Precision Multiple Limit Switches





Automation

More than safety.







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

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

Automation - Safety - ManMachine

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

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

Quality, reliability, precision

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

EUCHNER – More than safety.





Quality - made by EUCHNER

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General Information

Application

EUCHNER precision multiple limit switches are used for controlling and positioning in all areas of mechanical and systems engineering and for solving automation tasks.

The main advantages of these highly accurate and reliable positioning devices are:

- Minimum space requirements due to compact design
- Low-cost connection through the use of a common control cable
- Easy access to all switch stations for test and service purposes
- Easy installation

A range of housing versions, including DIN versions, is available to suit the full spectrum of application fields. A high standard of quality is guaranteed in every installation position by the degree of protection IP 67.

Function

Precision multiple limit switches possess several switching elements arranged in a row. The spacing between the individual switching positions of 12 mm and 16 mm is standardized in accordance with DIN 43697. The product range is completed with a particularly compact, space-saving version with a spacing of 8 mm.

The switching elements are actuated by means of plungers. This is achieved with trip dogs in accordance with DIN 69 639, which are mounted with an interference fit in trip rails according to DIN 69 638 (see separate catalogue *Trip Dogs and Trip Rails*).

Design

Depending on the technical requirements in terms of operating point accuracy and approach speed, four functionally different types of plunger (chisel, roller, ball and dome plungers) are used. Depending on the plunger type, the reproducible operating point accuracy is \pm 0.002 mm and the maximum approach speed is 120 m/min.

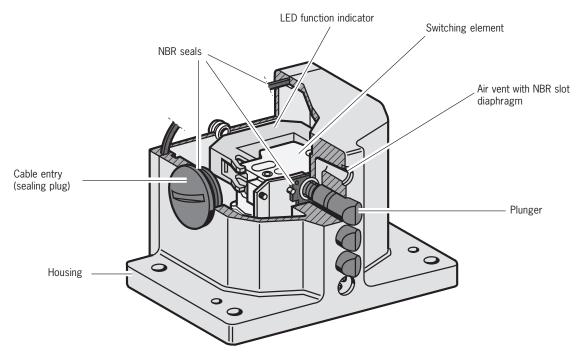
The precision multiple limit switches can be assembled with snapaction and safety switching elements, or also in combination with inductive switching elements. The mechanical life of the switching elements amounts to 30 x 10^6 mechanical switching cycles.

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

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

A series with an exterior diaphragm which is designed to resist the effect of resinous cooling lubricants is also available. This version prevents the plungers sticking.

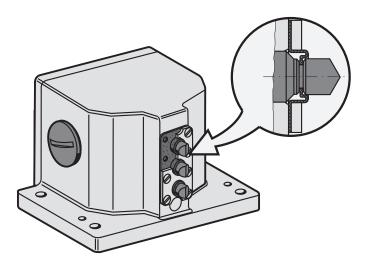
A further variant with an interchangeable plunger guide allows a quick and easy plunger replacement without any re-adjustment of the multiple limit switch. This keeps production downtimes as short as possible.





Exterior diaphragm

A series with an exterior diaphragm which is designed to resist the effect of resinous cooling lubricants is also 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 it is not necessary to replace the switch or plunger. For technical data on this series see pages 20 and 21.



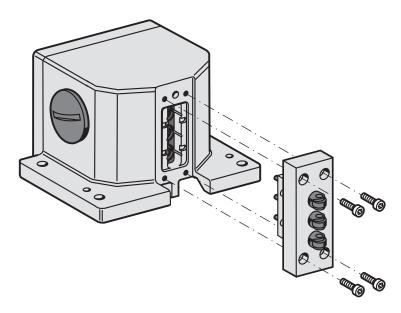
Interchangeable plunger guide

The series RGCS with its interchangeable plunger guide allows quick and easy plunger replacement without any new adjustment of the multiple limit switch. This keeps production downtimes as short as possible.

In case of damage or wear to the plunger, e.g. when processing abrasive materials, and also when the plunger has become completely stuck due to resinous cooling lubricants, it is only necessary to replace the plunger guide and plungers on these multiple limit switches.

The complete plunger guide is dismantled from the plunger side. The plungers can be replaced easily and quickly by the operator without special tools. Specialist knowledge is not required. It is not necessary to make changes to the machine installation or perform time-consuming re-adjustment of the system.

In this way, repair costs are reduced and the machine downtimes are minimized. For technical data on this series see pages 22 and 23.

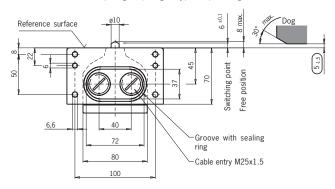


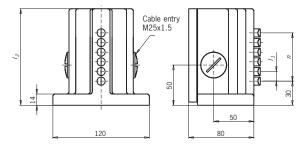
Series RGBF...

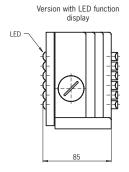
- ▶ Plunger spacing 12 or 16 mm
- ▶ Upright housing according to DIN 43697
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version





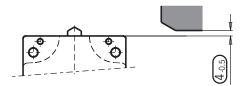




Note

The series RGBF multiple limit switches can be fully or partially equipped with **safety switching elements**. Here it is important that the **trip dog setting distance** is observed to ensure the safe opening of the circuit. The trip dogs must be positively mounted according to EN 1088, i.e. riveted, welded or secured in some other way against becoming loose.

Trip dog setting distance for safety switching elements



_		Plunger	spacing	
n Number of	I ₁ =	12	I ₁ =	16
plungers	l ₂	Housing material	l ₂	Housing material
2	70		70	
3	80		90	Die-cast
4	90	Die-cast	105	aluminum
5	105	aluminum	120	anodized
6	120	anodized	140	anouizeu
8	140		170	
10	170		200	Sand-cast
12	200	Sand-cast	240	aluminum anodized
14	240	aluminum	_	_
16	240	anodized	_	_



Parameter	Value					Unit	
Housing material			nst aluminum, an				
D ()	Sa	Sand cast aluminum, anodized (see table, left)					
Degree of protection according to IEC 60529		IP 67					
Installation position			any			°C	
Ambient temperature			- 5 to + 80 1)		147	30	
	D	R	В	K	W		
Plunger types							
The state of the s							
Operating point accuracy 3)	Chisel ± 0.002	± 0.01	ring) Roller (ball bearing) ± 0.01	Ball 2) ± 0,01	Dome ± 0,002	mm	
Approach speed, max. 4)	± 0,002 40	± 0,01	120 5)	10	10	m/min	
Number of plungers	40	00	See table, left		10	111/111111	
Plunger material			Stainless stee				
Plunger guide			Maintenance-fre				
Switching element	ES 50	12 E	ES 508		S 514		
Contact elements	1 NO +		1 NC ⊖		+ 1 NC →		
Switching principle	Snap-a		Slow-action		Snap-action		
	contact e		contact elemer		contact element		
Actuating force	≥ 20		≥ 15		≥ 30		
Approach speed, min.	0.0		-		0.01		
Differential travel	8.0		-		0.6	mm	
Pre-travel to the switching point	See travel diagram p. 26 ar					. ,	
Switching frequency	≤ 30		≤ 50		≤ 50	min ⁻¹	
Mech. life (switching cycles)		≥ 30 x	106	≥]	≥ 1 x 10 ⁶		
Rated impulse withstand voltage U _{imp}	4		-		4	kV	
Rated insulation voltage U _i			250			V	
Utilization category AC-12			-		-		
according to IEC 60947-5-1 AC-15			l _e 6 A U _e 230		A U _e 230 V		
DC-13	C C		l _e 6 A U _e 24 V	l _e 6	A U _e 24 V		
Switching current, min. at	10		10		5	mA	
Switching voltage	12		24		24	DC V	
Conventional thermal current I _{th}			10			Α	
Contact closing time	< 4		-		≤ 5	ms	
Contact bounce time	< 3	3	-		≤ 3	ms	
Short-circuit protection according to IEC 60269-1			10			A gG	
(control circuit fuse)						7, 8	
Connection type			Screw termina				
Conductor cross-section, max.			2 x 1.5 (per cont	act)		mm ²	
Approvals for switching elements	1R ₃			-			
LED function indicator (optional) 1) Special versions for low temperature range down to 30 °C		, tor other co	lours see accesso	ries on	request		

- Special versions for low temperature range down to -30 °C on request.

