

sensing the future



Electrical Sensing Edges

Electrical sensing edges for safeguarding machinery & robots, automatic doors & gates, and public transportation

Reliable, proven, long lasting

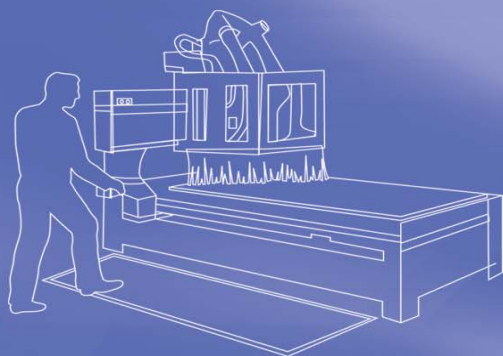
- Wide variety of profiles for every application
- Durable products stand up to tough environmental conditions
- High mechanical load capacity

Electrical Sensing Edges

For safeguarding machinery & robots, automatic doors & gates, and public transit applications

Electrical sensing edges are used to safeguard crush and shear points of machinery as well as automatic industrial doors & gates. Profiles of different sizes in combination with Bircher Reglomat's safety controllers protect people and objects from injury or damage.

Sensing edges are available as prefabricated assemblies or components can be purchased separately for self-assembly. In addition, custom profiles can be designed to meet your specific needs.

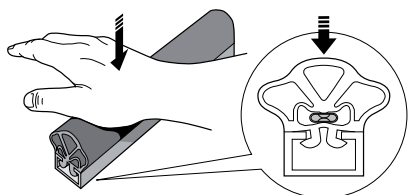


Your benefits

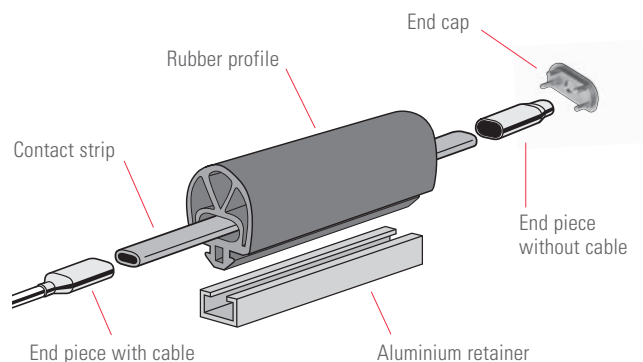
- Easy to install
- Meets safety category 3 when used with a safety controller
- Maintenance free
- Custom made to fit your application
- Resistant to many substances including waste water, acetone, methyl alcohol, and lactic acid
- Self-assembly options available for maximum flexibility
- Fully sealed systems available for special applications
- Wide variety of profile shapes/sizes and endpieces/cables allow for countless applications
- High mechanical load capacity
- Durable products stand up to tough environments
- Assembled in the USA – short leadtimes

Edge function

Our safety edges use the proven system of a conductive contact strip inserted into the rubber profile. Vertical force applied to the edge causes contact of the conductive elements inside the strip.



Edge design



Edge selection calculation

Use the following calculations to establish the stopping and overtravel distances in order to achieve the greatest possible safety:

Stopping distance of hazardous parts (s_1): $s_1 = \frac{1}{2} \times v \times T$

Minimum overtravel of the safety edge (s): $s = s_1 \times C$

v = Speed of the hazardous movement [mm/s]

T = Overtravel time of the entire system
(machine + safety edge) [s]

C = Safety factor, at least 1.2. A greater safety factor should be selected if there are other factors such as a brake system which might be damaged.



Safety controllers

ESD3 Series controllers for machine safety applications

- Rated PL e, meets safety category 3 when used with a safety edge
- Fail-safe wiring with only 2 wires and a resistor
- Two input terminals to connect multiple edges
- Automatic or external (manual) reset options
- Redundant safety outputs plus auxiliary output

The following chart provides the **safety output** logic of all Bircher Reglomat ESD3 series controllers. The additional **auxiliary output** can be used to operate a light, buzzer, etc. For the auxiliary output logic of the entire ESD3 controller series, please visit our website.

System operative (ie. machine running)	Sensor actuated (edge activated)	Wire failure / no voltage (ie. broken wire)
Closed	Open	Open

Please see back page for order details and controllers for door & gate applications.



