW	0.23 mH	6.2 μF	2.2 mH	55 μF	158428
9001/01-086-390-101	6 V DC	28 Ω	33 Ω	110 mA	8.6 V	390 mA	839 mW	0.16 mH	6.2 μF	1 mH	55 μF	158439
9001/01-126-150-101	8 V DC	93 Ω	106 Ω	75 mA	12.6 V	150 mA	473 mW	1.3 mH	1.15 μF	7 mH	7.4 μF	158502
9001/01-158-150-101	12 V DC	120 Ω	135 Ω	88 mA	15.8 V	150 mA	593 mW	1.3 mH	0.478 μF	7 mH	2.88 μF	158535 ▲
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μF	0.89 mH	2.88 μF	158509 ▲
9001/01-168-020-101	12 V DC	871 Ω	966 Ω	12 mA	16.8 V	20 mA	84 mW	90 mH	0.39 μF	330 mH	2.29 μF	158555
9001/01-168-075-101	12 V DC	235 Ω	262 Ω	45 mA	16.8 V	75 mA	315 mW	6.6 mH	0.39 μF	25 mH	2.29 μF	158568
9001/01-199-050-101	16 V DC	415 Ω	462 Ω	34 mA	19.9 V	50 mA	249 mW	15 mH	0.223 μF	56 mH	1.42 μF	158616
9001/01-199-100-101	16 V DC	216 Ω	241 Ω	66 mA	19.9 V	100 mA	498 mW	4 mH	0.223 μF	15 mH	1.42 μF	158632 ▲
9001/01-280-020-101	24 V DC	1435 Ω	1590 Ω	15 mA	28 V	20 mA	140 mW	50 mH	0.083 μF	50 mH	0.65 μF	158655
9001/01-280-050-101	24 V DC	599 Ω	666 Ω	36 mA	28 V	50 mA	350 mW	8.5 mH	0.083 μF	25 mH	0.65 μF	158665 ▲
9001/01-280-075-101	24 V DC	415 Ω	462 Ω	51 mA	28 V	75 mA	525 mW	3.3 mH	0.083 μF	21 mH	0.65 μF	158339
9001/01-280-085-101	24 V DC	340 Ω	375 Ω	64 mA	28 V	85 mA	595 mW	2.4 mH	0.083 μF	16 mH	0.65 μF	158351
9001/01-280-100-101	24 V DC	287 Ω	320 Ω	75 mA	28 V	100 mA	700 mW	1.6 mH	0.083 μF	11 mH	0.65 μF	158365 ▲
9001/01-280-110-101	24 V DC	263 Ω	294 Ω	81 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μF	9 mH	0.65 μF	158380 ▲
9001/01-280-165-101	24 V DC	177 Ω	198 Ω	110 mA	28 V	165 mA	1155 mW			3.5 mH	0.65 μF	158392

Positive Polarity Current Limitation



- Grounded circuit
- Current limitation to < 100 mA
- Various safety and operational characteristics as listed in the table below
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- 9001/01-199-390-101 and 9001/01-280-280-101 are not allowed for interfacing to field devices in Gas Groups A, B, E and IIC
- $T_a = 140\text{ }^\circ\text{F}$ (60 °C) except for 9001/01-280-280-101 in FM / UL / ATEX installations where $T_a = 122\text{ }^\circ\text{F}$ (50 °C)

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for A, B, E or IIC	C_1/C_2 for A, B, E or IIC	L_1/L_2 for C, D, F, G or IIB, IIA	C_1/C_2 for C, D, F, G or IIB, IIA	
9001/01-158-270-101	12 V DC	69 Ω	78 Ω	< 100 mA	15.8 V	270 mA	1067 mW	0.23 mH	0.478 μF	2.2 mH	2.88 μF	158503
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μF	0.89 mH	2.88 μF	158509 ▲
9001/01-199-390-101	16 V DC	62 Ω	71 Ω	< 100 mA	19.9 V	390 mA	1940 mW	-	-	0.89 mH	1.42 μF	158519
9001/01-280-280-101	24 V DC	115 Ω	128 Ω	< 100 mA	28 V	280 mA	1960 mW	-	-	0.6 mH	0.65 μF	158722 ▲

