



01618E00

STAHL

Position switches are used to monitor the position of moving parts of machines and systems.

They can be used in safety circuits as the device satisfies the standard EN 60 947-5-1 (VDE 0660 Part 200) and the normally closed contacts are positive opening contacts.

The switching element and the actuating element of category 1 safety switches form a constructional and functional unit.









As a result of the galvanic isolation of the moving contacts, the position switch is suitable for switching various potentials.

Position Switches Series 8070

- Explosion protection according to
 - CENELEC
 - IEC
- For use in
 - Zone 1 and Zone 2
 - Zone 21 and Zone 22
- Enclosures of type of protection "Increased safety"
- Dimensions and characteristic values according to EN 50041
- Replaceable contact in flameproof enclosure
- Positive opening contacts
- Category 1 safety position switch with:
 - Extended plunger
 - Roller plunger
 - Roller lever plunger
 - Angled roller lever
 - Swivelling lever
 - Adjustable roller lever
 - Actuating rod
 - Spring-rod actuator
- All inserts may be displaced by 4 x 90°
- Contacts with
 - Snap-action contact
 - Slow-action contact
 - Make before break slow-action contact
- Possible as version with unconnected cable end

Zones 1 & 2, 21 & 22



Selection Table				
Version	Actuator		Order number	Weight kg
 03788E00	Extended plunger	Plunger of stainless steel	8070/1-.-S	0.155
 03789E00	Roller plunger	Roller of moulded material	8070/1-.-RS	0.154
 04550E00	Roller lever, form E (can be modified into an angled roller lever)	Roller of moulded material	8070/1-.-AR	0.155
 03790E00	Swivelling roller lever, form A	Roller of moulded material	8070/1-.-HR311	0.221
	Swivelling roller lever, form A (swivelling lever of stainless steel)	Roller of moulded material	8070/1-.-HR311NR	0.221
 04551E00	Adjustable roller lever	Roller of moulded material; Roller rod of stainless steel	8070/1-.-HV	0.269
 09380E00	Actuating rod	Rod of moulded material No positive opening, not suitable for safety circuits!	8070/1-.-HH-K	0.237
 04552E00	Spring-rod actuator	Spring of stainless steel Only for use with snap-action contact! No positive opening, not suitable for safety circuits!	8070/1-2-F2	0.175
 04553E00	Safety switch	Separate actuator of moulded material	8070/1-1-ZB	0.208
			8070/1-3-ZB	0.208
Order Number Supplement				
Switching function	1 NC + 1 NO	Slow-action contact	8070/1-1-...	
	2 NC	Slow-action contact	8070/1-3-...	
	2 NO	Slow-action contact	8070/1-4-...	
	1 NC + 1 NO	Slow-action contact, make before break	8070/1-5-...	
	1 NC + 1 NO	Snap-action contact, with spring	8070/1-2-...	
		Possible as version with unconnected cable end	8070/1-.-.-.-K	
Note: The actuators enclosed are not mounted				

Technical Data

Explosion protection					
Gas explosion protection	⊕ II 2 G Ex de IIC T6				
Dust explosion protection	⊕ II 2 D Ex tD A21 IP65 T80 °C				
Certificates					
Gas explosion protection	PTB 01 ATEX 1053				
Dust explosion protection	PTB 01 ATEX 1053				
Other certificates	IECEX, Korea (KGS), Russia (CTB), Ukraine (IECVU), Belarus (Promatomnadzor)				
Rated operational voltage U_e	8070/1-1		8070/1-3		
	8070/1-2		8070/1-4		
	8070/1-5				
	Alternating current for equal potential:		max. 500 V	max. 400 V	
Alternating current for unequal potential:		max. 250 V	max. 250 V		
Direct current:		250 V	250 V		
Rated operational current I_e	max. 10 A: $-20\text{ °C} \leq T_a \leq +50\text{ °C}$				
	max. 6 A: $-20\text{ °C} \leq T_a \leq +70\text{ °C}$				
Switching capacity	AC 12		AC 15		DC 12
	8070/1-1	8070/1-3	8070/1-1	8070/1-3	8070/1-
	8070/1-2	8070/1-4	8070/1-2	8070/1-4	
	8070/1-5		8070/1-5		
	max. 250 V max. 500 V **)	max. 250 V max. 400 V **)	max. 250 V max. 500 V **)	max. 250 V max. 400 V **)	max. 125 V max. 10 A max. 400 W
	max. 10 A	max. 10 A	max. 10 A	max. 10 A	
	max. 5000 VA	max. 4000 VA	max. 1000 VA	max. 1000 VA	
	**) Only for equal potential				
Rated insulation voltage	550 V				
Rated impulse withstand voltage	6 kV				
Short circuit protection	10 A gL / gG				

