

Position Switches



EUCHNER

More than safety.

EUCHNER

More than safety.



Headquarters in Leinfelden-Echterdingen



Logistics center in Leinfelden-Echterdingen



Production location in Unterböhringen

Internationally successful – the EUCHNER company

EUCHNER GmbH + Co. KG is a world-leading company in the area of industrial safety technology. EUCHNER has been developing and producing high-quality switching systems for mechanical and systems engineering for more than 60 years.

The medium-sized family-operated company based in Leinfelden, Germany, employs more than 600 people around the world.

In addition to the production locations in Unterböhringen and Shanghai/China, 15 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

Quality and innovation – the EUCHNER products

A look into the past shows EUCHNER to be a company with a great inventive spirit. We take the technological and ecological challenges of the future as an incentive for extraordinary product developments.

EUCHNER safety switches monitor safety doors on machines and installations, help to minimize dangers and risks and thereby reliably protect people and processes. Today, our products range from electromechanical and electronic components to intelligent integrated safety solutions. Safety for people, machines and products is one of our dominant themes.

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers. The product ranges are subdivided as follows:

- ▶ Transponder-coded Safety Switches (CES)
- ▶ Transponder-coded Safety Switches with guard locking (CET)
- ▶ Interlocking and guard locking systems (Multifunctional Gate Box MGB)
- ▶ Access management systems (Electronic-Key-System EKS)
- ▶ Electromechanical Safety Switches
- ▶ Magnetically coded Safety Switches (CMS)
- ▶ Enabling Switches
- ▶ Safety Relays
- ▶ Emergency Stop Devices
- ▶ Hand-Held Pendant Stations and Handwheels
- ▶ Safety Switches with AS-Interface
- ▶ Joystick Switches
- ▶ Position Switches



Position switches

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General information

Precision single hole fixing limit switches with reed contact or snap-action switching element

EUCHNER precision single hole fixing limit switches are technically sophisticated control switches which have been proving their reliability, day in and day out, for decades in rough industrial applications.

These mechanically actuated precision single hole fixing limit switches are IP 67 rated and are entirely maintenance-free.

EUCHNER precision single hole fixing limit switches feature a thread on the upper part and can thus be inserted or screwed through the mounting hole either from the cable end or from the actuator end. Setting the position of the operating point opposite the part of the machine to be sensed is easy with this thread.

The compact overall size and the round design allow installation directly at the sensing points. This feature dispenses with the complicated levers or linkages associated with a high level of design complexity and expense.



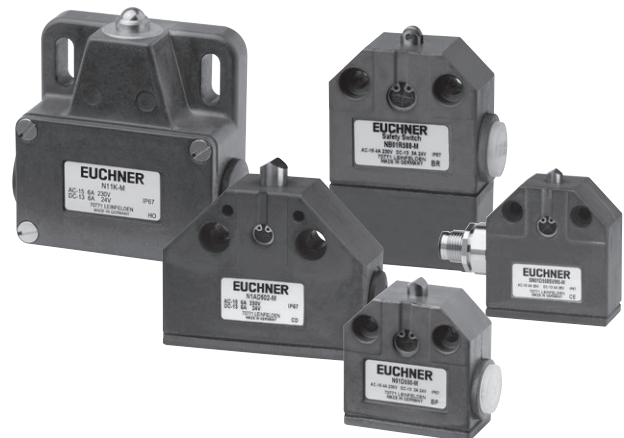
Precision single limit switches

EUCHNER precision single limit switches are technically precise control switches which have been developed on the basis of practical requirements in close collaboration with machine tool manufacturers.

The use of high-quality materials, the interplay of sophisticated technology and practically oriented design guarantee operation under even the toughest conditions.

EUCHNER precision single limit switches are used for positioning and controlling machines and in industrial installations.

The different designs, with a choice of five different types of plunger, and easy adjustability from longitudinal to transverse actuation offer the user a broad range of individual possible applications.

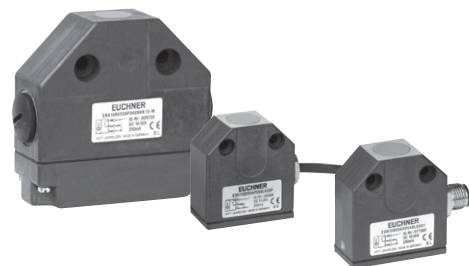


Inductive single limit switches

Inductive single limit switches are used for positioning and control in all areas of mechanical and systems engineering. Inductive single limit switches are used for automation tasks in machinery in the wood, textile and plastics industry.

Due to their non-contact and thus wear-free principle of operation, inductive single limit switches are insensitive to heavy vibration, heavy soiling and have an above average mechanical life even in aggressive ambient conditions.

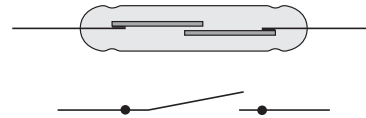
Interchangeability with mechanical single limit switches means that it is possible to straightforwardly modify machines. The switches can therefore be retrofitted on existing machine installations to take full advantage of the benefits of non-contact switches.



Switching elements with reed contact

Reed contact

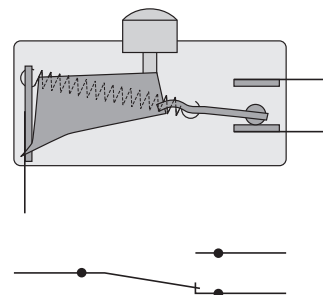
The reed contact comprises two ferromagnetic contacts in a glass bulb. When the reed contact is placed in a magnetic field, the contacts adopt opposite polarities and are closed. For series EGT with reed contact.



Mechanical switching elements

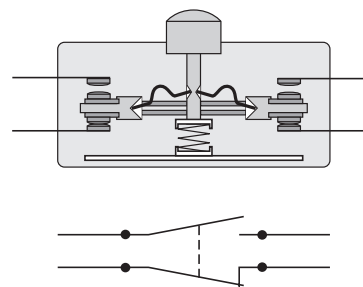
Changeover contact with snap-action function

Snap-action switching element¹⁾ with single gap and three connections. For series EGT with snap-action switch and series N01, NB01, SN01 with soldered connection.



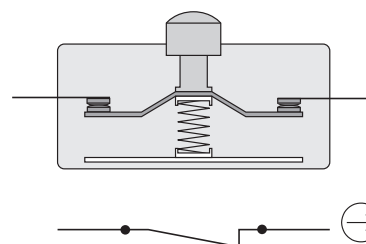
Snap-action switching element¹⁾ with one normally open contact (NO) and one normally closed contact (NC)

With double gap and electrically isolated switching bridge. The two moving contacts are electrically isolated from each other. Switching element with four connections. For series SN01 with soldered connection and series N1A, N10, N11.



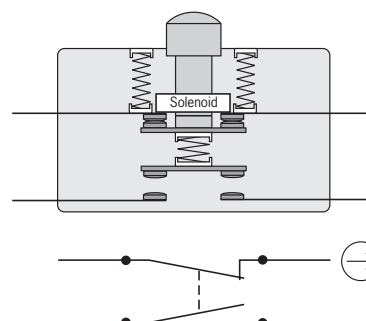
Safety switching element with slow-action switching contact²⁾

With one positively driven NC contact and double gap. Switching contact with two connections. For use in single limit switches with safety function. For series NB01 with safety function and series N1A with safety function.



Safety switching element with snap-action switching contact¹⁾

With one positively driven NC contact and one NO contact. Double gap and electrically isolated switching bridge. Switching contact with four connections. For use in single limit switches with safety function. For series N1A with safety function.



1) A snap-action contact element has a switching contact that opens and closes independently of the approach speed during actuation.
2) A slow-action contact element has a switching contact that opens and closes depending on the approach speed during actuation.

Positively driven contact

Positively driven contacts are used in some switching elements. These are special switching contacts that are designed to ensure the switching contacts are always reliably separated. Even if contacts are welded together, the connection is opened by the actuating force.

It is a common feature of all safety switching elements that at least one switching contact is designed as a positively driven contact. Often two positively driven contacts are employed to increase safety using the principle of duplicated design (redundancy). This dual-channel design ensures that on the failure of one channel or on a fault in the control circuit (e.g. in the machine wiring), the interlocking can still be provided with the aid of the second channel.

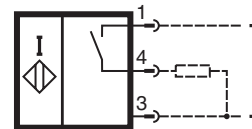


Positively driven position switch.
Safety switching elements marked with this symbol are not available as replacement switching elements.

Inductive switching elements

NO function

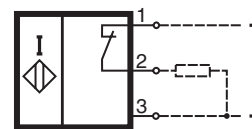
The NO function means that the load current flows when the active face of the inductive switching element is activated and that no current flows when the active face is not activated.



DC NO contact, PNP

NC function

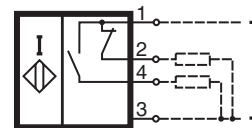
The NC function means that the load current does not flow when the active face of the inductive switching element is activated and that current flows when the active face is not activated.



DC NC, PNP

NO + NC function

The NO + NC function incorporates both an NO function and an NC function. Associated circuit diagrams and wiring diagrams are given in the technical data.



DC NO + NC contact, PNP

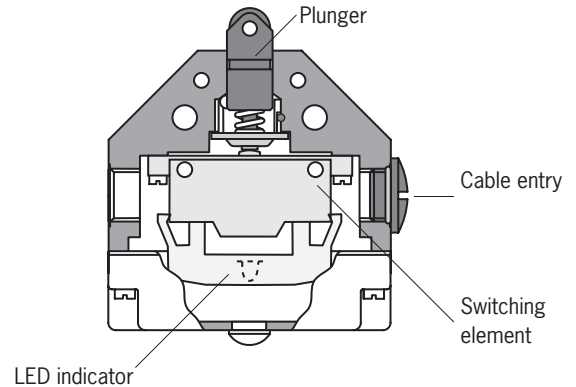
Precision single limit switches

Design

The die-cast aluminum housings for the EUCHNER single limit switches have been proven in even the harshest conditions with their high strength and resistance to corrosion.

They do not require a protective paint finish, but can be painted at any time without prior treatment.

Depending on the design, the hardened plungers made of stainless steel run precisely in either the anodic oxidized guide bore in the housing or in a sintered bronze sleeve. These maintenance-free sliding elements make a key contribution to the reliability and correct operation of the switches. Even beyond the guaranteed mechanical life.

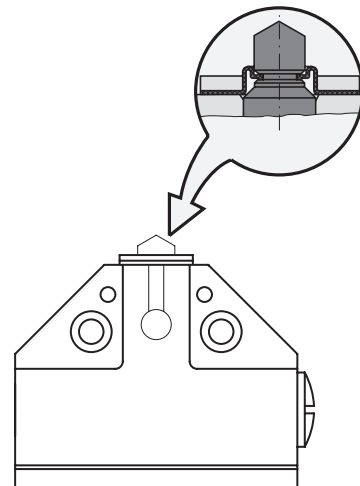


Exterior diaphragm

To provide protection against resinous cooling lubricants and against the penetration of very small particles, e.g. saw dust, graphite and glass dust, and to provide protection against freezing in the low temperature range, a series with an exterior diaphragm is available.

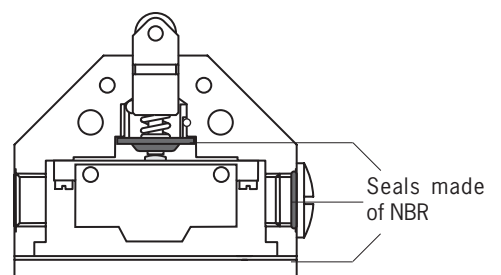
The exterior diaphragm provides additional sealing of the plunger outside the housing.

The plunger guides in the housing are thus reliably protected from the penetration of the cooling lubricant. Plunger sticking is prevented and the replacement of the switch or plunger is unnecessary. Technical data for this series see page 35.



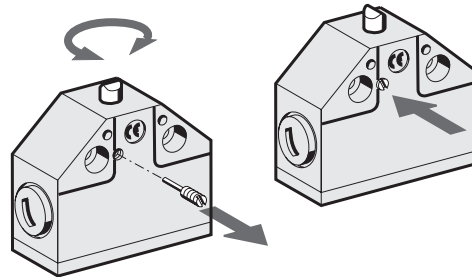
Seals

EUCHNER uses the high-quality and proven acrylonitrile-butadiene rubber (NBR) for all seals and sealed areas. This material is resistant to oils, greases, fuels, hydraulic fluids and most known cooling lubricants. Moreover, NBR possesses high mechanical strength over a wide temperature range and so it is perfectly suitable for the highly stressed diaphragm seal, which separates the plunger compartment and the interior of the switch. The material of the diaphragm seal is a key criterion for the quality, mechanical life and precision of the EUCHNER precision multiple limit switches. The same material is used for the cover seal and the cable entry. Seals made of Viton or silicone are available on request for special applications.



Adjustability

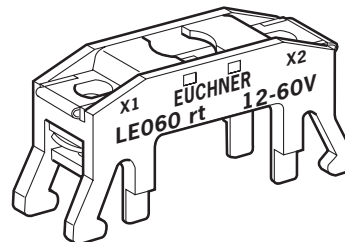
On the chisel plungers and the roller plungers (normal and extended) the approach direction can be changed by 90° at any time. After unscrewing the locking pin, the plunger can be rotated by 90°.



LED function display

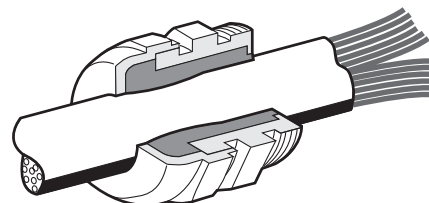
If required, the EUCHNER single limit switches of design N1A can be equipped with an LED function display (AC/DC 10 - 60 V or AC 110/230 V, color red).

Built-in electronic regulation ensures that the luminosity remains constant independent of the voltage applied.



Cable connection

EUCHNER position switches are tested to degree of protection IP 67 in accordance with IEC 60529. In order to obtain this degree of protection, only high-quality metal cable glands with a captive sealing ring are used. A selection for different cable diameters is listed on page 49.



Single hole fixing limit switches – cylindrical design

The round design with simple, single-hole assembly allows installation of the controls directly at the scanning points. Exact adjustment is permitted by means of the precision metric thread. The limit switches with inert gas contact (reed contact) can be operated up to a water column pressure of 30 meters with degree of protection IP 68.

Features

- ▶ 6 basic types M12 x 1 to M18 x 1.5
- ▶ Housing of nickel-plated brass or stainless steel
- ▶ Mechanical life up to 30 million operating cycles
- ▶ Degree of protection IP 68 / IP 67
- ▶ Operating point accuracy ± 0.01 mm max.
- ▶ With hard-wired cable or with M12 plug connection
- ▶ Temperature range -30 °C to $+120$ °C



Precision single hole fixing limit switches

- ▶ With reed contact and protective diode
- ▶ Plunger material stainless steel
- ▶ Any installation position



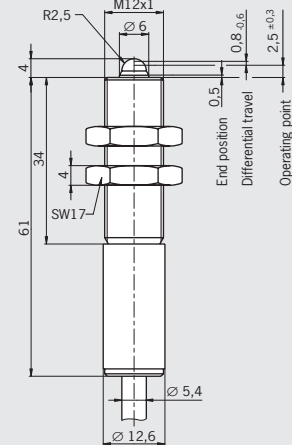
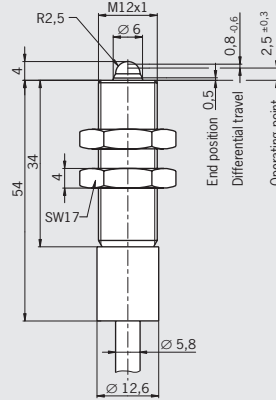
Ambient temperature up to 120 °C



Design EGT12, M12 x 1, dome plunger
Connection cable, double insulated

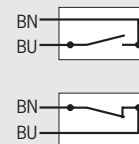
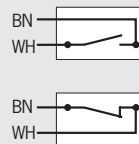
Design EGT12, M12 x 1, dome plunger
Connection cable, double insulated

Dimension drawings



⚠ Never switch incandescent lamps. Not even for test purposes.
Single hole fixing limit switches must not be used as an end stop.

Wiring diagrams



Technical data

Housing material	Sleeve	Stainless steel	Plastic
	Threaded section	Stainless steel	Stainless steel
Degree of protection acc. to IEC 60529		IP 65	IP 68
Ambient temperature	[°C]	-25 ¹⁾ ... +120	-25 ¹⁾ ... +80
Approach speed, max.	[m/min]	8	8
Mechanical life	axial actuation	30 x 10 ⁶ operating cycles (1 x 10 ⁶ at 120 °C)	30 x 10 ⁶ operating cycles
	radial actuation	-	1 x 10 ⁶ operating cycles (dog 30°)
Operating point accuracy ²⁾	[mm]	± 0.01	± 0.01
Actuating force (end position)	[N]	approx. 16	approx. 16
Switching element		Reed contact	Reed contact
Switching contact		1 NO or 1 NC	1 NO or 1 NC
Contact material		Rhodium	Rhodium
Rated insulation voltage U _i	[V]	50 \square	50 \square
Utilization category according to IEC 60947-5-1		AC-12 U _e 30 V I _e 0.3 A DC-13 U _e 24 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A DC-13 U _e 24 V I _e 0.3 A
Switching current, min., at 24 V	[mA]	1	1
Switching voltage, min.	[V DC]	1	1
Short circuit protection (control circuit fuse)	[A gG]	0.4	0.4
Connection		Silicone cable 2 x 0.5 mm ²	PUR cable 2 x 0.5 mm ²

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

3) Mating connector see page 46 and 47.

