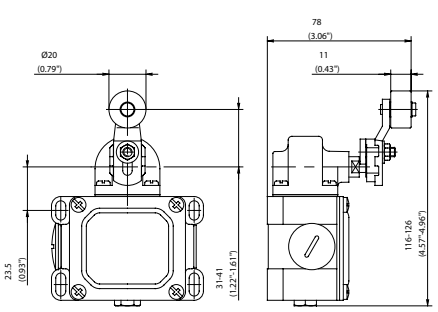
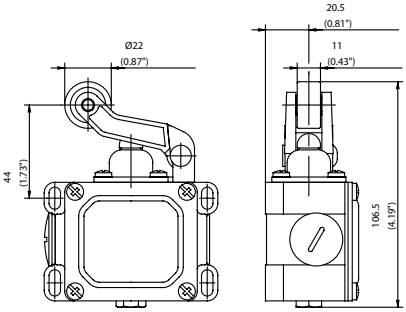
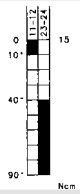
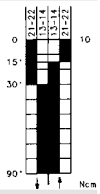
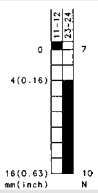
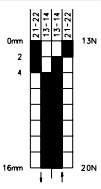
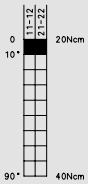
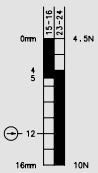
	AH	HW
		
Switching operation	**Slow-action** / **Snap-action**	**Slow-action** / **Snap-action**
1 NC / 1 NO contact	**6041135019** D-U1 AH  **6041185173** D-SU1 AH 	**6041121010** D-U1 HW  **6041171164** D-SU1 HW 
2 NC contacts	**6041835107** D-A2 AH 	
2 NO contacts		
1 NC / 1 NO contact Overlapping		**6041321142** D-UV1Z HW 
Approvals		

Replacement actuator: 3914350924

Special features / variants
(on request)

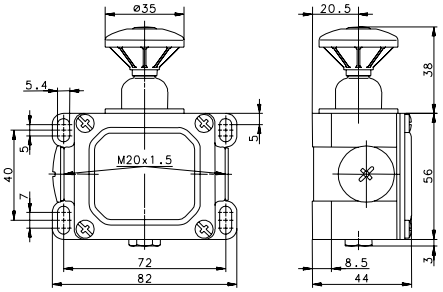
- With steel roller, various roller diameters
- Cranked or straight lever
- Different lever lengths
- Also available with following contacts:
  3 NC contacts
  2 NC / 2 NO contact

Replacement actuator: 3914211065

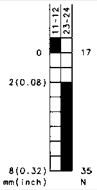
Special features / variants
(on request)

- Available for high temperature range
- With following contacts:
  3 NC contacts
  2 NC / 2 NO contact
  (larger enclosure)

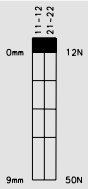
PW



Slow-action



6041113006
D-U1 PW



6041813835
D-A2Z PW

Replacement actuator: –

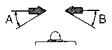
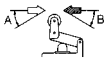
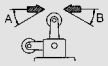
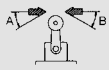
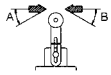
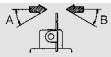
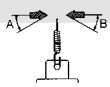
Special features / variants
(on request)

- Also available with following contacts:
  3 NC contacts
  3 NO contacts
  2 NC / 2 NO contact
  (larger enclosure)

Overview of Actuators

Actuator	Designation	Collar iw = internal w = external	Plastic series COMBI	TINY 2	I88	BIGGY 2	ENK	Metal series GC I	SN 2	ENM 2	DI
Plunger	–	iw	–	–	–	–	●	–	–	–	–
	–	w	–	●	●	●	–	–	–	–	–
	–	IP 30	●	–	–	–	–	–	–	–	–
	–	IP 43	–	–	–	–	–	–	–	–	○
Ball	KU	iw	–	–	–	–	–	○	○	○	–
Mushroom head	P	w	–	–	–	–	–	–	–	–	●
Telescopic plunger	L	iw	–	–	–	–	–	●	○	○	–
Adjustable plunger	ST	w	–	–	–	–	–	●	○	○	●
Plunger	ST	iw	–	–	–	–	–	●	○	○	–
	ST	IP 30	●	–	–	–	–	–	–	–	–
Button	K	IP 30	●	–	–	–	–	–	–	–	–
Roller	R	IP 30	●	–	–	–	–	–	–	–	–
	R	iw	–	●	○	●	●	●	●	●	–
		w	–	–	–	–	–	–	–	–	●
		IP 43	–	–	–	–	–	–	–	–	○
Roller, long	R ... L	iw	–	○	●	○	–	–	–	–	–
Roller, short	R ... K	iw	–	○	●	○	–	–	–	–	–
Lever	H	IP 30	●	–	–	–	–	–	–	–	–
	H	w	–	●	●	●	●	–	–	–	–
	H, HT	iw	–	–	–	–	–	●	○	○	–
Lever, long	H/D-WI	w	–	–	–	–	–	●	●	○	●
	HL	iw	–	–	–	–	–	●	○	○	–
	HL/D-H	w	–	–	–	–	–	●	○	○	●
	D – H	IP 43	–	–	–	–	–	–	–	–	○
Pivot joint, lever	DGH	w	–	○	●	○	○	○	●	●	–
Pivot joint, cranked lever	DGK	w	–	○	●	○	○	○	●	●	–
Cranked lever	KN	iw	–	–	–	–	–	●	○	○	–
	KN	w	–	○	●	○	–	●	○	○	○
Cranked lever link	KG	iw	–	–	–	–	–	●	○	○	–
	KG	w	–	○	●	○	–	●	○	○	–
Double roller	DR	iw	–	–	–	–	–	●	○	○	–
Spring feeler	FF	iw	–	–	–	–	–	●	●	○	–
	FF	w	–	●	○	●	●	–	–	–	–
Spring feeler, long	FFL	w	–	–	–	–	–	●	○	○	–
Spindle-mounted lever	AH	iw	–	●	●	●	–	●	○	○	●
Spindle-mounted lever, star clamping	AHS	iw	–	●	●	●	–	○	●	○	–
Spindle-mounted lever, fine spline	AHS-V	iw	–	–	–	–	●	○	●	●	–
Spindle-mounted lever for positive opening in forward / return direction	AHZ	iw	–	–	–	–	–	○	○	●	–
Spindle-mounted lever, adjustable	AV	iw	–	●	●	●	●	●	○	●	●
Spindle-mounted lever, wire	AD	iw	–	●	●	●	●	●	○	●	○
Spindle-mounted lever, spring	AF	iw	–	○	●	○	○	●	●	○	–