CSA Information – Ex Interface to Class I, II, III, Division 1

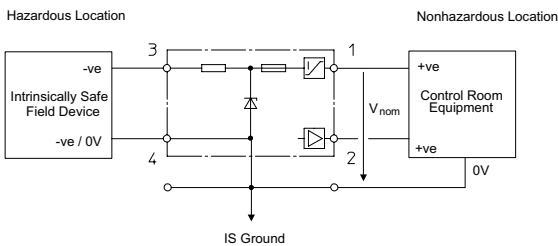
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for A, B, E	C_1/C_2 for A, B, E	L_1/L_2 for C, D, F, G	C_1/C_2 for C, D, F, G	
9001/01-158-270-101	12 V DC	69 Ω	78 Ω	< 100 mA	15.8 V	270 mA	1067 mW	0.23 mH	0.67 μF	2.1 mH	2 μF	158503
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.15 mH	0.67 μF	0.9 mH	2 μF	158509 ▲
9001/01-199-390-101	16 V DC	62 Ω	71 Ω	< 100 mA	19.9 V	390 mA	1940 mW	-	-	0.9 mH	1.03 μF	158519
9001/01-280-280-101	24 V DC	115 Ω	128 Ω	< 100 mA	28 V	280 mA	1960 mW	-	-	2.1 mH	0.43 μF	158722 ▲

CSA Information – Ex Interface to Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for IIC	C_1/C_2 for IIC	L_1/L_2 for IIA, IIB	C_1/C_2 for IIA, IIB	
9001/01-158-270-101	12 V DC	62 Ω	78 Ω	< 100 mA	15.8 V	270 mA	1067 mW	0.23 mH	0.478 μF	2.2 mH	2.88 μF	158503
9001/01-158-390-101	12 V DC	43 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μF	0.89 mH	2.88 μF	158509 ▲
9001/01-199-390-101	16 V DC	54.5 Ω	71 Ω	< 100 mA	19.9 V	390 mA	1940 mW	-	-	0.89 mH	1.42 μF	158519
9001/01-280-280-101	24 V DC	110 Ω	128 Ω	< 100 mA	28 V	280 mA	1960 mW	-	-	0.6 mH	0.65 μF	158722 ▲

ATEX Information – Ex Interface to Zone 0													
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_f/L_s for IIC	C_f/C_s for IIC	L_f/L_s for IIB	C_f/C_s for IIB		
9001/01-158-270-101	12 V DC	69 Ω	78 Ω	< 100 mA	15.8 V	270 mA	1067 mW	0.23 mH	0.478 μ F	2.2 mH	2.88 μ F	158503	
9001/01-158-390-101	12 V DC	50 Ω	57 Ω	< 100 mA	15.8 V	390 mA	1541 mW	0.16 mH	0.478 μ F	0.89 mH	2.88 μ F	158509 ▲	
9001/01-199-390-101	16 V DC	62 Ω	71 Ω	< 100 mA	19.9 V	390 mA	1940 mW			0.89 mH	1.42 μ F	158519	
9001/01-280-280-101	24 V DC	115 Ω	128 Ω	< 100 mA	28 V	280 mA	1960 mW			600 mH	0.65 μ F	158722 ▲	

Positive Polarity Current Limitation + Mirror - Digital



- Application specific for the connection of volt free contacts
- Operational current limited to < 40 mA
- Grounded field device
- Input to control system elevated above 0 V
- Allows the connection of unregulated power supplies, V_{nom} between +20 to 35 V DC
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- As terminal 4 is connected to ground, this barrier should not be used for fail safe applications. Use the 9002/13-252-121-041 instead.
- Maximum leakage current (terminal 1 to ground (0 V)) < 100 μ A

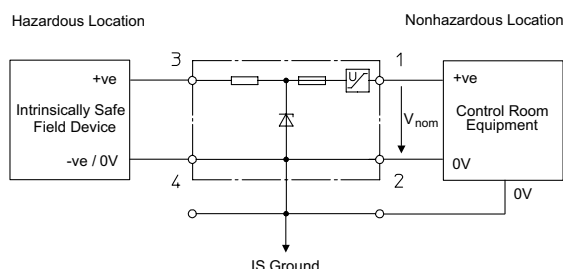
FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0													
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_f/L_s for A, B, E or IIC	C_f/C_s for A, B, E or IIC	L_f/L_s for C, D, F, G or IIB, IIA	C_f/C_s for C, D, F, G or IIB, IIA		
9001/01-252-060-141	20 to 35 V DC	455 Ω	506 Ω	40 mA	25.2 V	60 mA	378 mW	6.2 mH	0.107 μ F	25 mH	0.82 μ F	158693 ▲	

CSA Information – Ex Interface to Class I, II, III, Division 1													
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_f/L_s for A, B, E	C_f/C_s for A, B, E	L_f/L_s for C, D, F, G	C_f/C_s for C, D, F, G		
9001/01-252-060-141	20 to 35 V DC	455 Ω	506 Ω	40 mA	25.2 V	60 mA	378 mW	10.8 mH	0.18 μ F	41.1 mH	0.55 μ F	158693 ▲	

