

Position Switches



EUCHNER

More than safety.

EUCHNER

More than safety.



Headquarters in Leinfelden-Echterdingen



Logistics center in Leinfelden-Echterdingen



Production location in Unterböhringen

Internationally successful – the EUCHNER company

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

The medium-sized family-operated company based in Leinfelden, Germany, employs around 700 people around the world.

16 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

Quality and innovation – the EUCHNER products

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

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

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers.

The product ranges are subdivided as follows:

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



Position Switches

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General information

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

EUCHNER precision single hole fixing limit switches are technically sophisticated control switches which have been proving their reliability, day in and day out, for decades in 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 design allow installation directly at the sensing points. This feature dispenses with the complicated levers or linkages associated with a high level of design complexity and expense.



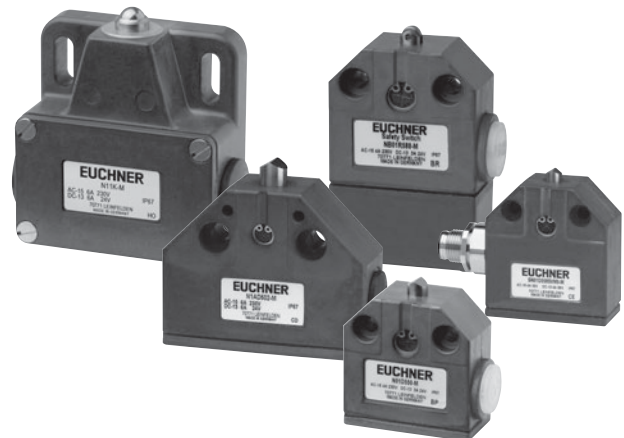
Precision single limit switches

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

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

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

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

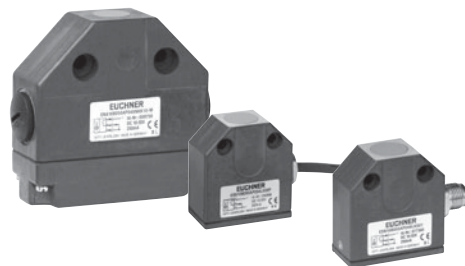


Inductive single limit switches

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

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

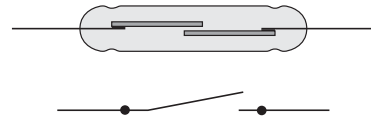
Interchangeability with mechanical single limit switches means that it is possible to straightforwardly modify machines. The switches can therefore be retrofitted on existing machine installations to take full advantage of the benefits of non-contact switches.



Switching elements with reed contact

Reed contact

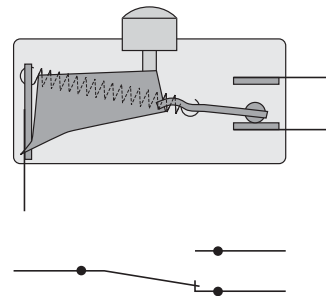
The reed contact comprises two ferromagnetic contacts in a glass bulb. When the reed contact is placed in a magnetic field, the contacts adopt opposite polarities and are closed. For series EGT with reed contact.



Mechanical switching elements

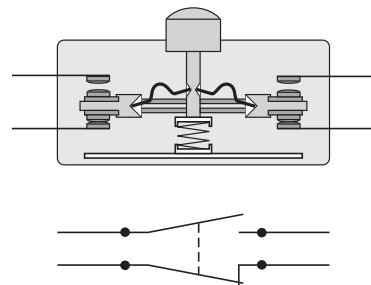
Changeover contact with snap-action function

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



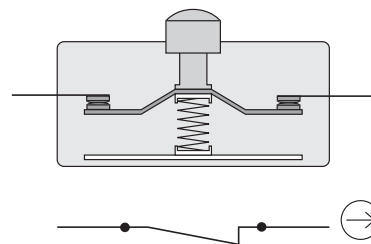
Snap-action switching element¹⁾ with one normally open contact (NO) and one normally closed contact (NC)

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



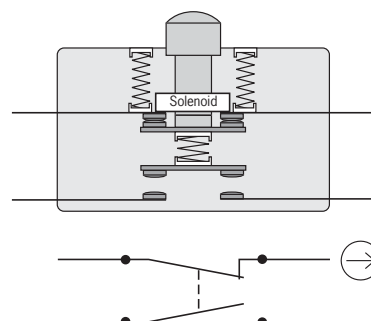
Safety switching element with slow-action switching contact²⁾

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



Safety switching element with snap-action switching contact¹⁾

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



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

Positively driven 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.

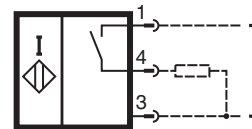


Positively driven position switch.
Safety switching elements marked with this symbol are not available as replacement switching elements.

Inductive switching elements

NO function

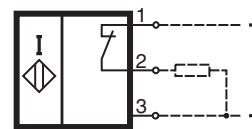
The NO function means that the load current flows when the active face of the inductive switching element is activated and that no current flows when the active face is not activated.



DC NO contact, PNP

NC function

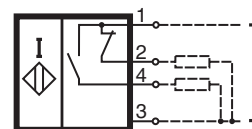
The NC function means that the load current does not flow when the active face of the inductive switching element is activated and that current flows when the active face is not activated.



DC NC, PNP

NO + NC function

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



DC NO + NC contact, PNP

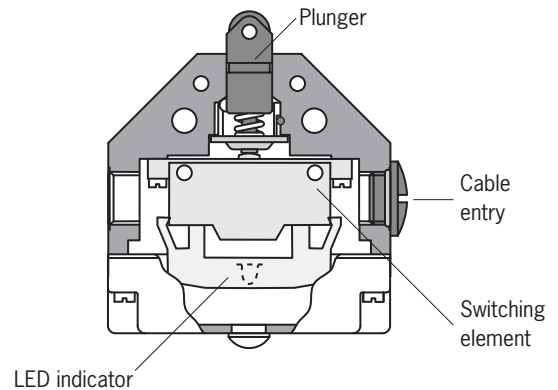
Precision single limit switches

Structure

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 anodized guide bore in the housing or in a sintered bronze sleeve. These maintenance-free sliding elements make a key contribution to the reliability and correct operation of the switches. Even beyond the guaranteed mechanical life.

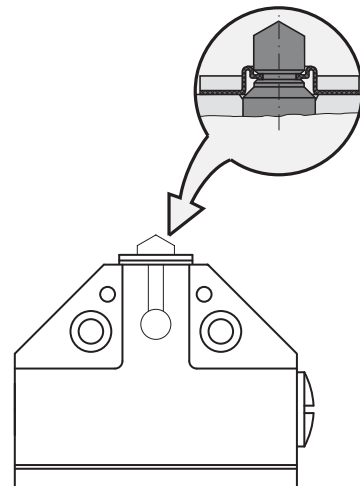


Exterior diaphragm

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

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

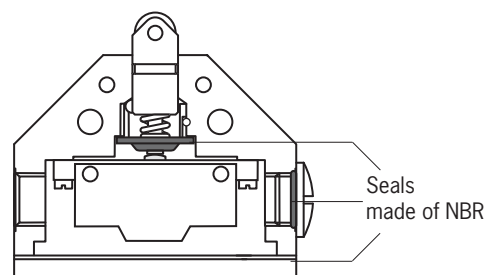
The plunger guides in the housing are thus reliably protected from the penetration of the cooling lubricant. Plunger sticking is prevented, and the replacement of the switch or plunger is unnecessary. Technical data for this series see page 35.



Seals

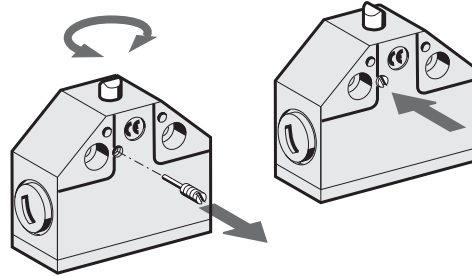
EUCHNER uses high-quality and proven acrylonitrile-butadiene rubber (NBR) for all seals and sealed areas. This material is resistant to oils, greases, fuels, hydraulic fluids and most known cooling lubricants. Moreover, NBR possesses high mechanical strength over a wide temperature range and so it is perfectly suitable for the highly stressed diaphragm seal, which separates the plunger compartment and the interior of the switch.

The material of the diaphragm seal is a key criterion for the quality, mechanical life and precision of the EUCHNER precision multiple limit switches. The same material is used for the cover seal and the cable entry. Seals made of Viton or silicone are available on request for special applications.



Adjustability

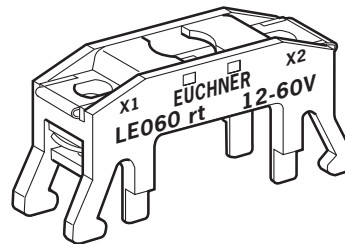
On the chisel plungers and the roller plungers (normal and extended) the approach direction can be changed by 90° at any time. After unscrewing the locking pin, the plunger can be rotated by 90°.



LED function display

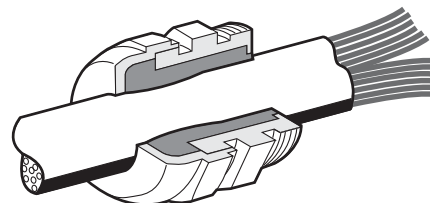
If required, the EUCHNER single limit switches of design N1A can be equipped with an LED function display (AC/DC 10 - 60 V or AC 110/230 V, color red).

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



Cable connection

EUCHNER position switches are tested to degree of protection IP 67 in accordance with IEC 60529. In order to obtain this degree of protection, only high-quality metal cable glands with a captive sealing ring are used. A selection for different cable diameters is listed on page 44.



Single hole fixing limit switches – cylindrical design

The round design with simple, single-hole assembly allows installation of the command switch 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

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



Precision single hole fixing limit switches

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



Ambient temperature up to 120 °C

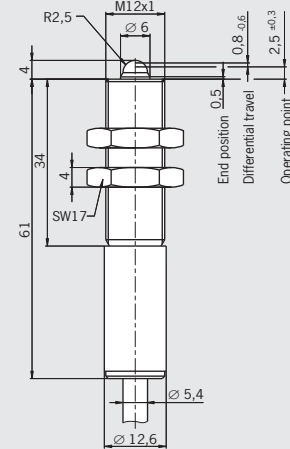
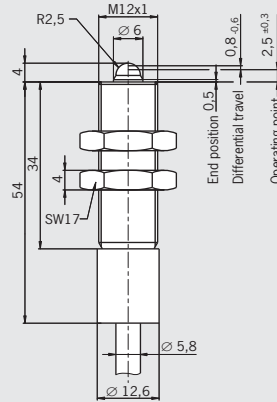


Design EGT12, M12 x 1, dome plunger
Connection cable, double insulated



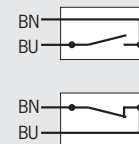
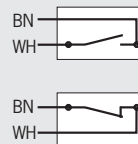
Design EGT12, M12 x 1, dome plunger
Connection cable, double insulated

Dimension drawings



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

Wiring diagrams



Technical data

Housing material	Sleeve	Stainless steel	Plastic
	Threaded section	Stainless steel	Stainless steel
Degree of protection acc. to IEC 60529		IP 65	IP 68
Ambient temperature	[°C]	-25 ¹⁾ ... +120	-25 ¹⁾ ... +80
Approach speed, max.	[m/min]	8	8
Mechanical life	axial actuation	30 x 10 ⁶ operating cycles (1 x 10 ⁶ at 120 °C)	30 x 10 ⁶ operating cycles
	radial actuation	-	1 x 10 ⁶ operating cycles (dog 30°)
Operating point accuracy ²⁾	[mm]	± 0.01	± 0.01
Actuating force (end position)	[N]	Approx. 16 (3 on request)	Approx. 16 (3 on request)
Switching element		Reed contact	Reed contact
Switching contact		1 NO or 1 NC	1 NO or 1 NC
Contact material		Rhodium	Rhodium
Rated insulation voltage U _i	[V]	50	50
Utilization category acc. to IEC 60947-5-1		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
Switching current, min., at 24 V	[mA]	1	1
Switching voltage, min.	[V DC]	1	1
Short circuit protection (control circuit fuse)	[A gG]	0.4	0.4
Connection		Silicone cable 2 x 0.5 mm ²	PUR cable 2 x 0.5 mm ²

1) Cable hard wired.

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

3) Mating connector see page 42 and 43.

