

Position Switches



More than safety.



EUCHNER

More than safety.



Emil Euchner, the company's founder and inventor of the multiple limit switch, circa 1928.



Around the world – the Swabian specialists in motion sequence control for mechanical and systems engineering.

EUCHNER's history began in 1940 with the establishment of an engineering office by Emil Euchner. Since that time, EUCHNER has been involved in the design and development of switchgear for controlling a wide variety of motion sequences in mechanical and systems engineering. In 1953, Emil Euchner founded EUCHNER + Co., a milestone in the company's history. In 1952, he developed the first multiple limit switch – to this day a symbol of the enterprising spirit of this family-owned company.

Automation – Safety – ManMachine

Today, our products range from electromechanical and electronic components to complex system solutions. With this wide range of products we can provide the necessary technologies to offer the right solution for special requirements – regardless of whether these relate to reliable and precise positioning or to components and systems for safety engineering in the automation sector.

EUCHNER products are sold through a world-wide sales network of competent partners. With our closeness to the customer and the guarantee of reliable solutions throughout the globe, we enjoy the confidence of customers all over the world.

Quality, reliability, precision

Quality, reliability and precision are the hallmarks of our corporate philosophy. They represent concepts and values to which we feel totally committed.

At EUCHNER, quality means that all our employees take personal responsibility for the company as a whole and, in particular, for their own field of work. This individual commitment to perfection results in products which are ideally tailored to the customers' needs and the requirements of the market. After all: our customers and their needs are the focus of all our efforts. Through efficient and effective use of resources, the promotion of personal initiative and courage in finding unusual solutions to the benefit of our customers, we ensure a high level of customer satisfaction. We familiarize ourselves with their needs, requirements and products and we learn from the experiences of our customers' own customers.

EUCHNER – More than safety.



Quality – made by EUCHNER

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 harsh 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 type of construction 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.

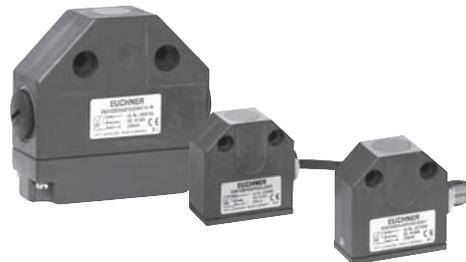


Inductive single limit switches

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

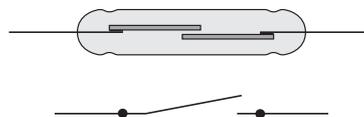
Interchangeability with mechanical single limit switches means that it is possible to straightforwardly modify machines. The switches can therefore be retrofitted on existing machine installations to take full advantage of the benefits of non-contact switches.



Switching Elements with Reed Contact

Reed contact

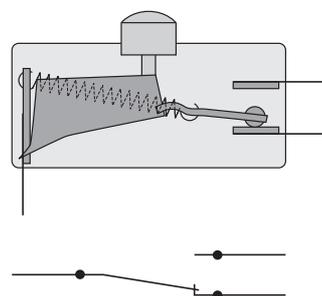
The reed contact comprises two ferromagnetic contacts in a glass bulb. When the reed contact is placed in a magnetic field, the contacts adopt opposite polarities and are closed.
For series EGT with reed contact.



Mechanical Switching Elements

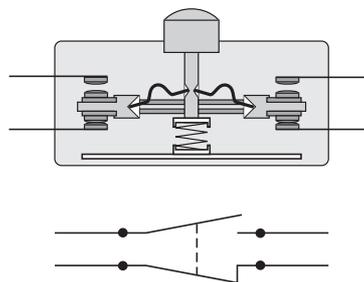
Changeover contact with snap-action function

Snap-action switching element ¹⁾ with single gap and three connections.
For series EGT with snap-action switch and series N01, NB01, SN01 with soldered connection.



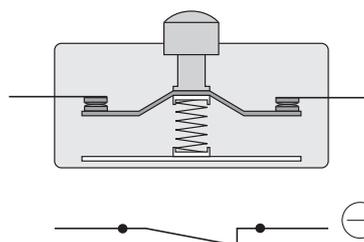
Snap-action switching element ¹⁾ with one NO contact and one NC contact

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.



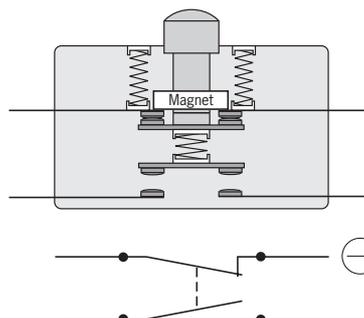
Safety switching element with slow-action switching contact ²⁾

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 contact ¹⁾

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 switching element has a switching contact which opens or closes regardless of the approach speed during actuation.
2) A slow-action switching element has a switching contact which opens and closes depending on the approach speed during actuation.

Positively driven contacts

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.



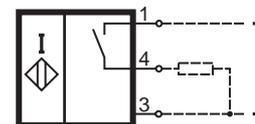
Positively driven position switch.

Safety switching elements marked with this symbol are not available as replacement switching elements.

Inductive Switching Elements

NO function

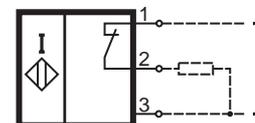
The NO function means that the load current flows when the active face of the inductive switching element is activated and that no current flows when the active face is not activated.



DC NO, 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.

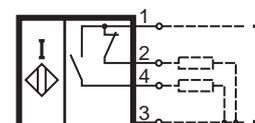


DC NC, PNP

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, PNP

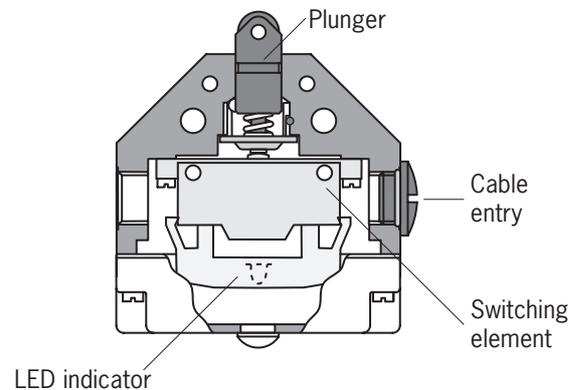
Precision Single Limit Switches

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.

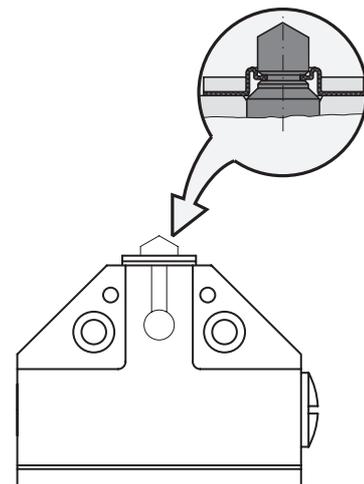


Exterior diaphragm

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. For technical data on this series see page 35.

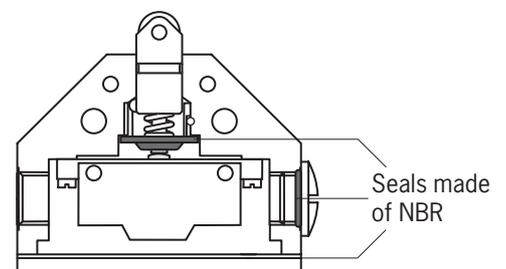


Seals

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 rigidity 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.

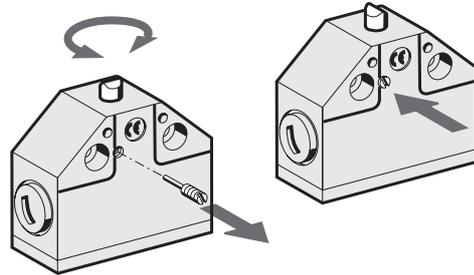
The material of the diaphragm seal is a key criterion for the quality, mechanical life and precision of the EUCHNER precision single limit switches. The same material is used for the cover seal and the cable entry.

Seals made of Viton or silicone are available on request for special applications.



Adjustability

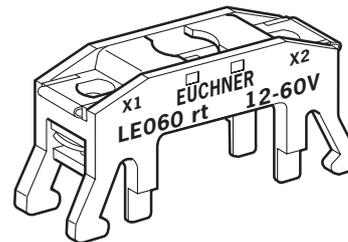
On the chisel plungers and the roller plungers (normal and extended) the approach direction can be changed by 90° at any time. After unscrewing the locking pin, the plunger can be rotated by 90°.



LED function display

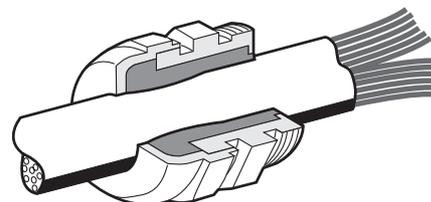
If required, the EUCHNER single limit switches of design N1A can be equipped with an LED function display (AC/DC 10 - 60 V or AC 110/230 V, color red).

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
- ▶ Switching point accuracy ± 0.01 max.
- ▶ With hard-wired cable or with M 12 plug connection
- ▶ Temperature range -30 °C up to +120 °C



Precision single hole fixing limit switches

Ambient temperatur
up to 120 °C



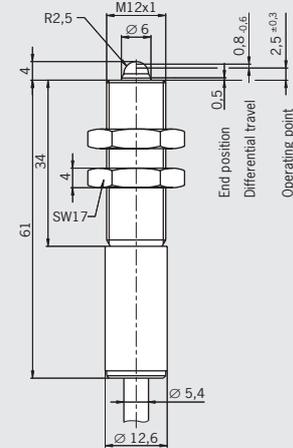
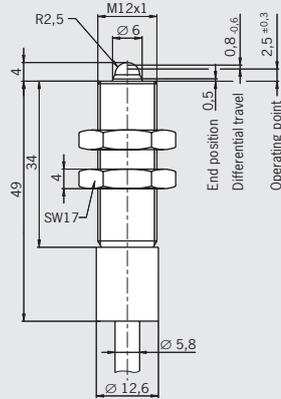
- ▶ With reed contact and protective diode
- ▶ Plunger material stainless steel
- ▶ Any installation position

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

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

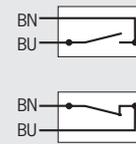
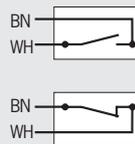


Dimension drawings



⚠ 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 according 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 contact or 1 NC contact	1 NO contact or 1 NC contact
Contact material		Rhodium	Rhodium
Rated insulation voltage U _i	[V]	50	50
Utilization category acc. 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 type		Silicon 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. 2000 operating cycles.

3) For mating connector see page 46 and 47.

Ordering table

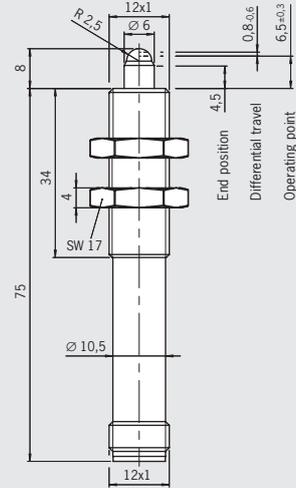
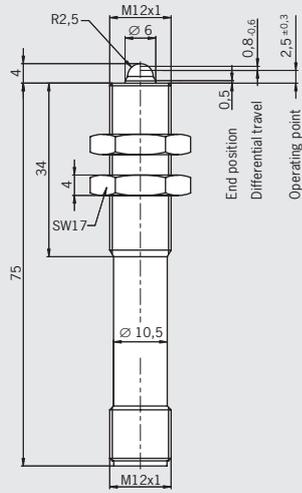
		104 223	
1 NO contact	Connection cable 3 m	EGT12A3000C2250	-
	Connection cable 5 m	-	082 201 EGT12A5000
	Plug connector	-	-
1 NC contact	Connection cable 3 m	On request	-
	Connection cable 5 m	-	078 848 EGT12R5000
	Plug connector	-	-



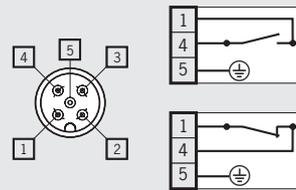
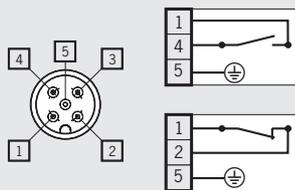
Design EGT12, M12 x 1, dome plunger
Plug connector M12 with PE connection

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 contact or 1 NC contact	1 NO contact or 1 NC contact
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⁾

-	-
-	-
075 426 EGT12ASFM5	095 112 EGT12ASFM5C2083
-	-
-	-
075 427 EGT12RSFM5	On request



Precision single hole fixing limit switches



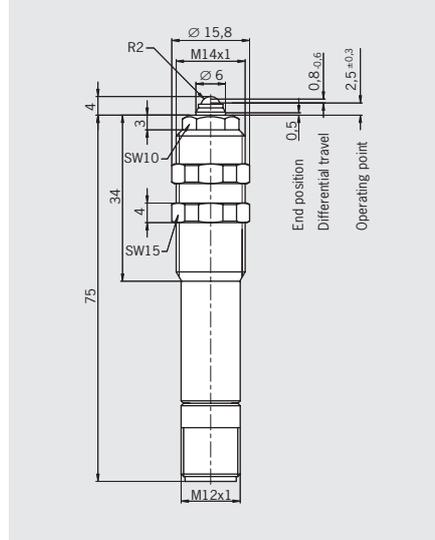
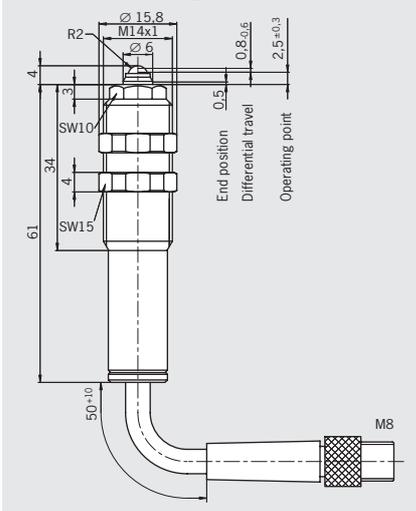
- ▶ With reed contact and protective diode
- ▶ Plunger material stainless steel
- ▶ Any installation position

Design EGT11, M14 x 1, ball plunger
Connection cable 0,5 m with plug connector M8

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

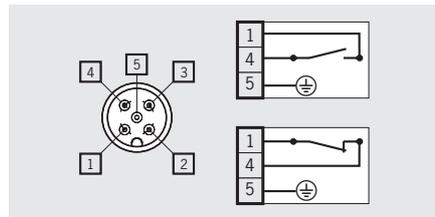
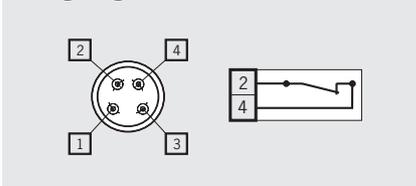


Dimension drawings



⚠ 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

	Sleeve	Brass, nickel-plated	Brass, nickel-plated
Housing material	Threaded section	Stainless steel	Stainless steel
Degree of protection according to IEC 60529		IP 67	IP 67
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 contact	1 NO contact or 1 NC contact
Contact material		Rhodium	Rhodium
Rated insulation voltage U _i	[V]	50	50
Utilization category acc. 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 type		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. 2000 operating cycles.