Technical Data

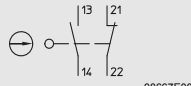
Contact

Version

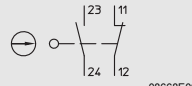
Slow-action contact

Snap-action contact

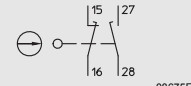
Slow-action contact, make before break



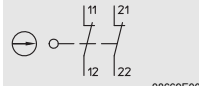
8070/1-1 08667E00



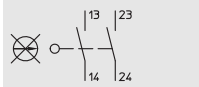
8070/1-2 08668E00



8070/1-5 08675E00



8070/1-3 08669E00



8070/1-4 08670E00

Attention:
The positive opening function ⊖ depends on the actuator used

Contact arrangement

2-pole, galvanically isolated, with double break action

Contact opening

≥ 1.5 mm (isolating distance ≥ 3 mm)

Contacts

Silver-nickel

Service Life

mechanical

max. 10⁶ operations

electrical

max. 10⁶ operations

Enclosure contact

Polyamide, glass fibre reinforced

Operating temperature range

- 20 °C ... + 50 °C (10 A)
- 20 °C ... + 70 °C (6 A)

Maximum switching frequency

max. 6000 operations/h

Ingress protection

IP65

Enclosure material

Polyamide, glass fibre reinforced, black

Cable glands

8161/5-M20-13

On the enclosure bottom: 1 x M 20 x 1.5

On the enclosure side: 1 x M 20 x 1.5

Connection

With cable glands 8161: For plastic sheathed cable 4 x 2.5 mm² (diameter 6 ... 13 mm); recommended 4 x 1.5 mm²

With mounted connecting cable: Plastic sheathed cable HK-SO-X05VV-F-OZ 4 x 1.5 mm, cable length 6 m

Terminals

1 x 2.5 mm² or 2 x 1 mm², single-wire / finely-stranded

Mechanical shock resistance

Snap-action contact: 2 g

Slow-action contact: 20 g

Tightening torque

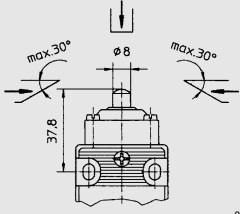
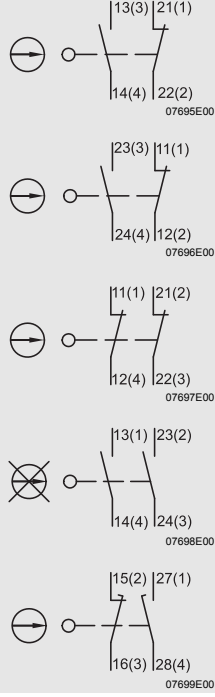
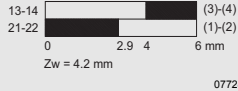
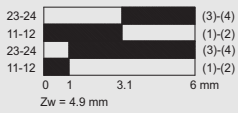
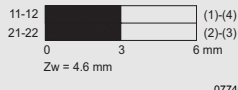
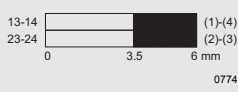
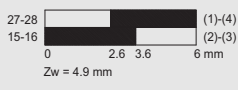
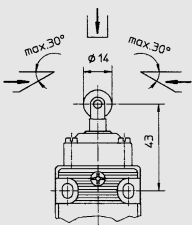
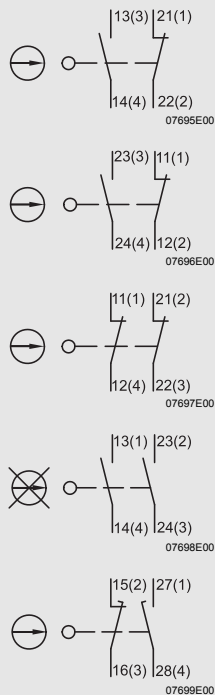
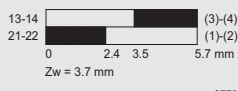
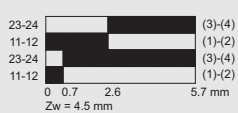
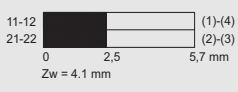