Ordering table

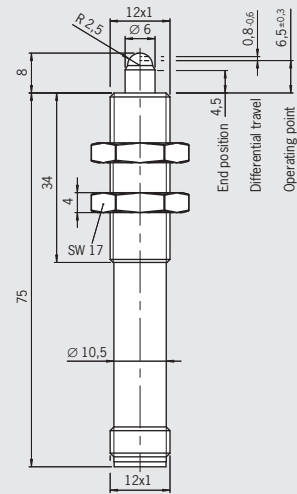
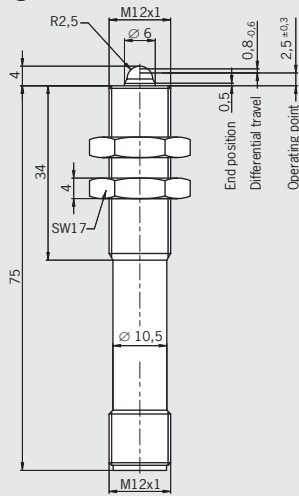
1 NO	Connection cable 3 m	104223 EGT12A3000C2250	-
	Connection cable 5 m	-	082201 EGT12A5000
	Plug connector	-	-
1 NC	Connection cable 3 m	-	-
	Connection cable 5 m	On request	078848 EGT12R5000
	Plug connector	-	-



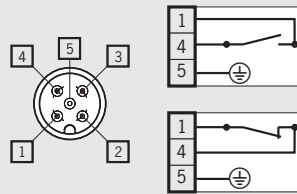
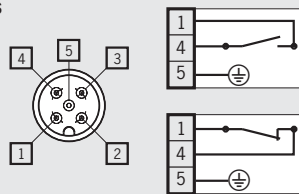
Design EGT12, M12 x 1, dome plunger
Plug connector M12 with PE connection

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

Dimension drawings



Wiring diagrams



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

-	-
-	-
075426 EGT12ASFM5	095112 EGT12ASFM5C2083
-	-
-	-
075427 EGT12RSFM5	-

Precision single hole fixing limit switches

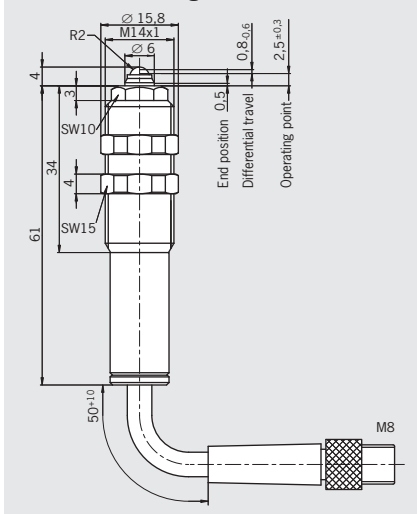


- ▶ With reed contact and protective diode
- ▶ Plunger material stainless steel
- ▶ Any installation position

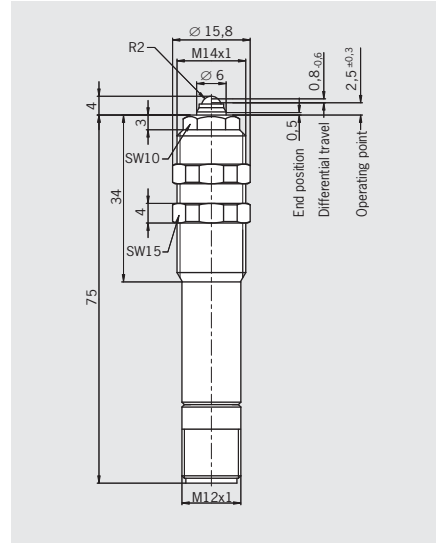


Design EGT11, M14 x 1, ball plunger
Connection cable 0.5 m with plug connector M8

Dimension drawings

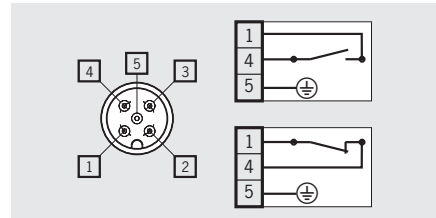
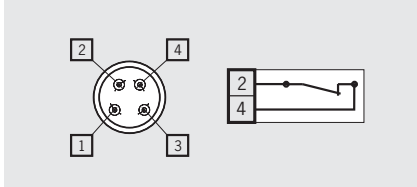


Design EGT11, M14 x 1, ball plunger
Plug connector M12 with PE connection



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

Wiring diagrams



Technical data

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

1) Cable hard wired.

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

3) Mating connector M12 see page 42 and 43

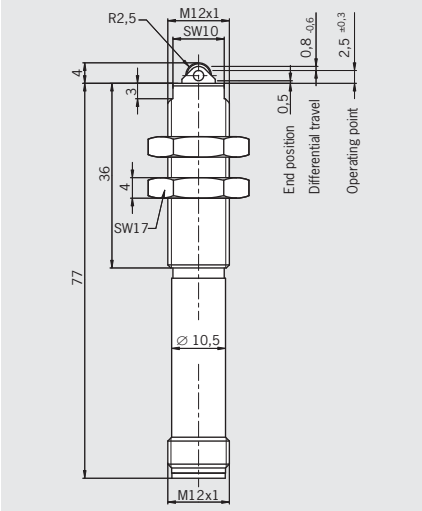
Ordering table

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

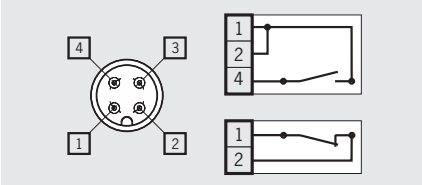


Design EGT12, M12 x 1, roller plunger
 Plug connector M12, double insulated

Dimension drawings



Wiring diagrams



Brass, nickel-plated
Stainless steel
IP 67
Mating connector inserted and screwed tight
-25 ... +80
20
30 x 10 ⁶ operating cycles
± 0.01
Approx. 16
Reed contact
1 NO or 1 NC
Rhodium
50
AC-12 U _e 30 V I _e 0.3 A
DC-13 U _e 24 V I _e 0.3 A
1
1
0.4
Plug connector M12 ²⁾

-
-
078483 EGT12ARSEM4C1888
-
-
079139 EGT12RRSEM4C1888

Precision single hole fixing limit switches

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



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



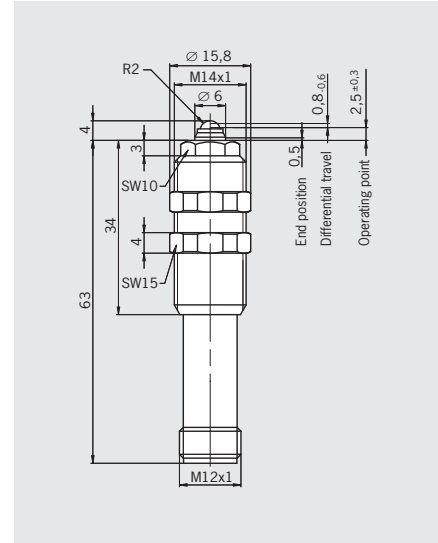
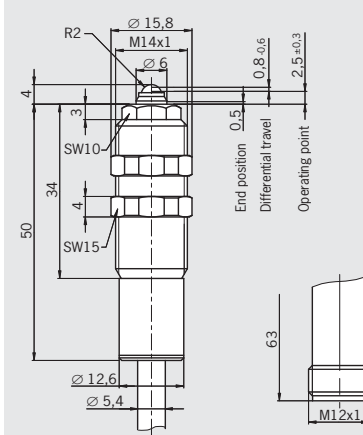
For mating connector with LED display



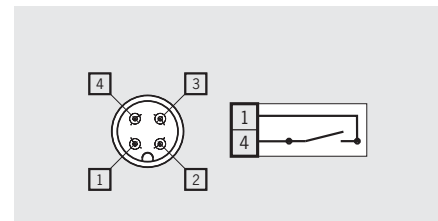
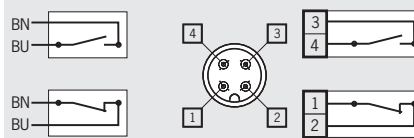
Design EGT1/4, M14 x 1, ball plunger Plug connector M12

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

Dimension drawings



Wiring diagrams



Technical data

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

1) Cable hard wired.
 2) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.
 3) Mating connector see page 42 and 43.
 4) Mating connector inserted and screwed tight

Ordering table

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

Made of high-quality stainless steel



With scraper made of PU



With scraper made of PU

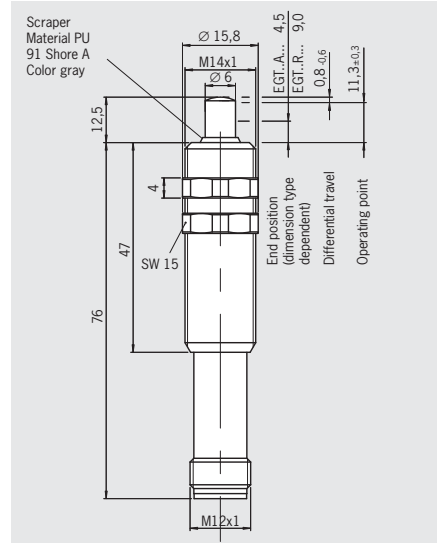
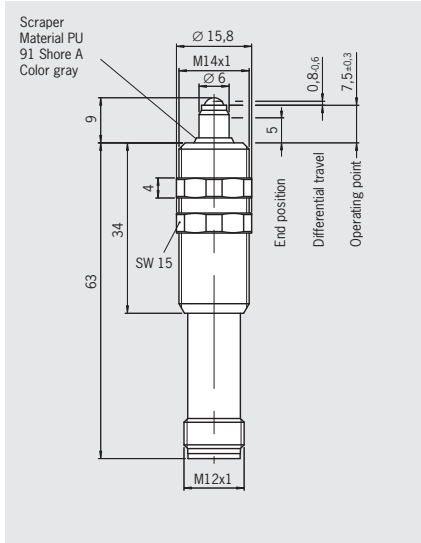
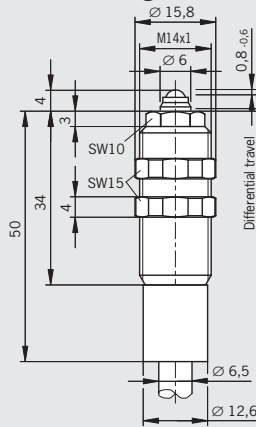


Design EGT1/4, M14 x 1, ball plunger
Connection cable, max. pressure 300 kPa

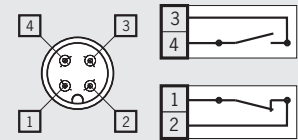
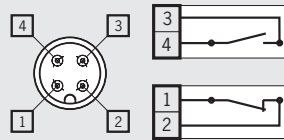
Design EGT1/4, M14 x 1, ball plunger
Plug connector M12

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

Dimension drawings



Wiring diagrams



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

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

Precision single hole fixing limit switches

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

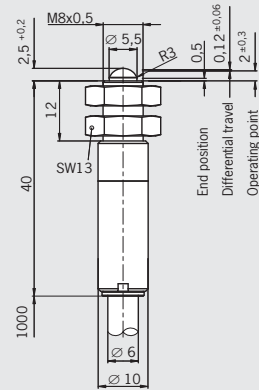


⚠ Single hole fixing limit switches must not be used as an end stop.

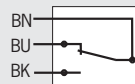
EAC

Design EGM8, M8 x 0.5, dome plunger
Connection cable, double insulated

Dimension drawings

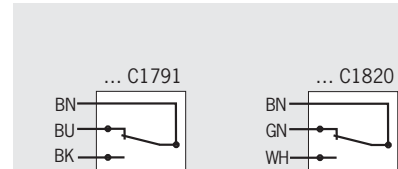
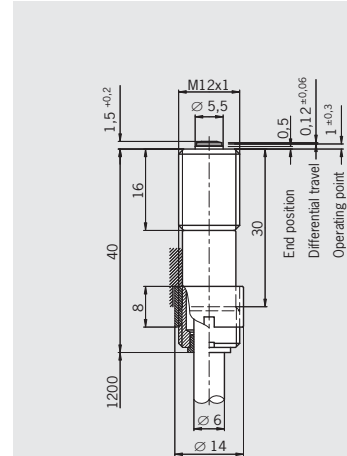


Wiring diagrams



EAC

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



Technical data

	Stainless steel	Stainless steel
Housing material	Stainless steel	Stainless steel
Degree of protection acc. to IEC 60529	IP 65	IP 65
Ambient temperature [°C]	-20 ¹⁾ ... +80	-20 ¹⁾ ... +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. 16	Approx. 16
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 changeover contact	1 changeover contact
Contact material	Fine silver, gold-plated	Silver alloy, gold-plated
Rated insulation voltage U _i [V]	250 \square	250 \square
Rated impulse withstand voltage U _{imp}	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 230 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A
Switching current, min., at 24 V [mA]	10	10
Switching voltage, min. [V DC]	12	12
Short circuit protection (control circuit fuse) [A gG]	2	2
Connection	PUR cable 3 x 0.5 mm ²	PUR cable 3 x 0.5 mm ² Silicone cable 3 x 0.5 mm ²

1) Cable hard wired.

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

3) Mating connector see page 42 and 43.

Ordering table

	119345 EGM8-1000C2396	-	-
1 changeover contact	Connection cable 1 m	-	-
	Connection cable 1.2 m	-	075556 EGM12-1200C1791
	Connection cable 2 m	-	-
	Connection cable 2.5 m	-	-
	Connection cable 4 m	-	076154 EGM12-4000C1791
	Connection cable 5 m	-	-
	Plug connector	-	-

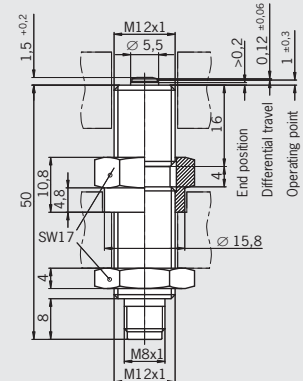
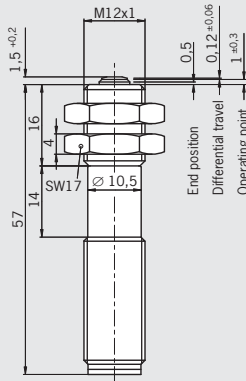
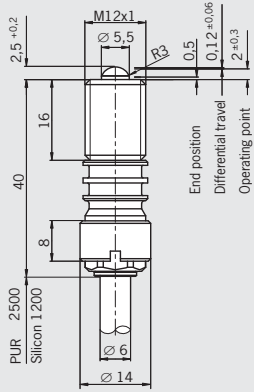


Design EGM12, M12 x 1, dome plunger
For sealing with O-rings

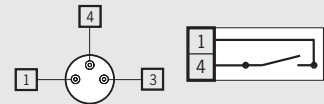
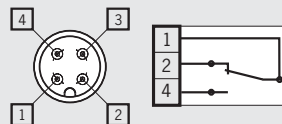
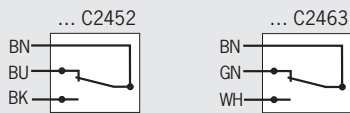
Design EGM12, M12 x 1, flat plunger
Plug connector M12