 ● Catalogue type (stock type or delivery time as per agreement) ○ Technical possible from modular system (from system layout) – Not included in design

Approach direction	Plunger direction	Approach speed/approach angle							Remarks
			m/s	0,1	0,5	1	2	5	
		Metal	A	20°	20°	10°	5°	–	● The values shown in the switching diagrams for switching travel/force refer **to plunger direction**
			B	20°	20°	10°	5°	–	
		Plastic	A	20°	20°	10°	5°	–	
			B	20°	20°	10°	5°	–	
		Metal	A	30°	5°	–	–	–	● The values shown in the switching diagrams for switching travel/force refer **to plunger direction** ● Plunger tip adjustable in ST version
			B	30°	5°	–	–	–	
		Plastic	A	30°	5°	–	–	–	
			B	30°	5°	–	–	–	
		Metal	A	30°	30°	20°	10°	5°	● The values shown in the switching diagrams for switching travel/force refer **to plunger direction**
			B	30°	30°	20°	10°	5°	
		Plastic	A	30°	30°	20°	10°	5°	
			B	30°	30°	20°	10°	5°	
		Metal	A	–	–	–	–	–	● The values shown in the switching diagrams for switching travel/force refer **to plunger direction**
			B	20°	20°	10°	–	–	
		Plastic	A	–	–	–	–	–	
			B	40°	40°	30°	20°	10°	
									
									
		Metal	A	–	–	–	–	–	● The values shown in the switching diagrams for switching travel / force refer **to plunger direction** ● Adjustable upper section of actuator with roller
			B	20°	20°	10°	–		
		Plastic	A	–	–	–	–	–	
			B	40°	40°	30°	20°	10°	
		Metal	A	–	–	–	–	–	● The values shown in the switching diagrams for switching travel / force refer to **90° to plunger direction** ● Adjustable upper section of actuator with roller
			B	30°	30°	20°	10°	–	
		Plastic	A	–	–	–	–	–	
			B	40°	40°	40°	30°	20°	
		Metal	A	–	–	–	–	–	● The values shown in the switching diagrams for switching travel / force refer to **90° to plunger direction**
			B	30°	30°	20°	10°	–	
		Plastic	A	–	–	–	–	–	
			B	40°	40°	40°	30°	20°	
		Metal	A	–	–	–	–	–	● The values shown in the switching diagrams for switching travel / force refer **to plunger direction**
			B	40°	40°	30°	20°	–	
		Plastic	A	–	–	–	–	–	
			B	40°	40°	40°	30°	20°	
		Metal	A	45°	45°	40°	30°	–	● The values shown in the switching diagrams for switching travel / force refer **to direction of rotation** ● Switch position retained after actuation
			B	45°	45°	40°	30°	–	
		Plastic	A	–	–	–	–	–	
			B	–	–	–	–	–	
		Metal	A	60°	50°	45°	–	–	● The values shown in the switching diagrams for switching angle / actuation torque refer **to any approach direction** ● Not suitable for personal protection
			B	–	–	–	–	–	
		Plastic	A	20°	20°	10°	5°	–	
			B	–	–	–	–	–	
		Metal	A	45°	45°	45°	40°	30°	● The values shown in the switching diagrams for switching angle / actuation torque refer **to direction of rotation** ● Graduated adjustment of roller lever on spindle with 180° repositioning
			B	45°	45°	45°	40°	30°	
		Plastic	A	45°	45°	45°	40°	30°	
			B	45°	45°	45°	40°	30°	
		Metal	A	45°	45°	45°	40°	30°	● The values shown in the switching diagrams for switching angle / actuation torque refer **to direction of rotation** ● Graduated adjustment of roller lever on spindle with 180° repositioning ● Not suitable for personal protection
			B	45°	45°	45°	40°	30°	
		Plastic	A	45°	45°	45°	40°	30°	
			B	45°	45°	45°	40°	30°	
		Metal	A	45°	45°	40°	30°	20°	● The values shown in the switching diagrams for switching angle / actuation torque refer **to direction of rotation** ● Graduate adjustment of rod about pivot axis and in longitudinal direction
			B	45°	45°	40°	30°	20°	
		Plastic	A	45°	45°	40°	30°	20°	
			B	45°	45°	40°	30°	20°	
		Metal	A	45°	45°	40°	30°	20°	● The values shown in the switching diagrams for switching angle / actuation torque refer **to direction of rotation** ● Graduated adjustment of spring about pivot axis ● Not suitable for personal protection
			B	45°	45°	40°	30°	20°	
		Plastic	A	45°	45°	40°	30°	20°	
			B	45°	45°	40°	30°	20°	