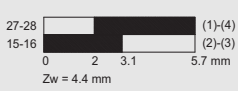
Screw terminals: max. 0.4 Nm

Cover screws: max. 0.7 Nm

Connection thread: 2.3 Nm (M 20 x 1.5)

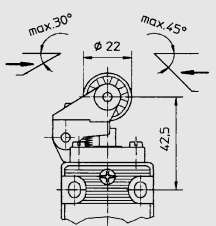
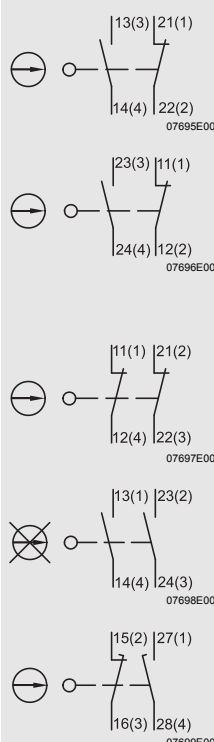
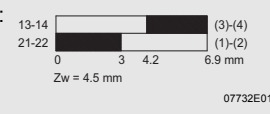
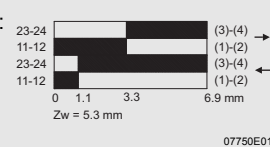
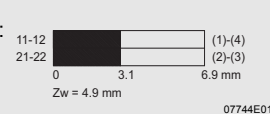

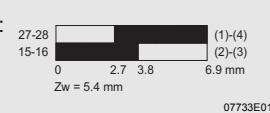
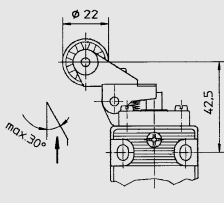
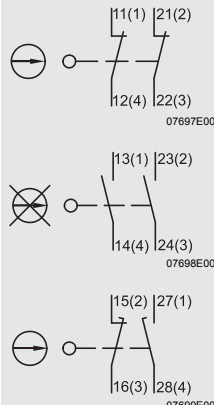
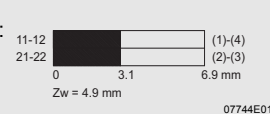

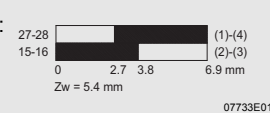
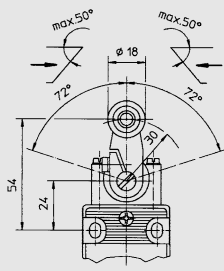
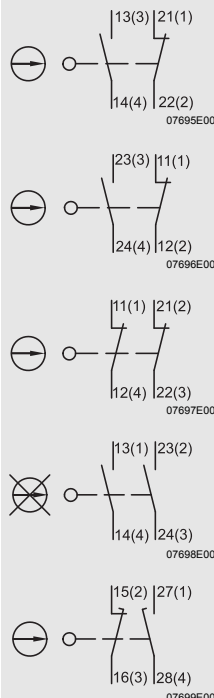
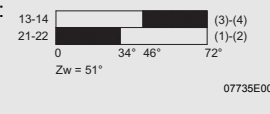
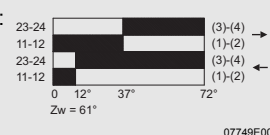
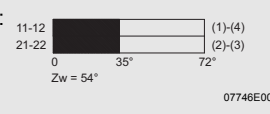
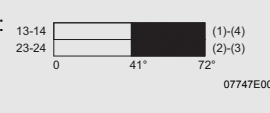
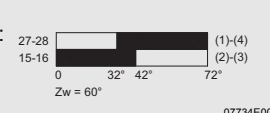
Pressure screw: 1.5 Nm (M 20 x 1.5)

