

SAFETY BARRIERS



Product	Installation in Zone						Series	Page	WebCode
	0	1	2	20	21	22			
Applications									
Safety Barriers								11	
Dual-Channel Safety Barriers									
Dual-Channel Safety Barriers			•			•	9002	15	9002A
Single-Channel Safety Barriers									
Single-Channel Safety Barriers			•			•	9001	12	9001A
Accessories and Spare Parts									
Accessories and Spare Parts Series 9001, 9002								18	
Dimensional Drawings									
Dimensional Drawings Series 9001, 9002								19	

For additional products and information please refer to r-stahl.com

Overview Typical Applications

Symbol	Application	INTRINSPAK Type
	2-wire transmitter HART	9002/13-280-110-001 9001/51-280-091-141
	i/p converter, control valve, indicator Field circuit grounded	9001/01-280-110-101 9002/13-280-110-001
	Contact, optocoupler output Switch (load grounded) field circuit grounded	9001/01-252-060-141
	Solenoid valve, LED indicator Field circuit grounded Field circuit floating	9002/13-280-093-001 9001/03 9001/01
	Thermocouple, mV signals Field circuit floating	9002/77-093-300-001
	Resistance thermometer (RTD), Potentiometer Pt100, 2-wire connection field circuit floating	9002/22-032-300-111
	Strain gauge load cells 350 Ω or 700 Ω 6-wire ± 7.5 V (15 V) Field circuit floating 350 Ω 6-wire + 10 V field circuit floating 350 Ω or 700 Ω 6-wire + 16 V field circuit floating	9002/10-187-270-001 9002/10-187-020-001 9002/77-093-040-001 9002/11-130-360-001 9002/11-120-024-001 9002/11-120-024-001 9002/13-199-225-001 9002/11-199-030-001 9002/11-199-030-001
	Fire & gas detection	9002/01-280-165-101
	Intrinsically safe data interface RS 232	9002/22-240-160-001

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- 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 to install as barriers can be simultaneously snapped onto rail and connected to PE

WebCode **9001A**



The 9001 series INTRINSPAK single-channel safety barriers enable the intrinsically safe operation of virtually all field devices. The comprehensive portfolio and the combination of safety 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 standardised for all variants.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface						
Installation in			•			•

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•		•		•

Selection Table								
Series 9001/00, Single-channel safety barriers for negative polarity								
Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
6 V	24 Ω	29 Ω	8.3 V	442 mA	917.2 mW	9001/00-083-442-101	158333	20
	28 Ω	33 Ω	8.6 V	390 mA	839 mW	9001/00-086-390-101	158434	20
24 V	287 Ω	320 Ω	28 V	100 mA	700 mW	9001/00-280-100-101	158356 ▲	20
	340 Ω	375 Ω	28 V	85 mA	595 mW	9001/00-280-085-101	158344	20
	599 Ω	666 Ω	28 V	50 mA	350 mW	9001/00-280-050-101	158660	20
	1435 Ω	1590 Ω	28 V	20 mA	140 mW	9001/00-280-020-101	158650	20
Series 9001/01, Single-channel safety barriers for positive polarity								
Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
6 V	24 Ω	29 Ω	8.3 V	442 mA	917.2 mW	9001/01-083-442-101	158338	20
	28 Ω	33 Ω	8.6 V	390 mA	839 mW	9001/01-086-390-101	158439	20
	39 Ω	45 Ω	8.6 V	270 mA	580.5 mW	9001/01-086-270-101	158428	20
	65 Ω	73 Ω	8.6 V	150 mA	322.5 mW	9001/01-086-150-101	158418 ▲	20
	129 Ω	145 Ω	8.6 V	75 mA	161.3 mW	9001/01-086-075-101	158391	20
8 V	93 Ω	106 Ω	12.6 V	150 mA	473 mW	9001/01-126-150-101	158502	20
12 V	50 Ω	57 Ω	15.8 V	390 mA	1541 mW	9001/01-158-390-101	158509	20
	120 Ω	135 Ω	15.8 V	150 mA	593 mW	9001/01-158-150-101	158535 ▲	20
	235 Ω	262 Ω	16.8 V	75 mA	315 mW	9001/01-168-075-101	158568	20
	871 Ω	966 Ω	16.8 V	20 mA	84 mW	9001/01-168-020-101	158555	20