Limit Switch – Spindle-Mounted Lever

Switching devices with spindle-mounted lever enclosure

On delivery, contact-making takes place in both pivot directions corresponding to the switching diagrams.

Adaptation of basic actuator setting on spindle

The basic setting of the device can be varied in steps and fixed for exact positioning:

- AH, AHS, AHZ, AF, AD, AV:
  Adjustment in steps of 15° (Fig. 1)
- AHS-V:
  Adjustment in steps of 7.5° or 15° (only here ⊖) by repositioning the intermediate piece (Fig. 2)
- Adaptation AV, AD:
  Adjustment in radial direction
- AH, AHS, AHS-V, AHZ, AV:
  The roller levers can be used in a different axial actuating plane by repositioning by 180° (Fig. 3 and 4)

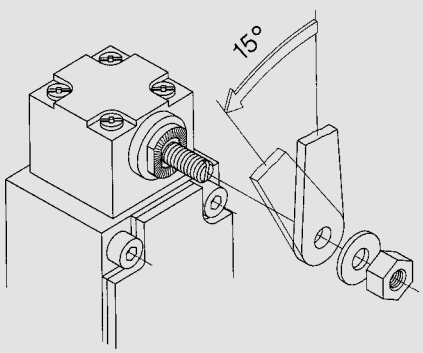


Fig.1

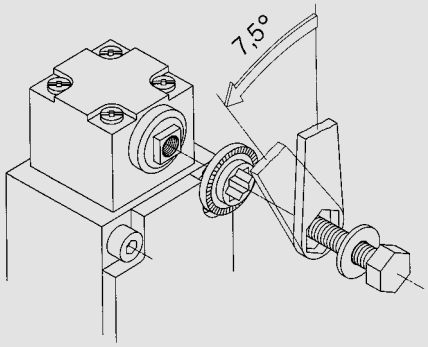


Fig. 2

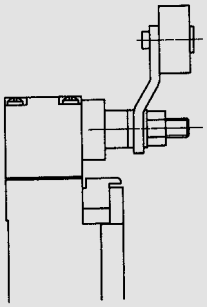


Fig. 3

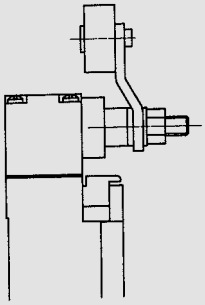


Fig. 4

Adaptation of direction-independent switching function

With actuators AHS, AHS-V, AV, AD.

On delivery, contact-making takes place in both pivot directions corresponding to the switching diagrams. An idle function in the required pivot direction is achieved by simply repositioning the actuator cam (Fig. 5 and 6).

The idle function can be used in control systems that cannot process successive rebound pulses caused by oscillatory movement of extremely long AV/AD actuators.

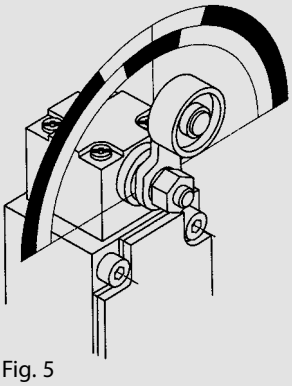


Fig. 5

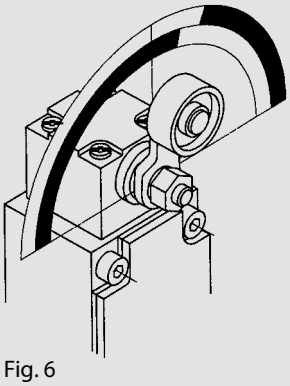


Fig. 6

Positive opening action Forward and return AHZ

For special safety applications, the positive opening action of the normally-closed contacts takes place both in forward (moving in one direction) as well as in return (moving back to home position) direction. For personal protection applications movement of the roller must be restrained in a guide block in both directions (Fig. 7 and 8).

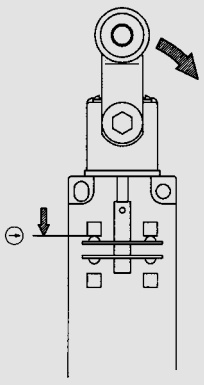


Fig. 7

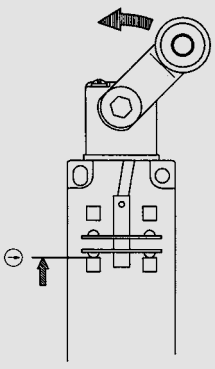


Fig. 8

Note on changing actuators AH, AHS, AHS-V, AHZ, AF, AD, AV, DGH, DGK

The guaranteed as-delivered properties change when the actuation directions are adjusted and when actuators are repositioned by 90°.

