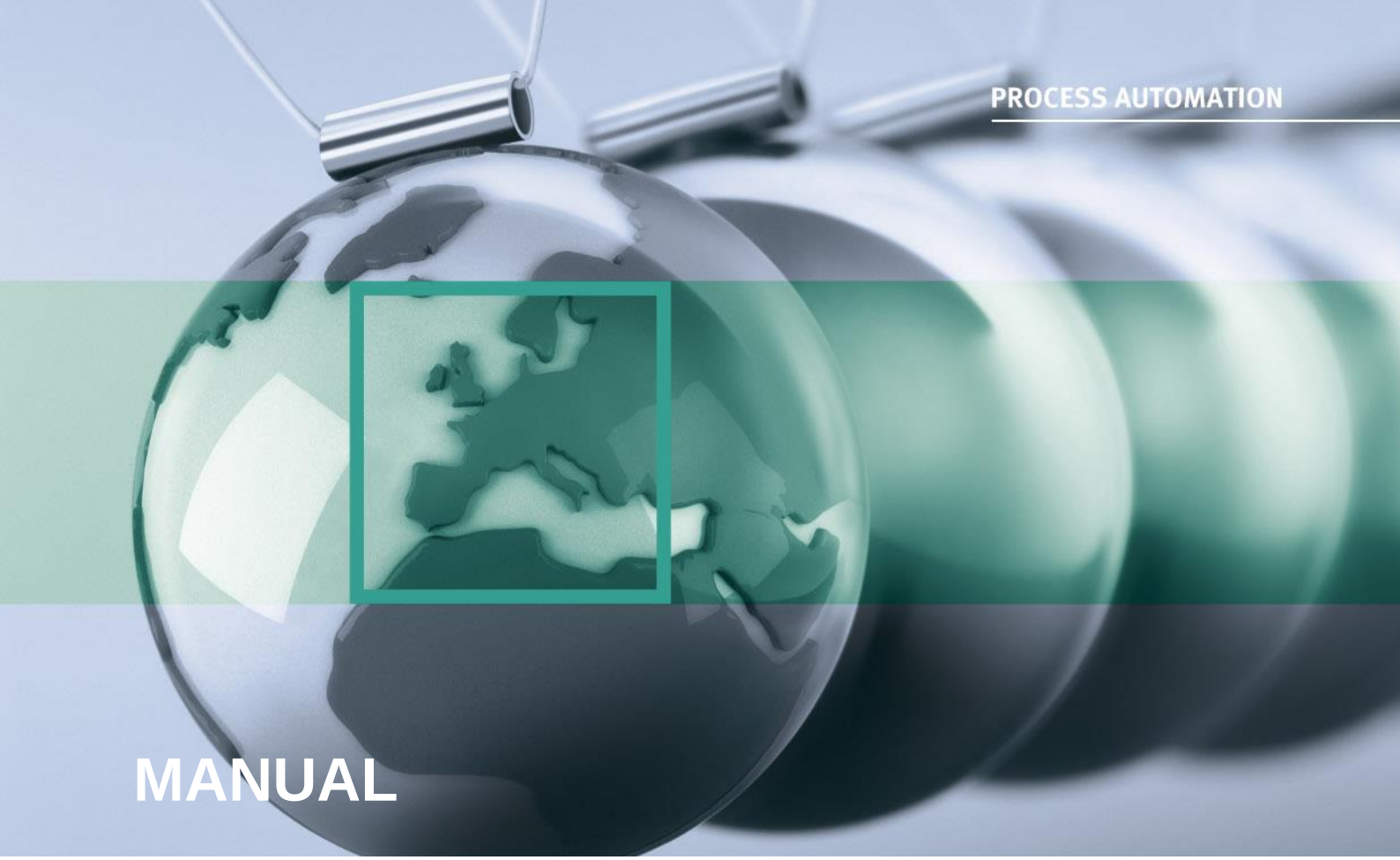


MANUAL

FB Remote I/O Field Unit
FB9???-???-?-?-?-?-?
FB9???-???-?-?-?-?-?-Y######

Your automation, our passion.