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

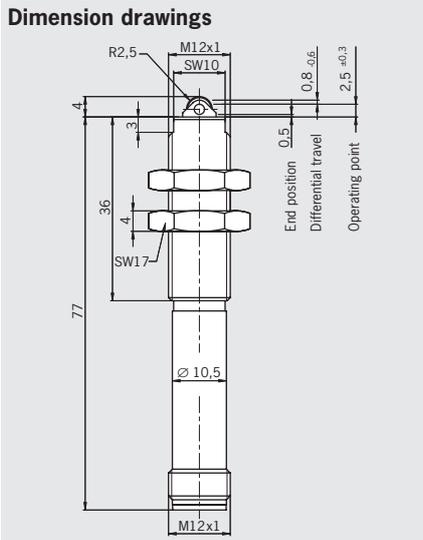
Ordering table

1 NO contact	Connection cable 0,5 m with plug connector M8	-	-
	Connection cable 5 m	-	-
	Plug connector	-	093 352 EGT11A2NSFM5
1 NC contact	Connection cable 0,5 m with plug connector M8	084 000 EGT11R2N50SAM4	-
	Connection cable 5 m	-	-
	Plug connector	-	091 848 EGT11R2NSFM5

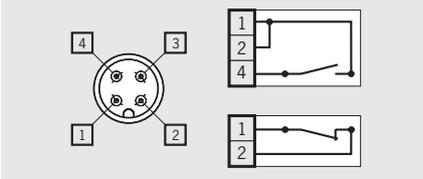


Design EGT12, M12 x 1, roller plunger
 Plug connector M12, double insulated

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 contact or 1 NC contact
Rhodium
50 \square
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⁾

-
-
078 483
EGT12ARSEM4C1888
-
-
079 139
EGT12RRSEM4C1888

Subject to technical modifications; no responsibility is accepted for the accuracy of this information.

Precision single hole fixing limit switches

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



For mating connector with LED display

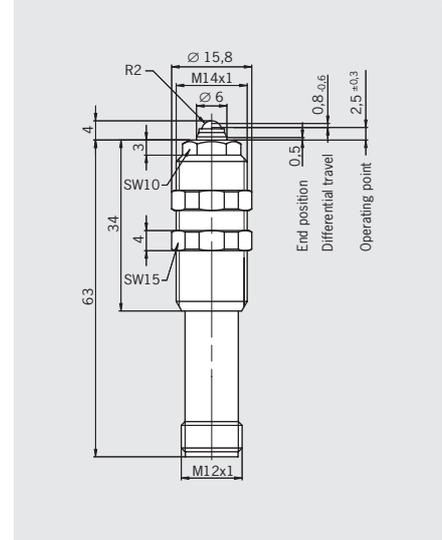
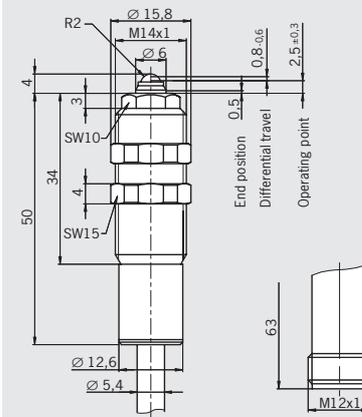


Design EGT1/4, M14 x 1, ball plunger
Connection cable, double insulated/plug connector M12

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

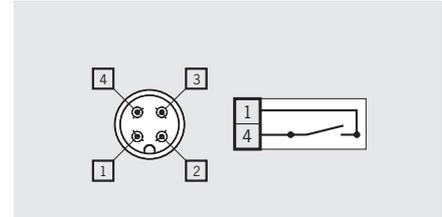
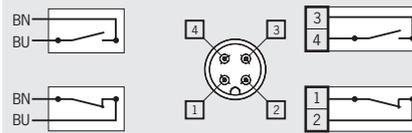


Dimension drawings



⚠ 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	Plastic	Brass, nickel-plated	Brass, nickel-plated
	Threaded section	Stainless steel		Stainless steel
Degree of protection according 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 contact or 1 NC contact		1 NO contact or 1 NC contact
Contact material		Rhodium		Rhodium
Rated insulation voltage U _i	[V]	250 □	50	50
Utilization category	AC-12	U _e 230 V I _e 0.03 A	U _e 30 V I _e 0.3 A	AC-12 U _e 30 V I _e 0.3 A
acc. to IEC 60947-5-1	DC-13	U _e 24 V I _e 0.3 A	U _e 24 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 type		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. 2000 operating cycles.

3) For mating connector see page 46 and 47.

4) Mating connector inserted and screwed tight.

Ordering table

1 NO contact	Connection cable 2 m	001 366 ⁵⁾ EGT1/4A2000	-
	Connection cable 5 m	001 368 ⁵⁾ EGT1/4A5000	-
	Plug connector	033 976 EGT1/4ASEM4	075 644 EGT1/4ASEM4C1802
1 NC contact	Connection cable 2 m	001 371 ⁵⁾ EGT1/4R2000	-
	Connection cable 5 m	001 372 ⁵⁾ EGT1/4R5000	-
	Plug connector	033 982 EGT1/4RSEM4	-

5) No UL approval. UL approval only for single hole fixing limit switch with plug connector

Made of high-quality stainless steel



With scraper made of PU



With scraper made of PU

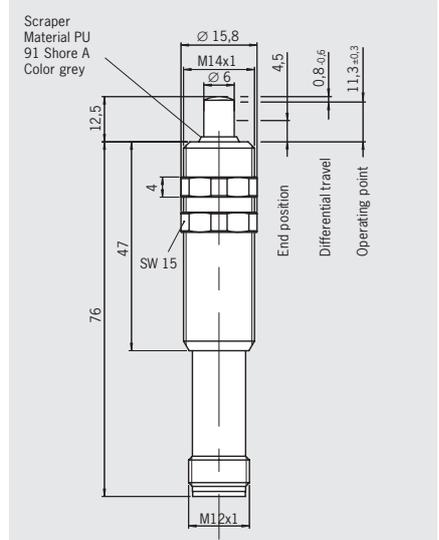
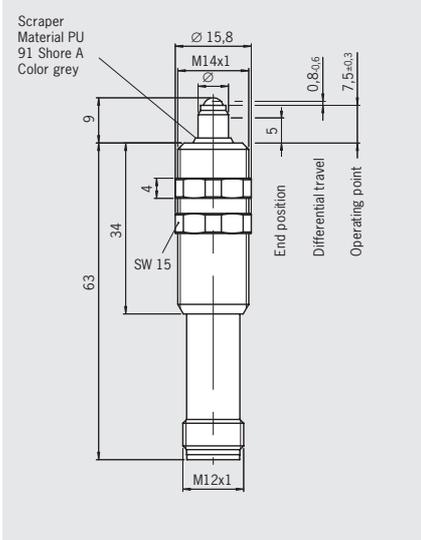
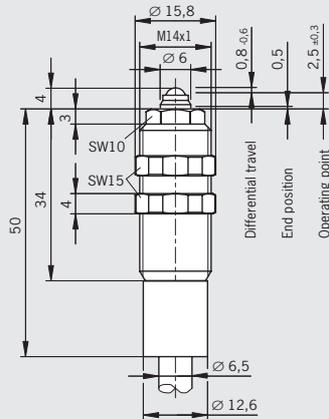


Design EGT1/4, M14 x 1, ball plunger
Connection cable, max. pressure 300 kPa

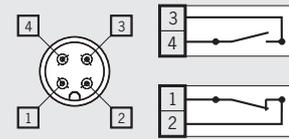
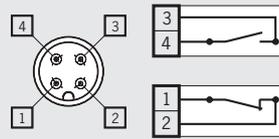
Design EGT1/4, M14 x 1, ball plunger
Plug connector M12

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	Mating connector inserted and screwed tight -25...+80	Mating connector inserted and screwed tight -25...+80
8	Approx. 16	8
30 x 10 ⁶ operating cycles ± 0.01	5 x 10 ⁶ operating cycles ± 0.01	30 x 10 ⁶ operating cycles ± 0.01
Approx. 16	Approx. 16	Approx. 16
Reed contact	Reed contact	Reed contact
1 NO contact	1 NO contact or 1 NC contact	1 NO contact
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 2x0.5 mm ² , encapsulated	Plug connector M12 ³⁾	Plug connector M12 ³⁾

094 982 EGT1/4A2000C2079	-	102 476 EGT1/4A2000C2137
-	-	-
-	095 278 EGT1/4ASEM4C2088	098 071 EGT1/4ASEM4C2137
-	-	-
-	-	-
-	104 316 EGT1/4RSEM4C2088	104 372 EGT1/4RSEM4C2137

Precision single hole fixing limit switches



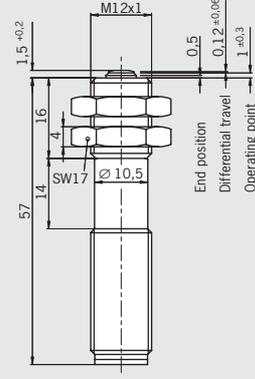
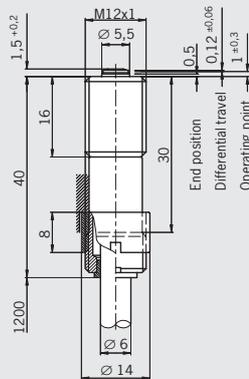
- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position

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

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

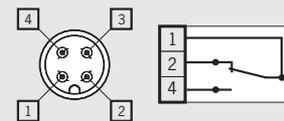
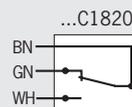
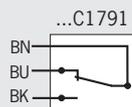


Dimension drawings



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

Wiring diagrams



Technical data

	Stainless steel		Stainless steel	
	IP 65		IP 65	
Housing material	Stainless steel		Stainless steel	
Degree of protection according to IEC 60529	IP 65		IP 65	
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} [kV]	2.5		1.5	
Utilization category acc. 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 type	PUR cable 3x0.5 mm ²	Silicone cable 3x0.5 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. 2000 operating cycles.

3) For mating connector see page 46, 47 and 48.

Ordering table

		075 556	076 464	
		EGM12-1200C1791	EGM12-1200C1820	-
1 changeover contact	Connection cable 1.2 m			-
	Connection cable 2 m	-	-	-
	Connection cable 4 m	076 154 EGM12-4000C1791	-	-
	Connection cable 5 m	-	-	-
Plug connector	-	-	082 205 EGM12SEM4	093 733 EGM12SEM4C1820

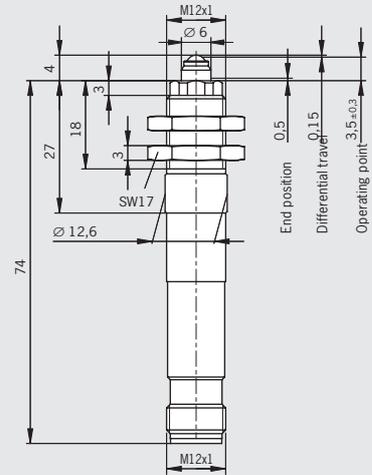
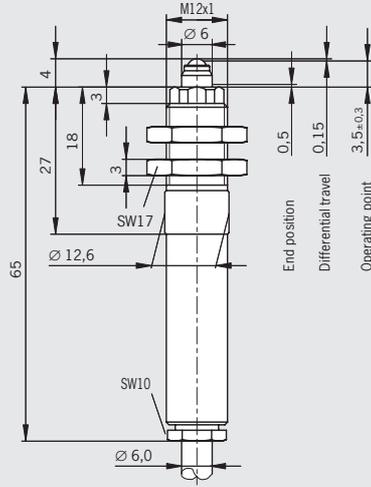
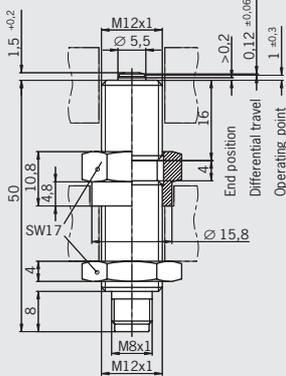


Design EGM12, M12 x 1, flat plunger
Plug connector M8

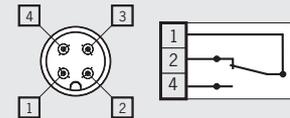
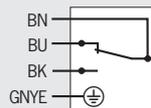
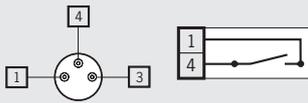
Design EGT1, M12 x 1, ball plunger
Connection cable with PE connection

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

Dimension drawings



Wiring diagrams



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 contact	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⁾

-	-	-
-	092 695 EGT1M12-2000	-
-	-	-
-	093 364 EGT1M12-5000	-
077 228 EGM12SAM3C1868	-	093 365 EGT1M12SEM4

Precision single hole fixing limit switches



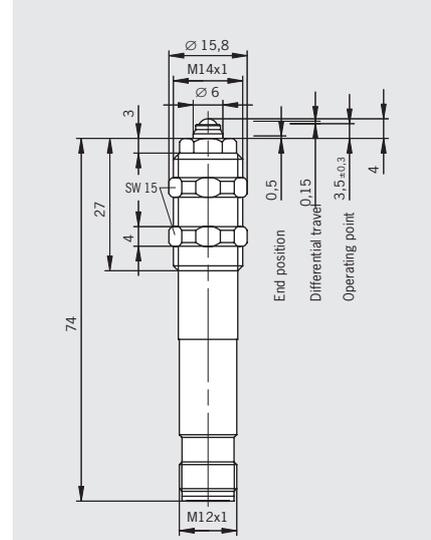
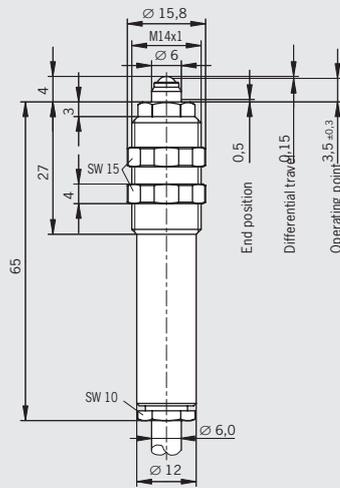
- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position

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

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

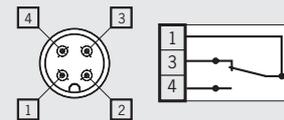
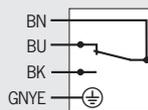


Dimension drawings



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

Wiring diagrams



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 according 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} [kV]	2.5	2.5
Utilization category acc. 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 type	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. 2000 operating cycles.

