



**SAFETY
SENSORS
AND SYSTEMS**



Automated processes require increased operator protection and accident prevention.

Pepperl+Fuchs offers a wide range of no-contact safety equipment to limit the typical risks that are associated with machines and industrial equipment. The SafeBox modular control unit and AS-Interface Safety at Work network complete our program.

Our products provide effective solutions for functional safety in different markets, such as Material Handling, Print and Paper Industry and Machine and Plant Engineering.

Pepperl+Fuchs provides Safety for your application.

Any questions?

Our service team is available to answer your questions:

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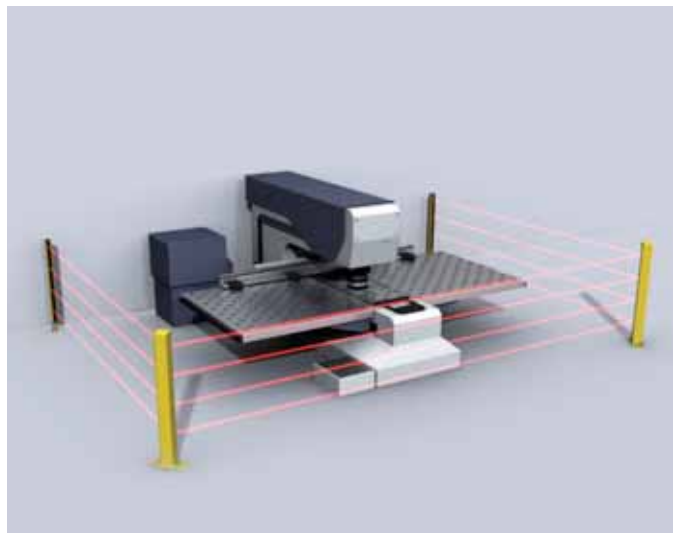
ACCESS CONTROL WITH BEAM-PROTECTED MUTING AND DOUBLE MUTING

Depending on the application, safety light grids with two, three or four safety beams are installed to control access. Double muting allows the transport of goods into and out of the danger area.



PROTECTION AGAINST HAND AND FINGER INTRUSION

For hand and finger protection Pepperl+Fuchs offers the SLCS and SCLT series safety light curtains. Due to their compact design these light curtains can be easily integrated into your machines.



PERIMETER GUARDING WITH REDIRECTION MIRRORS

For perimeter access control from all sides Pepperl+Fuchs' safety light grids with long sensing range are used in combination with redirection mirrors.

PROTECTION OF PALLET AND POSITIONING RACKS WITH SINGLE AND MULTI BEAM SAFETY SENSORS

Single beam sensors from Pepperl+Fuchs solve diverse tasks in complex environments. They can be used to detect personnel in aisles or around automated pallet storage and retrieval systems.



EMERGENCY STOP

Emergency stops deactivate machines safely and quickly. Pepperl+Fuchs offers emergency stop buttons for AS-Interface, which are connected directly or via safe input modules. This reduces the time and effort needed for assembly and installation.

SAFETY LIGHT CURTAINS

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SAFETY LIGHT GRIDS

6



SAFETY SENSORS

7



SAFETY CONTROL UNIT

8

SafeBox

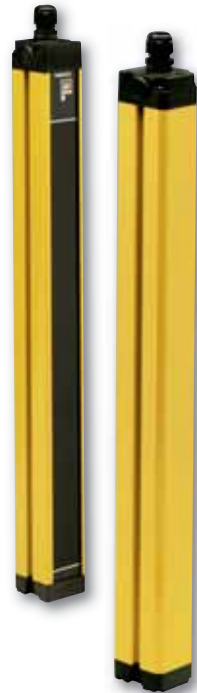


AS-INTERFACE SAFETY AT WORK

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SAFETY LIGHT CURTAINS



Type 4 (IEC 61496)

