MAYSER®

Innovative by tradition.

RailFR®: Sensors, cables

EN | Data sheet

Sensors

- EKS 002 RailFR®
- EKS 030 RailFR®
- SE 1 15 RailFR®
- SE 1 18 RailFR®

Cables

- Mayser RailFR® 2× 0.25 mm²

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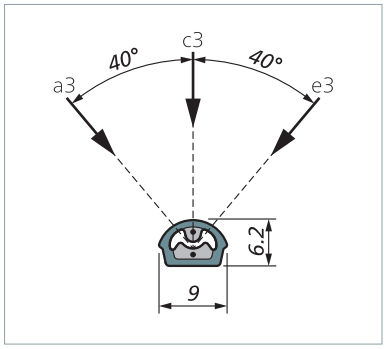
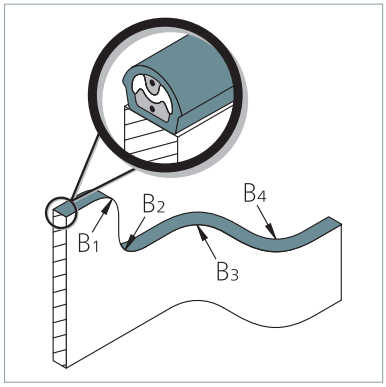
Sensors

EKS 002 RailFR



Dimensional tolerances according to ISO 3302 E2/L2

Bend radii:

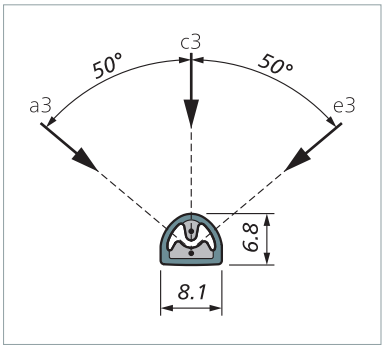


Switching characteristics at v_{test} = 50 mm/min			
Actuation force (c3)	**+23 °C**	**–25 °C**	**–40 °C**
Test piece (rod) Ø 20 mm	< 10 N	< 20 N	< 25 N
Test piece (cylinder) Ø 80 mm	< 60 N	< 100 N	< 120 N
Actuation distance (c3)			
Test piece (cylinder) Ø 80 mm	< 2.0 mm		
Actuation angle (a3 to e3)			
Test piece (cylinder) Ø 80 mm	±40°		
Safety classifications			
ISO 13849-1: B_{10D}	1× 10^6		
Mechanical operating conditions			
Sensor length (min./max.)	100 mm / 50 m		
Cable length (min./max.)	200 mm / 100 m		
Tensile load, cable (max.)	60 N		
Bend radii, minimum			
B_1 / B_2 / B_3 / B_4	50 / 40 / 40 / 40 mm		
Installation position	Any		
IEC 60529: degree of protection	IP67		
EN 50125-1:			
Air temperature class	T3		
Short-term (max. 10 min)	TX		
Class of altitude range	AX, max. 2000 m NHN		
Max. humidity at	100 %		
Max. temperature change	3 K/s		
Operating temperature	–40 to +60 °C		
Weight (without cable)	43 g/m		
Electrical operating conditions			
When sensor is not actuated			
Terminal resistance (±1%)	1k2, 8k2, others on request		
Nominal output (max.)	250 mW		
When sensor is actuated	Test piece (cylinder) / F = 150 N		
Contact transition resistance	< 400 ohms		
Switching current (min. / max.)	DC 1 mA / DC 10 mA		
More than one sensor	Max. 5 in series		
Connection cable	Ø 3.8 ±0.2 mm, 2× 0.25 mm^2		