 For safety reasons, multiple limit switches with switching elements ES 508 and ES 514 are not available with ball plungers.

 The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles.

 The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.
- Special versions for high usage with roller plungers on request.

 Only in conjunction with switching element ES 502 E or ES 508.

Ordering code	R G B F		-	LE	 M
Series —					
Number of plungers (see table, left)					
Plunger types (D = Chisel, R = Roller (slide bearing), B =	= Rolle (ball bearing), K = Bal	II, W = Dome)			
Plunger spacing (12 or 16 mm) -					
Switching elements (ES 502 E, ES	508 , ES 514)				
LED function indicator (AC/DC 12-6	0 V = 060 , AC 110 V =	110 , AC 220 V =	220)		
Cable entry with metric thread M25	x 1.5 (M) —				J

Ordering example: Multiple limit switch according to DIN 43697, 8 roller plungers,

plunger spacing 12 mm, switching element ES 502 E, LED 24 V

RGBF 08 R 12 -502 LE060-M

Mixed contact assembly: If the multiple limit switch is equipped with safety switching elements and the standard switching element ES 502 E, please note page 28.

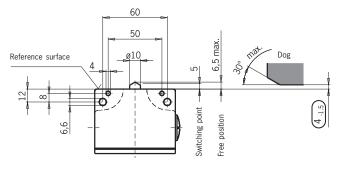


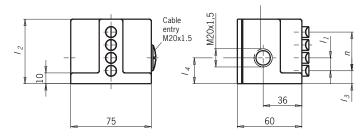
Series SN...

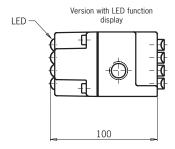
- ▶ Plunger spacing 12 or 16 mm
- ► Upright housing, small flange
- ▶ Degree of protection IP 67 according to IEC 60529

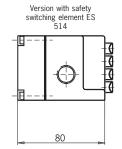
Dimension drawing

Illustration with chisel plunger, plunger type depending on version







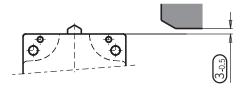




Note

The series SN multiple limit switches can be fully or partially equipped with **safety switching elements**. Here it is important that the **trip dog setting distance** is observed to ensure the safe opening of the circuit. The trip dogs must be positively mounted according to EN 1088, i.e. riveted, welded or secured in some other way against becoming loose.

Trip dog setting distance for safety switching elements



n Number of		P I ₁ = 12	Housing				
plungers	l ₂	I ₃	I ₄	l ₂	I ₃	I ₄	material
2	36		19	48			
3	48			72	16	24	Die-cast
4	60	12	24	84			aluminum
5	72		24	_	_	_	anodized
6	84			_	_	_	



Parameter	***************************************					Unit
Housing material						
Degree of protection according to IEC 60529						
Installation position			any			
Ambient temperature			- 5 to + 80 ¹⁾			°C
	D	R	В	K	W	
Plunger types	Chisel	Dallar (alida basa)	ing) Roller (ball bearing)	Ball 2)	Dome	
Operating point accuracy 3)	± 0.002	± 0.01	± 0.01	± 0,01	± 0,002	mm
Approach speed, max. 4)	40	80	120 5)	10	10	m/min
Number of plungers	10		See table, left	10	10	111/111111
Plunger material			Stainless steel			
Plunger guide			Maintenance-free			
Switching element	ES 50	2 E	ES 508	ES 51	4 (on request)	
Contact elements	1 NO +		1 NC ⊖		+ 1 NC →	
Switching principle	Snap-ad		Slow-action		ap-action	
omeaning principle	contact e		contact element		ct element	
Actuating force	≥ 20		≥ 15	≥ 30		N
Approach speed, min.	0.0		-		0.01	m/min
Differential travel	0.8		-		0.6	mm
Pre-travel to the switching point	See travel diagram p. 26 and			nd p. 27		
Switching frequency			≤ 50			
Mech. life (switching cycles)		≥ 30 x	≥ 30 x 10 ⁶		l x 10 ⁶	
Rated impulse withstand voltage U _{imp}	4		-	4		kV
Rated insulation voltage U _i			250			V
Utilization category AC-12	l _e 10 A U _e		-		-	
according to IEC 60947-5-1 AC-15	I _e 6 A U _e		I _e 6 A U _e 230 V		A U _e 230 V	
DC-13	I _e 6 A U _e		I _e 6 A U _e 24 V	l _e 6	A U _e 24 V	
Switching current, min. at	10		10		5	mA
Switching voltage	12		24		24	DC V
Conventional thermal current I _{th}			10			Α
Contact closing time	< 4		-		≤ 5	ms
Contact bounce time	< 3	3	-		≤ 3	ms
Short-circuit protection according to IEC 60269-1 (control circuit fuse)	10				A gG	
Connection type			Screw terminal			
Conductor cross-section, max.		2	x 1.5 (per contac	t)		mm ²
Approvals for switching elements LED function indicator (optional)	Standard red.	US	lours see accessorie	-	request	
1\ 0 :: : (-1 3		<u> </u>

Ordering code	SN			L	E	_	M
Series —							
Number of plungers (see table, left) ———							
Plunger types (D = Chisel, R = Roller (slide bearing), B = Rolle (ba	all bearing), K = Ba	all, W = Dome)					
Plunger spacing (12 or 16 mm)							
Switching elements (ES 502 E, ES 508, ES	5 514) ———						
LED function indicator (AC/DC 12-60 V = 0	60 , AC 110 V =	= 110 , AC 2	20 V = 220)				
Cable entry with metric thread M20 x 1.5 (Л) ————						

Ordering example: Multiple limit switch, 3 chisel plungers, plunger spacing 12 mm,

switching element ES 508, no LED

SN 03 D 12 -508 -M

Mixed contact assembly: If the multiple limit switch is equipped with safety switching elements and the standard switching element ES 502 E, please note page 28.



¹⁾ Special versions for low temperature range down to -30 °C on request.
2) For safety reasons, multiple limit switches with switching elements ES 508 and ES 514 are not available with ball plungers.
3) The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles.
4) The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.
4) Special versions for high usage with roller plungers on request.
5) Only in conjunction with switching element ES 502 E or ES 508.

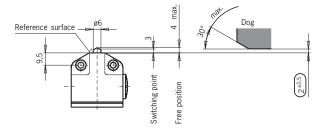
Series SN... / SB...

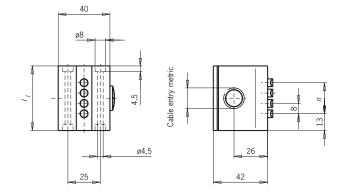
- ► Plunger spacing 8 mm
- ► Upright housing, without flange
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Series SN...