3) For mating connector see page 46 and 47.

Ordering table

Ordering code	Description	Part number	Notes
1 changeover contact	Connection cable 2 m	001 732 EGT1-2000	-
	Connection cable 5 m	001 733 EGT1-5000	-
	Plug connector	-	019 727 EGT1SEM4

For plug connector
with LED display



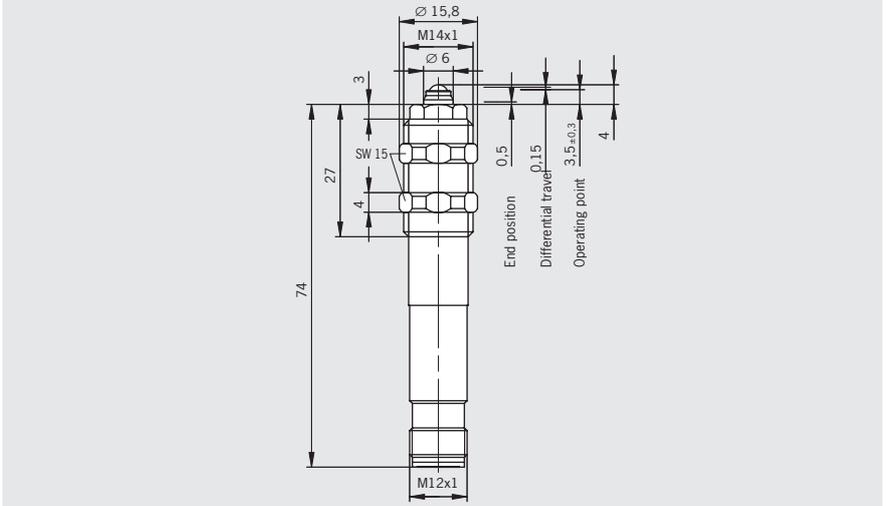
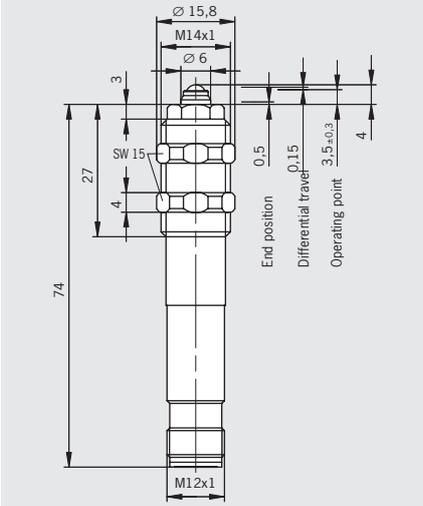
Suitable for aggressive coolants,
Diaphragm made out of Viton



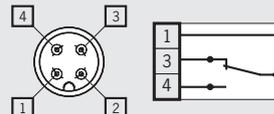
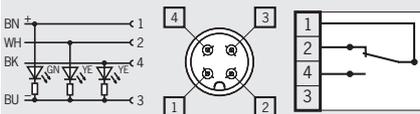
Design EGT1, M14 x 1, ball plunger
Plug connector M12

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⁾

-	-
-	-
054 250 EGT1SEM4C1613	077 347 EGT1SEM4C1832

Precision single hole fixing limit switches



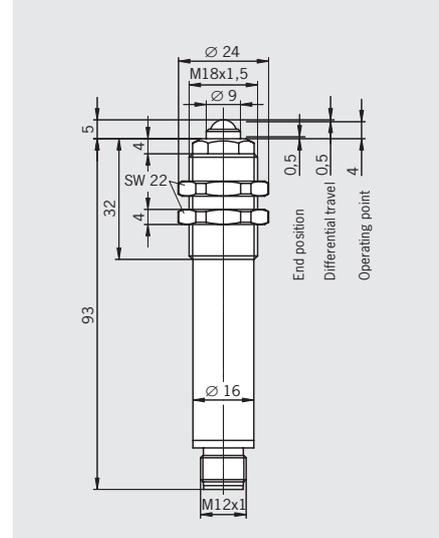
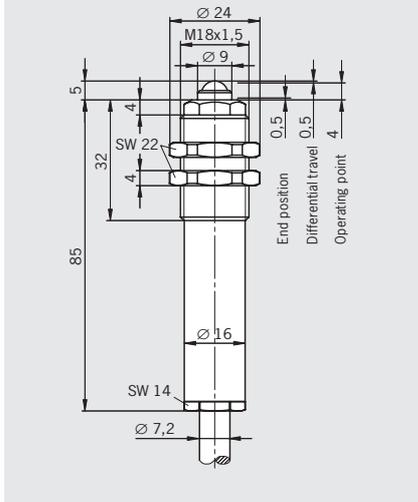
- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position



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

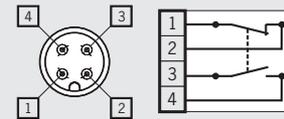
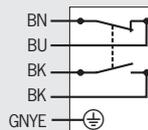
Design EGT2, M18 x 1.5, ball plunger
Plug connector M12

Dimension drawings



⚠ 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 according 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 contact and 1 NO contact	1 NC contact and 1 NO contact
Contact material	Fine silver gold-plated	Fine silver gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp} [kV]	2.5	2.5
Utilization category acc. 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 type	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. 2000 operating cycles.
2) For mating connector see page 46 and 47.

Ordering table

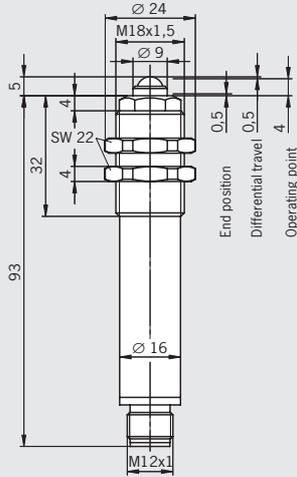
1 NC contact + 1 NO contact	Connection cable 2 m	001 864 EGT2-2000	-
	Connection cable 5 m	001 865 EGT2-5000	-
	Plug connector	-	052 504 EGT2SEM4



Switch head can be used as end stop

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

Dimension drawings

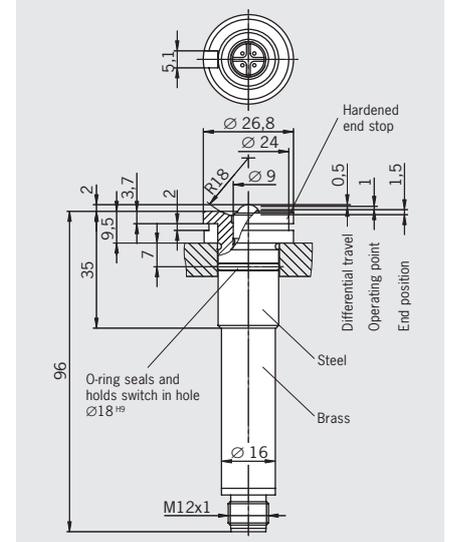
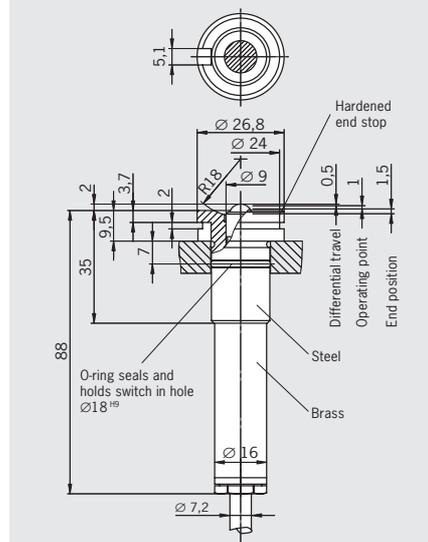


Switch head can be used as end stop

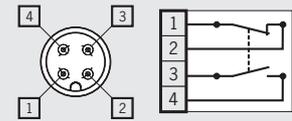
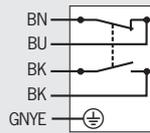
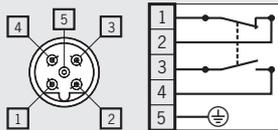
Design EGT3, Ø 18, ball plunger
Connection cable with PE connection



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		
-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 contact and 1 NO contact	1 NC contact and 1 NO contact	1 NC contact and 1 NO contact
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⁾

-	001 896 EGT3-2000	-
-	001 897 EGT3-5000	-
042 819 EGT2SEM5	-	070 834 EGT3SEM4

Precision single hole fixing limit switches

With 4 switching contacts

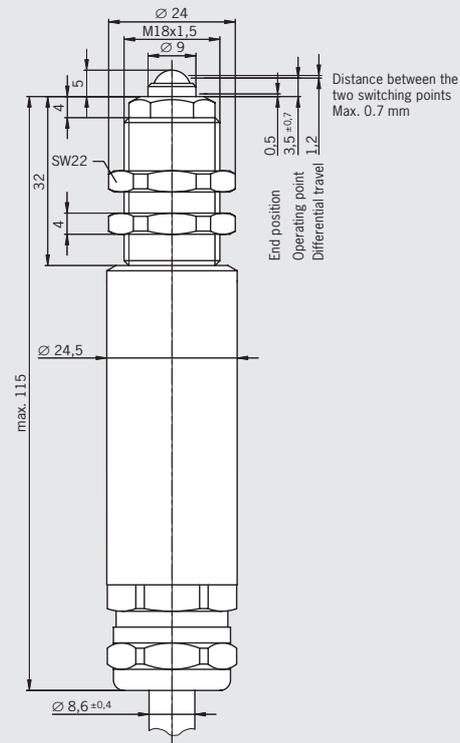


- ▶ With snap-action switching element
- ▶ Plunger material stainless steel
- ▶ Any installation position

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

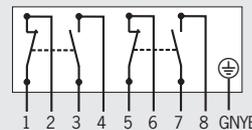


Dimension drawings



! 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 according 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 contacts and 2 NO contacts
Contact material	Fine silver gold-plated
Rated insulation voltage U _i [V]	250
Rated impulse withstand voltage U _{imp} [kV]	2.5
Utilization category acc. 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 type	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. 2000 operating cycles.

Ordering table

2 NC contact + 2 NO contact	Connection cable 2 m	094 339 EGT4-2000
	Connection cable 5 m	092 026 EGT4-5000
	Connection cable 10 m	093 967 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

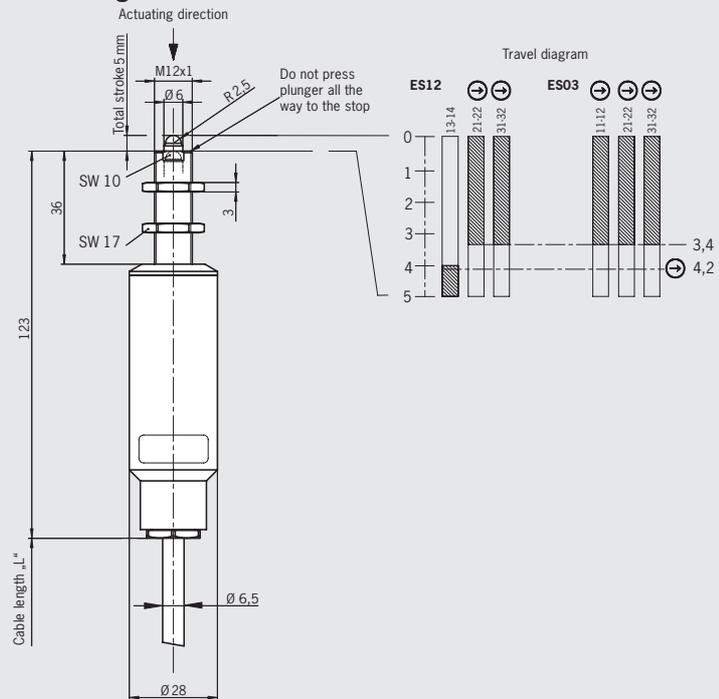
Switching element,
with 3 switching contacts



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 according 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}	[kV]	2.5
Utilization category according to EN 60947-1-5		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., at 10 mA	[V DC]	12
Short circuit protection (control circuit fuse)	[A gG]	4
Connection type		PUR cable 7 x 0.5 mm ²

1) Cable hard wired.

