





Limit Switches

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Description

Definition

Limit switches are also dealt under position switches or limiting switches. However, behind all these terms hides a switchgear which is primarily used to protect man and machine.

Characteristics of DUX Limit Switches

These limit switches offer quite a number of actuators to be selected depending on the required mode of operation. They are used in auxiliary and pilot circuits and are excellently suitable for the control and movement limitation, e.g. in machine tools and processing machines, lifts, conveyor systems, vehicles, cranes, technical building equipments as well as trigger switches in safety and alarm systems, and many more. The limit switches are available in various designs and materials and can such be used in different fields of application and environmental conditions. In order to meet the diverse equipment controlling requirements, a multitude of contact configurations can be implemented to provide optimal solutions for nearly all mechanical switching requirements. The variety of actuators, which are rotatable by 90°, providing high flexibility for each particular case of application.

Set-up and Operation of Limit Switches

Limit switch and plunger drive should only be used when the switching point is subject to a tight tolerance range. The actuation movement should preferably be in the same direction as the plunger movement. The limit switches are constructed in a way that they may in no case be used as a mechanical limit stop. The reset force for other movable actuating appliances (such as flaps, doors, etc.) must not be taken from the limit switch actuator, because it was only designed for the plunger reset of the limit switch. In order to guarantee an optimal switching action the max. operating angles of the different actuators must be observed. The cam of the respective machine must actuate the plunger only in the permissible level. The over-travel of the actuator may only be used as shown in the relative switch travel diagram. It is

not permitted to shorten the working travel by operating the actuator in advance. The reset movement of the actuator must be guided by the return movement of the machine's cam, i.e. the actuator must not spring back freely to its original position.

The length of the actuating cam must be selected so that an actuating time with double safety is achieved. If e.g. the response time of the operated auxiliary contactor to its latching position is 15 ms, the min. actuating time of the limit switch should be 30 ms.

Limit Switch Mounting

Limit switches have to be mounted to be easy accessible and shock-resistant, following the a.m. instructions. To guarantee the specified degree of protection, the lid screws must be tightened evenly and the cable entry must be fixed appropriately according to the cable diameter.

The limit switches must be used under strict observance of the relative parameters and rules of application. Depending on the number of switching actuations and operating conditions, the operational reliability of the switches has to be checked regularly. Switching actuations and operating conditions, the operational reliability of the switches has to be checked regularly.

Limit Switches - EKU Series

Operating and ambient conditions compliant to	DIN IEC 721-3-1..3 and DIN IEC 721-3-6
Degree of protection acc. to DIN 40050 IEC 144	IP 65
Fastening dimensions acc. to DIN EN 50047	2x M4
Contact base material	PA6
Transport, storage and operating temperature	-25°C up to +55°C
Screw clamp connection	M 3.5
Terminal cross-section	2x 0.75 ... 2.5 mm ² solid, flexible multicore with ferrule 2x 0.75..1.5 mm ²
Cable gland	M16x1.5
Operating speed on plunger	max. 0.25 m/s min. 1mm/s AC; min. 20mm/s DC
Mechanical life	1x10.000.000 switching cycles
Operating force on plunger	10N
Insulation group acc. to DIN VDE 110	C
Admissible on-load switching cycles	1200/h
Min. switching current using silver contacts	0.1A
with slow-action contact	0.012A
with snap-action contact	0.012A
Min. switching voltage using silver contacts	24V
Electrical life	5x 100.000 switching cycles AC 380V/1A DC 220V/0,2A
Max. rated current/AC	6A
Rated frequency	50...60Hz
Max. rated voltage	AC 380V DC 220V

Limit Switches

EKU

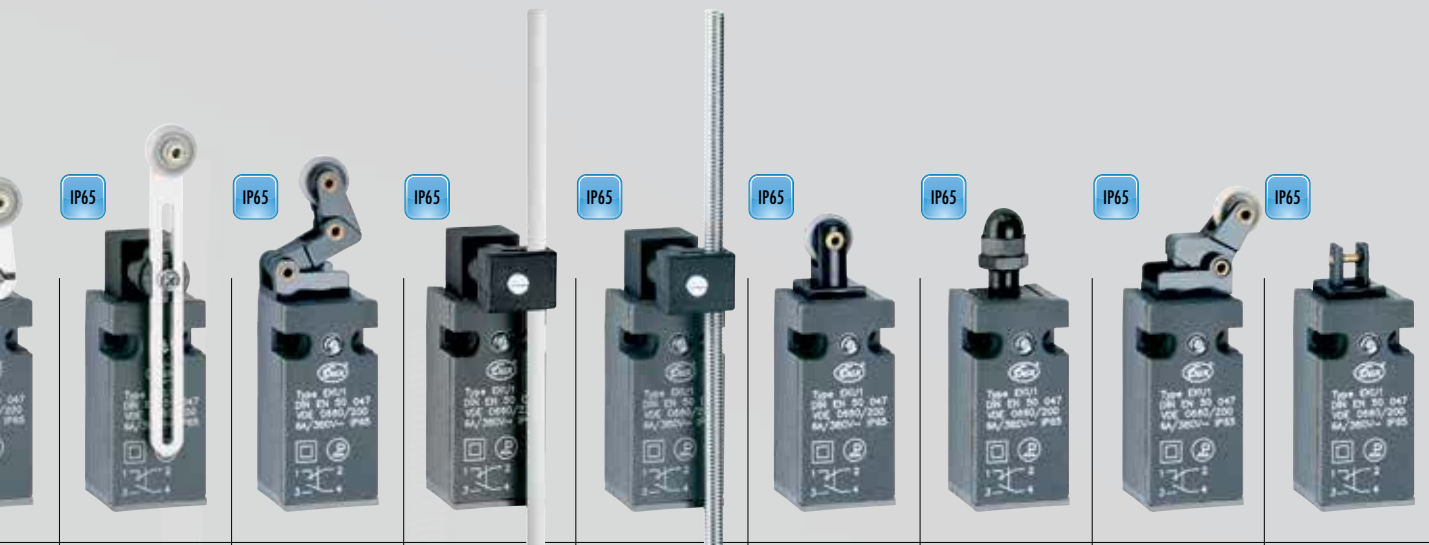


<p>1NC + 1NO</p>	EKU1-KST	EKU1-KD		EKU1-KG	EKU1-KH	EKU1-K
<p>1NC + 1NO snap action contact</p>	EKU1-SPR-KST	EKU1-SPR-KD	EKU1-SPR-KFS	EKU1-SPR-KG	EKU1-SPR-KH	EKU1-SPR-KRH
<p>1NC + 1NO slow action contact</p>	EKU1-FD-KST	EKU1-FD-KD		EKU1-FD-KG	EKU1-FD-KH	

- recommended operating travel
- positive opening

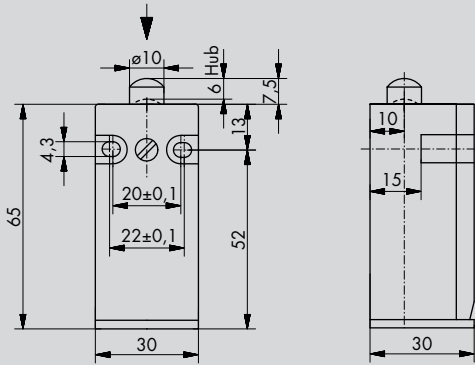
If you require a cable gland, just add „mKV“ to type number (e.g. EKU1-KSTmKV).

The EKU series are also available for AS-Interface applications.