PEPPERL+FUCHS

TABLE OF CONTENTS

1 General Notes

Pepperl+Fuchs endeavours to ensure that all information contained herein is accurate. Pepperl+Fuchs also reserve the right to change information contained herein without prior announcement. Pepperl+Fuchs are not liable for damages, irrespective of their nature, incurred by the use or the non-use of the information.
This manual is property of Pepperl+Fuchs and may not be reproduced or distributed in whole or part without the prior written permission of Pepperl+Fuchs.
Pepperl+Fuchs' liability is limited to typical and foreseeable damages. The liability resulting from the German Product Liability Act is not affected by this.
Applicable law is the law of the Federal Republic of Germany. Place of jurisdiction is Mannheim.
The manual is only valid when used in conjunction with the corresponding instruction manual(s) and the equipment data sheet(s).

Symbols used
This document contains information that you must read for your own personal safety and to avoid property damage. The warning signs are displayed in descending order depending on the hazard category, as follows:

Danger!
This symbol indicates a warning about a possible danger. In case of ignoring the consequences may range from personal injury to death.

Warning!
This symbol indicates a warning about a possible fault or danger. In case of ignoring the consequences may cause personal injury or heaviest property damage.

2 Safety

Refer to instruction manual(s).

3 Intended Use

The Field Unit is equipped with minimum one backplane which contains plug-in slots for 10 (12) dual width I/O modules or 20 (24) single width I/O modules depending on the version of the FB backplane installed.
In addition it could be equipped with appropriated accessories like grounding bar(s), terminal blocks for field wiring, disconnect terminals, fuses, fibre optical links, etc.

3.1 Installation area

The Field Unit may be installed in

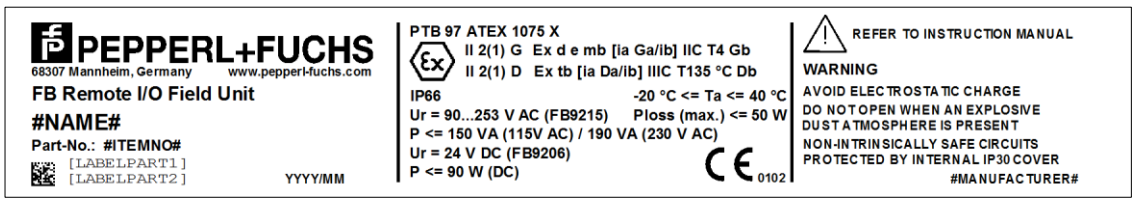
- hazardous area category 2G Zone 1
- hazardous area category 2D Zone 21

in accordance with ATEX Directive.

The permitted installation area depends on the configuration of the Field Unit and can be identified on the nameplate.

3.2 Marking

Each Field Unit is labelled as shown below:



Note: The nameplate shows a typical content.

Allocation variables:

#NAME#:	*Type code (e.g. FB9240-S70-0-0-0-0-1)*
#ITEMNO#:	*Part-No. (e.g. 296422)*
[LABELPART1]:	*Serial-No. digit 1-7 (e.g. 4 000 002)*
[LABELPART2]:	*Serial-No. digit 8-14 (e.g. 0 998 000)*
YYYY/MM:	*Date of production (e.g. 2017/10)*
#MANUFACTURER#:	*Country of production (e.g. Made in Germany)*

Electrical data:

Ur:	*Rated voltage*
Ir:	*Rated current*
Ploss (max): given	*maximum allowed power loss inside the enclosure based on the ambient temperature*

The Ex-marking, the warnings and the electrical data depend on the configuration of the Field Unit.
For the Ex-relevant parameters please refer to the datasheets of the assemblies.

The ratings shown are the maximum values for explosion protection and must not be exceeded for safe operation. Also refer to the technical data in the corresponding datasheets.