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

Dimension drawings



Wiring diagrams



Stainless steel IP 65		Stainless steel IP 65 Mating connector inserted and screwed tight		Stainless steel IP 65 Mating connector inserted and screwed tight	
-20 ¹⁾ ... +80	-30 ... +80	-20 ... +80	-30 ... +85	-20 ... +85	
8		8		8	
1 x 10 ⁶ operating cycles ± 0.01		1 x 10 ⁶ operating cycles ± 0.01		1 x 10 ⁶ operating cycles ± 0.01	
Approx. 16		Approx. 16		Approx. 16	
Snap-action switching contact 1 changeover contact Fine silver, gold-plated		Snap-action switching contact 1 changeover contact Silver alloy, gold-plated		Snap-action switching contact 1 NO Silver alloy, gold-plated	
250 □ 2.5		50 1.5		50 1.5	
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		AC-15 U _e 24 V I _e 0.5 A DC-13 U _e 24 V I _e 0.6 A	
10		10		10	
12		12		12	
2		2		2	
PUR cable 3 x 0.5 mm ²	Silicone cable 3 x 0.5 mm ²	Plug connector M12 ³⁾		Plug connector M8 ³⁾	

-	-	-	-	-
-	128196 EGM12-1200C2463	-	-	-
-	-	-	-	-
126384 EGM12-2500C2452	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	082205 EGM12SEM4	093733 EGM12SEM4C1820	077228 EGM12SAM3C1868

Precision single hole fixing limit switches

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



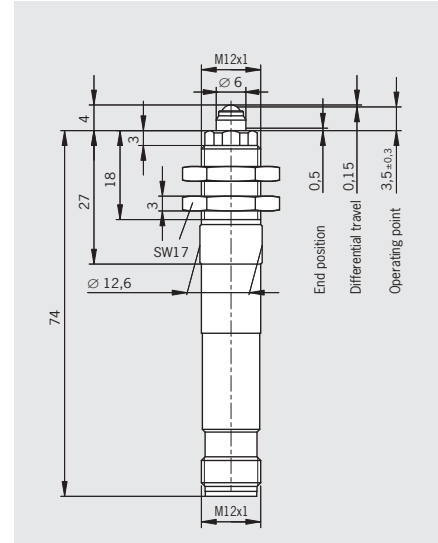
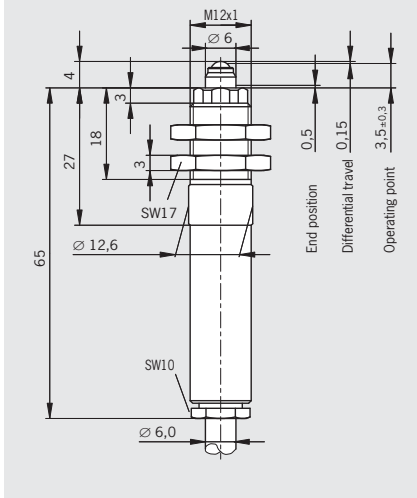
⚠ Single hole fixing limit switches must not be used as an end stop.



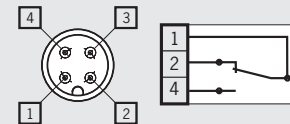
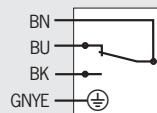
Design EGT1, M12 x 1, ball plunger
Connection cable with PE connection

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

Dimension drawings



Wiring diagrams



Technical data

Housing material	Brass, nickel-plated	Brass, nickel-plated
Degree of protection acc. to IEC 60529	IP 67	IP 67 Mating connector inserted and screwed tight
Ambient temperature [°C]	-25 ¹⁾ ... +80	-25 ... +80
Approach speed, max. [m/min]	8	8
Mechanical life (axial)	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
Operating point accuracy ²⁾ [mm]	± 0.01	± 0.01
Actuating force (end position) [N]	Approx. 20	Approx. 20
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 changeover contact	1 changeover contact
Contact material	Silver alloy, gold-plated	Silver alloy, gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp}	2.5	2.5
Utilization category 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	PUR cable 4 x 0.5 mm ²	Plug connector M12 ³⁾

1) Cable hard wired.

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

3) Mating connector see page 42 and 43.

Precision single hole fixing limit switches

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

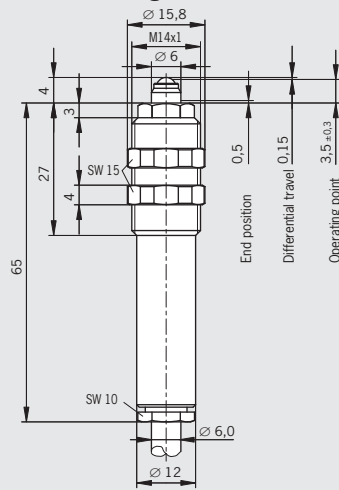


⚠ Single hole fixing limit switches must not be used as an end stop.

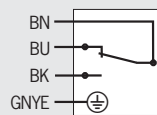


Design EGT1, M14 x 1, ball plunger Connection cable with PE connection

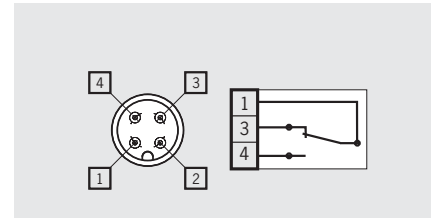
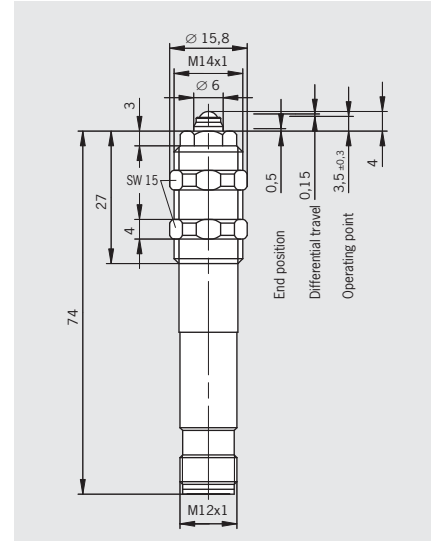
Dimension drawings



Wiring diagrams



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



Technical data

Housing material	Brass, nickel-plated	Brass, nickel-plated
Degree of protection acc. to IEC 60529	IP 67	IP 67 Mating connector inserted and screwed tight
Ambient temperature [°C]	-25 ¹⁾ ... +80	-25 ... +80
Approach speed, max. [m/min]	8	8
Mechanical life (axial)	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
Operating point accuracy ²⁾ [mm]	± 0.01	± 0.01
Actuating force (end position) [N]	Approx. 20	Approx. 20
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 changeover contact	1 changeover contact
Contact material	Silver alloy, gold-plated	Silver alloy, gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp}	2.5	2.5
Utilization category 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	PUR cable 4 x 0.5 mm ²	Plug connector M12 ³⁾

1) Cable hard wired.

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

3) Mating connector see page 42 and 43.

Ordering table

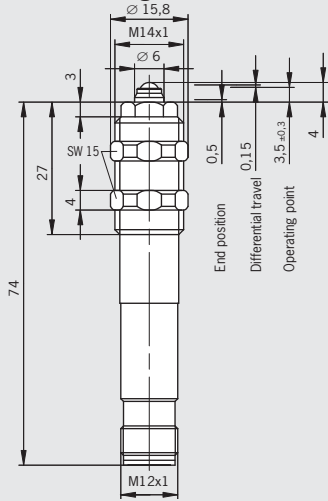
1 changeover contact	Connection cable 2 m	001732 EGT1-2000	-
	Connection cable 5 m	001733 EGT1-5000	-
	Plug connector	-	019727 EGT1SEM4

For plug connector
with LED display

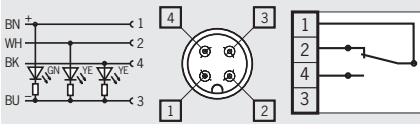


Design EGT1, M14 x 1, ball plunger
Plug connector M12

Dimension drawings



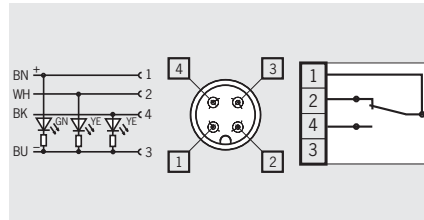
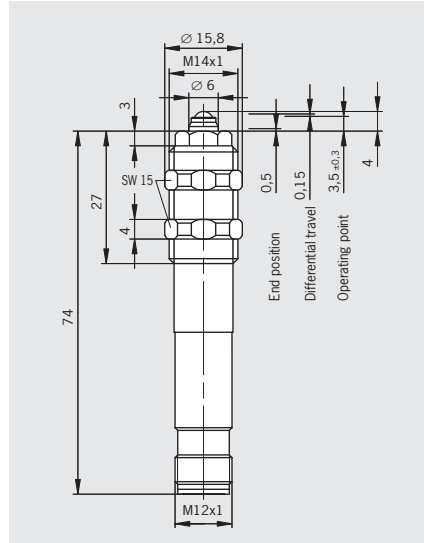
Wiring diagrams



For plug connector
with LED display



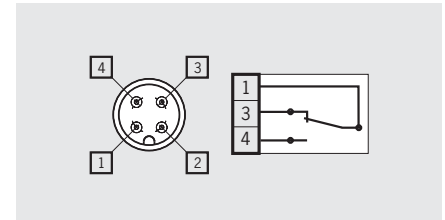
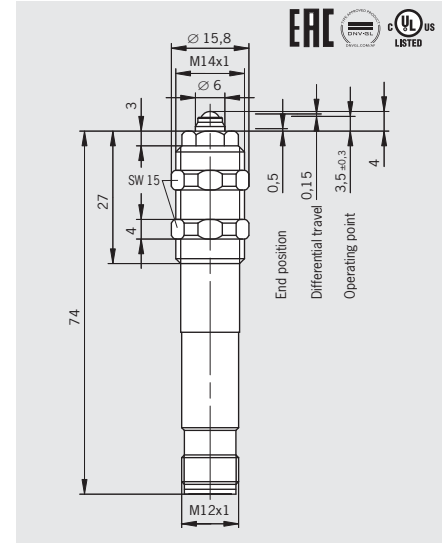
Design EGT1, M14 x 1, ball plunger
Plug connector M12



Suitable for aggressive coolants;
diaphragms made of Viton



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



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

-	-	-
054250 EGT1SEM4C1613	102479 EGT1SEM4C2221	077347 EGT1SEM4C1832

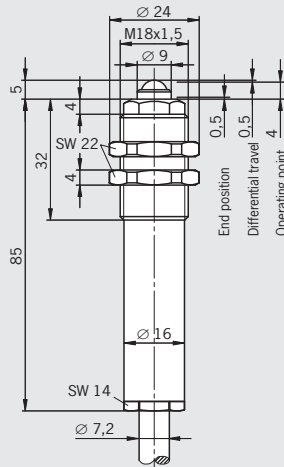
Precision single hole fixing limit switches

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

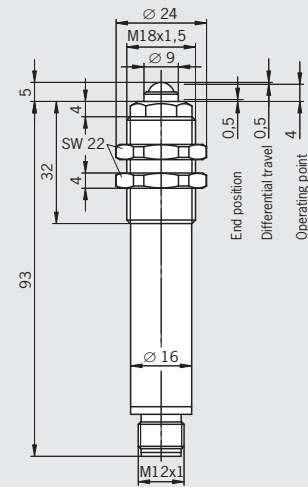


Design EGT2, M18 x 1.5, ball plunger Connection cable with PE connection

Dimension drawings

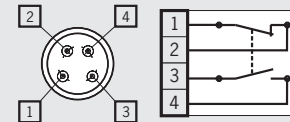
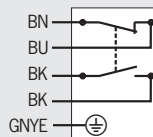


Design EGT2, M18 x 1.5, ball plunger Plug connector M12



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

Wiring diagrams



Technical data

	Design EGT2, M18 x 1.5, ball plunger Connection cable with PE connection	Design EGT2, M18 x 1.5, ball plunger Plug connector M12
Housing material	Brass, nickel-plated	Brass, chromium-plated
Degree of protection acc. to IEC 60529	IP 67	IP 67 Mating connector inserted and screwed tight
Ambient temperature [°C]	-5 ... +60	-5 ... +60
Approach speed, max. [m/min]	10	10
Mechanical life	1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles
Operating point accuracy ¹⁾ [mm]	± 0.01	± 0.01
Actuating force (end position) [N]	Approx. 24	Approx. 24
Switching element	Snap-action switching contact	Snap-action switching contact
Switching contact	1 NC and 1 NO	1 NC and 1 NO
Contact material	Fine silver, gold-plated	Fine silver, gold-plated
Rated insulation voltage U _i [V]	250	50
Rated impulse withstand voltage U _{imp}	2.5	2.5
Utilization category 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	PUR cable 5 x 0.75 mm ²	Plug connector M12 ²⁾

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.
2) Mating connector see page 42 and 43.

Ordering table

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

Precision single hole fixing limit switches

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

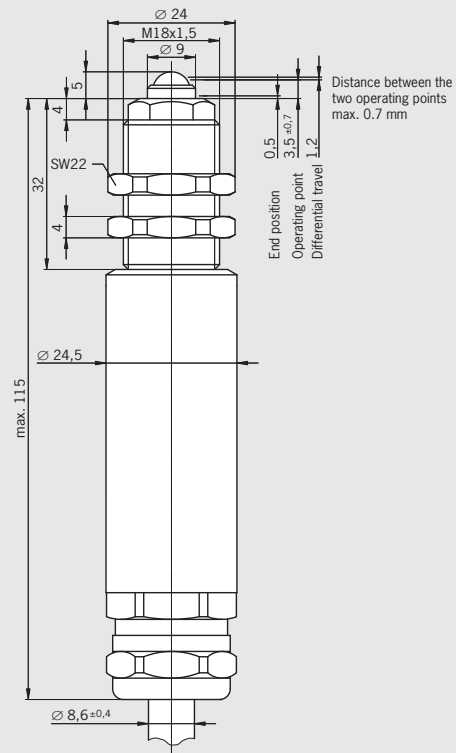


With four switching contacts



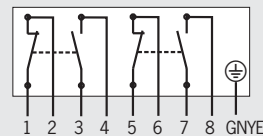
Design EGT4, M18 x 1.5, ball plunger
Connection cable with PE connection

Dimension drawings



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

Wiring diagrams



Technical data

Housing material		Brass, nickel-plated
Degree of protection acc. to IEC 60529		IP 67
Ambient temperature	[°C]	-25 ¹⁾ ... +70
Approach speed, max.	[m/min]	10
Mechanical life		5 x 10 ⁵ operating cycles
Operating point accuracy ²⁾	[mm]	± 0.01
Actuating force (end position)	[N]	Approx. 25
Switching element		Snap-action switching contact
Switching contact		2 NC and 2 NO
Contact material		Fine silver, gold-plated
Rated insulation voltage U _i	[V]	250
Rated impulse withstand voltage U _{imp}		2.5
Utilization category 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		PUR cable 9 x 0.5 mm ²

1) Cable hard wired.