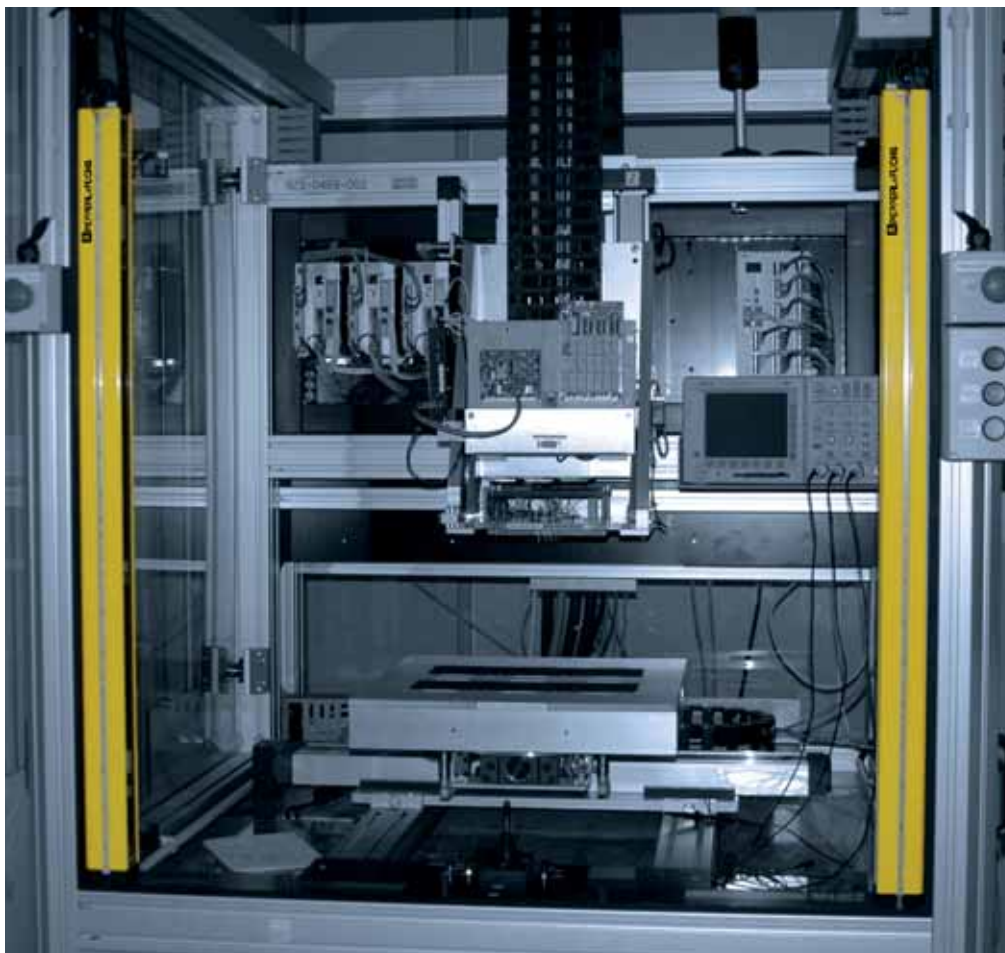
SERIES SLC – HIGHLIGHTS

- Rugged housing
- Cascadable
- ATEX-approval for Zone 2 and 22 optional

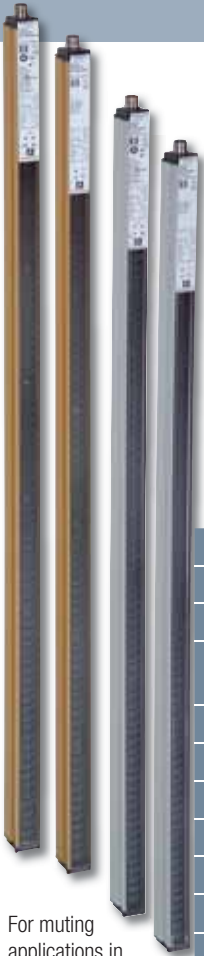
	SLC14	SLC30	SLC60	SLC90
Resolution	14 mm	30 mm	60 mm	90 mm
Angle of divergence	< 5°			
Detection range	0.2 m ... 5 m	0.2 m ... 15 m	0.2 m ... 15 m	
Height of protected area (in 150 mm increments)	150 mm ... 1800 mm			
Outputs	Depending on type: 2 independent fail safe semiconductor outputs or relays			
Response time	max. 30 ms (semiconductor outputs)			
Start/restart interlock	Selectable			
Operating voltage	24 V DC			
Housing	Aluminum extrusion profile, coated			
Optical face	Plastic			
Protection degree	IP67			
Ambient temperature	0 °C ... +55 °C			
Connection	Terminal compartment or M12-connector (4-/8-pin)			