4 Mounting and Installation

Refer also to 3rd. party instruction manual(s) supplied with the Field Unit.

4.1 Mounting

Mounting should only be performed by suitably qualified personnel.
The Glass Fibre Reinforced Polyester (GRP) enclosure can be mounted via the through-holes that are exposed when the lid is removed.
The metal enclosure can be mounted via the external mounting brackets that are attached to the enclosure.

The following steps need to be considered during the mounting process:

1. Remove any temporary protection or packing materials.
2. Expanding anchors should be used when mounting on concrete, or suitably sized bolts, nuts and anti-vibration washers when mounting to a steel framework.
3. When the boxes are mounted directly onto the wall, they shall rest evenly only on the fastening points provided for this purpose, and they shall be fixed in such a way that they cannot twist or turn.
4. The screw used shall match the fixing hole and must not damage the opening (e.g. use of a washer).
5. The Field Unit shall be fixed with a minimum of four screws at the edges (for GRP enclosures) or at all mounting brackets (for metal enclosures).
6. Use the enclosure as a template when marking fixing points, alternatively, the dimensions of the fixing centres are moulded into the rear face of the GRP enclosure or the dimensions of the fixing centres are provided in the drawing.
7. During mounting the accepted technical rules and installation regulations must be considered.

Excessive tightening of fixing screws can result in damage to the Field Unit.

The improper installation and operation of the enclosures can result in invalidating the guarantee.

4.2 Installation

4.2.1 Cable Entries

The Field Unit can be supplied either with cable glands, stopping plugs or clearance holes or a mixture of them.

If cable glands are already assembled it has to be ensured that:

1. the tightening torque for the cap is applied according the instruction manual of the cable glands
2. unused cable glands must be fitted either with sealing plugs (if supplied) or must be replaced with stopping plugs

If cable glands or stopping plugs will be assembled on site it has to be ensured that:

1. the devices used are suitably certified for the hazardous area of application
2. the devices used do not reduce the IP rating given on the nameplate
3. the devices used do not reduce the ambient temperature range given on the nameplate
4. the cable glands are correctly dimensioned for the cable diameters
5. the devices are installed according the installation instruction of the manufacturer
6. the tightening torques are applied according the installation instruction of the manufacturer
7. unused cable entries must be fitted either with cable glands and sealing plugs or with stopping plugs

4.2.2 Cables

The requisite cable parameters should be taken from the installation instructions of the particular fieldbus system.
The cables enter the enclosure via cable glands fitted usually at the bottom of the enclosure.
It has to be ensured that:

1. the cable diameter fits into the range of the used cable gland
2. the cabling is not strained and adequate strain relief is provided
3. creepage and clearance distances have been maintained

4.2.3 Connections

For connection details see wiring schematic of the Field Unit.
For wiring details of the terminals and equipment provided see dedicated instruction manuals.

It has to be ensured that:

1. only one wire per terminal clamp has been installed
2. unused conductors are terminated correctly or securely tied down and insulated and not left floating within the enclosure
3. clearance and creepage distances have been maintained
4. all unused terminal screws are tightened down

Tightening torque: If screw terminals are used the torque values given in the instruction manuals need to be applied.
Ensure that connectors are mechanically locked where possible.

If stranded cables cores are used in an explosion hazardous area, the un-insulated strands must be protected from spreading e.g. by fitting bootlace ferrules.

The diameter of individual conductors in explosion hazardous areas must be greater than 0.1mm. This also applies to the wires in stranded conductors.

4.3 Grounding and shielding

4.3.1 Grounding the enclosure

The Field Unit is provided with an internal/external earth stud for a plant safety earth. A bonding conductor with a minimum cross-sectional area of 4 mm^2 must be connected to the earth stud. Depending on the size of the earth stud the following torque values need to be applied:

Size	Conductor cross section	Torque
M6	up to 25 mm^2	3 Nm
M10	up to 70 mm^2	10 – 20 Nm

4.3.2 Grounding/Shielding

The Field Unit provides minimum one screen bar with shield terminals which is by default connected to local earth (either via PE of mains supply or PA of enclosure).
Several screen bars are interconnected together.