Applications



Machine safety: Protect people working near pinch/shear/crush points.



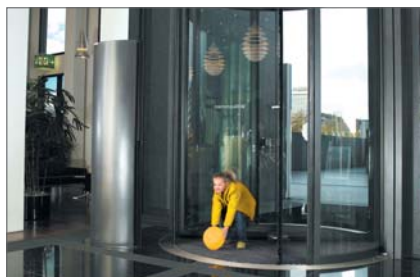
Overhead doors: Protect people and vehicles in the closing path of automatic overhead doors.



Sliding gates: Protect people and vehicles in the closing path of automatic gates. Also used on secondary closing edges.



Public transit: Protect people in the closing path of bus and train doors.



Revolving doors: Protect people from pinch points of revolving doors. Also used as heel guard.



Material handling: Protect people working near shear points of scissor lifts, platforms and other equipment.

ClickLine

Rubber profiles with a click-fit foot

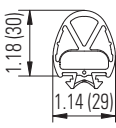
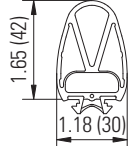
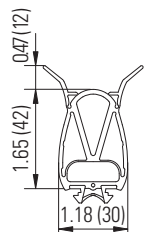
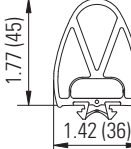
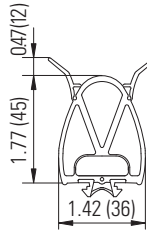
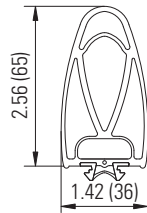
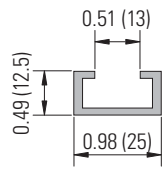
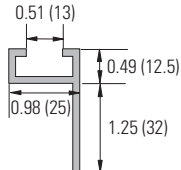
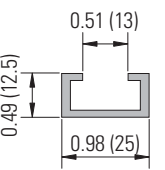
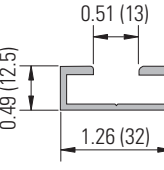
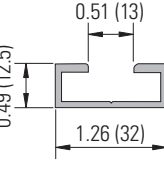
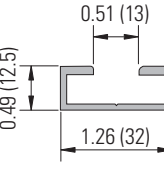
ClickLine edges are designed with a click-fit foot for the easiest possible installation. No need to pull the profile into the retainer from the side. The uniquely designed profile shape guarantees the maximum switching reliability.

If vertical mounting is required, use in conjunction with EN-PHK profile holder or select an alternate CoverLine or StandardLine profile.

Please see back page for information on ordering prefabricated edges or components for self-assembly as well as technical data.



ClickLine profiles & aluminum retainer

Dimensions in inches (mm) ¹	 1.18 (30) 1.14 (29)	 1.65 (42) 1.18 (30)	 1.65 (42) 1.18 (30) 0.47 (12) <i>Sealing fins can be removed if necessary</i>	 1.77 (45) 1.42 (36)	 1.77 (45) 1.42 (36) 0.47 (12) <i>Sealing fins can be removed if necessary</i>	 2.56 (65) 1.42 (36)
	EPE025/029A0V Part no. 210736	EPE030/042A0V Part no. 210751	EPE030/042J2V Part no. 210752	EPE036/045A0V Part no. 210760	EPE036/045J2V Part no. 210761	EPE036/065A0V Part no. 210764
Designation for prefabricated edges²	ELE025/029A0Vx	ELE030/042A0Vx	ELE030/042J2Vx	ELE036/045A0Vx	ELE036/045J2Vx	ELE036/065A0Vx
Roll length	164 ft (50 m)	164 ft (50 m)	164 ft (50 m)	82 ft (25 m)	82 ft (25 m)	82 ft (25 m)
Retainer part no.³	AP-5 (shown)/AP-5L	AP-5/AP-5L (shown)	AP-5 (shown)/AP-5L	AP-8	AP-8	AP-8
Retainer dimensions	 0.49 (12.5) 0.51 (13) 0.98 (25)	 0.49 (12.5) 0.51 (13) 0.98 (25) 1.25 (32)	 0.49 (12.5) 0.51 (13) 0.98 (25)	 0.49 (12.5) 0.51 (13) 1.26 (32)	 0.49 (12.5) 0.51 (13) 1.26 (32)	 0.49 (12.5) 0.51 (13) 1.26 (32)
Activation distance	0.28" (7 mm)	0.24" (6 mm)	0.39" (10 mm)	0.39" (10 mm)	0.59" (15 mm)	0.39" (10 mm)
Switch point force	15.7 lbf (70 N)	13.5 lbf (60 N)	22.5 lbf (100 N)	11.2 lbf (50 N)	20.2 lbf (90 N)	24.7 lbf (110 N)
Overtravel⁴ 56 lbf (250N) 90 lbf (400N)	0.31" (8 mm) 0.39" (10 mm)	0.39" (10 mm) 0.79" (20 mm)	0.20" (5 mm) 0.55" (14 mm)	0.83" (21 mm) 0.87" (22 mm)	0.67" (17 mm) 0.79" (20 mm)	0.83" (21 mm) 0.98" (25 mm)