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

Ordering table

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

Precision single hole fixing limit switches

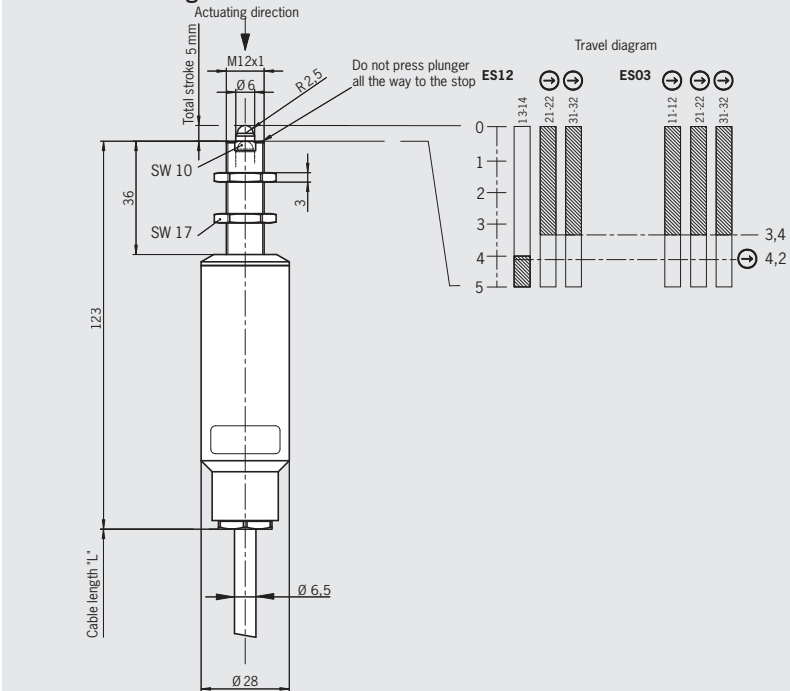
- ▶ With slow-action switching element
- ▶ Plunger and housing made of high-quality stainless steel
- ▶ Any installation position
- ▶ Threaded section M12 x 1



Switching element, with three switching contacts

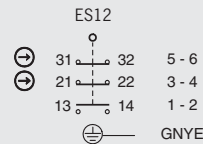
Design EGZ12, M12 x 1, dome plunger
Connection cable with PE connection

Dimension drawings



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

Wiring diagrams



Technical data

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

1) Cable hard wired.

Ordering table

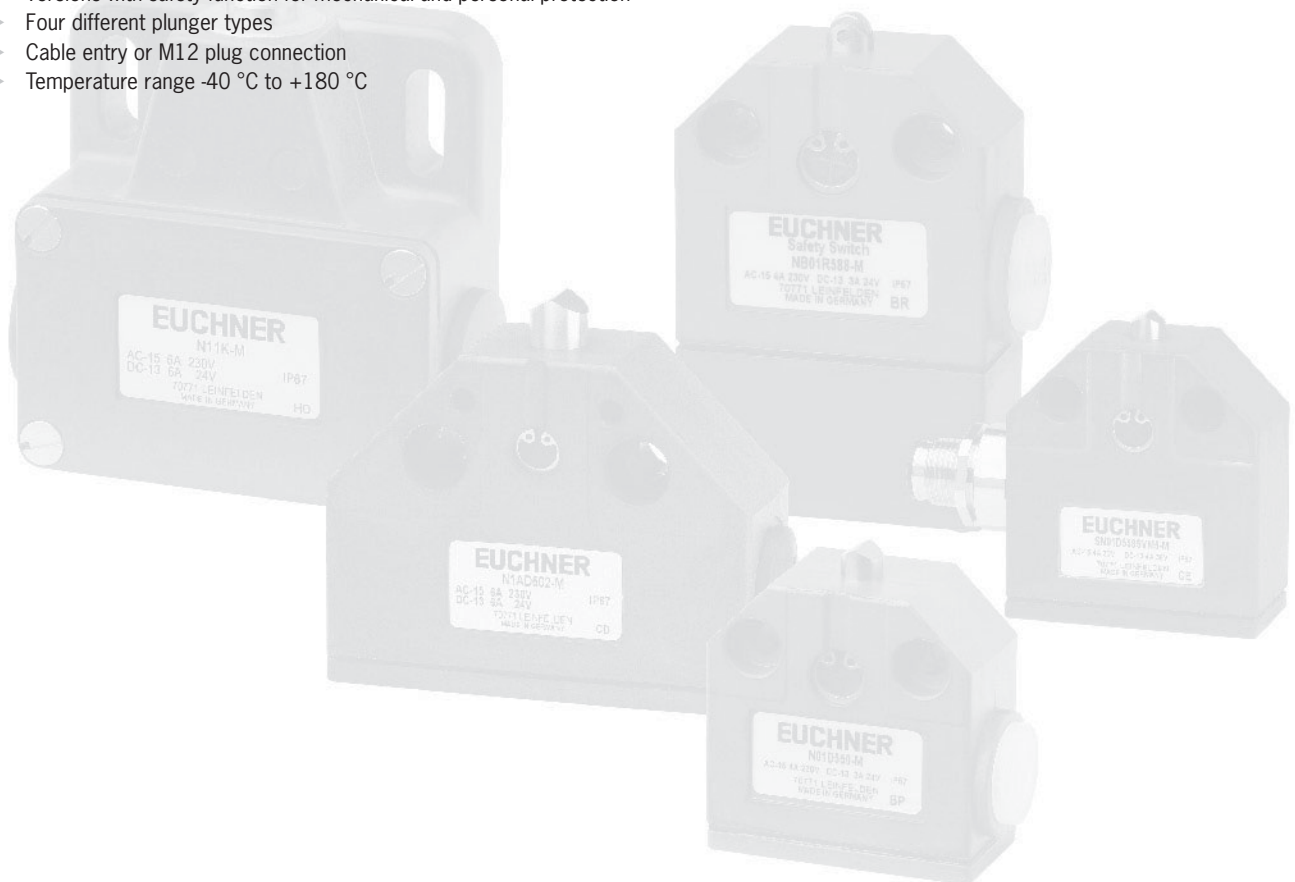
Connection cable	ES12
Connection cable 5 m	094823 EGZ12-12-5000

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

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



Precision single limit switches

► Plunger material stainless steel



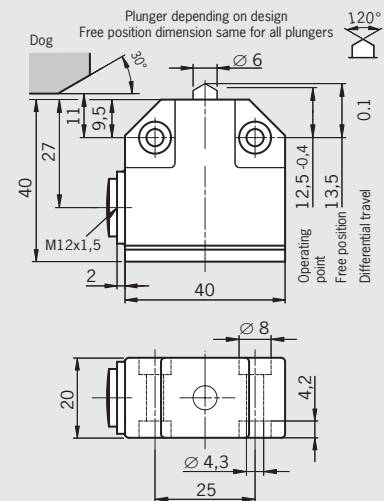
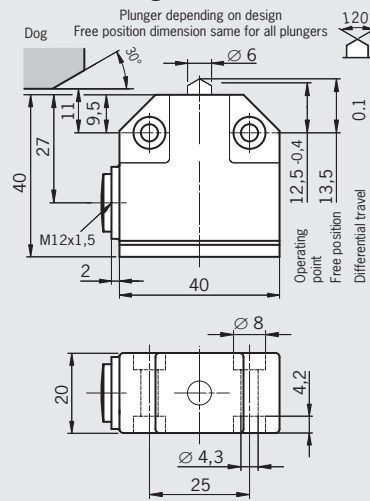
For temperatures up to 180 °C



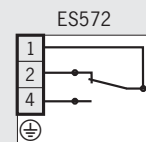
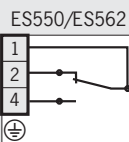
Design N01
Cable entry M12 x 1.5

Design N01
Cable entry M12 x 1.5

Dimension drawings



Wiring diagrams



Technical data

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

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

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

3) Mating connector see page 42 and 43.

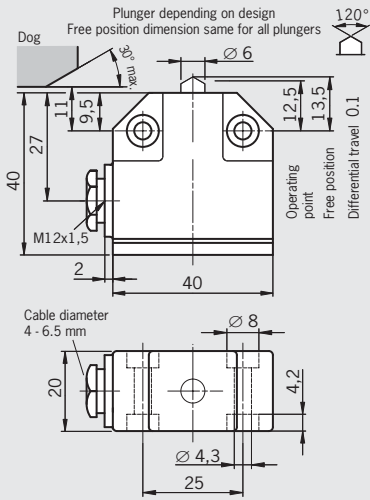
Ordering table

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

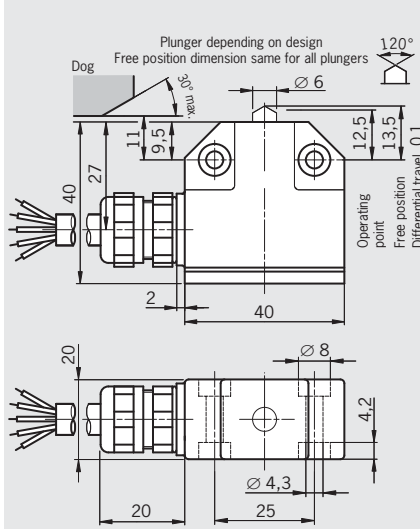


Design N01
Cable gland M12 x 1.5

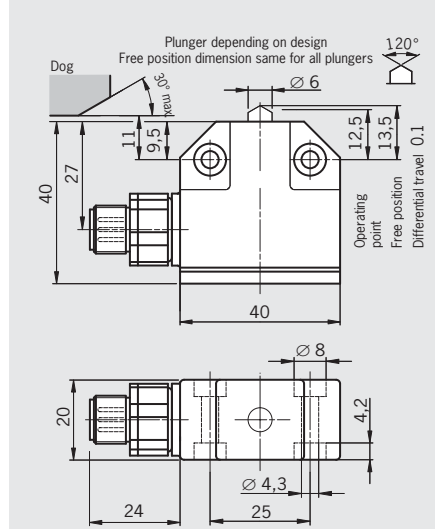
Dimension drawings



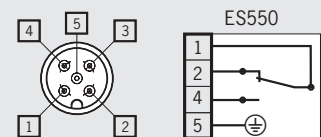
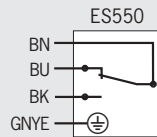
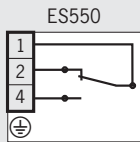
Design N01
Connection cable, length 5 m



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

ES550	ES550	ES550	ES562
085708 N01D550-MC2018	088978 N01D550X5000-M	088623 N01D550X5000-M	-
094856 N01R550-MC2018	088982 N01R550X5000-M	088622 N01R550X5000-M	093426 N01R562X5000-M
089619 N01K550-MC2018	088986 N01K550X5000-M	088624 N01K550X5000-M	-

Precision single limit switches

► Plunger material stainless steel

For plug connector with LED display



For operating voltage 230 V

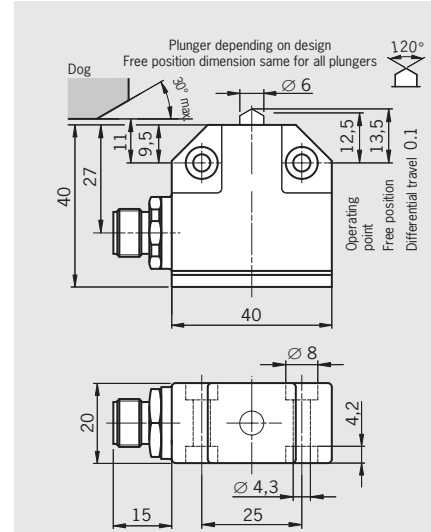
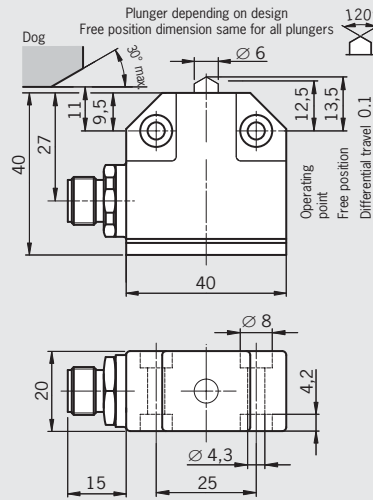


Design N01
M12 plug, 4-pin

Design N01
M12 plug, 4-pin + PE

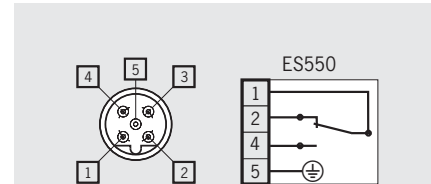
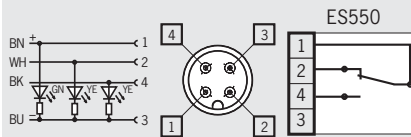


Dimension drawings



⚠ To achieve the positively driven travel, the dimension (11.0.5) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN ISO 14119, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