The user himself must ensure that the device achieves safe operation for its intended purpose.

Accessories for Insulation-Enclosed Limit Switches

The mounting plates help to prevent over-tightening and damage to the switch.

Article	Mounting pads	Mounting pads
Series	I88	ENK
Article number	3191871157	3191871154

The Finger guard help to prevent the user from an electric shock.

The guide element allows additional support to the rear of the switch.

Article	Finger guard	Guide element
Series	I88, Biggy 2, ENK	I88
Article number	3595900060	3515900209

The mounting plate allows I88 switches to be din rail mounted in control enclosures.

Article	Mounting plate, control cabinet	
Series	I88	
Article number	3595900087	

Article	NPT adapter	NPT adapter
Series	Various families	Various families
Article number	3998000115	3998000116

Type 1 switches

Slow-action contact			C2 / Ti2							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	A2Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A
Changeover contact	1NC/1S	U1Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A
Changeover contact, overlapping	1NC/1S	UV1Z	–	–	–	–	–	–	–	–
Normally-open contact	2S	E2	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	–	–	–

Snap-action contact			C2 / Ti2							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	SA2Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A
Changeover contact	1NC/1S	SU1Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A
Normally-open contact	2S	SE2	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	–	–	–

Slow-action contact			Bi2							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	A2Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.	400 V	5 A
Changeover contact	1NC / 1NO	U1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.	400 V	10 A
Changeover contact, overlapping	1NC / 1NO	UV1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.	400 V	10 A
Normally-open contact	2S	E2	–	–	–	–	–	–	–	–

Snap-action contact			Bi2							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	SA2Z	–	–	–	–	–	–	–	–
Changeover contact	1NC / NO	SU1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.	400 V	10 A
Normally-open contact	2S	SE2	–	–	–	–	–	–	–	–

Slow-action contact			GC							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	A2Z	400 V	6 A	–	Fuse 6 A gL/gG	1×10^5	0,2 mill.①	400 V	10 A
Changeover contact	1NC / 1NO	U1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.②	400 V	10 A
Changeover contact, overlapping	1NC / 1NO	UV1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.	–	–
Normally-open contact	2S	E2	400 V	6 A	–	Fuse 6 A gL/gG	3×10^6	–	–	–

① 6021820175 GC-A2 HIW = 20 million ② 60121100622 GC-U1Z VKS, 6121100623 GC-U1Z VKW = 2 million

Snap-action contact			GC							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	2NC	SA2Z	–	–	–	–	–	–	–	–
Changeover contact	1NC / 1NO	SU1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.	400 V	10 A
Normally-open contact	2S	SE2	–	–	–	–	–	–	–	–

IF				I88					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	5 A	AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.*
–	–	–	–	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
–	–	–	–	250 V	5 A	AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	–

*6116819140 I88-U1Z KS, 6186103005 I88-U1Z W RAST = 2 million

IF				I88					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	–	–	–	–	–	–
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.
–	–	–	–	–	–	–	–	–	–

ENK			
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**
AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.*
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
–	–	–	–

*6181135251 ENK-U1Z AHSGU RAST RO50 = 2 million

ENK			
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**
–	–	–	–
AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.
–	–	–	–

SN2				ENM2					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	10×10^6	20 mill.	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	–	20 mill.	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.*
–	–	–	–	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
–	–	–	–	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	–

*6087135013 ENM2-U1Z AHS-V, 6087135030 ENM2-U1Z AHZ = 2 million

SN2				ENM2					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
–	–	–	–	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	6 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 2 A gL/gG	10×10^6	20 mill.
–	–	–	–	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	3×10^6	–

Electrical data

Type 1 switches

Slow-action contact			D					
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
Normally-closed contact	2NC	A2Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
Changeover contact	1NC/1S	U1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
Changeover contact, overlapping	1NC/1S	UV1Z	400 V	16 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
Normally-open contact	2S	E2	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	–

Snap-action contact			D					
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
			–	–	–	–	–	–
Normally-closed contact	2NC	SA2Z	–	–	–	–	–	–
Changeover contact	1NC/1S	SU1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	10×10^6	20 mill.
Normally-open contact	2S	SE2	–	–	–	–	–	–

Type 2 switches

Slow-action contact			SKT							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	1NC	A1Z								
Normally-closed contact	2NC	A2Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A DC-13 U_e/I_e 250V / 0.27 A	Fuse 6 A gL/gG	A* 1×10^6 B* 1×10^5	2 mill.	250 V	10 A
Changeover contact	1NC/1S	U1/U1Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A DC-13 U_e/I_e 250V / 0.27 A	Fuse 6 A gL/gG	A* $\times 10^6$ B* 1×10^5	2 mill.	250 V	10 A
Changeover contact, overlapping	2NC/1S	UV15Z	250 V	5 A	–	–	–	–	250 V	5 A

*A = Standard; B = Increased actuating force

Slow-action contact			SK							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	1NC	A1Z	–	–	–	–	–	–	–	–
Normally-closed contact	2NC	A2Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.		
Changeover contact	1NC/1S	U1/U1Z	250 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	1×10^6	2 mill.	250 V	10 A
Changeover contact, overlapping	2NC/1S	UV15Z	400 V	5 A	AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	2 mill.	–	–

Slow-action contact			ENM2							
Switching function	**Switching contacts**	**Designation**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**
Normally-closed contact	1NC	A1Z	–	–	–	–	–	–	–	–
Normally-closed contact	2NC	A2Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.	400 V	6 A
Changeover contact	1NC/1S	U1/U1Z	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	1×10^6	2 mill.	400 V	10 A
Changeover contact, overlapping	2NC/1S	UV15Z	250 V	5 A	AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	2 mill.		