¹ Tolerances acc. to DIN ISO 3302-1, class E2

² See back page for more information on ordering prefabricated edges

³ Other retainer styles / material available – call for details

⁴ Temp. 73°F (23°C), test object dia. 3.15" (80 mm), measuring point C3

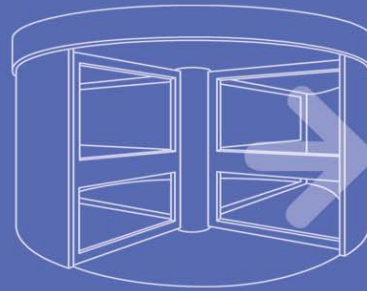
CoverLine

Optimized for vertical mounting or enhanced aesthetics

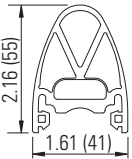
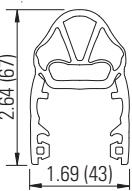
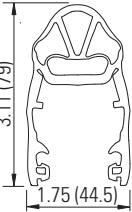
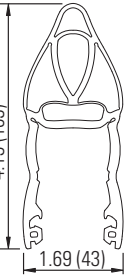
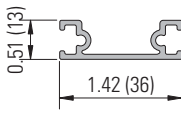
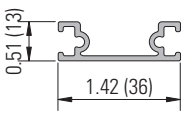
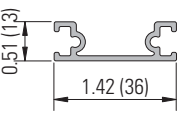
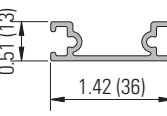
CoverLine edges are designed with a profile that completely covers the aluminum retainer and has the following benefits:

- Sleek, aesthetically pleasing design
- Enhanced vertical mounting capability (sliding gate applications)
- Longer overtravel distances possible
- Easy to install (no need to pull profile into retainer from side)
- Most appropriate for applications involving side forces

Please see back page for information on ordering prefabricated edges or components for self-assembly as well as technical data.



CoverLine profiles & aluminum retainer

Dimensions in inches (mm) ¹	 EPE040/055A0J Part no. 210766	 EPE040/067A0J Part no. 354468	 EPE040/081A0J Part no. 262476	 EPE040/105A0J Part no. 219341
Designation for prefabricated edges²	ELE040/055A0Jx	ELE040/067A0Jx	ELE040/081A0Jx	ELE040/105A0Jx
Roll length	98 ft (30 m)	65 ft (20 m)	65 ft (20 m)	82 ft (25 m)
Retainer part no.³	AP-G1	AP-G1	AP-G1	AP-G1
Retainer dimensions				
Activation distance	0.39" (10 mm)	0.20" (5 mm)	0.31" (8 mm)	0.20" (5 mm)
Switch point force	22.5 lbf (100 N)	13.5 lbf (60 N)	18.7 lbf (83 N)	15.7 lbf (70 N)
Overtravel⁴	0.43" (11 mm)	1.18" (30 mm)	1.50" (38 mm)	1.26" (32 mm)
56 lbf (250N)	0.59" (15 mm)	1.26" (32 mm)	1.61" (41 mm)	2.09" (53 mm)
90 lbf (400N)				