Illustration with chisel plunger, plunger type depending on version

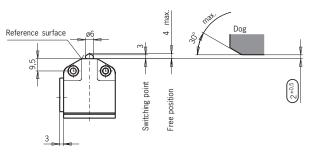


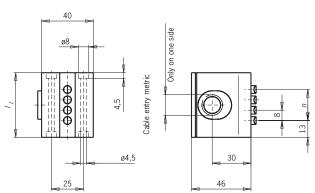




n	Plunger spacing 8 mm							
Number of plungers	l ₁	Cable entry	Housing material					
2	34	ona y	matorial					
3	42	M16x1.5	Die-cast					
4	50		aluminum					
5	58	M20x1.5	anodized					
6	66	IVIZUXI.J						

Series SB... (with enlarged space for wiring) Illustration with chisel plunger, plunger type depending on version







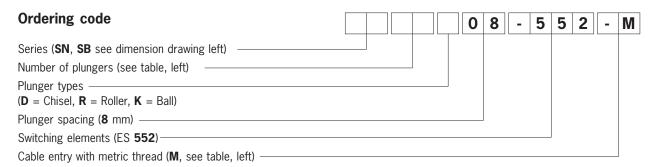
n	P	lunger spacin	g 8 mm
Number of plungers	l ₁	Cable entry	Housing material
2	34		Die-cast
3	42	M16x1.5	aluminum
4	50		anodized
5	58	M20x1.5	anouizeu





Parameter		Value		Unit			
Housing material	Die	-cast aluminum, anod	ized				
Degree of protection according to IEC 60529		IP 67					
Installation position		any					
Ambient temperature		- 5 to + 80		°C			
Plunger types	D	R Roller	K Ball				
Operating point accuracy 1)	± 0.02	± 0.05	± 0.03	mm			
Approach speed, max. 2)	20	50	8	m/min			
Number of plungers		See table, left					
Plunger material		Stainless steel					
Plunger guide		Maintenance-free					
Switching element		ES 552					
Contact elements		1 changeover contact					
Switching principle	Sn	ap-action contact elen	nent				
Actuating force		≥ 15		N			
Approach speed, min.		0.01		m/min			
Differential travel		0.2					
Pre-travel to the switching point	See tr	avel diagram p. 26 an	d p. 27				
Switching frequency		≤ 200		min ⁻¹			
Mech. life (switching cycles)		$\geq 10 \times 10^6$					
Rated impulse withstand voltage U _{imp}		4		kV			
Rated insulation voltage U _i		250		V			
Utilization category AC-15		le 2.5 A U _e 230 V					
according to IEC 60947-5-1 DC-13		le 2 A U _e 24 V					
Switching current, min. at		10		mA			
Switching voltage		24		DC V			
Conventional thermal current I _{th}		<u>4</u> ≤10		A			
Contact closing time		ms					
Contact bounce time		≤ 1.5		ms			
Short-circuit protection according to IEC 60269-1		4		A aC			
(control circuit fuse)				A gG			
Connection type		Screw terminal					
Conductor cross-section, max.		1.5		mm²			

¹⁾ The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 552 has been run-in with approx. 2000 switching cycles.
2) The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.



Ordering example: Multiple limit switch series SB, 3 roller plungers, plunger spacing 8 mm, switching element ES 552

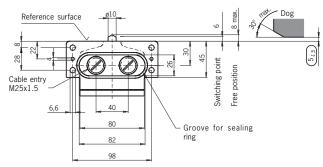
SB 03 R 08 -552 -M

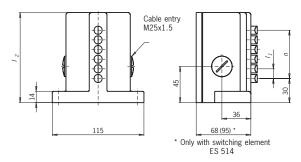
Series GSBF...

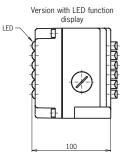
- ▶ Plunger spacing 12 or 16 mm
- ▶ Upright housing
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version







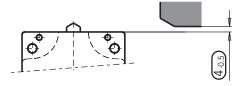
_		Plunger	spacing	
<i>n</i> Number	I ₁ =	12 Housing	16 Housing	
of plungers	l ₂	material	I ₂	material
2	70		70	
3	70	Diagont	82	Die-cast
4	82	Die-cast	96	aluminum
5	96	aluminum	112	anodized
6	112	anodized	130	
8	130		160	
10	160		192	Sand-cast
12	179	Sand-cast	226	aluminum
14	208	aluminum	256	
16	226	anodized	288	anodized
18	256	anouizeu	_	_
20	288		_	_



Note

The series GSBF multiple limit switches can be fully or partially equipped with **safety switching elements**. Here it is important that the **trip dog setting distance** is observed to ensure the safe opening of the circuit. The trip dogs must be positively mounted according to EN 1088, i.e. riveted, welded or secured in some other way against becoming loose.

Trip dog setting distance for safety switching elements



Grey values on request



Parameter			Val				Unit
Housing material		Die-cast aluminum, anodized /					
Degree of protection according to IEC COE20	Sand cast aluminum, anodized (see table, left) IP 67						
Degree of protection according to IEC 60529							
Installation position Ambient temperature	any - 5 to + 80					°C	
Ambient temperature						\A/	C
	D D		R	K		W	
Plunger types							
	Chisel		Roller	Ball 1)		Dome	
Operating point accuracy ²⁾	± 0.002		± 0.01	± 0.0		± 0.002	mm
Approach speed, max. 3)	40	-	80	± 0.0	1	10	m/min
Number of plungers	40		See tal			10	111/111111
Plunger material			Stainles				
Plunger guide			Maintena				
Switching element	ES 502 E		ES !			ES 514	
Contact elements	1 NO + 1 N		1 NO		1 1	NO + 1 NC →	
			Slow-				
Switching principle	Snap-action contact elem-		1		Snap-action		
Ashusting four	≥ 20	епі	contact element ≥ 15		contact element ≥ 30		N
Actuating force			≥ 13		≥ 30 0.01		
Approach speed, min.	0.01		-			0.01	m/min
Differential travel Pre-travel to the switching point		'aa tr	l diagram	n n 26 an			mm
Switching frequency	≤ 300	See travel diagram p. 26 and p. 2 ≤ 50		<i>y</i> ≤ 50	min ⁻¹		
Mech. life (switching cycles)		> 20	$\times 10^6$	$\begin{array}{c c} 50 & \leq 50 \\ & \geq 1 \times 10^6 \end{array}$			1111111
Rated impulse withstand voltage U _{imp}	4	≥ 30	X 10°			4	kV
Rated insulation voltage U _i	4		25			4	V
Utilization category AC-12	I _e 10 A U _e 25	Λ V)()			V
according to IEC 60947-5-1 AC-15	I _e 10 A U _e 230		I _e 6 A U	. 33U V	1.3	2.5 A U _e 230 V	
DC-13	I _e 6 A U _e 24		I _e 6 A U			6 A U _e 24 V	
Switching current, min. at	10	V	1 1e 0 A C		ıe	5	mA
Switching voltage	12		2	-		24	DC V
Conventional thermal current I _{th}	12					27	A
Contact closing time	< 4 -			≤ 5	ms		
Contact bounce time	< 3					<u>≤</u> 3	ms
Short-circuit protection according to IEC 60269-1					1		
(control circuit fuse)	10			A gG			
Connection type			Screw 1	erminal			
Conductor cross-section, max.			2 x 1.5 (pe				mm ²
Approvals for switching elements	c 711 us		- 4				
LED function indicator (optional)	Standard red, for	other (colours see a	accessories		-	
For safety reasons, multiple limit switches with switching ele					ungorc		-

For safety reasons, multiple limit switches with switching elements ES 508 and ES 514 are not available with ball plungers.

The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles.

The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.

Ordering code	GSBF		-	L	. E	-	M
Series —							
Number of plungers (see table, left)) ————	_					
Plunger types —							
$(\mathbf{D} = \text{Chisel}, \mathbf{R} = \text{Roller}, \mathbf{K} = \text{Ball}, \mathbf{W})$	I = Dome)						
Plunger spacing (12 or 16 mm) -							
Switching elements (ES 502 E, ES	508 , ES 514)						
LED function indicator (AC/DC 12-6	0 V = 060 , AC 110 V	= 110 , AC 220 V	′ = 220) ——				
Cable entry with metric thread M25	x 1.5 (M)						

Ordering example: Multiple limit switch, 10 chisel plungers,

plunger spacing 12 mm, switching element ES 508, LED 24 V

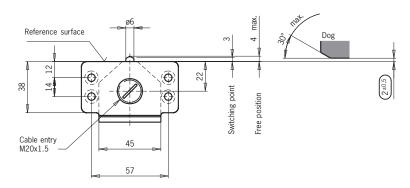
GSBF 10 D 12 -508 LE060-M

Series GSBF...