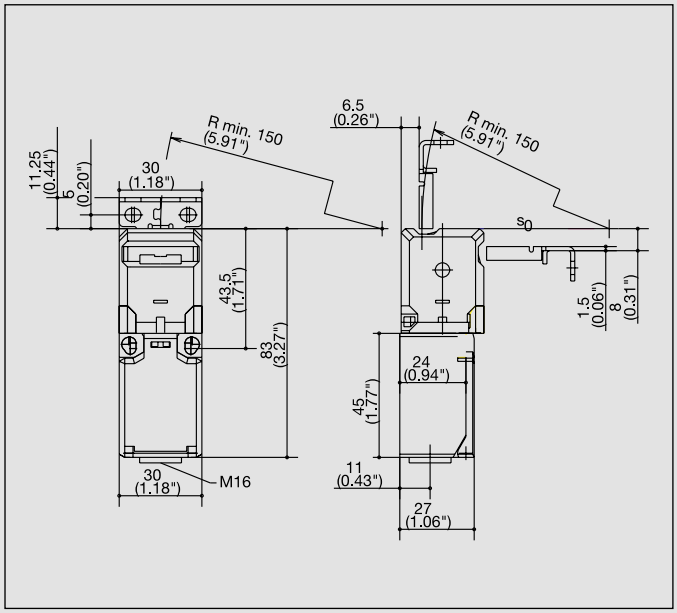
U_i Rated insulation voltage
I_{the} Conventional thermal output from devices in enclosure

SKI				SKC					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
				250 V	5 A	AC-15 U_e/I_e 240 V/1,5 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	A* 1×10^6 B* 1×10^5	2 mill.	–	–	–	–	–	–
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	A* 1×10^6 B* 1×10^5	2 mill.	–	–	–	–	–	–
AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	A* 1×10^6 B* 1×10^5	2 mill.	–	–	–	–	–	–
*A = Standard; B = Increased actuating force									

I88				ENK					
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**	**U_i**	**I_{the}**	**Utilization category**	**Short-circuit protection**	**Mechanical service life**	**B10d**
–	–	–	–	–	–	–	–	–	–
				400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	1×10^6	2 mill.	400 V	10 A	AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	1×10^6	2 mill.
–	–	–	–	400 V	5 A	AC-15 U_e/I_e 240 V/1.5 A	Fuse 6 A gL/gG	1×10^6	2 mill.

GC			
Utilization category	**Short-circuit protection**	**Mechanical service life**	**B10d**
–	–	–	–
AC-15 U_e/I_e 240 V/3 A	Fuse 6 A gL/gG	1×10^6	2 mill.
AC-15 U_e/I_e 240 V/3 A	Fuse 10 A gL/gG	1×10^6	2 mill.

SKT



Safety switches with separate actuator are positive opening position switches. In terms of design, the switching element and actuator are separated. On actuation, the switching element and actuator are either brought together or separated. The positive opening NC contact is always open when the actuator is withdrawn. These switches are assigned to Type 2.

BERNSTEIN offers various versions of these Type 2 switches. The differences and advantages of the individual switch groups are outlined in the following.

The SKT is the smallest safety switch with a separate actuator. It is particularly suited for applications that require an extremely slim and short switch design. Its rotary head, two actuator openings and various switching functions underscore its versatility in extremely confined spaces.

Added to this, the SKT features other options to meet any requirements:

- **Integrated eject function (FE):**

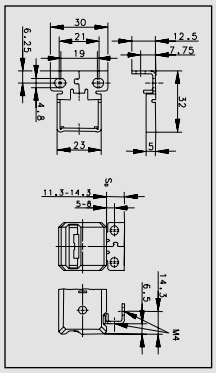
  The actuator is ejected if the door is not locked securely. Consequently, the safety contact is opened, thus preventing the machine from starting up. In addition, this function makes it apparent that the door still needs to be locked.

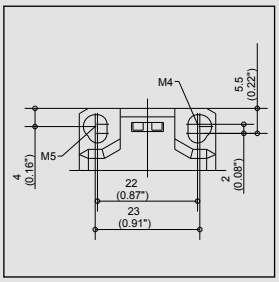
- **Actuating force (up to 50 N):**

  The standard actuating force is 10 N. Depending on the switch variant, an actuating force of 50 N can also be selected. In many applications, hatches and doors need to be secured to prevent them being opened unintentionally. This is achieved by means of bolts, fasteners or other latching mechanisms. The SKI safety switch should be selected for applications requiring increased actuating force.

- **Universal Hinged Actuator (MRU):**

  The MRU actuator is ideally suited for applications where the installation conditions severely restrict the actuating travel or radius. It has an adjustable actuating radius in the horizontal and vertical plane.