CSA Information – Ex Interface to Class I, Zone 0													
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_f/L_s for IIC	C_f/C_s for IIC	L_f/L_s for IIA, IIB	C_f/C_s for IIA, IIB		
9001/01-252-060-141	20 to 35 V DC	470 Ω	506 Ω	40 mA	25.2 V	60 mA	378 mW	6.2 mH	0.107 μ F	25 mH	0.82 μ F	158693 ▲	

ATEX Information – Ex Interface to Zone 0													
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_f/L_s for IIC	C_f/C_s for IIC	L_f/L_s for IIB	C_f/C_s for IIB		
9001/01-252-060-141	20 to 35 V DC	455 Ω	506 Ω	40 mA	25.2 V	60 mA	378 mW	6.2 mH	0.107 μ F	25 mH	0.82 μ F	158693 ▲	

Positive Polarity Voltage Limitation



- Application specific for the connection of solenoid valves, LEDs or audible alarms
- Grounded circuit
- Allows the connection of unregulated power supplies, V_{nom} between +20 to 35 V DC
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- Maximum leakage current at 24 V (terminal 1 to ground (0 V)) = 1 mA
- Maximum leakage current at 35 V (terminal 1 to ground (0 V)) = 10 mA

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for A, B, E or IIC	C_1/C_2 for A, B, E or IIC	L_1/L_2 for C, D, F, G or IIB, IIA	C_1/C_2 for C, D, F, G or IIB, IIA	
9001/01-252-100-141	20 to 35 V DC	259 Ω	268 Ω	78 mA	25.2 V	100 mA	630 mW	2 mH	0.107 μ F	11 mH	0.82 μ F	158697 ▲

CSA Information – Ex Interface to Class I, II, III, Division 1

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for A, B, E	C_1/C_2 for A, B, E	L_1/L_2 for C, D, F, G	C_1/C_2 for C, D, F, G	
9001/01-252-100-141	20 to 35 V DC	259 Ω	268 Ω	78 mA	25.2 V	100 mA	630 mW	3.5 mH	0.18 μ F	13.9 mH	0.55 μ F	158697 ▲

CSA Information – Ex Interface to Class I, Zone 0

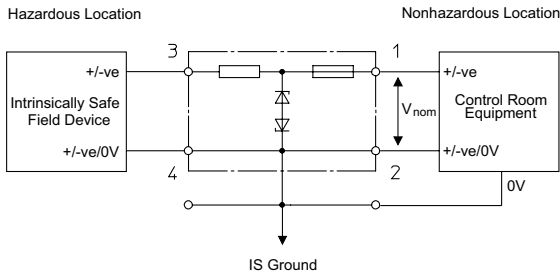
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for IIC	C_1/C_2 for IIC	L_1/L_2 for IIA, IIB	C_1/C_2 for IIA, IIB	
9001/01-252-100-141	20 to 35 V DC	255 Ω	268 Ω	78 mA	25.2 V	100 mA	630 mW	2 mH	0.107 μ F	11 mH	0.82 μ F	158697 ▲

ATEX Information – Ex Interface to Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_1/L_2 for IIC	C_1/C_2 for IIC	L_1/L_2 for IIB	C_1/C_2 for IIB	
9001/01-252-100-141	20 to 35 V DC	259 Ω	268 Ω	78 mA	25.2 V	100 mA	630 mW	2 mH	0.107 μ F	11 mH	0.82 μ F	158697 ▲

Alternating Polarity

08 b



- Grounded circuit
- Suitable for AC and DC circuits
- Various safety and operational characteristics as listed in the table below
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- 9001/02-412-095-101 not allowed for interfacing to field devices in Gas Groups A, B, E and IIC
- 9001/02-016-...-1.1 - Maximum leakage current (terminal 1 to ground (0V)) < 10 μ A
- 9001/02-016-...-111 - Tolerance = +0.5 %