Ordering table

Connection cable	ES12	ES03
Connection cable 5 m	094 823 ²⁾ EGZ12-12-5000	On request

2) UL approval pending



Multiple clamping strip

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

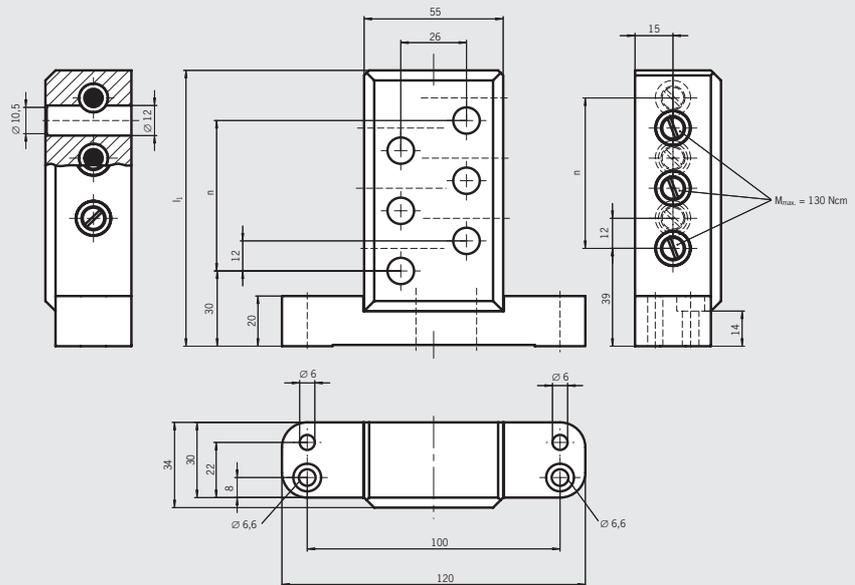


The multiple clamping strip is used for mounting several single hole fixing limit switches of design EGT 12 / EGM 12.

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

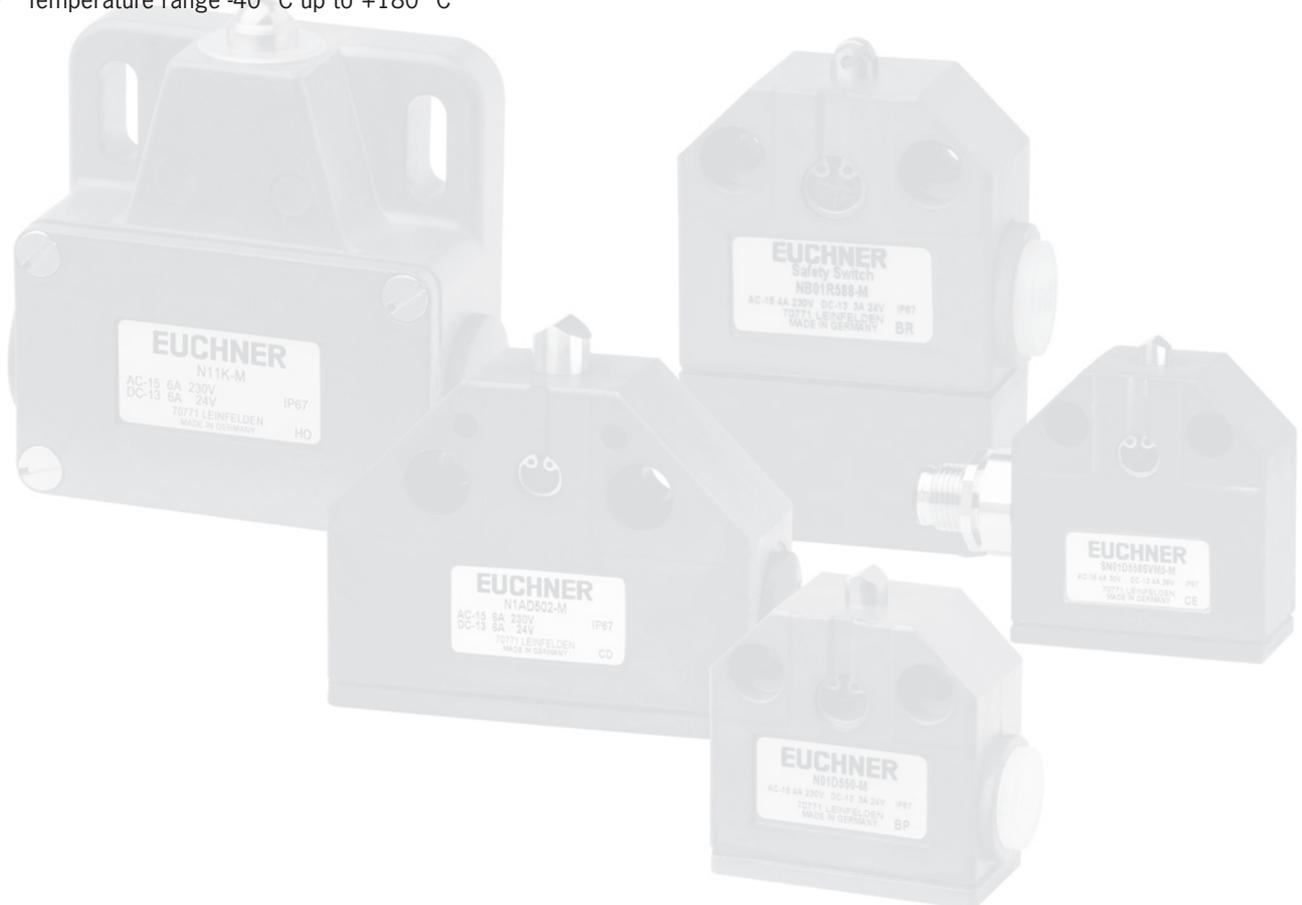
Item	Number of brackets	Dimension l ₁ [mm]	Order No.
RGKB02N12	2	62	084 511
RGKB04N12	4	86	084 514
RGKB06N12	6	110	084 510

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



Precision single limit switches

► Plunger material stainless steel

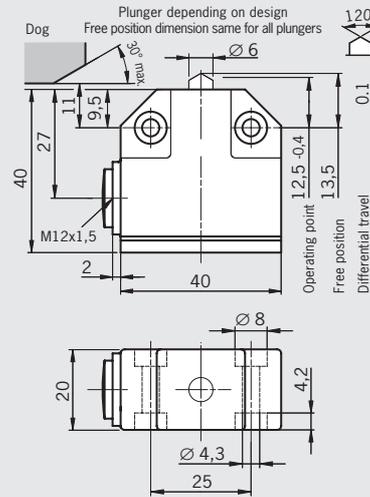


For temperatures up to 180 °C

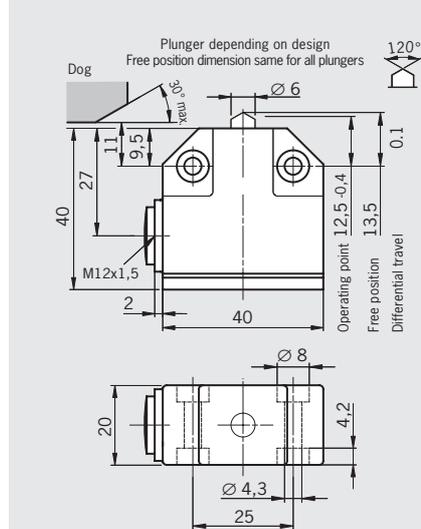


Design N01 Cable entry M12 x 1.5

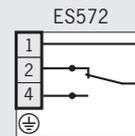
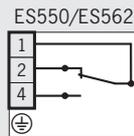
Dimension drawings



Design N01 Cable entry M12 x 1.5



Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection according 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 acc. to IEC 60947-5-1	AC-15 U _e 230V I _e 2A DC-13 U _e 24V I _e 2A		DC-13 U _e 30V I _e 100mA	AC-15 U _e 230V I _e 4A DC-13 U _e 24V I _e 1A		
Contact material	Silver, gold-plated		Gold alloy	Fine silver		
Switching current, min. at [mA]	10		5	10		
Switching current [V DC]	24		5	24		
Short circuit protection (control circuit fuse) [A gG]	6		0.125	5		
Connection type	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. 2000 operating cycles.

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

3) For mating connector see page 46 and 47.

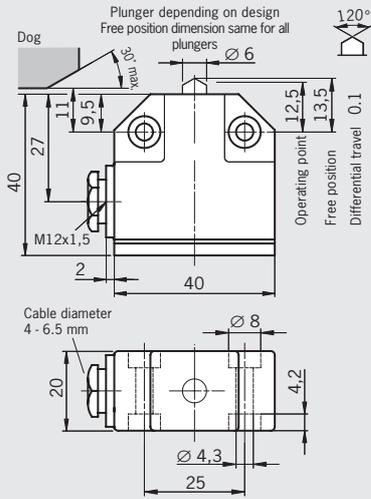
Ordering table

Plunger type	ES550	ES562	ES572
Chisel plunger	084 902 N01D550-M	087 151 N01D562-M	087 162 N01D572-M
Roller plunger R = 2.5 mm	084 903 N01R550-M	085 243 N01R562-M	087 163 N01R572-M
Ball plunger	084 904 N01K550-M	087 152 N01K562-M	087 164 N01K572-M

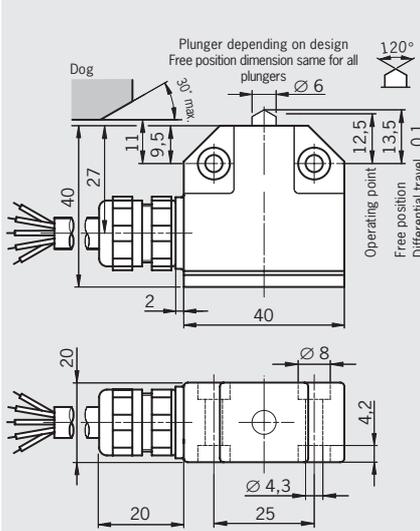


Design N01
Cable gland M12 x 1.5

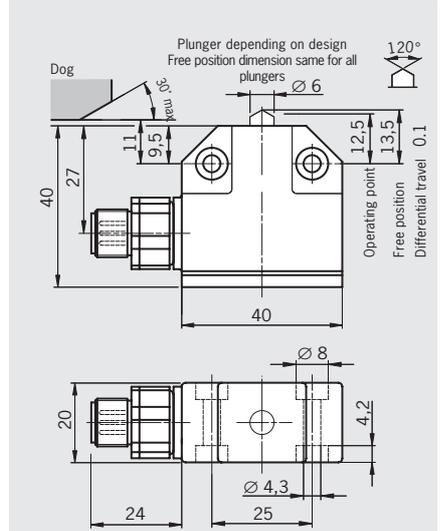
Dimension drawings



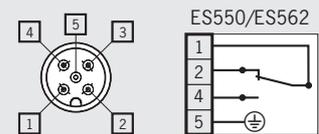
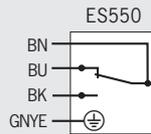
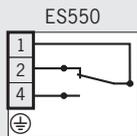
Design N01
Connection cable, length 5 m



Design N01
M12 plug adjustable, 4-pin + PE



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	Roller	Ball	Chisel	Roller	Ball	Chisel	Roller	Ball
± 0.02	± 0.05	± 0.03	± 0.02	± 0.05	± 0.03	± 0.02	± 0.05	± 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 230V I _e 2A			AC-15 U _e 230V I _e 2A			AC-15 U _e 30V I _e 2A	DC-13 U _e 30V I _e 100mA	
DC-13 U _e 24V I _e 2A			DC-13 U _e 24V I _e 2A			DC-13 U _e 24V I _e 3A	Gold alloy	
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
085 708	088 978	088 623	-
N01D550-MC2018	N01D550X5000-M	N01D550SVM5-M	
094 856	088 982	088 622	093 426
N01R550-MC2018	N01R550X5000-M	N01R550SVM5-M	N01R562SVM5-M
089 619	088 986	088 624	-
N01K550-MC2018	N01K550X5000-M	N01K550SVM5-M	



Precision single limit switches

► Plunger material stainless steel

For plug connector with LED display



For operating voltage 230 V

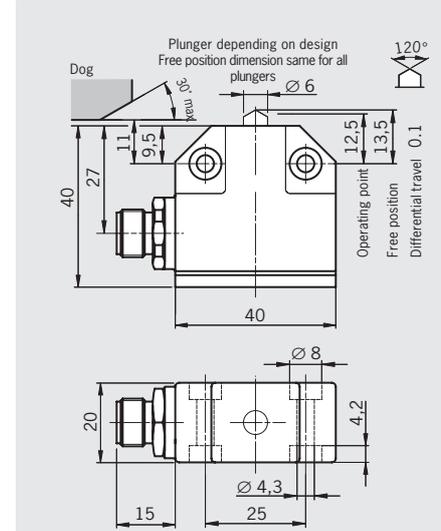
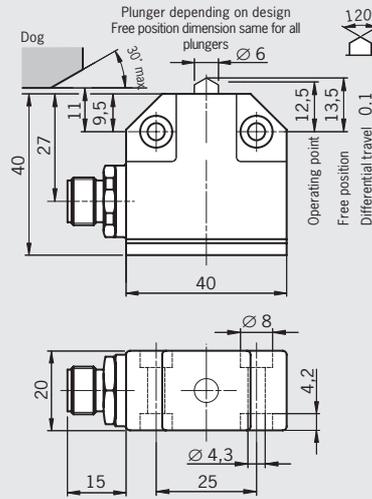


Design N01
M12 plug, 4-pin

Design N01
M12 plug, 4-pin + PE

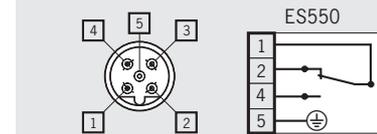
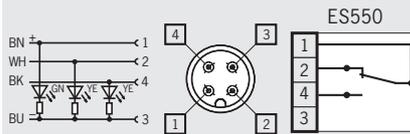


Dimension drawings



⚠ To achieve the positively driven travel, the dimension (I1-0.5) must be maintained by the trip dog. Actuating elements such as dog approach guides must be firmly 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 according to IEC 60529	IP 67			IP 67		
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 acc. to IEC 60947-5-1	DC-13 U _e 24V I _e 2A			AC-15 U _e 230V I _e 2A DC-13 U _e 24V I _e 2A		
Contact material	Silver, gold-plated			Silver, gold-plated		
Switching current, min. at [mA]	10			10		
Switching current [V DC]	24			24		
Short circuit protection (control circuit fuse) [A gG]	4			4		
Connection type	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. 2000 operating cycles.