¹ Tolerances acc. to DIN ISO 3302-1, class E2

² See back page for more information on ordering prefabricated edges

³ Other retainer styles / material available - call for details

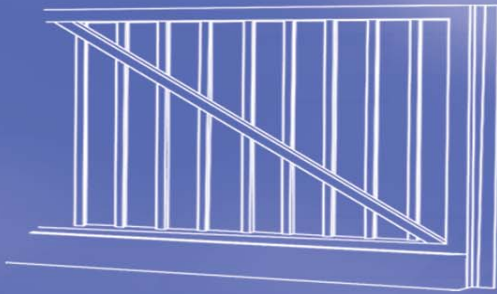
⁴ Temp. 73°F (23°C), test object dia. 3.15" (80 mm), measuring point C3

StandardLine

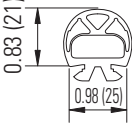
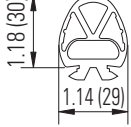
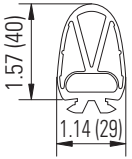
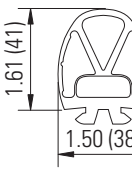
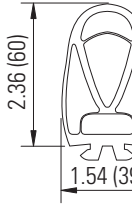
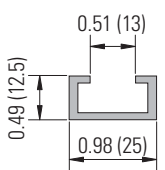
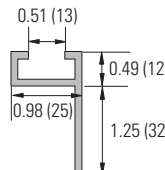
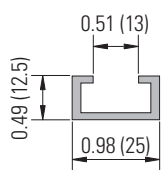
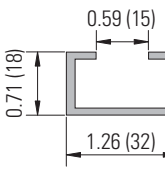
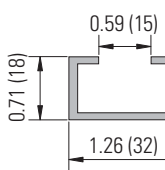
Rubber profiles with standard mounting foot

StandardLine offers a wide range of profile shapes for many applications. This profile type is especially suited for vertical mounting or applications with side forces applied.

Please see back page for information on ordering prefabricated edges or components for self-assembly as well as technical data.



StandardLine profiles & aluminum retainer

Dimensions in inches (mm) ¹					
	EPE025/020A0K Part no. 210732	EPE025/029A0K Part no. 210733	EPE025/040A0K Part no. 210746	EPE036/040A0D Part no. 210753	EPE036/060A0D Part no. 210762
Designation for prefabricated edges²	ELE025/020A0Kx	ELE025/029A0Kx	ELE025/040A0Kx	ELE036/040A0Dx	ELE036/060A0Dx
Roll length	164 ft (50 m)	164 ft (50 m)	164 ft (50 m)	164 ft (50 m)	164 ft (50 m)
Retainer part no.³	AP-5 (shown)/AP-5L	AP-5/AP-5L (shown)	AP-5 (shown)/AP-5L	AP-4	AP-4
Retainer dimensions					
Activation distance	0.12" (3 mm)	0.28" (7 mm)	0.16" (4 mm)	0.35" (9 mm)	0.20" (5 mm)
Switch point force	15.7 lbf (70 N)	18.0 lbf (80 N)	15.7 lbf (70 N)	20.2 lbf (90 N)	20.2 lbf (90 N)
Overtravel⁴ 56 lbf (250N) 90 lbf (400N)	0.08" (2 mm) 0.16" (4 mm)	0.24" (6 mm) 0.39" (10 mm)	0.35" (9 mm) 0.47" (12 mm)	0.31" (8 mm) 0.63" (16 mm)	0.51" (13 mm) 1.18" (30 mm)

¹ Tolerances acc. to DIN ISO 3302-1, class E2

² See back page for more information on ordering prefabricated edges

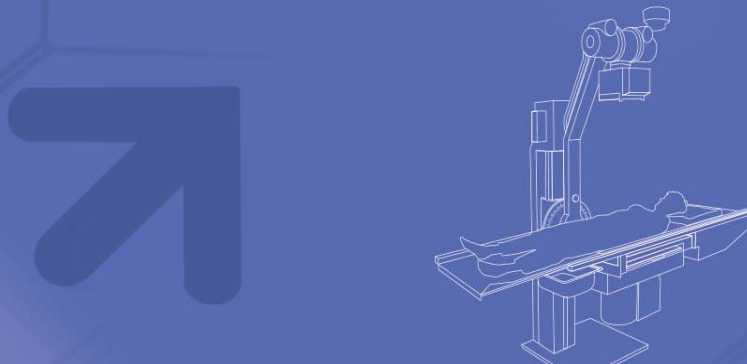
³ Other retainer styles / material available - call for details

