

Selection table for safety switches NM with safety function

Actuating element		
WO	Domed plunger	Approach direction vertical
RB	Roller plunger	Approach direction horizontal
KB	Roller arm	Approach direction horizontal
HB	Lever arm	Approach direction horizontal
AV	Hinged actuator	Solid shaft length 75 mm
AL	Hinged actuator	Solid shaft length 110 mm
AG	Hinged actuator	Hollow shaft internal diameter 10.2 mm
AK	Hinged actuator	Hollow shaft internal diameter 8.2 mm

Connection

M	Thread M16x1.5 for cable glands
SM4	Plug connector M12 4-pin

Housing

Short

Long

Switching element

One contact	1 NC ⊖
Two contacts	1 NC ⊖ + 1 NO,
	2 NC ⊖
Three contacts	2 NC ⊖ + 1 NO,
	3 NC ⊖

Actuating element								Connection		Housing		Switching element			Page
WO	RB	KB	HB	AV	AL	AG	AK	M	SM4	Short	Long	One contact	Two contacts	Three contacts	
•								•		•		•	•		14
•								•			•		•	•	14
	•							•		•		•	•		15
	•							•			•		•	•	15
		•						•		•		•	•		16
		•						•			•		•	•	16
			•					•		•		•	•		17
			•					•			•		•	•	17
				•				•		•		•	•		18
				•				•			•		•	•	18
					•			•		•		•	•		18
					•			•	•		•		•	•	18
						•		•		•		•	•		19
						•		•			•		•	•	19
						•		•	•		•		•		19
							•	•		•		•	•		20
							•	•			•		•	•	20

Safety switch NM..WO with domed plunger



Approach direction



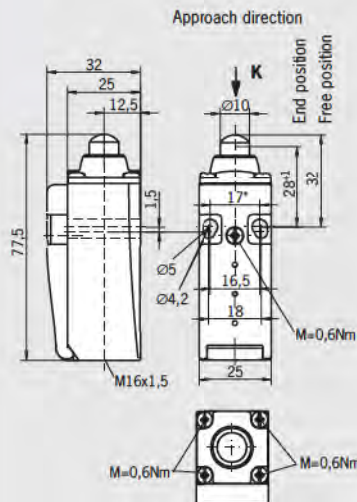
Vertical

Switching elements

- **ES01** Slow-action switching element
1 NC $\ominus$
- **ES11** Slow-action switching element
1 NC $\ominus$ + 1 NO
- **ES02** Slow-action switching element
2 NC $\ominus$
- **ES12** Slow-action switching element
2 NC $\ominus$ + 1 NO
- **ES03** Slow-action switching element
3 NC $\ominus$

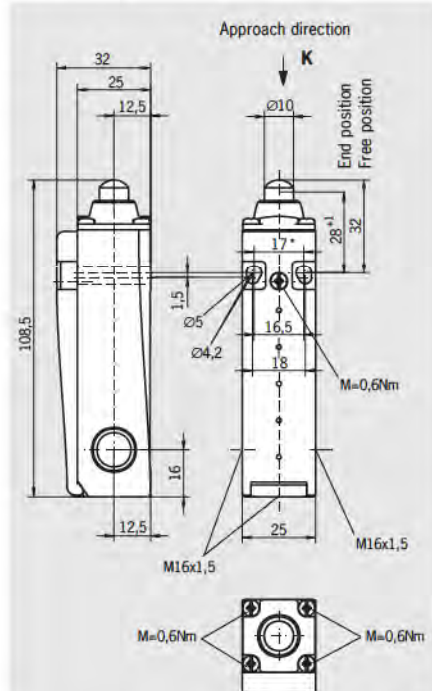
Cable entry M16 x 1.5 Short housing

Dimension drawing



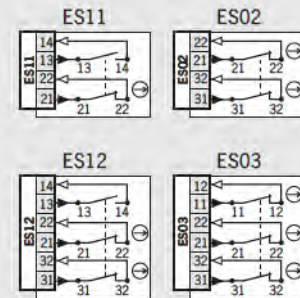
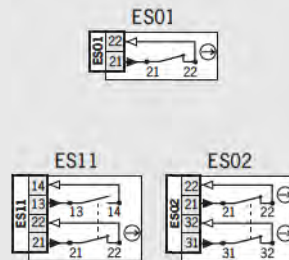
For cable glands see page 89