Ordering table

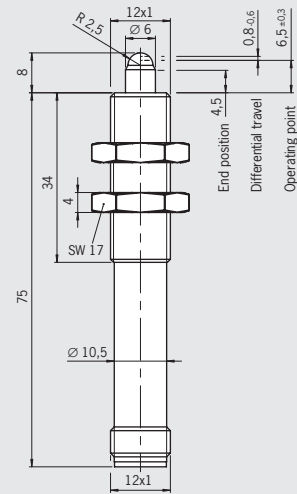
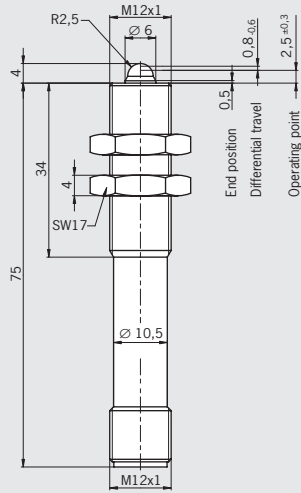
1 NO	Connection cable 3 m	104223 EGT12A3000C2250	-
	Connection cable 5 m	-	082201 EGT12A5000
	Plug connector	-	-
1 NC	Connection cable 3 m	On request	-
	Connection cable 5 m	-	078848 EGT12R5000
	Plug connector	-	-



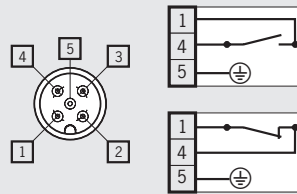
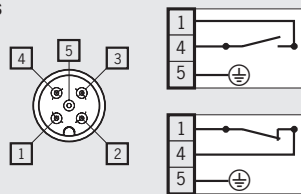
Design EGT12, M12 x 1, dome plunger
Plug connector M12 with PE connection

Design EGT12, M12 x 1, dome plunger
Plug connector M12, long plunger

Dimension drawings



Wiring diagrams



Brass, nickel-plated	Brass, nickel-plated
Stainless steel	Stainless steel
IP 67	IP 67
Mating connector inserted and screwed tight	Mating connector inserted and screwed tight
-25 ... +80	-25 ... +80
8	5
30 x 10 ⁶ operating cycles	5 x 10 ⁶ operating cycles
1 x 10 ⁶ operating cycles (dog 30°)	
± 0.01	± 0.01
approx. 16	approx. 16
Reed contact	Reed contact
1 NO or 1 NC	1 NO or 1 NC
Rhodium	Rhodium
50	50
AC-12 U _e 30 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A
DC-13 U _e 24 V I _e 0.3 A	DC-13 U _e 24 V I _e 0.3 A
1	1
1	1
0.4	0.4
Plug connector M12 ³⁾	Plug connector M12 ³⁾

-	-
-	-
075426 EGT12ASFM5	095112 EGT12ASFM5C2083
-	-
-	-
075427 EGT12RSFM5	On request



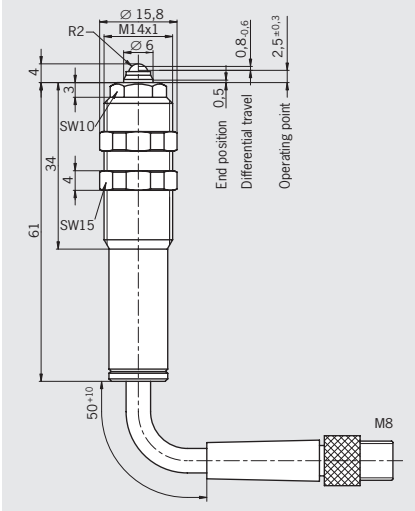
Precision single hole fixing limit switches

- ▶ With reed contact and protective diode
- ▶ Plunger material stainless steel
- ▶ Any installation position

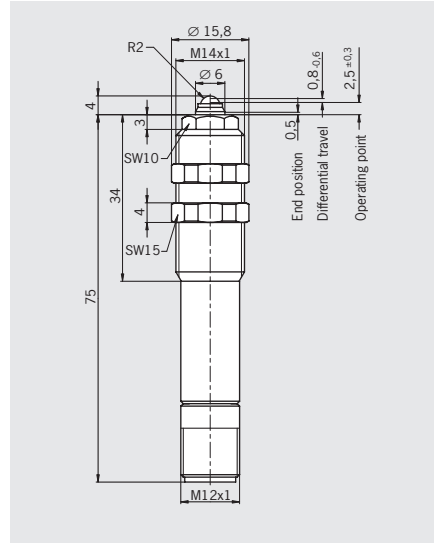


Design EGT11, M14 x 1, ball plunger
Connection cable 0.5 m with plug connector M8

Dimension drawings

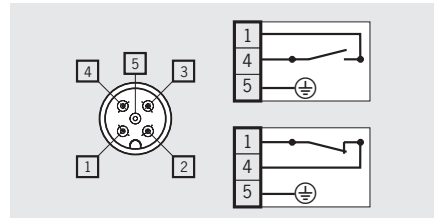
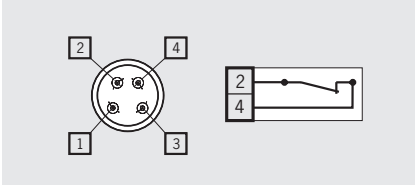


Design EGT11, M14 x 1, ball plunger
Plug connector M12 with PE connection



⚠ Never switch incandescent lamps. Not even for test purposes.
Single hole fixing limit switches must not be used as an end stop.

Wiring diagrams



Technical data

	Sleeve	Brass, nickel-plated	Brass, nickel-plated
Housing material	Threaded section	Stainless steel	Stainless steel
Degree of protection acc. to IEC 60529		IP 67	IP 67
		Mating connector inserted and screwed tight	Mating connector inserted and screwed tight
Ambient temperature	[°C]	-5 ... +65	-25 ... +80
Approach speed, max.	[m/min]	60	60
Mechanical life	axial actuation	30 x 10 ⁶ operating cycles	30 x 10 ⁶ operating cycles
	radial actuation	-	5 x 10 ⁶ operating cycles (dog 15°)
Operating point accuracy ²⁾	[mm]	± 0.01	± 0.01
Actuating force (end position)	[N]	approx. 2	approx. 3
Switching element		Reed contact	Reed contact
Switching contact		1 NC	1 NO or 1 NC
Contact material		Rhodium	Rhodium
Rated insulation voltage U _i	[V]	50	50
Utilization category according to IEC 60947-5-1		AC-12 U _e 30 V I _e 0.3 A DC-13 U _e 24 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A DC-13 U _e 24 V I _e 0.3 A
Switching current, min., at 24 V	[mA]	1	1
Switching voltage, min.	[V DC]	1	1
Short circuit protection (control circuit fuse)	[A gG]	0.4	0.4
Connection		Plug connector M8 ³⁾	Plug connector M12 ³⁾

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

3) Mating connector M8 see page 48. Mating connector M12 see page 46 and 47

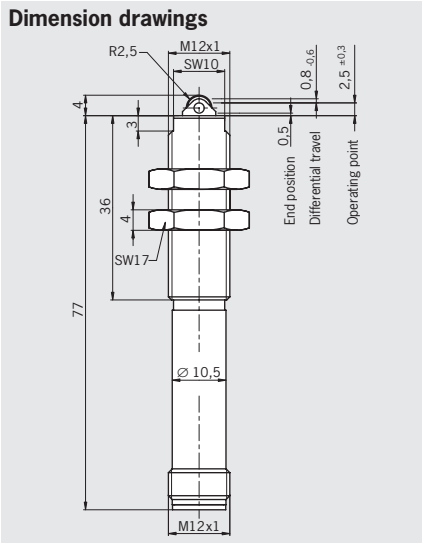
Ordering table

Switching element	Connection	Part number	Product name
1 NO	Connection cable 0.5 m with plug connector M8	-	-
	Connection cable 5 m	-	-
	Plug connector	-	093352 EGT11A2NSFM5
1 NC	Connection cable 0.5 m with plug connector M8	084000 EGT11R2N50SAM4	-
	Connection cable 5 m	-	-
	Plug connector	-	091848 EGT11R2NSFM5

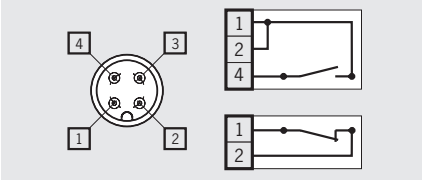


Design EGT12, M12 x 1, roller plunger
 Plug connector M12, double insulated

Dimension drawings



Wiring diagrams



Brass, nickel-plated
Stainless steel
IP 67
Mating connector inserted and screwed tight
-25 ... +80
20
30 x 10 ⁶ operating cycles
± 0.01
approx. 16
Reed contact
1 NO or 1 NC
Rhodium
50
AC-12 U _e 30 V I _e 0.3 A
DC-13 U _e 24 V I _e 0.3 A
1
1
0.4
Plug connector M12 ³⁾

-
-
078483 EGT12ARSEM4C1888
-
-
079139 EGT12RRSEM4C1888

Precision single hole fixing limit switches

- ▶ With reed contact
- ▶ Plunger material stainless steel
- ▶ Any installation position



⚠ Never switch incandescent lamps. Not even for test purposes.
Single hole fixing limit switches must not be used as an end stop.

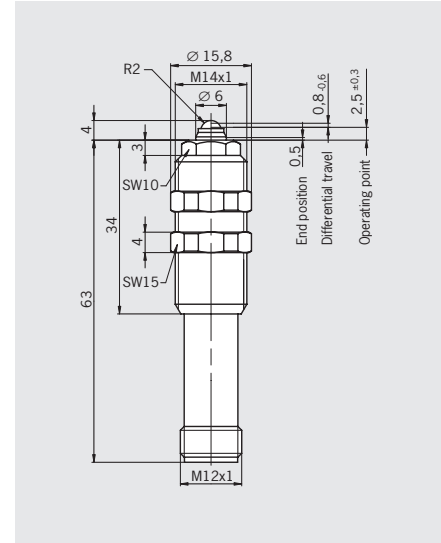
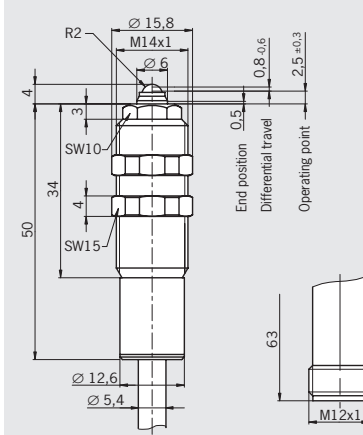


For mating connector with LED display

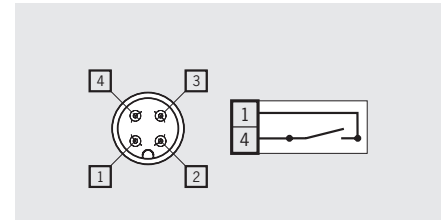
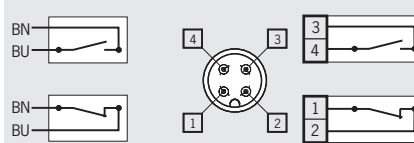


Design EGT1/4, M14 x 1, ball plunger
Plug connector M12

Dimension drawings



Wiring diagrams



Technical data

Housing material	Sleeve	Plastic	Brass, nickel-plated	Brass, nickel-plated
	Threaded section	Stainless steel		Stainless steel
Degree of protection acc. to IEC 60529		IP 68	IP 67 ⁴⁾	IP 67 Mating connector inserted and screwed tight
Ambient temperature	[°C]	-25 ¹⁾ ... +80	-25 ... +80	-25 ... +80
Approach speed, max.	[m/min]	8		8
Mechanical life (axial)		30 x 10 ⁶ operating cycles		30 x 10 ⁶ operating cycles
Operating point accuracy ²⁾	[mm]	± 0.01		± 0.01
Actuating force (end position)	[N]	Approx. 16 / 3 on request		Approx. 16 / 3 on request
Switching element		Reed contact		Reed contact
Switching contact		1 NO or 1 NC		1 NO or 1 NC
Contact material		Rhodium		Rhodium
Rated insulation voltage U _i	[V]	250 □	50	50
Utilization category according to IEC 60947-5-1	AC-12 DC-13	U _e 230 V I _e 0.03 A U _e 24 V I _e 0.3 A	U _e 30 V I _e 0.3 A U _e 24 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A DC-13 U _e 24 V I _e 0.3 A
Switching current, min., at 24 V	[mA]	1		1
Switching voltage, min.	[V DC]	1		1
Short circuit protection (control circuit fuse)	[A gG]	0.4		0.4
Connection		PUR cable 2 x 0.5 mm ² , encapsulated	Plug connector M12 ³⁾	Plug connector M12 ³⁾

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

3) Mating connector see page 46 and 47.

Ordering table

Switching element	Connection	Ordering code	Accessories
1 NO	Connection cable 2 m	001366 ⁵⁾ EGT1/4A2000	-
	Connection cable 5 m	001368 ⁵⁾ EGT1/4A5000	-
	Plug connector	033976 EGT1/4ASEM4	075644 EGT1/4ASEM4C1802
1 NC	Connection cable 2 m	001371 ⁵⁾ EGT1/4R2000	-
	Connection cable 5 m	001372 ⁵⁾ EGT1/4R5000	-
	Plug connector	033982 EGT1/4RSEM4	-

Made of high-quality stainless steel



With scraper made of PU



With scraper made of PU

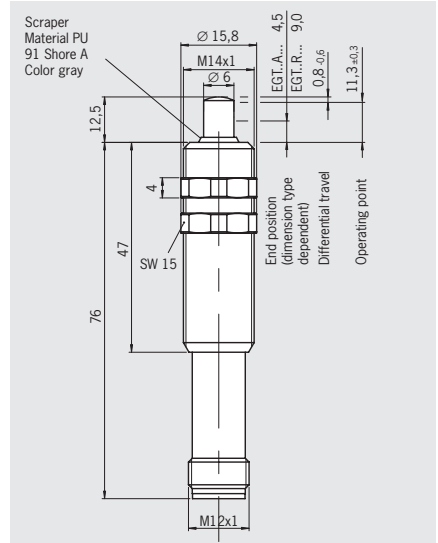
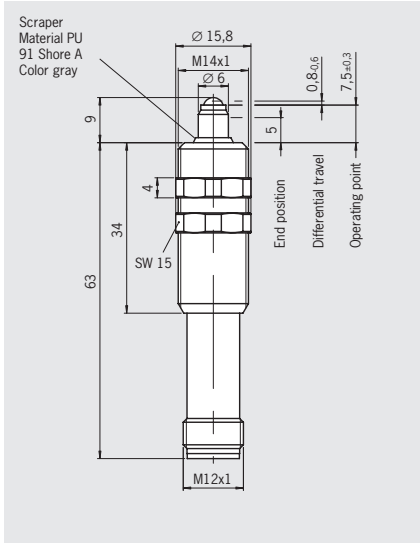
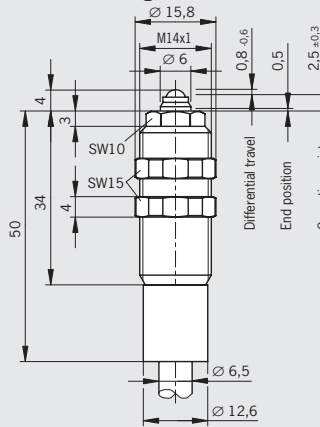


Design EGT1/4, M14 x 1, ball plunger
Connection cable, max. pressure 300 kPa

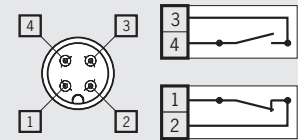
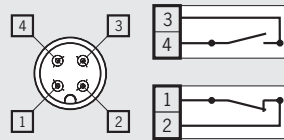
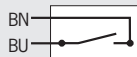
Design EGT1/4, M14 x 1, ball plunger
Plug connector M12

Design EGT1/4, M14 x 1, dome plunger
Plug connector M12

Dimension drawings



Wiring diagrams



High-quality stainless steel	Brass, nickel-plated Stainless steel	Brass, nickel-plated Stainless steel
IP 68	IP 67	IP 67
-25 ... +80	-25 ... +80	-25 ... +80
8	approx. 16	8
30 x 10 ⁶ operating cycles	5 x 10 ⁶ operating cycles	30 x 10 ⁶ operating cycles
± 0.01	± 0.01	± 0.01
approx. 16	approx. 16	approx. 16
Reed contact	Reed contact	Reed contact
1 NO	1 NO or 1 NC	1 NO
Rhodium	Rhodium	Rhodium
50	50	50
AC-12 U _e 30 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A
DC-13 U _e 24 V I _e 0.3 A	DC-13 U _e 24 V I _e 0.3 A	DC-13 U _e 24 V I _e 0.3 A
1	1	1
1	1	1
0.4	0.4	0.4
Hydrofirm cable 2 x 0.5 mm ² , encapsulated	Plug connector M12 ³⁾	Plug connector M12 ³⁾

094982 EGT1/4A2000C2079	-	102476 EGT1/4A2000C2137
-	-	-
-	095278 EGT1/4ASEM4C2088	098071 EGT1/4ASEM4C2137
-	-	-
-	-	-
-	104316 EGT1/4RSEM4C2088	104372 EGT1/4RSEM4C2137

Precision single hole fixing limit switches

- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position



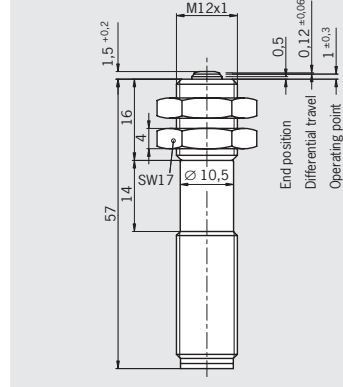
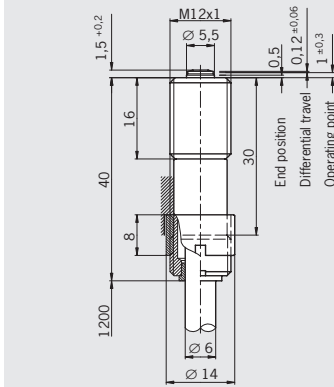
⚠ Single hole fixing limit switches must not be used as an end stop.