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0												
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_c for A, B, E or IIC	C_0/C_c for A, B, E or IIC	L_0/L_c for C, D, F, G or IIB, IIA	C_0/C_c for C, D, F, G or IIB, IIA	
9001/02-016-015-101	± 0.7 V AC+DC	120 Ω	134 Ω	5 mA	1.6 V	15 mA	6 mW	160 mH	100 μ F	560 mH	1000 μ F	158669
9001/02-016-050-111	± 0.7 V AC+DC	37 Ω	40 Ω	17 mA	1.6 V	50 mA	20 mW	15 mH	100 μ F	56 mH	1000 μ F	158677
9001/02-016-150-111	± 0.7 V AC+DC	19.9 Ω	20.1 Ω	35 mA	1.6 V	150 mA	60 mW	1.3 mH	100 μ F	7 mH	1000 μ F	158685 ▲
9001/02-016-320-101	± 0.7 V AC+DC	11 Ω	14 Ω	50 mA	1.6 V	320 mA	128 mW	0.19 mH	100 μ F	1.6 mH	1000 μ F	158497
9001/02-093-003-101	± 6 V AC+DC	3141 Ω	3473 Ω	1.7 mA	9.3 V	3 mA	6.975 mW	1000 mH	4.1 μ F	1000 mH	31 μ F	158741
9001/02-093-030-101	± 6 V AC+DC	319 Ω	355 Ω	16 mA	9.3 V	30 mA	69.75 mW	40 mH	4.1 μ F	150 mH	31 μ F	158743 ▲
9001/02-093-390-101	± 6 V AC+DC	31 Ω	36 Ω	110 mA	9.3 V	390 mA	906.8 mW	0.16 mH	4.1 μ F	0.89 mH	31 μ F	158755 ▲
9001/02-133-150-101	± 10 V AC+DC	102 Ω	115 Ω	86 mA	13.3 V	150 mA	498.8 mW	1.3 mH	0.91 μ F	7 mH	5.6 μ F	158758
9001/02-175-100-101	± 12 V AC+DC	198 Ω	223 Ω	53 mA	17.5 V	100 mA	437.5 mW	4 mH	0.339 μ F	15 mH	1.97 μ F	158301 ▲
9001/02-280-090-101	± 24 V AC+DC	320 Ω	357 Ω	67 mA	28 V	90 mA	630 mW	2.2 mH	0.083 μ F	14 mH	0.65 μ F	158317
9001/02-412-095-101	± 36 V AC+DC	456 Ω	508 Ω	70 mA	41.2 V	95 mA	978.5 mW			9 mH	0.287 μ F	158329

CSA Information – Ex Interface to Class I, II, III, Division 1

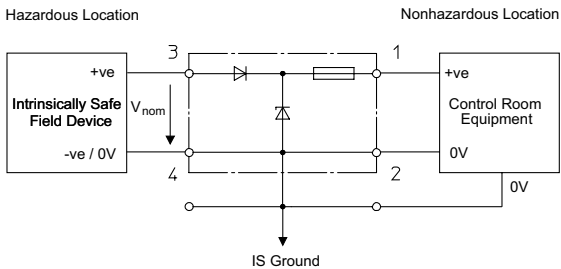
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_o/V_{oc}	I_o/I_{sc}	P_o	L_o/L_c for A, B, E	C_o/C_c for A, B, E	L_o/L_c for C, D, F, G	C_o/C_c for C, D, F, G	
9001/02-016-015-101	± 0.7 V AC+DC	120 Ω	134 Ω	5 mA	1.6 V	15 mA	6 mW	172 mH	1000 µF	608 mH	3000 µF	158669
9001/02-016-050-111	± 0.7 V AC+DC	37 Ω	40 Ω	17 mA	1.6 V	50 mA	20 mW	13.8 mH	1000 µF	52 mH	3000 µF	158677
9001/02-016-150-111	± 0.7 V AC+DC	19.9 Ω	20.1 Ω	35 mA	1.6 V	150 mA	60 mW	2.2 mH	1000 µF	8.7 mH	3000 µF	158685 ▲
9001/02-016-320-101	± 0.7 V AC+DC	11 Ω	14 Ω	50 mA	1.6 V	320 mA	128 mW	0.19 mH	1000 µF	1.6 mH	3000 µF	158497
9001/02-093-003-101	± 6 V AC+DC	3141 Ω	3473 Ω	1.7 mA	9.3 V	3 mA	6.975 mW	1000 mH	3.7 µF	1000 mH	11.2 µF	158741
9001/02-093-030-101	± 6 V AC+DC	319 Ω	355 Ω	16 mA	9.3 V	30 mA	69.75 mW	39.1 mH	3.7 µF	143 mH	11.2 µF	158743 ▲
9001/02-093-390-101	± 6 V AC+DC	31 Ω	36 Ω	110 mA	9.3 V	390 mA	906.8 mW	0.16 mH	3.7 µF	1 mH	11.2 µF	158755 ▲
9001/02-133-150-101	± 10 V AC+DC	102 Ω	115 Ω	86 mA	13.3 V	150 mA	498.8 mW	1.3 mH	1.1 µF	7 mH	3.2 µF	158758
9001/02-175-100-101	± 12 V AC+DC	198 Ω	223 Ω	53 mA	17.5 V	100 mA	437.5 mW	4 mH	0.47 µF	15.7 mH	1.4 µF	158301 ▲
9001/02-280-090-101	± 24 V AC+DC	320 Ω	357 Ω	67 mA	28 V	90 mA	630 mW	4.3 mH	0.14 µF	16.9 mH	0.42 µF	158317
9001/02-412-095-101	± 36 V AC+DC	456 Ω	508 Ω	70 mA	41.2 V	95 mA	978.5 mW	-	-	15.7 mH	0.18 µF	158329

