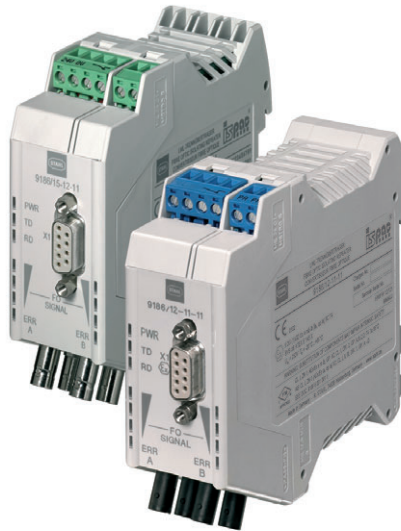


Fibre Optics Fieldbus Isolating Repeater Series 9186



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08579E00

- > Easy installation and maintenance due to:
 - Inherently safe optical interface
 - Intrinsically safe bus connection via RS-485 IS (PNO)
- > High availability due to:
 - Build-up of ring structures, redundant Point-to-Point, line structures
 - Integrated analysis of optical input signal
 - Error message if critical levels of input signal reached
- > Transmission of Profibus DP, Modbus, HART on RS-485, R. STAHL Servicebus
- > 9186/12
 - Installation in Zone 1 and Zone 2 possible
 - Fieldbus interface for intrinsically safe Profibus DP (PNO)
- > 9186/5
 - Installation in Zone 2 possible

A3



The Fibre Optic Isolating Repeater is used to build-up fibre optic network structures in hazardous areas. It enables to transmit Profibus DP or Modbus signals over distances of up to 2 km or 1,2 miles. The optical interfaces are designed to be inherently safe (Ex op is). The protection scheme Ex op is allows to apply usual standardized industry connectors. The Zone 1 / Div. 2 version of the Fibre Optic Isolating Repeater offers an intrinsically safe RS-485 interface acc. to the standard RS-485 IS (PNO).

Critical levels of the received optical signal are detected by the integrated diagnostic function. The fault is indicated by LEDs on the front side of the device and in addition by a line fault contact. The contact is used to trigger a remote fault indication in the control room. The diagnostic function enables preventive maintenance and improves the availability of the plant.

	IECEX / ATEX						NEC 505			NEC 506			NEC 500						
	0	1	2	20	21	22	Class I			Class I			Class I		Class II		Class III		
Zone							0	1	2	20	21	22	Division	1	2	1	2	1	2
9186/12-11-11: Ex i interface	x	x	x	x	x	x	x	x	x				9186/12-11-11: Ex i interface	x	x	x	x	x	x
9186/5-...-...: Ex i interface			x			x			x				9186/5-...-...: Ex i interface		x		x		x
9186/12-11-11: Installation in		x	x		x	x		x	x			x	9186/12-11-11: Installation in		x		x		x
9186/5-...-...: Installation in			x			x			x			x	9186/5-...-...: Installation in		x		x		x

WebCode 9186A

Fibre Optics Fieldbus Isolating Repeater

Series 9186



Selection Table

Version	Installation in	Network structure	Order number
Fibre optics fieldbus isolating repeater Series 9186	Zone 1	Ring, point-to-point redundant, line	9186/12-11-11
	Zone 2 and in the safe area	Point-to-point, end of line	9186/25-12-11
		Ring, point-to-point redundant, line	9186/15-12-11

Explosion Protection

Global (IECEX)			
Version	9186/12-11-11	9186/5-12-11	
Installation in	Zone 1	Zone 2 and in the safe area	
Gas and dust	IECEX BVS 12.0081 X Ex e mb ib [ia op is Ga] IIC T4 Gb [Ex ia Da] IIIC	IECEX BVS 13.0107 X Ex nA nC [op is T6 Ga] IIC T4 Gc [Ex op is Da] IIIC	
Europe (ATEX)			
Version	9186/12-11-11	9186/5-12-11	
Installation in	Zone 1	Zone 2 and in the safe area	
Gas and dust	BVS 06 ATEX E 145 X ⊕ II 2 (1) G Ex e mb ib [ia op is Ga] IIC T4 Gb ⊕ II (1) D [Ex ia Da] IIIC	BVS 07 ATEX 068 X ⊕ II 3 (1) G Ex nA nC [op is T6 Ga] IIC T4 Gc ⊕ II (1) D [Ex op is Da] IIIC	
Certifications and certificates			
Version	9186/12-11-11	9186/5-12-11	
Installation in	Zone 1	Zone 2 and in the safe area	
Certificates	IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (cFM), Kazakhstan (GOST K), Russia (GOST R), Serbia (SRPS), USA (FM)	IECEX, ATEX, Canada (UL), Kazakhstan (GOST K), Russia (GOST R), USA (UL)	
Ship approval	ABS, DNV	ABS, DNV	
Safety data			
Version	9186/12-11-11	9186/5-12-11	
Installation in	Zone 1	Zone 2 and in the safe area	
Max. voltage U_o	± 3.7 V	--	
Max. current I_o	148 mA	--	
Max. power P_o	137 mW	--	
For connection RS 485 IS			
Max. permissible voltage U_i	± 4.2 V	--	
Internal capacity C_i and inductivity L_i	negligible	--	
Ex i fault-contact			
Max. permissible voltage U_i	24 V	--	
Max. permissible current I_i	600 mA	--	
Internal capacity C_i and inductivity L_i	negligible	--	
Optical interface			
Zündschutzart	Ex op is IIC T6	Ex op is IIC T6	
Strahlungsleistung P_o	15 mW	15 mW	
Further parameters			
Further information	see respective certificate and operating instructions		