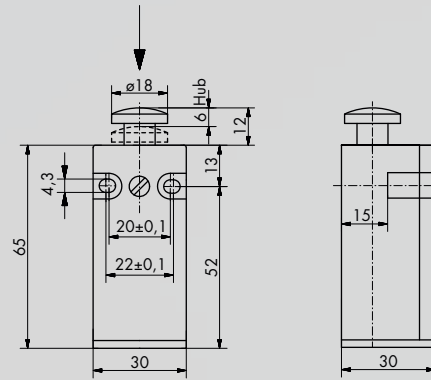


RH	EKU1-KRHV	EKU1-KK	EKU1-KDH	EKU1-KDF	EKU1-KR	EKU1-KV	EKU1-KW	EKU1-KZ
PR-	EKU1-SPR-KRHV	EKU1-SPR-KK	EKU1-SPR-KDH	EKU1-SPR-KDF	EKU1-SPR-KR	EKU1-SPR-KV	EKU1-SPR-KW	
		EKU1-FD-KK			EKU1-FD-KR	EKU1-FD-KV	EKU1-FD-KW	

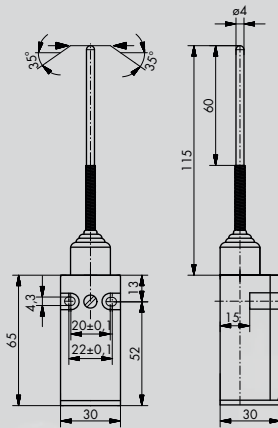
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EKU1-FD-KST
EKU1-SPR-KST



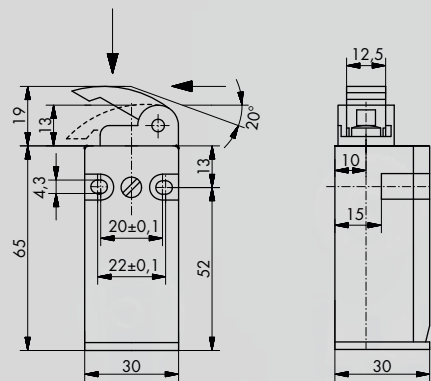
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EKU1-SPR-KD
EKU1-FD-KD



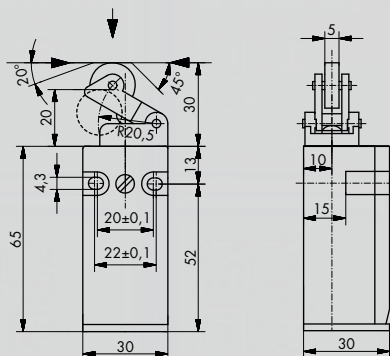
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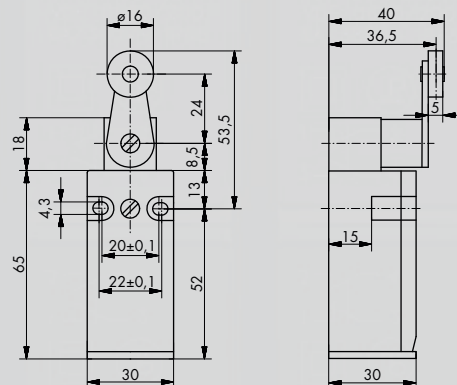
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EKU1-FD-KG



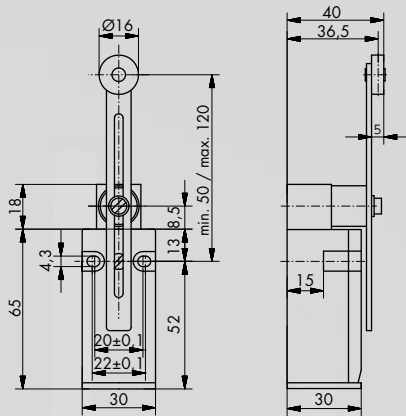
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EKU1-SPR-KH
EKU1-FD-KH



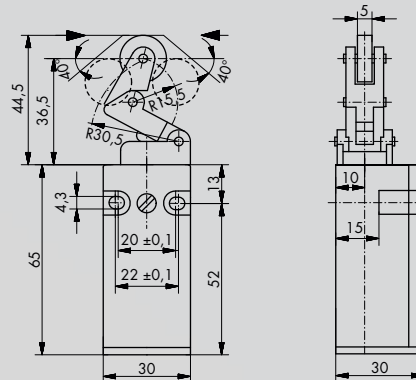
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EKU1-SPR-KRH



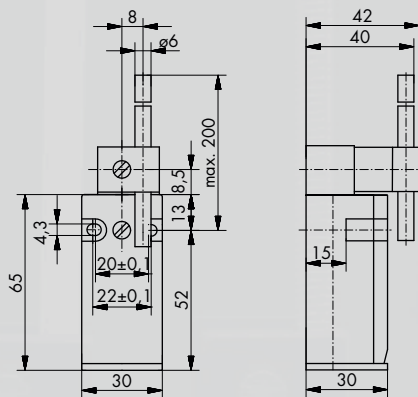
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EKU1-SPR-KRHV



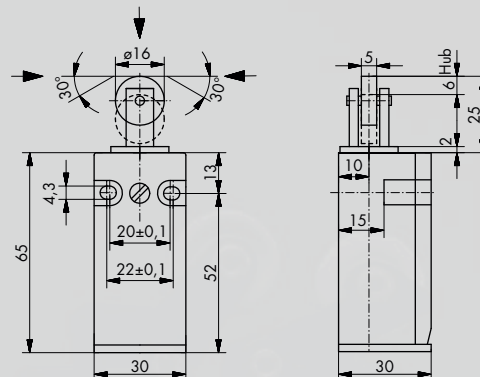
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EKU1-SPR-KK
EKU1-FD-KK



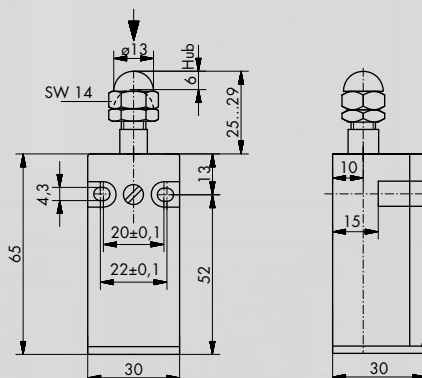
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EKU1-SPR-KDH
EKU1-KDF
EKU1-SPR-KDF



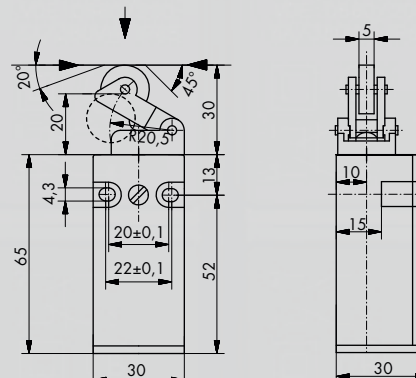
EKU1-KR
EKU1-SPR-KR
EKU1-FD-KR



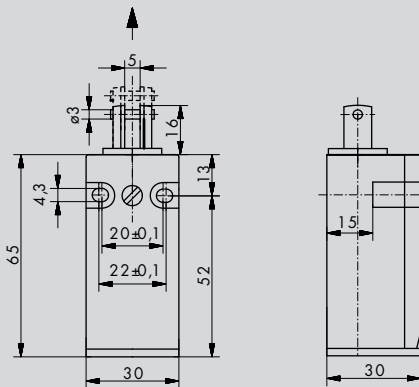
EKU1-KV
EKU1-SPR-KV
EKU1-FD-KV



EKU1-KW
EKU1-SPR-KW
EKU1-FD-KW



EKU1-KZ



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The limit switches must be used under strict observance of the relative parameters and rules of application. Depending on the number of switching actuations and operating conditions, the operational reliability of the switches has to be checked regularly.

Due to the flexible AS-Interface network structure, the DUX limit switches designed for AS-Interface application can be connected in any position. Each limit switch acts as a separate node with individual address within the AS-Interface network.

switching actuations and operating conditions, the operational reliability of the switches has to be checked regularly.