⁴ Temp. 73°F (23°C), test object dia. 3.15" (80 mm), measuring point C3

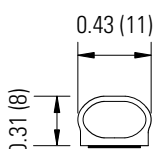
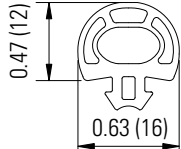
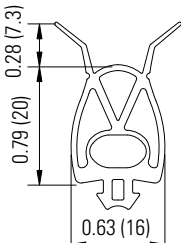
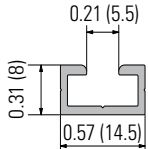
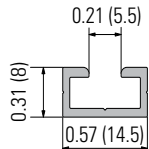
S-Line

Miniature safety edge system

S-Line edges have all the same robust features of Bircher Reglomat's other profile offerings in a more compact design. These profiles are ideal for applications where space is limited. The self-adhesive profile fits in small spaces where a traditional aluminum retainer cannot be used.



S-Line profiles & aluminum retainer

Dimensions in inches (mm) ¹			
	EPT011/008A0W1 Part no. 210858	EPE016/012A0V1 Part no. 210728	EPE016/020J2V1 Part no. 210729
Designation for prefabricated edges²	ELE011/008A0Wx	ELE016/012A0Vx	ELE016/020J2Vx
Roll length	164 ft (50 m)	164 ft (50 m)	164 ft (50 m)
Retainer part no.³	N/A (adhesive back)	AP-S	AP-S
Retainer dimensions	N/A (adhesive back)		
Activation distance	0.08" (2 mm)	0.20" (5 mm)	0.20" (5 mm)
Switch point force	< 34 lbf (<150 N)	<34 lbf (<150 N)	18 lbf (80 N)
Overtravel⁴	0.00" (0 mm)	0.04" (1 mm)	0.20" (5 mm)
56 lbf (250N)	0.00" (0 mm)	0.08" (2 mm)	0.23" (6 mm)
90 lbf (400N)			

Sealing fins can be removed if necessary

S-Line Self-assembly components

How to order individual components (self-assembly ONLY)

Contact strip

244421	ENT-7/50	ENT-7 164 ft (50 m) roll
244422	ENT-7/100	ENT-7 328 ft (100 m) roll

End pieces

210681	ENES-8	8k2 terminating resistor
210680	ENES-0	Blank - no cable, no resistor
210682	ENES-K05	20" (0.5 m) cable end piece
210684	ENES-K2	6.5' (2 m) cable end piece
210691	ENES-K4	13' (4 m) cable end piece
210683	ENES-K10	32' (10 m) cable end piece

Sealing plugs (sold in bags of 10)

210701	ENS-DS	Sealing plug for arcing chamber
210700	ENS-DL	Sealing plug with hole for cable

End cap

210699	ENSC	End cap for S-Line
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Tools & accessories

210964	ES-BD	Sealing compound for profile seal, sufficient for approx. 40 edges
211010	ES-K20	Contact adhesive for sealing plugs
212001	ESS-PRESS	To press end pieces onto contact strips
212876	ELE RUBBER-CUTTER	Rubber profile cutter

¹ Tolerances acc. to DIN ISO 3302-1, class E2

² See back page for more information on ordering prefabricated edges

³ Other retainer styles / material available – call for details

⁴ Temp. 73°F (23°C), test object dia. 3.15" (80 mm), measuring point C3

Order Details – Prefabricated Edges

How to order prefabricated safety edge assemblies – Create your part number:


ELE036/045A0V	2	1	36"	20"	13'	AP-8
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Profile type	Contact strip	End piece/Retainer configuration	Length	1st Cable*	2nd Cable*	Retainer Type
See designation for prefabricated edges ClickLine → pg. 4 CoverLine → pg. 5 StandardLine → pg. 6 S-Line → pg. 7	2 = ENT-R S-Line: 3 = ENT-7	With retainer: 1 = 1 cable + 8.2 kOhm resistor 2 = 2 cables 3 = 1 cable + blank end piece Without retainer: 4 = 1 cable + 8.2 kOhm resistor 5 = 2 cables 6 = 1 cable + blank end piece	Length of edge in inches (mm also accepted)	Length (inches or feet)	Length (inches or feet) 00 = no 2nd cable	See profile info for correct retainer. WO = without retainer
Contact Bircher Reglomat for special sealed edge requirements				* Cable length options: 20" (0.5 m), 6'6" (2 m) 13' (4 m), 32' (10 m)		



Self-Assembly Components

For self-assembly ONLY See page 7 for S-Line components



ENT-R Contact strip Must be used with a safety controller. Suited for moist environments.