Fibre Optics Fieldbus Isolating Repeater

Series 9186



Technical Data

Electrical data

	9186/12-11-11	9186/5-12-11
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Auxiliary power		
Nominal voltage U_N	24 V DC	24 V DC
Voltage range	18 V ... 31.2 V	18 V ... 31.2 V
Residual ripple	< 3.6 Vss	< 3.6 Vss
Nominal current (at U_N)	67 mA	130 mA
Power input	≤ 2 W	3 W
Operation indication	LED green "PWR"	LED green "PWR"
Polarity reversal protection	yes	yes
Galvanic separation		
Test voltage		
acc. to standard	EN 60079-11	--
between RS-485 and power supply	--	≥ 1.5 kV
Ex i RS485 to power supply	1.5 kV	--
Error-contact to power supply	1.5 kV	--
PA to power supply	1.5 kV	--
Ex i RS 485 to error-contact	500 V	--
Ex i RS 485 to PA	500 V	--
Error contact to PA	500 V	--
Optical interface		
Protocols	protocol transparent for RS-485 interface	protocol transparent for RS-485 interface
Network topologies	Ring topology, line topology, point-to-point connection	Ring topology, line topology, point-to-point connection
Redundancy	automatic switching in case of line fault	automatic switching in case of line fault (except 9186/25-12-11)
Connection	ST®, BFOC/2.5 connector	ST®, BFOC/2.5 connector
Wavelength	850 nm	
Transmission distance	≤ 2000 m	
Recommended optical fibres	G 50 / 125 G 62.5 / 125	
Electromagnetic compatibility	Integrated diagnosis function with alarm and automatic switching to the backup path. This enables increased availability. Tested to the following standards and regulations: EN 61326-1 Use in industrial environment	

Electrical interfaces

	9186/12-11-11	9186/5-12-11
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Protocols	PROFIBUS DP, Modbus, HART, ServiceBus R. STAHL (IS1)	PROFIBUS DP, Modbus, HART, ServiceBus R. STAHL (IS1)
Version	RS 485 IS (PNO)	RS-485
Connection	Sub-D socket X1, 9-pole	Sub-D socket X1, 9-pole
Bit rate	1.2 kbit/s ... 1.5 Mbit/s	9.6 kbit/s ... 1.5 Mbit/s
Settings	You can select fixed baud rates or automatic baud rate detection (only for PROFIBUS DP).	
Bit refresh	Received bit is reset to the original form.	
Line length	According to PROFIBUS Guideline depends on bit rate and cable	
Transmission method	2-wire, half-duplex	
Terminating resistor	to be connected to an external plug	
Indication of data reception	LED green "RD" ON	
Indication of data transmission	LED yellow "TD" ON	