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Technical Data of Limit Switches for AS-Interface Application

Communication

- AS-Interface specification: V2.11, Rev. 1
- Slave profile: S-B.A.E
- Connection: 4-pole sensor connector M12x1, contact 1 is assigned to ASI+ and contact 3 to ASI-
- Max. network length: 100m (without repeater)
- Max. cycle time: 10ms (62 A/B slaves)

Ambient Conditions

- Transport, storage- and Operating temperature: -25°C ... +55°C

Mechanical Data

- Operating travel: 6mm

Electrical Data

- Voltage supply: 26.5...31.6 V, through the AS-Interface line
- Total power consumption: <= 30 mA
- Reverse polarity protection: available

- Admissible on-load switching cycles: 1200/h
- Mechanical life: 10 mill. switching cycles
- Operating force on plunger: 10 N
- Actuators: exchangeable and rotatable by 90°
- Degree of protection acc. to DIN 40050: IP65
- Construction: compliant to VDE 0660/200
- Ambient conditions: stationary use at weatherproof locations
- acc. to DIN IEC 721-3-3: 3D6/3Z2/3Z10/3B2/3C2/3S3/3M6

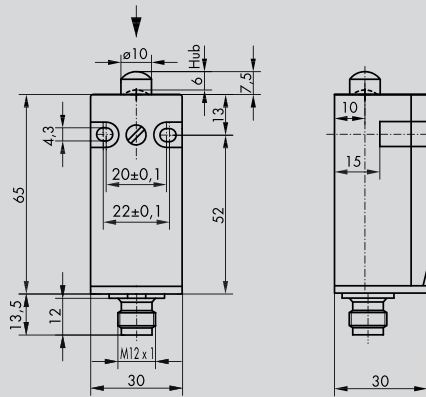


<p>1NC + 1NO</p>	<p>ASI_EKU1-KST</p>	<p>ASI_EKU1-KD</p>		<p>ASI_EKU1-KG</p>	<p>ASI_EKU1-KH</p>	<p>ASI_EKU1-KR</p>
<p>1NC + 1NO snap action contact</p>	<p>ASI_EKU1-SPR-KST</p>	<p>ASI_EKU1-SPR-KD</p>	<p>ASI_EKU1-SPR-KFS</p>	<p>ASI_EKU1-SPR-KG</p>	<p>ASI_EKU1-SPR-KH</p>	<p>ASI_EKU1-SPR-KRH</p>

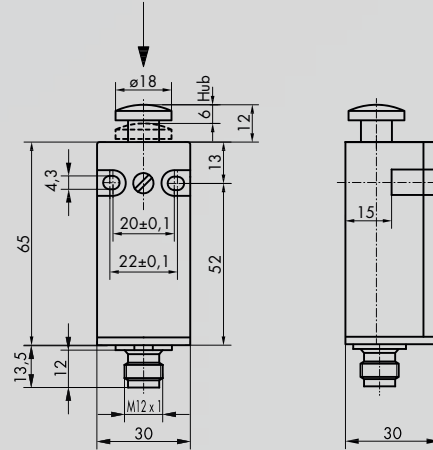
- recommended operating travel
- positive opening

IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP65	
-KRH	ASI_EKU1-KRHV	ASI_EKU1-KK	ASI_EKU1-KDH	ASI_EKU1-KDF	ASI_EKU1-KR	ASI_EKU1-KV	ASI_EKU1-KW	ASI_EKU1-KZ
-SPR	ASI_EKU1-SPR-KRHV	ASI_EKU1-SPR-KK	ASI_EKU1-SPR-KDH	ASI_EKU1-SPR-KDF	ASI_EKU1-SPR-KR	ASI_EKU1-SPR-KV	ASI_EKU1-SPR-KW	

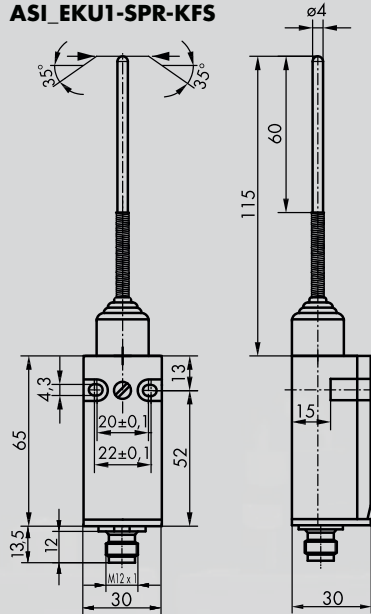
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ASI_EKU1-SPR-KST



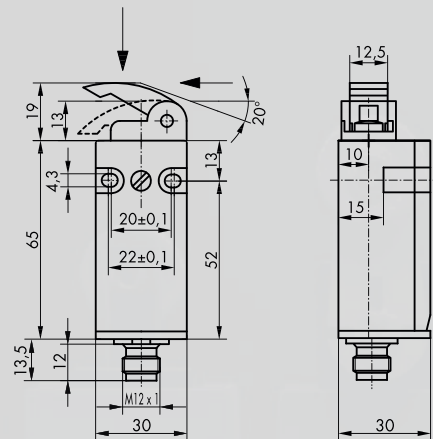
ASI_EKU1-KD
ASI_EKU1-SPR-KD



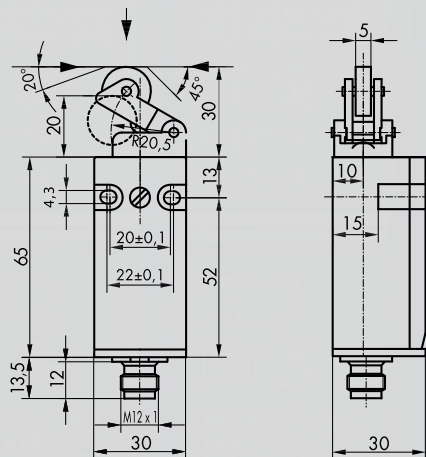
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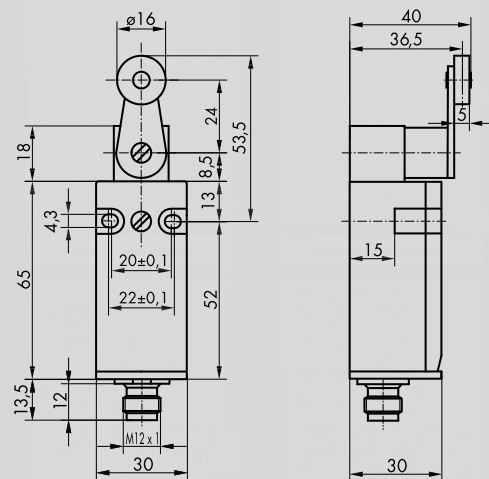
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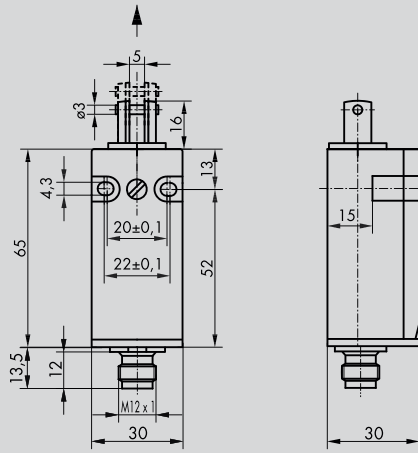
ASI_EKU1-KH
ASI_EKU1-SPR-KH



ASI_EKU1-KRH
ASI_EKU1-SPR-KRH



ASI_EKU1-KZ



Limit Switches - K... Series

Type approval	GL
Operating and ambient conditions compliant to	DIN IEC 721-3-1..3 and DIN IEC 721-3-6
Degree of protection acc. to DIN 40050 IEC 144	IP 65
Contact base material	PA6
Transport, storage and operating temperature	-25°C up to +55°C
Screw clamp connection	M 3.5
Terminal cross-section	2x 0.75 ... 2.5 mm ² solid, flexible multicore with ferrule 2x 0.75..1.5 mm ²
Operating speed on plunger	max. 0.25 m/s min. 1 mm/s AC; min. 20mm/s DC
Mechanical life	1x10.000.000 switching cycles
Operating force on plunger	10N
Insulation group acc. to DIN VDE 110	C
Admissible on-load switching cycles	1200/h
Min.switching current using silver contacts	0.1A
with slow-action contact	0.012A
with snap-action contact	0.012A
Min.switching voltage using silver contacts	24V
Electrical life	5x 100.000 switching cycles AC 380V/1A DC 220V/0,2A
Max.rated current/ AC	6A
Rated frequency	50....60Hz
Max.rated voltage	AC 380V DC 220V