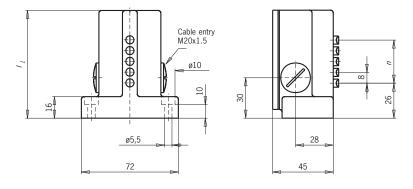
- ► Plunger spacing 8 mm
- **▶** Upright housing
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version







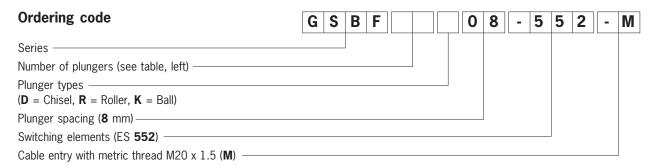
n	Plunger spacing 8 mm				
Number of plungers	l ₁	Housing material			
2	48				
3	64				
4	64				
5	80				
6	80	Sand-			
8	96	cast			
10	112	aluminum			
12	128	anodized			
14	144				
16	160				
18	176				
20	192				

Grey values on request



Parameter		Value		Unit
Housing material	San	d-cast aluminum, ano	dized	
Degree of protection according to IEC 60529		IP 67		
Installation position		any		
Ambient temperature		- 5 to + 80		°C
Plunger types	D Chisel	R Roller	K Ball	
Operating point accuracy 1)	± 0.02	± 0.05	± 0.03	mm
Approach speed, max. 2)	20	50	8	m/min
Number of plungers		See table, left		
Plunger material		Stainless steel		
Plunger guide		Maintenance-free		
Switching element		ES 552		
Contact elements		1 changeover contact		
Switching principle	Sna	ap-action contact elen ≥ 15	nent	
Actuating force		N		
Approach speed, min.		m/min		
Differential travel		0.2		mm
Pre-travel to the switching point	See tra	avel diagram p. 26 an	ıd p. 27	
Switching frequency		≤ 200		min ⁻¹
Mech. life (switching cycles)		$\geq 10 \times 10^6$		
Rated impulse withstand voltage U _{imp}		4		kV
Rated insulation voltage U _i		250		V
Utilization category AC-15		le 2.5 A U _e 230 V		
according to IEC 60947-5-1 DC-13		le 2 A U _e 24 V		
Switching current, min. at		10		mA
Switching voltage		24		DC V
Conventional thermal current I _{th}		A		
Contact closing time		≤ 10		ms
Contact bounce time		≤ 1.5		ms
Short-circuit protection according to IEC 60269-1		4		A gG
(control circuit fuse)				A gu
Connection type		Screw terminal		
Conductor cross-section, max.		1.5		mm ²

¹⁾ The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 552 has been run-in with approx. 2000 switching cycles.
2) The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.



Ordering example: Multiple limit switch, 8 roller plungers,

plunger spacing 8 mm, switching element ES 552

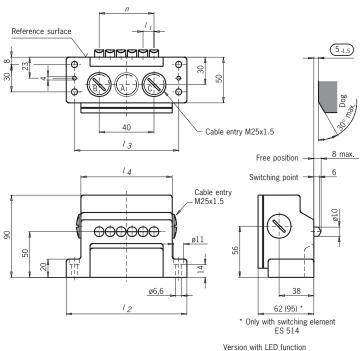
GSBF 08 R 08 -552 -M

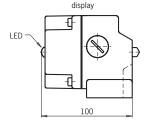
Series GLBF...

- ▶ Plunger spacing 12 or 16 mm
- ► Horizontal housing
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version





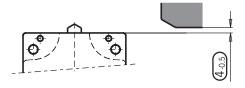
n	Plunger spacing								
Number of plungers	l ₂	l ₁	= 12 I ₄	Cable entry	l ₂	I ₁	= 16 I ₄	Cable entry	Housing material
2	84	66	52	Α	84	66	52	Α	
3	84	66	52	M25x1.5	100	82	68	M25x1.5	
4	100	82	68	IVIZUXI.U	114	98	84		
5	114	98	84		132	114	100		
6	132	114	100		148	130	116		Sand-cast
8	148	130	116		180	162	148	D . C	aluminum
10	180	162	148	B + C	212	194	180	B + C M25x1.5	anodized
12	199	178	167	M25x1.5	244	226	212	IVIZOX1.5	
14	228	210	196	IVIZOXI.S	276	258	244		
16	244	226	212		308	290	276		
18	276	258	244		340	322	308		
20	308	290	276		_	_	_	_	_



Note

The series GLBF multiple limit switches can be fully or partially equipped with **safety switching elements**. Here it is important that the **trip dog setting distance** is observed to ensure the safe opening of the circuit. The trip dogs must be positively mounted according to EN 1088, i.e. riveted, welded or secured in some other way against becoming loose.

Trip dog setting distance for safety switching elements





Housing material Sand cast aluminum, anodized (see table, left)	Parameter						Unit	
Installation position	Housing material	Sand o	ast a			ee tabl	e, left)	
Plunger types			IP 67					
Plunger types								
Plunger types	Ambient temperature							°C
Chise Roller Ball Dome Dome		D		R	K		W	
Chise Roller Ball Dome Dome	Plunger types				\triangle			
Departing point accuracy 2 ± 0.002 ± 0.01 ± 0.01 ± 0.002 mm	· imigor typos					-	444	
Approach speed, max. 3								
Number of plungers See table, left	Operating point accuracy 2)		=			1		
Plunger material Stainless steel Maintenance-free Maintenance-free Maintenance-free Switching element I NO + 1 NC		40					10	m/min
Plunger guide								
Switching element								
Contact elements 1 NO + 1 NC 1 NC → 1 NO + 1 NC → Switching principle Snap-action contact element Slow-action contact element Snap-action contact element Actuating force ≥ 20 ≥ 15 ≥ 30 N Approach speed, min. 0.01 - 0.01 m/min Differential travel 0.8 - 0.6 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 switching frequency ≤ 300 ≤ 50 ≤ 50 min¹ Mech. life (switching cycles) ≥ 30 x 10 ⁶ ≥ 1 x 10 ⁶ Rated impulse withstand voltage U _{imp} 4 - 4 kV Rated insulation voltage U _i 250 V V Utilization category AC-12 I _e 10 A U _e 250 V - - - according to IEC 60947-5-1 AC-15 I _e 6 A U _e 230 V I _e 6 A U _e 230 V I _e 2.5 A U _e 230 V I _e 6 A U _e 24 V I _e								
Switching principle Snap-action contact element Slow-action contact element	Switching element			ES!	508		ES 514	
Contact element Contact element Contact element	Contact elements	1 NO + 1 N	C	1 NO	$\supset \ominus$	11	$NO + 1 NC \ominus$	
Actuating force \$\geq 20\$ \$\geq 15\$ \$\geq 30\$ N Approach speed, min. 0.01 - 0.01 m/min Differential travel 0.8 - 0.6 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency \$\geq 300\$ \$\sq 50\$ \$\geq 50\$ min\frac{1}{2}\$ Mech. life (switching cycles) \$\geq 300\$ \$\geq 50\$ \$\geq 50\$ min\frac{1}{2}\$ Rated impulse withstand voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 kV Rated insulation voltage U_{imp} 4 - 4 4 4 4 4 4 4 4	Switching principle	Snap-action	1	Slow-a	action		Snap-action	
Approach speed, min. 0.01 - 0.01 m/min Differential travel 0.8 - 0.6 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 300 ≤ 50 ≤ 50 min¹ Mech. life (switching cycles) ≥ 30 x 106 ≥ 1 x 106 kV Rated impulse withstand voltage U _{imp} 4 - 4 kV Rated insulation voltage U _i 250 V V Utilization category according to IEC 60947-5-1 AC-12 I _e 10 A U _e 250 V - - - - - AC-15 I _e 6 A U _e 230 V I _e 6 A U _e 230 V I _e 6 A U _e 230 V I _e 6 A U _e 24		contact eleme	ent	contact	element	CO	ntact element	
Differential travel 0.8	Actuating force	≥ 20		≥ ;	15		≥ 30	N
Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 300 ≤ 50 ≤ 50 ≤ 50 Mech. life (switching cycles) Rated impulse withstand voltage U_{imp} $\leq 30 \times 10^6$ $\leq 1 \times 10^6$ Rated insulation voltage U_i Rated insulation voltage U_i ≤ 50 ≤ 50 ≤ 50 $\leq 1 \times 10^6$ Rated insulation voltage U_i ≤ 50 $\leq $	Approach speed, min.			-			0.01	m/min
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Differential travel							mm
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Pre-travel to the switching point	S	ee tra	avel diagran	n p. 26 an	d p. 2	7	
Rated impulse withstand voltage U_{imp}	Switching frequency	≤ 300		≤!	50		≤ 50	min ⁻¹
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Mech. life (switching cycles)		≥ 30	x 10 ⁶			≥ 1 x 10 ⁶	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		4					4	
according to IEC 60947-5-1 $AC-15$ $I_e 6 A U_e 230 V$ $I_e 6 A U_e 230 V$ $I_e 6 A U_e 24 V$ $I_e 6 A U_e $				25	50			V
Switching current, min. at $10 \ 10 \ 5 \ mA$ Switching voltage $12 \ 24 \ 24 \ DC V$ Conventional thermal current I_{th} $10 \ A$ Contact closing time $4 \ A \ A$ $4 \ A$							-	
Switching current, min. at 10 10 5 mA Switching voltage 12 24 24 $DC V$ Conventional thermal current I_{th} 10 A Contact closing time $0.00000000000000000000000000000000000$								
Switching voltage 12 24 24 $DC V$ Conventional thermal current I_{th} 10 A Contact closing time <4 $ \le 5$ ms Contact bounce time <3 $ \le 3$ ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) 10 $A gG$ Connection type 10 a Screw terminal 10 a Conductor cross-section, max.			٧			l _e	6 A U _e 24 V	
							-	
Contact closing time < 4 - ≤ 5 ms Contact bounce time < 3 - ≤ 3 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) 10 A gG Connection type Screw terminal Conductor cross-section, max. 2×1.5 (per contact) mm² Approvals for switching elements - -		12					24	
Contact bounce time < 3 - ≤ 3 msShort-circuit protection according to IEC 60269-1 (control circuit fuse)10A gGConnection typeScrew terminalConductor cross-section, max. 2×1.5 (per contact)mm²Approvals for switching elements-				1	0			Α
Short-circuit protection according to IEC 60269-1 (control circuit fuse) Connection type Conductor cross-section, max. Approvals for switching elements								ms
(control circuit fuse) TO Connection type Screw terminal Conductor cross-section, max. 2 x 1.5 (per contact) Approvals for switching elements -		< 3		-			≤ 3	ms
Connection type Screw terminal Conductor cross-section, max. Approvals for switching elements Conductor cross-section and a conductor cross-section and	Short-circuit protection according to IEC 60269-1			1	0			ΛαΩ
Conductor cross-section, max. Approvals for switching elements 2 x 1.5 (per contact) mm ²	,							A gu
Approvals for switching elements								
	Conductor cross-section, max.			2 x 1.5 (pe	er contact)			mm ²
LED function indicator (optional) Standard red, for other colours see accessories -	Approvals for switching elements							
	LED function indicator (optional)	Standard red, for	other o	colours see a	accessories		-	