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Technical Data

Fault control		
Power supply failure	Fault-contact is open	
Transmission level is good	LED green and yellow "FO signal", fault-contact is closed	
Transmission level reduced (-1,5 dBm)	LED yellow "FO signal", fault-contact is open	
Fibre breakage or transmission level is too low (-3 dBm)	LED red "FO ERR", fault-contact is open	
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Switching capacity of fault-contact	see Ex i values	max. 60 V DC, 42 V AC, 0.46 A
Ambient conditions		
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Ambient temperature	-20 ... +65 °C The installation conditions affect the ambient temperature.	-20 ... +60 °C
Storage temperature	-40 ... +85 °C	-40 ... +85 °C
Relative humidity (no condensation)	≤ 95 %	≤ 95 %
Connectors		
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Power supply	Spring clamp terminal, 0.2 ... 1.5 mm ² (Ex e)	Screw terminal, 0.2 ... 2.5 mm ² green
Fault-contact	Screw terminal, 0.2 ... 2.5 mm ² blue (Ex i)	Screw terminal, 0.2 ... 2.5 mm ² green
Screen connection to PA	Screw terminal, 0,2 ... 2,5 mm ² blue	via DIN rail contact
Serial connection	Sub-D socket X1, 9-pole	Sub-D socket X1, 9-pole
Shield	Using sub-D socket terminal strip	Using sub-D socket terminal strip
Fibre optic cable	BFOC/2.5 for fibre optics 50/125, 62.5/125	BFOC/2.5 for fibre optics 50/125, 62.5/125
Mechanical data		
Version	9186/12-11-11	9186/5-12-11
Installation in	Zone 1	Zone 2 and in the safe area
Weight	approx. 330 g	approx. 200 g
Mounting type	on DIN rail (NS35/15; NS35/7.5)	on DIN rail (NS35/15; NS35/7.5)
Type of protection		
Enclosure	IP30	IP30
Terminals Powersupply	IP20	IP30
Terminals	IP30	IP30
Enclosure material	PA 6.6	PA 6.6
Fire resistance (UL-94)	V0	V0

Fibre Optics Fieldbus Isolating Repeater Series 9186

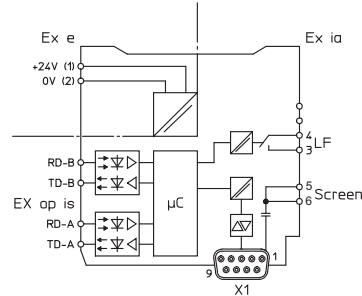


Technical Data

Electrical connection

Connection diagram

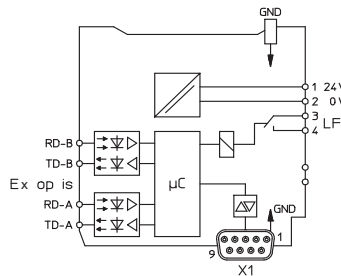
9186/12-...-



PIN	RS 485 IS
8	A -
3	B +
6	ISP (+)
5	ISGND

05352E00

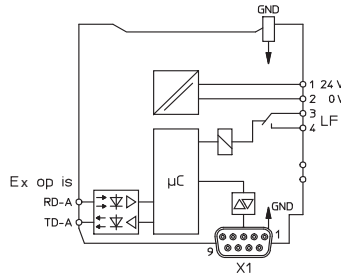
9186/15-...-



PIN	RS 485
8	A -
3	B +
6	U +
5	GND

05354E00




9186/25-...-



PIN	RS 485
8	A -
3	B +
6	U +
5	GND

06005E00

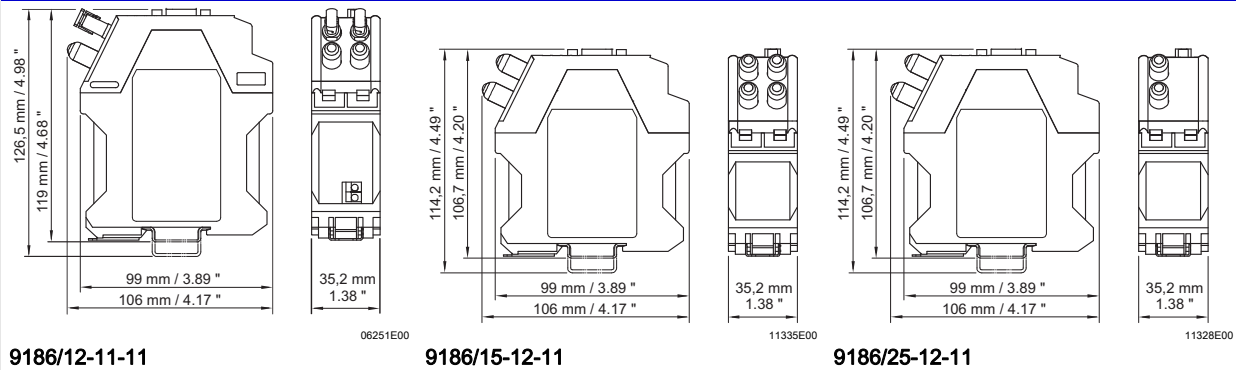
Accessories and Spare Parts

Designation	Figure	Description	Art. no.	Weight kg
Sub-D plug		9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/15 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For non-intrinsically safe RS-485.	162699	0.050
Sub-D plug for RS-485 IS	 09868E00	9-pin for connection of the fieldbus or ServiceBus to the CPU & power module Series 9440/22 and fieldbus-isolating repeater 9185. Integrated terminator can be switched on or off. For RS-485 IS to PNOstandard.	162693	0.100
Sub-D plug, angled, for RS-485 IS	 12489E00	9-pin, for connection of fieldbus or ServiceBus to CPU & Power Module Type 9440/12 and fieldbus isolating repeater Type 9185. The termination resistance is built-in. Suitable for RS-485 IS (PNO standard).	201805	0.050