Limit Switches

K



	IP65	IP65	IP65	IP65
1NC 	KA1	KA1-D		KA1-G
1NC + 1NO 	KU1	KU1-D		KU1-G
1NC + 1NO (overlapping) 	KÜ1	KÜ1-D		KÜ1-G
1NC + 1NO slow action contact 	KU1-FD	KU1-FD-D		KU1-FD-G
1NC + 1NO snap action contact 	KU1-SP	KU1-SP-D	KU1-SP-FS	KU1-SP-G
2NC 	KA2	KA2-D		KA2-G
2NC + 1NO 	KA2-E1	KA2-E1-D		KA2-E1-G
2NO 	KE2	KE2-D		KE2-G
1NC + 2NO 	KE2-A1	KE2-A1-D		KE2-A1-G
1NC + 1NO slow action contact 	KA1-E1-FD	KA1-E1-FD-D		KA1-E1-FD-G

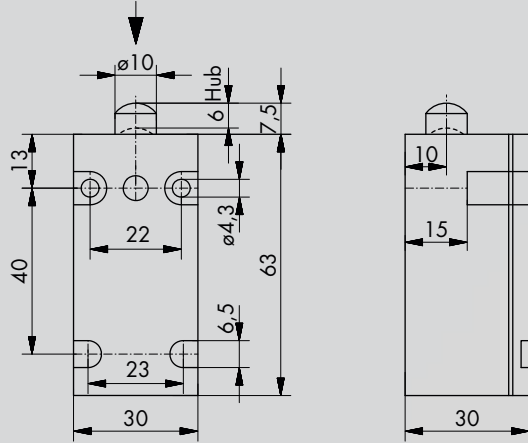
recommended operating travel
 positive opening

					
KA1-H	KA1-K	KA1-R	KA1-V	KA1-W	
KU1-H	KU1-K	KU1-R	KU1-V	KU1-W	KU1-Z
KÜ1-H	KÜ1-K	KÜ1-R	KÜ1-V	KÜ1-W	
KU1-FD-H	KU1-FD-K	KU1-FD-R	KU1-FD-V	KU1-FD-W	
KU1-SP-H	KU1-SP-K	KU1-SP-R	KU1-SP-V	KU1-SP-W	
KA2-H	KA2-K	KA2-R	KA2-V	KA2-W	
KA2-E1-H	KA2-E1-K	KA2-E1-R	KA2-E1-V	KA2-E1-W	
KE2-H	KE2-K	KE2-R	KE2-V	KE2-W	
KE2-A1-H	KE2-A1-K	KE2-A1-R	KE2-A1-V	KE2-A1-W	
KA1-E1-FD-H	KA1-E1-FD-K	KA1-E1-FD-R	KA1-E1-FD-V	KA1-E1-FD-W	

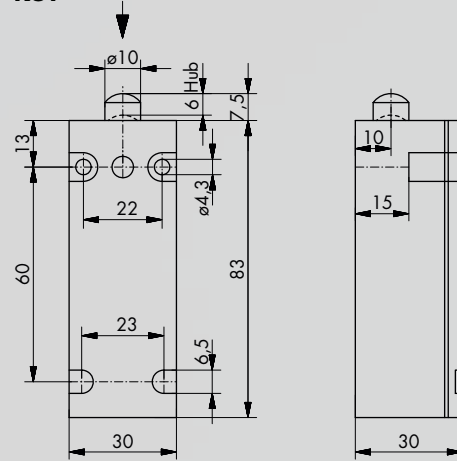
If you require a cable gland, just add „mKV” to type number (e.g. KA1mKV).

If you want to have the limit switches with “GL approval”, just add “T” in front of type number (e.g. T-KA1).

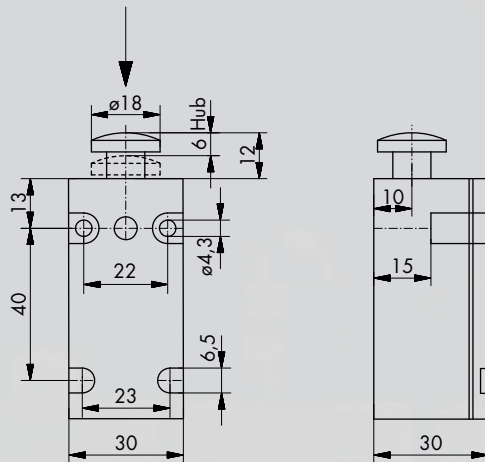
KA1
KU1
KU1-FD
KU1-SP



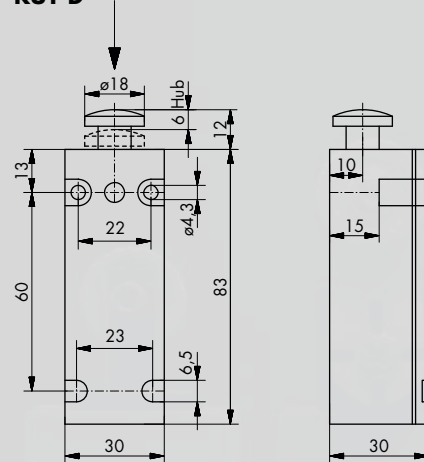
KA2
KA2-E1
KE2
KE2-A1
KA1-E1-FD
KÜ1



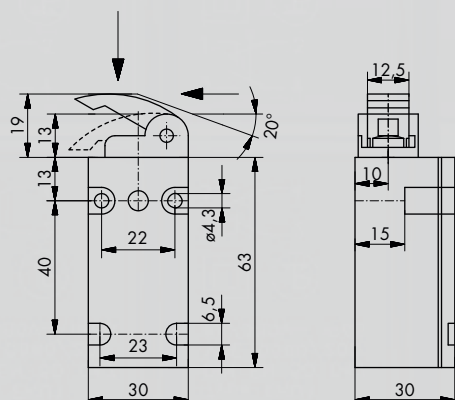
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KU1-D
KU1-FD-D
KU1-SP-D



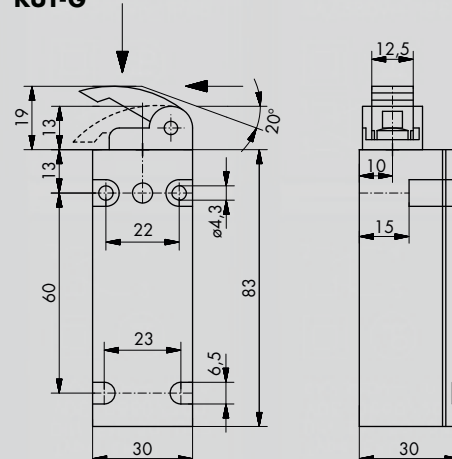
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KE2-D
KE2-A1-D
KA1-E1-FD-D
KÜ1-D



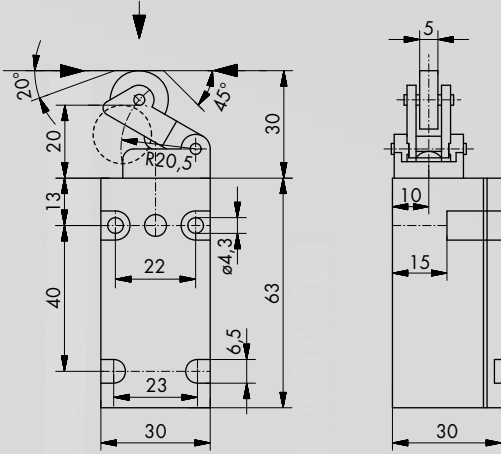
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KU1-G
KU1-FD-G
KU1-SP-G