238947	ENT-R/25	82 ft (25 m) roll	
210718	ENT-R/50	164 ft (50 m) roll	
210715	ENT-R/100	328 ft (100 m) roll	


End pieces

Terminating end pieces	Terminator Description	8k2 resistor	No resistor	1k2 resistor	Diode	
	ENEH-8	ENEH-8	ENEH-0	ENEH-1	ENEH-D	
	Part no.	210642	210626	210627	210643	
Cable end pieces	Description	20" (0.5 m)	6.5' (2 m)	13' (4 m)	32' (10 m)	
	ENEH-K05	ENEH-K05	ENEH-K2	ENEH-K4	ENEH-K10	
	Part no.	210649	210661	210670	210654	

End caps


221785	EN-KAS	Standard end cap for full size rubber profiles	
210616	ENA-10	Sealing band for all rubber profiles, 32' (10 m) roll <i>for special applications only – ie. food packaging</i>	

Tools & accessories


210624	EN-DS	Sealing plug for arcing chamber, bag of 10	
210622	EN-DL	Sealing plug with hole for cable, bag of 10	
210964	ES-BD	Sealing compound (for approx. 40 edges)	
211010	ES-K20	Contact adhesive for sealing plugs, 1 oz (28 g)	
211739	ES-PRESS	For pressing end pieces onto the contact strip	
212876	ELE RUBBER-CUTTER	Rubber profile cutter	
254924	EN-PHC	Profile holder for CoverLine	
262494	EN-PHK	Profile holder for ClickLine and StandardLine	

Order Details – Safety Controllers

ESD3 Series for machine safety

210985	ESD3-04-24ACDC	Automatic reset, 24 VAC/DC	
210983	ESD3-04-115AC	Automatic reset, 115 VAC	
210984	ESD3-04-230AC	Automatic reset, 230 VAC	
210994	ESD3-06-24ACDC	External (manual) reset, 24 VAC/DC	

ESGate for automatic doors & gates

263913	ESGate 3 24V	24 V controller	
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Technical data

ENT-R contact strip	
Dimensions (max.)	¼" × ¾" (7 × 19 mm)
Operating temperature	-15°F to +140°F (-25°C to +60°C)
Storage temperature	-40°F to +180°F (-40°C to +80°C)
Material	EPDM
Contact material	Conductive EPDM
Current (min. / max.)	1 mA / 100 mA
Max. voltage	30 VACDC
Resistance per unit length	< 0.6 Ohm/ft (2 Ohm/m)
Contact resistance	typ. < 200 Ohm, max. < 500 Ohm
Min # cycles	> 100,000 with test object dia 3 ¼" (80 mm)

ENT-7 contact strip	
Dimensions (max.)	0.15" × 0.27" (4 × 7 mm)
Operating temperature	-13°F to +140°F (-25°C to +60°C)
Storage temperature	-40°F to +180°F (-40°C to +80°C)
Material	EPDM
Contact material	Conductive EPDM
Current (min. / max.)	1 mA / 100 mA
Max. voltage	30 VACDC
Resistance per unit length	< 0.6 Ohm/ft (< 2 Ohm/m)
Contact resistance	Typ. < 200 Ohm, max. < 500 Ohm
Min # cycles	> 100,000 with test object dia 3 ¼" (80 mm)

Prefabricated safety edges	
Temperature range	-5°F to +130°F (-20°C to +55°C)
Max. length	19.6 ft [6 m] (longer lengths on requ.)
Insulating strength	1500 V AC
Max. load capacity	110 lbf (500 N)
Dead zone	¼" (20 mm) Exception: ELE040/105A0J2: 0 mm
Min # cycles	> 10'000 with test object dia 3 ¼" (80 mm)
Connection cable	Double-jacketed cable, PVC, ø 3/16" (4.7 mm), strain relief wire 2 × AWG 22 (0.34 mm²), min. bending, radius 3/8" (10 mm), non-detachable
Protection class	NEMA 4 (IP65)
Standards conformity when used w/safety controller	EN ISO 13849-1:2008 EN 12978:2003+A1:2009 EN ISO 13856-2:2013

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