Cable entry M16 x 1.5 Long housing



For cable glands see page 89

Wiring diagrams Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	WO Domed plunger	Cable entry 1 x M16 x 1.5	Short 	01 1 NC $\ominus$	084 495 NM01WOK-M
				11 1 NC $\ominus$ + 1 NO	095 375 NM11WOK-MC2069
				02 2 NC $\ominus$	095 374 NM02WOK-MC2069
				11 1 NC $\ominus$ + 1 NO	084 496 NM11WOK-M
		Cable entry 3 x M16 x 1.5	Long 	02 2 NC $\ominus$	084 497 NM02WOK-M
				12 2 NC $\ominus$ + 1 NO	084 498 NM12WOK-M
				03 3 NC $\ominus$	084 499 NM03WOK-M

Safety switch NM..RB with roller plunger



Approach direction



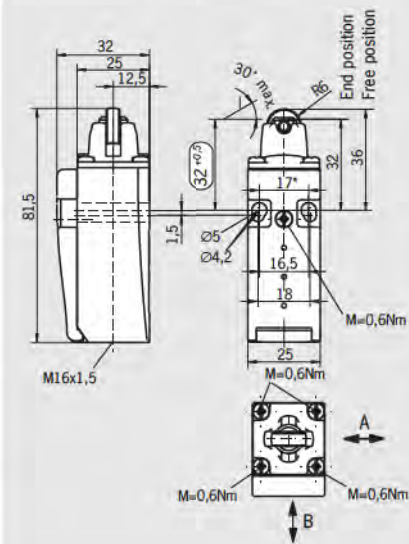
Horizontal
Can be adjusted in 90° steps.

Switching elements

- **ES01** Slow-action switching element
1 NC ⊖
- **ES11** Slow-action switching element
1 NC ⊖ + 1 NO
- **ES02** Slow-action switching element
2 NC ⊖
- **ES12** Slow-action switching element
2 NC ⊖ + 1 NO
- **ES03** Slow-action switching element
3 NC ⊖

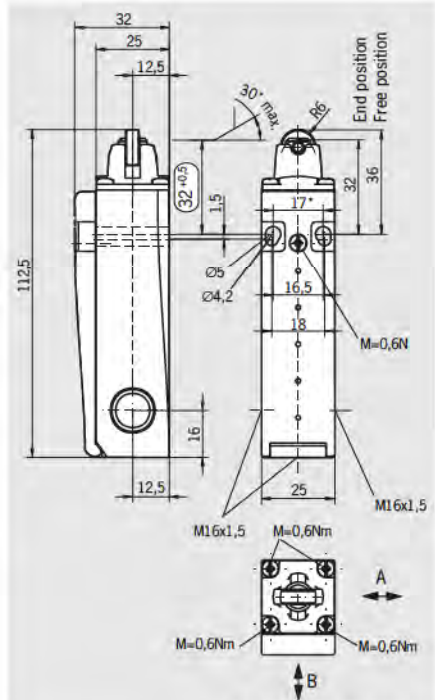
Cable entry M16 x 1.5
Short housing

Dimension drawing



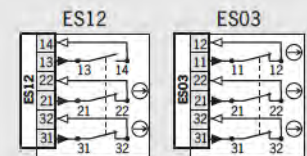
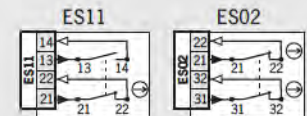
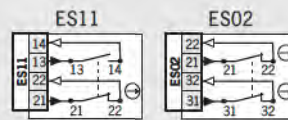
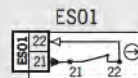
For cable glands see page 89