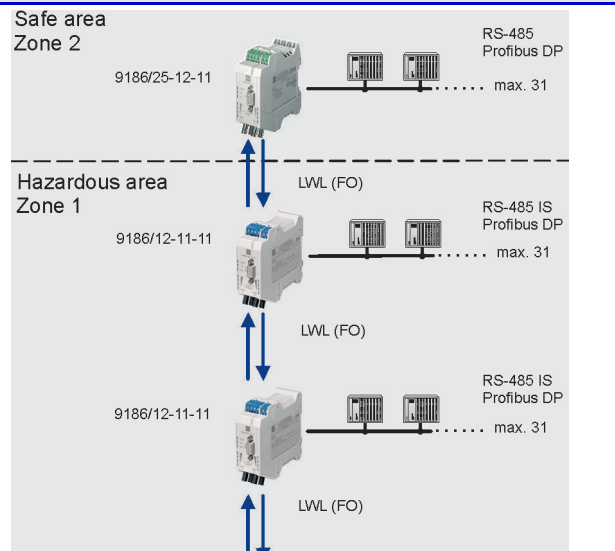
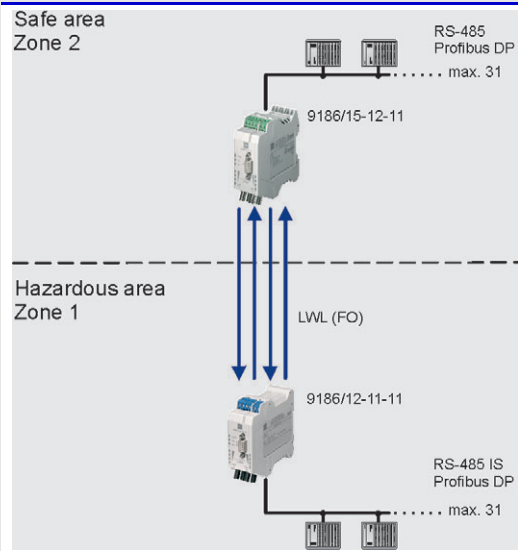
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Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations

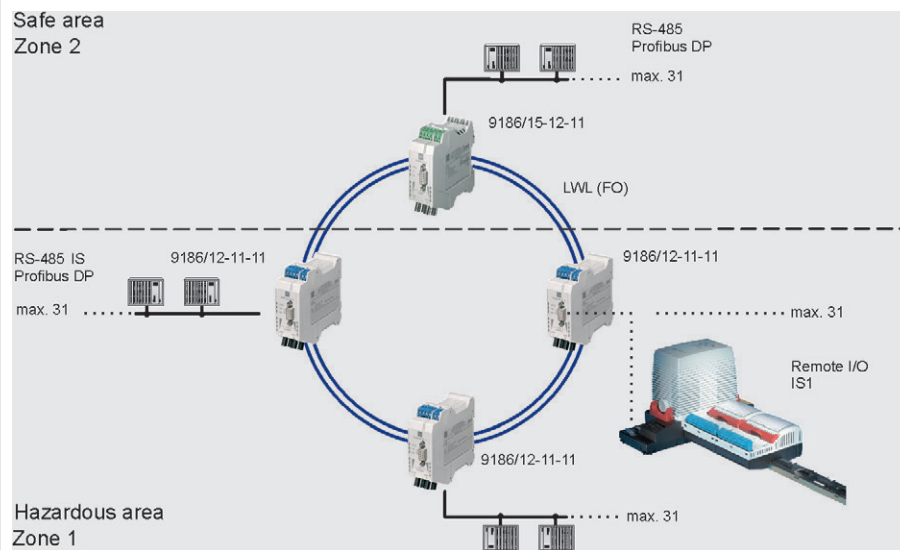


Network-topology



Point-to-Point structure

Line structure



We reserve the right to make alterations to the technical data, dimensions, weights, designs and products available without notice. The illustrations cannot be considered binding.