Selection Table									
Series 9001/01, Single-channel safety barriers for positive polarity									
Product variant	Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_0	Maximum current I_0	Maximum power P_0	Product Type	Art. No.	PS
16 V		216 Ω	241 Ω	19.9 V	100 mA	498 mW	9001/01-199-100-101	158632 ▲	20
		415 Ω	462 Ω	19.9 V	50 mA	249 mW	9001/01-199-050-101	158616	20
20 ... 35 V		259 Ω	268 Ω	25.2 V	100 mA	630 mW	9001/01-252-100-141	158697 ▲	20
		455 Ω	506 Ω	25.2 V	60 mA	378 mW	9001/01-252-060-141	158693 ▲	20
24 V		115 Ω	128 Ω	28 V	280 mA	1960 mW	9001/01-280-280-101	158722	20
		177 Ω	198 Ω	28 V	165 mA	1155 mW	9001/01-280-165-101	158392 ▲	20
		263 Ω	294 Ω	28 V	110 mA	770 mW	9001/01-280-110-101	158380 ▲	20
		287 Ω	320 Ω	28 V	100 mA	700 mW	9001/01-280-100-101	158365 ▲	20
		340 Ω	375 Ω	28 V	85 mA	595 mW	9001/01-280-085-101	158351 ▲	20
		415 Ω	462 Ω	28 V	75 mA	525 mW	9001/01-280-075-101	158339	20
		599 Ω	666 Ω	28 V	50 mA	350 mW	9001/01-280-050-101	158665	20
		1435 Ω	1590 Ω	28 V	20 mA	140 mW	9001/01-280-020-101	158655	20
Series 9001/02, Single-channel safety barriers for alternating polarity									
Product variant	Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_0	Maximum current I_0	Maximum power P_0	Product Type	Art. No.	PS
± 0.7 V		19.9 Ω	20.1 Ω	1.6 V	150 mA	60 mW	9001/02-016-150-111	158685 ▲	20
		37 Ω	40 Ω	1.6 V	50 mA	20 mW	9001/02-016-050-111	158677	20
		120 Ω	134 Ω	1.6 V	15 mA	6 mW	9001/02-016-015-101	158669	20
± 6 V		31 Ω	36 Ω	9.3 V	390 mA	906.8 mW	9001/02-093-390-101	158755 ▲	20
		319 Ω	355 Ω	9.3 V	30 mA	69.8 mW	9001/02-093-030-101	158743 ▲	20
		3141 Ω	3473 Ω	9.3 V	3 mA	6.975 mW	9001/02-093-003-101	158741	20
± 10 V		102 Ω	115 Ω	13.3 V	150 mA	498.8 mW	9001/02-133-150-101	158758	20
± 12 V		198 Ω	223 Ω	17.5 V	100 mA	437.5 mW	9001/02-175-100-101	158301	20
± 24 V		320 Ω	357 Ω	28 V	90 mA	630 mW	9001/02-280-090-101	158317	20
Series 9001/03, Single-channel diode return barriers for positive polarity									
Product variant	Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_0	Maximum current I_0	Maximum power P_0	Product Type	Art. No.	PS
16 V		-	-	19.9 V	0 mA	0 mW	9001/03-199-000-101	158475	20
24 V		-	-	28 V	0 mA	0 mW	9001/03-280-000-101	158486	20
Series 9001/51, Single-channel safety barriers for transmitter									
Product variant	Nominal voltage	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_0	Maximum current I_0	Maximum power P_0	Product Type	Art. No.	PS
20 ... 35 V		-	-	28 V	91 mA	637 mW	9001/51-280-091-141	158524 ▲	20
		-	-	28 V	110 mA	770 mW	9001/51-280-110-141	158530 ▲	20

Schematics of the safety barriers on the Internet r-stahl.com

Technical Data	
Explosion Protection	
IECEx gas explosion protection	Ex nA [ia Ga] IIC/IIB T4 Gc
IECEx dust explosion protection	[Ex ia Da] IIIC
ATEX gas explosion protection	Ⓔ II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
ATEX dust explosion protection	Ⓔ II (1) D [Ex ia Da] IIIC
EAC gas explosion protection	Ⓔ 2 Ex nA [ia Ga] IIC T4 Gc X
EAC dust explosion protection	Ⓔ [Ex ia Da] IIIC