Cable entry M16 x 1.5
Long housing



For cable glands see page 89

Wiring diagrams Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	RB Roller plunger	Cable entry 1 x M16 x 1.5	Short	01 1 NC ⊖	084 515 NM01RBAM
				11 1 NC ⊖ + 1 NO	095 373 NM11RBAMC2069
				02 2 NC ⊖	095 372 NM02RBAMC2069
		Cable entry 3 x M16 x 1.5	Long	11 1 NC ⊖ + 1 NO	084 516 NM11RBAM
				02 2 NC ⊖	084 517 NM02RBAM
				12 2 NC ⊖ + 1 NO	084 518 NM12RBAM
				03 3 NC ⊖	084 519 NM03RBAM

Safety switch NM..KB with roller arm



Approach direction



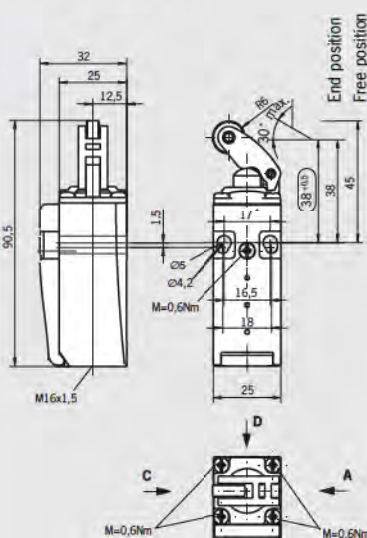
Horizontal
Can be adjusted in 90° steps.

Switching elements

- **ES01** Slow-action switching element
1 NC $\ominus$
- **ES11** Slow-action switching element
1 NC $\ominus$ + 1 NO
- **ES02** Slow-action switching element
2 NC $\ominus$
- **ES12** Slow-action switching element
2 NC $\ominus$ + 1 NO
- **ES03** Slow-action switching element
3 NC $\ominus$

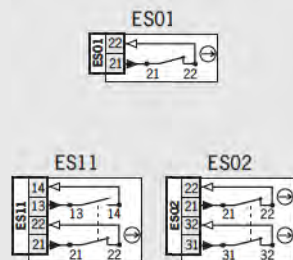
Cable entry M16 x 1.5
Short housing

Dimension drawing

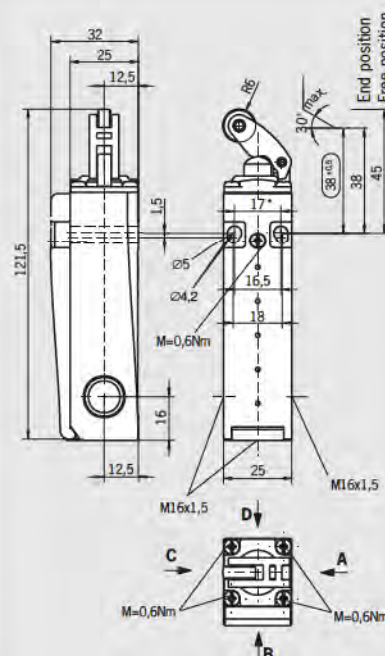


For cable glands see page 89

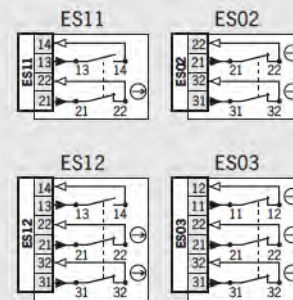
Wiring diagrams Switch not actuated



Cable entry M16 x 1.5
Long housing



For cable glands see page 89



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	KB Roller arm	Cable entry 1 x M16 x 1.5	Short 	01 1 NC ⊖	084 522 NM01KBA-M
				11 1 NC ⊖ + 1 NO	095 371 NM11KBA-MC2069
				02 2 NC ⊖	095 370 NM02KBA-MC2069
		Cable entry 3 x M16 x 1.5	Long 	11 1 NC ⊖ + 1 NO	084 523 NM11KBA-M
				02 2 NC ⊖	084 524 NM02KBA-M
				12 2 NC ⊖ + 1 NO	084 525 NM12KBA-M
				03 3 NC ⊖	084 526 NM03KBA-M