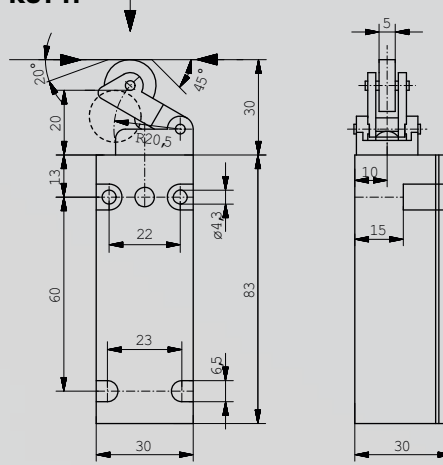
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KE2-G
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KA1-E1-FD-G
KÜ1-G



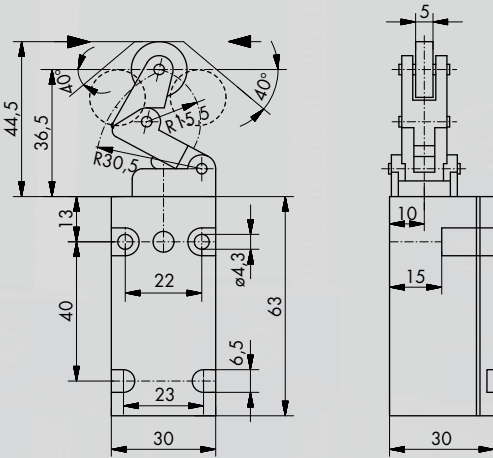
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KU1-FD-H
KU1-SP-H



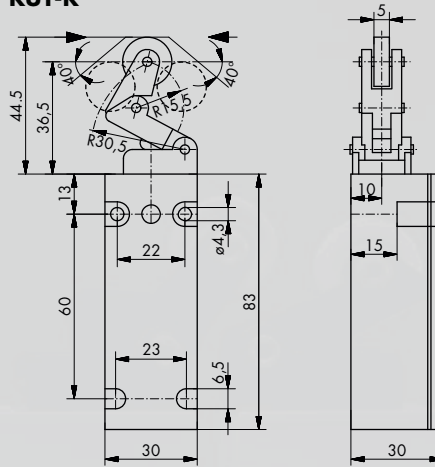
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KA2-E1-H
KE2-H
KE2-A1-H
KA1-E1-FD-H
KÜ1-H



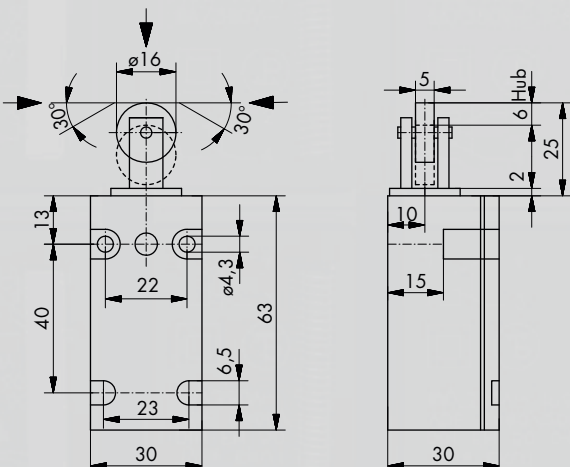
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KU1-FD-K
KU1-SP-K



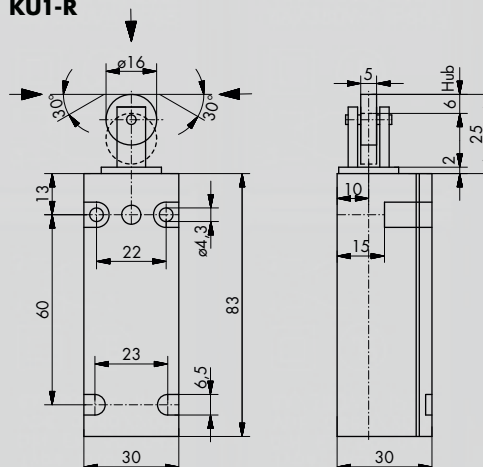
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KA2-E1-K
KE2-K
KE2-A1-K
KA1-E1-FD-K
KÜ1-K



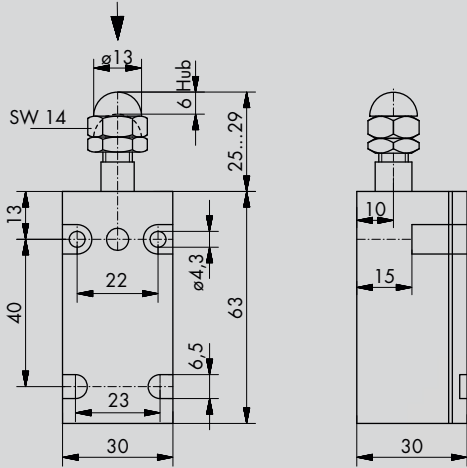
KA1-R
KU1-R
KU1-FD-R
KU1-SP-R



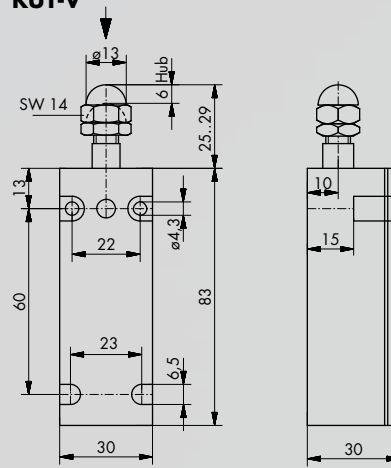
KA2-R
KA2-E1-R
KE2-R
KE2-A1-R
KA1-E1-FD-R
KÜ1-R



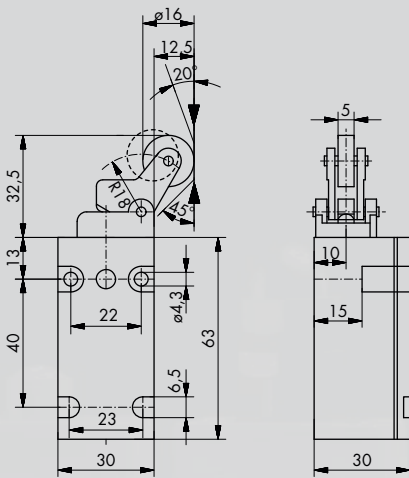
KA1-V
KU1-V
KU1-FD-V
KU1-SP-V



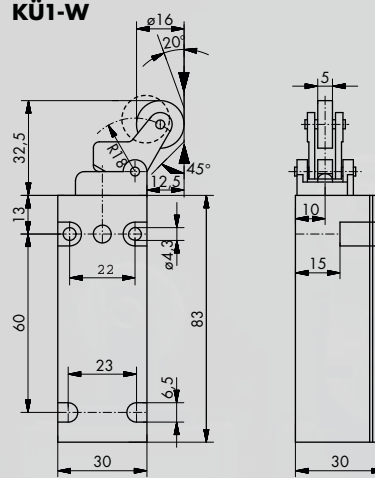
KA2-V
KA2-E1-V
KE2-V
KE2-A1-V
KA1-E1-FD-V
KÜ1-V



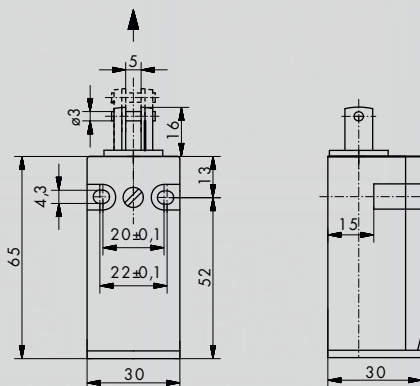
KA1-W
KU1-W
KU1-FD-W
KU1-SP-W



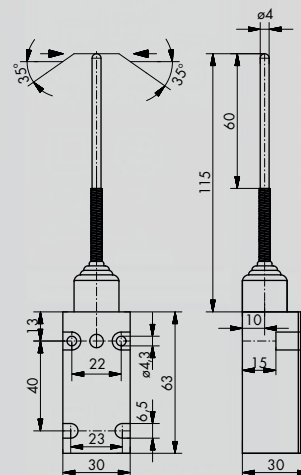
KA2-W
KA2-E1-W
KE2-W
KE2-A1-W
KA1-E1-FD-W
KÜ1-W