Ordering code	G L B F		-	LE	-	M
Series —						
Number of plungers (see table, lef	(t)	_				
Plunger types (D = Chisel, R = Roller, K = Ball,	W = Dome)					
Plunger spacing (12 or 16 mm)						
Switching elements (ES 502 E, ES	S 508, ES 514)					
LED function indicator (AC/DC 12-	60 V = 060 , AC 110 V	= 110 , AC 220 V	= 220)			
Cable entry with metric thread M2	5 x 1.5 (M) —					

Ordering example: Multiple limit switch, 6 roller plungers,

plunger spacing 16 mm, switching element ES 508, LED 220 V

GLBF 06 R 16 -508 LE220-M

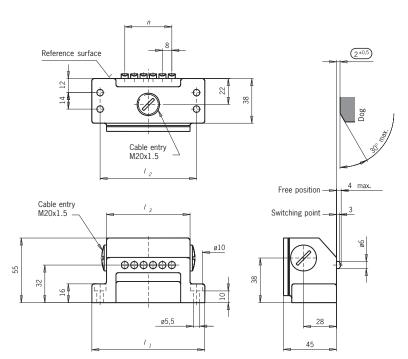
For safety reasons, multiple limit switches with switching elements ES 508 and ES 514 are not available with ball plungers.
 The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles.
 The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.

Series GLBF...

- ► Plunger spacing 8 mm
- ► Horizontal housing
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version





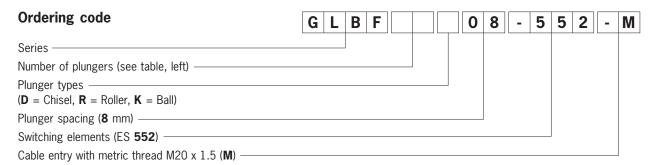
n	Plunger spacing 8 mm								
Number of plungers	I ₁	l ₂	l ₃	Housing material					
2	64	50	39						
3	80	66	55						
4	80	66	55	Sand-cast					
5	96	82	71	aluminum					
6	96	82	71	anodized					
8	112	98	87	anouizeu					
10	128	114	103						
12	144	130	119						