Safety switch NM..HB with lever arm



Approach direction

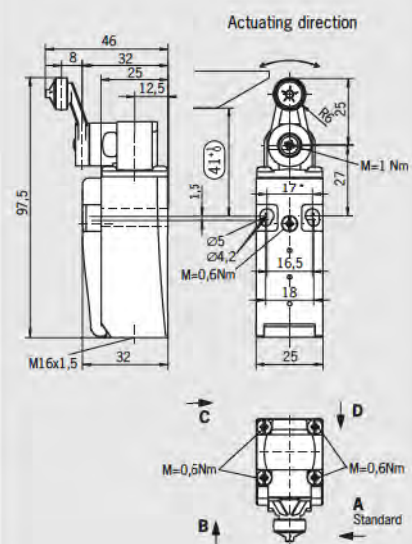
Horizontal
Can be adjusted in 90° steps.

Switching elements

- **ES01** Slow-action switching element
1 NC $\ominus$
- **ES11** Slow-action switching element
1 NC $\ominus$ + 1 NO
- **ES02** Slow-action switching element
2 NC $\ominus$
- **ES12** Slow-action switching element
2 NC $\ominus$ + 1 NO
- **ES03** Slow-action switching element
3 NC $\ominus$

Cable entry M16 x 1.5
Short housing

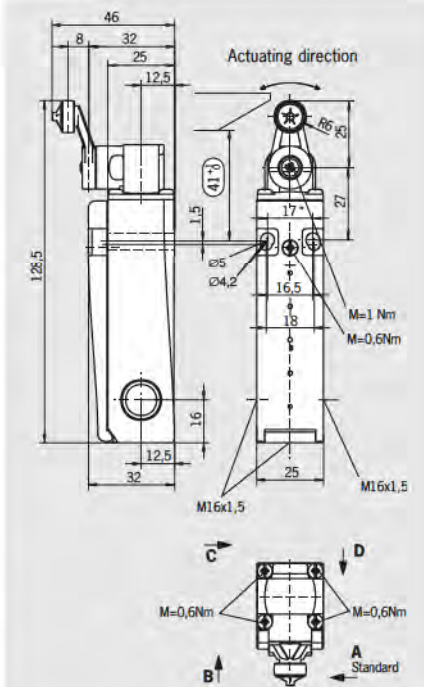
Dimension drawing



For cable glands see page 89

Cable entry M16 x 1.5
Long housing

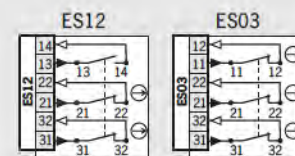
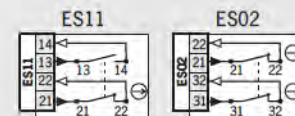
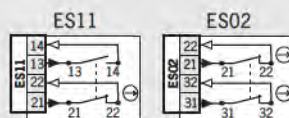
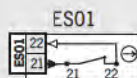
46



For cable glands see page 89

Wiring diagrams

Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	HB Lever arm	Cable entry 1 x M16 x 1.5	Short 	01 1 NC ⊖	084 527 NM01HBA-M
				11 1 NC ⊖ + 1 NO	095 369 NM11HBA-MC2069
				02 2 NC ⊖	095 368 NM02HBA-MC2069
		Cable entry 3 x M16 x 1.5	Long 	11 1 NC ⊖ + 1 NO	084 528 NM11HBA-M
				02 2 NC ⊖	084 529 NM02HBA-M
				12 2 NC ⊖ + 1 NO	084 530 NM12HBA-M
				03 3 NC ⊖	084 531 NM03HBA-M