Technical Data	
Explosion Protection	
Certificates	ATEX (PTB), Brazil (ULB), Canada (CSA), EAC (STV), IECEx (PTB), Korea (KGS), USA (FM), USA (UL)
Installation	in Zone 2, Division 2 and in safe area
Further information	see respective certificate and operating instructions
Ambient Conditions	
Ambient temperature	-20 °C ... +60 °C
Storage temperature	-20 °C ... +75 °C
Mechanical Data	
Degree of protection (IP)	IP40
Degree of protection note	according to IEC 60529
Terminal degree of protection (IP)	IP20
Enclosure material	Polyamide 6GF
Number of connection terminals	4
Connection cross section max.	1.5 mm ²
Type of connection cable	Finely stranded Solid
Weight	0.11 kg
Accessories and spare parts see page 18	
Dimensional Drawings see page 19	



- 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 to install as barriers can be simultaneously snapped onto rail and connected to PE

A2

WebCode **9002A**



The 9002 series INTRINSPAK two-channel safety barriers enable the intrinsically safe operation of virtually all field devices. The comprehensive portfolio and the combination of safety barriers cover a wide variety of signals. The devices are incredibly robust and require very little space. The back-up fuse is a convenient feature as it is standardised for all variants.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	•	•	•	•	•	•
Installation in			•			•

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface						
Installation in		•		•		

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	•	•	•	•	•	•
Installation in		•		•		•

Selection Table									
Product variant Series 9002/00, Potential: negative / negative									
Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	25 V	322 Ω	359 Ω	28 V	93 mA	650 mW	9002/00-280-186-001	158845	20
2	25 V	322 Ω	359 Ω	28 V	93 mA	650 mW			
1 + 2	-	-	-	28 V	186 mA	1300 mW			
Product variant Series 9002/10, Potential: positive / negative									
Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	6 V	490 Ω	543 Ω	9.3 V	20 mA	50 mW	9002/10-187-020-001	158937 ▲	20
2	6 V	490 Ω	543 Ω	9.3 V	20 mA	50 mW			
1 + 2	-	-	-	18.7 V	20 mA	90 mW			
1	6 V	43 Ω	49 Ω	9.3 V	270 mA	630 mW	9002/10-187-270-001	158933 ▲	20
2	6 V	43 Ω	49 Ω	9.3 V	270 mA	630 mW			
1 + 2	-	-	-	18.7 V	270 mA	1260 mW			
Product variant Series 9002/11; Potential: positive / positive									
Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	9 V	1052 Ω	1165 Ω	12 V	12 mA	40 mW	9002/11-120-024-001	158943	20
2	25 V	1052 Ω	1165 Ω	12 V	12 mA	40 mW			
1 + 2	-	-	-	12 V	24 mA	70 mW			
1	10 V	46 Ω	52 Ω	13 V	321 mA	1040 mW	9002/11-130-360-001	158958	20
2	1 V	46 Ω	52 Ω	1.6 V	39 mA	16 mW			
1 + 2	-	-	-	13 V	360 mA	1170 mW			
1	16 V	1435 Ω	1590 Ω	19.9 V	15 mA	75 mW	9002/11-199-030-001	158929 ▲	20
2	16 V	1435 Ω	1590 Ω	19.9 V	15 mA	75 mW			
1 + 2	-	-	-	19.9 V	30 mA	150 mW			

Selection Table

Product variant Series 9002/11; Potential: positive / positive

Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	25 V	322 Ω	359 Ω	28 V	89 mA	630 mW	9002/11-280-293-001	158864	20
2	6 V	60 Ω	68 Ω	9.6 V	180 mA	430 mW			
1 + 2	-	-	-	28 V	269 mA	1050 mW			
1	25 V	322 Ω	359 Ω	28 V	93 mA	650 mW	9002/11-280-186-001	158848 ▲	20
2	25 V	322 Ω	359 Ω	28 V	93 mA	650 mW			
1 + 2	-	-	-	28 V	186 mA	1300 mW			

Product variant Series 9002/13, Safety barrier potential: positive / diode return barrier potential: positive

Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	16 V	96 Ω	109 Ω	19.9 V	222 mA	1100 mW	9002/13-199-225-001	158921 ▲	20
2	16 V	-	-	19.9 V	3 mA	15 mW			
1 + 2	-	-	-	19.9 V	225 mA	1120 mW			
1	20 ... 35 V	217 Ω	244 Ω	25.2 V	118 mA	740 mW	9002/13-252-121-041	158830 ▲	20
2	22 V	-	-	25.2 V	0 mA	20 mW			
1 + 2	-	-	-	25.2 V	121 mA	760 mW			
1	24 V	322 Ω	359 Ω	28 V	90 mA	630 mW	9002/13-280-093-001	158852 ▲	20
2	24 V	-	-	28 V	3 mA	21 mW			
1 + 2	-	-	-	28 V	93 mA	651 mW			
1	24 V	270 Ω	296 Ω	28 V	107 mA	749 mW	9002/13-280-110-001	158857 ▲	20
2	24 V	-	-	28 V	3 mA	21 mW			
1 + 2	-	-	-	28 V	110 mA	770 mW			