Physical resistance
See page 7

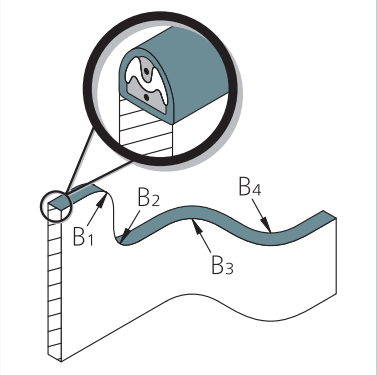
Chemical resistance
See page 7

EKS 030 RailFR



Dimensional tolerances
according to ISO 3302 E2/L2

Bend radii:



Switching characteristics at v_{test} = 50 mm/min			
Actuation force (c3)	**+23 °C**	**–25 °C**	**–40 °C**
Test piece (rod) Ø 20 mm	< 10 N	< 20 N	< 25 N
Test piece (cylinder) Ø 80 mm	< 60 N	< 100 N	< 120 N
Actuation distance (c3)			
Test piece (cylinder) Ø 80 mm	< 1.5 mm		
Actuation angle (a3 to e3)			
Test piece (cylinder) Ø 80 mm	±50°		
Safety classifications			
ISO 13849-1: B_{10D}	1× 10^6		
Mechanical operating conditions			
Sensor length (min./max.)	100 mm / 50 m		
Cable length (min./max.)	200 mm / 100 m		
Tensile load, cable (max.)	60 N		
Bend radii, minimum			
B_1 / B_2 / B_3 / B_4	60 / 70 / 30 / 30 mm		
Installation position	Any		
IEC 60529: degree of protection	IP67		
EN 50125-1:			
Air temperature class	T3		
Short-term (max. 10 min)	TX		
Class of altitude range	AX, max. 2000 m NHN		
Max. humidity at	100 %		
Max. temperature change	3 K/s		
Operating temperature	–40 to +60 °C		
Weight (without cable)	43 g/m		
Electrical operating conditions			
When sensor is not actuated			
Terminal resistance (±1%)	1k2, 8k2, others on request		
Nominal output (max.)	250 mW		
When sensor is actuated	Test piece (cylinder) / F = 150 N		
Contact transition resistance	< 400 ohms		
Switching current (min. / max.)	DC 1 mA / DC 10 mA		
More than one sensor	Max. 5 in series		
Connection cable	Ø 3.8 ±0.2 mm, 2× 0.25 mm^2		

Physical resistance
See page 7

Chemical resistance
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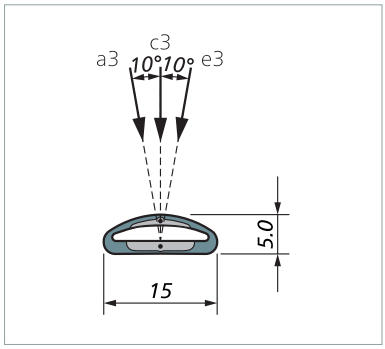
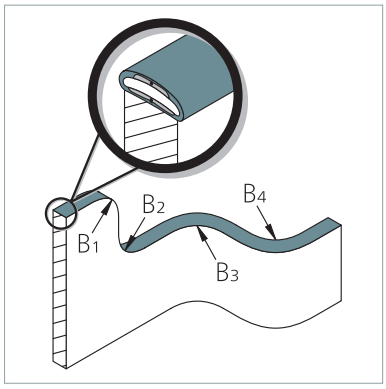
SE 1 15 RailFR

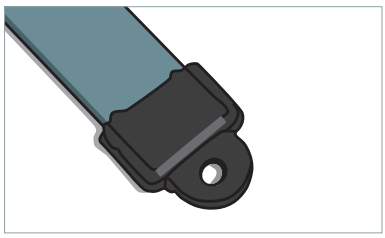


Dimensional tolerances
according to ISO 3302 E2/L2

Bend radii:



With pull-in tab:

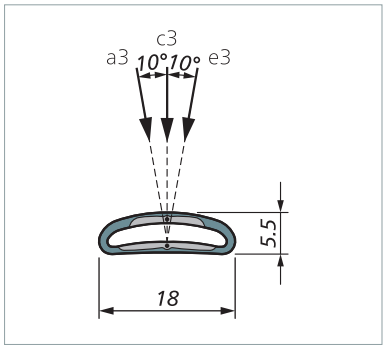


Switching characteristics at v_{test} = 50 mm/min			
Actuation force (c3)	**+23 °C**	**–25 °C**	**–40 °C**
Test piece (rod) Ø 20 mm	< 15 N	< 25 N	< 25 N
Test piece (cylinder) Ø 80 mm	< 70 N	< 100 N	< 100 N
Test specimen length	1.0 m		
Actuation distance (c3)			
Test piece (cylinder) Ø 80 mm	< 3.0 mm		
Actuation angle (a3 to e3)			
Test piece (cylinder) Ø 80 mm	±10°		
Safety classifications			
ISO 13849-1: B_{10D}	1× 10^6		
Mechanical operating conditions			
Sensor length (min./max.)	100 mm / 50 m		
Cable length (min./max.)	200 mm / 100 m		
Tensile load (max.)			
Cable	50 N		
Pull-in tab	30 N		
Bend radii, minimum			
B_1 / B_2 / B_3 / B_4	100 / – / 150 / 150 mm		
Installation position	Any		
IEC 60529: degree of protection	IP67		
EN 50125-1:			
Air temperature class	T3		
Short-term (max. 10 min)	TX		
Class of altitude range	AX, max. 2000 m NHN		
Max. humidity at	100 %		
Max. temperature change	3 K/s		
Operating temperature	–40 to +60 °C		
Weight (without cable)	47 g/m		
Electrical operating conditions			
When sensor is not actuated			
Terminal resistance (±1%)	1k2, 8k2, others on request		
Nominal output (max.)	250 mW		
When sensor is actuated	Test piece (cylinder) / F = 150 N		
Contact transition resistance	< 400 ohms		
Switching current (min. / max.)	DC 1 mA / DC 10 mA		
More than one sensor	Max. 5 in series		
Connection cable	Ø 3.8 ±0.2 mm, 2× 0.25 mm^2		

Physical resistance
See page 7

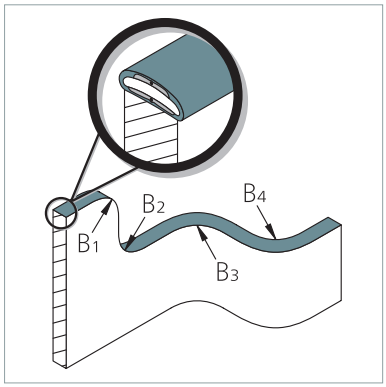
Chemical resistance
See page 7

SE 1 18 RailFR

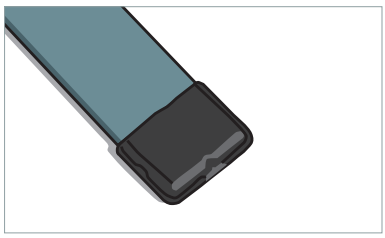


Dimensional tolerances
according to ISO 3302 E2/L2

Bend radii:



Without pull-in tab:



Switching characteristics at v_{test} = 50 mm/min			
Actuation force (c3)	**+23 °C**	**–25 °C**	**–40 °C**
Test piece (rod) Ø 20 mm	< 15 N	< 25 N	< 25 N
Test piece (cylinder) Ø 80 mm	< 80 N	< 120 N	< 120 N
Test specimen length	1.0 m		
Actuation distance (c3)			
Test piece (cylinder) Ø 80 mm	< 3.0 mm		
Actuation angle (a3 to e3)			
Test piece (cylinder) Ø 80 mm	±10°		
Safety classifications			
ISO 13849-1: B_{10D}	1× 10^6		
Mechanical operating conditions			
Sensor length (min./max.)	100 mm / 50 m		
Cable length (min./max.)	200 mm / 100 m		
Tensile load (max.)			
Cable	50 N		
Pull-in tab (optional)	30 N		
Bend radii, minimum			
B_1 / B_2 / B_3 / B_4	80 / – / 100 / 100 mm		
Installation position	Any		
IEC 60529: degree of protection	IP67		
EN 50125-1:			
Air temperature class	T3		
Short-term (max. 10 min)	TX		
Class of altitude range	AX, max. 2000 m NHN		
Max. humidity at	100 %		
Max. temperature change	3 K/s		
Operating temperature	–40 to +60 °C		
Weight (without cable)	55 g/m		
Electrical operating conditions			
When sensor is not actuated			
Terminal resistance (±1%)	1k2, 8k2, others on request		
Nominal output (max.)	250 mW		
When sensor is actuated	Test piece (cylinder) / F = 150 N		
Contact transition resistance	< 400 ohms		
Switching current (min. / max.)	DC 1 mA / DC 10 mA		
More than one sensor	Max. 5 in series		
Connection cable	Ø 3.8 ± 0.2 mm 2× 0.25 mm^2		