Safety switch NM..AV / NM..AL



- ▶ Hinged actuator as solid shaft
- ▶ Shaft length 75 mm or 110 mm

Cable entry M16 x 1.5
Short housing

Cable entry M16 x 1.5
Long housing

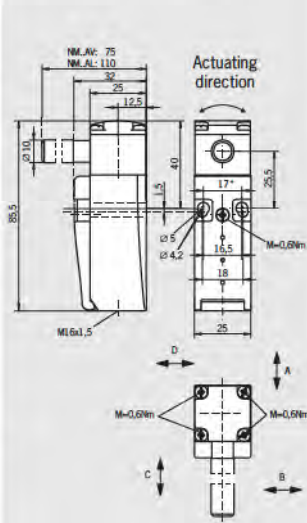
Plug connector M12
4-pin, long housing



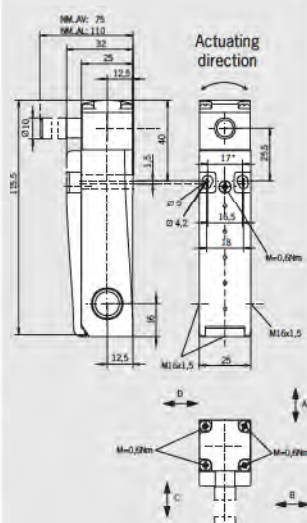
Switching elements

- ES01 Slow-action switching element 1 NC ⊖
- ES11 Slow-action switching element 1 NC ⊖ + 1 NO
- ES02 Slow-action switching element 2 NC ⊖
- ES12 Slow-action switching element 2 NC ⊖ + 1 NO
- ES03 Slow-action switching element 3 NC ⊖

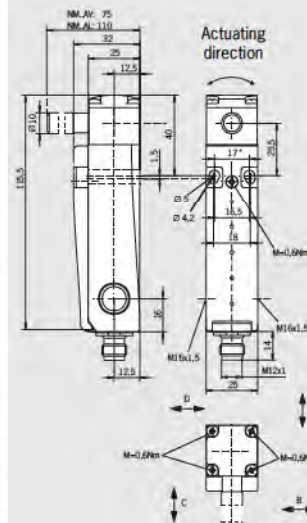
Dimension drawing



For cable glands see page 89

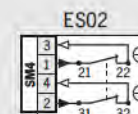
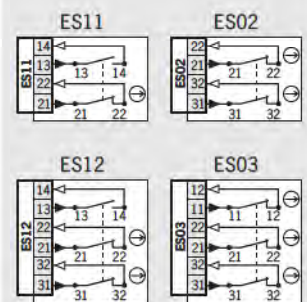
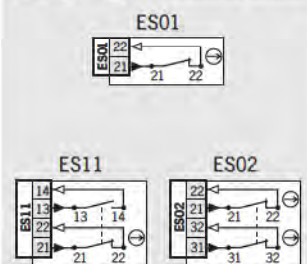


For cable glands see page 89



For plug connectors see page 85

Wiring diagrams Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	AV Hinged actuator solid shaft length 75 mm	Cable entry 1 x M16 x 1.5	Short	01 1 NC ⊖	084 545 NM01AV-M
				11 1 NC ⊖ + 1 NO	095 367 NM11AV-MC2069
				02 2 NC ⊖	095 366 NM02AV-MC2069
		Cable entry 3 x M16 x 1.5	Long	11 1 NC ⊖ + 1 NO	084 546 NM11AV-M
				02 2 NC ⊖	084 547 NM02AV-M
				12 2 NC ⊖ + 1 NO	084 548 NM12AV-M
	AL Hinged actuator solid shaft length 110 mm	Cable entry 1 x M16 x 1.5	Short	03 3 NC ⊖	084 549 NM03AV-M
				01 1 NC ⊖	079 117 NM01AL-M
				11 1 NC ⊖ + 1 NO	095 365 NM11AL-MC2069
		Cable entry 3 x M16 x 1.5	Long	02 2 NC ⊖	095 364 NM02AL-MC2069
				11 1 NC ⊖ + 1 NO	079 118 NM11AL-M
				02 2 NC ⊖	079 119 NM02AL-M
	Plug connector M12		Long	12 2 NC ⊖ + 1 NO	079 120 NM12AL-M
				03 3 NC ⊖	079 121 NM03AL-M
				02 2 NC ⊖	093 246 NM02AL-SM4