Product variant Series 9002/22, Potential: alternating / alternating

Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	0.7 V	21.6 Ω	23.8 Ω	1.6 V	150 mA	60 mW	9002/22-032-300-111	158954 ▲	20
2	0.7 V	21.6 Ω	23.8 Ω	1.6 V	150 mA	60 mW			
1 + 2	1.4 V	-	-	3.2 V	300 mA	120 mW			
1	5.5 V	84 Ω	95 Ω	7.9 V	100 mA	198 mW	9002/22-158-200-001	158952	20
2	5.5 V	84 Ω	95 Ω	7.9 V	100 mA	198 mW			
1 + 2	11 V	-	-	15.8 V	200 mA	395 mW			
1	9 V	1051 Ω	1164 Ω	12 V	12 mA	40 mW	9002/22-240-024-001	158950	20
2	9 V	1051 Ω	1164 Ω	12 V	12 mA	40 mW			
1 + 2	18 V	-	-	24 V	24 mA	80 mW			
1	9 V	158 Ω	177 Ω	12 V	80 mA	240 mW	9002/22-240-160-001	158948	20
2	9 V	158 Ω	177 Ω	12 V	80 mA	240 mW			
1 + 2	18 V	-	-	24 V	160 mA	480 mW			

Product variant Series 9002/33, Diode return barrier potential: positive / diode return barrier potential: negative

Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	25.5 V	0	0	28 V	0 mA	0	9002/33-280-000-001	158913	20
2	25.5 V	-	-	28 V	0 mA	0			
1 + 2	-	-	-	28 V	0 mA	0			

Product variant Series 9002/77, Star barrier / star barrier

Channel	Nominal voltage U_N	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	-	492 Ω	546 Ω	9.3 V	20 mA	50 mW	9002/77-093-040-001	158905 ▲	20
2	-	492 Ω	546 Ω	9.3 V	20 mA	50 mW			
1 + 2	6 V	-	-	9.3 V	40 mA	90 mW			
1	-	71.7 Ω	81.5 Ω	9.3 V	150 mA	350 mW	9002/77-093-300-001	158897 ▲	20
2	-	71.7 Ω	81.5 Ω	9.3 V	150 mA	350 mW			
1 + 2	6 V	-	-	9.3 V	300 mA	700 mW			
1	-	60.3 Ω	68.9 Ω	10 V	200 mA	500 mW	9002/77-100-400-001	158893	20
2	-	60.3 Ω	68.9 Ω	10 V	200 mA	500 mW			
1 + 2	6 V	-	-	10 V	400 mA	1000 mW			
1	-	112 Ω	126 Ω	15 V	150 mA	560 mW	9002/77-150-300-001	158889 ▲	20
2	-	112 Ω	126 Ω	15 V	150 mA	560 mW			
1 + 2	12 V	-	-	15 V	300 mA	1130 mW			

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Selection Table									
Series 9002/77, Star barrier / star barrier									
Channel	Nominal voltage U_n	Minimum resistance R_{min}	Maximum resistance R_{max}	Maximum voltage U_o	Maximum current I_o	Maximum power P_o	Product Type	Art. No.	PS
1	-	322 Ω	359 Ω	22 V	73 mA	400 mW	9002/77-220-146-001	158885	20
2	-	322 Ω	359 Ω	22 V	73 mA	400 mW			
1 + 2	18 V	-	-	22 V	296 mA	800 mW			
1	-	657 Ω	731 Ω	28 V	94 mA	330 mW	9002/77-280-094-001	158877	20
2	-	657 Ω	731 Ω	28 V	47 mA	330 mW			
1 + 2	24 V	-	-	28 V	94 mA	660 mW			