KU1-Z



KU1-SP-FS



Limit Switches - GW...1 Standard Series

Type Approval	GL
Operating and ambient conditions compliant to	DIN IEC 721-3-1..3 and DIN IEC 721-3-6
Degree of protection acc. to DIN 40050 IEC 144	IP 65
Housing material	aluminium die casting
Transport, storage and operating temperature	-25°C up to +55°C
Screw clamp connection	M 4
Terminal cross-section	2x 0.75 ... 2.5 mm ² solid, flexible multicore with ferrule 2x 0.75..1.5 mm ²
Operating speed on plunger	max. 0.25 m/s min. 1mm/s AC; min. 20mm/s DC
Mechanical life	1x10.000.000 switching cycles
Operating force on plunger	18N
Insulation group acc. to DIN VDE 110	C
Admissible on-load switching cycles	1200/h
Min. switching current using silver contacts	0.1A
Min. switching voltage using silver contacts	24V
Electrical life	5x 100.000 switching cycles AC 380V/1A DC 220V/0,2A
Max. rated current/ AC	6A
Rated frequency	50....60Hz
Max. rated voltage	AC 380V DC 220V

Limit Switches - GW...2 Modular Series

Module type approval	--
Operating and ambient conditions compliant to	DIN IEC 721-3-1..3 and DIN IEC 721-3-6
Degree of protection acc. to DIN 40050 IEC 144	IP 65
Housing material	aluminium die casting
Contact base material	PA6.6
Transport, storage and operating temperature	-25°C up to +55°C
Screw clamp connection	Schlegel Modular Contact System
Screwless connection technology	CAGE CLAMP Modular Contact System
Operating speed on plunger	max. 0.25 m/s min 1mm/s AC min 20mm/s DC
Mechanical life	--
Operating force on plunger	18N
Admissible on-load switching cycles	1200/h

The possible combinations of the modular contact elements create a modular assembly system that offers a variant diversity which is unique. For instance, for connection workings the modular contact block can be freely removed from the housing, which makes wiring very easy.

Limit Switches - PW... Series

Operating and ambient conditions compliant to	DIN IEC 721-3-1..3
Degree of protection acc. to DIN 40050 IEC 144	IP 65
Housing material	PA6
Transport, storage and operating temperature	-25°C up to +55°C
Screw clamp connection	M 4
Terminal cross-section	2x 0.75 ... 2.5 mm ² solid, flexible multicore with ferrule 2x 0.75..1.5 mm ²
Operating speed on plunger	max. 0,25 m/s min. 1mm/s AC; min. 20mm/s DC
Mechanical life	1x10.000.000 switching cycles
Operating force on plunger	18N
Insulation group acc. to DIN VDE 110	C
Admissible on-load switching cycles	1200/h
Min. switching current using silver contacts	0.1A
Min. switching voltage using silver contacts	24V
Electrical life	5x 100.000 switching cycles AC 380V/1A DC 220V/0,2A
Max. rated current/ AC	6A
Rated frequency	50....60Hz
Max. rated voltage	AC 380V DC 220V

Limit Switches


GW/PW



	IP65	IP65	IP65
1NC 	GWA1 PWA1		GWA1-H PWA1-H
1NC + 1NO 	GWU1 PWU1	GWU1-D	GWU1-H PWU1-H
1NC + 1NO (overlapping) 	GWÜ1	GWÜ1-D	GWÜ1-H
NC + 1NO (overlapping) + 1NC 	GWÜA1		GWÜA1-H
1NC + 1NO (overlapping) + 1NO 	GWÜE1		GWÜE1-H
2NC 	GWA2	GWA2-D	GWA2-H
2NC + 1NO 	GWA2-E1	GWA2-E1-D	GWA2-E1-H
2NC, positive opening contact 	GWA2-Zw		GWA2-H-Zw
2NC + 2NO 	GWU2	GWU2-D	GWU2-H
2NO 	GWE2	GWE2-D	GWE2-H
3NC 	GWA3	GWA3-D	GWA3-H
3NO 	GWE3	GWE3-D	GWE3-H

If you require a cable gland, just add „mKV“ to type number (e.g. GWA1mKV).

If you want to have the limit switches with **“GL approval”**, just add “T” in front of type number (e.g. T-GWA1).

			
GWA1-R PWA1-R	GWA1-V		
GWU1-R PWU1-R	GWU1-V	GWU1-F	GWU1-ZB PWU1-ZB
GWÜ1-R	GWÜ1-V	GWÜ1-F	
GWÜA1-R			
GWÜE1-R			
GWA2-R	GWA2-V	GWA2-F	
GWA2-E1-H	GWA2-E1-V	GWA2-E1-F	
GWA2-R-Zw	GWA2-V-Zw		
GWU2-R	GWU2-V	GWU2-F	
GWE2-R	GWE2-V	GWE2-F	
GWA3-R	GWA3-V	GWA3-F	
GWE3-R	GWE3-V	GWE3-F	