Grey values on request



Housing material Sand-cast aluminum, anodized Degree of protection according to IEC 60529 IP 67 Installation position any	Parameter Value			Unit		
Installation position		San		dized		
Ambient temperature Plunger types Chisel Roller Ball Operating point accuracy 1) ± 0.02 ± 0.05 ± 0.03 mm Approach speed, max. 2) 20 50 8 m//min Number of plungers Plunger material Plunger guide Stainless steel Plunger guide Maintenance-free Switching element Contact elements 1 changeover contact Switching force Actuating force Suitching principle Snap-action contact element Actuating force Suitching principle Snap-action contact element Actuating force > 2 15 N Approach speed, min. Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency Mech. life (switching cycles) Sation 10 10 m/min Mech. life (switching cycles) At 4 kV Rated insulation voltage U _{mp} 4 kV Rated insulation voltage U, Contact closing time Contact closing time See travel diagram p. 26 and p. 27 Switching current, min. at 10 mA Switching current, min. at Switching current, min. at 10 mA Switching current, min. at Switching current, min. at Switching current, min. at Switching current l _{th} 4 A Contact closing time See travel diagram p. See travel diagram			IP 67			
Plunger types Chise Roller Ball						
Plunger types Chisel Roller Ball	Ambient temperature				°C	
Approach speed, max. ²⁷ 20 50 8 m/min		Chisel	Roller	Ball		
Number of plungers Plunger material Plunger guide Maintenance-free Switching element Es 552 Contact elements 1 changeover contact Switching principle Actuating force Approach speed, min. Differential travel Pre-travel to the switching opint See travel diagram p. 26 and p. 27 Switching frequency Mech. life (switching cycles) Rated impulse withstand voltage U₁ Utilization category AC-15 Switching to LEC 60947-5-1 Switching current, min. at Di Conventional thermal current I₂ Contact closing time Contact closing time Contact proper in the standard standard process in the sum of	Operating point accuracy 1)			± 0.03	mm	
Plunger material Stainless steel Plunger guide Maintenance-free Switching element ES 552 Scoract element I changeover contact Switching principle Snap-action contact element Actuating force ≥ 15 N Approach speed, min. 0.01 m/min Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹ Mech. life (switching cycles) ≥ 10 x 106 Rated impulse withstand voltage U _{imp} 4 kV Rated insulation voltage U _i 250 V Utilization category AC-15 Be 2.5 A U _e 230 V according to IEC 60947-5-1 DC-13 DC-13 Be 2 A U _e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I _{th} 4 A A Contact closing time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) Connection type Screw terminal	Approach speed, max. 2)	20	50	8	m/min	
Plunger guide Maintenance-free						
Switching element Contact elements 1 changeover contact Switching principle Snap-action contact element Actuating force ≥ 15 N Approach speed, min. 0.01 m/min Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹ Mech. life (switching cycles) ≥ 10 x 106 Rated impulse withstand voltage U _{imp} 4 kV Rated insulation voltage U _i 250 V Utilization category AC-15 le 2.5 A U _e 230 V according to IEC 60947-5-1 DC-13 le 2.5 A U _e 230 V according to IEC 60947-5-1 DC-13 le 2 A U _e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I _{th} 4 A Contact closing time ≤ 1.5 ms Contact bounce time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 4 A gG Connection type Screw term			Stainless steel			
Contact elements 1 changeover contact Switching principle Snap-action contact element Actuating force ≥ 15 N Approach speed, min. 0.01 m/min Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹¹ Mech. life (switching cycles) ≥ 10 x 106 Rated impulse withstand voltage U _{imp} 4 kV Rated insulation voltage U _i 250 V Utilization category AC-15 le 2.5 A U _e 230 V according to IEC 60947-5-1 DC-13 le 2 A U _e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I _{th} 4 A Contact closing time ≤ 1.5 ms Contact bounce time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) 4 A Connection type Screw terminal						
Switching principle Snap-action contact element Actuating force ≥ 15 N Approach speed, min. 0.01 m/min Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹ Mech. life (switching cycles) ≥ 10 x 106 Rated impulse withstand voltage U _{imp} 4 kV Rated insulation voltage U _i 250 V Utilization category AC-15 le 2.5 A U _e 230 V according to IEC 60947-5-1 DC-13 le 2 A U _e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I _{th} 4 A Contact closing time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 4 A Control circuit fuse) Screw terminal						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			1 changeover contact			
Approach speed, min. Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹ Mech. life (switching cycles) $\geq 10 \times 10^6$ Rated impulse withstand voltage U_{imp} ≤ 200	Switching principle	Sna	ap-action contact elen	nent		
Differential travel 0.2 mm Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min¹¹ Mech. life (switching cycles) ≥ 10×10^6 Rated impulse withstand voltage U_{imp} 4 kV Rated insulation voltage U_i 250 V Utilization category AC-15 le 2.5 A U_e 230 V according to IEC 60947-5-1 DC-13 le 2 A U_e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I_{th} 4 A Contact closing time ≤ 10 ms Contact bounce time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) 4 A gG Connection type Screw terminal			N			
Pre-travel to the switching point See travel diagram p. 26 and p. 27 Switching frequency ≤ 200 min^{-1} Mech. life (switching cycles) ≥ 10×10^6 Rated impulse withstand voltage U_{imp} 4 kV Rated insulation voltage U_i 250 V Utilization category AC-15 le 2.5 A U_e 230 V according to IEC 60947-5-1 DC-13 le 2 A U_e 24 V Switching current, min. at 10 mA Switching voltage 24 DC V Conventional thermal current I_{th} 4 A Contact closing time ≤ 10 ms Contact bounce time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) A gG Connection type Screw terminal						
					mm	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		See tra		d p. 27		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					min ⁻¹	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			$\geq 10 \times 10^6$			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
according to IEC 60947-5-1 $\overline{\text{DC-}13}$ $\overline{\text{Ie 2 A U}_e}$ 24 V Switching current, min. at $\overline{\text{10}}$ $\overline{\text{mA}}$ Switching voltage $\overline{\text{24}}$ $\overline{\text{DC V}}$ Conventional thermal current I _{th} $\overline{\text{4}}$ $\overline{\text{A}}$ Contact closing time $\overline{\text{5 In Contact bounce time}}$ $\overline{\text{6 In Contact bounce time}}$ $\text{6 In Contact bounce ti$					V	
					DC V	
Contact bounce time ≤ 1.5 ms Short-circuit protection according to IEC 60269-1 (control circuit fuse) 4 A gG Connection type Screw terminal			A			
Short-circuit protection according to IEC 60269-1 (control circuit fuse) Connection type A gG Screw terminal	Contact closing time		ms			
(control circuit fuse) 4 A gG Connection type Screw terminal			≤ 1.5		ms	
Connection type Screw terminal			1		ΔαG	
					A gu	
Conductor cross-section, max. 1.5 mm ²						
	Conductor cross-section, max.		1.5		mm ²	

¹⁾ The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 552 has been run-in with approx. 2000 switching cycles.
2) The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.



Ordering example: Multiple limit switch, 12 ball plungers,

plunger spacing 8 mm, switching element ES 552

GLBF 12 K 08 -552 -M

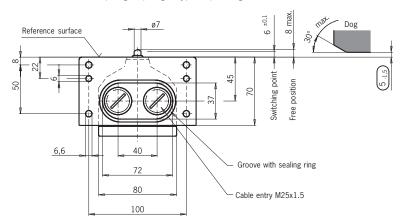
Series RGBF...AM / SN...AM with exterior diaphragm

- ▶ Plunger spacing 12 mm
- **▶** Upright housing
- ▶ Degree of protection IP 67 according to IEC 60529

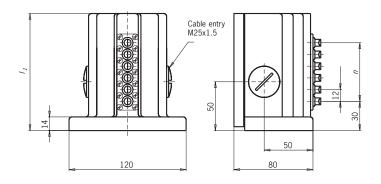
Dimension drawing

Series RGBF... (according to DIN 43697)

Illustration with chisel plunger, plunger type depending on version

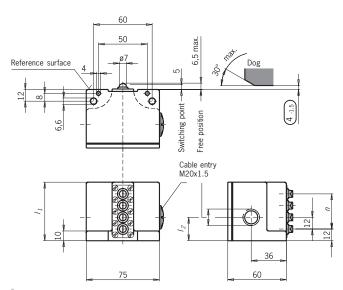






n	Plunger spacing	12 mm
Number of plungers	l ₁	Housing material
2	70	
3	80	Die-cast
4	90	aluminum
5	105	anodized
6	120	allouizeu
8	140	

Series SN... Illustration with chisel plunger, plunger type depending on version



n	Plunger spacing 12 mm						
Number of plungers	I 1	l ₂	Housing material				
2	36	19					
3	48		Die-cast				
4	60	24	aluminum				
5	72	24	anodized				
6	84						

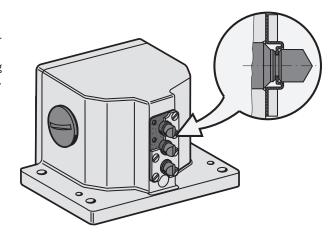
Parameter	Val	ue	Unit
Housing material	Die-cast alumir		
Degree of protection according to IEC 60529	IP (67	
Installation position	ar	y	
Ambient temperature	- 5 to	+ 80	°C
Plunger types	D	R	
Operating point accuracy 1)	Chisel ± 0.002	Roller ± 0.01	mm
Approach speed, max. 2)	20	50	m/min
Number of plungers	See tab		,
Plunger material	Stainles		
Plunger guide	Maintena	nce-free	
Switching element	ES 5	02 E	
Contact elements	1 NO +	- 1 NC	
Switching principle	Snap-action co	ntact element	
Actuating force	≥ :	.5	N
Approach speed, min.	0.0	01	m/min
LED function indicator	on re	quest	

The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles. The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.

Exterior diaphragm

The exterior diaphragm provides additional protection to the plunger

Plunger sticking, primarily caused by resinous lubricating coolants, can be prevented by this exterior diaphragm version.