Operation, Operating Speed, Contact travel or Angle

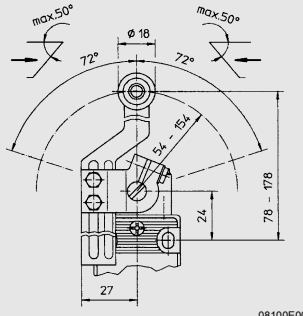
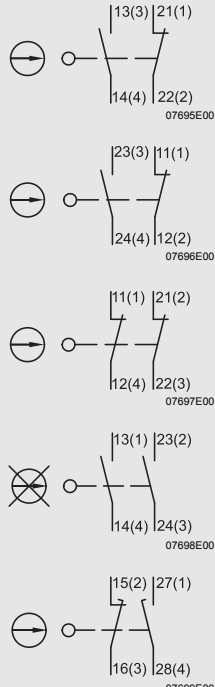
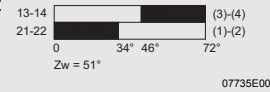

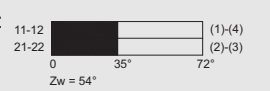
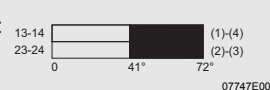
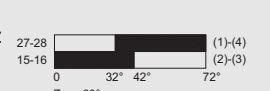
Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	<p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p>	<p>⊕ = Positive opening</p>	<p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p>	
Extended plunger 8070/1- . -S	 <p>08096E00</p> <p>Lateral operation: V = 0.5 m/s</p> <p>Operation in stroke direction: V = 0.5 m/s</p>		<p>In stroke direction</p> <p>8070/1-1:</p>  <p>Zw = 4.2 mm</p> <p>07728E01</p> <p>8070/1-2:</p>  <p>Zw = 4.9 mm</p> <p>07751E01</p> <p>8070/1-3:</p>  <p>Zw = 4.6 mm</p> <p>07740E01</p> <p>8070/1-4:</p>  <p>Zw = 4.6 mm</p> <p>07741E01</p> <p>8070/1-5:</p>  <p>Zw = 4.9 mm</p> <p>07729E01</p>	15 N
Roller plunger 8070/1- . -RS	 <p>08097E00</p> <p>Lateral operation: V = 0.5 m/s</p> <p>Operation in stroke direction: V = 0.5 m/s</p>		<p>In stroke direction</p> <p>8070/1-1:</p>  <p>Zw = 3.7 mm</p> <p>07731E01</p> <p>8070/1-2:</p>  <p>Zw = 4.5 mm</p> <p>07752E01</p> <p>8070/1-3:</p>  <p>Zw = 4.1 mm</p> <p>07742E01</p> <p>8070/1-4:</p>  <p>Zw = 4.1 mm</p> <p>07743E01</p> <p>8070/1-5:</p>  <p>Zw = 4.4 mm</p> <p>07730E01</p>	15 N



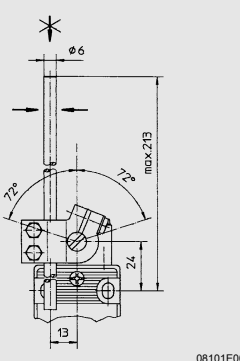
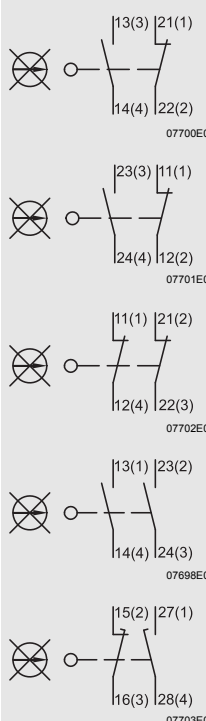
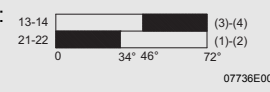
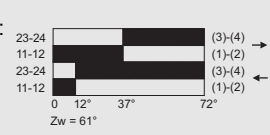
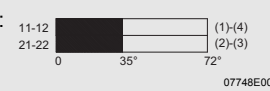
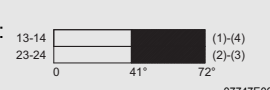
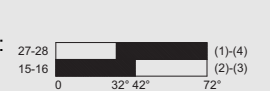
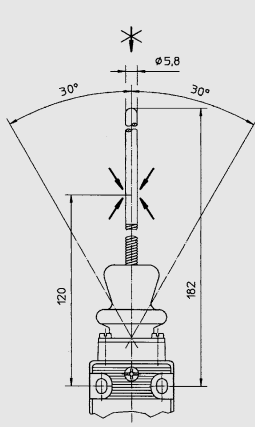
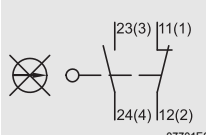