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

1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.
2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.
3) Mating connector see page 42 and 43

Ordering table

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

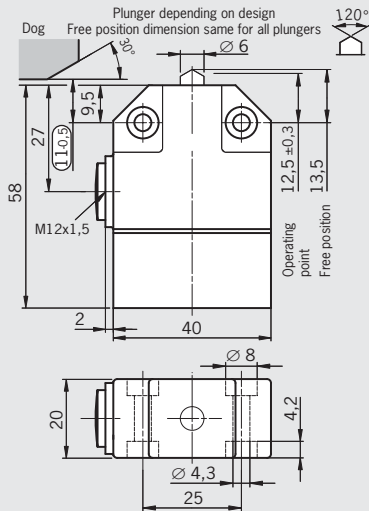
With safety function



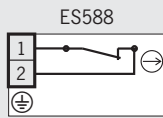
Design NB01

Cable entry M12 x 1.5

Dimension drawings

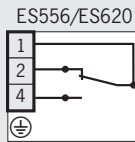
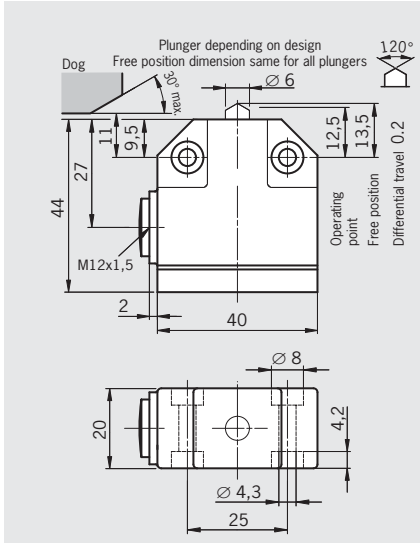


Wiring diagrams



Design NB01

Cable entry M12 x 1.5

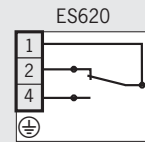
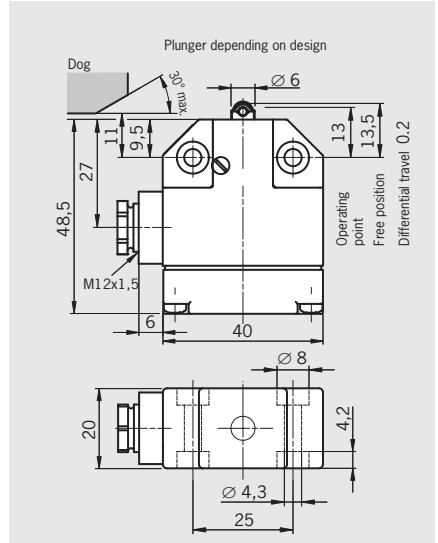


Larger connection space, robust screw terminal



Design NB01

Cable gland M12 x 1.5



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	Roller ± 0.05	
20	50	20	50	8	50	
0.01		0.01			0.01	
15		15			15	
ES588		ES556/ES620			ES620	
1 NC ⊕		1 changeover contact			1 changeover contact	
Slow-action switching contact		Snap-action switching contact			Snap-action switching contact	
1 x 10 ⁷ operating cycles		1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles	
2.5		2.5			2.5	
250		250			250	
AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 3 A		AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A			AC-15 U _e 230 V I _e 2 A DC-13 U _e 24 V I _e 2 A	
Fine silver		Silver, gold-plated			Silver, gold-plated	
1		-			-	
5		-			-	
10		6			6	
Screw terminal, 1.0 mm ² max.		1.3 mm hexagon socket screw terminal/screw terminal, 1.0 mm ² max.			Screw terminal, 1.0 mm ² max.	

ES588	ES556	ES620
088584 NB01D588-M	085245 NB01D556-M	-
088583 NB01R588-M	085246 NB01R556-M	102883 NB01R620-MC2276
-	085247 NB01K556-M	-

Precision single limit switches

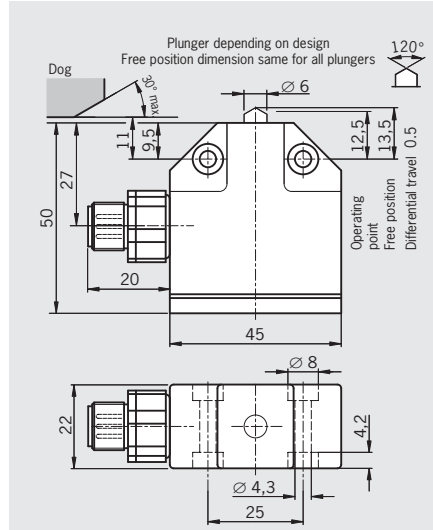
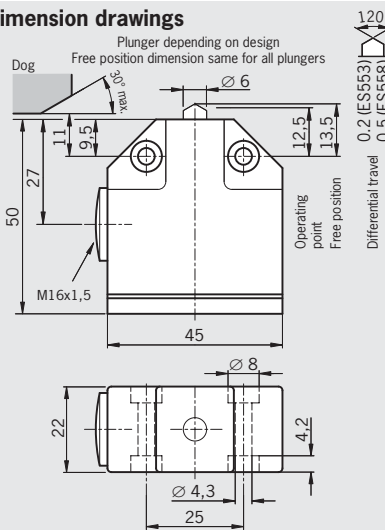
► Plunger material stainless steel



Design SN01
Cable entry M16 x 1.5

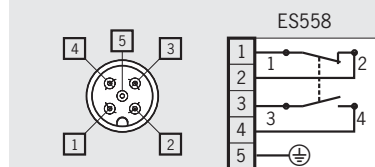
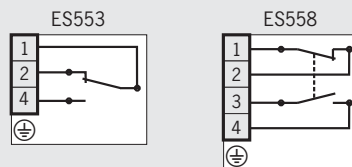
Design SN01
M12 plug adjustable, 4-pin + PE

Dimension drawings



⚠ To achieve the positively driven travel, the dimension (12.5) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN ISO 14119, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67			IP 67 Mating connector inserted and screwed tight		
Ambient temperature [°C]	-5 ... +80			-5 ... +80		
Plunger type	Chisel	Roller	Ball	Chisel	Roller	Ball
Operating point accuracy ¹⁾ [mm]	± 0.02	± 0.05	± 0.03	± 0.02	± 0.05	± 0.03
Approach speed, max. ²⁾ [m/min]	20	50	8	20	50	8
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	15			15		
Switching element	ES553		ES558	ES558		
Switching contact	1 changeover contact		1 NO + 1 NC	1 NO + 1 NC		
Switching principle	Snap-action switching contact			Snap-action switching contact		
Mechanical life	1 x 10 ⁷ operating cycles			1 x 10 ⁷ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5		
Rated insulation voltage U _i [V]	250			30		
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 2 A	AC-15 U _e 230 V I _e 4 A DC-13 U _e 24 V I _e 3 A		AC-15 U _e 36 V I _e 4 A DC-13 U _e 24 V I _e 3 A		
Contact material	Silver, gold-plated		Silver	Silver		
Switching current, min., at switching voltage [mA]	-		10	10		
[V DC]	-		5	5		
Short circuit protection (control circuit fuse) [A gG]	6		4	4		
Connection	Screw terminal, 1.0 mm ² max.		Soldered connection, 1.0 mm ² max.	Plug connector M12 ³⁾		

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

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

3) Mating connector 42 and 43.

Ordering table

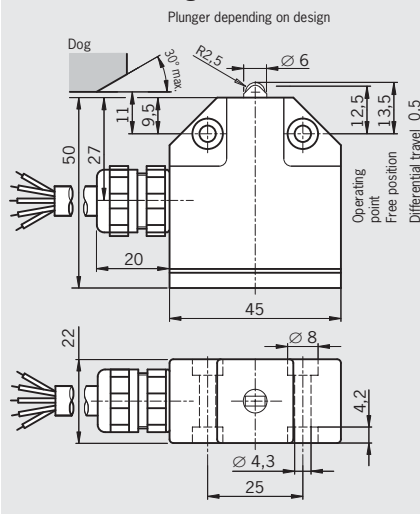
Plunger type		ES553	ES558	ES558
Chisel plunger		085252 SN01D553-M	085260 SN01D558-M	088625 SN01D558SVM5-M
Roller plunger	R = 2.5 mm	085253 SN01R553-M	085261 SN01R558-M	088626 SN01R558SVM5-M
Ball plunger		085254 SN01K553-M	085262 SN01K558-M	088627 SN01K558SVM5-M



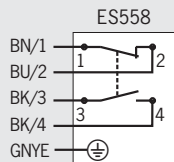
Design SN01

Connection cable, length 2 m

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized

IP 67

-5 ... +80

Roller

± 0.05

50

0.01

15

ES558

1 NO + 1 NC

Snap-action switching contact

1 x 10⁷ operating cycles

2.5

250

AC-15 U₀ 230 V I₀ 4 A

DC-13 U₀ 24 V I₀ 3 A

Silver

10

5

4

PUR cable 5 x 0.5 mm²

ES558

-

090515

SN01R558X2000-M

-

Precision single limit switches

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

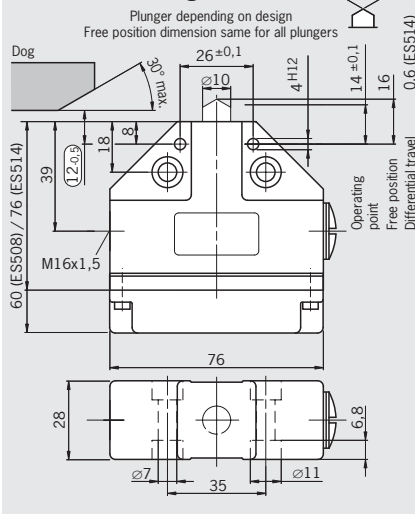


With safety switching element

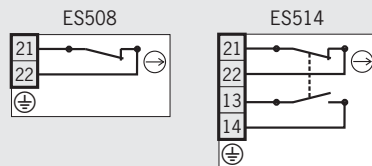


Design N1A
Cable entry M16 x 1.5

Dimension drawings



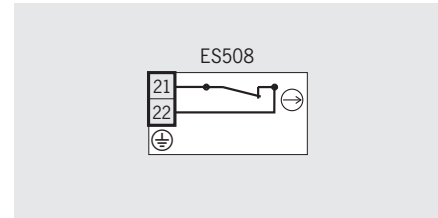
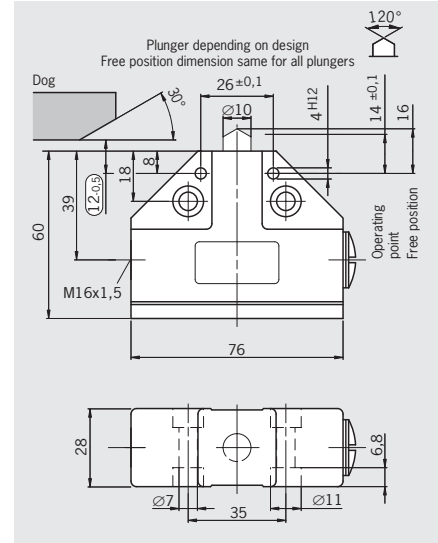
Wiring diagrams



With safety switching element, silicone diaphragm (interior) 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 acc. to IEC 60529	IP 67			IP 67		
Ambient temperature [°C]	-25 ... +80			-40 ... +80		
Plunger type	Chisel	Roller	Dome	Chisel	Roller 3)	Dome
Operating point accuracy ¹⁾ [mm]	± 0.002	± 0.01	± 0.002	± 0.002	± 0.01	± 0.002
Approach speed, max. ²⁾ [m/min]	40	80	10	40	80	10
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	≥ 15			≥ 30		
Switching element	ES508 ⁴⁾		ES514	ES508 ⁴⁾		
Switching contact	1 NC ⊕		1 NO + 1 NC ⊕	1 NC ⊕		
Switching principle	Slow-action switching cont.		Snap-action switching cont.	Slow-action switching contact		
Mechanical life	30 x 10 ⁶ operating cycles		1 x 10 ⁶ operating cycles	1 x 10 ⁶ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	4			4		
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			Silver, gold-plated		
Switching current, min., at switching voltage [mA]	10		5	10		
[V DC]	24		24	24		
Short circuit protection (control circuit fuse) [A gG]	10		6	10		
Connection	Screw terminal 0.34 ... 1.5 mm ²			Screw terminal 0.34 ... 1.5 mm ²		

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

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

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

Ordering table

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

With safety switching element, silicone diaphragm (internal/external) and low-temperature grease



With safety switching element



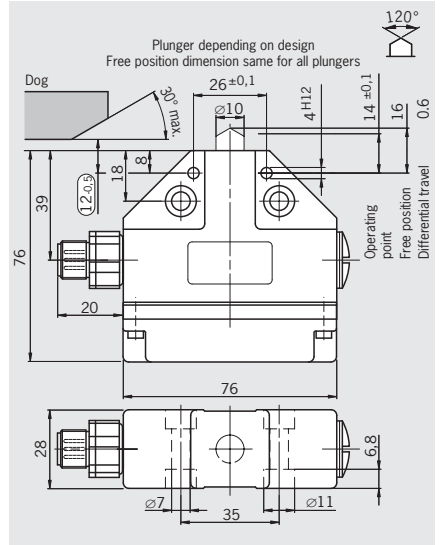
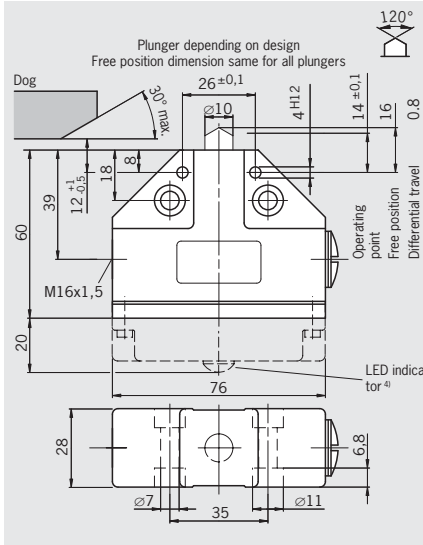
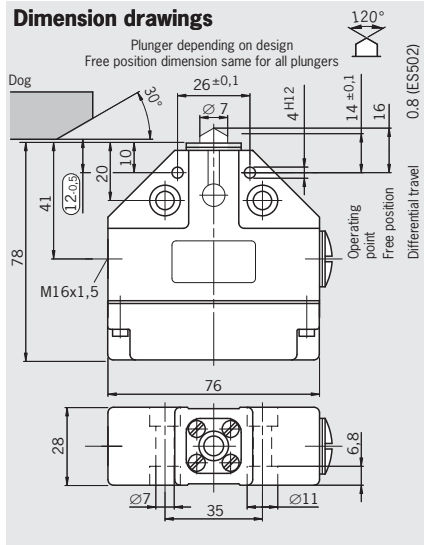
Design N1A
Cable entry M16 x 1.5