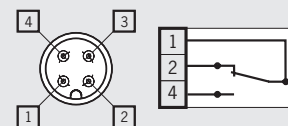
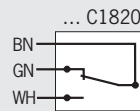
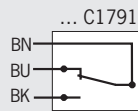
Design EGM12, M12 x 1, flat plunger
Connection cable, double insulated

Design EGM12, M12 x 1, flat plunger
Plug connector M12

Dimension drawings



Wiring diagrams



Technical data

	Stainless steel		Stainless steel	
	IP 65		IP 65 Mating connector inserted and screwed tight	
Housing material	Stainless steel		Stainless steel	
Degree of protection acc. to IEC 60529	IP 65		IP 65 Mating connector inserted and screwed tight	
Ambient temperature [°C]	-20 ¹⁾ ... +80	-30 ... +80	-20 ... +80	-30 ... +85
Approach speed, max. [m/min]	8		8	
Mechanical life (axial)	1 x 10 ⁶ operating cycles		1 x 10 ⁶ operating cycles	
Operating point accuracy ²⁾ [mm]	± 0.01		± 0.01	
Actuating force (end position) [N]	approx. 16		approx. 16	
Switching element	Snap-action switching contact		Snap-action switching contact	
Switching contact	1 changeover contact		1 changeover contact	
Contact material	Silver alloy, gold-plated		Silver alloy, gold-plated	
Rated insulation voltage U _i [V]	250 □		50	
Rated impulse withstand voltage U _{imp}	2.5		1.5	
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A		AC-15 U _e 50 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A	
Switching current, min., at 24 V [mA]	10		10	
Switching voltage, min. [V DC]	12		12	
Short circuit protection (control circuit fuse) [A gG]	2		2	
Connection	PUR cable 3 x 0.5 mm ²	Silicone cable 3 x 0.5 mm ²	Plug connector M12 ³⁾	

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

3) Mating connector see page 46, 47 and 48.

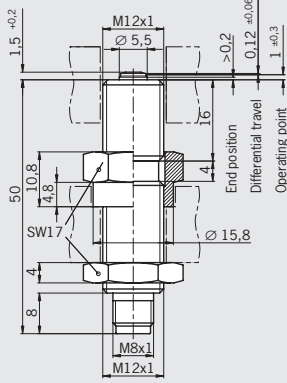
Ordering table

		075556	076464		
		EGM12-1200C1791	EGM12-1200C1820	-	-
1 changeover contact	Connection cable 1.2 m	075556 EGM12-1200C1791	076464 EGM12-1200C1820	-	-
	Connection cable 2 m	-	-	-	-
	Connection cable 4 m	076154 EGM12-4000C1791	-	-	-
	Connection cable 5 m	-	-	-	-
	Plug connector	-	-	082205 EGM12SEM4	093733 EGM12SEM4C1820

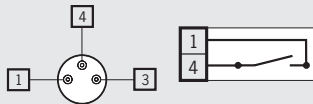


Design EGM12, M12 x 1, flat plunger
Plug connector M8

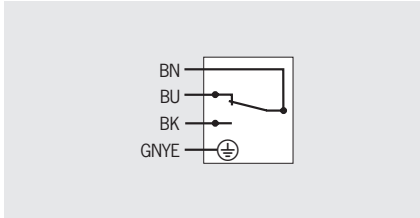
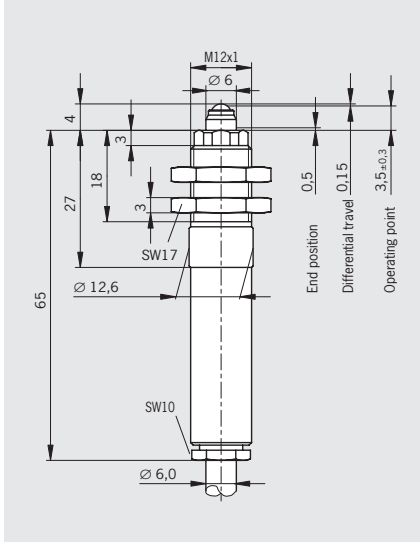
Dimension drawings



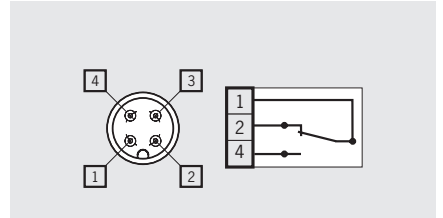
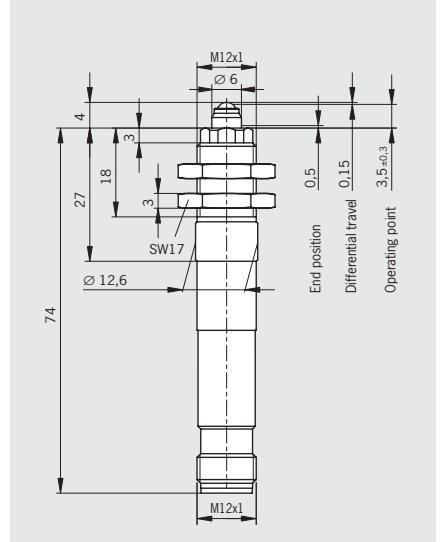
Wiring diagrams



Design EGT1, M12 x 1, ball plunger
Connection cable with PE connection



Design EGT1, M12 x 1, ball plunger
Plug connector M12



Stainless steel	Brass, nickel-plated	Brass, nickel-plated
IP 65	IP 67	IP 67
Mating connector inserted and screwed tight	Mating connector inserted and screwed tight	Mating connector inserted and screwed tight
-20 ... +85	-25 ¹⁾ ... +80	-25 ... +80
8	8	8
1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
± 0.01	± 0.01	± 0.01
approx. 16	approx. 20	approx. 20
Snap-action switching contact	Snap-action switching contact	Snap-action switching contact
1 NO	1 changeover contact	1 changeover contact
Silver alloy, gold-plated	Silver alloy, gold-plated	Silver alloy, gold-plated
50	250	50
1.5	2.5	2.5
AC-15 U _e 24 V I _e 0.5 A	AC-15 U _e 230 V I _e 0.5 A	AC-15 U _e 50 V I _e 0.5 A
DC-13 U _e 24 V I _e 0.6 A	DC-13 U _e 24 V I _e 0.6 A	DC-13 U _e 24 V I _e 0.6 A
10	10	10
12	12	12
2	2	2
Plug connector M8 ³⁾	PUR cable 4 x 0.5 mm ²	Plug connector M12 ³⁾

-	-	-
-	092695 EGT1M12-2000	-
-	-	-
-	093364 EGT1M12-5000	-
077228 EGM12SAM3C1868	-	093365 EGT1M12SEM4

Precision single hole fixing limit switches

- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position

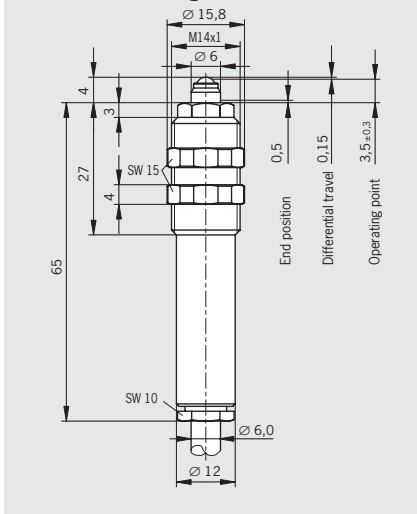


⚠ Single hole fixing limit switches must not be used as an end stop.

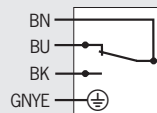


Design EGT1, M14 x 1, ball plunger Connection cable with PE connection

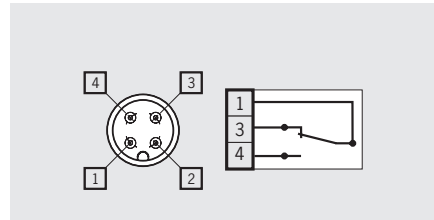
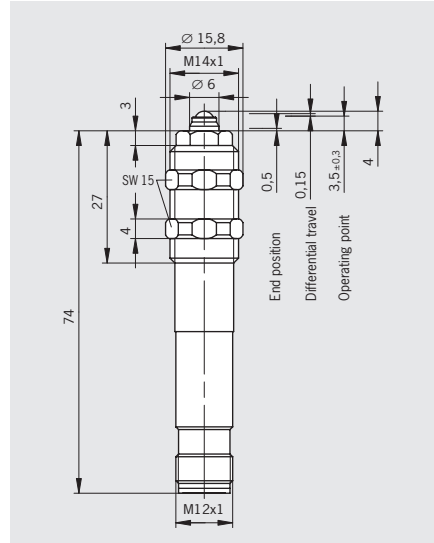
Dimension drawings



Wiring diagrams



Design EGT1, M14 x 1, ball plunger Plug connector M12



Technical data

	Design EGT1, M14 x 1, ball plunger Connection cable with PE connection	Design EGT1, M14 x 1, ball plunger Plug connector M12
Housing material	Brass, nickel-plated	Brass, nickel-plated
Degree of protection acc. to IEC 60529	IP 67	IP 67 Mating connector inserted and screwed tight
Ambient temperature [°C]	-25 ¹⁾ ... +80	-25 ... +80
Approach speed, max. [m/min]	8	8
Mechanical life (axial)	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
Operating point accuracy ²⁾ [mm]	± 0.01	± 0.01
Actuating force (end position) [N]	approx. 20	approx. 20
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 changeover contact	1 changeover contact
Contact material	Silver alloy, gold-plated	Silver alloy, gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp}	2.5	2.5
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A	AC-15 U _e 50 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A
Switching current, min., at 24 V [mA]	10	10
Switching voltage, min. [V DC]	12	12
Short circuit protection (control circuit fuse) [A gG]	2	2
Connection	PUR cable 4 x 0.5 mm ²	Plug connector M12 ³⁾

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

3) Mating connector see page 46 and 47.

Ordering table

Ordering code	Description	Part number
1 changeover contact	Connection cable 2 m	001732 EGT1-2000
	Connection cable 5 m	001733 EGT1-5000
	Plug connector	- 019727 EGT1SEM4

For plug connector
with LED display



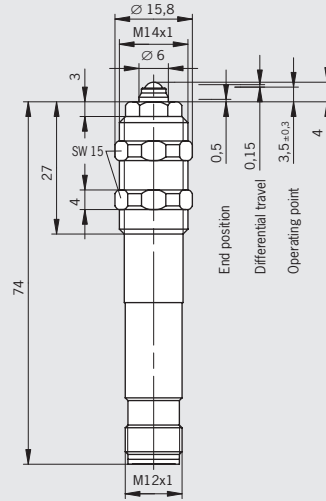
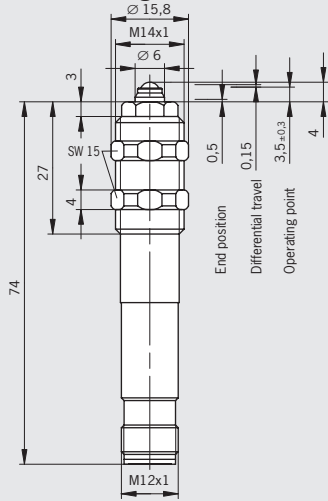
Design EGT1, M14 x 1, ball plunger
Plug connector M12

Suitable for aggressive coolants,
diaphragm made out of Viton

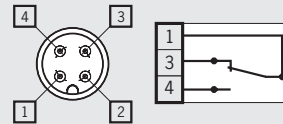
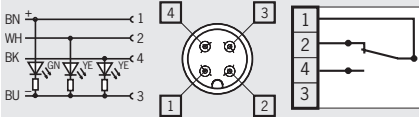


Design EGT1, M14 x 1, ball plunger
Plug connector M12

Dimension drawings



Wiring diagrams



Brass, nickel-plated	Brass, nickel-plated
IP 67	IP 67
Mating connector inserted and screwed tight	Mating connector inserted and screwed tight
-25 ... +80	-5 ... +80
8	8
1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
± 0.01	± 0.01
approx. 20	approx. 20
Snap-action switching contact	Snap-action switching contact
1 changeover contact	1 changeover contact
Silver alloy, gold-plated	Silver alloy, gold-plated
50	50
2.5	2.5
DC-13 U _e 24 V I _e 0.6 A	AC-15 U _e 50 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A
10	10
12	12
2	2
Plug connector M12 ³⁾	Plug connector M12 ³⁾

-	-
-	-
054250 EGT1SEM4C1613	077347 EGT1SEM4C1832

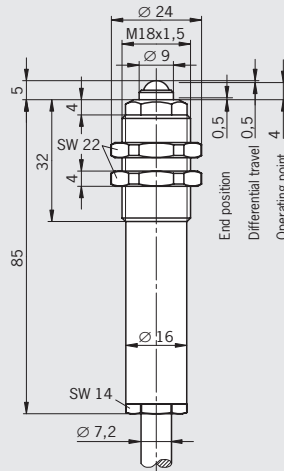
Precision single hole fixing limit switches

- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position

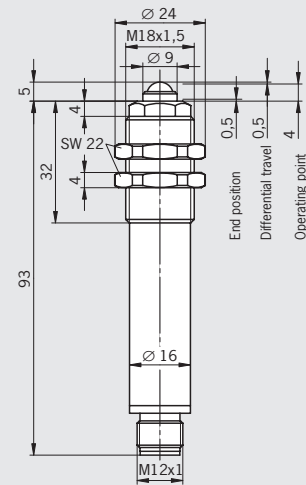


Design EGT2, M18 x 1.5, ball plunger Connection cable with PE connection

Dimension drawings

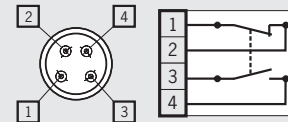
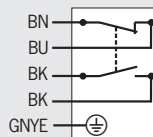


Design EGT2, M18 x 1.5, ball plunger Plug connector M12



⚠ Single hole fixing limit switches must not be used as an end stop.

Wiring diagrams



Technical data

	Brass, nickel-plated	Brass chromium plated
Housing material	Brass, nickel-plated	Brass chromium plated
Degree of protection acc. to IEC 60529	IP 67	IP 67 Mating connector inserted and screwed tight
Ambient temperature [°C]	-5 ... +60	-5 ... +60
Approach speed, max. [m/min]	10	10
Mechanical life	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
Operating point accuracy ¹⁾ [mm]	± 0.01	± 0.01
Actuating force (end position) [N]	approx. 24	approx. 24
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 NC and 1 NO	1 NC and 1 NO
Contact material	Fine silver gold-plated	Fine silver gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp}	2.5	2.5
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 1 A	AC-15 U _e 30 V I _e 2 A DC-13 U _e 24 V I _e 1 A
Switching current, min., at 24 V [mA]	10	10
Switching voltage, min. [V DC]	12	12
Short circuit protection (control circuit fuse) [A gG]	2	2
Connection	PUR cable 5 x 0.75 mm ²	Plug connector M12 ²⁾

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) Mating connector see page 46 and 47.