For muting applications in combination with

SafeBox



SAFETY LIGHT CURTAINS



Type 2 (IEC 61496)

Type 4 (IEC 61496)

For muting applications in combination with

SafeBox

SERIES SLCS AND SLCT – HIGHLIGHTS

SLCT

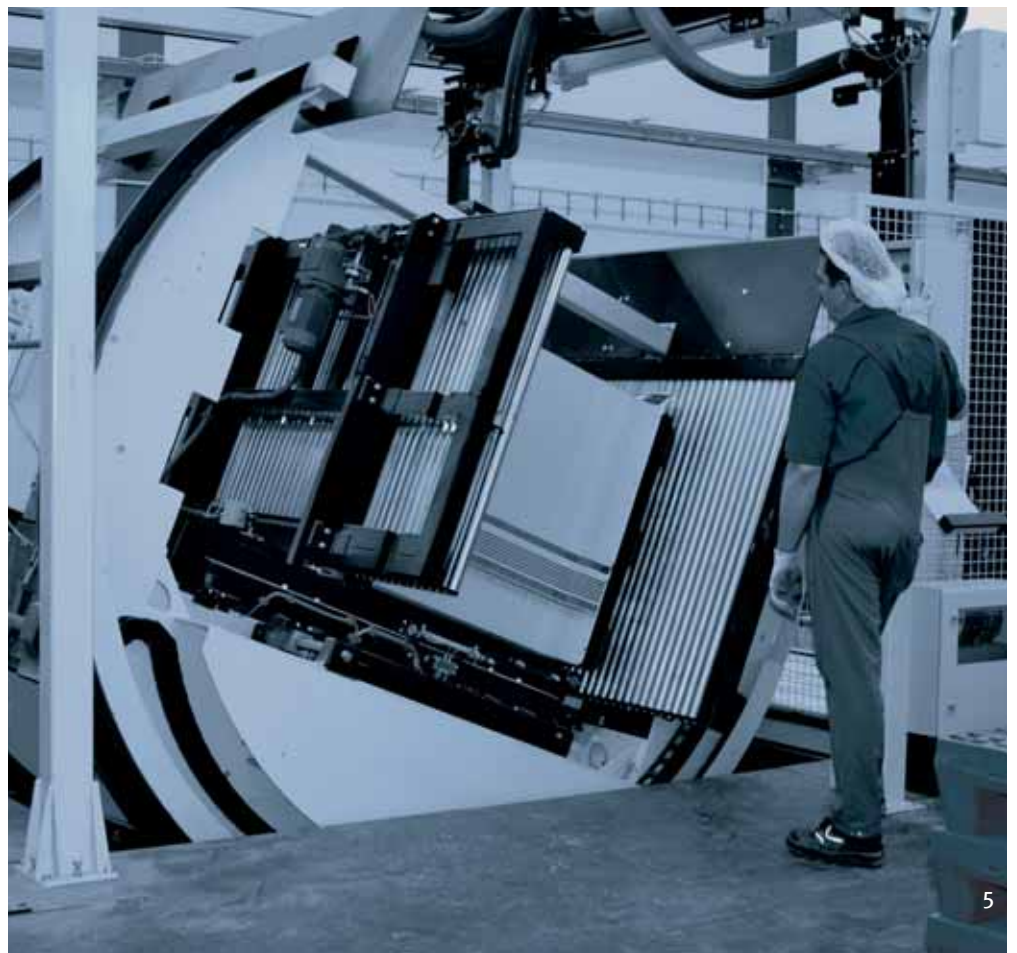
- Type 2 (IEC 61496)
- SIL2 (IEC 61508)

SLCS

- Type 4 (IEC 61496)
- SIL3 (IEC 61508)

- Fully self-contained “2-box” systems; no separate control box needed
- Ultra slim design
- Top-to-Top mounting with no dead zone in models with 30, 60 or 90 mm resolution
- Flexible 3-sided mounting
- Mounting, installation, and removal are a snap with unique mounting bracket