Operation, Operating Speed, Contact travel or Angle

Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end	⊖ = Positive opening	■ = Contact closed □ = Contact open Zw = Travel for positive opening	
Roller lever plunger, form E 8070/1-.-AR	 <p>V = 1,5 m/s</p>		<p>Movement of the roller in stroke direction of the plunger after plunger starts moving</p> <p>8070/1-1:</p>  <p>8070/1-2:</p>  <p>8070/1-3:</p>  <p>8070/1-4:</p>  <p>8070/1-5:</p> 	13 N
Angled roller lever, form E: modified version of 8070/1-.-AR	 <p>V = 1,5 m/s</p> <p>Angled roller lever made by rotating the roller lever plunger by 180°</p>		<p>8070/1-3:</p>  <p>8070/1-4:</p>  <p>8070/1-5:</p> 	
Swivelling roller lever form A 8070/1-.- HR311..	 <p>V = 1.8 m/s</p>		<p>8070/1-1:</p>  <p>8070/1-2:</p>  <p>8070/1-3:</p>  <p>8070/1-4:</p>  <p>8070/1-5:</p> 	HR311: 0.3 Nm HR311R: 0.1 Nm



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Type 8070/1	<p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p>	<p>⊖ = Positive opening</p> <p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p>		
Adjustable roller lever 8070/1- . -HV	 <p>08100E00</p> <p>V = 1.4 m/s</p> <p>Should the adjustable roller lever swing back from an angle exceeding 40°, the lever could cause a false signal.</p>		<p>8070/1-1:</p>  <p>8070/1-2:</p>  <p>8070/1-3:</p>  <p>8070/1-4:</p>  <p>8070/1-5:</p> 	0.3 Nm

Operation, Operating Speed, Contact travel or Angle

Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	<p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p>	<p>⊖ = Positive opening</p>	<p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p>	
Actuating rod 8070/1- -HH-K	 <p>08101E00</p> <p>V = 1.4 m/s</p> <p>No positive opening, not suitable for safety circuits</p>		<p>8070/1-1:  07736E00</p> <p>8070/1-2:  07749E00</p> <p>8070/1-3:  07748E00</p> <p>8070/1-4:  07747E00</p> <p>8070/1-5:  07737E00</p>	0.3 Nm
Spring-rod actuator 8070/1-2-F2	 <p>08721E00</p> <p>No positive opening, not suitable for safety circuits</p>		<p>Only for use with snap-action contact!</p> <p>8070/1-2:  07753E00</p>	--











Operation, Operating Speed, Contact travel or Angle

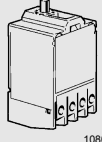
Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	<p>V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end</p>	<p>⊖ = Positive opening</p>	<p>■ = Contact closed □ = Contact open Zw = Travel for positive opening</p>	
Safety switch with separate actuator 8070/1- . -ZB			<p>8070/1-1:</p> <p>Zw = 17 mm</p> <p>07739E00</p> <p>8070/1-3:</p> <p>Zw = 19 mm</p> <p>07738E00</p>	--
	<p>Do not use the switch as a mechanical stop.</p>			08727E00
	<p>The actuators can be mounted in several ways, this substantially increases the range of application of the switches.</p>			