Ordering table

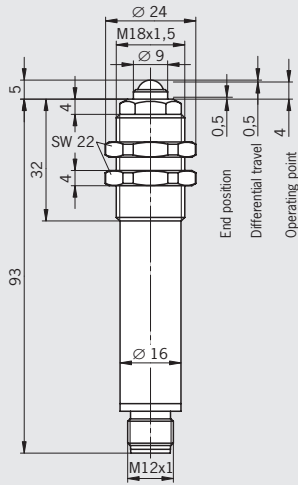
Ordering code	Description	Product code
1 NC + 1 NO	Connection cable 2 m	001864 EGT2-2000
	Connection cable 5 m	001865 EGT2-5000
	Plug connector	- 052504 EGT2SEM4



Switch head can be used as end stop

Design EGT2, M18 x 1.5, ball plunger
Plug connector M12 with PE connection

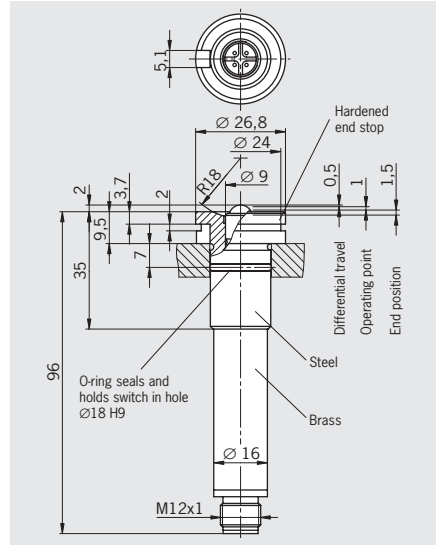
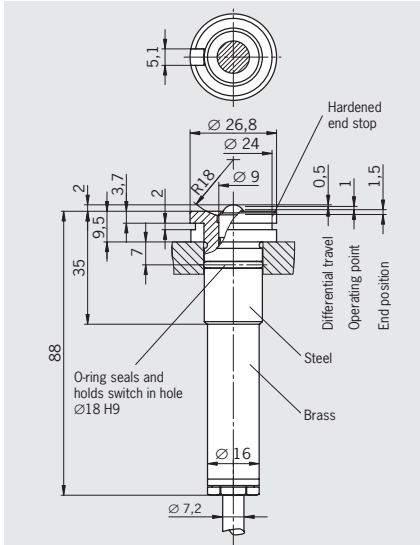
Dimension drawings



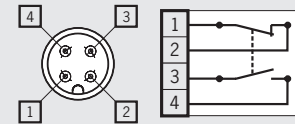
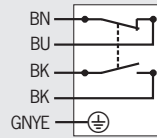
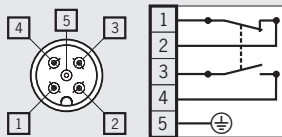
Switch head can be used as end stop

Design EGT3, Ø 18, ball plunger
Connection cable with PE connection

Design EGT3, Ø 18, ball plunger
Plug connector M12



Wiring diagrams



Brass chromium plated	Steel/brass	Steel/brass
IP 67	IP 67	IP 67
Mating connector inserted and screwed tight		Mating connector inserted and screwed tight
-5 ... +60	-5 ... +60	-5 ... +60
10	Contact force max. 40 kN	Contact force max. 40 kN
1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
± 0.01	± 0.01	± 0.01
approx. 24	approx. 18	approx. 18
Snap-action switching contact	Snap-action switching contact	Snap-action switching contact
1 NC and 1 NO	1 NC and 1 NO	1 NC and 1 NO
Fine silver gold-plated	Fine silver gold-plated	Fine silver gold-plated
50	250	50
2.5	2.5	2.5
AC-15 U _e 30 V I _e 2 A	AC-15 U _e 230 V I _e 2 A	AC-15 U _e 30 V I _e 2 A
DC-13 U _e 24 V I _e 1 A	DC-13 U _e 24 V I _e 1 A	DC-13 U _e 24 V I _e 1 A
10	10	10
12	12	12
2	2	2
Plug connector M12 ²⁾	PUR cable 5 x 0.75 mm ²	Plug connector M12 ²⁾

-	001896 EGT3-2000	-
-	001897 EGT3-5000	-
042819 EGT2SEM5	-	070834 EGT3SEM4

Precision single hole fixing limit switches

With 4 switching contacts

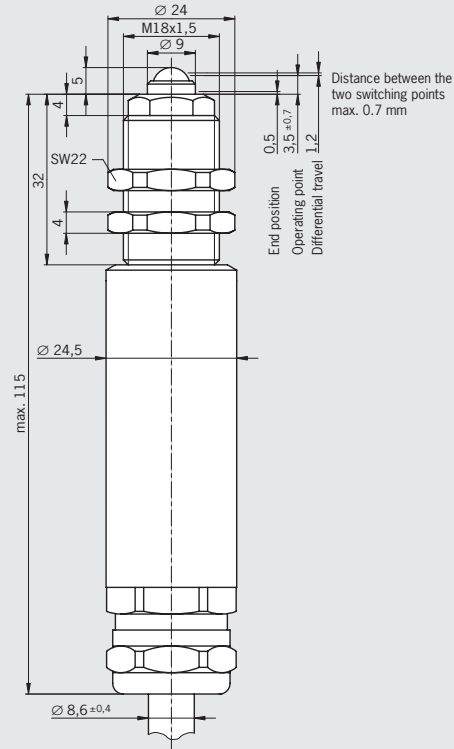


- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position



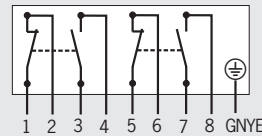
Design EGT4, M18 x 1.5, ball plunger
Connection cable with PE connection

Dimension drawings



! Single hole fixing limit switches must not be used as an end stop.

Wiring diagrams



Technical data

Housing material	Brass, nickel-plated
Degree of protection acc. to IEC 60529	IP 67
Ambient temperature [°C]	-25 ¹⁾ ... +70
Approach speed, max. [m/min]	10
Mechanical life	5 x 10 ⁵ operating cycles
Operating point accuracy ²⁾ [mm]	± 0.01
Actuating force (end position) [N]	approx. 25
Switching element	Snap-action switching contact
Switching contact	2 NC and 2 NO
Contact material	Fine silver gold-plated
Rated insulation voltage U _i [V]	250
Rated impulse withstand voltage U _{imp}	2.5
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 1 A
Switching current, min., at 24 V [mA]	10
Switching voltage, min. [V DC]	12
Short circuit protection (control circuit fuse) [A gG]	2
Connection	PUR cable 9 x 0.5 mm ²

1) Cable hard wired.

2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

Ordering table

2 NC + 1 NO	Connection cable 2 m	094339 EGT4-2000
	Connection cable 5 m	092026 EGT4-5000
	Connection cable 10 m	093967 EGT4-10000

Precision single hole fixing limit switches

- ▶ With slow-action switching element
- ▶ Plunger and housing made of high-quality stainless steel
- ▶ Any installation position
- ▶ Threaded section M12 x 1

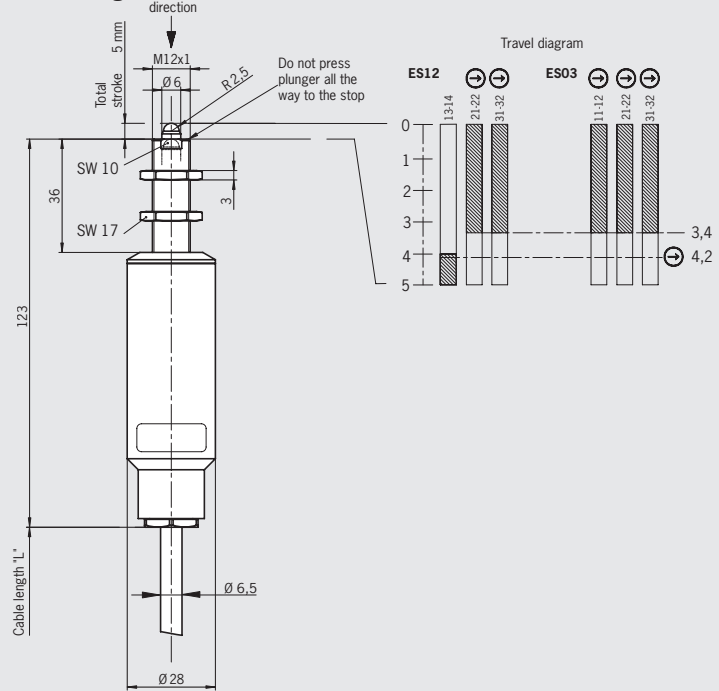


Switching element, with 3 switching contacts



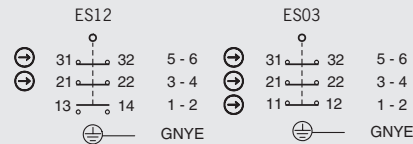
Design EGZ12, M12 x 1, dome plunger
Connection cable with PE connection

Dimension drawings



⚠ Single hole fixing limit switches must not be used as an end stop.

Wiring diagrams



Technical data

Housing material	Stainless steel
Plunger material	Stainless steel 60 HRC hardened and polish-ground
Degree of protection acc. to IEC 60529	IP 67
Ambient temperature [°C]	-20 ¹⁾ ... +80
Approach speed, max. [m/min]	8
Mechanical life	3 x 10 ⁶ operating cycles
Actuating force at 20 °C [N]	< 16
Switching element	Slow-action switching contact
Switching contact	See travel diagram
Contact material	Silver alloy, gold flashed
Rated insulation voltage U _i [V]	250
Rated impulse withstand voltage U _{imp}	2.5
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 4 A
Switching current, min., at 24 V [mA]	1
Switching voltage, min. [V DC]	12
Short circuit protection (control circuit fuse) [A gG]	4
Connection	PUR cable 7 x 0.5 mm ²

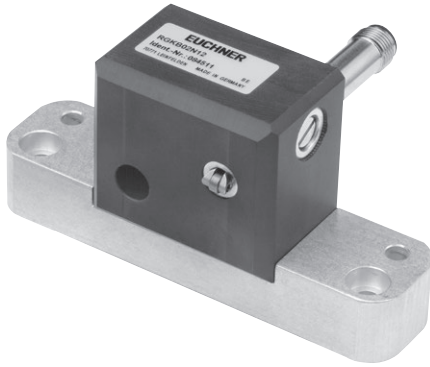
1) Cable hard wired.

Ordering table

Connection cable	ES12	ES03
Connection cable 5 m	094823 ²⁾ EGZ12-12-5000	On request

Multiple clamping strip

- ▶ For single hole fixing limit switches with threaded section M12 x 1
- ▶ Switch position as for multiple limit switches according to DIN 43697
- ▶ For 2, 4 or 6 single hole fixing limit switches

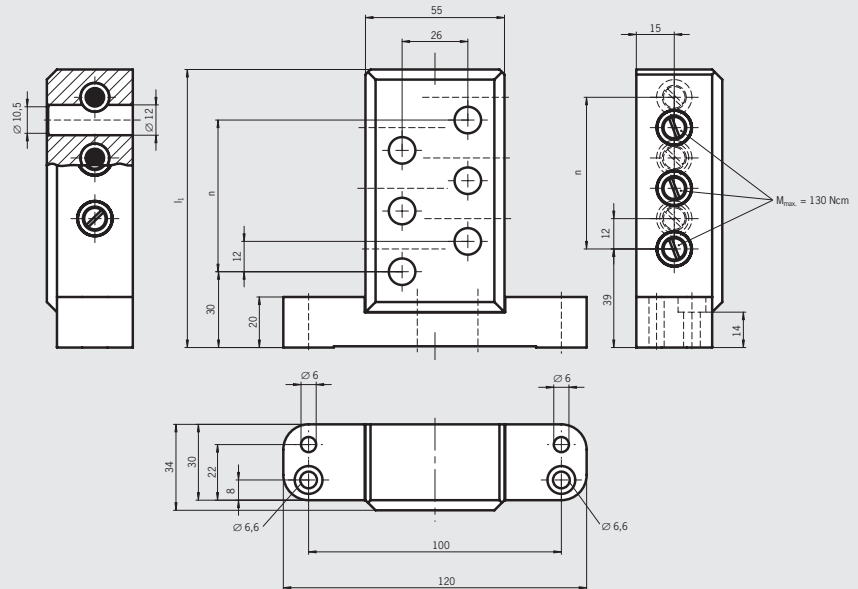


The multiple clamping strip is used for mounting several single hole fixing limit switches of design EGT 12 / EGM 12.

The robust actuator-sensor bracket with quick-action fastening system is mounted on an aluminum flange with fastening holes in accordance with DIN 43697.

Spacing 12 mm

Dimension drawings



Ordering table

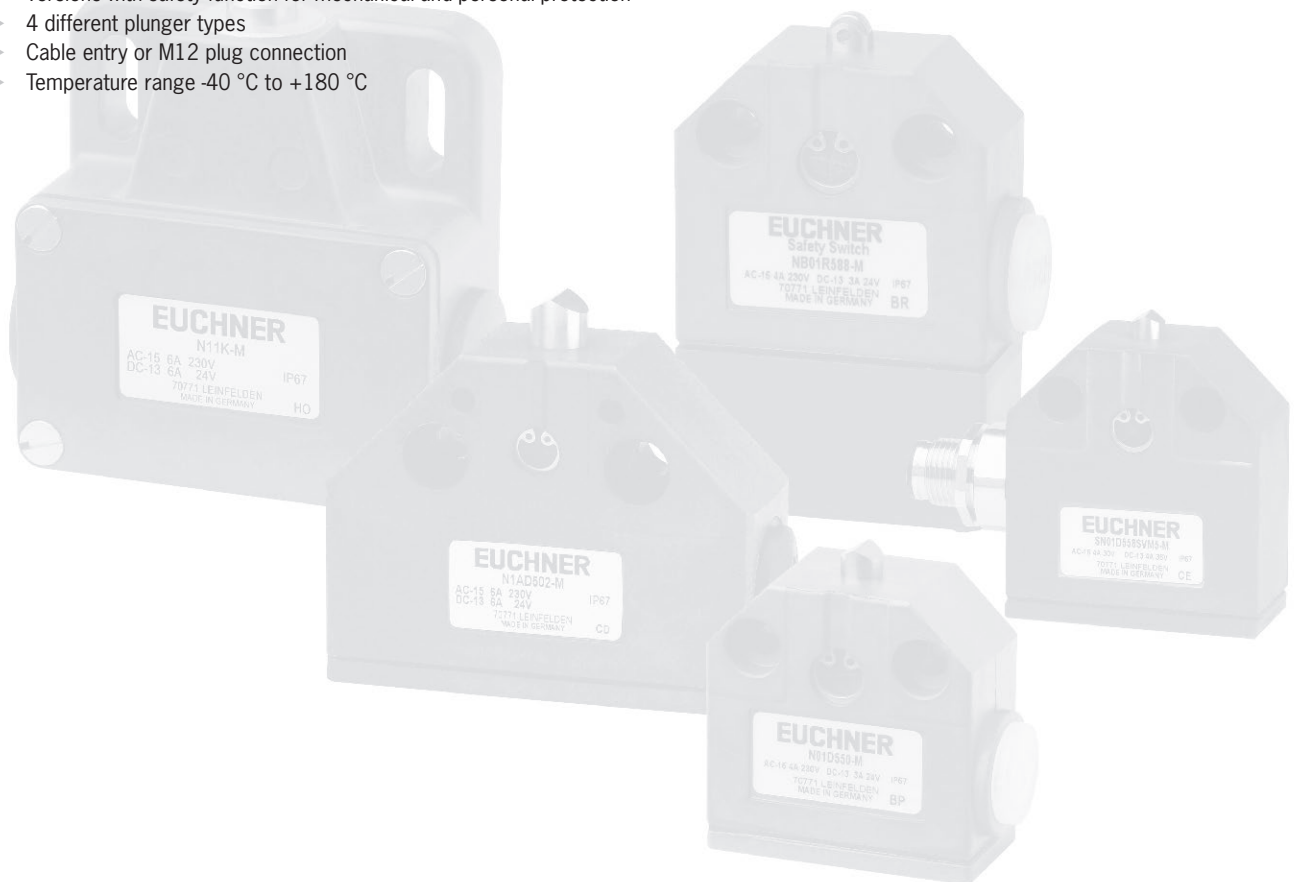
Item	Number of brackets	Dimension l_1 [mm]	Order no.
RGKB02N12	2	62	084511
RGKB04N12	4	86	084514
RGKB06N12	6	110	084510

Precision single limit switches

These switches are used in mechanical and systems engineering for controlling and positioning tasks. The robust housings made of die-cast anodized aluminum are characterized by their high level of mechanical endurance and corrosion resistance.

Features

- ▶ 9 basic types in die-cast aluminum housings
- ▶ From the miniature version 40 x 40 mm to the standard size according to DIN 43693
- ▶ Mechanical life up to 30 million operating cycles
- ▶ Versions with safety function for mechanical and personal protection
- ▶ 4 different plunger types
- ▶ Cable entry or M12 plug connection
- ▶ Temperature range -40 °C to +180 °C



Precision single limit switches

► Plunger material stainless steel



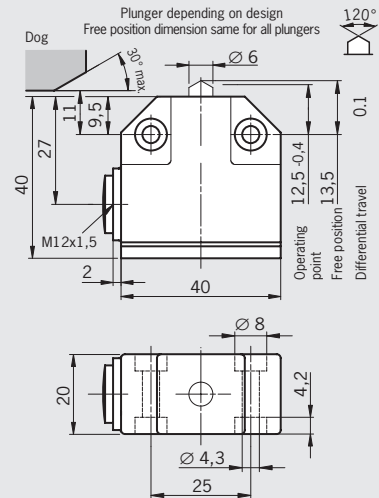
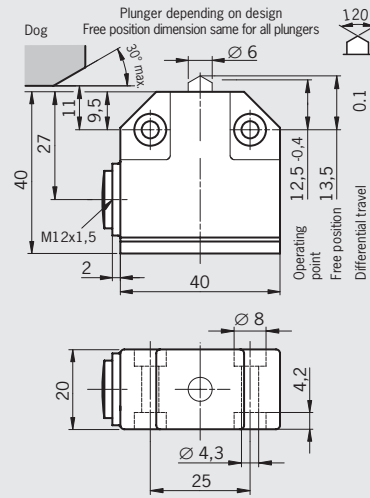
For temperatures up to 180 °C



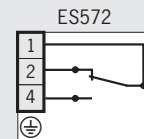
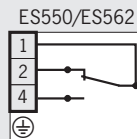
Design N01 Cable entry M12 x 1.5

Design N01 Cable entry M12 x 1.5

Dimension drawings



Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67			IP 67		
Ambient temperature [°C]	-5 ... +80			-5 ... +180		
Plunger type	Chisel	Roller	Ball	Chisel	Roller	Ball
Operating point accuracy ¹⁾ [mm]	± 0.02	± 0.05	± 0.03	± 0.02	± 0.05	± 0.03
Approach speed, max. ²⁾ [m/min]	20	50	8	20	50	8
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	15			15		
Switching element	ES550		ES562	ES572		
Switching contact	1 changeover contact			1 changeover contact		
Switching principle	Snap-action switching contact			Snap-action switching contact		
Mechanical life	1 x 10 ⁷ operating cycles			5 x 10 ⁵ operating cycles at -5 ... +125 °C, 200 h at +180 °C		
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5		
Rated insulation voltage U _i [V]	250			250		
Utilization category according to IEC 60947-5-1	AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A		DC-13 U _e 30 V I _e 100 mA	AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 1 A		
Contact material	Silver, gold-plated		Gold alloy	Fine silver		
Switching current, min., at switching voltage [mA]	10		5	10		
[V DC]	24		5	24		
Short circuit protection (control circuit fuse) [A gG]	6		0.125	5		
Connection	Soldered connection, 1.0 mm ² max.			Soldered connection, 1.0 mm ² max.		

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

3) Mating connector see page 46 and 47.