For more details see documentation of the supplied Field Unit.

5 Operation

Once wiring has been completed and before closing the lid, a visual inspection must be performed to ensure that there are no visible signs of damage on the lid gasket. In the event of damage, the gasket must be suitably repaired or replaced.
Ensure that the lid is correctly located and properly locked down using either the screws or the quarter-turn locks provided.

Lid screws should be tightened with a torque of 2,5 Nm.
Over tightening can impair the degree of protection.

5.1 Opening of the Enclosure

The enclosure can be opened while energized only if no warning “DO NOT OPEN WHILE ENERGIZED” is attached to the enclosure (e.g. on the nameplate) or when no explosive atmosphere is present.

5.2 Disconnection

Only intrinsically safe circuits may be connected or disconnected while the circuit is live even if combustible gases are present.

Explosion hazard – Do not connect or disconnect non-intrinsically safe circuits unless the power has been switched off or the area is known to be non-hazardous.

6 Fault elimination

Field Units and the electrical and electronic devices which are used in explosion hazardous area applications must not be altered in any way.
In the event of a fault, the Field Unit or the device(s) must be replaced. Defective enclosure parts must be replaced with original parts only. Fault elimination work may only be performed by suitably qualified and authorised personnel.

7 Disposal

The packaging materials and the Field Unit must be disposed of in accordance with the regulations pertaining to the country in which they are installed.
No batteries which need to be separately disposed of are contained within the Field Unit.

8 Maintenance

The equipment supplied is essentially maintenance free, however the following maintenance procedure or checks should be undertaken in order to ensure the safe operation of the equipment:

No.	Activity	Frequency
1	Check that the lid seal is not damaged and is in place	Each time the enclosure is opened
2	Check that all lid screws are in place and secured	Each time the enclosure is opened
3	Check that the mounting bolts are tight and corrosion free	Annually
4	Check the security of all cable glands	Annually
5	Check the enclosure for damage	Annually
6	Check that all screw terminals are secured	Annually
7	Check that all leads are not damaged and secured	Annually
8	Check that the condensation drain is clean and functioning	Each time the enclosure is opened
9	Check that the IP 30 cover of non-intrinsically safe circuits is in place	Each time the enclosure is opened

To avoid electrostatic charging, the enclosure or installed equipment should only be wiped or cleaned using a damp cloth.

9 Technical data

	F92*-S*	F92*-P*	Others
Manufacturer	Pepperl+Fuchs GmbH Lilienthalstraße 200 68307 Mannheim Germany		
Mechanical specifications			
Enclosure cover	detachable hinged door with quarter-turn locks	detachable cover with captive retaining screws	see documentation
Degree of protection	see nameplate	see nameplate	see nameplate
Material			
Housing	stainless steel 1.4404 / AISI 316L	polyester, impact resistant, glass fiber reinforced	see documentation
Surface	electropolished	black molded finish	see documentation
Seal	lid: polyurethane (PUR), one piece gland plate: polymer (CR)	silicone, one piece	see documentation
Material thickness	body: 1.2 mm cover: 1.5 mm gland plate: 3.0 mm	body: 4.0 mm cover: 4.0 mm grounding plate: 3.0 mm	see documentation
Dimensions	see type code or documentation	see type code or documentation	see documentation
Mounting	thru-holes Ø11 mm	thru-holes Ø6.5 mm	see documentation
Grounding	grounding bolt M10, brass	-	see documentation
General specifications			
Installed components	see type code and documentation For technical data on installed electronic component see data sheet.		
Data for application in connection with Ex-areas			
EU-Type Examination Certificate	PTB 97 ATEX 1075 X	PTB 97 ATEX 1075 X	PTB 97 ATEX 1075 X
Group, category, type of protection	see nameplate	see nameplate	see nameplate
Directive conformity	see EU-Declaration of conformity	see EU-Declaration of conformity	see EU-Declaration of conformity