Safety switch NM..AG

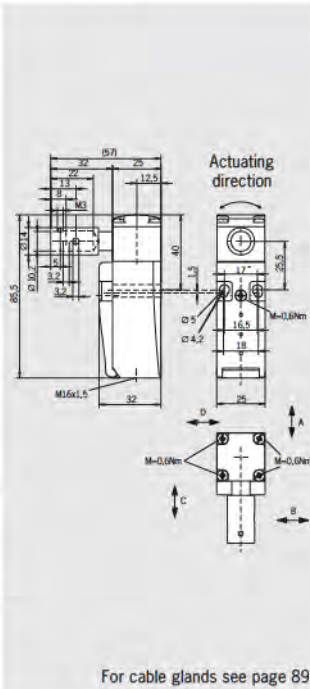
- Hinged actuator as hollow shaft
- Internal diameter 10.2 mm



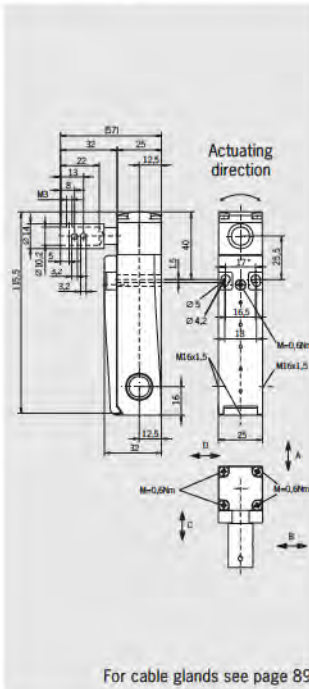
Switching elements

- ES01** Slow-action switching element 1 NC ⊖
- ES11** Slow-action switching element 1 NC ⊖ + 1 NO
- ES02** Slow-action switching element 2 NC ⊖
- ES12** Slow-action switching element 2 NC ⊖ + 1 NO
- ES03** Slow-action switching element 3 NC ⊖

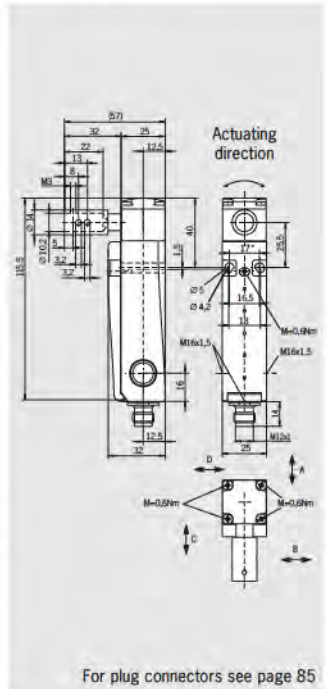
Cable entry M16 x 1.5
Short housing



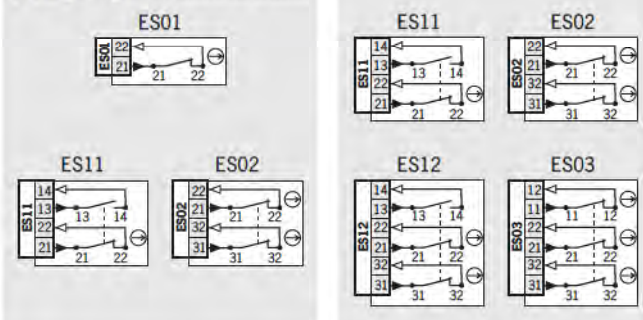
Cable entry M16 x 1.5
Long housing



Plug connector M12
4-pin, long housing



Wiring diagrams Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	AG Hinged actuator hollow shaft Ø 10.2 mm	Cable entry 1 x M16 x 1.5	Short	01 1 NC ⊖	084 553 NM01AG-M
				11 1 NC ⊖ + 1 NO	095 361 NM11AG-MC2069
				02 2 NC ⊖	095 360 NM02AG-MC2069
		Cable entry 3 x M16 x 1.5	Long	11 1 NC ⊖ + 1 NO	084 554 NM11AG-M
				02 2 NC ⊖	084 555 NM02AG-M
				12 2 NC ⊖ + 1 NO	084 556 NM12AG-M
				03 3 NC ⊖	084 557 NM03AG-M
				02 2 NC ⊖	084 565 NM02AG-SM4
		Plug connector M12	Long		