	SLCT14 SLCS14	SLCT30 SLCS30	SLCT60 SLCS60	SLCT90 SLCS90
Resolution	14 mm	30 mm	60 mm	90 mm
Angle of divergence	< 5°			
Detection range	0.2 m ... 8 m (SLCT); 0.4 m ... 8 m (SLCS)			
Height of protected area (100 mm increments)	100 mm ... 1200 mm	100 mm ... 2400 mm	300 mm ... 2400 mm	
Outputs	2 independent fail safe semiconductor PNP outputs			
Response time	≤ 54 ms	≤ 38 ms	≤ 23 ms	≤ 17 ms
Start/restart interlock	Selectable			
Operating voltage	24 V DC			
Housing	Aluminum extrusion profile, anodized			
Optical face	Clear polycarbonate			
Protection degree	IP65			
Ambient temperature	-30 °C ... +60 °C			
Connection	M12-connector, 4-/8-pin			



SERIES SLPC AND SLPCM – HIGHLIGHTS



Type 4 (IEC 61496)

- Detection range up to 65 m
- Rugged housing

SERIES SLPCM

- Parallel or sequential muting with time or safety beam limiting function
- Integral muting override function
- M12-connection on front side
- Connection for indication light



SERIES SLPC



SERIES SLPCM

	SLPC8 SLPCM8	SLPC10 SLPCM10	SLPC30 SLPCM30	SLPC65 SLPCM65
Design	Transceiver*		Emitter and receiver	
Number of beams	2		2, 3 or 4	
Beam spacing: 2/3/4-radial	500 mm		500 mm/400 mm/300 mm	
Angle of divergence	< 5°			
Detection range	0.2 m ... 8 m	0.2 m ... 10 m	6 m ... 30 m	12 m ... 65 m
Outputs	2 independent fail safe outputs, force guided NO/pnp-semiconductor			
Response time: Semiconductor output/relay output (max)	20 ms/40 ms			
Protection degree	IP65			
Start/restart interlock	Selectable			
Relay monitor	Selectable			
Operating voltage	24 V DC			
Housing	Aluminum extrusion profile, coated			
Optical face	Plastic			
Ambient temperature	0 °C ... +50 °C			
Connection	Terminal compartment for cage clamp terminals, with M16 cable gland			

* in combination with redirection mirror SLP8-2-M

In combination with
SafeBox



Type 4 (IEC 61496)

SERIES SLP – HIGHLIGHTS

- Detection range up to 65 m
- Red transmission light
- Rugged housing



SERIES SLP

	SLP8	SLP10	SLP30	SLP65
Design	Transceiver*		Emitter and receiver	
Number of beams	2		2, 3 or 4	
Beam spacing: 2/3/4-radial	500 mm		500 mm/400 mm/300 mm	
Angle of divergence	< 5°			
Detection range	0.2 m ... 8 m	0.2 m ... 10 m	6 m ... 30 m	12 m ... 65 m
Outputs	SafeBox			
Response time	30 ms ... 78 ms (SafeBox)			
Protection degree	IP65			
Operation voltage	Power supply via SafeBox			
Housing	Aluminum extrusion profile, coated			
Optical face	Plastic			
Ambient temperature	-20 °C ... +60 °C			
Connection	Terminal compartment for cage clamp terminals, with M16 cable gland			

* in combination with redirection mirror SLP8-2-M



Type 4 (IEC 61496)

SERIES SLA – HIGHLIGHTS

- Detection range up to 65 m
- Red transmission light
- Rugged housing

In combination with

SafeBox



	SLA12	SLA29	SLA20	SLA40
Design	2-wire		3-wire	
Number of beams	1			
Angle of divergence	< 5°			
Detection range	0.2 m ... 10 m	0.2 m ... 30 m	0.2 m ... 10 m	0.2 m ... 4 m
Heightened detection range	–	6 m ... 65 m	–	–
Outputs	SafeBox			
Response time	30 ms (SafeBox)			
Protection degree	IP67	IP67	IP65	IP65
Operating voltage	Power supply via SafeBox			
Housing	Die-cast zinc, nickel plated	ABS	Terluran	Die-cast aluminum
Optical face	Plastic			
Ambient temperature	–20 °C ... +60 °C			
M12-plug connection	5-pin	4- or 5-pin	4-pin	4-pin
Cable connection	5-wire	–	–	5-wire

*Extended temperature range up to –20 °C with heated front panel (SLA29/106/116)