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

3) For mating connector see page 46 and 47.

Ordering table

Plunger type	ES550	ES550
Chisel plunger	091 003 N01D550-MC1526	-
Roller plunger R = 2.5 mm	091 001 N01R550-MC1526	091 257 N01R550SEM5-M
Ball plunger	091 002 N01K550-MC1526	-

With safety switching element

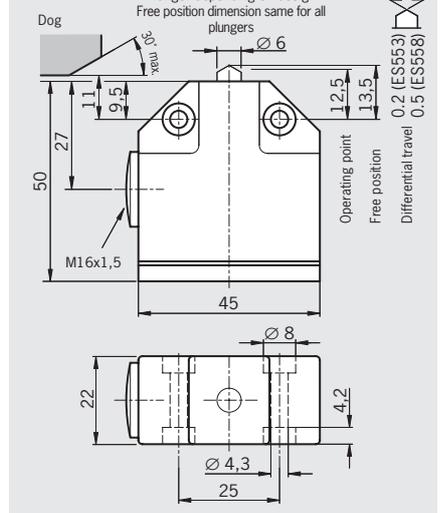
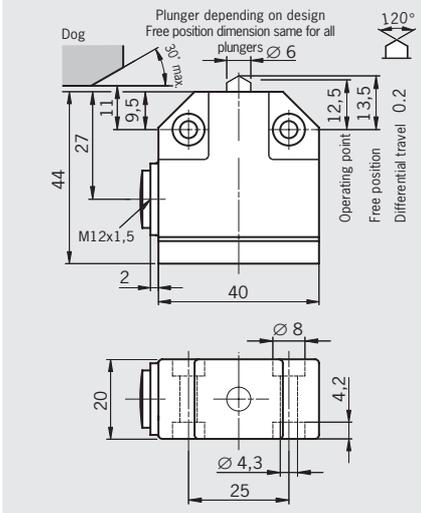
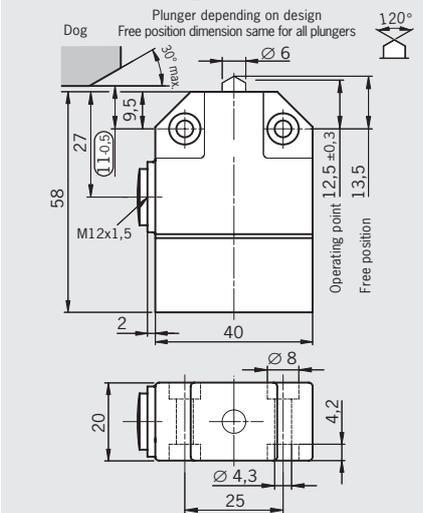


Design NB01
Cable entry M12 x 1.5

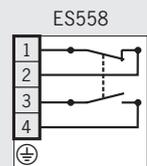
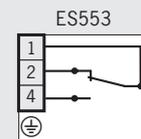
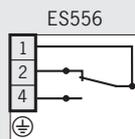
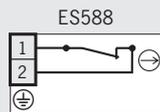
Design NB01
Cable entry M12 x 1.5

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	Roller ± 0.05	Chisel ± 0.02	Roller ± 0.05	Ball ± 0.03	Chisel ± 0.02	Roller ± 0.05	Ball ± 0.03
20	50	20	50	8	20	50	8
0.01		0.01			0.01		
15		15			15		
ES588		ES556			ES553	ES558	
1 NC contact ⊖		1 changeover contact			1 changeover contact	1 NO + 1 NC	
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			250		
AC-15 U _e 230V I _e 4A DC-13 U _e 24V I _e 3A		AC-15 U _e 230V I _e 2A DC-13 U _e 24V I _e 2A			AC-15 U _e 230V I _e 2A DC-13 U _e 24V I _e 2A	AC-15 U _e 230V I _e 4A DC-13 U _e 24V I _e 3A	
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
088 584 NB01D588-M	085 245 NB01D556-M	085 252 SN01D553-M	085 260 SN01D558-M
088 583 NB01R588-M	085 246 NB01R556-M	085 253 SN01R553-M	085 261 SN01R558-M
-	085 247 NB01K556-M	085 254 SN01K553-M	085 262 SN01K558-M



Precision single limit switches

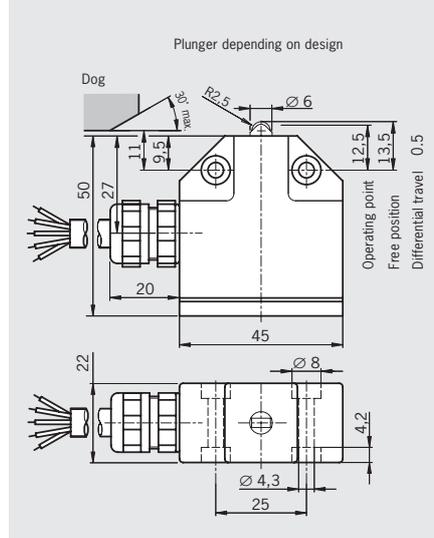
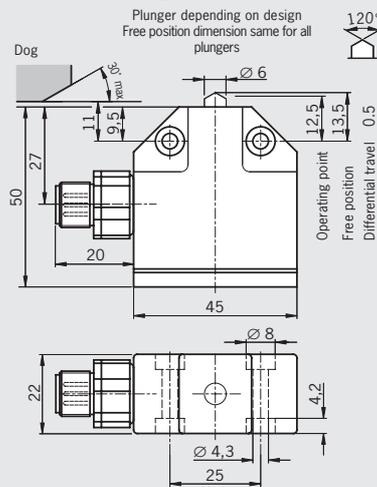


► Plunger material stainless steel

Design SN01
M12 plug adjustable, 4-pin + PE

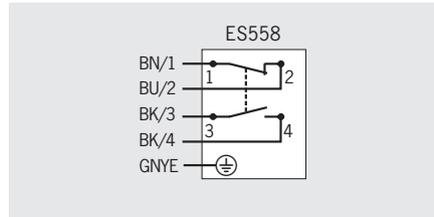
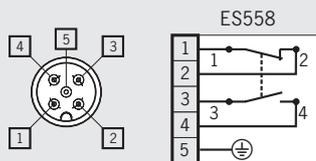
Design SN01
Connection cable, length 2 m

Dimension drawings



⚠ To achieve the positively driven travel, the dimension (120.5) must be maintained by the trip dog. Actuating elements such as dog approach guides must be firmly 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 according 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 contact + 1 NC contact			1 NO contact + 1 NC 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]	30			250
Utilization category acc. to IEC 60947-5-1	AC-15 U _e 36V I _e 4A DC-13 U _e 24V I _e 3A			AC-15 U _e 230V I _e 4A DC-13 U _e 24V I _e 3A
Contact material	Silver			Silver
Switching current, min. at [mA]	10			10
Switching current [V DC]	5			5
Short circuit protection (control circuit fuse) [A gG]	4			4
Connection type	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. 2000 operating cycles.

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

3) For mating connector see page 46 and 47.

Ordering table

Plunger type	ES558	ES558
Chisel plunger	088 625 SN01D558SVM5-M	-
Roller plunger SN01: R = 2.5 mm N1A: R = 4.0 mm	088 626 SN01R558SVM5-M	090 515 SN01R558X2000-M
Ball plunger	088 627 SN01K558SVM5-M	-
Dome plunger	-	-

Precision single limit switches

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

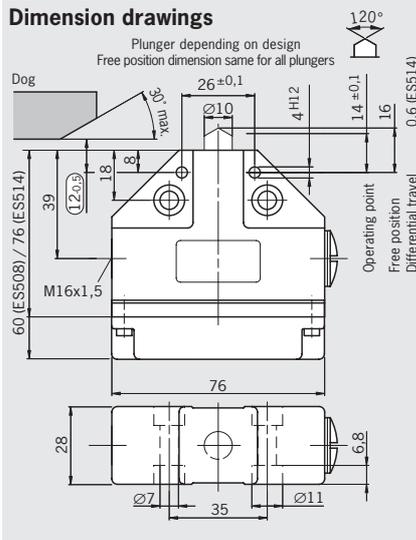


With safety switching element

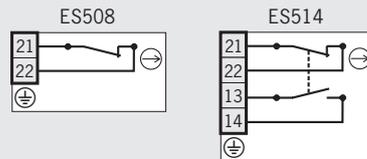


Design N1A
Cable entry M16 x 1.5

Dimension drawings

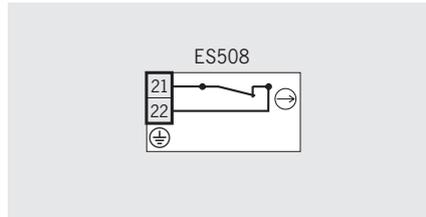
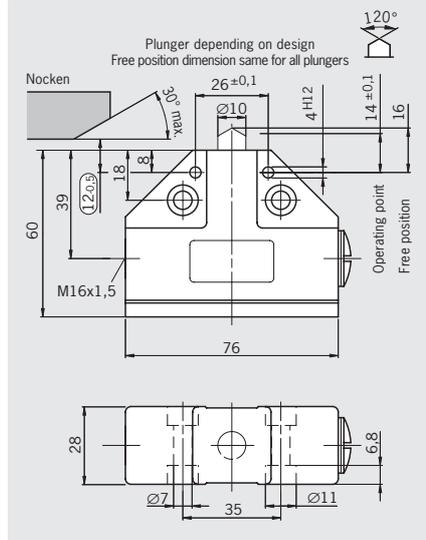


Wiring diagrams



With safety switching element, silicone membrane (inside) and low temperature grease

Design N1A
Cable entry M16 x 1,5



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection according 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		≥ 30	≥ 15		
Switching element	ES508 ⁴⁾		ES514	ES508 ⁴⁾		
Switching contact	1 NC contact ⊖		1 NO + 1 NC ⊖	1 NC contact ⊖		
Switching principle	Slow-action		Snap-action	Slow-action switching contact		
Mechanical life	30 x 10 ⁶ op. cycles		1 x 10 ⁶ op. 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 acc. 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			Silber, vergoldet		
Switching current, min. at [mA]	10		5	10		
Switching current [V DC]	24		24	24		
Short circuit protection (control circuit fuse) [A gG]	10			10		
Connection type	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. 2000 operating cycles.

2) The approach speed applies for 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		
Chisel plunger		083 886 N1AD508-M	083 849 N1AD514-M	103 237 N1AD508-MC2222
Roller plunger	 SN01: R = 2.5 mm N1A: R = 4.0 mm	083 887 N1AR508-M	078 487 N1AR514-M	103 221 N1AR508-MC2222
Ball plunger		-	-	-
Dome plunger		087 205 N1AW508-M	083 850 N1AW514-M	103 222 N1AW508-MC2222

With safety switching element, silicone membrane (in- and outside) and low temperature grease



With safety switching element

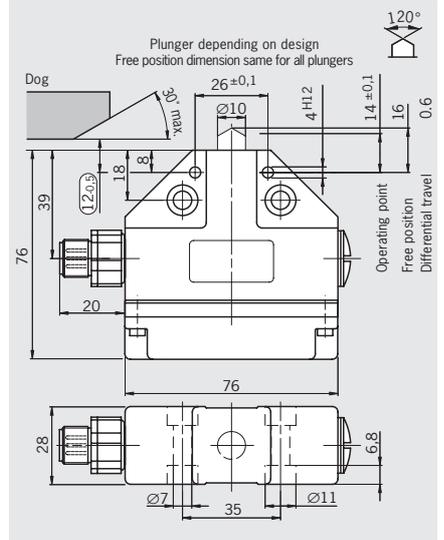
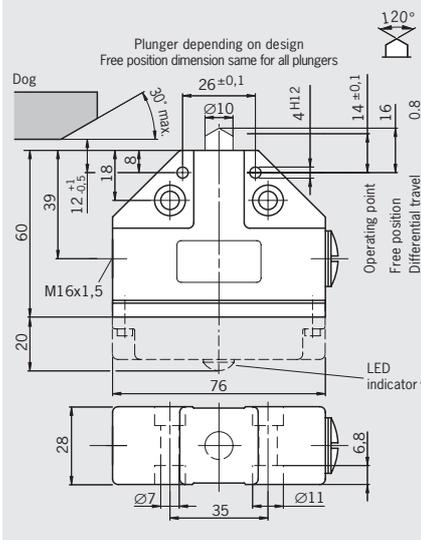
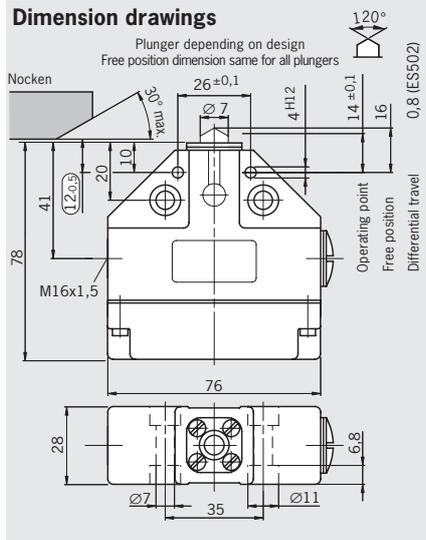


Design N1A
Cable entry M16 x 1,5

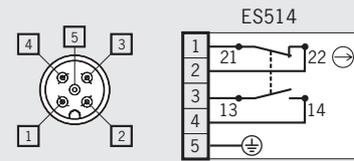
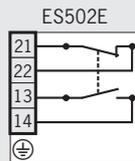
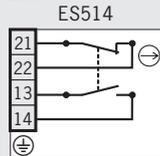
Design N1A
Cable entry M16 x 1,5

Design N1A
M12 plug adjustable, 4-pin + PE

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized IP 67 Mating connector inserted and screwed tight -30...+80		Die-cast aluminum, anodized IP 67 -5...+80			Die-cast aluminum, anodized IP 67 Mating connector inserted and screwed tight -25...+80		
Chisel ± 0.002 40	Roller ± 0.01 80	Chisel ± 0.002 40	Roller ³⁾ ± 0.01 80	Ball ± 0.01 10	Chisel ± 0.002 40	Roller ± 0.01 80	Dome ± 0.002 10
0.01		0.01			0.01		
≥ 30		≥ 20			≥ 30		
ES502E		ES502E ⁴⁾			ES514		
1 NO contact + 1 NC contact ⊖ Snap-action switching contact 1 x 10 ⁶ operating cycles		1 NO contact + 1 NC contact Snap-action switching contact 30 x 10 ⁶ operating cycles			1 NO contact + 1 NC contact ⊖ Snap-action switching contact 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 Silver, gold-plated		AC-12 U _e 230V I _e 10A / AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A Silver, gold-plated			AC-15 U _e 36V I _e 2.5A DC-13 U _e 24V I _e 4A 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) For mating connector see page 46 and 47.