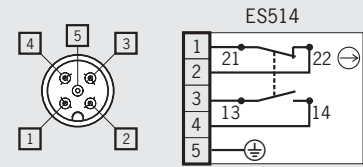
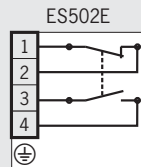
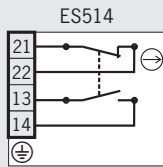
Design N1A
Cable entry M16 x 1.5

Design N1A
M12 plug adjustable, 4-pin + PE

Dimension drawings



Wiring diagrams



Die-cast aluminum, anodized		Die-cast aluminum, anodized			Die-cast aluminum, anodized		
IP 67		IP 67			IP 67		
-30 ... +80		-5 ... +80			-25 ... +80		
Chisel	Roller	Chisel	Roller 3)	Ball	Chisel	Roller	Dome
± 0.002	± 0.01	± 0.002	± 0.01	± 0.01	± 0.002	± 0.01	± 0.002
40	80	40	80	10	40	80	10
0.01		0.01			0.01		
≥ 30		≥ 20			≥ 30		
ES514		ES502E ⁴⁾			ES514		
1 NO + 1 NC ⊕		1 NO + 1 NC			1 NO + 1 NC ⊕		
Snap-action switching contact		Snap-action switching contact			Snap-action switching contact		
1 x 10 ⁶ operating cycles		30 x 10 ⁶ operating cycles			1 x 10 ⁶ operating cycles		
2.5		2.5			1.5		
250		250			30		
AC-15 U _e 230V I _e 2.5A DC-13 U _e 24V I _e 6A		AC-12 U _e 250V I _e 8A / AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A			AC-15 U _e 36V I _e 2.5A DC-13 U _e 24V I _e 4A		
Silver, gold-plated		Silver, gold-plated			Silver, gold-plated		
5		10			5		
24		24			24		
8		8			6		
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 10-60 V or AC 110/230 V on request.

5) Mating connector see page 42 and 43.

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

Precision single limit switches

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



For plug connectors with LED indicator

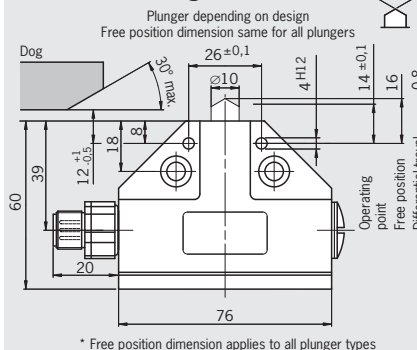


Design N1A
M12 plug adjustable, 4-pin + PE

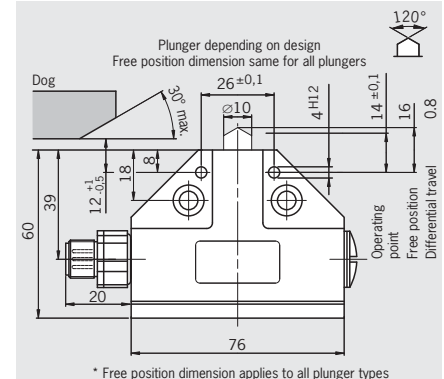
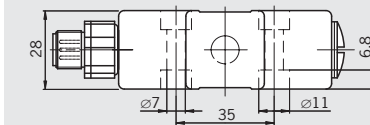
Design N1A
M12 plug adjustable, 4-pin + PE



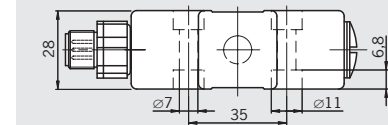
Dimension drawings



* Free position dimension applies to all plunger types

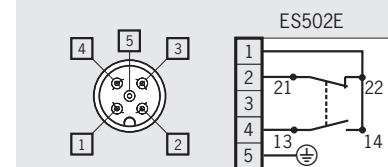
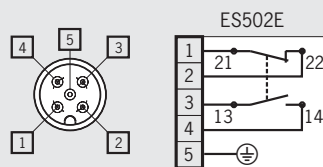


* Free position dimension applies to all plunger types



⚠ To achieve the positively driven travel, the dimension (31-0.5) must be maintained by the trip dog. Actuating elements such as cam approach guides must be positively mounted in accordance with EN ISO 14119, i.e. riveted, welded or otherwise secured against becoming loose.

Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized		
Degree of protection acc. to IEC 60529	IP 67 Mating connector inserted and screwed tight			IP 67 Mating connector inserted and screwed tight		
Ambient temperature [°C]	-5 ... +80			-5 ... +80		
Plunger type	Chisel	Roller	Ball	Chisel	Roller	Ball
Operating point accuracy ¹⁾ [mm]	± 0.002	± 0.01	± 0.01	± 0.002	± 0.01	± 0.01
Approach speed, max. ²⁾ [m/min]	40	80	10	40	80	10
Approach speed, min. [m/min]	0.01			0.01		
Actuating force, max. [N]	≥ 20			≥ 20		
Switching element	ES502E			ES502E		
Switching contact	1 NO + 1 NC			1 NO + 1 NC		
Switching principle	Snap-action switching contact			Snap-action switching contact		
Mechanical life	30 x 10 ⁶ operating cycles			30 x 10 ⁶ operating cycles		
Rated impulse withstand voltage U _{imp} [kV]	1.5			1.5		
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 switching voltage [mA]	10			10		
[V DC]	24			24		
Short circuit protection (control circuit fuse) [A gG]	8			8		
Connection	Plug connector M12 ⁴⁾			Plug connector M12 ⁴⁾		

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

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

Ordering table

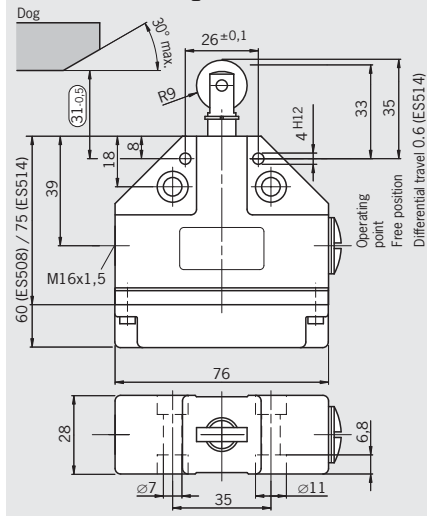
Plunger type	ES502E	ES502E
Chisel plunger	087487 N1AD502SVM5-M	091471 N1AD502SVM5-MC1883
Roller plunger R = 4.0 mm	087488 N1AR502SVM5-M	-
Ball plunger	087489 N1AK502SVM5-M	087496 N1AK502SVM5-MC1883
Extended roller plunger	-	-

With safety switching element

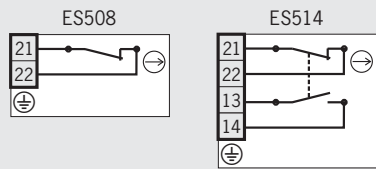


Design N1A, extended roller plunger
Cable entry M16 x 1.5

Dimension drawings



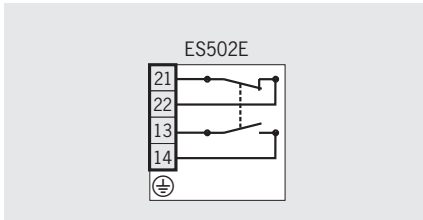
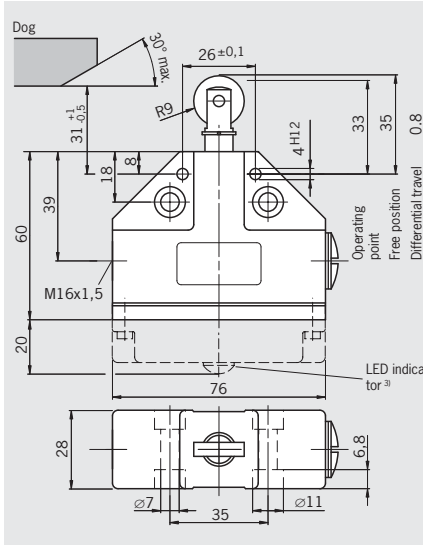
Wiring diagrams



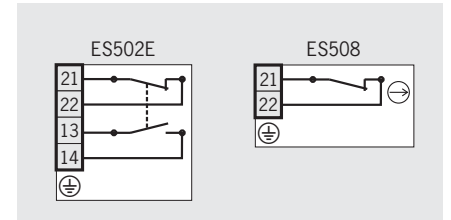
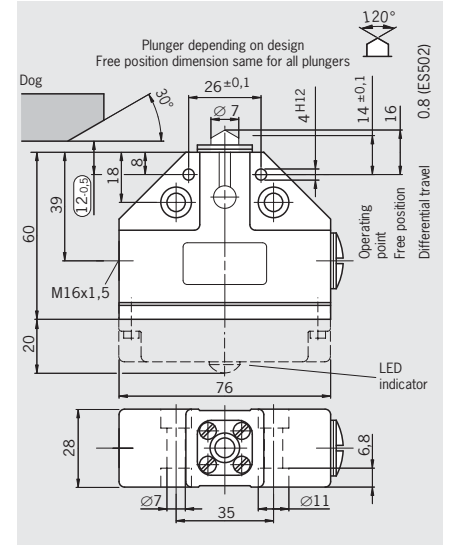
With exterior diaphragm



Design N1A, extended roller plunger
Cable entry M16 x 1.5



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 ⊖	1 NO + 1 NC ⊕	1 NO + 1 NC		1 NO + 1 NC		1 NC ⊕
Slow-action switching contact 30 x 10 ⁶ operating cycles	Snap-action switching contact 1 x 10 ⁶ operating cycles	Snap-action switching contact 30 x 10 ⁶ operating cycles		Snap-action switching contact 30 x 10 ⁶ operating cycles		Slow-action switching contact 30 x 10 ⁶ operating cycles
4		2.5		2.5		4
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 250V I _e 8A AC-15 U _e 230V I _e 6A DC-13 U _e 24V I _e 6A		AC-12 U _e 250V I _e 8A 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	6	8		8		10
Screw terminal 0.34 ... 1.5 mm ²		Screw terminal 0.34 ... 1.5 mm ²		Screw terminal 0.34 ... 1.5 mm ²		

4) Version with LED function display AC/DC 10-60 V or AC 110/230 V on request.
5) Mating connector see page 42 and 43.

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

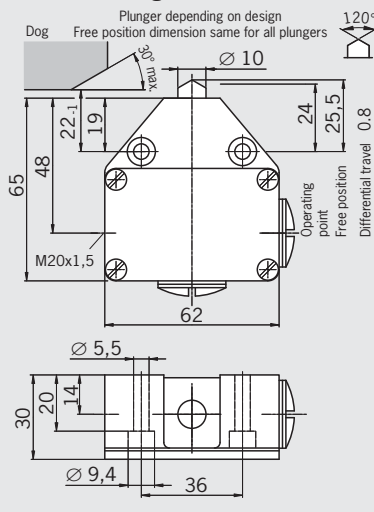
Precision single limit switches

► Plunger material stainless steel

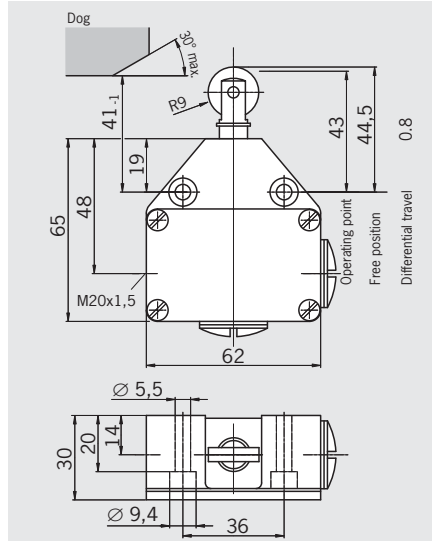


Design N10
Cable entry M20 x 1.5

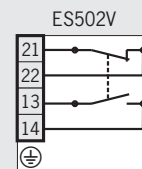
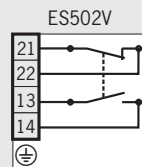
Dimension drawings



Design N10, extended roller plunger
Cable entry M20 x 1.5



Wiring diagrams



Technical data

Housing material	Die-cast aluminum, anodized			Die-cast aluminum, anodized
Degree of protection acc. to IEC 60529	IP 67			IP 67
Ambient temperature [°C]	-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 + 1 NC			1 NO + 1 NC
Switching principle	Snap-action switching contact			Snap-action switching contact
Mechanical life	30 x 10 ⁶ operating cycles			30 x 10 ⁶ operating cycles
Rated impulse withstand voltage U _{imp} [kV]	2.5			2.5
Rated insulation voltage U _i [V]	250			250
Utilization category 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 switching voltage [mA]	20			20
[V DC]	24			24
Short circuit protection (control circuit fuse) [A gG]	16			16
Connection	Screw terminal, 1.5 mm ² max.			Screw terminal, 1.5 mm ² max.