Schematics of the safety barriers on the Internet r-stahl.com

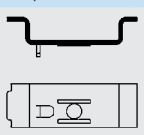
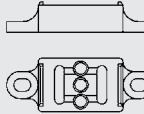
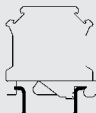
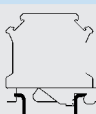
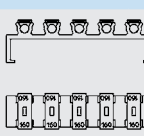
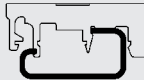
Technical Data	
Explosion Protection	
IECEX gas explosion protection	Ex nA [ia Ga] IIC/IIB T4 Gc
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas explosion protection	Ⓔ II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
ATEX dust explosion protection	Ⓔ II (1) D [Ex ia Da] IIIC
EAC gas explosion protection	Ⓔ 2 Ex nA [ia Ga] IIC T4 Gc X
EAC dust explosion protection	Ⓔ [Ex ia Da] IIIC
Certificates	ATEX (PTB), Brazil (ULB), Canada (CSA), China (CQST), EAC (STV), IECEX (PTB), India (PESO), Korea (KGS), USA (FM), USA (UL)
Further information	see respective certificate and operating instructions
Ambient Conditions	
Ambient temperature	-20 °C ... +60 °C
Storage temperature	-20 °C ... +75 °C
Mechanical Data	
Degree of protection (IP)	IP40
Terminal degree of protection (IP)	IP20
Enclosure material	Polyamide 6GF
Number of connection terminals	4
Connection cross section max.	1.5 mm ²
Type of connection cable	Solid Finely stranded
Weight	0.11 kg

Accessories and spare parts see page 18


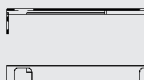
Dimensional Drawings see page 19

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Accessories

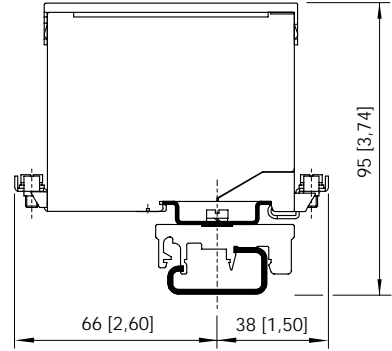
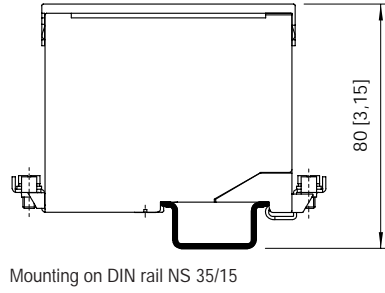
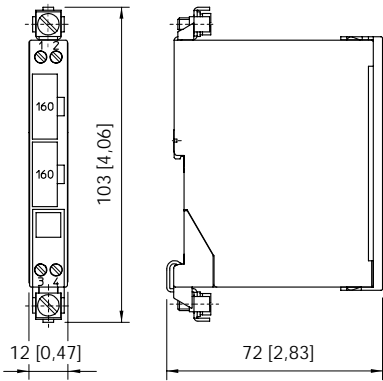
Figure	Description	Art. No.	PS	Weight kg
Adaptor				
	Adaptor allows installation of a safety barrier Series 900x on a mounting plate of a previous series.	158826	Z2	0.006
Insulating stand off				
	Suitable for DIN rail NS35/15, allows electrically insulated mounting of DIN rail from mounting plate.	158828	Z2	0.023
Protective conductor terminal				
	USLKG 5 (wire range 4 mm ²) Terminal enables connection of protective conductors to DIN rail. Colour green-yellow.	112760	Z1	0.012
Earth terminal				
	USLKG 6 N (wire range 6 mm ²) Terminal enables connection of protective / earthing conductors to DIN rail. Colour green-yellow.	112599	18	0.030
Fuse holder				
	Fuse holder is snapped onto the side of the safety barrier and can be equipped with up to 5 back-up fuses (replacement).	158834	Z2	0.020
Mounting attachment moulded plastic				
	Enables mounting of safety barrier on a G-rail.	165283	Z2	0.004

Spare Parts

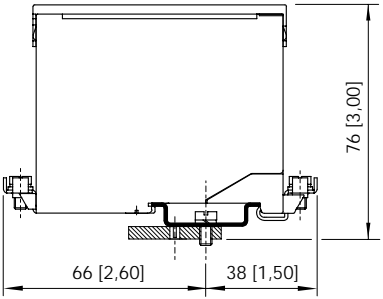
Figure	Description	Art. No.	PS	Weight kg
Back-up fuse				
	For all safety barriers Series 9001, 9002 and 9004 unit: 5 pcs.	158964	E2	0.008
Holder for label				
	Transparent cover for labelling	158977	E2	0.002

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

A2



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



Mounting on mounting plate by means of adaptor