SafeBox



System Power Supply and Relay Outputs

OR

Inputs	1 system reset button 1 system restart button 1 relay monitor two-wire
Connectable safety sensors	
Outputs	2 independent safe relay outputs 3 indicator lamps 1 RS422 (visualisation)
- Voltage	10 ... 250 V AC/DC
- Current	10 mA ... 6 A AC/DC
- Max. switching capacity	24 VA DC/230 VA AC
Response time	30 ms ... 78 ms
Selectable functions	Restart interlock (RI) Relay monitor
Supply voltage	24 V DC
Connection	Removable screw type/cage tension spring terminals
Housing	Polyamide (PA) 6.6, UL94, V0, black

SAFEBOX – HIGHLIGHTS

Self monitoring Type 4 (IEC 61496)

SIL₃ (IEC 61508)

Control unit for use with safety sensors

- Safety sensors series SLA
- Safety light grids series SLP
- Safety light curtains series SLC or SLCS
- Dry-contact safety sensors, emergency stop buttons, door contacts, relay contacts, ...
- Sensors or devices with pnp-semiconductor outputs
- Muting sensors

Modular, configurable safety system

- No programming required - system configuration is accomplished by physical placement and dip switches on modules
- Up to 8 modules with up to 32 inputs can be installed (up to 6 safety components per module)
- Dip switches at the modules, single or independent multiple zone safeguarding
- No software knowledge required

Support of following functions

- Emergency stop
- Emergency stop per request
- Muting*, including indication with controllable indicator lamps
- Muting override
- Start/restart interlock
- Relay monitor
- STOP o or Stop 1 (EN 60204)
- Multiple zones safeguarding, including central stop for all zones

* parallel or sequential muting with time or safety beam limiting function

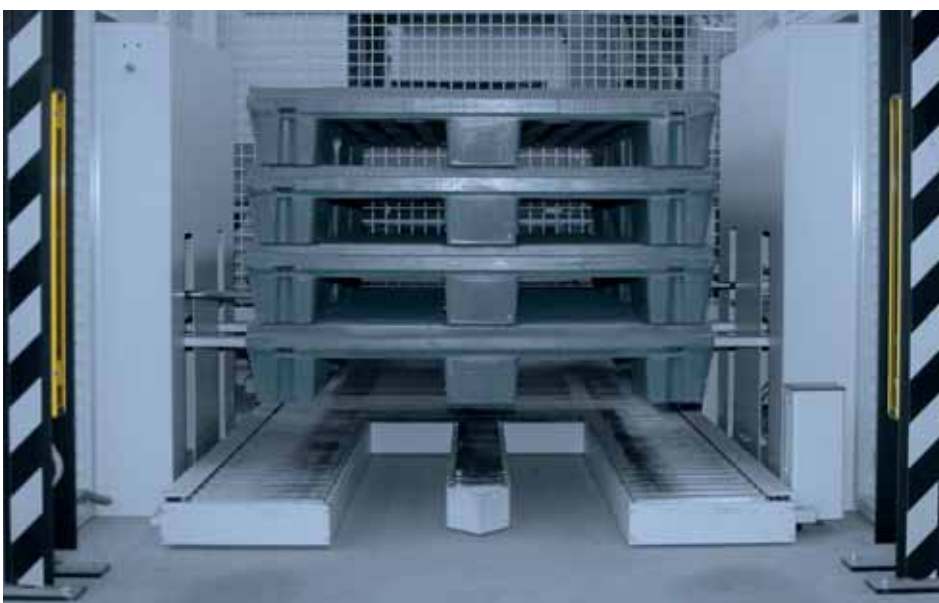
Monitoring via RS422 interface



Input modules with micro controller		Input modules		Muting module	Emergency stop module
4CP 4CG	4XP 4XG	4C 6C	4X	4M	2E
Max. 4 channels	Max. 4 channels	Max. 4/6 channels	Max. 4 channels	Max. 4 channels for muting sensors 1 override button	1 emergency stop button, 2-channel 1 restart button 1 relay monitor, 2-channel
For devices with: ■ NC-contacts ■ NO-contacts	For devices with: ■ Pnp-semiconductor outputs ■ NC-contacts ■ NO-contacts	For devices with: ■ NC-contacts ■ NO-contacts	For devices with: ■ Pnp-semiconductor outputs ■ NC-contacts ■ NO-contacts		
■ SLA12 or SLA29	■ SLA20 or SLA40 ■ SLP ■ SLC ■ SLCS	■ SLA12 or SLA29	■ SLA20 or SLA40 ■ SLP ■ SLC ■ SLCS		
				2 independent, controllable indication lamps	2 independent safe relay outputs
					10 ... 250 V AC/ DC
					10 mA ... 6 A AC/DC
					24 VA DC/230 VA AC
					30 ms ... 78 ms
				Sequential muting, parallel muting, single/double muting, time or safety beam limiting function	Stop 0 Stop 1 Restart interlock (RI) Relay monitor
Pairwise allocation of switching contacts as NO or NC Antivalent allocation of contact pairs Synchronic allocation of contact pairs					
Internally via backplane				24 V DC	

