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STAHL

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) acc. to IEC EN 60079-28. This approach reduces the installation and maintenance effort of fibre optic lines in hazardous areas dramatically. The transmitted optical signal is energy limited in a way which does not allow to ignite hazardous atmosphere. The protection scheme Ex op is allows to apply usual standardized industry connectors. Furthermore an operator may connect or disconnect the optical line without switching off the transmitter in prior. 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), enabling once more a facilitated installation and maintenance.

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.

By means of the Fibre Optic Isolating Repeater various network structures may be build-up. Beside the well-know point-to-point structure the user may build-up redundant ring structures, offering an unmatched availability of the bus signal.

Fibre Optics Fieldbus Isolating Repeater for Installation in Zone 1 Type 9186/12

- Easy installation and maintenance due to:
 - Intrinsically 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

	Zones					
	0	1	2	20	21	22
RS 485 interfaces		X	X		X	X
Installation in		X	X			X
LWL interface	X	X	X	X	X	X

Selection Table

Version	Network structure	Installation in	Order number
Fibre optics fieldbus isolating repeater Type 9186/12	Ring, point-to-point redundant, line	Zone 1	9186/12-11-11

Technical Data

Installation in	Zone 1
Certificates	BVS 06 ATEX E 145 X
Other certificates	USA (FM), Russia (CTB), Belarus (Gospromnadzor)
Explosion protection	E II 2G (1) GD Ex e mb ib [ia, op is] IIC T4 E II (1) D [Ex iaD]
Safety data (CENELEC)	
Fibre optic interface	conform to Ex op is acc. to EN 60079-28
max. radiated power P_o	(15 mW
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. connectable voltage U_i	± 4.2 V
Internal capacitance C_i and inductance L_i	negligible
Ex i fault monitoring contact	
Max. connectable voltage U_i	24 V
Max. connectable current I_i	600 mA
Internal capacitance C_i and inductance L_i	negligible
	Further information and combinations of values, see certification
Power supply	
Nominal voltage U_N	24 V DC
Voltage range	18 V ... 31.2 V
Residual ripple	< 3.6 Vss
Nominal current (at U_N)	67 mA
Power consumption	(2 W
Indication	green LED "PWR"
Polarity reversal protection	yes
Galvanic transmission	
	Test voltage under regulations EN 50020
between RS 485 and power supply	--
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 to RS-485 interface
Network topologies	ring structure, Line structure, point-to-point connection
Redundancy	automatic switchover triggered by line fault
Connection	ST®, BFOC/2.5 socket
Wave length	850 nm
Transmission line length	(2000 m
Recommended fibre optic cables	G 50 / 125 G 62.5 / 125
	Integrated diagnostic function with alarming and automatic switch-over to the protection path, improves the availability



Fibre Optics Fieldbus Isolating Repeater for Installation in Zone 1 Type 9186/12



Technical Data

Electrical interface

Protocols	Profibus DP, Modbus, HART, ServiceBus R.STAHL (IS1)
Version	RS 485 IS (PNO)
Connection	Sub-D socket X1, 9-pole
Transmission speed	1.2 kBit/s ... 1.5 Mbit/s
Settings	Set-up of fixed transmission speed or automatic detection (only with Profibus DP)
Bit refresh	Received bit is restored
Cable length	according to Profibus guideline, depends on transmission speed and cable
Transmission	2-wire, half duplex
Terminating resistor	to be set in external plug
Indication received Data	LED green "RD" ON
Indication transmitted data	LED yellow "TD" ON

Fault monitoring

Power supply failure	LF signalisation contact open
Input signal level good	LED green and yellow "FO Signal", LF signalisation contact closed
Input signal level reduced (- 1.5 dBm)	LED yellow "FO Signal", LF signalisation contact open
Break of fibre or Input signal level too low (- 3 dBm)	LED red "FO ERR", LF signalisation contact open
Max. load of the contact	see Ex i parameter

Electromagnetic compatibility

Tested under the following standards and regulations:
EN 61326-1 Use in industrial environment

Ambient conditions

Ambient temperature	- 20 ... + 65 °C
Storage temperature	- 40 ... + 85 °C
Relative humidity (no condensation)	(95 %

Connectors

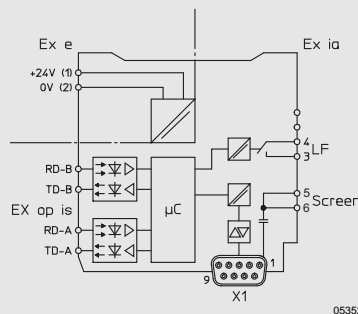
Powersupply	Spring clamp terminal, 0.2 ... 1.5 mm ² (Ex e)
Error contact	Screw terminal, 0.2 ... 2.5 mm ² blue (Ex i)
Shield connection to PA	Screw terminal, 0,2 ... 2,5 mm ² blue
Serial connection	Sub-D socket X1, 9-pole
Shielding	Via Sub-D socket
Fibre type	BFOC/2.5 for glas fibre 50/125, 62.5/125

Mechanical data

Weight	approx.200 g
Installation	on DIN rail, EN 50022 (NS35/15; NS35/7.5)
Protection	
Casing	IP30
Terminals Powersupply	IP20
Terminals	IP30
Enclosure material	PA 6.6
Fire protection class (UL-94)	V0