CSA Information – Ex Interface to Class I, Zone 0

Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_o/V_{oc}	I_o/I_{sc}	P_o	L_o/L_c for IIC	C_o/C_c for IIC	L_o/L_c for IIA, IIB	C_o/C_c for IIA, IIB	
9001/02-016-015-101	± 0.7 V AC+DC	121 Ω	134 Ω	5 mA	1.6 V	15 mA	6 mW	160 mH	100 µF	560 mH	1000 µF	158669
9001/02-016-050-111	± 0.7 V AC+DC	33.2 Ω	40 Ω	17 mA	1.6 V	50 mA	20 mW	15 mH	100 µF	56 mH	1000 µF	158677
9001/02-016-150-111	± 0.7 V AC+DC	13 Ω	20.1 Ω	35 mA	1.6 V	150 mA	60 mW	1.3 mH	100 µF	7 mH	1000 µF	158685 ▲
9001/02-016-320-101	± 0.7 V AC+DC	5.6 Ω	14 Ω	50 mA	1.6 V	320 mA	128 mW	0.19 mH	100 µF	1.6 mH	1000 µF	158497
9001/02-093-003-101	± 6 V AC+DC	3320 Ω	3473 Ω	1.7 mA	9.3 V	3 mA	6.975 mW	1000 mH	4.1 µF	1000 mH	31 µF	158741
9001/02-093-030-101	± 6 V AC+DC	332 Ω	355 Ω	16 mA	9.3 V	30 mA	69.75 mW	40 mH	4.1 µF	150 mH	31 µF	158743 ▲
9001/02-093-390-101	± 6 V AC+DC	27 Ω	36 Ω	110 mA	9.3 V	390 mA	906.8 mW	0.16 mH	4.1 µF	0.89 mH	31 µF	158755 ▲
9001/02-133-150-101	± 10 V AC+DC	100 Ω	115 Ω	86 mA	13.3 V	150 mA	498.8 mW	1.3 mH	0.91 µF	7 mH	5.6 µF	158758
9001/02-175-100-101	± 12 V AC+DC	200 Ω	223 Ω	53 mA	17.5 V	100 mA	437.5 mW	4 mH	0.339 µF	15 mH	1.97 µF	158301 ▲
9001/02-280-090-101	± 24 V AC+DC	330 Ω	357 Ω	67 mA	28 V	90 mA	630 mW	2.2 mH	0.083 µF	14 mH	0.65 µF	158317
9001/02-412-095-101	± 36 V AC+DC	470 Ω	508 Ω	70 mA	41.2 V	95 mA	978.5 mW	-	-	9 mH	0.287 µF	158329

ATEX Information – Ex Interface to Zone 0												
Product Type	Operational Characteristics				Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	R_{max}	I_{max}	U_j/V_{oc}	I_j/I_{sc}	P_o	L_j/L_s for IIC	C_j/C_s for IIC	L_j/L_s for IIB	C_j/C_s for IIB	
9001/02-016-015-101	± 0.7 V AC+DC	120 Ω	134 Ω	5 mA	1.6 V	15 mA	6 mW	160 mH	100 μF	560 mH	1000 μF	158669
9001/02-016-050-111	± 0.7 V AC+DC	37 Ω	40 Ω	17 mA	1.6 V	50 mA	20 mW	15 mH	100 μF	56 mH	1000 μF	158677
9001/02-016-150-111	± 0.7 V AC+DC	19.9 Ω	20.1 Ω	35 mA	1.6 V	150 mA	60 mW	1.3 mH	100 μF	7 mH	1000 μF	158685 ▲
9001/02-016-320-101	± 0.7 V AC+DC	11 Ω	14 Ω	50 mA	1.6 V	320 mA	128 mW	0.19 mH	100 μF	1.6 mH	1000 μF	158497
9001/02-093-003-101	± 6 V AC+DC	3141 Ω	3473 Ω	1.7 mA	9.3 V	3 mA	6.975 mW	1000 mH	4.1 μF	1000 mH	31 μF	158741
9001/02-093-030-101	± 6 V AC+DC	319 Ω	355 Ω	16 mA	9.3 V	30 mA	69.8 mW	40 mH	4.1 μF	150 mH	31 μF	158743 ▲
9001/02-093-390-101	± 6 V AC+DC	31 Ω	36 Ω	110 mA	9.3 V	390 mA	906.8 mW	0.16 mH	4.1 μF	0.89 mH	31 μF	158755 ▲
9001/02-133-150-101	± 10 V AC+DC	102 Ω	115 Ω	86 mA	13.3 V	150 mA	498.8 mW	1.3 mH	0.91 μF	7 mH	5.6 μF	158758
9001/02-175-100-101	± 12 V AC+DC	198 Ω	223 Ω	53 mA	17.5 V	100 mA	437.5 mW	4 mH	0.339 μF	15 mH	1.97 μF	158301 ▲
9001/02-280-090-101	± 24 V AC+DC	320 Ω	357 Ω	67 mA	28 V	90 mA	630 mW	2.2 mH	0.083 μF	14 mH	0.65 μF	158317
9001/02-412-095-101	± 36 V AC+DC	456 Ω	508 Ω	70 mA	41.2 V	95 mA	979 mW			9 mH	0.287 μF	158329