Ordering table

Plunger type		ES550	ES562	ES572
Chisel plunger		084902 N01D550-M	087151 N01D562-M	087162 N01D572-M
Roller plunger	R = 2.5 mm	084903 N01R550-M	085243 N01R562-M	087163 N01R572-M
Ball plunger		084904 N01K550-M	087152 N01K562-M	087164 N01K572-M

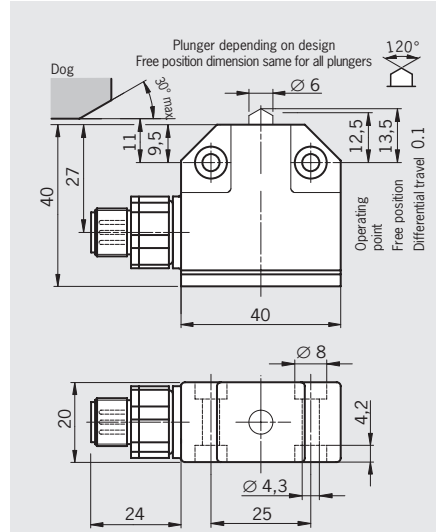
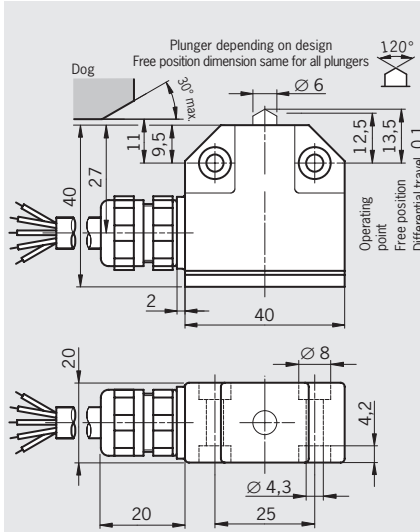
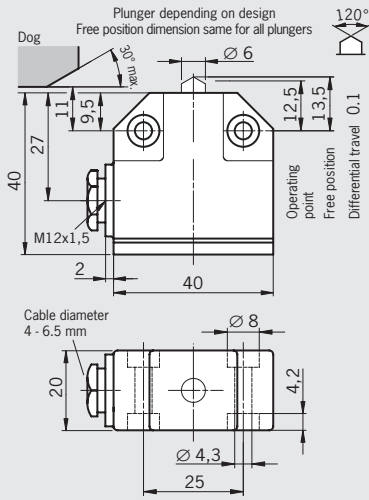


Design N01
Cable gland M12 x 1.5

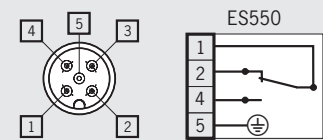
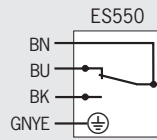
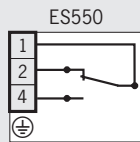
Design N01
Connection cable, length 5 m

Design N01
M12 plug adjustable, 4-pin + PE

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized			Die-cast aluminum, anodized			Die-cast aluminum, anodized		
IP 67			IP 67			IP 67		
-5 ... +80			-5 ... +80			-5 ... +80		
Chisel ± 0.02	Roller ± 0.05	Ball ± 0.03	Chisel ± 0.02	Roller ± 0.05	Ball ± 0.03	Chisel ± 0.02	Roller ± 0.05	Ball ± 0.03
20	50	8	20	50	8	20	50	8
0.01			0.01			0.01		
15			15			15		
ES550			ES550			ES550		ES562
1 changeover contact			1 changeover contact			1 changeover contact		
Snap-action switching contact			Snap-action switching contact			Snap-action switching contact		
1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles		
2.5			2.5			2.5		
250			250			50	50	
AC-15 U _e 230 V I _e 2 A			AC-15 U _e 230 V I _e 2 A			AC-15 U _e 30 V I _e 2 A	DC-13 U _e 30 V I _e	
DC-13 U _e 24 V I _e 2 A			DC-13 U _e 24 V I _e 2 A			DC-13 U _e 24 V I _e 3 A	100 mA	
Silver, gold-plated			Silver, gold-plated			Silver, gold-plated	Gold alloy	
10			10			10	5	
24			24			24	5	
6			6			4	0.125	
Soldered connection, 1.0 mm ² max.			PUR cable 4 x 0.5 mm ²			Plug connector M12 ³⁾		

ES550	ES550	ES550	ES562
085708 N01D550-MC2018	088978 N01D550X5000-M	088623 N01D550SVM5-M	-
094856 N01R550-MC2018	088982 N01R550X5000-M	088622 N01R550SVM5-M	093426 N01R562SVM5-M
089619 N01K550-MC2018	088986 N01K550X5000-M	088624 N01K550SVM5-M	-

Precision single limit switches

► Plunger material stainless steel

For plug connector
with LED display



For operating voltage 230 V

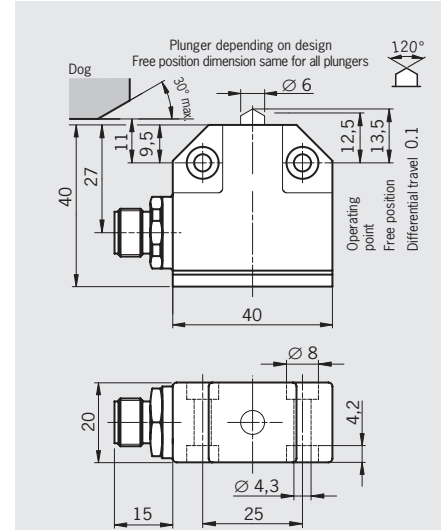
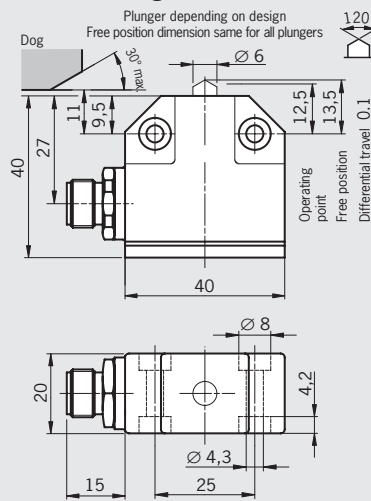


Design N01
M12 plug, 4-pin

Design N01
M12-plug, 4-pin + PE

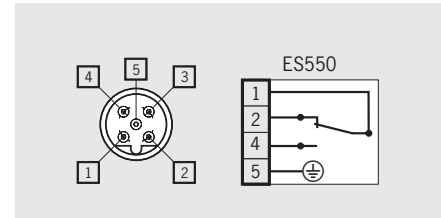
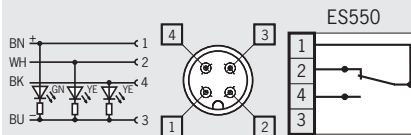


Dimension drawings



⚠ To achieve the positively driven travel, the dimension (11.0.3) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN 1088, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67 Mating connector inserted and screwed tight			IP 67 Mating connector inserted and screwed tight		
Ambient temperature [°C]	-5 ... +80			-5 ... +80		
Plunger type	Chisel	Roller	Ball	Chisel	Roller	Ball
Operating point accuracy ¹⁾ [mm]	± 0.02	± 0.05	± 0.03	± 0.02	± 0.05	± 0.03
Approach speed, max. ²⁾ [m/min]	20	50	8	20	50	8
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	15			15		
Switching element	ES550			ES550		
Switching contact	1 changeover contact			1 changeover contact		
Switching principle	Snap-action switching contact			Snap-action switching contact		
Mechanical life	1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5		
Rated insulation voltage U _i [V]	50			250		
Utilization category according to IEC 60947-5-1	DC-13 U _e 24 V I _e 2 A			AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A		
Contact material	Silver, gold-plated			Silver, gold-plated		
Switching current, min., at switching voltage [mA]	10			10		
Short circuit protection (control circuit fuse) [A gG]	4			4		
Connection	Plug connector M12 ³⁾			Plug connector M12, B-coded ³⁾		

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

3) Mating connector see page 46 and 47

Ordering table

Plunger type		ES550	ES550
Chisel plunger		091003 N01D550-MC1526	-
Roller plunger	R = 2.5 mm	091001 N01R550-MC1526	091257 N01R550SEM5-M
Ball plunger		091002 N01K550-MC1526	-

With safety switching element

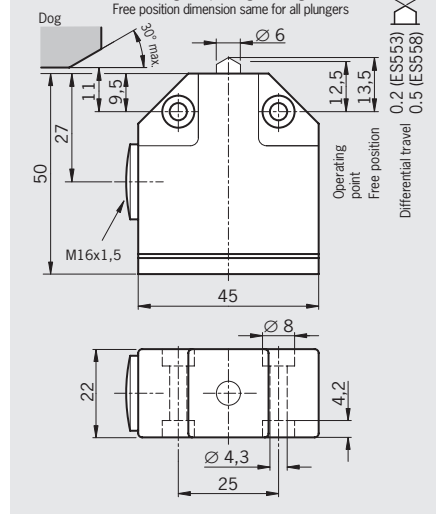
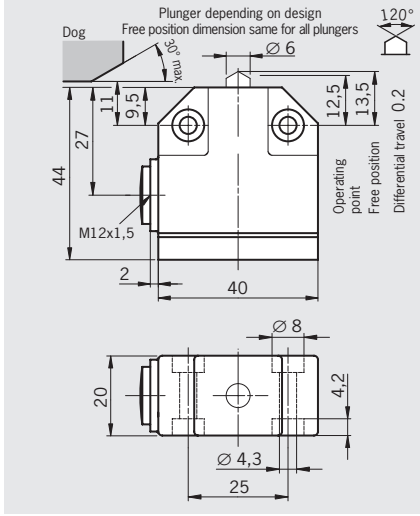
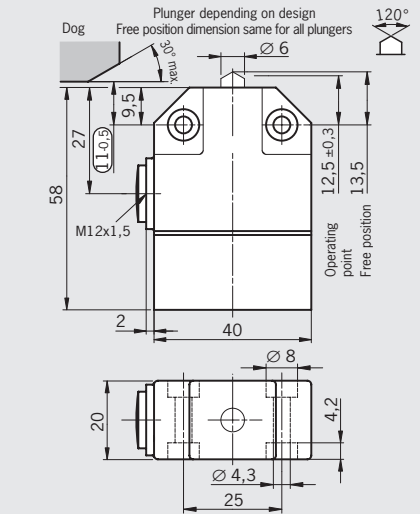


Design NB01
Cable entry M12 x 1.5

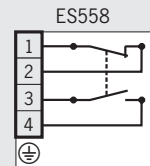
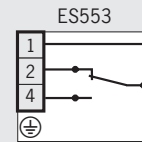
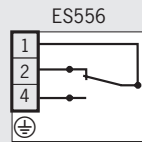
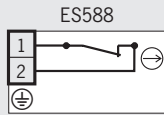
Design NB01
Cable entry M12 x 1.5

Design SN01
Cable entry M16 x 1.5

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized		Die-cast aluminum, anodized			Die-cast aluminum, anodized		
IP 67		IP 67			IP 67		
-25 ... +60		-5 ... +80			-5 ... +80		
Chisel ± 0.02 20	Roller ± 0.05 50	Chisel ± 0.02 20	Roller ± 0.05 50	Ball ± 0.03 8	Chisel ± 0.02 20	Roller ± 0.05 50	Ball ± 0.03 8
0.01		0.01			0.01		
15		15			15		
ES588		ES556			ES553	ES558	
1 NC ⊖		1 changeover contact			1 changeover contact		1 NO + 1 NC
Slow-action switching contact		Snap-action switching contact			Snap-action switching contact		
1 x 10 ⁷ operating cycles		1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles		
2.5		2.5			2.5		
250		250			250		
AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 3 A		AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A			AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A		AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 3 A
Fine silver		Silver, gold-plated			Silver, gold-plated		Silver
1		-			-		10
5		-			-		5
10		6			6		4
Screw terminal, 1.0 mm ² max.		Screw terminal, 1.0 mm ² max.			Screw terminal, 1.0 mm ² max.		Soldered connection, 1.0 mm ² max.

ES588	ES556	ES553	ES558
088584 NB01D588-M	085245 NB01D556-M	085252 SN01D553-M	085260 SN01D558-M
088583 NB01R588-M	085246 NB01R556-M	085253 SN01R553-M	085261 SN01R558-M
-	085247 NB01K556-M	085254 SN01K553-M	085262 SN01K558-M

Precision single limit switches

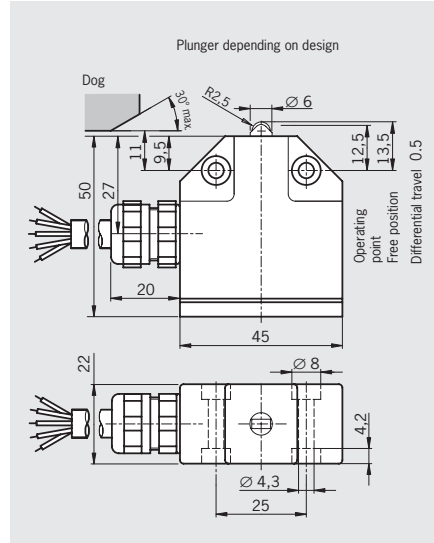
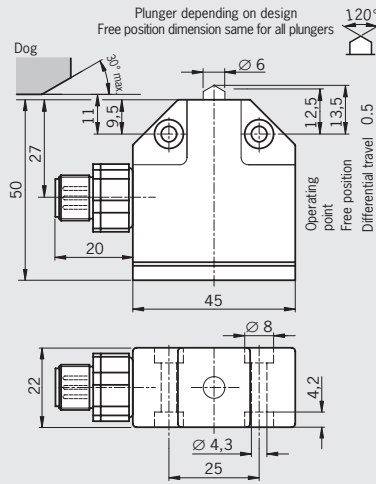


► Plunger material stainless steel

Design SN01
M12 plug adjustable, 4-pin + PE

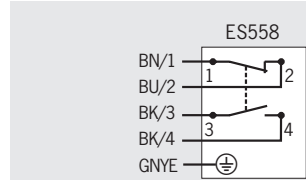
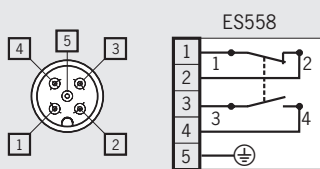
Design SN01
Connection cable, length 2 m

Dimension drawings



⚠ To achieve the positively driven travel, the dimension (12.5) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN 1088, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized
Degree of protection acc. to IEC 60529	IP 67 Mating connector inserted and screwed tight			IP 67
Ambient temperature [°C]	-5 ... +80			-5 ... +80
Plunger type	Chisel	Roller	Ball	Roller
Operating point accuracy ¹⁾ [mm]	± 0.02	± 0.05	± 0.03	± 0.05
Approach speed, max. ²⁾ [m/min]	20	50	8	50
Approach speed, min. [m/min]	0.01			0.01
Actuating force, max. [N]	15			15
Switching element	ES558			ES558
Switching contact	1 NO + 1 NC			1 NO + 1 NC
Switching principle	Snap-action switching contact			Snap-action switching contact
Mechanical life	1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5
Rated insulation voltage U _i [V]	30			250
Utilization category according to IEC 60947-5-1	AC-15 U _e 36 V I _e 4 A DC-13 U _e 24 V I _e 3 A			AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 3 A
Contact material	Silver			Silver
Switching current, min., at switching voltage [mA]	10			10
Switching voltage [V DC]	5			5
Short circuit protection (control circuit fuse) [A gG]	4			4
Connection	Plug connector M12 ³⁾			PUR cable 5 x 0.5 mm ²

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

3) Mating connector 46 and 47.

Ordering table

Plunger type	ES558	ES558
Chisel plunger	088625 SN01D558SVM5-M	-
Roller plunger SN01: R = 2.5 mm N1A: R = 4.0 mm	088626 SN01R558SVM5-M	090515 SN01R558X2000-M
Ball plunger	088627 SN01K558SVM5-M	-

Precision single limit switches

- ▶ Plunger material stainless steel
- ▶ Housing according to DIN 43693
- ▶ Low temperature down to -40 °C

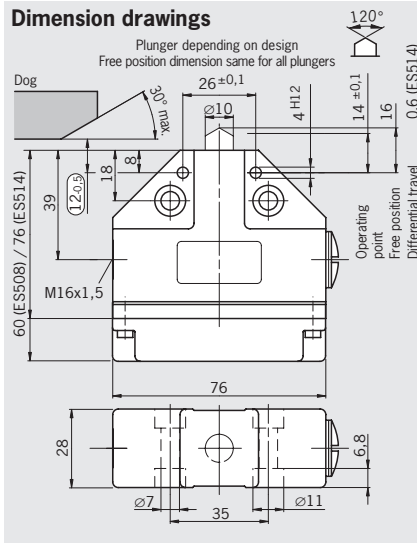
With safety switching element



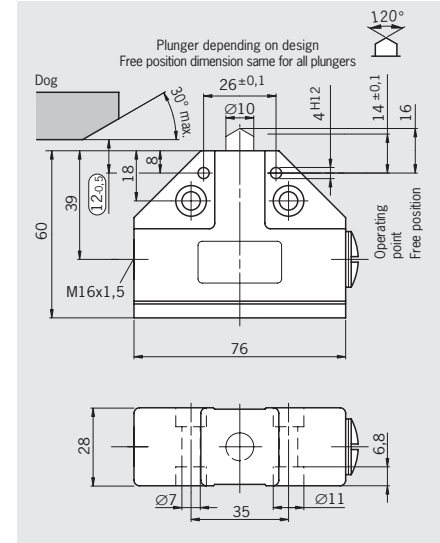
With safety switching element, silicone diaphragm (interior) and low-temperature grease

Design N1A
Cable entry M16 x 1.5

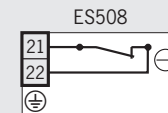
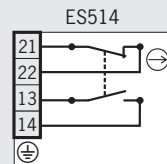
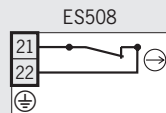
Dimension drawings



Design N1A
Cable entry M16 x 1.5



Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67			IP 67		
Ambient temperature [°C]	-25 ... +80			-40 ... +80		
Plunger type	Chisel	Roller	Dome	Chisel	Roller 3)	Dome
Operating point accuracy ¹⁾ [mm]	± 0.002	± 0.01	± 0.002	± 0.002	± 0.01	± 0.002
Approach speed, max. ²⁾ [m/min]	40	80	10	40	80	10
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	≥ 15			≥ 15		
Switching element	ES508 ⁴⁾		ES514	ES508 ⁴⁾		
Switching contact	1 NC ⊖		1 NO + 1 NC ⊖	1 NC ⊖		
Switching principle	Slow-action switching contact		Snap-action switching contact	Slow-action switching contact		
Mechanical life	30 x 10 ⁶ operating cycles		1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5		
Rated insulation voltage U _i [V]	250			250		
Utilization category according to IEC 60947-5-1	AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A		AC-15 U _e 230V I _e 2.5A DC-13 U _e 24V I _e 6A	AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A		
Contact material	Silver, gold-plated			Silver, gold-plated		
Switching current, min., at switching voltage [mA]	10		5	10		
[V DC]	24		24	24		
Short circuit protection (control circuit fuse) [A gG]	10			10		
Connection	Screw terminal 0.34 ... 1.5 mm ²			Screw terminal 0.34 ... 1.5 mm ²		

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

3) Version with bearing for high speeds and long travel distances on request.