Physical resistance
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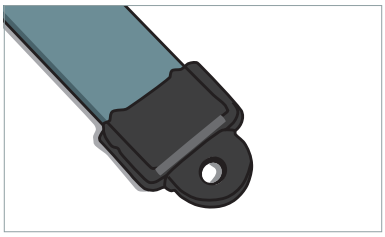
Chemical resistance
See page 7

Options for SE 1 18 RailFR

With pull-in tab:



Physical resistance

	RailFR
EN 45545-2: suitable for	
Hazard level	HL3
Set of requirements	R26

Chemical resistance

The product is resistant to normal chemical influences over an exposure time of 24 hours.

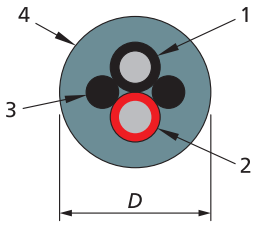
	RailFR
Cyanoacrylate adhesive	+
Greases	±
Graffiti remover	±
Skin cream	±
Isopropanol	±
Neutral cleaner	+
Alkaline cleaner	+
Hydrochloric acid cleaner	+
Phosphoric acid cleaner	+
Plastic cleaners	+
Soap solution	+
Saline solution 5%	+
Spirit (ethyl alcohol)	±
Talc	+

Explanation of symbols:
+ = resistant
± = resistant to a certain extent
– = not resistant

All tests were carried out at room temperature (+23 °C).

Cables

Mayser RailFR 2× 0.25 mm²



Cable structure		
Conductors, Nos. 1 and 2		CU wire, tinned, wire EN 13602 – Cu-ETP1
Nominal cross-section		0.25 mm²
Insulation	No. 1	Black, TPE
	No. 2	Red, TPE
Dummy wire	No. 3	Black, TPE
Sheath	No. 4	Squirrel grey (RAL 7000), TPE
Outer diameter D		3.8 ±0.2 mm
Weight		22 g/m
Electrical operating conditions		
Conductor resistance at 20 °C		≤ 80 ohms/km
Operating voltage (max.)		DC 48 V
Test voltage		1.5 kV
Mechanical operating conditions		
Bend radii (min.)		
Fixed installation		19 mm (5× D)
Moving / free installation		39 mm (10× D)
Drag chain		41 mm (10.5× D)
Operating temperature (fixed)		–40 to +90 °C
Operating temperature (flexible)		–30 to +90 °C
Physical resistance		
EN 45545-2: suitable for		
Hazard level		HL3
Set of requirements		R15 and R16
EN 60332-1-2		Flame-retardant and self-extinguishing
EN 60332-3-25		No spreading of fire
HD 605: artificial weathering		
60 W/m², 720 h, 38 °C, 65% rel. humidity, cycle: 18/102 min		No cracks
IEC 60754-1		Halogen-free
2011/65/EU: RoHS		Complies
Chemical resistance		
Hydrolysis		Very good
Acids		Good
EN 50264-1 (EM 104)		
Oil		Very good
Fuels		Very good
EN 50396 paragraph 8.1.3:		
Ozone resistance 72 h, 40 °C, 55% rel. humidity		No cracks