Ordering table (Other versions on request)

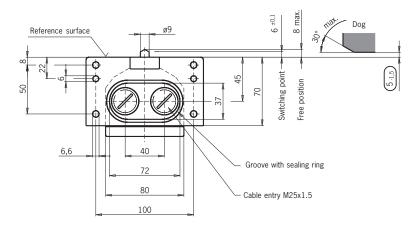
Number of	Plunger type	Multiple limit switch exterior diaphragm version						
plungers		Series RGBF	Order No.	Series SN	Order No.			
2	D	RGBF 02 D 12 -502 AM -M	082 325	SN 02 D 12 -502 AM -M	086 584			
3	<u></u>	RGBF 03 D 12 -502 AM -M	088 365	SN 03 D 12 -502 AM -M	086 585			
4		RGBF 04 D 12 -502 AM -M	082 326	SN 04 D 12 -502 AM -M	086 586			
5		RGBF 05 D 12 -502 AM -M	088 366	SN 05 D 12 -502 AM -M	088 752			
6		RGBF 06 D 12 -502 AM -M	087 097	SN 06 D 12 -502 AM -M	088 753			
8	Chisel plunger	RGBF 08 D 12 -502 AM -M	087 135	_	_			
2	R	RGBF 02 R 12 -502 AM -M	087 098	SN 02 R 12 -502 AM -M	079 289			
3		RGBF 03 R 12 -502 AM -M	088 364	SN 03 R 12 -502 AM -M	086 587			
4		RGBF 04 R 12 -502 AM -M	082 327	SN 04 R 12 -502 AM -M	086 588			
5		RGBF 05 R 12 -502 AM -M	087 099	SN 05 R 12 -502 AM -M	088 765			
6		RGBF 06 R 12 -502 AM -M	087 100	SN 06 R 12 -502 AM -M	088 766			
8	Roller plunger	RGBF 08 R 12 -502 AM -M	085 730	_	_			

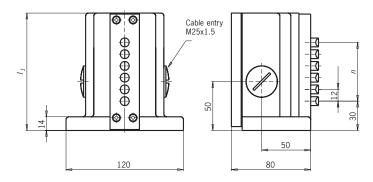
Series RGCS... with interchangeable plunger guide

- ▶ Plunger spacing 12 mm
- ▶ Upright housing according to DIN 43697
- ▶ Degree of protection IP 67 according to IEC 60529

Dimension drawing

Illustration with chisel plunger, plunger type depending on version







Features

- ▶ Plunger guide made of special material
- Can be dismantled from the plunger side
- ► Complete plunger guide can be replaced

n	Plunger spacing	12 mm		
Number of plungers	l ₁	Housing material		
2	70			
3	80	Die-cast		
4	90			
5	105	aluminum		
6	120	anodized		
8	140			

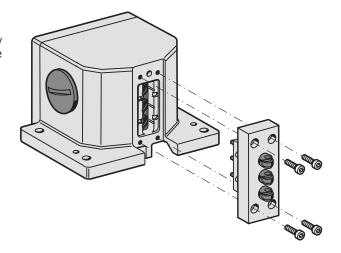
Parameter	Val	Unit	
Housing material	Die-cast alumii		
Degree of protection according to IEC 60529	IP		
Installation position	ar		
Ambient temperature	- 5 to	°C	
	D	R	
Plunger types			
	Chisel	Roller	
Operating point accuracy 1)	± 0.002	± 0.01	mm
Approach speed, max. 2)	20	50	m/min
Number of plungers	See tal		
Plunger material	Stainles		
Plunger guide	Maintena		
Switching element	ES 5		
Contact elements	1 NO +		
Switching principle	Snap-action co		
Actuating force	≥ :	N	
Approach speed, min.	0.0	m/min	
LED function indicator	on re-		

¹⁾ The reproducible operating point accuracy refers to the axial travel of the plunger after the switching element ES 502 E has been run-in with approx. 2000 switching cycles.
2) The approach speed specified applies in conjunction with EUCHNER trip dogs in accordance with DIN 69639.

Interchangeable plunger guide

The interchangeable plunger guide makes it possible to rapidly and easily replace the plunger without re-adjusting the multiple limit switch.

This keeps production downtimes as short as possible.



Ordering table (Other versions on request)

Number of	Plunger type	Multiple limit switch RGCS		Interchangeable plunger guide		
plungers		Item	Order No.	Item	Order No.	
2	D	RGCS 02 D 12 -502 -M	087 452	RGCS 02 D 12	074 591	
3	_	RGCS 03 D 12 -502 -M	087 453	RGCS 03 D 12	079 203	
4	\triangle	RGCS 04 D 12 -502 -M	087 454	RGCS 04 D 12	074 592	
5	111	RGCS 05 D 12 -502 -M	087 455	RGCS 05 D 12	077 449	
6		RGCS 06 D 12 -502 -M	087 456	RGCS 06 D 12	074 593	
8	Chisel plunger	RGCS 08 D 12 -502 -M	087 457	RGCS 08 D 12	077 450	
2	R	RGCS 02 R 12 -502 -M	087 459	RGCS 02 R 12	075 412	
3		RGCS 03 R 12 -502 -M	087 460	RGCS 03 R 12	079 205	
4		RGCS 04 R 12 -502 -M	087 461	RGCS 04 R 12	075 413	
5		RGCS 05 R 12 -502 -M	087 462	RGCS 05 R 12	078 382	
6		RGCS 06 R 12 -502 -M	087 463	RGCS 06 R 12	075 414	
8	Roller plunger	RGCS 08 R 12 -502 -M	087 464	RGCS 08 R 12	078 383	



Accessories

LED function indicator

Three versions with the voltage ranges AC/DC 12 - 60 V, AC 110 V \pm 15 %, AC 220 V \pm 15 % are available in the standard colour red. On request they can be supplied in the colours green and yellow.

The built-in electronic closed-loop control ensures that the luminosity remains constant independently of the voltage applied.



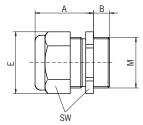
Operating voltage [V]	Color	Item	Order No.	
	Red	LE 060 rt	035 495	
AC/DC 12 - 60	Green	LE 060 gr	035 496	
	Yellow	LE 060 ge	035 497	
	Red	LE 110 rt	045 579	
AC $110 \pm 15 \%$	Green	LE 110 gr	on request	
	Yellow	LE 110 ge	on request	
	Red	LE 220 rt	045 582	
$AC 220 \pm 15 \%$	Green	LE 220 gr	on request	
	Yellow	LE 220 ge		

Cable glands

EUCHNER multiple limit switches are manufactured and supplied with the degree of protection IP 67 according to IEC 60529. High-quality cable glands must be used to maintain this degree of protection.

The following table contains the items suitable for the corresponding internal thread in the multiple limit switch and for the outer diameter of the cable used.

Material: brass, nickel-plated



	Metric	Cable outer	Α	В	Е	AF	
Item	thread	diameter	[mm]	[mm]	[mm]	[mm]	Order No.
	M	[mm]	[]	[]	[]	[]	
EKVM12/04	M12 x 1.5	4 - 6.5	20	5	15.5	14	086 327
EKVM16/04	M16 x 1.5	4 - 6.5	20	6	20	18	086 328
EKVM16/05	M16 x 1.5	5 - 8	20	6	20	18	086 329
EKVM16/06	M16 x 1.5	6.5 - 9.5	20	6	20	18	086 330
EKVM20/06	M20 x 1.5	6.5 - 9.5	20	6	24.4	22	077 683
EKVM20/09	M20 x 1.5	9 - 13	21	6	24.4	22	077 684
EKVM25/09	M25 x 1.5	9 - 13	21	6.5	31.2	28	086 334
EKVM25/11	M25 x 1.5	11.5 - 15.5	21	6.5	31.2	28	086 335

Switching elements

The switching elements ES 502 E can be supplied for multiple limit switches with 12 or 16 mm plunger spacing and ES 552 for multiple limit switches with 8 mm plunger spacing.

The switching elements ES 508 and ES 514 must not be replaced for safety reasons.

In safety circuits, the entire multiple limit switch must be replaced in case of damage or wear. Repairs are only to be made by the manufacturer.







Appendix

Plunger systems

General

Plungers for precision multiple limit switches are made of stainless steel and are extremely accurate.

In conjunction with a specially surface-treated plunger guide, the extremely reliable and maintenance-free operation extends even beyond the guaranteed mechanical life.

There are two different types of actuating system, depending on application. For standard applications, the plunger is fitted with a telescopic device.