Ordering table

Plunger type		ES508	ES514	ES508
Chisel plunger		083886 N1AD508-M	083849 N1AD514-M	103237 N1AD508-MC2222
Roller plunger	SN01: R = 2.5 mm N1A: R = 4.0 mm	083887 N1AR508-M	078487 N1AR514-M	103221 N1AR508-MC2222
Ball plunger		-	-	-
Dome plunger		087205 N1AW508-M	083850 N1AW514-M	103222 N1AW508-MC2222

With safety switching element, silicone diaphragm (int./ext.) and low-temperature grease



With safety switching element

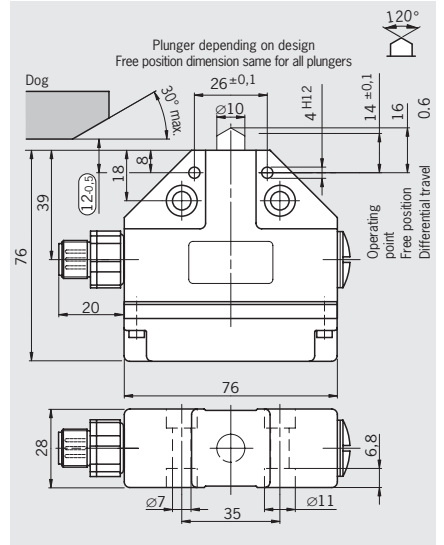
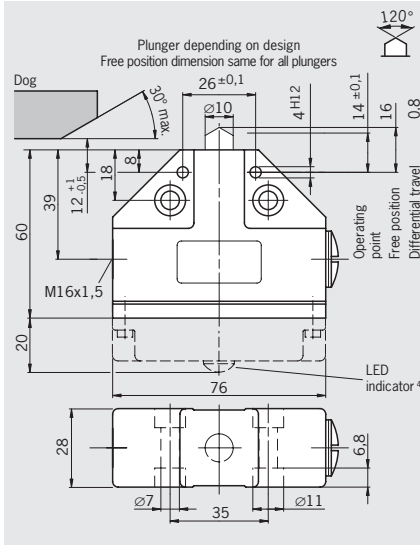
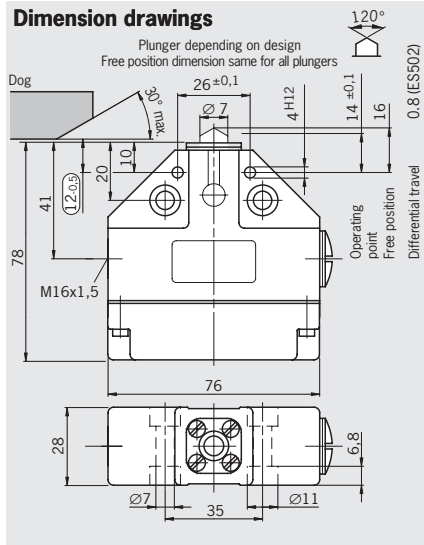


Design N1A
Cable entry M16 x 1.5

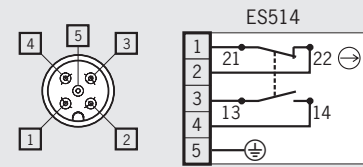
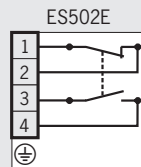
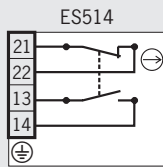
Design N1A
Cable entry M16 x 1.5

Design N1A
M12 plug adjustable, 4-pin + PE

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized		Die-cast aluminum, anodized			Die-cast aluminum, anodized		
IP 67		IP 67			IP 67		
-30 ... +80		-5 ... +80			-25 ... +80		
Chisel	Roller	Chisel	Roller 3)	Ball	Chisel	Roller	Dome
± 0.002	± 0.01	± 0.002	± 0.01	± 0.01	± 0.002	± 0.01	± 0.002
40	80	40	80	10	40	80	10
0.01		0.01			0.01		
≥ 30		≥ 20			≥ 30		
ES502E		ES502E 4)			ES514		
1 NO + 1 NC ⊖		1 NO + 1 NC			1 NO + 1 NC ⊖		
Snap-action switching contact		Snap-action switching contact			Snap-action switching contact		
1 x 10 ⁶ operating cycles		30 x 10 ⁶ operating cycles			1 x 10 ⁶ operating cycles		
2.5		2.5			2.5		
250		250			30		
AC-15 U _e 230V I _e 2.5A DC-13 U _e 24V I _e 6A		AC-12 U _e 230V I _e 10A / AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A			AC-15 U _e 36V I _e 2.5A DC-13 U _e 24V I _e 4A		
Silver, gold-plated		Silver, gold-plated			Silver, gold-plated		
5		10			5		
24		24			24		
10		10			4		
Screw terminal 0.34 ... 1.5 mm ²		Screw terminal 0.34 ... 1.5 mm ²			Plug connector M12 5)		

4) Version with LED function display AC/DC 10-60V or AC 110/230 V on request.

5) Mating connector see page 46 and 47.

ES514	ES502E	ES514
110462 N1AD514AM-MC2222	079265 N1AD502-M	087603 N1AD514SVM5-M
103247 N1AR514AM-MC2222	078485 N1AR502-M	087604 N1AR514SVM5-M
-	083847 N1AK502-M	-
-	-	090743 N1AW514SVM5-M

Precision single limit switches

- ▶ Plunger material stainless steel
- ▶ Housing according to DIN 43693

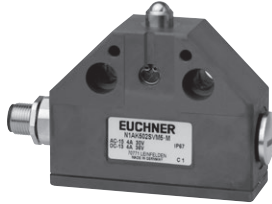


For plug connectors with LED indicator

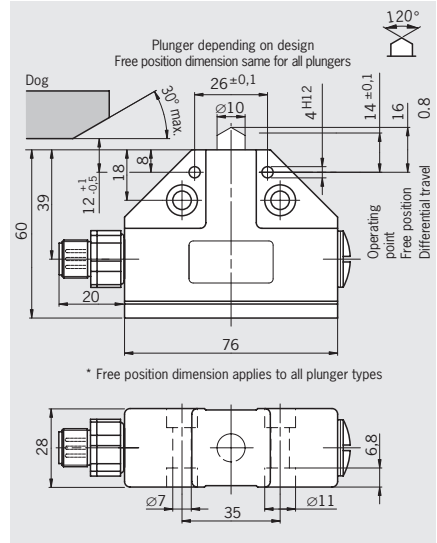
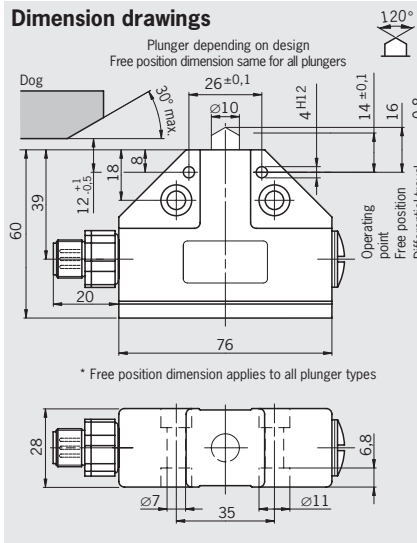


Design N1A
M12 plug adjustable, 4-pin + PE

Design N1A
M12 plug adjustable, 4-pin + PE

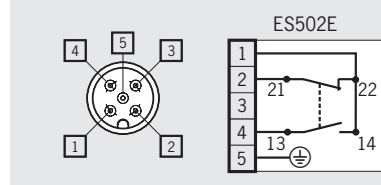
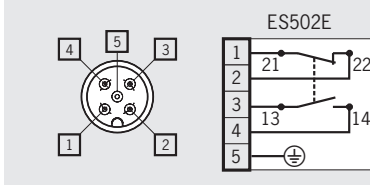


Dimension drawings



⚠ To achieve the positively driven travel, the dimension (31-0.3) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN 1088, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67 Mating connector inserted and screwed tight			IP 67 Mating connector inserted and screwed tight		
Ambient temperature [°C]	-5 ... +80			-5 ... +80		
Plunger type	Chisel	Roller	Ball	Chisel	Roller	Ball
Operating point accuracy ¹⁾ [mm]	± 0.002	± 0.01	± 0.01	± 0.002	± 0.01	± 0.01
Approach speed, max. ²⁾ [m/min]	40	80	10	40	80	10
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	≥ 20			≥ 20		
Switching element	ES502E			ES502E		
Switching contact	1 NO + 1 NC			1 NO + 1 NC		
Switching principle	Snap-action switching contact			Snap-action switching contact		
Mechanical life	30 x 10 ⁶ operating cycles			30 x 10 ⁶ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5		
Rated insulation voltage U _i [V]	50			50		
Utilization category according to IEC 60947-5-1	AC-15 U _e 30V I _e 4A DC-13 U _e 24V I _e 4A			AC-15 U _e 30V I _e 4A DC-13 U _e 24V I _e 4A		
Contact material	Silver, gold-plated			Silver, gold-plated		
Switching current, min., at switching voltage [mA]	10			10		
[V DC]	24			24		
Short circuit protection (control circuit fuse) [A gG]	4			4		
Connection	Plug connector M12 ⁴⁾			Plug connector M12 ⁴⁾		

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

Ordering table

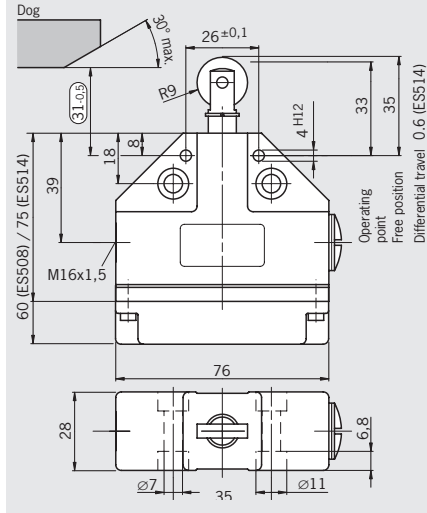
Plunger type	ES502E	ES502E
Chisel plunger	087487 N1AD502SVM5-M	091471 N1AD502SVM5-MC1883
Roller plunger SN01: R = 2.5 mm N1A ... AM:R = 4.0 mm	087488 N1AR502SVM5-M	On request
Ball plunger	087489 N1AK502SVM5-M	087496 N1AK502SVM5-MC1883
Extended roller plunger	-	-

With safety switching element

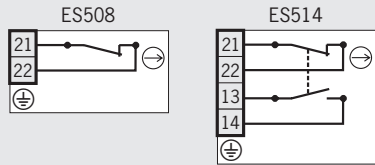


Design N1A, extended roller plunger
Cable entry M16 x 1.5

Dimension drawings

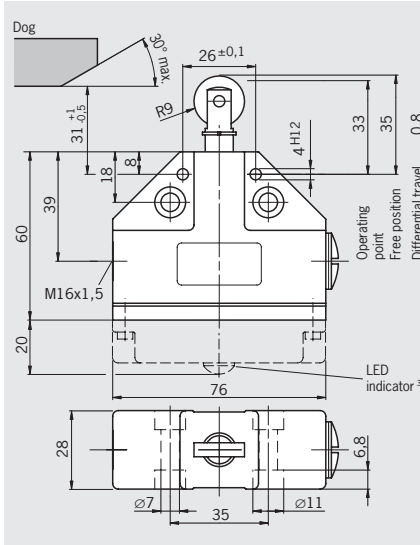


Wiring diagrams

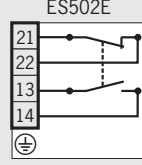


With exterior diaphragm

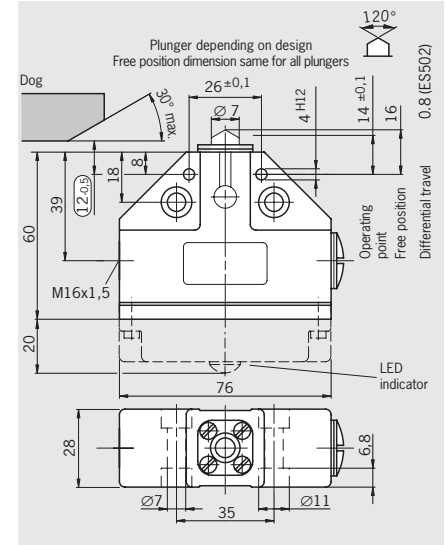
Design N1A, extended roller plunger
Cable entry M16 x 1.5



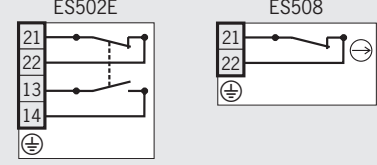
Wiring diagrams



Design N1A
Cable entry M16 x 1.5



Wiring diagrams



Die-cast aluminum, anodized		Die-cast aluminum, anodized		Die-cast aluminum, anodized		
IP 67		IP 67		IP 67		
-25 ... +80		-5 ... +80		-5 ... +80 (ES502E)	-25 ... +80 (ES508)	
Extended roller		Extended roller		Chisel	Roller	Ball
0.1		0.1		± 0.002	± 0.01	± 0.01
20		20		40	80	10
0.01		0.01		0.01		
≥ 15	≥ 30	≥ 20		≥ 20	≥ 15	
ES508	ES514	ES502E 3)		ES502E	ES508	
1 NC ⊖	1 NO + 1 NC ⊖	1 NO + 1 NC		1 NO + 1 NC	1 NC ⊖	
Slow-action switch. contact	Slow-action switch. contact	Snap-action switching contact		Slow-action switch. contact	Slow-action switch. contact	
30 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles	30 x 10 ⁶ operating cycles		30 x 10 ⁶ operating cycles		
2.5		2.5		2.5		
250		250		250		
AC-15 U _e 230V I _e 6A	AC-15 U _e 230V I _e 2.5A	AC-12 U _e 230V I _e 10A		AC-12 U _e 230V I _e 10A	AC-15 U _e 230V I _e 6A	
DC-13 U _e 24V I _e 6A	DC-13 U _e 24V I _e 6A	AC-15 U _e 230V I _e 6A		AC-15 U _e 230V I _e 6A	DC-13 U _e 24V I _e 6A	
DC-13 U _e 24V I _e 6A		DC-13 U _e 24V I _e 6A		DC-13 U _e 24V I _e 6A		
Silver, gold-plated		Silver, gold-plated		Silver, gold-plated		
10	5	10		10		
24	24	24		24		
10		10		10		
Screw terminal 0.34 ... 1.5 mm ²		Screw terminal 0.34 ... 1.5 mm ²		Screw terminal 0.34 ... 1.5 mm ²		

4) Version with LED function display AC/DC 10-60V or AC 110/230 V on request.

5) Mating connector see page 46 and 47.

ES508	ES514	ES502E	ES502E	ES508
-	-	-	090542 N1AD502AM-M	090546 N1AD508AM-M
-	-	-	090541 N1AR502AM-M	090547 N1AR508AM-M
-	-	-	091059 N1AK502AM-M	-
087147 N1ARL508-M	087204 N1ARL514-M	083848 N1ARL502-M	-	-

Precision single limit switches

► Plunger material stainless steel

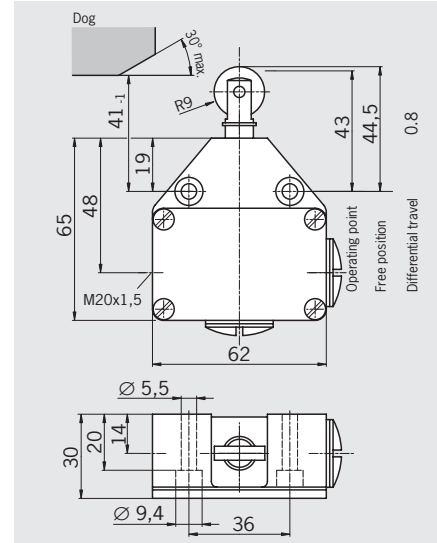
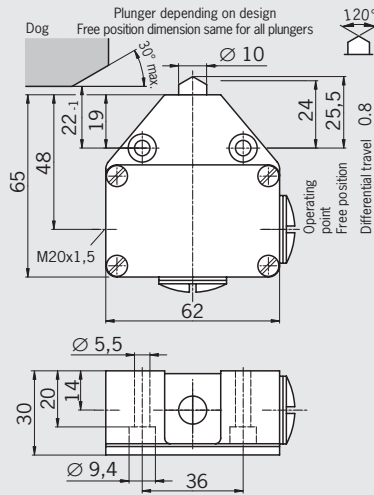


Design N10 Cable entry M20 x 1.5

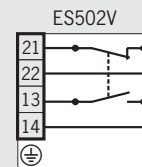
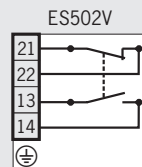
Design N10, extended roller plunger Cable entry M20 x 1.5



Dimension drawings



Wiring diagrams



Technical data

	Die-cast aluminum, anodized	Die-cast aluminum, anodized
Housing material	Die-cast aluminum, anodized	Die-cast aluminum, anodized
Degree of protection acc. to IEC 60529	IP 67	IP 67
Ambient temperature [°C]	-5 ... +80	-5 ... +80
Plunger type	Chisel Roller Ball	Extended roller
Operating point accuracy ¹⁾ [mm]	± 0.002	± 0.01
Approach speed, max. ²⁾ [m/min]	40	20
Approach speed, min. [m/min]	0.01	0.01
Actuating force, max. [N]	≥ 20	≥ 20
Switching element	ES502V	ES502V
Switching contact	1 NO + 1 NC	1 NO + 1 NC
Switching principle	Snap-action switching contact	Snap-action switching contact
Mechanical life	30 x 10 ⁶ operating cycles	30 x 10 ⁶ operating cycles
Rated impulse withstand voltage U _{imp} [kV]	2.5	2.5
Rated insulation voltage U _i [V]	250	250
Utilization category according to IEC 60947-5-1	AC-12 U _e 230V I _e 16A/AC-15 U _e 230V I _e 10A DC-13 U _e 24V I _e 6A	AC-12 U _e 230V I _e 16A/AC-15 U _e 230V I _e 10A DC-13 U _e 24V I _e 6A
Contact material	Silver, gold-plated	Silver, gold-plated
Switching current, min., at switching voltage [mA]	20	20
Switching voltage [V DC]	24	24
Short circuit protection (control circuit fuse) [A gG]	16	16
Connection	Screw terminal, 1.5 mm ² max.	Screw terminal, 1.5 mm ² max.