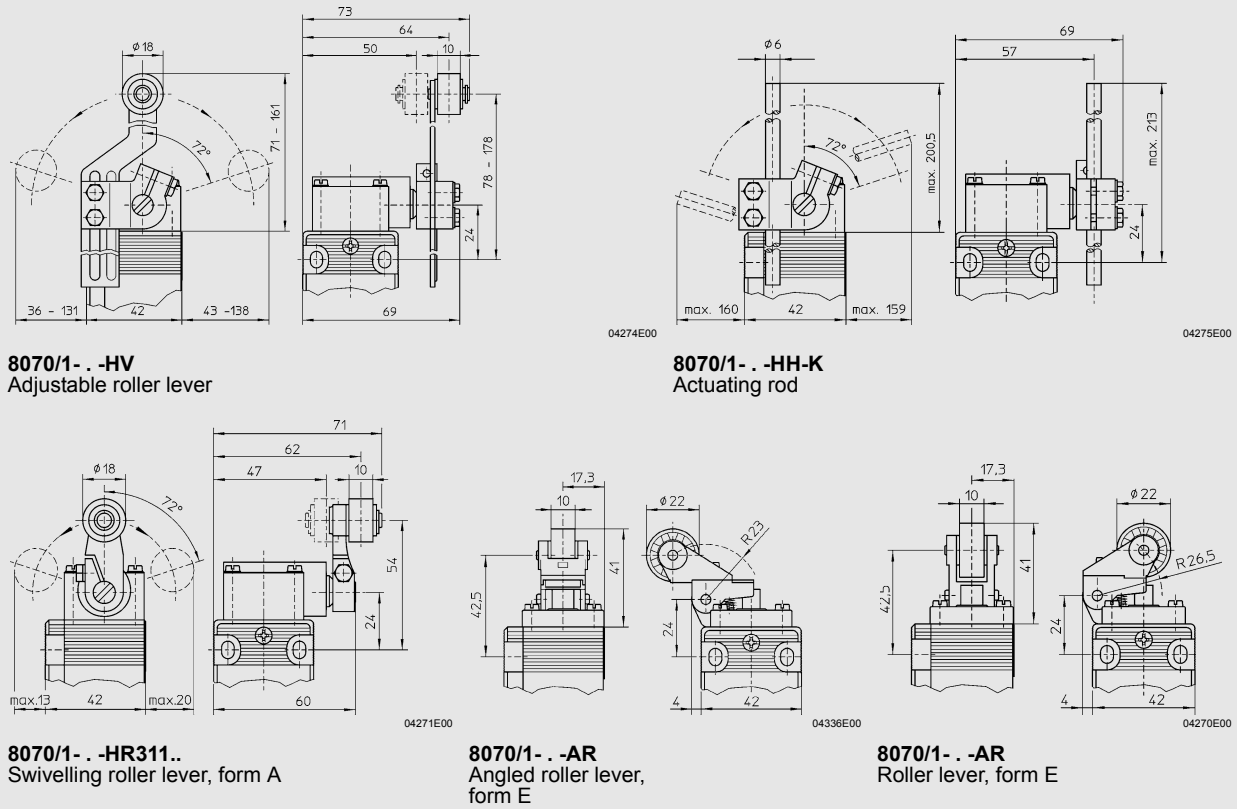


Accessories and Spare Parts					
Designation	Illustration		Order number	Weight kg	
Actuator	 05652E00	Extended plunger	8070/1-0-S	131805	0.044
	 05653E00	Roller plunger	8070/1-0-RS	131809	0.042
	 05653E00	Roller lever, form E (can be modified into an angled roller lever)	8070/1-0-AR	131812	0.046
	 05655E00	Swivelling roller lever, form A	8070/1-0-HR311	131815	0.099
		Swivelling roller lever, form A (swivelling lever of stainless steel)	8070/1-0-HR311NR	131841	0.099
	 05656E00	Adjustable roller lever	8070/1-0-HV	131818	0.148
	 05657E00	Actuating rod	8070/1-0-HH-K	131821	0.162
	 05658E00	Spring-rod actuator Only for use with snap-action contact!	8070/1-0-F2	131824	0.059
		Safety switch with separate actuator (safety operating head)	8070/1-0-ZB	131832	0.071
Safety switch with separate actuator (actuating element)		8070/1-0-ZB	131835	0.039	
Cable gland	 05864E00	8161/5-M 20-13	1 piece	138518	0.012