Diode Return Barriers for Positive Polarity



- Grounded circuit
- For DC current signal returns
- Current limitation to $< I_{max}$.
- Various safety and operational characteristics as listed in the table below
- Approved for installation in hazardous areas (refer to certificate).
- Return diode causes a 3.5 voltage drop

Technical tips

- Not short circuit proof
- $T_a = 140\text{ °F}$ (60 °C) except for 9001/03-280-000-101 in FM / UL / ATEX installations where $T_a = 122\text{ °F}$ (50 °C)

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0										
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters			Art. No.	
	V_{nom}	I_{max}	U_j/V_{oc}	I_j/I_{sc}	P_o	L_j/L_s for A, B, E or IIC	C_j/C_s for A,B,E or IIC	L_j/L_s for C, D, F, G or IIB, IIA		C_j/C_s for C, D, F, G or IIB, IIA
9001/03-199-000-101	16 V DC	< 100 mA	19.9 V	0 mA	0 mW	1000 mH	0.223 μF	1000 mH	1.42 μF	158475
9001/03-280-000-101	24 V DC	< 100 mA	28 V	0 mA	0 mW	50 mH	0.083 μF	50 mH	0.65 μF	158486

CSA Information – Ex Interface to Class I, II, III, Division 1

Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for A, B, E	C_0/C_s for A, B, E	L_0/L_s for C, D, F, G	C_0/C_s for C, D, F, G	
9001/03-199-000-101	16 V DC	< 100 mA	19.9 V	0 mA	0 mW	1000 mH	0.34 μ F	1000 mH	1.02 μ F	158475
9001/03-280-000-101	24 V DC	< 100 mA	28 V	0 mA	0 mW	1000 mH	0.14 μ F	1000 mH	0.43 μ F	158486

CSA Information – Ex Interface to Class I, Zone 0

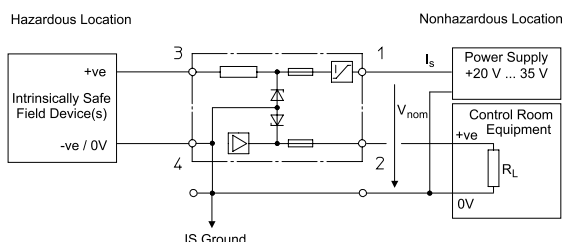
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	R_{min}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for IIC	C_0/C_s for IIC	L_0/L_s for IIA, IIB		C_0/C_s for IIA, IIB
9001/03-199-000-101	16 V DC	Diode *	< 100 mA	19.9 V	0 mA	0 mW	1000 mH	0.223 μ F	1000 mH	1.42 μ F	158475
9001/03-280-000-101	24 V DC	Diode *	< 100 mA	28 V	0 mA	0 mW	50 mH	0.083 μ F	50 mH	0.65 μ F	158486

ATEX Information – Ex Interface to Zone 0

Product Type	Operational Characteristics		Entity Parameters		Gas Group Cable Parameters			Art. No.
	V_{nom}	I_{max}	U_0/V_{oc}	L_0/L_s for IIC	C_0/C_s for IIC	L_0/L_s for IIB	C_0/C_s for IIB	
9001/03-199-000-101	16 V DC	< 100 mA	19.9 V	1000 mH	0.223 μ F	1000 mH	1.42 μ F	158475
9001/03-280-000-101	24 V DC	< 100 mA	28 V	50 mH	0.083 μ F	50 mH	0.65 μ F	158486