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.

2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

Ordering table

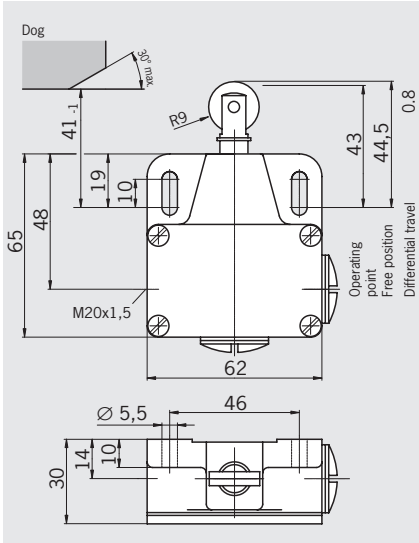
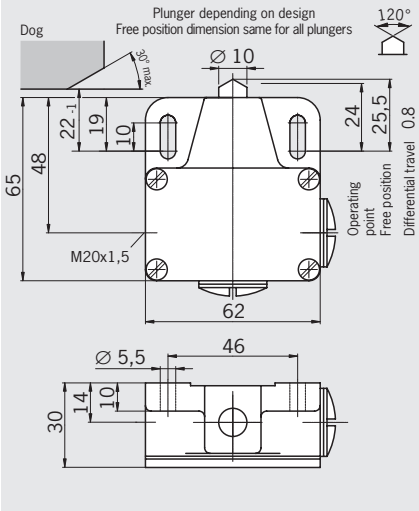
Plunger type	ES502V	ES502V
Chisel plunger	086293 N10D-M	-
Roller plunger	086294 N10R-M	-
Ball plunger	088589 N10K-M	-
Extended roller plunger	-	088587 N10RL-M



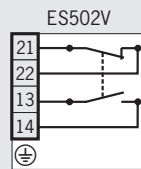
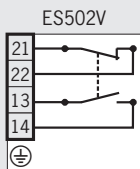
Design N11
Cable entry M20 x 1.5

Design N11, extended roller plunger
Cable entry M20 x 1.5

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized			Die-cast aluminum, anodized		
IP 67			IP 67		
-5 ... +80			-5 ... +80		
Chisel	Roller	Ball	Extended roller		
± 0.002	± 0.01	± 0.01	± 0.1		
40	80	10	20		
0.01			0.01		
≥ 20			≥ 20		
ES502V			ES502V		
1 NO + 1 NC			1 NO + 1 NC		
Snap-action switching contact			Snap-action switching contact		
30 x 10 ⁶ operating cycles			30 x 10 ⁶ operating cycles		
2.5			2.5		
250			250		
AC-12 U _e 230V I _e 16A/AC-15 U _e 230V I _e 10A			AC-12 U _e 230V I _e 16A/AC-15 U _e 230V I _e 10A		
DC-13 U _e 24V I _e 6A			DC-13 U _e 24V I _e 6A		
Silver, gold-plated			Silver, gold-plated		
20			20		
24			24		
16			16		
Screw terminal, 1.5 mm ² max.			Screw terminal, 1.5 mm ² max.		

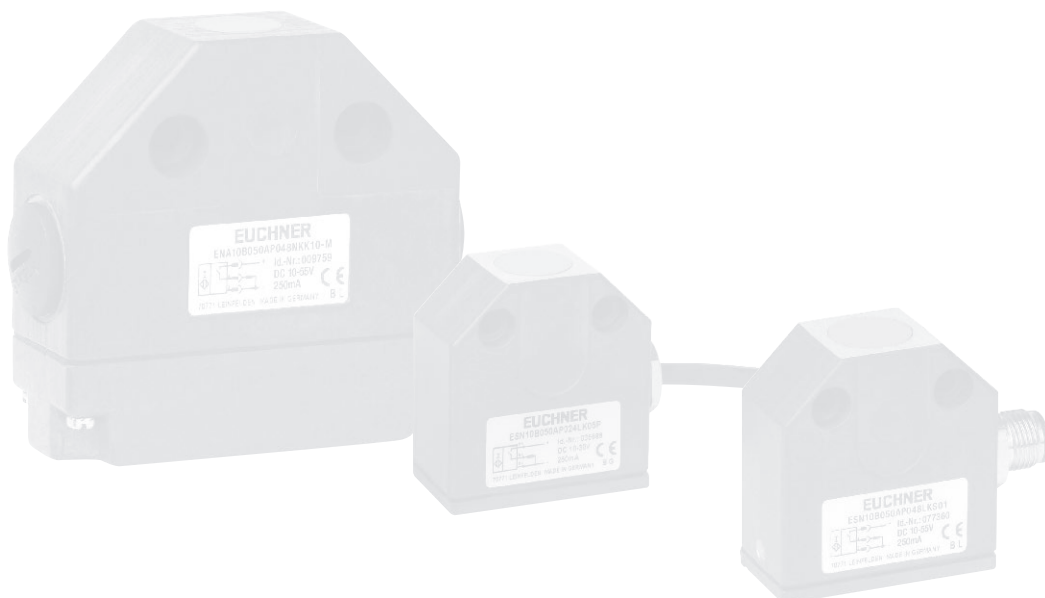
ES502V	ES502V
086298 N11D-M	-
086313 N11R-M	-
088585 N11K-M	-
-	086299 N11RL-M

Inductive single limit switches

Inductive single limit switches are non-contact in operation. They are used as an alternative to mechanical switches. The main advantage is their wear-free operating mode. They are noted for their insensitivity to corrosive ambient conditions and their virtually unlimited mechanical life.

Features

- ▶ High approach speed and high switching frequency
- ▶ Resistant to strong vibrations and coarse fouling
- ▶ Resistant to most cutting oils and coolants
- ▶ Replacement for precision single limit switch of the same design



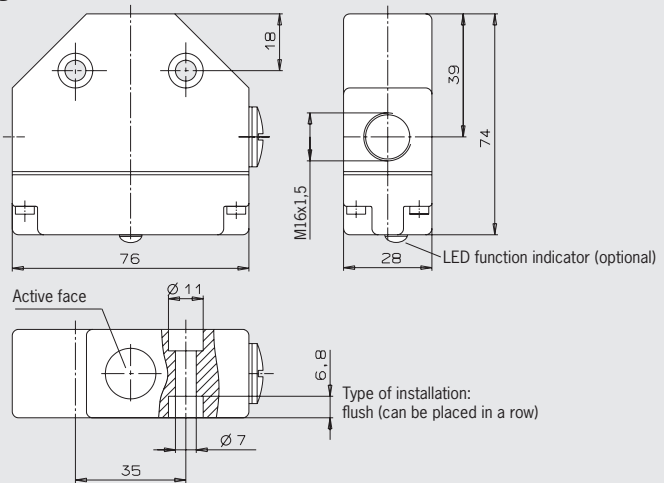
Inductive single limit switch design ENA, DC version

- ▶ Housing according to DIN 43693
- ▶ Rated operating distance 5 mm
- ▶ LED function display optional

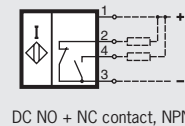
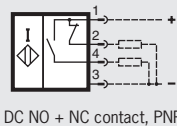


Design ENA
Cable entry M16 x 1.5

Dimension drawings



Wiring diagrams



Technical data

Parameter	Value	Unit
Rated operating distance s_n	5	mm
Assured operating distance s_a	0 ... 4	mm
Switching function	NO + NC	
Output	PNP or NPN (see ordering table)	
LED function display	See ordering table	
Operating voltage U_B	DC 10 ... 55	V
Voltage drop U_d	≤ 2.5	V
Rated insulation voltage U_i	DC 60	V
Rated operating current I_e	≤ 250	mA
Off-state current I_r	≤ 0.001	mA
No-load current I_0	≤ 15	mA
Short circuit and overload protection, pulsed	Yes	
Reverse polarity protection	Yes	
Wire break safety	Yes	
EMC compliance as per	IEC 60947-5-2	
Hysteresis H	≤ 0.5	mm
Repeat accuracy R	≤ 5	%
Switching frequency f	≤ 500	Hz
Utilization category according to IEC 60947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection acc. to IEC 60529	IP 67	
Ambient temperature T	- 25 ... + 70	°C
Connection	Screw terminal	
Conductor cross-section, max.	2 x 1.5 (per contact)	mm ²
Mass	0.2	kg

Ordering table

LED function display		PNP	NPN
with	Order no.	ENA 086280	On request
	Item	ENA10B050UP048LKK10-M	
without	Order no.	ENA 086099	ENA 086282
	Item	ENA10B050UP048NKK10-M	ENA10B050UN048NKK10-M

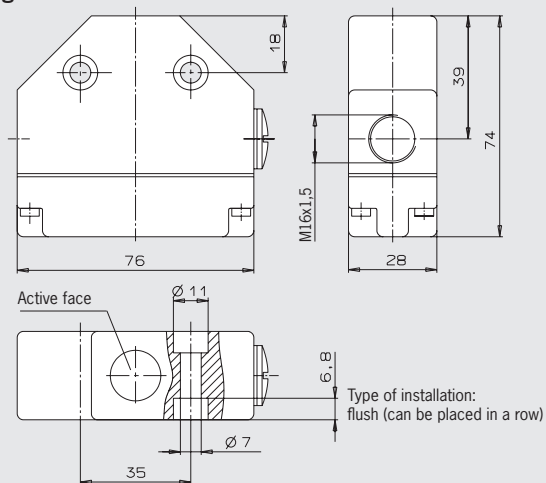
Inductive single limit switch design ENA, AC version

- ▶ Housing according to DIN 43693
- ▶ Rated operating distance 5 mm

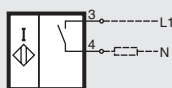


Design ENA
Cable entry M16 x 1.5

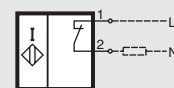
Dimension drawings



Wiring diagrams



AC NO contact



AC NC contact

Technical data

Parameter	Value	Unit
Rated operating distance s_n	5	mm
Assured operating distance s_a	0 ... 4	mm
Switching function	NO or NC (see ordering table)	
Output	AC	
LED function indicator on the switching element	Yes	
Short circuit protection	No	V
Operating voltage U_B	AC 20 ... 250	V
Voltage drop U_d	≤ 8	V
Rated insulation voltage U_i	AC 250	V
Rated operating current I_o	≤ 250	mA
Switch-on current I_k (20 ms)	1.5	A
Off-state current I_r	110 V \leq 1.5 / 230 V \leq 2.0	mA
Minimum operating current I_m	5	mA
EMC compliance as per	IEC 60947-5-2	
Hysteresis H	≤ 0.5	mm
Repeat accuracy R	≤ 5	%
Switching frequency f	≤ 10	Hz
Utilization category according to IEC 60947-5-2	AC-140	Hz
Rated supply frequency	50 ... 60	Hz
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection acc. to IEC 60529	IP 67	
Ambient temperature T	- 25 ... + 70	°C
Connection	Screw terminal	
Max. conductor cross-section	2 x 1.5 (per contact)	mm ²
Mass	0.2	kg

Ordering table

LED function display	NO	NC
on the switching element	ENA 086284	ENA 088775
Order no. Item	ENA10B050AW250NNK10-M	ENA10B050RW250NNK10-M

LED visible from the exterior on request.

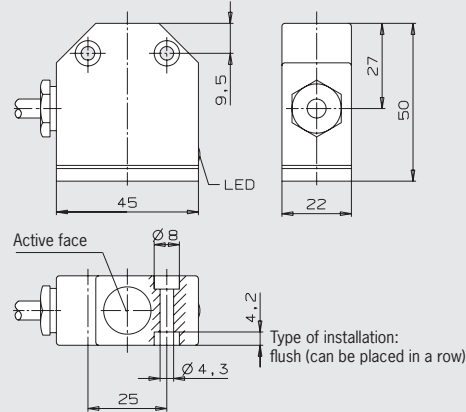
Inductive single limit switch design ESN, DC version

- ▶ Compact design with connection cable
- ▶ Rated operating distance 5 mm
- ▶ LED function display

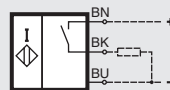


Design ESN
Connection cable 5 m PUR

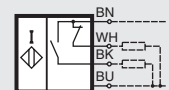
Dimension drawings



Wiring diagrams



DC NO contact, PNP



DC NO + NC contact, PNP

Technical data

Parameter	Value	Unit
Rated operating distance s_n	5	mm
Assured operating distance s_a	0 ... 4	mm
Output and switching function	PNP NO or NO + NC (see ordering table)	
LED function display	Yes	
Operating voltage U_B	DC 10 ... 55	V
Voltage drop U_d	≤ 2.5	V
Rated insulation voltage U_i	DC 60	V
Rated operating current I_e	≤ 250	mA
Off-state current I_f	≤ 0.05	mA
No-load current I_0	≤ 15	mA
Short circuit and overload protection, pulsed	Yes	
Reverse polarity protection	Yes	
Wire break safety	Yes	
EMC compliance as per	IEC 60947-5-2	
Hysteresis H	≤ 0.5	mm
Repeat accuracy R	≤ 5	%
Switching frequency f	≤ 500	Hz
Utilization category according to IEC 60947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection acc. to IEC 60529	IP 67	
Ambient temperature T	-25 ... +70	°C
Connection	NO NO + NC	PUR cable 3 x 0.25 PUR cable 4 x 0.25
Mass	0.3	kg

Ordering table

Connection cable		PNP NO	PNP NO + NC
5 m PUR	Order no.	ESN 088769	ESN 088771
	Item	ESN10B050AP048LK05P-M	ESN10B050UP048LK05P-M

Other cable lengths on request. Output NPN NO + NC on request.

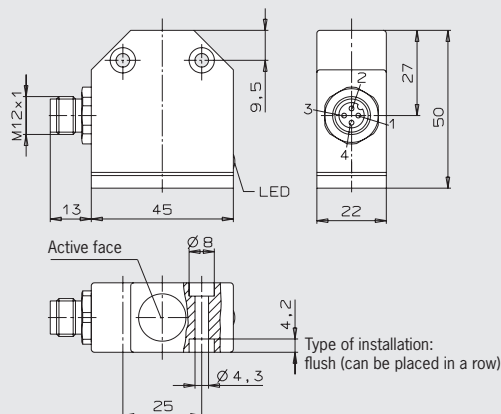
Inductive single limit switch design ESN, DC version

- ▶ Compact design with plug connector
- ▶ Rated operating distance 5 mm
- ▶ LED function display



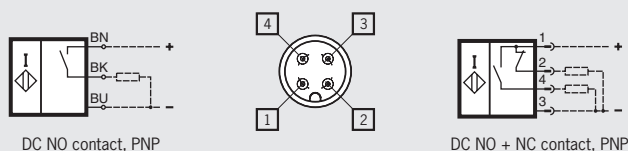
Design ESN
Plug connector M12, 4-pin

Dimension drawings



Plug connectors see page 46/47

Wiring diagrams



Technical data

Parameter	Value	Unit
Rated operating distance s_n	5	mm
Assured operating distance s_a	0 ... 4	mm
Output and switching function	PNP NO or PNP NO + NC (see ordering table)	
LED function display	Yes	
Operating voltage U_B	DC 10 ... 55	V
Voltage drop U_d	≤ 2.5	V
Rated insulation voltage U_i	DC 60	V
Rated operating current I_e	≤ 250	mA
Off-state current I_r	≤ 0.05	mA
No-load current I_0	≤ 15	mA
Short circuit and overload protection, pulsed	Yes	
Reverse polarity protection	Yes	
Wire break safety	Yes	
EMC compliance as per	IEC 60947-5-2	
Hysteresis H	≤ 0.5	mm
Repeat accuracy R	≤ 5	%
Switching frequency f	≤ 500	Hz
Utilization category according to IEC 60947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection acc. to IEC 60529	IP 67	
Ambient temperature T	- 25 ... + 70	°C
Connection	Plug connector M12 ¹⁾	
Mass	0.1	kg

1) Degree of protection only guaranteed on the usage of the plug connectors on page 46 and 47.