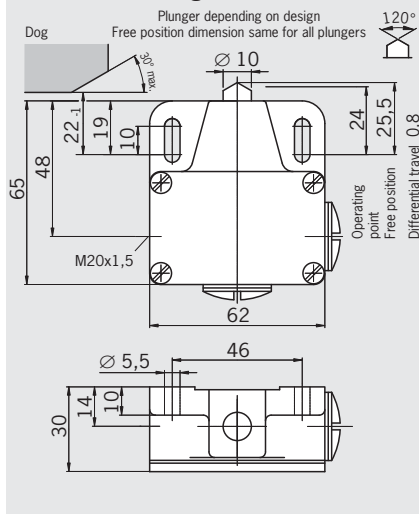
1) The reproducible operating point accuracy relates to axial actuation, after run-in of approx. 2,000 operating cycles.
2) The approach speed applies to a trip dog approach angle of 30°, 100 mm long, hardened and ground.

Ordering table

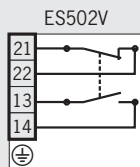
Plunger type	ES502V	ES502V
Chisel plunger	086293 N10D-M	-
Roller plunger R = 4 mm	086294 N10R-M	-
Ball plunger	088589 N10K-M	-
Extended roller plunger	-	088587 N10RL-M

Design N11 Cable entry M20 x 1.5

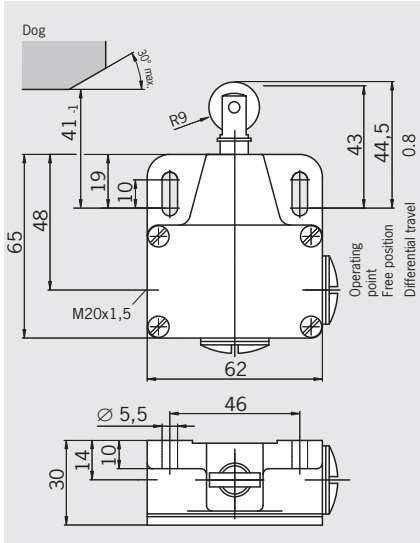
Dimension drawings



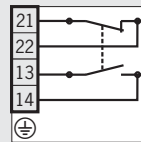
Wiring diagrams



Design N11, extended roller plunger Cable entry M20 x 1.5



Wiring diagrams



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

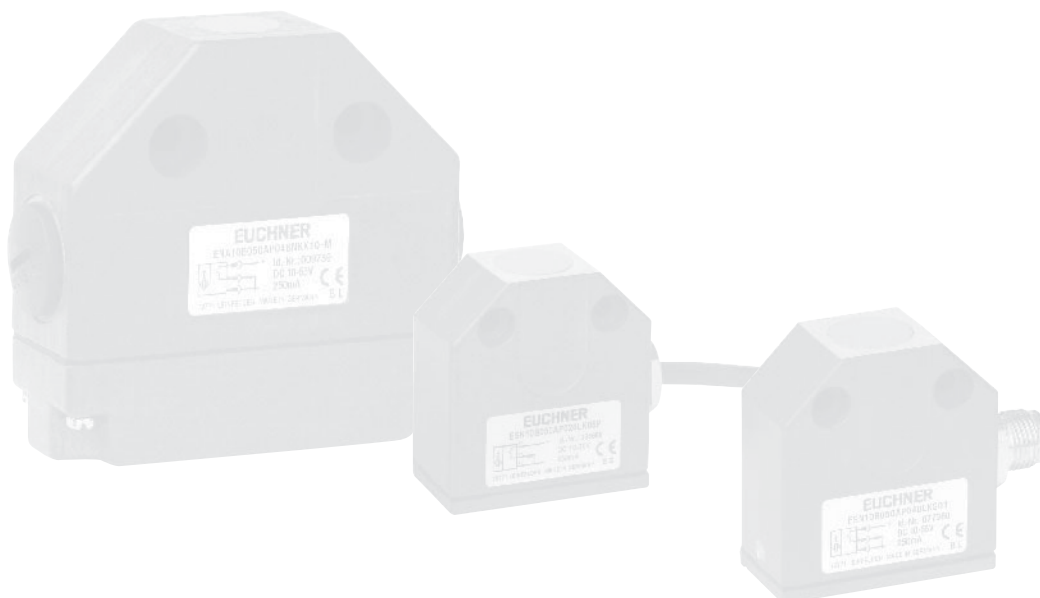
ES502V	ES502V
086298 N11D-M	-
086313 N11R-M	-
088585 N11K-M	-
-	086299 N11RL-M

Inductive single limit switches

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

Features

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



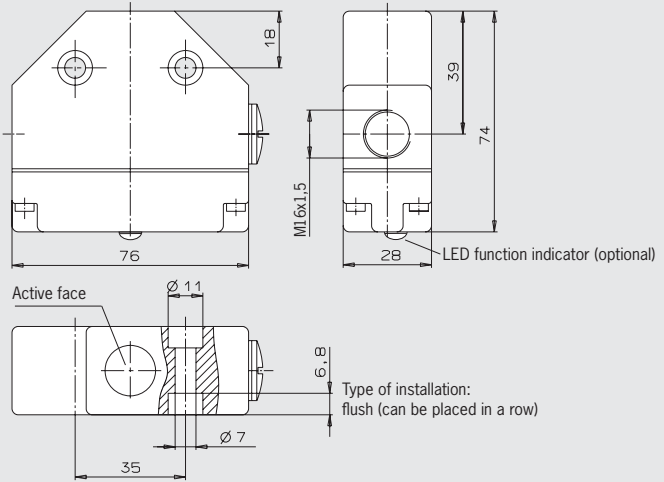
Inductive single limit switch design ENA, DC version

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

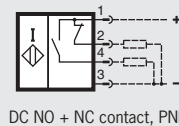


Design ENA
Cable entry M16 x 1.5

Dimension drawings



Wiring diagrams



Technical data

Rated operating distance S_n	[mm]	5
Assured operating distance S_a	[mm]	0 ... 4
Switching function		NO + NC
Output		PNP or NPN (see Ordering table)
LED function display		See ordering table
Operating voltage U_B	[V]	DC 10 ... 55
Voltage drop U_d	[V]	≤ 2.5
Rated insulation voltage U_i	[V]	DC 60
Rated operating current I_e	[mA]	≤ 250
Off-state current I_r	[mA]	≤ 0.001
No-load current I_0	[mA]	≤ 15
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	[mm]	≤ 0.5
Repeat accuracy R	[%]	≤ 5
Switching frequency f	[Hz]	≤ 500
Utilization category acc. to IEC 60947-5-2		DC-13
Housing material		Die-cast aluminum, anodized
Material for the sensing face		PBT
Degree of protection acc. to IEC 60529		IP 67
Ambient temperature T	[°C]	- 25 ... + 70
Connection		Screw terminal
Conductor cross-section, max.	[mm ²]	2 x 1.5 (per contact)
Weight	[kg]	0.2

Ordering table

LED function display		
with	Order no.	ENA 086280
	Item	ENA10B050UP048LKK10-M
without	Order no.	ENA 086099
	Item	ENA10B050UP048NKK10-M

Inductive single limit switch design ESN, DC version

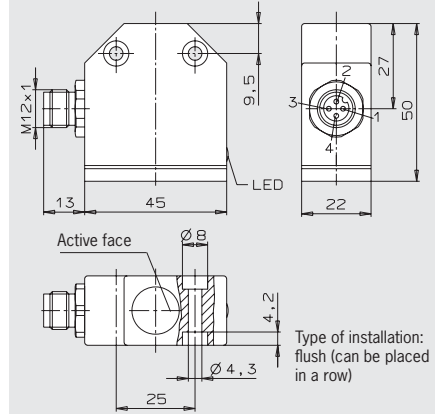
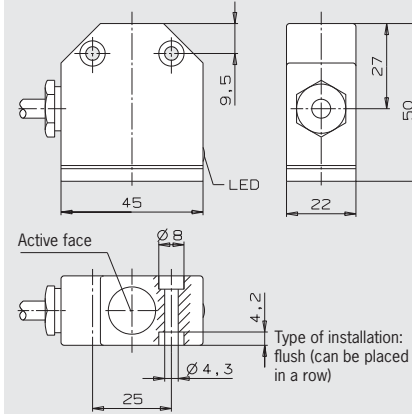
- ▶ Compact design with connection cable or plug connector
- ▶ Rated operating distance 5 mm
- ▶ LED function display



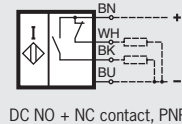
Design ESN
Connection cable 5 m PUR

Design ESN
Plug connector M12, 4-pin

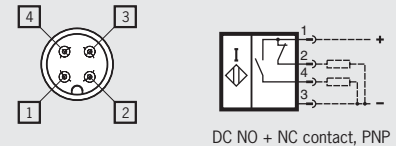
Dimension drawings



Wiring diagrams



DC NO + NC contact, PNP



DC NO + NC contact, PNP

Technical data

Rated operating distance S_n	[mm]	5	5
Assured operating distance S_a	[mm]	0 ... 4	0 ... 4
Switching function		NO + NC	NO + NC
Output		PNP	PNP
LED function display		Yes	Yes
Operating voltage U_B	[V]	DC 10 ... 55	DC 10 ... 55
Voltage drop U_d	[V]	≤ 2.5	≤ 2.5
Rated insulation voltage U_i	[V]	DC 60	DC 60
Rated operating current I_e	[mA]	≤ 250	≤ 250
Off-state current I_f	[mA]	≤ 0.05	≤ 0.05
No-load current I_0	[mA]	≤ 15	≤ 15
Short circuit and overload protection, pulsed		Yes	Yes
Reverse polarity protection		Yes	Yes
Wire break safety		Yes	Yes
EMC compliance as per		IEC 60947-5-2	IEC 60947-5-2
Hysteresis H	[mm]	≤ 0.5	≤ 0.5
Repeat accuracy R	[%]	≤ 5	≤ 5
Switching frequency f	[Hz]	≤ 500	≤ 500
Utilization category acc. to IEC 60947-5-2		DC-13	DC-13
Housing material		Die-cast aluminum, anodized	Die-cast aluminum, anodized
Material for the sensing face		PBT	PBT
Degree of protection acc. to IEC 60529		IP 67	IP 67
Ambient temperature T	[°C]	- 25 ... + 70	- 25 ... + 70
Connection		PUR cable 4 x 0.25	Plug connector M12 ¹⁾
Weight	[kg]	0.3	0.3

1) Degree of protection only guaranteed on the usage of the plug connectors on page 42 and 43.

Ordering table

Read head			
PUR cable 5 m (4 x 0.25 mm ²)	Order no.	ESN 088771	
	Item	ESN10B050UP048LK05P-M	
Plug connector S01 (M12, 4-pin)	Order no.	ESN 088770	
	Item	ESN10B050UP048LKS01-M	

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

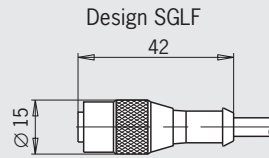
Round connector M12

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

Straight plug connector M12

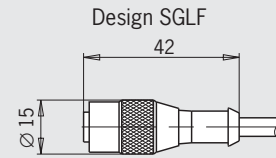
4-pin / 4-pin + PE

Dimension drawings

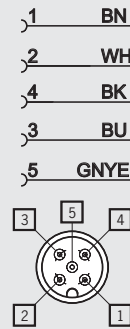
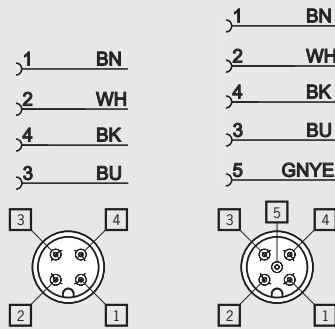


Straight plug connector M12, coded

4-pin + PE



Wiring diagrams



Technical data

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

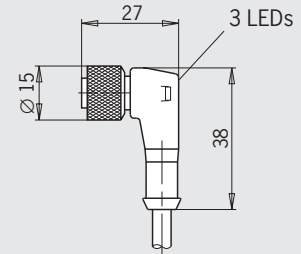
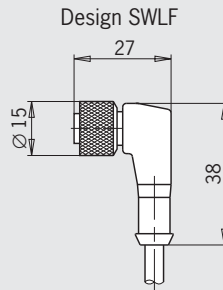
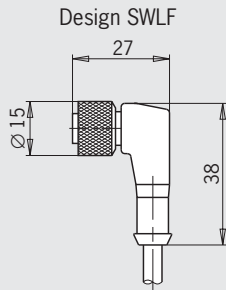
Plug connector M12, without LED, connection cable 5 m	035613 C-M12F04-04X034PU05,0- GA-035613	073461 C-M12F05-05X050PU05,0- GA-073461	045524 C-M12F05-05XDIFPV0,50-GA-045524
Plug connector M12, with 3 LEDs, connection cable 5 m	-	-	-

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

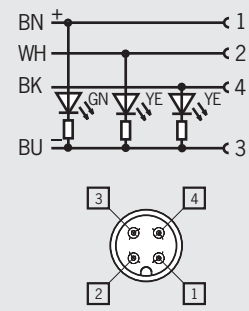
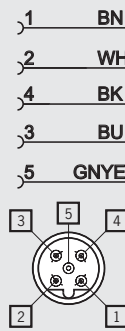
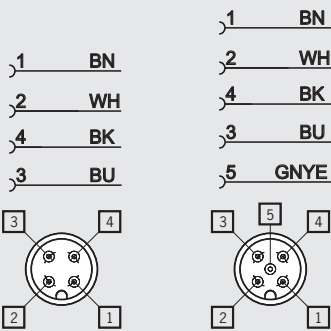
Right-angle plug connector M12, coded
4-pin + PE

Plug connector M12 with 3 LEDs
4-pin

Dimension drawings



Wiring diagrams

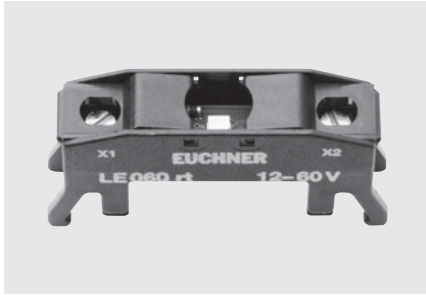


4	4+PE	4+PE	4
TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing
TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing	TPU self-extinguishing
PUR, halogen-free, flame retardant	PVC, halogen-free, flame retardant	PVC, halogen-free, flame retardant	PUR, halogen-free, flame retardant
Black	Orange	Orange	Black
IP 67	IP 67	IP 67	IP 67
-25 ... +80	-25 ... +90	-25 ... +90	-25 ... +80
CuSn nickel-plated, 0.3 µm gold-plated	CuSn nickel-plated, 0.8 µm gold-plated	CuSn nickel-plated, 0.8 µm gold-plated	CuSn nickel-plated, 0.3 µm gold-plated
4 x 0.34	5 x 0.5	5 x 0.5	4 x 0.34
6	5	5	5
≤ 5	≤ 5	≤ 5	≤ 5
2	2	2	-
1.5	1.5	1.5	-
AC 250/DC 300	AC 30/DC 36	AC 250/DC 300	DC 10 ... 30
4	4	4	4

035618 C-M12F04-04X034PU05,0- GA-035618	073462 C-M12F05-05X050PU05,0- GA-073462	045523 C-M12F05-05XDIFPV05,0-GA-045523	-
-	-	-	041091 C-M12F04-04X034PU05,0-GA-041091

LED function display

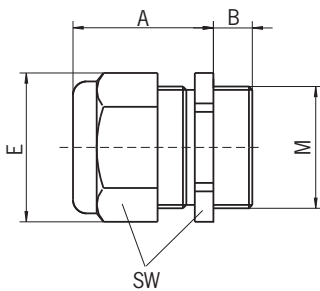
On request, versions with voltage ranges AC 110/230 V are available.