Safety switch NM..AK

- ▶ Hinged actuator as hollow shaft
- ▶ Internal diameter 8.2 mm

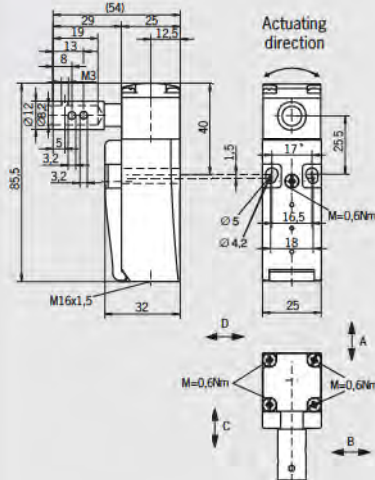


Switching elements

- **ES01** Slow-action switching element
1 NC $\ominus$
- **ES11** Slow-action switching element
1 NC $\ominus$ + 1 NO
- **ES02** Slow-action switching element
2 NC $\ominus$
- **ES12** Slow-action switching element
2 NC $\ominus$ + 1 NO
- **ES03** Slow-action switching element
3 NC $\ominus$

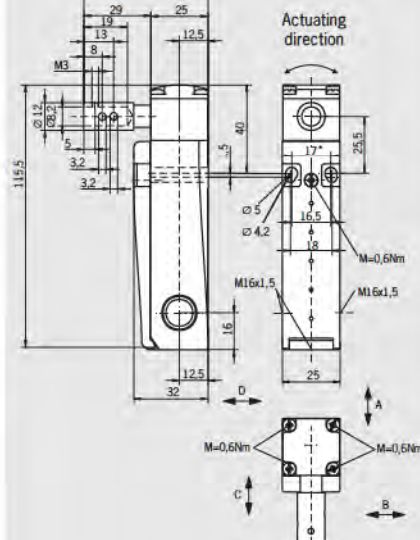
Cable entry M16 x 1.5 Short housing

Dimension drawing



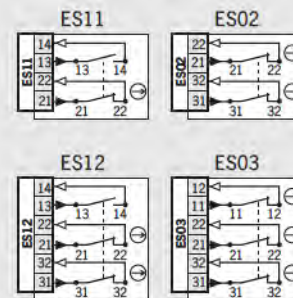
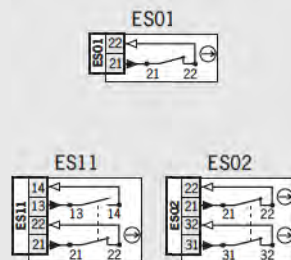
For cable glands see page 89

Cable entry M16 x 1.5 Long housing



For cable glands see page 89

Wiring diagrams Switch not actuated



Ordering table

Series	Actuator	Connection	Housing	Switching element	Order No. / Item
NM	AK Hinged actuator hollow shaft Ø 8.2 mm	Cable entry 1 x M16 x 1.5	Short	01 1 NC $\ominus$	084 559 NM01AK-M
				11 1 NC $\ominus$ + 1 NO	095 363 NM11AK-MC2069
				02 2 NC $\ominus$	095 362 NM02AK-MC2069
				11 1 NC $\ominus$ + 1 NO	084 560 NM11AK-M
		Cable entry 3 x M16 x 1.5	Long	02 2 NC $\ominus$	084 561 NM02AK-M
				12 2 NC $\ominus$ + 1 NO	084 562 NM12AK-M
				03 3 NC $\ominus$	084 563 NM03AK-M

Safety switch NM...



The technical data on switches and switching elements apply to all connections. Further technical data are given for the connection selected.

Switch



Parameter	Value			Unit
Housing material	Reinforced thermoplastic			
Mechanical life	WO/RB	KB/HB	AV/AL/AG/AK	
	30 x 10 ⁶	20 x 10 ⁶	> 4 x 10 ⁶	Operating cycles
Weight	approx. 0.1			kg
Actuator material	Plastic; hinged actuators steel (stainless)			
Approach speed, max.	60			m/min
Actuating force	15			N