ES514	ES502E	ES514
110 462 N1AD514AM-MC2222	079 265 N1AD502-M	087 603 N1AD514SVM5-M
103 247 N1AR514AM-MC2222	078 485 N1AR502-M	087 604 N1AR514SVM5-M
-	083 847 N1AK502-M	-
-	-	090 743 N1AW514SVM5-M



Precision single limit switches

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



For plug connectors with LED indicator

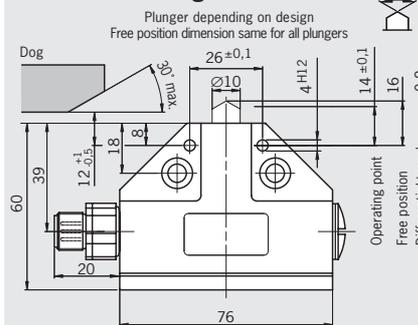


Design N1A
M12 plug adjustable, 4-pin + PE

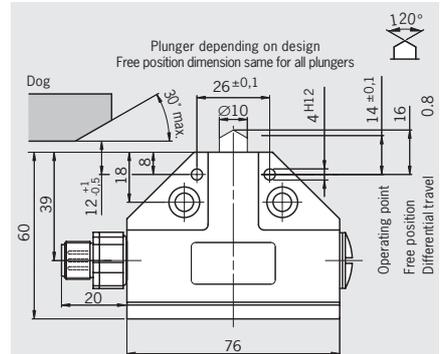
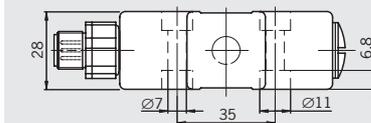
Design N1A
M12 plug adjustable, 4-pin + PE



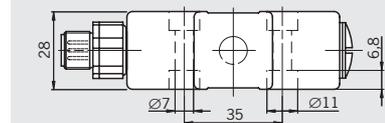
Dimension drawings



* Free position dimension applies for all plunger types

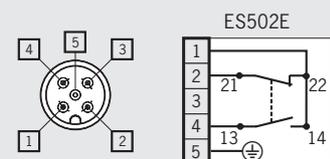
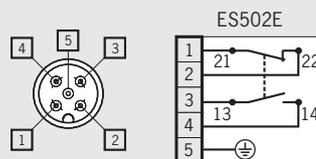


* Free position dimension applies for all plunger types



⚠ To achieve the positively driven travel, the dimension (31.0.5) must be maintained by the trip dog. Actuating elements such as dog approach guides must be firmly 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 according to IEC 60529	IP 67			IP 67		
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 contact + 1 NC contact			1 NO contact + 1 NC contact		
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 acc. 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 [mA]	10			10		
Switching current [V DC]	24			24		
Short circuit protection (control circuit fuse) [A gG]	4			4		
Connection type	Plug connector M12 ⁴⁾			Plug connector M12 ⁴⁾		

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2000 operating cycles.

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

Ordering table

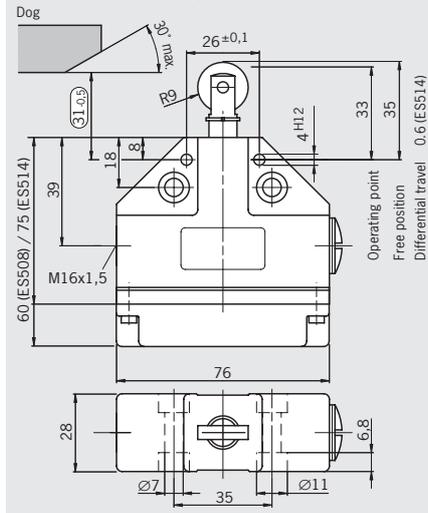
Plunger type	ES502E	ES502E
Chisel plunger	087 487 N1AD502SVM5-M	091 471 N1AD502SVM5-MC1883
Roller plunger N1A: R = 4.0 mm N1A...AM: R = 2.5 mm	087 488 N1AR502SVM5-M	On request
Ball plunger	087 489 N1AK502SVM5-M	087 496 N1AK502SVM5-MC1883
Extended roller plunger	-	-

With safety switching element

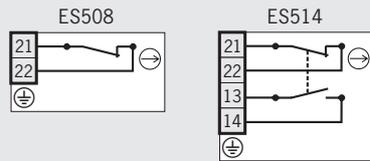


Design N1A, extended roller plunger
Cable entry M16 x 1.5

Dimension drawings



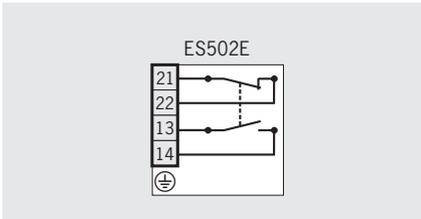
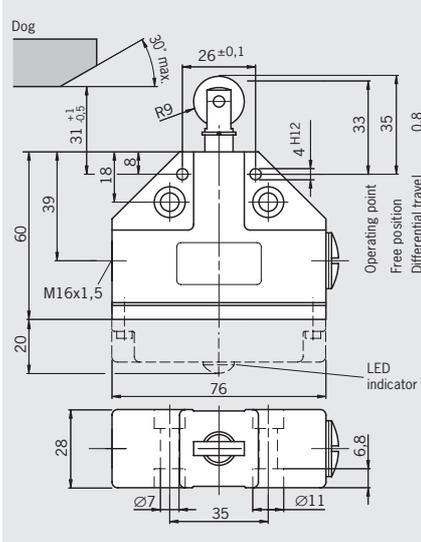
Wiring diagrams



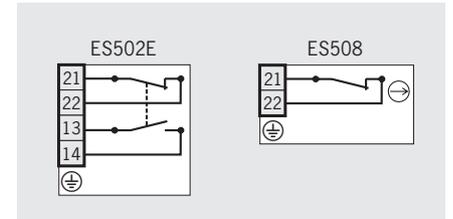
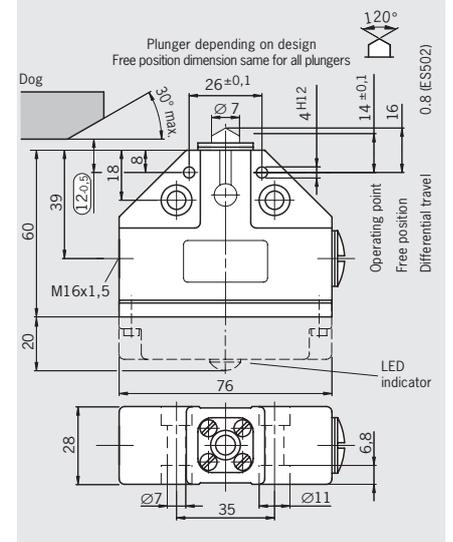
With exterior diaphragm



Design N1A, extended roller plunger
Cable entry M16 x 1.5



Design N1A
Cable entry M16 x 1.5



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 contact	1 NO + 1 NC	1 NO contact + 1 NC contact		1 NO + 1 NC	1 NC contact	
Slow-action	Snap-action	Snap-action switching contact		Snap-action	Slow-action	
30 x 10 ⁶ op. cycles	1 x 10 ⁶ op. 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 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-12 U _e 230V I _e 10A AC-15 U _e 230V I _e 6A 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 230V 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		

3) Version with LED function display AC/DC 10-60V or AC 110/230 V on request.
4) For mating connector see page 46 and 47.

ES508	ES514	ES502E	ES502E	ES508
-	-	-	090 542 N1AD502AM-M	090 546 N1AD508AM-M
-	-	-	090 541 N1AR502AM-M	090 547 N1AR508AM-M
-	-	-	091 059 N1AK502AM-M	-
087 147 N1ARL508-M	087 204 N1ARL514-M	083 848 N1ARL502-M	-	-



Precision single limit switches

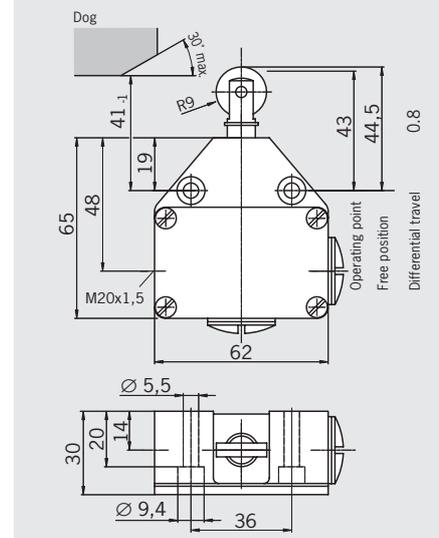
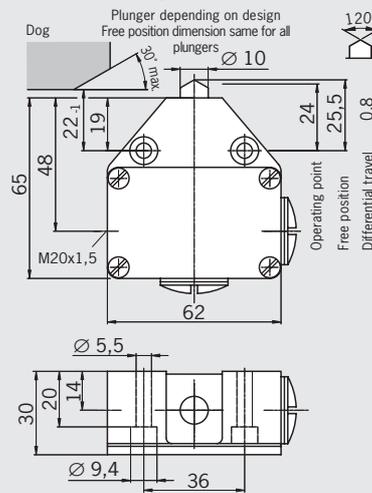
► Plunger material stainless steel



Design N10
Cable entry M20 x 1.5

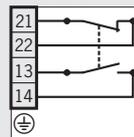
Design N10, extended roller plunger
Cable entry M20 x 1.5

Dimension drawings

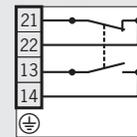


Wiring diagrams

ES502V



ES502V



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized
Degree of protection according 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	± 0.01	± 0.1
Approach speed max. ²⁾ [m/min]	40	80	10	20
Approach speed, min. [m/min]	0.01			0.01
Actuating force, max. [N]	≥ 20			≥ 20
Switching element	ES502V			ES502V
Switching contact	1 NO contact + 1 NC contact			1 NO contact + 1 NC contact
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 acc. 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 [mA]	20			20
Switching current [V DC]	24			24
Short circuit protection (control circuit fuse) [A gG]	16			16
Connection type	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. 2000 operating cycles.

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

Ordering table

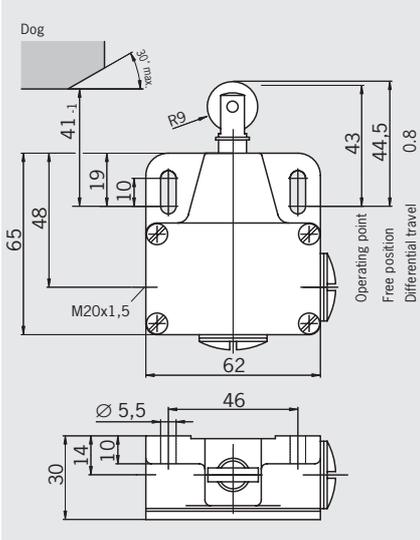
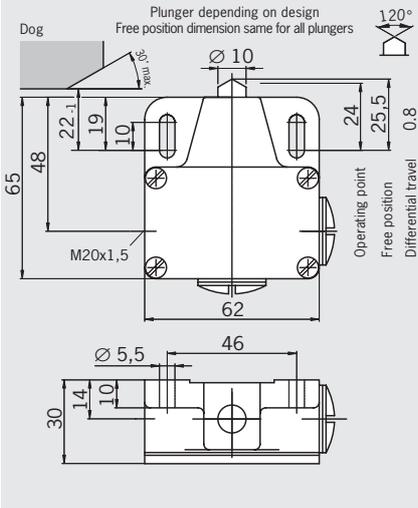
Plunger type	ES502V	ES502V
Chisel plunger 	086 293 N10D-M	-
Roller plunger 	086 294 N10R-M	-
Ball plunger 	088 589 N10K-M	-
Extended roller plunger 	-	088 587 N10RL-M



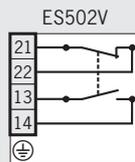
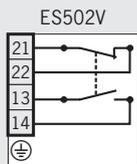
Design N11
Cable entry M20 x 1.5

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 contact + 1 NC contact			1 NO contact + 1 NC contact		
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
086 298 N11D-M	-
086 313 N11R-M	-
088 585 N11K-M	-
-	086 299 N11RL-M