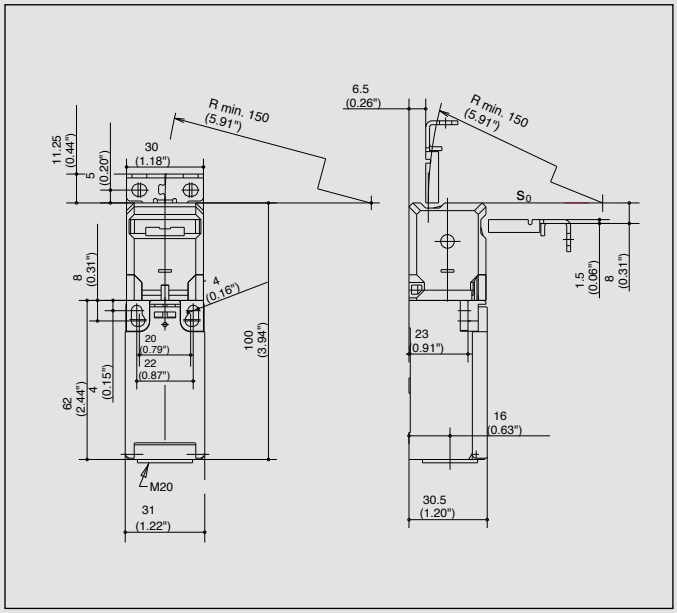
R_{min} 150 mm
Actuating forces FE to FI50

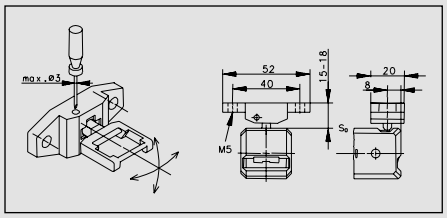
Technical data

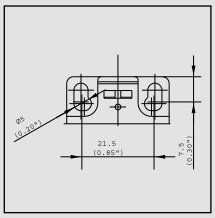
Electrical data		
Rated insulation voltage	U_i max.	250 V
Rated operating voltage	U_e max.	240 V AC
Conventional thermal current	I_{the}	10 A
Utilization category		AC-15, U_e/I_e 240 V / 3 A; DC-13, U_e/I_e 250 V / 0.27 A
Mechanical data		
Switching frequency		≤ 30/min
Mechanical service life Standard Mechanical service life encreased actuator holding force		1 x 10^6 switching cycles 1 x 10^5 switching cycles
B10d (up to) ①		2 Mill.
Short-circuit protection		Fuse 6 A gL/gG
Protection class		II, Insulated
Ambient temperature		–30 °C to + 80 °C
Protection class		IP 65 conforming to IEC/EN 60529
Type of connection		Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2
Enclosure		Thermoplastic, glass fibre-reinforced (UL94-V0)
Cable entry		M16 x 1.5
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

① Depending on switching system. See Table on Pages 70 – 73.

SKI







R_{min} in setting directions 50 mm
Actuating forces FE to FI50

The SKI is the slimline version of a safety switch with a separate actuator. It is based on the BERNSTEIN I88 family. Its dimensions, not including the actuating head, correspond to EN 50047.

The actuating head is rotary mounted and has two actuator openings. The SKI safety switch is predestined for installation on section structures and in applications with confined installation conditions. Compared to the SKT, it offers more connection space for the wiring and variants with up to three switching contacts available.

Other advantages of this series include:

- **Integrated eject function (FE):**

  The actuator is ejected if the door is not locked securely. Consequently, the safety contact is opened, thus preventing the machine from starting up. In addition, this function makes it apparent that the door still needs to be locked.

- **Actuating force (up to 50 N):**

  The standard actuating force is 10 N. Depending on the switch variant, an actuating force of 50 N can also be selected. In many applications, hatches and doors need to be secured to prevent them from being opened unintentionally. This is achieved by means of bolts, fasteners or other latching mechanisms. The SKI safety switch should be selected for applications requiring increased actuating force.

- **Universal radius actuator (MRU):**

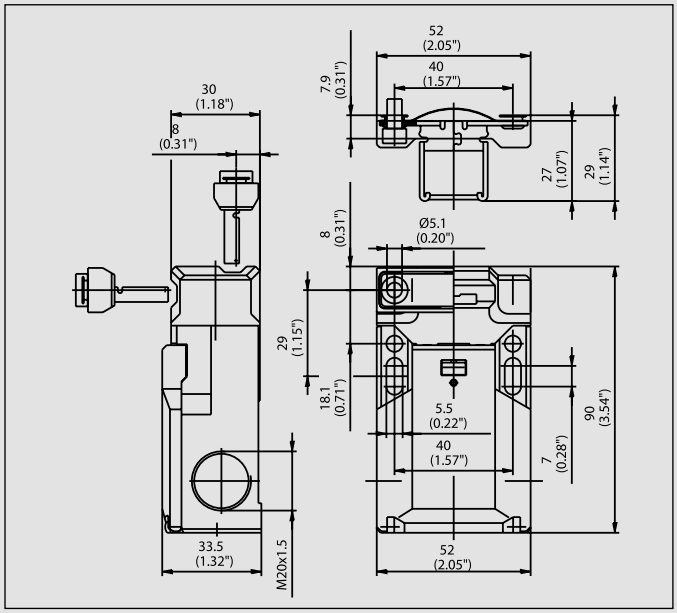
  The MRU actuator is ideally suited for applications where the installation conditions severely restrict the actuating travel or radius. It has an adjustable actuating radius in the horizontal and vertical plane.