Diode*: designates diode return

Zener Barriers for HART / SMART Transmitter



- Application specific for HART / SMART transmitters
- Grounded field device
- Input to control system elevated above 0 V
- Allows the connection of unregulated power supplies, V_{nom} between +20 to 35 V DC
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- $R_L \leq 350 \Omega$
- Transmitter supply voltage = 14 V when $V_{nom} > 23.5$ V
- Transmitter supply voltage = $V_{nom} - 9.5$ V when $V_{nom} \leq 23.5$ V

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0

Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for A, B, E or IIC	C_0/C_s for A, B, E or IIC	L_0/L_s for C, D, F, G or IIB, IIA	C_0/C_s for C, D, F, G or IIB, IIA	
9001/51-280-091-141	20 to 35 V DC	< 91 mA	28 V	91 mA	637 mW	2.2 mH	0.083 μ F	14 mH	0.65 μ F	158524 ▲

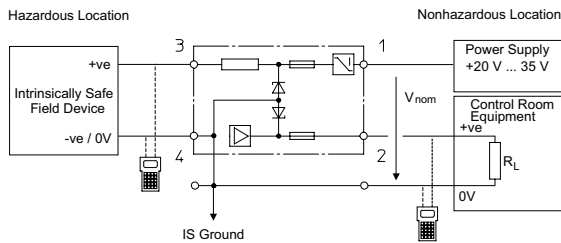
CSA Information – Ex Interface to Class I, II, III, Division 1

Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for A, B, E	C_0/C_s for A, B, E	L_0/L_s for C, D, F, G	C_0/C_s for C, D, F, G	
9001/51-280-091-141	20 to 35 V DC	< 91 mA	28 V	91 mA	637 mW	4.5 mH	0.14 μ F	17.6 mH	0.43 μ F	158524 ▲

CSA Information – Ex Interface to Class I, Zone 0											
Product Type	Operational Characteristics			Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	R_{min}	I_{max}	U_d/V_{oc}	I_d/I_{sc}	P_o	L_d/L_c for IIC	C_d/C_c for IIC	L_d/L_c for IIA, IIB	C_d/C_c for IIA, IIB	
9001/51-280-091-141	20 to 35 V DC	320 Ω	< 91 mA	28 V	91 mA	637 mW	2.2 mH	0.083 μ F	14 mH	0.65 μ F	158524 ▲

ATEX Information – Ex Interface to Zone 0										
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_d/V_{oc}	I_d/I_{sc}	P_o	L_d/L_c for IIC	C_d/C_c for IIC	L_d/L_c for IIB	C_d/C_c for IIB	
9001/51-280-091-141	20 to 35 V DC	< 91 mA	28 V	91 mA	637 mW	2.2 mH	0.083 μ F	14 mH	0.65 μ F	158524 ▲

Zener Barriers for HART Transmitter



- Application specific for HART transmitters
- Grounded field device
- Input to control system elevated above 0 V
- Allows the connection of unregulated power supplies, V_{nom} between +20 to 35 V DC
- Approved for installation in hazardous areas (refer to certificate).

Technical tips

- $R_L \leq 500 \Omega$ when $V_{nom} \leq 23.5 V$
- $R_L \leq 750 \Omega$ when $V_{nom} > 23.5 V$
- Transmitter supply voltage = 15 V when $V_{nom} > 23.5 V$
- Transmitter supply voltage = $V_{nom} - 8.5 V$ when $V_{nom} \leq 23.5 V$
- $T_a = 104^\circ F (40^\circ C)$ for FM / UL installations

FM / UL Information – Ex Interface to Class I, II, III, Division 1 or Class I, Zone 0											
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	I_{max}	U_d/V_{oc}	I_d/I_{sc}	P_o	L_d/L_c for A, B, E or IIC	C_d/C_c for A, B, E or IIC	L_d/L_c for C, D, F, G or IIB, IIA	C_d/C_c for C, D, F, G or IIB, IIA		
9001/51-280-110-141	20 to 35 V DC	< 110 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μ F	9 mH	0.65 μ F	158530 ▲	

CSA Information – Ex Interface to Class I, II, III, Division 1										
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_d/V_{oc}	I_d/I_{sc}	P_o	L_d/L_c for A, B, E	C_d/C_c for A, B, E	L_d/L_c for C, D, F, G	C_d/C_c for C, D, F, G	
9001/51-280-110-141	20 to 35 V DC	< 110 mA	28 V	110 mA	770 mW	3.2 mH	0.14 μ F	12.4 mH	0.43 μ F	158530 ▲

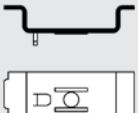
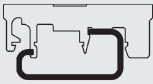
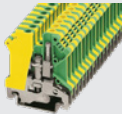
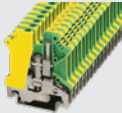