△ recommended operating travel

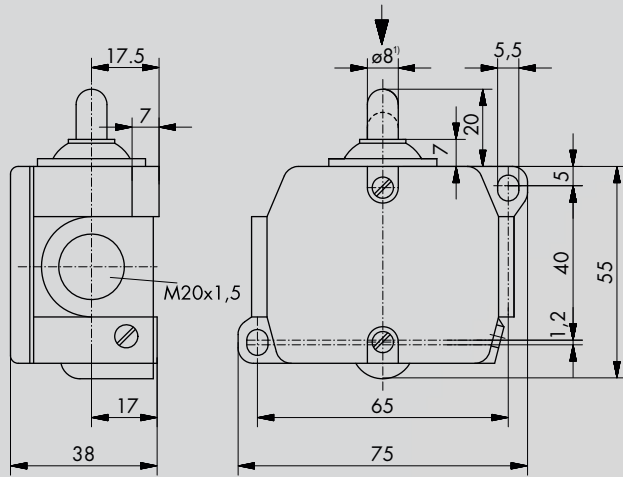
▲ positive opening

Limit Switches

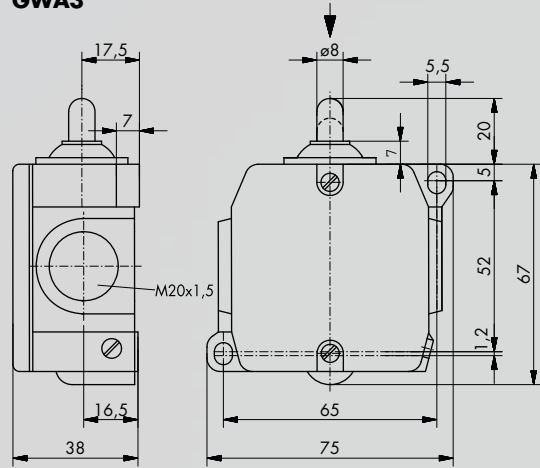
GW/PW



**GWA1
GWU1
PWA1
PWU1**

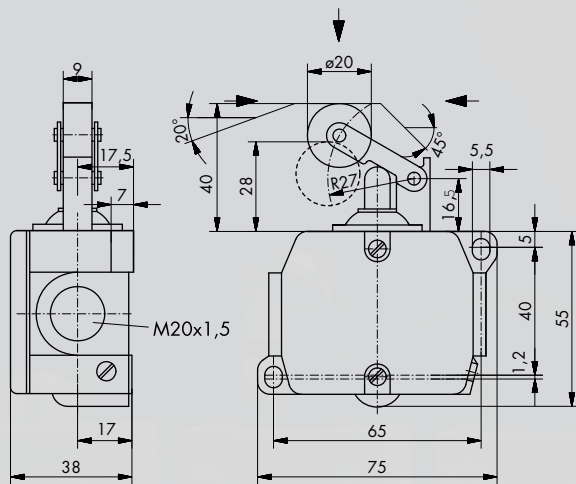


**GWA2
GWA2-E1
GWA2-Zw
GWU2
GWE2
GWA3**

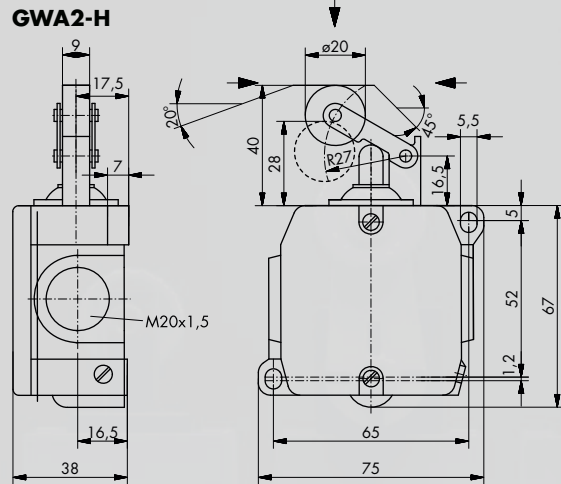


**GWE3
GWÜ1
GWÜA1
GWÜE1**

**GWA1-H
GWU1-H
PWA1-H
PWU1-H**

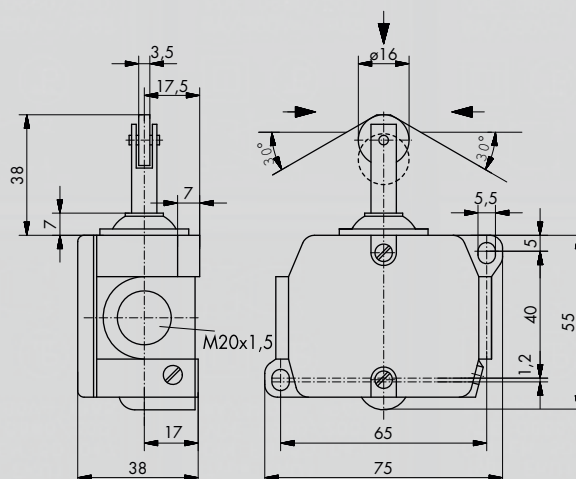


**GWA2-H-Zw
GWU2-H
GWE2-H
GWA3-H
GWE3-H
GWA2-H**

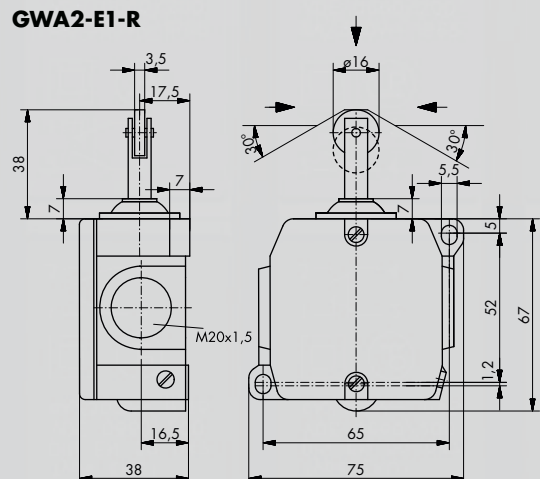


**GWA2-E1-H
GWÜ1-H
GWÜA1-H
GWÜE1-H**

**GWA1-R
GWU1-R
PWA1-R
PWU1-R**

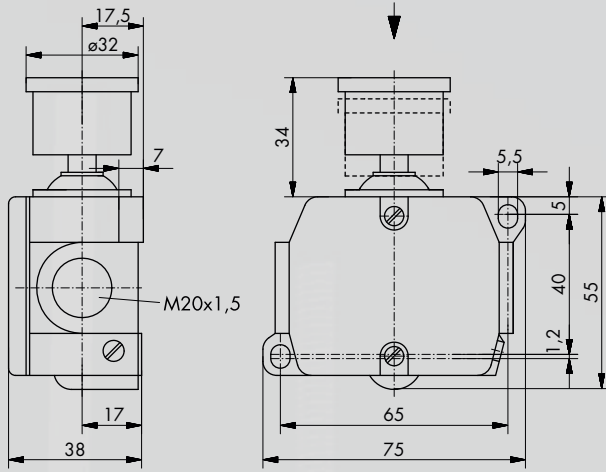


**GWA2-R
GWU2-R
GWE2-R
GWA3-R
GWE3-R
GWA2-E1-R**

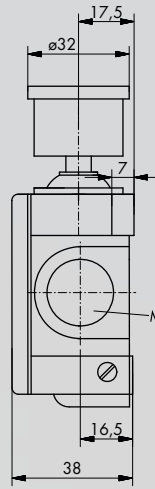


**GWÜ1-R
GWÜA1-R
GWÜE1-R
GWA2-R-Zw**

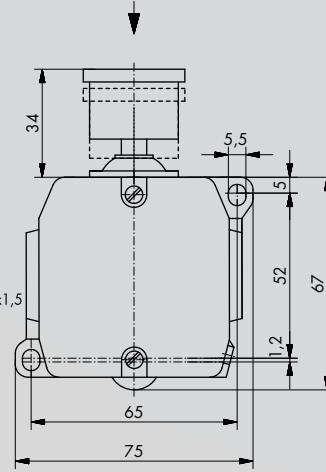
GWU1-D



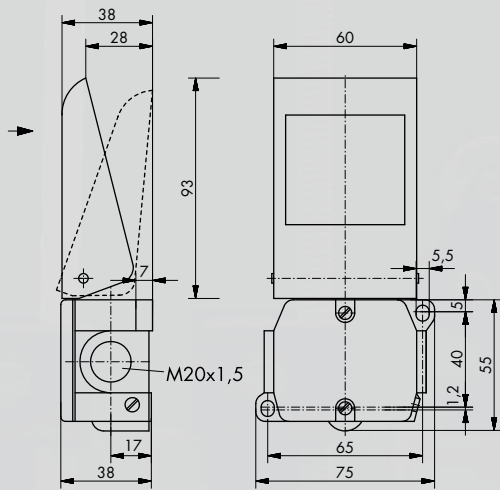
**GWA2-D
GWU2-D
GWE2-D
GWE3-D**



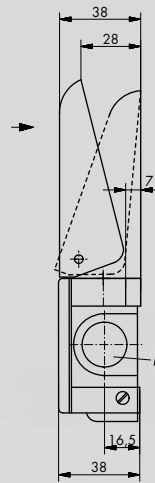
**GWÜ1-D
GWA3-D
GWA2-E1-D**



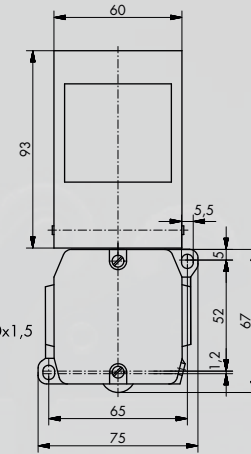
GWU1-F



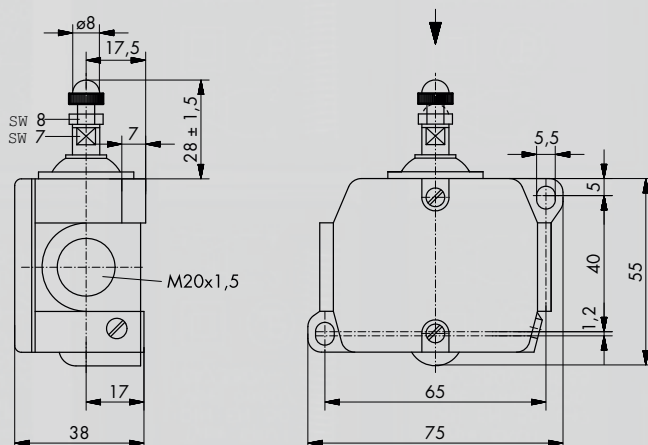
**GWA2-F
GWU2-F
GWE2-F
GWA3-F
GWE3-F**



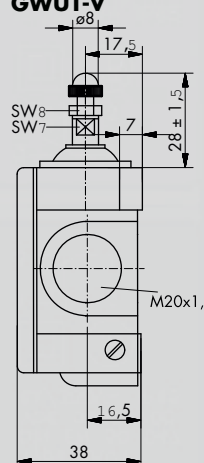
**GWÜ1-F
GWA2-E1-F**



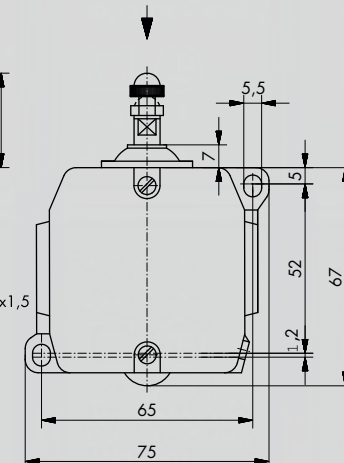
**GWU1-V
GWA1-V**



**GWA2-V
GWA2-V-Zw
GWU2-V
GWE2-V
GWE3-V
GWÜ1-V**



**GWA2-E1-V
GWA3-V**

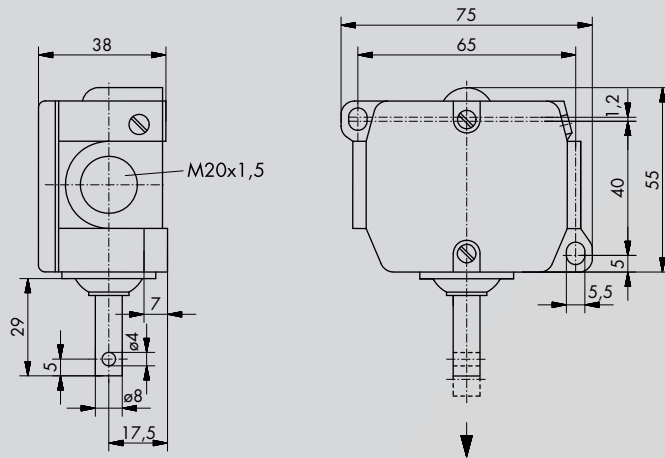


Limit Switches

GW/PW



GWU1-ZB
PWU1-ZB










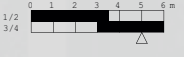