Technical data

Electrical data		
Rated insulation voltage	U_i max.	250 V AC
Rated operating voltage	U_e max.	240 V
Conventional thermal current (up to) ①	I_{the}	10 A
Utilization category (up to) ①		AC-15, U_e /I_e 240 V / 3 A
Mechanical data		
Switching frequency		≤ 30/min.
Mechanical service life Standard Mechanical service life encreased actuator holding force		1 x 10^6 switching cycles 1 x 10^5 switching cycles
B10d (up to) ①		2 Mill.
Short-circuit protection		Fuse 6 A gL/gG
Protection class		II, Insulated
Ambient temperature		–30 °C to + 80 °C
Protection class		IP 65 conforming to IEC/EN 60529
Type of connection		Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2
Enclosure		Thermoplastic, glass fibre-reinforced (UL94-V0)
Cable entry		1 x M20 x 1.5
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

① Depending on switching system. See Table on Pages 70 – 73.

SK



The SK safety position switch is an industry standard and can be used in virtually any application.

Thanks to design safety features conforming to VDE 0660 T200, IEC 60947-5-1 and the test regulations GS-ET 15, the SK is particularly suitable for personal protection applications. Its versatility is enhanced by the variable actuator head and two actuator openings.

Other decisive advantages include:

- **Different actuating forces:**

  Corresponding to your specific application, in addition to the standard 10 N, you can also choose an actuating force of 5, 20 or 30 N.

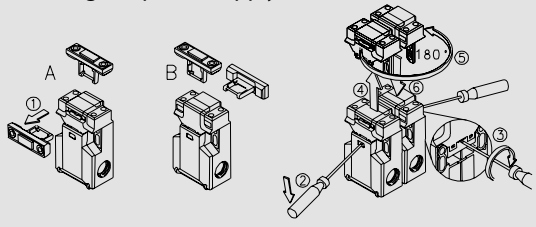
  Actuating forces from 30 to 100 N can be realised with the aid of additional components that are mounted on the outside of the switch.

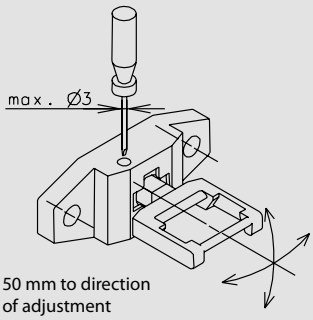
- **Anti-tamper facility:**

  The switching system is protected by multiple coding to ensure enhanced safety of your application.

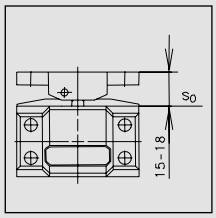
- **Outstanding handling:**

  With the two slots you can easily adjust the SK safety switch and lock it in position by means of the two holes accessible from the top or the two holes accessible from the front. The switch can be wired from three different sides. A transparent cover prevents foreign particles from entering the contact space while connecting the power supply cable.





50 mm to direction
of adjustment
Actuator: metal

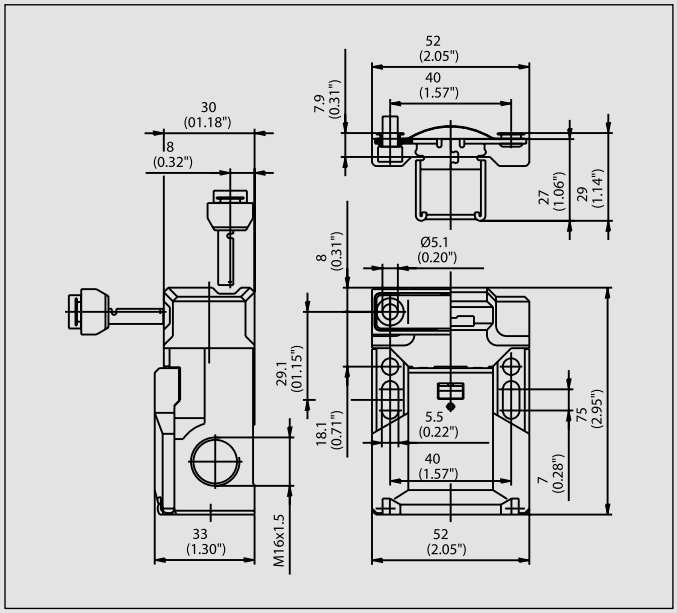


Technical data

Electrical data		
Rated insulation voltage (up to) ①	U_i max.	400 V AC
Rated operating voltage	U_e max.	240 V
Conventional thermal current (up to) ①	I_{the}	10 A
Utilization category		AC-15, U_e /I_e 240 V / 1.5 A
Mechanical data		
Switching frequency		≤ 30/min
Mechanical service life		1 x 10^6 switching cycles
B10d (bis zu) ①		2 Mill.
Short-circuit protection (up to) ①		Fuse 10 A gL/gG
Protection class		II, Insulated
Ambient temperature		–30 °C ... + 80 °C
Protection class		IP 65 conforming to IEC/EN 60529
Type of connection		Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm² or Stranded wire with ferrule 0.5 – 1.5 mm²
Enclosure		Thermoplastic, glass fibre-reinforced (UL94-V0)
Cable entry		3 x M20 x 1.5
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

① Depending on switching system. See Table on Pages 70 – 73.