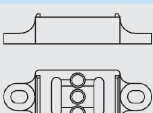
CSA Information – Ex Interface to Class I, Zone 0											
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.	
	V_{nom}	I_{max}	U_d/V_{oc}	I_d/I_{sc}	P_o	L_d/L_c for IIC	C_d/C_c for IIC	L_d/L_c for IIA, IIB	C_d/C_c for IIA, IIB		
9001/51-280-110-141	20 to 35 V DC	< 110 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μ F	9 mH	0.65 μ F	158530 ▲	

ATEX Information – Ex Interface to Zone 0

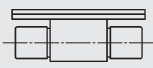
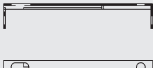
Product Type	Operational Characteristics		Entity Parameters			Gas Group Cable Parameters				Art. No.
	V_{nom}	I_{max}	U_0/V_{oc}	I_0/I_{sc}	P_o	L_0/L_s for IIC	C_0/C_s for IIC	L_0/L_s for IIB	C_0/C_s for IIB	
9001/51-280-110-141	20 to 35 V DC	< 110 mA	28 V	110 mA	770 mW	1.2 mH	0.083 μ F	9 mH	0.65 μ F	158530 ▲

Schematics of the zener barriers available at r-stahl.com

Accessories

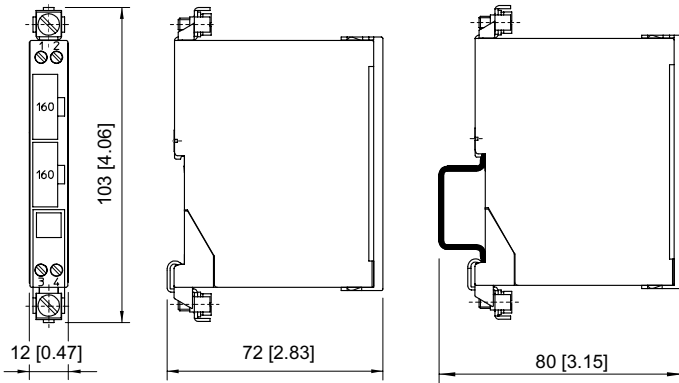
Figure	Description	Product Type	Art. No.	Weight
Adaptor				
	Adaptor allows installation of a zener barrier Series 900x on a mounting plate of a previous series.	-	158826	6 g
Clamping base, moulded material				
	Enables mounting of zener barrier on a G-rail.	-	165283	4 g
Protective conductor terminal				
	USLKG 5 (wire range AWG 12 / 4 mm ²) Terminal enables connection of protective conductors to DIN rail. Color green-yellow.	USLKG5 GNYE	112760	12 g
Ground terminal				
	USLKG 6 N (wire range AWG 10 / 6 mm ²) Terminal enables connection of protective /Ground conductors to DIN rail. Color green-yellow.	USLKG6 N GNYE	112599	30 g
Fuse holder				
	Fuse holder is snapped onto the side of the zener barrier and can be equipped with up to 5 back-up fuses (replacement).	-	158834	20 g
Insulation and fastening material				
	Suitable for the NS 35/15 DIN rail, makes it possible to install the DIN rail such that it is electrically insulated from the mounting plate.	-	158828	23 g

Spare Parts

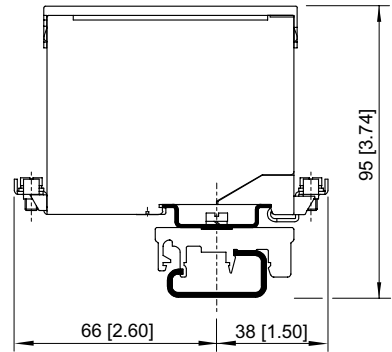
Figure	Description	Art. No.	Weight
Back-up fuse			
	For all zener barriers Series 9001, 9002 and 9004 unit: 5 pcs.	158964 ▲	8 g
Label carrier			
	Transparent cover for the label	158977	2 g

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations

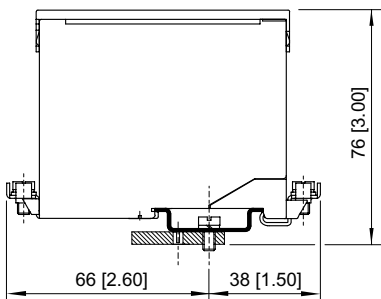
08 b



Mounting on DIN rail NS 35/15



Mounting on DIN rail NS 32 by means of adaptor and mounting attachment, moulded plastic



Mounting on mounting plate by means of adaptor