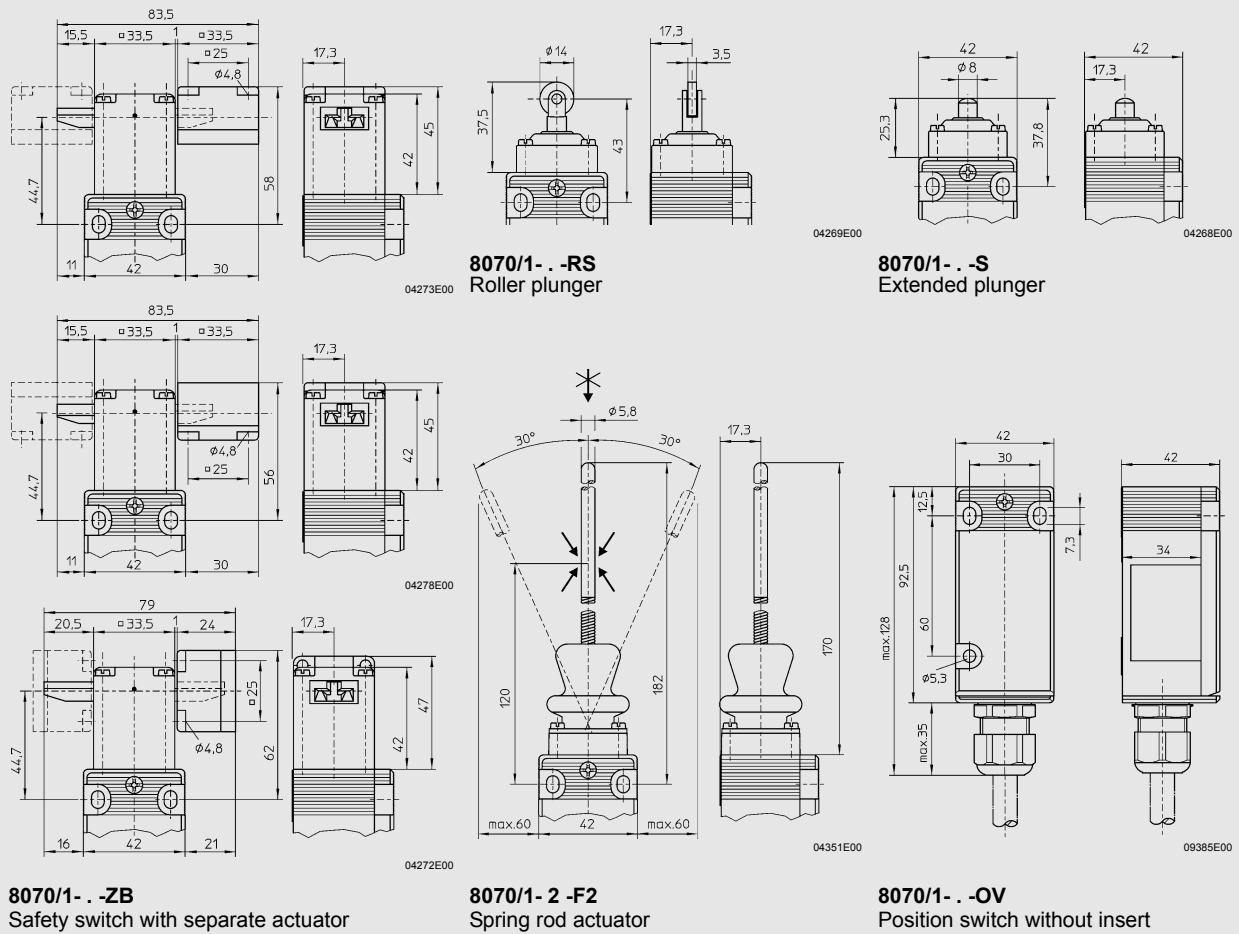
Accessories and Spare Parts

Designation	Illustration	Order number	Weight kg	
Contact		1 NC + 1 NO Slow-action contact 8080/1-1	132529	0.025
		2 NC Slow-action contact 8080/1-3	132532	0.025
		2 NO Slow-action contact 8080/1-4	132533	0.025
		1 NC + 1 NO Slow-action contact, make before break 8080/1-5	132534	0.025
		1 NC + 1 NO Snap-action contact, with spring 8080/1-2	132530	0.025

Dimensional Drawings (All Dimensions in mm) - Subject to Alterations



Dimensional Drawings (All Dimensions in mm) - Subject to Alterations



We reserve the right to make alterations to the technical data, weights, dimensions, designs and products available without notice. The illustrations cannot be considered binding.