Connection diagram



9186/12-...-



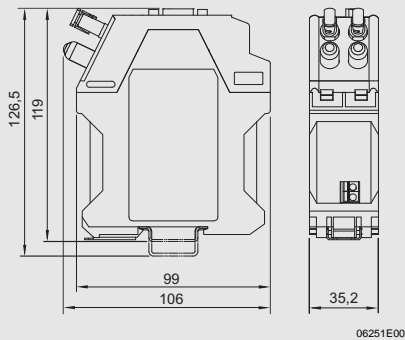
PIN	RS 485 IS
8	A -
3	B +
6	ISP (+)
5	ISGND



Accessories and Spare Parts

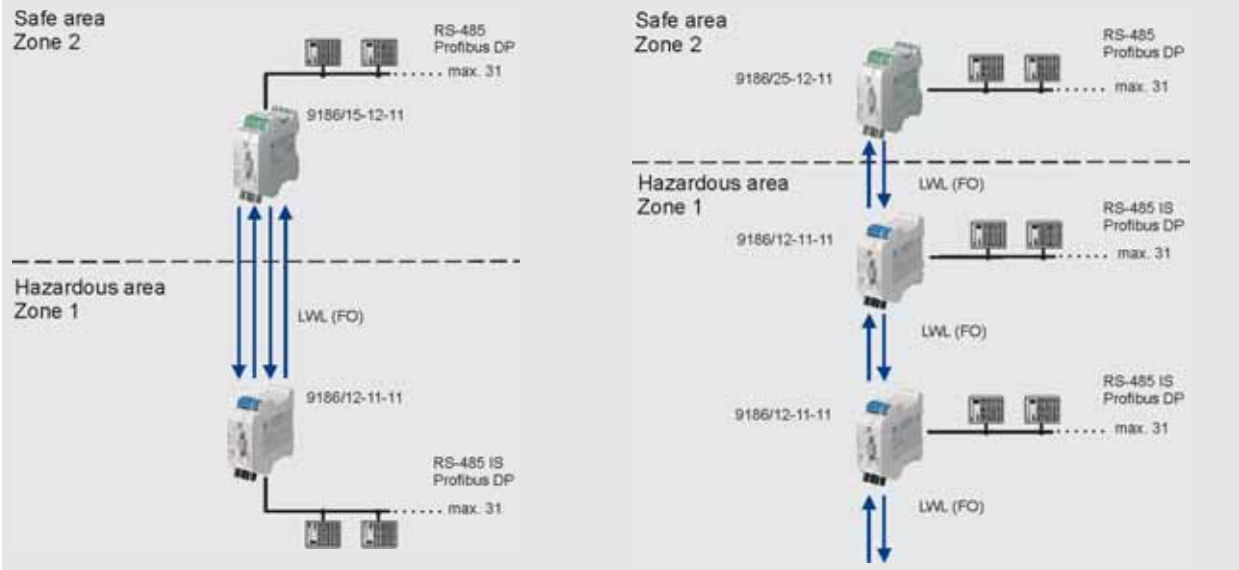
Designation	Illustration	Description	Order number	Weight kg
Sub-D plug	 09868E00	9-pin, for connection of fieldbus or ServiceBus to CPU & Power Module Type 9440/12 and fieldbus isolating repeater Type 9185. The termination resistance is built-in. Suitable for RS 485 IS (PNO standard).	162693	0.001
Sub-D plug, angled	 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	0.100

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

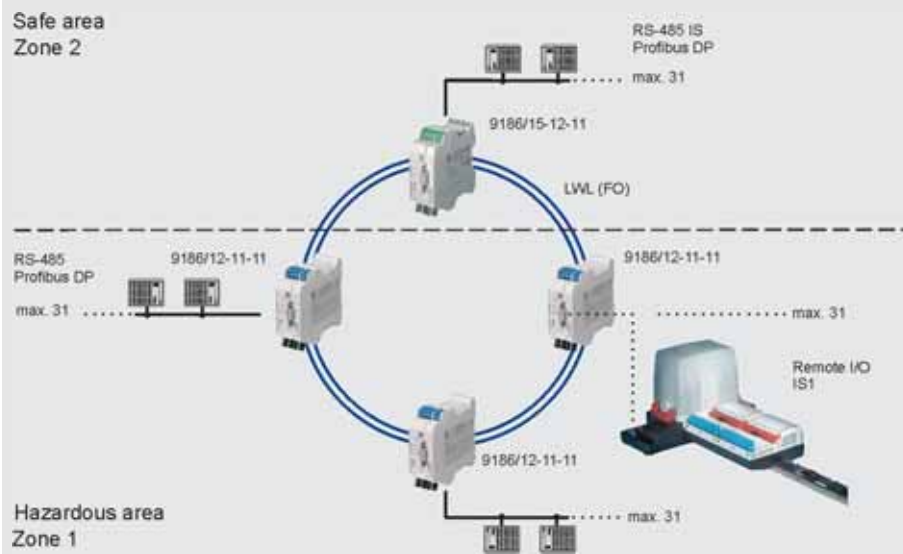


Fibre Optics Fieldbus Isolating Repeater for Installation in Zone 1 Type 9186/12

Network-topology



Point-to-Point structure



Ring structure

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