Ordering table

Plug connector system		PNP NO	PNP NO + NC
Plug connector S01 (M12, 4-pin)	Order no.	ESN 090439	ESN 088770
	Item	ESN10B050AP048LKS01-M	ESN10B050UP048LKS01-M

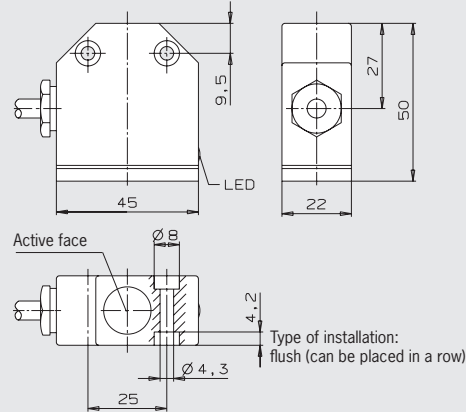
Inductive single limit switch design ESN, AC version

- ▶ Compact design with connection cable
- ▶ Rated operating distance 5 mm
- ▶ LED function display

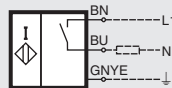


Design ESN
Connection cable 5 m PVC

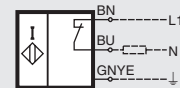
Dimension drawings



Wiring diagrams



AC NO contact



AC NC contact

Technical data

Parameter	Value	Unit
Rated operating distance s_n	5	mm
Assured operating distance s_a	0 ... 4	mm
Switching function	NO or NC (see ordering table)	
Output	AC	
LED function display	Yes	
Short circuit protection	No	V
Operating voltage U_B	AC 20 ... 250	V
Voltage drop U_d	≤ 8	V
Rated insulation voltage U_i	AC 250	V
Rated operating current I_o	≤ 250	mA
Switch-on current I_k (20 ms)	1.5	A
Off-state current I_r	$110 V \leq 1.5 / 230 V \leq 2.0$	mA
Minimum operating current I_m	5	mA
EMC compliance as per	IEC 60947-5-2	
Hysteresis H	≤ 0.5	mm
Repeat accuracy R	≤ 5	%
Switching frequency f	≤ 10	Hz
Utilization category according to IEC 60947-5-2	AC-140	Hz
Rated supply frequency	50 ... 60	Hz
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection acc. to IEC 60529	IP 67	
Ambient temperature T	- 25 ... + 70	°C
Connection	PVC cable 3 x 0.5	mm ²
Mass	0.3	kg

Ordering table

Connection cable	PNP NO	PNP NO + NC
5 m PVC	ESN 088773	ESN 088774
Order no. Item	ESN10B050AW250LN05V-M	ESN10B050RW250LN05V-M

Other cable lengths on request.

Round plug connector M12

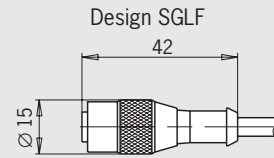
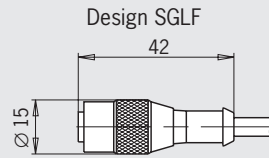
- ▶ Straight design and elbow connector
- ▶ Screw connection
- ▶ Molded cable
- ▶ 4-pin and 5-pin



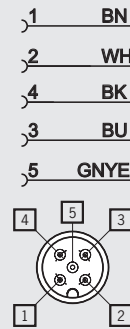
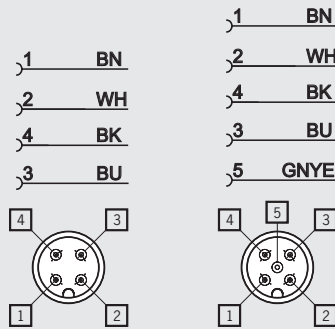
Straight plug connector M12 4-pin / 4-pin + PE

Straight plug connector M12, coded 4-pin + PE

Dimension drawings



Wiring diagrams



Technical data

	4	4+PE	4+PE
Number of pins	4	4+PE	4+PE
Housing material	TPU self-extinguishing		TPU self-extinguishing
Grip	TPU self-extinguishing		TPU self-extinguishing
Contact carrier	TPU self-extinguishing		TPU self-extinguishing
Sheath material	PUR, halogen-free, flame retardant		PVC, halogen-free, flame retardant
Sheath color	Black		Orange
Degree of protection acc. to IEC 60529 (inserted and screwed tight)	IP 67		IP 67
Ambient temperature [°C]	-25 ... +80		-25 ... +90
Contact material	CuSn nickel-plated, 0.3 µm gold-plated		CuSn nickel-plated, 0.8 µm gold-plated
Connection cross-section [mm ²]	4 x 0.34	5 x 0.5	4 x 0.34 / 1 x 0.5
Cable diameter [mm]	6		5
Contact resistance [mΩ]	≤ 5		≤ 5
Test voltage (60 s) [kV rms]	2		1.5
Rated voltage [V]	AC 250/DC 300	AC 30/DC 36	AC 250/DC 300
Rated current [A]	4		4

Ordering table

Plug connector M12, without LED, Connection cable 5 m	035613 SGLF4-5000P	073461 SGLF5-5000P	045524 SGLF5PE-5000
Plug connector M12, with 3 LEDs, Connection cable 5 m	-	-	-

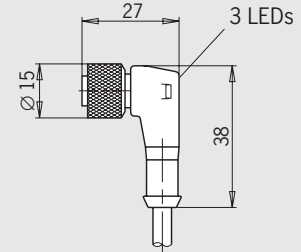
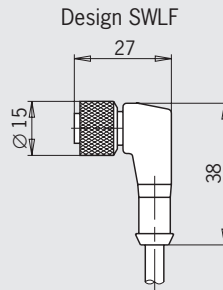
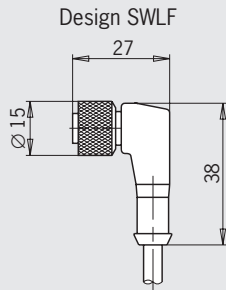


Right-angle plug connector M12
4-pin / 4-pin + PE

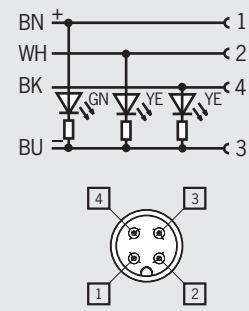
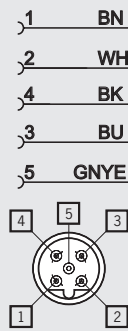
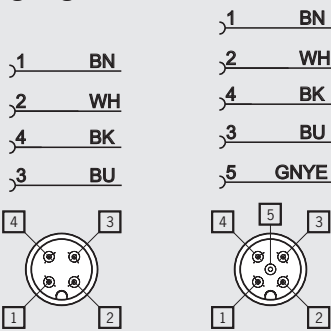
Right-angle plug connector M12, coded
4-pin + PE

Plug connector M12 with 3 LEDs
4-pin

Dimension drawings



Wiring diagrams



4	4+PE	4+PE	4
TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing
TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing
PUR, halogen-free, flame retardant	PVC, halogen-free, flame retardant	PVC, halogen-free, flame retardant	PUR, halogen-free, flame retardant
Black	Orange	Orange	Black
IP 67	IP 67	IP 67	IP 67
-25 ... +80	-25 ... +90	-25 ... +90	-25 ... +80
CuSn nickel-plated, 0.3 µm gold-plated	CuSn nickel-plated, 0.8 µm gold-plated	CuSn nickel-plated, 0.8 µm gold-plated	CuSn nickel-plated, 0.3 µm gold-plated
4 x 0.34	5 x 0.5	5 x 0.5	4 x 0.34
6	5	5	5
≤ 5	≤ 5	≤ 5	≤ 5
2	2	2	-
AC 250/DC 300	AC 250/DC 300	AC 250/DC 300	DC 10 ... 30
4	4	4	4

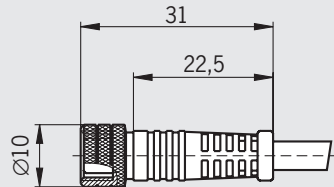
035618 SWLF4-5000P	073462 SWLF5-5000P	045523 SWLF5PE-5000	-
-	-	-	041091 SWLF4P-5000P

Round plug connector M8

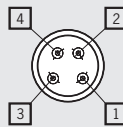
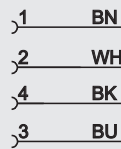
- ▶ Straight design and elbow connector
- ▶ Screw connection
- ▶ Molded cable
- ▶ 4-pin

Straight plug connector M8 4-pin

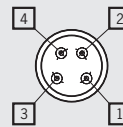
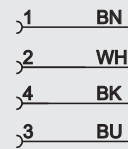
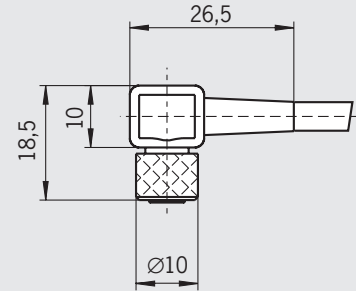
Dimension drawings



Wiring diagrams



Right-angle plug connector M8 4-pin



Technical data

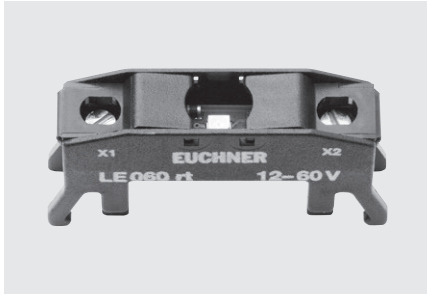
Number of pins		4	4
Housing material	Grip	PUR	PUR
	Contact carrier	PUR	PUR
Sheath material		PVC, self-extinguishing and flame retardant	PVC, self-extinguishing and flame retardant
Sheath color		Black	Black
Degree of protection acc. to IEC 60529 (inserted and screwed tight)		IP 67	IP 67
Ambient temperature	[°C]	-10 ... +70	-10 ... +70
Contact material		CuSn nickel-plated, gold-plated	CuSn nickel-plated, gold-plated
Connection cross-section	[mm ²]	4 x 0.25	4 x 0.25
Cable diameter	[mm]	5	5

Ordering table

Plug connector M8, connection cable 2 m	088812 C-M08F04-04X025PV02,0-ZN	-
Plug connector M8, connection cable 5 m	088813 C-M08F04-04X025PV05,0-ZN	-
Plug connector M8, connection cable 10 m	088814 C-M08F04-04X025PV10,0-ZN	084703 C-M08F04-04X025PV10,0-ZN-084703
Plug connector M8, connection cable 15 m	088815 C-M08F04-04X025PV15,0-ZN	-
Plug connector M8, connection cable 25 m	095035 C-M08F04-04X025PV25,0-ZN	-
Plug connector M8, connection cable 50 m	097100 C-M08F04-04X025PV50,0-ZN	-

LED function display

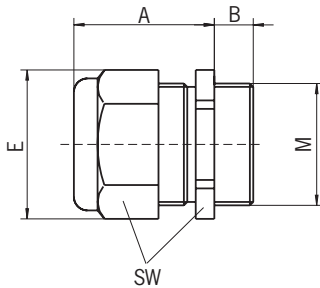
On request, versions with voltage ranges AC 110/230 V are available.



Operating voltage [V]	Color	Item	Order no.
AC/DC 12 - 60	Red	LE 060 rt	035495
	Green	LE 060 gr	035496
	Yellow	LE 060 ge	035497

Cable glands

Material nickel-plated brass, degree of protection IP 67



Item	Metric thread M	Cable outer diameter [mm]	A [mm]	B [mm]	E [mm]	SW [mm]	Order no.
EKVM12/04	M12 x 1.5	4 - 6.5	20	5	15.5	14	086327
EKVM16/04	M16 x 1.5	4 - 6.5	20	6	20	18	086328
EKVM16/06	M16 x 1.5	6.5 - 9.5	20	6	20	18	086330
EKVM20/06	M20 x 1.5	6.5 - 9.5	20	6	24.4	22	077683

Additional products

Trip rails/trip dogs

U-trip rails

enable the trip dogs to be adjusted from the switch side. The trip dogs can be installed and adjusted quickly and easily in any location.

U-trip dogs

are designed for usage in U-trip rails. They have an expansion plate clamp and enable precise adjustment, even when the limit switch is activated.

G-trip rails

enable the trip dogs to be adjusted from the side opposite the switch. They are made of steel and are protected from corrosion by a special surface treatment. Trip rails can be ordered pre-assembled or as a component for self-assembly.

G-trip dogs

are designed for use in G-trip rails. The trip dogs are clamped in the trip rail by a hexagon socket head screw with spring washer. This washer locks the trip dog in place even when the trip rail is in a vertical position and allows precise adjustment.



For detailed information see catalog for multiple limit switches.

Appendix

Terms and explanations

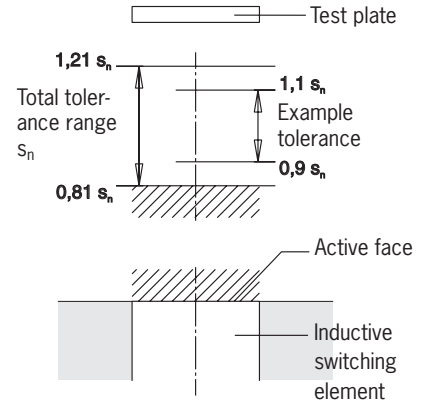
Rated operating distance s_n

The rated operating distance is a general variable used for measurement of operating distances. It does not take into account either the production tolerances or changes caused by external effects such as voltage and temperature.

Assured operating distance s_a

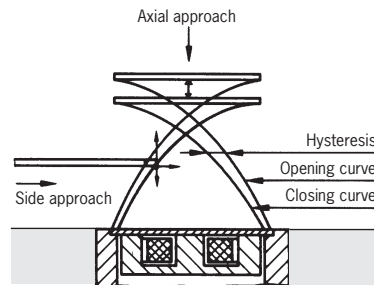
The assured operating distance is the operating distance at which correct operation of the inductive switching element is guaranteed within the permissible operating conditions (temperature and voltage).

The actuation distance lies between 0 and 81% of the rated operating distance s_n .



Hysteresis H

The hysteresis is the difference in distance terms between the ON point as the test plate approaches and the OFF point as it moves away from the active face of the inductive switching element.



Repeat accuracy R

The repeat accuracy is the accuracy of the real operating distance s_r for two switching actions in succession within 8 hours at an operating temperature of $23 \pm 5 \text{ }^\circ\text{C}$ and an operating voltage of $U_B \pm 5\%$.

Operating voltage U_B

The operating voltage defines the voltage range in which the inductive switching element functions reliably. The specified values represent limits without any tolerances. The values can be obtained by referring to the technical data for the switching element. In the case of two-wire switching elements, this is applicable only in series connection with the load.

Voltage drop U_d

The voltage drop is measured across the active output of the inductive switching element when the output is in the "active energized" condition and when the rated operating current I_e flows.

Rated operating current I_e

The rated operating current is the nominal current which can load the inductive switching element in continuous operation.

Off-state current I_r

The off-state current is the current which flows in the load circuit of an inductive switching element in the non-conducting condition. In practical terms, this current has to be taken into account only for two-wire switching elements.

Minimum operating current I_m

The minimum operating current is the minimum current required for the function of a 2-wire switching element in active energized condition.

Switch-on current I_k

The switch-on current is the maximum current which can flow in an AC 2-wire switching element for a particular period at the moment it is switched on. The details in the technical data are valid for 20 ms.

Switching frequency f

The switching frequency is the maximum possible number of switching operations per second. This is determined according to IEC 60947-5-2 and is based on a mark-space ratio of 1:2. The switching frequency is a switch-specific variable and can be obtained by referring to the technical data for the switching element.

Ambient temperature T

The ambient temperature is the temperature range in which the reliable operation of the inductive switching element is guaranteed. This range is between -25 and $+70 \text{ }^\circ\text{C}$.

Temperature drift Δs

The temperature drift defines the offset in the switching point in $\mu\text{m/K}$ on a change in the ambient temperature from -25 to $+70 \text{ }^\circ\text{C}$ under otherwise constant measurement conditions.

Suppressor circuits

The inductive switching elements are largely protected against external interference by use of various circuit techniques (suppressor circuits). For utilization category DC-13 the output is to be protected with a free-wheeling diode for inductive loads.

Short-circuit and overload protection

The inductive switching elements are designed so that short circuits cannot damage the outputs. **Pulsed short circuit protection** is used. This means that the output transistor is switched off and on again in quick succession in the event of overloading or a short circuit. In this way, it is possible to establish whether the fault is still present or has been rectified.

Transient protection

EUCHNER proximity switches are protected against interference caused by the occurrence of inductive voltage peaks in accordance with IEC 801-4. The respective values are specified in the technical data. Testing is performed in accordance with the stipulations in DIN VDE 0660, Part 208 and IEC 947-5-2.

Wire break safety

The EUCHNER proximity switches with wire break safety are designed such that on a wire break on any connection, the switch does not output a spurious signal.

Reverse polarity protection

Protection against reverse polarization of the operating voltage.

Special versions

Inductive switching elements according to NAMUR

These switching elements fulfill the specification IEC 60947-5-6 and IEC 61934.

The current consumption at $U_B = 8.2 \text{ V}$ is greater than 2.5 mA when the oscillator face is not activated and less than 1.0 mA when the oscillator face is activated. The current consumption characteristic is linear during the transition from the inactivated to the activated state of the oscillator face, i.e. these switches do not have a snap action.

DC 2-wire switching elements

Two-wire switching elements can be used in principle instead of mechanical switches. Their low off-state current makes them especially suitable for use in conjunction with programmable logic controllers.

Compared with three-wire switching elements they have the advantage of requiring less wiring.

Increased operating distance

For designs with 12 mm proximity switch spacing, switching elements with increased operating distance ($s_n = 5 \text{ mm}$) are available on request. Due to their technical characteristics, these switching elements can be used both with a pulsed operating voltage and an operating voltage that is not pulsed.

Index by item designation

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