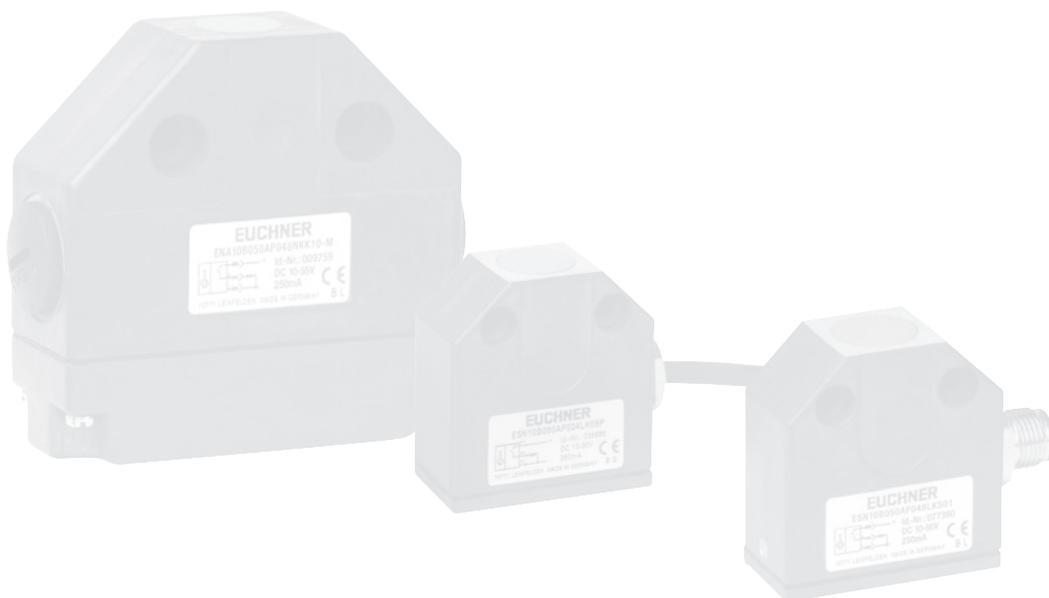


Inductive Single Limit Switches

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 actuating velocity and high operating frequency
- ▶ Resistant to strong vibrations and coarse soiling
- ▶ 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

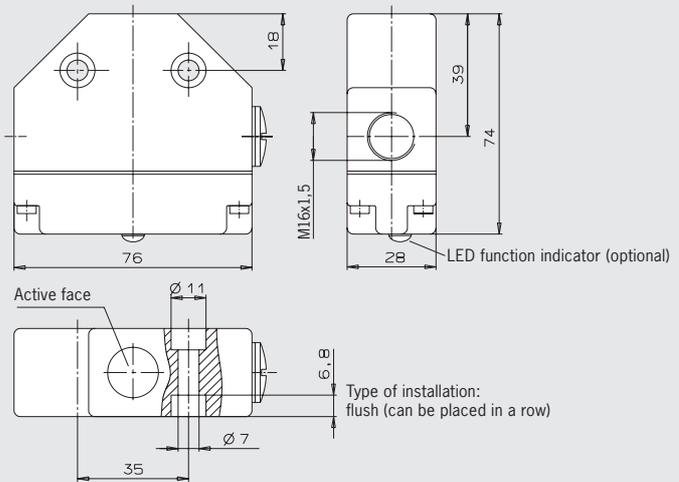
- ▶ Housing according to DIN 43693
- ▶ Rated operating distance 5 mm
- ▶ LED function display optional



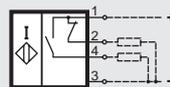
Design ENA

Cable entry M16 x 1.5

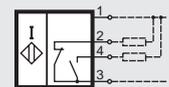
Dimension drawings



Wiring diagrams



DC NO + NC, PNP



DC NO + NC, NPN

Technical data

Parameters	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 60 947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection according to IEC 60529	IP 67	
Ambient temperature T	- 25...+ 70	°C
Connection type	Screw terminal	
Conductor cross-section, max.	2 x 1.5 (per contact)	mm ²
Weight	0,2	kg

Ordering table

LED function display		PNP	NPN
With	Item	ENA10B050UP048LKK10-M	On request
	Order No.	ENA 086 280	
Without	Item	ENA10B050UP048NKK10-M	ENA10B050UN048NKK10-M
	Order No.	ENA 086 099	ENA 086 282

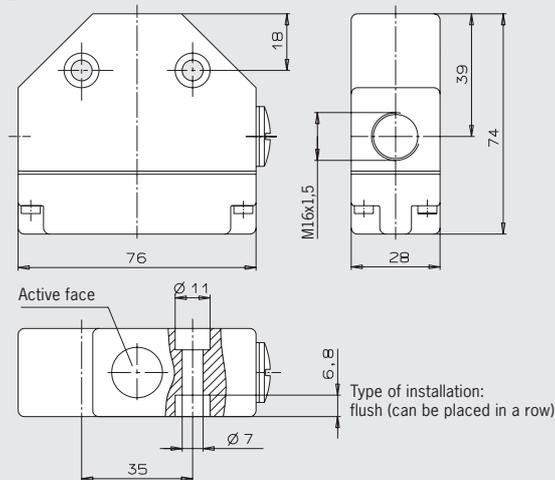
Inductive single limit switch design ENA, AC version

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

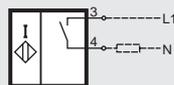


Design ENA
Cable entry M16 x 1.5

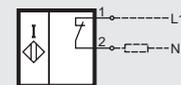
Dimension drawings



Wiring diagrams



AC NO



AC NC

Technical data

Parameters	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	
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_e	≤ 250	mA
Inrush current I_k (20 ms)	1.5	A
Off-state current I_r	$110 \text{ V} \leq 1.5 / 230 \text{ V} \leq 2.0$	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 60 947-5-2	AC-140	
Rated supply frequency	50 ... 60	Hz
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection according to IEC 60529	IP 67	
Ambient temperature T	- 25...+ 70	°C
Connection type	Screw terminal	
Max. conductor cross-section	2 x 1.5 (per contact)	mm ²
Weight	0.2	kg

Ordering table

LED function display	NO	NC
Item	ENA10B050AW250NNK10-M	ENA10B050RW250NNK10-M
Order No.	ENA 086 284	ENA 088 775

LED visible from the exterior on request.

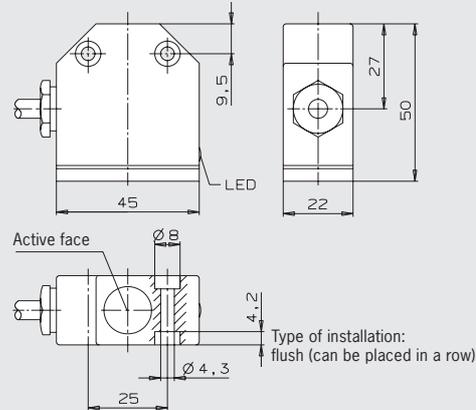
Inductive single limit switch design ESN, DC version

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

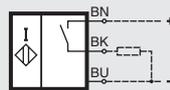


Design ESN
Connection cable 5 m PUR

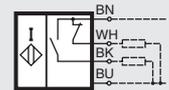
Dimension drawings



Wiring diagrams



DC NO, PNP



DC NO + NC, PNP

Technical data

Parameters	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_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 60 947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection according 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
Weight	0.3	mm ² kg

Ordering table

Connection cable		PNP NO	PNP NO + NC
5 m PUR	Item	ESN10B050APO48LK05P-M	ESN10B050UPO48LK05P-M
	Order No.	ESN 088 769	ESN 088 771

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

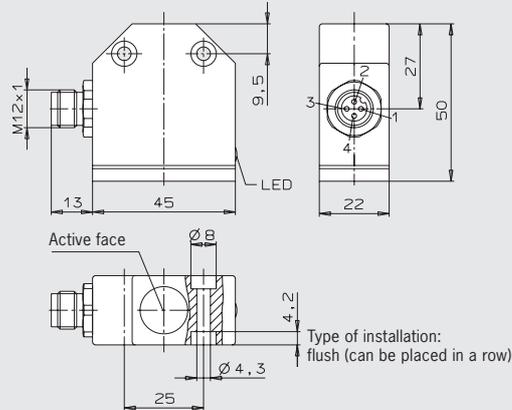
Inductive single limit switch design ESN, DC version

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



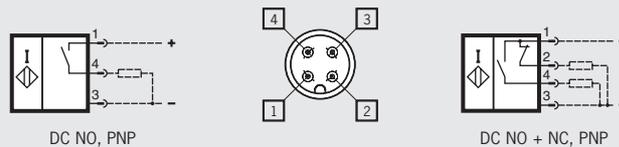
Design ESN
Plug connector M12, 4-pin

Dimension drawings



For plug connector see page 46/47

Wiring diagrams



Technical data

Parameters	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 60 947-5-2	DC-13	
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection according to IEC 60529	IP 67	
Ambient temperature T	- 25...+ 70	°C
Connection	Plug connector M12 ¹⁾	
Weight	0.1	kg

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

Ordering table

Plug connector system		PNP NO	PNP NO + NC
Plug connector S01	Item	ESN10B050AP048LKS01-M	ESN10B050UP048LKS01-M
(M12, 4-pin)	Order No.	ESN 090 439	ESN 088 770

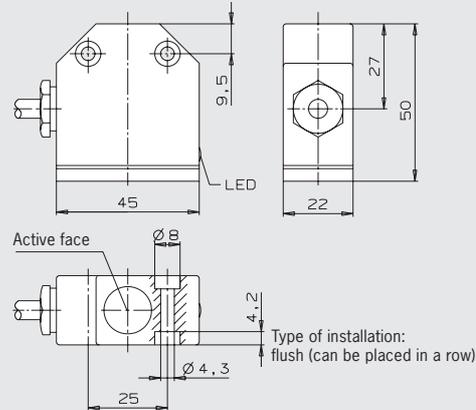
Inductive single limit switch design ESN, AC version

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

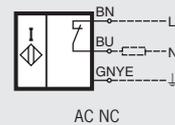
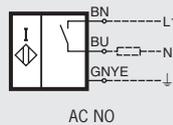


Design ESN
Connection cable 5 m PVC

Dimension drawings



Wiring diagrams



Technical data

Parameters	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 push-pull +U	AC	
LED function display	Yes	
Short circuit protection	No	
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_e	≤ 250	mA
Inrush current I_k (20 ms)	1.5	A
Off-state current I_r	$110\text{ V} \leq 1.5 / 230\text{ V} \leq 2.0$	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 60 947-5-2	AC-140	
Rated supply frequency	50 ... 60	Hz
Housing material	Die-cast aluminum, anodized	
Material for the sensing face	PBT	
Degree of protection according to IEC 60529	IP 67	
Ambient temperature T	- 25...+ 70	°C
Connection type	PVC cable 3 x 0.5	mm ²
Weight	0.3	kg

Ordering table

Connection cable		NO	NC
5 m PVC	Item	ESN10B050AW250LN05V-M	ESN10B050RW250LN05V-M
	Order No.	ESN 088 773	ESN 088 774

Other cable lengths on request.

Round connectors M12

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



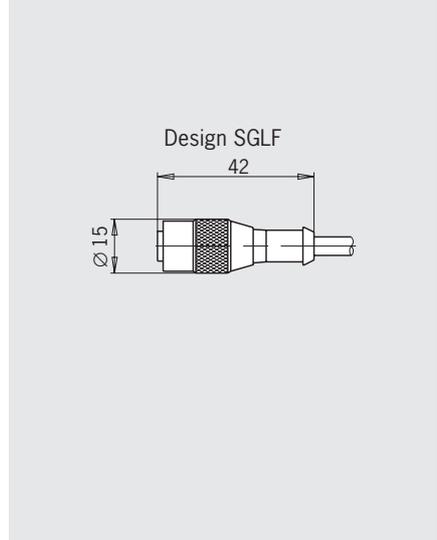
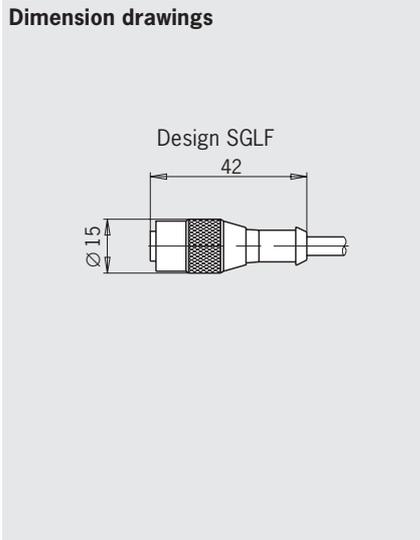
Straight plug connector M12

4-pin / 4-pin + PE

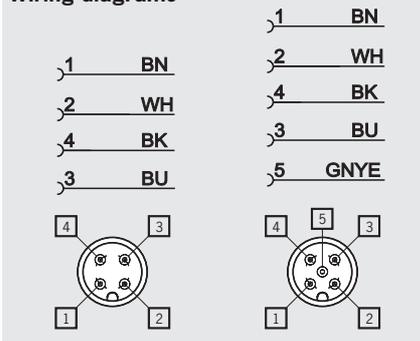
Straight plug connector M12, coded

4-pin + PE

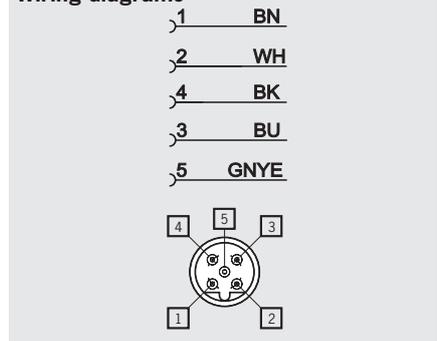
Dimension drawings



Wiring diagrams



Wiring diagrams



Technical data

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 according 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
Conductor cross-section [mm²]	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 eff]	2	1.5	2
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	035 613 SGLF4-5000P	073 461 SGLF5-5000P	045 524 SGLF5PE-5000
Plug connector M12, with 3 LEDs, Connection cable 5 m	-	-	-