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

Cable glands

Material nickel-plated brass, degree of protection IP 67



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

Additional products

Trip rails/trip dogs

U-trip rails

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



For detailed information see catalog for multiple limit switches.

Appendix

Terms and explanations

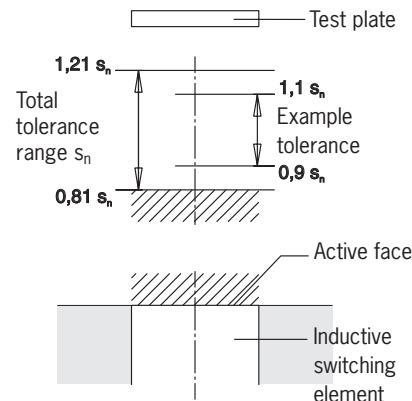
Rated operating distance S_n

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

Assured operating distance S_a

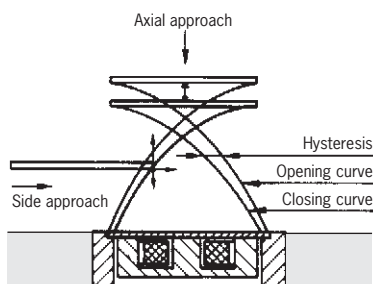
The assured operating distance is the operating distance at which correct operation of the inductive switching element is guaranteed within the permissible operating conditions (temperature and voltage).

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



Hysteresis H

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



Repeat accuracy R

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

Operating voltage U_b

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

Voltage drop U_d

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

Rated operating current I_e

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

Off-state current I_r

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

Minimum operating current I_m

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

Switch-on current I_k

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

Switching frequency f

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

Ambient temperature T

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

Temperature drift Δs

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

Suppressor circuits

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

Short circuit and overload protection

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

Transient protection

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

Wire break safety

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

Reverse polarity protection

Protection against reverse polarization of the operating voltage.

Index by item designation

Item	Order no.	page	Item	Order no.	page
C-M12F04-04X034PU05,0-GA-035613	035613	42	ESN10B050UP048LKS01-M	ESN 088770	41
C-M12F04-04X034PU05,0-GA-035618	035618	43	LE 060 ge	035497	44
C-M12F04-04X034PU05,0-GA-041091	041091	43	LE 060 gr	035496	44
C-M12F05-05X050PU05,0-GA-073461	073461	42	LE 060 rt	035495	44
C-M12F05-05X050PU05,0-GA-073462	073462	43	N01D550-M	084902	26
C-M12F05-05XDIFPV0,50-GA-045524	045524	42	N01D550-MC1526	091003	28
C-M12F05-05XDIFPV05,0-GA-045523	045523	43	N01D550-MC2018	085708	27
EGM12-1200C1791	075556	16	N01D550SVM5-M	088623	27
EGM12-1200C1820	076464	16	N01D550X5000-M	088978	27
EGM12-1200C2463	128196	17	N01D562-M	087151	26
EGM12-2500C2452	126384	17	N01D572-M	087162	26
EGM12-4000C1791	076154	16	N01K550-M	084904	26
EGM12SAM3C1868	077228	17	N01K550-MC1526	091002	28
EGM12SEM4	082205	17	N01K550-MC2018	089619	27
EGM12SEM4C1820	093733	17	N01K550SVM5-M	088624	27
EGM8-1000C2396	119345	16	N01K550X5000-M	088986	27
EGT1/4A2000	001366	14	N01K562-M	087152	26
EGT1/4A2000C2079	094982	15	N01K572-M	087164	26
EGT1/4A2000C2137	102476	15	N01R550-M	084903	26
EGT1/4A5000	001368	14	N01R550-MC1526	091001	28
EGT1/4ASEM4	033976	14	N01R550-MC2018	094856	27
EGT1/4ASEM4C1802	075644	14	N01R550SEM5-M	091257	28
EGT1/4ASEM4C2088	095278	15	N01R550SVM5-M	088622	27
EGT1/4ASEM4C2137	098071	15	N01R550X5000-M	088982	27
EGT1/4R2000	001371	14	N01R562-M	085243	26
EGT1/4R5000	001372	14	N01R562SVM5-M	093426	27
EGT1/4RSEM4	033982	14	N01R572-M	087163	26
EGT1/4RSEM4C2088	104316	15	N10D-M	086293	36
EGT1/4RSEM4C2137	104372	15	N10K-M	088589	36
EGT1-2000	001732	20	N10R-M	086294	36
EGT1-5000	001733	20	N10RL-M	088587	36
EGT11A2NSFM5	093352	12	N11D-M	086298	37
EGT11R2N50SAM4	084000	12	N11K-M	088585	37
EGT11R2NSFM5	091848	12	N11R-M	086313	37
EGT12A3000C2250	104223	10	N11RL-M	086299	37
EGT12A5000	082201	10	N1AD502-M	079265	33
EGT12ARSEM4C1888	078483	13	N1AD502AM-M	090542	35
EGT12ASFM5	075426	11	N1AD502SVM5-M	087487	34
EGT12ASFM5C2083	095112	11	N1AD502SVM5-MC1883	091471	34
EGT12R5000	078848	10	N1AD508-M	083886	32
EGT12RRSEM4C1888	079139	13	N1AD508-MC2222	103237	32
EGT12RSFM5	075427	11	N1AD508AM-M	090546	35
EGT1M12-2000	092695	18	N1AD514-M	083849	32
EGT1M12-5000	093364	18	N1AD514AM-MC2222	110462	33
EGT1M12SEM4	093365	18	N1AD514SVM5-M	087603	33
EGT1SEM4	019727	20	N1AK502-M	083847	33
EGT1SEM4C1613	054250	21	N1AK502AM-M	091059	35
EGT1SEM4C1832	077347	21	N1AK502SVM5-M	087489	34
EGT1SEM4C2221	102479	21	N1AK502SVM5-MC1883	087496	34
EGT2-2000	001864	22	N1AR502-M	078485	33
EGT2-5000	001865	22	N1AR502AM-M	090541	35
EGT2SEM4	052504	22	N1AR502SVM5-M	087488	34
EGT4-10000	093967	23	N1AR508-M	083887	32
EGT4-2000	094339	23	N1AR508-MC2222	103221	32
EGT4-5000	092026	23	N1AR514-M	078487	32
EGZ12-12-5000	094823	24	N1AR514AM-MC2222	103247	33
EKVM12/04	086327	44	N1AR514SVM5-M	087604	33
EKVM16/04	086328	44	N1ARL502-M	083848	35
EKVM16/06	086330	44	N1ARL508-M	087147	35
EKVM20/06	077683	44	N1ARL514-M	087204	35
ENA10B050UP048LKK10-M	ENA 086280	40	N1AW508-M	087205	32
ENA10B050UP048NKK10-M	ENA 086099	40	N1AW508-MC2222	103222	32
ESN10B050UP048LK05P-M	ESN 088771	41	N1AW514-M	083850	32

Index by order number

Order no.	Item	page	Order no.	Item	page
001366	EGT1/4A2000	14	086298	N11D-M	37
001368	EGT1/4A5000	14	086299	N11RL-M	37
001371	EGT1/4R2000	14	086313	N11R-M	37
001372	EGT1/4R5000	14	086327	EKVM12/04	44
001732	EGT1-2000	20	086328	EKVM16/04	44
001733	EGT1-5000	20	086330	EKVM16/06	44
001864	EGT2-2000	22	087147	N1ARL508-M	35
001865	EGT2-5000	22	087151	N01D562-M	26
019727	EGT1SEM4	20	087152	N01K562-M	26
033976	EGT1/4ASEM4	14	087162	N01D572-M	26
033982	EGT1/4RSEM4	14	087163	N01R572-M	26
035495	LE 060 rt	44	087164	N01K572-M	26
035496	LE 060 gr	44	087204	N1ARL514-M	35
035497	LE 060 ge	44	087205	N1AW508-M	32
035613	C-M12F04-04X034PU05,0-GA-035613	42	087487	N1AD502SVM5-M	34
035618	C-M12F04-04X034PU05,0-GA-035618	43	087488	N1AR502SVM5-M	34
041091	C-M12F04-04X034PU05,0-GA-041091	43	087489	N1AK502SVM5-M	34
045523	C-M12F05-05XDIFPV05,0-GA-045523	43	087496	N1AK502SVM5-MC1883	34
045524	C-M12F05-05XDIFPV0,50-GA-045524	42	087603	N1AD514SVM5-M	33
052504	EGT2SEM4	22	087604	N1AR514SVM5-M	33
054250	EGT1SEM4C1613	21	088583	NB01R588-M	29
073461	C-M12F05-05X050PU05,0-GA-073461	42	088584	NB01D588-M	29
073462	C-M12F05-05X050PU05,0-GA-073462	43	088585	N11K-M	37
075426	EGT12ASFM5	11	088587	N10RL-M	36
075427	EGT12RSFM5	11	088589	N10K-M	36
075556	EGM12-1200C1791	16	088622	N01R550SVM5-M	27
075644	EGT1/4ASEM4C1802	14	088623	N01D550SVM5-M	27
076154	EGM12-4000C1791	16	088624	N01K550SVM5-M	27
076464	EGM12-1200C1820	16	088625	SN01D558SVM5-M	30
077228	EGM12SAM3C1868	17	088626	SN01R558SVM5-M	30
077347	EGT1SEM4C1832	21	088627	SN01K558SVM5-M	30
077683	EKVM20/06	44	088978	N01D550X5000-M	27
078483	EGT12ARSEM4C1888	13	088982	N01R550X5000-M	27
078485	N1AR502-M	33	088986	N01K550X5000-M	27
078487	N1AR514-M	32	089619	N01K550-MC2018	27
078848	EGT12R5000	10	090515	SN01R558X2000-M	31
079139	EGT12RRSEM4C1888	13	090541	N1AR502AM-M	35
079265	N1AD502-M	33	090542	N1AD502AM-M	35
082201	EGT12A5000	10	090546	N1AD508AM-M	35
082205	EGM12SEM4	17	090743	N1AW514SVM5-M	33
083847	N1AK502-M	33	091001	N01R550-MC1526	28
083848	N1ARL502-M	35	091002	N01K550-MC1526	28
083849	N1AD514-M	32	091003	N01D550-MC1526	28
083850	N1AW514-M	32	091059	N1AK502AM-M	35
083886	N1AD508-M	32	091257	N01R550SEM5-M	28
083887	N1AR508-M	32	091471	N1AD502SVM5-MC1883	34
084000	EGT11R2N50SAM4	12	091848	EGT11R2NSFM5	12
084902	N01D550-M	26	092026	EGT4-5000	23
084903	N01R550-M	26	092695	EGT1M12-2000	18
084904	N01K550-M	26	093352	EGT11A2NSFM5	12
085243	N01R562-M	26	093364	EGT1M12-5000	18
085245	NB01D556-M	29	093365	EGT1M12SEM4	18
085246	NB01R556-M	29	093426	N01R562SVM5-M	27
085247	NB01K556-M	29	093733	EGM12SEM4C1820	17
085252	SN01D553-M	30	093967	EGT4-10000	23
085253	SN01R553-M	30	094339	EGT4-2000	23
085254	SN01K553-M	30	094823	EGZ12-12-5000	24
085260	SN01D558-M	30	094856	N01R550-MC2018	27
085261	SN01R558-M	30	094982	EGT1/4A2000C2079	15
085262	SN01K558-M	30	095112	EGT12ASFM5C2083	11
085708	N01D550-MC2018	27	095278	EGT1/4ASEM4C2088	15
086293	N10D-M	36	098071	EGT1/4ASEM4C2137	15
086294	N10R-M	36	102476	EGT1/4A2000C2137	15

A series of 30 horizontal grey bars stacked vertically, providing a space for taking notes. Each bar is approximately 20 pixels high and spans most of the page width.

A series of 30 horizontal grey bars, evenly spaced, intended for writing notes. The bars span most of the width of the page, leaving a small margin on the left and right.

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