10 Type code

Family		Installation area		Slots			Enclosure options			Cable entries		Wiring field signals		Power supply		TAG-plate		Fieldbus		Customized							Description						STD	ENG
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	**Pos. Type code**						x	x
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?														x	
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?	-	Y	#	#	#	#	#	#								x
Family																																		x	x
F	B																											FB Remote I/O Field Unit						x	x
		Installation area																																x	x
		9	2																									Zone 1 / 21						x	x
		9	3																									Zone 1						x	x
				Slots																														x	x
				0	2	-																						PWR-Backplane f. max 2PSUs							x
				1	0	-																						10 slots						x	x
				1	0	-																						5 slots (f. double width I/O-modules)							x
				1	1	-																						10 slots redundant						x	x
				2	0	-																						20 slots						x	x
				2	1	-																						20 slots redundant						x	x
				2	4	-																						24 slots						x	x
				2	5	-																						24 slots redundant						x	x
				4	0	-																						40 slots						x	x
				4	1	-																						40 slots redundant						x	x
				4	8	-																						48 slots						x	x
				4	9	-																						48 slots redundant						x	x
				n	n	-																						n slots							x
				x	x	-																						>99 slots (additional information on the name plate)							x
				B	U	-																						Only Base Unit (Extension / Replacement)						x	x
				E	U	-																						Only Extension Unit (Extension / Replacement)						x	x
				R	U	-																						Only Redundant Unit (Extension / Replacement)						x	x
				M	U	-																						Multifunctional Unit (red. Base Unit or red. Extension Unit)						x	x
							Enclosure options																													x	x
							Metal enclosures																													x	x
							Enclosure material																													x	x
							S																					Stainless steel 3.16 - electro chemical polished						x	x
							E																					Stainless steel 3.04 - electro chemical polished							x
							L																					Sheet steel, powder coated, RAL 7035							x
							T																					Stainless steel 3.16 - brushed							x
							R																					Stainless steel 3.04 - brushed							x

Family		Installation area		Slots			Enclosure options			Cable entries		Wiring field signals		Power supply		TAG-plate		Fieldbus		Customized							Description						STD	ENG
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Pos. Type code						x	x
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?													x	
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?	-	Y	#	#	#	#	#	#							x
Enclosure size																												**(WxHxD)**						**x**	**x**
																												Base unit	**Extension unit (optional)**	**Redundant unit (optional)**				x	x
							A																					700x350x220mm							x
							5																					600x400x220mm						x	x
							6																					600x600x220mm						x	x
							7																					800x800x300mm						x	x
							8																					800x1000x300mm						x	x
							9																					350x306x215mm							x
							X																					Customized							x
Cable entry options																																		**x**	**x**
																												Gland plate			**M12**	**M16**	**M20**	**others/ mixed**	**without holes**	**x**	**x**
								0	-																			x				X				x	x
								1	-																			x			X					x	x
								2	-																			x					X			x	x
								3	-																							X					x
								4	-																						X						x
								5	-																								X				x
								W	-																			x						X		x
								X	-																			x						X		x
								Y	-																									X			x
								Z	-																										X		x
GRP enclosures																																		**x**	**x**
Enclosure material																																		x	x
							P																					Polyester glass-fiber reinforced						x	x
Enclosure size																												**(WxHxD)**						**x**	**x**
																												Base unit	**Extension unit (optional)**	**Redundant unit (optional)**				x	x
							M																							271 x 271 x 210 mm						x
							B																					544 x 271 x 210 mm	544 x 271 x 210 mm	271 x 271 x 210 mm				x	x
							F																					600 x 480 x 241 mm	600 x 480 x 241 mm					x	x
							G																					544 x 407 x 210 mm	544 x 407 x 210 mm	271 x 407 x 210 mm				x	x
							H																					544 x 544 x 210 mm	544 x 544 x 210 mm	271 x 544 x 210 mm				x	x
							T																					815 x 544 x 210 mm							x