Removable screw type/cage tension spring terminals

Polyamide (PA) 6.6, UL94, V0, black



AS-Interface Safety at Work is a system that enables networking of safety devices (safety door switches, e-stop buttons, safety light curtains, etc.) using a standard AS-Interface network.

A significant advantage is the yellow flat cable as it provides both power and communication for all connected devices. It utilizes a redundant piercing technology where contacts penetrate the insulation to secure an electrical connection – no cutting, stripping, or labeling.



With AS-Interface Safety at Work logic combinations AND/OR dependencies of input signal and timer-functions can be easily configured via drag-and-drop using a windows-based configuration software. All safe inputs are connected using safe input modules. Drives, motors, or turbines are energized with safe output modules.

AS-Interface Safety at Work devices send a dynamic code sequence that is constantly monitored. Parallel wiring is avoided. All diagnostic messages can be accessed in plain text at the monitor or can be transferred to the PLC or at the process control level. This system is economical and very flexible if modifications become necessary.



HIGHLIGHTS

- Applicable up to Safety Category 4 or SIL3
- Safe and non-safe data as well as power supply on one flat cable
- No safety PLC required
- Automatic single node replacement
- The logic connection of the safety system can be easily and clearly configured
- Extensive diagnostics via AS-Interface network

SAFETY MONITOR – HIGHLIGHTS

- Up to 16 safe output circuits
- One monitor can safely monitor 2 AS-Interface networks
- Safe coupling of up to 31 AS-interface networks
- Plain text diagnostics with graphical display and at PLC
- Safety configuration on memory card enables fast device exchange
- Logic and timer functions
- Stop category 0 and 1

Safety Monitor for safety-oriented monitoring

VAS-2A-K31

VAS-4A16L-K31



AS-Interface PROFIBUS gateway and integrated Safety Monitor combined in one device

VBG-PB-K30-D-S

VBG-PB-K30-D-S16

VBG-PB-K30-DMD-S16

AS-INTERFACE SAFETY AT WORK MODULES – HIGHLIGHTS

- Quick release fastener
- Stainless steel base
- M12-half turn SPEEDCON connections
- Diagnostic-LEDs
- Integrated I/O logic function



Flat module

Number of inputs	2 safe inputs for dry contacts
Number of outputs	2 standard outputs
Protection degree	IP67
Connection for AS-Interface and AUX	flat cable
I/O connection	M12-connector
Order code	VAA-2E2A-G12-SAJ/EA2L



- Connection of light grids and light curtains
- Power supply of inputs from the module



Field module

2 safe semiconductor inputs

–

IP67

Flat or round cable

Cage clamp terminals

VAA-2E-G4-SE

- Only 50 mm installation height



Cabinet module

2 safe inputs for dry contacts

2 standard outputs

IP20

Removable, color-coded terminals

Removable screw terminals

VAA-2E2A-KE1-S/E2
VAA-2E-KE1-S

- A/B-addressing of input modules
- Safe relay output does not require an additional AS-Interface address



Input module with safe output

4 standard inputs

1 safe relay output

IP20

Removable, color-coded terminals

Removable screw terminals

VBA-4E1A-KE2-ZAJ/SR

- Release by pushing or turning
- Mechanically loaded contacts for increased functional safety

PM

F85



Emergency stop

2-channel force guided

1 LED red (standard version with illumination)

IP20/IP65

M12-plug connection

–

VAA-2E-PM-S
VAA-2E1A-PM-S with illumination
VAA-2E-F85A-S-V1
VAA-2E1A-F85A-S-V1 with illumination

FACTORY AUTOMATION – SENSING YOUR NEEDS



Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements – wherever you need us.

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