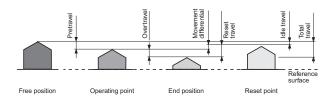
With this system the plunger can be depressed to the reference surface without damaging the switching element.

Precision multiple limit switches with safety switching elements have a "rigid" plunger instead of a plunger with telescopic action; the rigid plunger provides a positively driven NC contact in accordance with EN 60947. This means that the contact point will be reliably opened in the event of mechanical failure of the switching element - e.g. owing to the failure of a contact spring or contact weld resulting from an overload.

Plunger travel

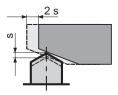
The graphic shows the various positions of the plunger when actuated by a trip dog.

The precise values for the relevant design are shown in the technical data.



Travel ratio for plunger/trip dog

All the plunger travel data shown in the technical data refers to axial actuation. When using our trip dogs in accordance with DIN 69639, this travel is doubled at the trip rail.



Plunger types

Depending on the technical requirements, four functionally different types of plunger (chisel, roller, ball and domed plungers) are used for 8, 12 or 16 mm plunger spacing respectively.

Chisel plunger D

Hardened and polish-ground.

Operating point accuracy up to ± 0.002 mm.

Max. approach speed of 40 m/min.



Ball plunger K

(not in conjunction with safety switching elements) Hardened ball.

Can be actuated from various directions. Operating point accuracy up to \pm 0.01 mm. Max. approach speed of 10 m/min.



Roller plunger R with slide bearing

(standard version for roller plunger)
Hardened roller.
Operating point accuracy up to ± 0.01 mm.
Max. approach speed of 80 m/min.

Roller plunger R with ball bearing

Hardened roller.

Operating point accuracy up to \pm 0.01 mm. Max. approach speed of 120 m/min.



Dome plunger W

(instead of ball plungers in safety switching elements)
Hardened and polish-ground.
Can be actuated from various directions.
Operating point
accuracy up to ± 0.002 mm.
Max. approach speed of 10 m/min.





Switching elements

General Information

Different switching elements are available for various applications. Along with the standard switching elements with snap-action function, switching elements with positively driven NC contacts can be used for safety functions.

Switching element ES 502 E

Approval c us

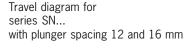
Snap-action contact element ¹⁾ according to DIN 43695 with one NO and one NC contact. Double gap, electrically isolated contact elements, silver contact, electro-gold plated. Screw terminal with self-lifting clamp washers.

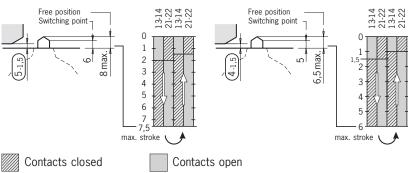
Used in multiple limit switches with 12 and 16 mm plunger spacing.

Pin assignment and switching function



Travel diagram for series RGBF.../GSBF.../GLBF... with plunger spacing 12 and 16 mm





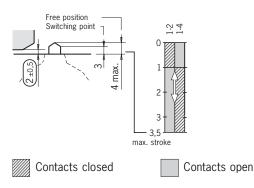
Switching element ES 552

Snap-action contact element $^{\scriptscriptstyle 1)}$ with one changeover contact. Silver contact, electro-gold plated. Screw terminal. Used in multiple limit switches with 8 mm plunger spacing.

Pin assignment and switching function

Travel diagram for series GSBF.../GLBF.../SN.../SB... with plunger spacing 8 mm





1) A snap-action contact element has a contact element which opens or closes regardless of its actuation speed.



Switching element ES 514

(safety switching element)

Magnetic snap-action contact element ¹⁾ with one positively driven NC contact and one NO contact.

Double gap, electrically isolated contact elements, silver contact, electro-gold plated. Screw terminal with self-lifting clamp washers.

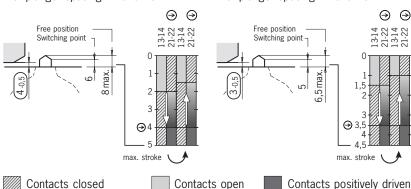
Used in multiple limit switches with 12 and 16 mm plunger spacing.

Pin assignment and switching function



Travel diagram for series RGBF.../GSBF.../GLBF... with plunger spacing 12 and 16 mm

Travel diagram for series SN... with plunger spacing 12 and 16 mm



Switching element ES 508

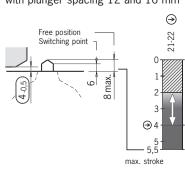
(safety switching element)

Slow-action contact element ²⁾ with one positively driven NC contact. Double gap, silver contact, electro-gold plated. Screw terminal with self-lifting clamp washers. Used in multiple limit switches with 12 and 16 mm plunger spacing.

Pin assignment and switching function



Travel diagram for series RGBF.../GSBF.../GLBF... with plunger spacing 12 and 16 mm



Travel diagram for series SN... with plunger spacing 12 and 16 mm

Free position Switching point 7 27.17 2 1.5 2 1.5 2 3.5 4 4 5 5 max, stroke

Contacts closed

Contacts open

Contacts positively driven

Electrical life

The electrical life of the switching elements is dependent on the electrical load, the switching frequency and the approach speed.



EUCHNER switching elements marked with this symbol meet the IEC 60947-5-1 requirements for multiple limit switches with positively driven NC contacts.

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

- 1) A snap-action contact element has a contact element which opens or closes regardless of its actuation speed.
- 2) A slow-action contact element has a contact element which opens and closes depending on its actuation speed.



Customized versions

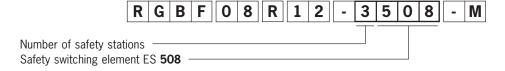
Mixed contact assembly (only in multiple limit switches with 12 and 16 mm plunger spacing)

For specific functions on machines and systems, e.g. end of travel limit switching, EMERGENCY STOP or similar, it is necessary that one or more stations on multiple limit switches are equipped with safety switching elements. See the ordering example below for information on the specification of such multiple limit switches.

The following requirements are to be observed:

- ▶ On **upright** multiple limit switches (e.g. RGBF...) it is necessary to start with the safety station/s on the flange side.
- On horizontal multiple limit switches (e.g. RGBF...) it is necessary to start with the safety station/s on the left side (view on the plunger side).
- ▶ If several safety stations are to be fitted, these must be fitted directly one after the other.
- ▶ The remaining stations are equipped with standard switching elements ES 502 E.

Ordering example: Multiple limit switch series RGBF, 8 roller plunger, plunger spacing 12 mm, stations 1 to 3 with safety switching elements ES 508, remaining stations with standard switching elements ES 502 E



If a multiple limit switch of mixed assembly cannot be specified with this ordering code, we would ask you to state your order in plain English.

Multiple limit switches with 12 mm plunger spacing can be assembled on request with a mixture of mechanical and inductive switching elements.

Approach speed and performance with roller plungers

Using high quality ball bearings and technology matched to the application, approach speeds up to 120 m/min and very high performance can be realized at the same time.

Low temperature

The selection of specially tested materials permits operation at ambient temperatures down to -30 °C.

Interchangeable plunger guide Exterior diaphragm

Resinous lubricating coolants and the processing of abrasive materials can result in failure of the plunger function in particularly difficult conditions. Proven series, shown on pages 20 to 23, minimizes downtimes and reduces repair costs.



Additional Products

Inductive multiple limit switches with long mechanical life

EUCHNER offers inductive multiple limit switches as an alternative to precision multiple limit switches. There are five different designs available for various areas of application with 8, 12 or 16 mm proximity switch spacing respectively. The dimensions of these versions are such that they can be interchanged with precision multiple limit switches.

The crucial advantages

- Very long mechanical life
- High switching frequency
- Contact-less, non-reactive switching
- Safe switching under extreme conditions
- Resistant to strong vibrations, heavy dirt and aggressive fluids



Trip rails / trip dogs

U-trip rails

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

U-trip dogs

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

G-trip rails

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

G-trip dogs

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