Switching element



Parameter	Value				Unit
Switching principle	Slow-action switching element				
Switching elements with 1 switching element	ES01 1 NC ⊖				
Switching elements with 2 switching elements	ES11 1 NC ⊖ + 1 NO	ES02 2 NC ⊖	ES12 2 NC ⊖ + 1 NO	ES03 3 NC ⊖	
Switching current, min., at DC 24 V	1				mA
Switching voltage, min.	12				V
Contact material	Silver alloy, gold flashed				

Connection, cable entry M16 x 1.5



Parameter	Value		Unit
Ambient temperature	- 20 ... + 80		°C
Connection	Screw terminal		
Version	M16 x 1.5		
Conductor cross-section	0.34 ... 1.5		mm ²
Degree of protection according to IEC 60529	IP 67		
Rated insulation voltage U _i	250		V AC/DC
Rated impulse withstand voltage U _{imp}	2.5		kV
Conventional thermal current I _{th}	4		A
Short circuit protection according to IEC 60269-1 (control circuit fuse)	4		A gG
Utilization category to IEC 60947-5-1	AC-15	I _e 4 A U _e 230 V	
	DC-13	I _e 4 A U _e 24 V	

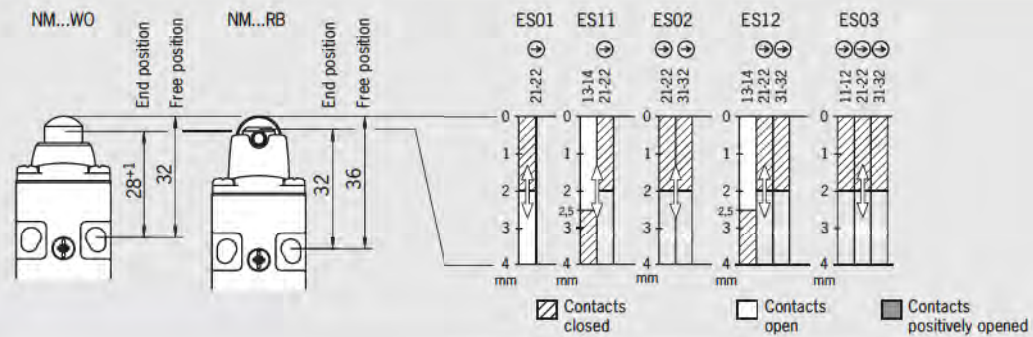
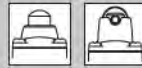
Connection, plug connector SM 4 (M12)



Parameter	Value		Unit
Ambient temperature	- 20 ... + 60		°C
Connection	Plug connector		
Version	M12 (4-pin)		
Degree of protection according to IEC 60529	IP 67 ¹⁾		
Rated insulation voltage U _i	250		V AC/DC
Rated impulse withstand voltage U _{imp}	2.3		kV
Conventional thermal current I _{th}	1.5		A
Short circuit protection according to IEC 60269-1 (control circuit fuse)	4		A gG
Utilization category to IEC 60947-5-1	AC-15	I _e 4 A U _e 230 V	
	DC-13	I _e 4 A U _e 24 V	

1) Screwed tight with the related plug connector (see page 85)

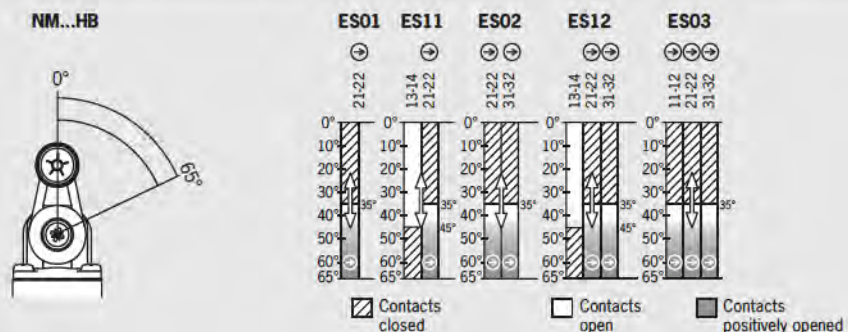
Travel diagram NM.WO/NM.RB



Travel diagram NM.KB



Travel diagram NM.HB



Travel diagram NM.AV/NM.AL/NM.AG/NM.AK