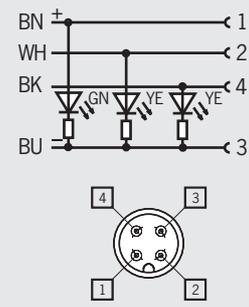
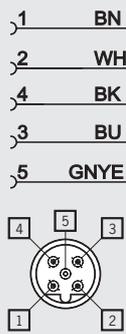
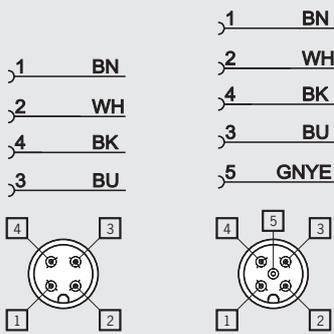
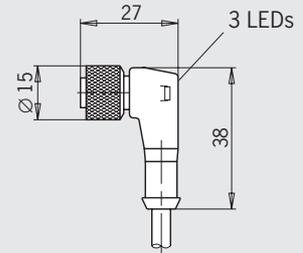
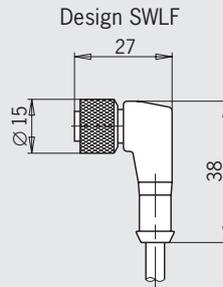
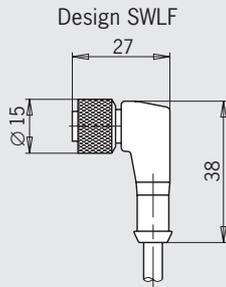


Right-angle plug connector M12
4-pin / 4-pin + PE

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

Plug connector M12 with 3 LEDs
4-pin

Dimension drawings



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	5 x 0.5	4 x 0.34
6	5	5	5	5
≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
2	1.5	2	2	-
AC 250/DC 300	AC 30/DC 36	AC 250/DC 300	AC 250/DC 300	DC 10 ... 30
4	4	4	4	4

035 618 SWLF4-5000P	073 462 SWLF5-5000P	045 523 SWLF5PE-5000	-
-	-	-	041 091 SWLF4P-5000P

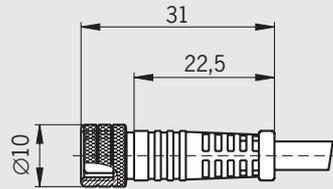


Round connectors M8

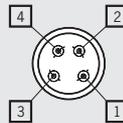
- ▶ Straight design and elbow connector
- ▶ Screw connection
- ▶ Sprayed cable
- ▶ 4-pin

Straight plug connector M8 4-pin

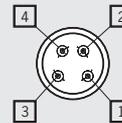
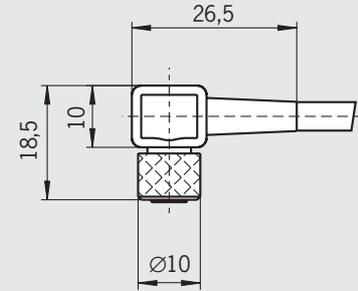
Dimension drawings



Wiring diagrams



Right-angle plug connector M8 4-pin



Technical data

Number of pins	4	4
Housing material	PUR	PUR
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 according 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
Conductor 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	088 812 C-M08F04-04X025PV02,0-ZN	—
Plug connector M8, connection cable 5 m	088 813 C-M08F04-04X025PV05,0-ZN	—
Plug connector M8, connection cable 10 m	088 814 C-M08F04-04X025PV10,0-ZN	084 703 C-M08F04-04X025PV10,0-ZN-084703
Plug connector M8, connection cable 15 m	088 815 C-M08F04-04X025PV15,0-ZN	—
Plug connector M8, connection cable 25 m	095 035 C-M08F04-04X025PV25,0-ZN	—
Plug connector M8, connection cable 50 m	097 100 C-M08F04-04X025PV50,0-ZN	—

LED function display

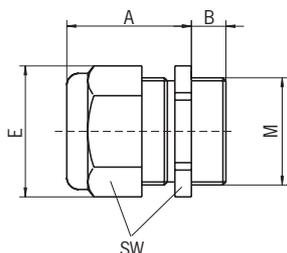
On request, versions with voltage ranges AC 110/230 V are available.



Operating voltage [V]	Color	Item	Order No.
AC/DC 12 - 60	Red	LE 060 rt	035 495
	Green	LE 060 gr	035 496
	Yellow	LE 060 ge	035 497

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	086 327
EKVM16/04	M16 x 1.5	4 - 6.5	20	6	20	18	086 328
EKVM16/06	M16 x 1.5	6.5 - 9.5	20	6	20	18	086 330
EKVM20/06	M20 x 1.5	6.5 - 9.5	20	6	24.4	22	077 683

Additional products

Trip rails/trip dogs

U-trip rails

enable the trip dogs to be adjusted from the switch side. The trips 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

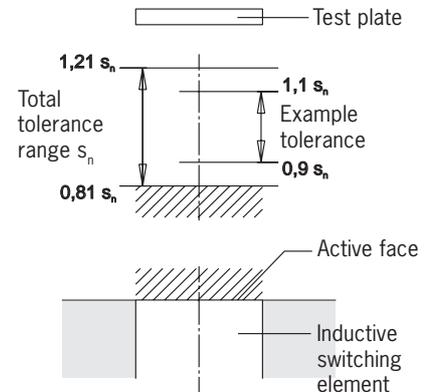
Rated operating distance s_n

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

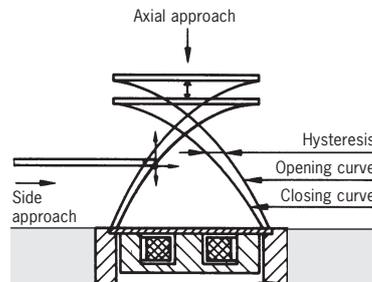
The assured operating distance is the operating distance at which correct operation of the inductive switching element is guaranteed within the permissible operating conditions (temperature and voltage).

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_o flows.

Rated operating current I_o

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

Off-state current I_o

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.

Inrush current I_k

The inrush 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.

Customized versions

Inductive switching elements according to NAMUR

These switching elements fulfill the specification IEC 60 947-5-6 and IEC 61 934.

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 are available on request ($s_n = 5 \text{ mm}$).

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.

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088 982	N01R550X5000-M	27
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089 619	N01K550-MC2018	27
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091 848	EGT11R2NSFM5	12
092 026	EGT4-5000	22
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International representation

Australia

Micromax Sensors & Automation
112 Beaconsfield St
Auburn NSW 2144
Tel. +61-2-4271-1300
Fax +61-2-4271-8091
micromax@micromax.com.au

Austria

EUCHNER G.m.b.H.
Süddruckgasse 4
2512 Tribuswinkel
Tel. +43-2252-421-91
Fax +43-2252-452-25
info@euchner.at

Benelux

EUCHNER (BENELUX) BV
Visschersbuurt 23
3350 AC Papendrecht
Tel. +31-78-6154-766
Fax +31-78-6154-311
info@euchner.nl

Brazil

EUCHNER Ltda
Av. Prof. Luiz Ignácio Anhaia Mello,
no. 4387
S. Lucas
São Paulo - SP - Brasil
CEP 03295-000
Tel. +55-11-2918-2200
Fax +55-11-2301-0613
euchner@euchner.com.br

Canada

IAC & Associates Inc.
2180 Fasan Drive
Unit A
Oldcastle, Ontario
NOR 1L0
Tel. +1-519-737-0311
Fax +1-519-737-0314
sales@iacnassociates.com

China

EUCHNER (Shanghai) Trading Co., Ltd.
Unit C, Floor 20
Cross Region Plaza
No. 899 Lingling Road
Xuhui District
Shanghai, 200030
Tel. +86-21-5774-7090
Fax +86-21-5774-7599
info@euchner.com.cn

Czech Republic

EUCHNER electric s.r.o.
Spielberk Office Center
Holandská 8
639 00 Brno
Tel. +420-533-443-150
Fax +420-533-443-153
info@euchner.cz

Denmark

Duelco A/S
Mommarmvej 5
6400 Sønderborg
Tel. +45-7010-1007
Fax +45-7010-1008
info@duelco.dk

Finland

Sähkölehto Oy
Holkkitie 14
00880 Helsinki
Tel. +358-9-774-6420
Fax +358-9-759-1071
office@sahkolehto.fi

France

EUCHNER France S.A.R.L.
Parc d'Affaires des Bellevues
Allée Rosa Luxembourg
Bâtiment le Colorado
95610 ERAGNY sur OISE
Tel. +33-1-3909-9090
Fax +33-1-3909-9099
info@euchner.fr

Hong Kong

Imperial Engineers & Equipment Co. Ltd.
Unit B 12/F Cheung Lee Industrial Building
9 Cheung Lee Street Chai Wan
Hong Kong
Tel. +852-2889-0292
Fax +852-2889-1814
info@imperial-elec.com

Hungary

EUCHNER Ges.m.bH
Magyarországi Fióktelep
2045 Törökbálint
FSD Park 2.
Tel. +36-2342-8374
Fax +36-2342-8375
info@euchner.hu

India

EUCHNER Electric (India) Pvt. Ltd.
West End River View
40, First Floor
Survey No. 169/1, Aundh
Pune 411007
Tel. +91-20-6401 6384
Fax +91-20-2588 5148
info@euchner.in

Teknic Euchner Pvt. Ltd.

64, Electronics City
Hosur Road
Bangalore 560100
Tel. +91-80-28520711
Fax +91-80-28520900
marketing@teknic-euchner.co.in

Israel

Ilan At Gavish Automation Service Ltd.
16 Shenkar St. Qiryat Arie 49513
P.O. Box 10118
Petach Tikva 49001
Tel. +972-3-922-1824
Fax +972-3-924-0761
mail@ilan-gavish.com

Italy

TRITECNICA S.r.l.
Viale Lazio 26
20135 Milano
Tel. +39-02-5419-41
Fax +39-02-5501-0474
info@tritecnica.it

Japan

Solton Co. Ltd.
2-13-7, Shin-Yokohama
Kohoku-ku, Yokohama
Japan 222-0033
Tel. +81-45-471-7711
Fax +81-45-471-7717
sales@solton.co.jp

Korea

EUCHNER Korea Co., Ltd.
RM 810 Daerung Technotown 3rd
#448 Gasang-Dong
Kumchon-Gu, Seoul
Tel. +82-2-2107-3500
Fax +82-2-2107-3999
info@euchner.co.kr

Mexico

SEPIA S.A. de C.V.
Maricopa # 10
302, Col. Napoles.
Del. Benito Juarez
03810 Mexico D.F.
Tel. +52-55-5536-7787
Fax +52-55-5682-2347
alazcano@sepia.mx

Poland

ELTRON
Pl. Wolności 7B
50-071 Wrocław
Tel. +48-71-3439-755
Fax +48-71-3460-225
eltron@eltron.pl

Republic of South Africa

RUBICON ELECTRICAL DISTRIBUTORS
4 Reith Street, Sidwell
6061 Port Elizabeth
Tel. +27-41-451-4359
Fax +27-41-451-1296
sales@rubiconelectrical.com

Romania

First Electric SRL
5, Luterana Street
App. 27, Sector 1
010161 Bucharest
Tel. +40-21-31231-39
Fax +40-21-31131-93
office@firstelectric.ro

Singapore

Sentronics Automation & Marketing Pte Ltd.
Blk 3, Ang Mo Kio Industrial Park 2A
#05-06
Singapore 568050
Tel. +65-6744-8018
Fax +65-6744-1929
sentronics@pacific.net.sg

Slovakia

EUCHNER electric s.r.o.
Spielberk Office Center
Holandská 8
639 00 Brno
Tel. +420-533-443-150
Fax +420-533-443-153
info@euchner.cz

Slovenia

SMM d.o.o.
Jaskova 18
2000 Maribor
Tel. +386-2450-2326
Fax +386-2462-5160
franc.kit@smm.si

Spain

EUCHNER, S.L.
Gurutzege 12 - Local 1
Polígono Belartza
20018 San Sebastian
Tel. +34-943-316-760
Fax +34-943-316-405
comercial@euchner.es

Sweden

Censit AB
Box 331
33123 Värnamo
Tel. +46-370-6910-10
Fax +46-370-1888-8
info@censit.se

Switzerland

EUCHNER AG
Grofstrasse 17
8887 Mels
Tel. +41-81-720-4590
Fax +41-81-720-4599
info@euchner.ch

Taiwan

Daybreak Int'l (Taiwan) Corp.
3F, No. 124, Chung-Cheng Road
Shihlin 11145, Taipei
Tel. +886-2-8866-1234
Fax +886-2-8866-1239
day111@ms23.hinet.net

Thailand

Aero Automation Co., Ltd.
600/441 Moo 14 Phaholyothin Rd.
Kukot, Lam Lukka
Patumthanee 12130
Tel. +66-2-536-7660-1
Fax +66-2-536-7877
aeroautomation@yahoo.co.th

Turkey

Entek Otomasyon Urunleri San.ve Tic.Ltd.Sti.
Perpa Tic.Mer. B Blok
Kat: 11 No:1622 - 1623
34384 Okmeydani / Istanbul
Tel. +90-212-320-2000 / 01
Fax +90-212-320-1188
entekotomasyon@entek.com.tr

United Kingdom

EUCHNER (UK) Ltd.
Unit 2 Petre Drive,
Sheffield
South Yorkshire
S4 7PZ
Tel. +44-114-256-0123
Fax +44-114-242-5333
info@euchner.co.uk

USA

EUCHNER USA Inc.
6723 Lyons Street
East Syracuse, NY 13057
Tel. +1-315-7010-315
Fax +1-315-7010-319
info@euchner-usa.com

EUCHNER USA Inc.

Detroit Office
130 Hampton Circle
Rochester Hills, MI 48307
Tel. +1-248-537-1092
Fax +1-248-537-1095
info@euchner-usa.com

EUCHNER GmbH + Co. KG

Kohlhammerstraße 16

70771 Leinfelden-Echterdingen

Germany

Tel. +49-(0)711-7597-0

Fax +49-(0)711-753316

info@euchner.de

www.euchner.com

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