Family		Installation area		Slots			Enclosure options				Cable entries		Wiring field signals		Power supply		TAG-plate		Fieldbus		Customized							Description						STD	ENG
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Pos. Type code						x	x
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?														x	
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?	-	Y	#	#	#	#	#	#							x
Enclosure size																												(WxHxD)						x	x
																												Base unit	**Extension unit (optional)**	**Redundant unit (optional)**				x	x
							U																					815 x 544 x 210 mm	544 x 544 x 210 mm						x
							V																					815 x 544 x 210 mm	815 x 544 x 210 mm						x
							W																					1086 x 544 x 210 mm							x
							Y																					1086 x 544 x 210 mm	544 x 544 x 210 mm						x
							Z																					1086 x 544 x 210 mm	815 x 544 x 210 mm						x
							8																					800 x 1000 x 300 mm							x
							X																					Customized	Customized	Customized					x
Cable entry - options																																		x	x
																												Gland plate			**M12**	**M16**		**others/ mixed**	**without holes**	x	x
								0	-																							X				x	x
								1	-																						X					x	x
								W	-																			X							X		x
								X	-																			X						X			x
								Y	-																							X					x
								Z	-																										X		x
Others																																		x	x
							Z	Z	Z	-																		Only mounting plate									x
Cable entry material																																		x	x
											0	-																Plastic								x	x
											B	-																Brass nickel plated									x
											A	-																Brass nickel plated f. armoured cables									x
											S	-																Stainless steel									x
											Q	-																Stainless steel f.armoured cables									x
											D	-																No cable glands									x
											X	-																Mixed									x
Wiring field signals																																		x	x
													0	-														No wiring								x	x
													1	-														Ex-i screw terminals								x	x
													2	-														Ex-i spring cage terminals									x
													3	-														Ex-e (Non-Ex) screw terminals									x

Family		Installation area		Slots			Enclosure options				Cable entries		Wiring field signals		Power supply		TAG-plate		Fieldbus		Customized							Description						STD	ENG
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	**Pos. Type code**						x	x
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?														x	
F	B	9	?	?	?	-	?	?	?	-	?	-	?	-	?	-	?	-	?	-	Y	#	#	#	#	#	#								x
Wiring field signals																																		x	x
													4	-														Ex-e (Non-Ex) spring cage terminals							x
													5	-														Ex-i / Ex-e (Non-Ex) screw terminals							x
													6	-														Ex-i / Ex-e (Non-Ex) spring cage terminals							x
													7	-														Terminals supplied without wiring							x
Power supply																																		x	x
															0	-												Power supply variable						x	x
															1	-												Power supply 24V DC							x
															2	-												Power supply 110V AC							x
															3	-												Power supply 230V AC							x
															4	-												Power supply 24V DC + 230V AC							x
															6	-												Power supply 110V AC / 230V AC							x
Tag plate																																		x	x
																	0	-										without						x	x
																	1	-										TAG plate plastic							x
																	2	-										TAG plate stainless steel							x
																	3	-										Printed TAG plate							x
																	A	-										Plastic (120x30mm)							x
																	B	-										Stainless steel (120x30mm)							x
																	C	-										Plastic (95x20mm)							x
																	D	-										Stainless steel (95x20mm)							x
Fieldbus																																		x	x
																			0									Profibus DP Vx / Modbus RTU						x	x
																			1									Profibus DP Vx / Modbus RTU / Modbus TCP/IP						x	x
																			F									Foundation Fieldbus H1						x	x
Customized																																			x
																				-	Y	#	#	#	#	#	#	Customized (####### => P+F Part-No.)							x

Your automation, our passion.

Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- AS-Interface
- Identification Systems
- Logic Control Units

PEPPERL+FUCHS

www.pepperl-fuchs.com
Subject to modifications · © Pepperl+Fuchs
Printed in Germany