SKC



In terms of lengths, the SKC safety position switch is the 15 mm shorter variant of the SK. This makes it the right choice for confined installation conditions.

The SKC otherwise offers the same advantages as the SK: Industrial standard with particular emphasis on safety, personal protection and a variable actuator head with two actuator openings.

Other decisive advantages include:

- **Different actuating forces:**

  Corresponding to your specific application, in addition to the standard 10 N, you can also choose an actuating force of 5, 20, 30 or 50 N.

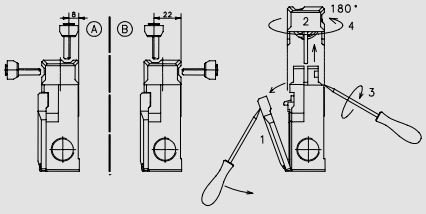
  Actuating forces from 30 to 100 N can be realised with the aid of additional components that are mounted on the outside of the switch.

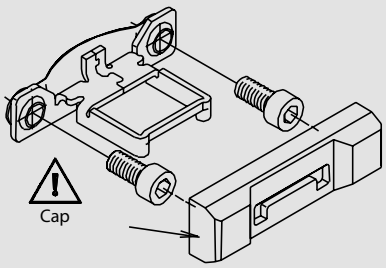
- **Anti-tamper facility:**

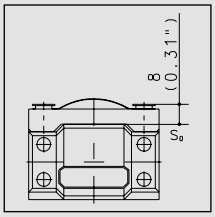
  The switching system is protected by multiple coding to ensure enhanced safety of your application.

- **Outstanding handling:**

  With the two slots you can easily adjust the SKC safety switch and lock it in position by means of the two holes accessible from the top or the two holes accessible from the front. The switch can be wired from three different sides. A transparent cover prevents foreign particles from entering the contact space while connecting the power supply cable.







R_{min} 150 mm (5.9")
Actuator: Metal

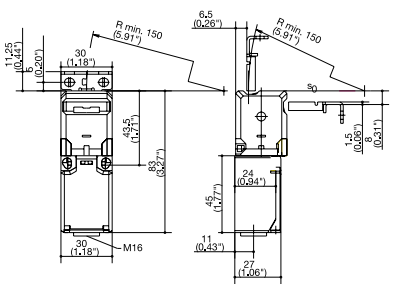
Technical data

Electrical data		
Rated insulation voltage	U_i max.	250 V AC
Rated operating voltage	U_e max.	240 V
Conventional thermal current	I_{the}	5 A
Utilization category		AC-15, U_e /I_e 240 V / 1.5 A
Mechanical data		
Switching frequency		≤ 30/min.
Mechanical service life		1 x 10^6 switching cycles
B10d (up to) ①		2 Mill.
Short-circuit protection		Fuse 6 A gL/gG
Protection class		II, Insulated
Ambient temperature		–30 °C ... + 80 °C
Protection class		IP 65 conforming to IEC/EN 60529
Type of connection		Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm² or Stranded wire with ferrule 0.5 – 1.5 mm²
Enclosure		Thermoplastic, glass fibre-reinforced (UL94-V0)
Cable entry		3 x M16 x 1.5
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1		

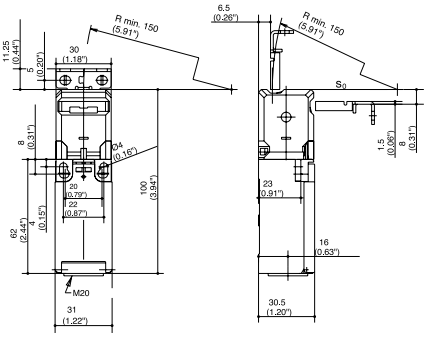
① Depending on switching system. See Table on Pages 70 – 73.

Safety Switches with Separate Actuator

SKT



SKI



Switching operation	Standard	High actuating force	Radius actuation
1 NC / 1 NO contact	**6016419059** SKT-U1Z M3		
1 NC contacts			
2 NC contacts	**6016469066** SKT-A2Z M3		
1 NC / 1 NO contact Overlapping			
Approvals			

Special features / variants
(on request)

- Replacement actuator for:
  3112850340

Switching operation	Standard	High actuating force	Radius actuation
1 NC / 1 NO contact	**6016819052** SKI-U1Z M3	**6016819139** SKI-U1Z FI50 M3	**6016819123** SKI-U1Z MRU
1 NC contacts			
2 NC contacts	**6016869056** SKI-A2Z M3		**6016869122** SKI-A2Z MRU
1 NC / 1 NO contact Overlapping	**6016869058** SKI-UV15Z M3	**6016869145** SKI-UV15Z FI50 M3	**6016869131** SKI-UV15Z MRU
Approvals			

Special features / variants
(on request)

- Replacement actuator for:
  Standard **3112850340**
  High actuating force **3112850340**
  Radius actuation **3911452058**