Limit Switches - O/P...Series

Operating and ambient conditions compliant to
 Degree of protection for P... series acc. to DIN 40050 IEC 144
 Degree of protection for O...series acc. to DIN 40050 IEC 144
 Contact base material
 Cover material (only on P...series)
 Transport, storage and operating temperature
 Screw clamp connection
 Terminal cross-section

Operating speed on plunger
 Mechanical life
 Operating force on plunger
 Insulation group acc. to DIN VDE 110
 Admissible on-load switching cycles
 Min. switching current using silver contacts
 Min. switching voltage using silver contacts
 Electrical life

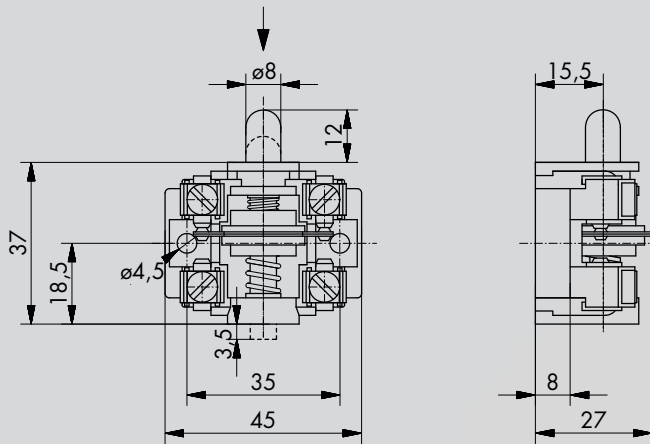
Max. rated current/AC
 Rated frequency
 Max. rated voltage

DIN IEC 721-3-1..3
 IP 10
 IP 00
 PA6
 PC
 -25°C up to +55°C
 M 4
 2x 0.75 ... 2.5 mm² solid, flexible
 multicore with ferrule 2x 0.75..1.5 mm²
 max. 0.25 m/s min. 1 mm/s AC; min. 20mm/s DC
 1x10.000.000 switching cycles
 P1/O1=7N P2/O2=16N
 C
 1200/h
 0.1A
 24V
 5x 100.000 switching cycles
 AC 380V/1A DC 220V/0,2A
 6A
 50....60Hz
 AC 380V
 DC 220V

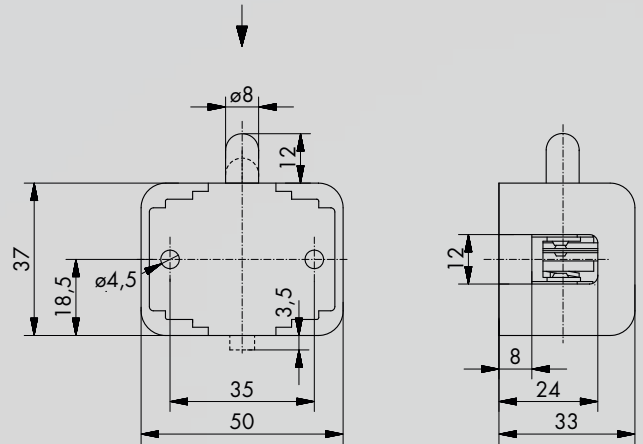
	IP00	IP10	IP00	IP10
1NC + 1NO 				
2NC 		PA2		PA2-R
2NO 		PE2		PE2-R
1NC + 1NO (overlapping) 		PÜ1		PÜ1-R

△ recommended operating travel
 ▲ positive opening

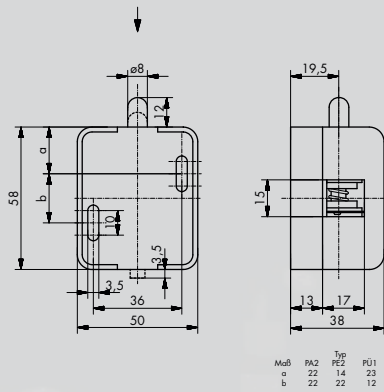
OU1



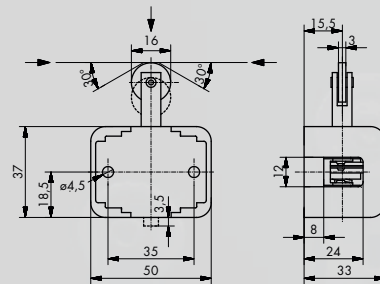
PUI



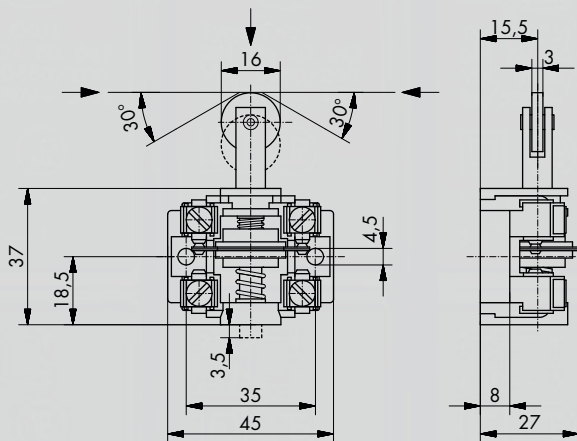
**PA2
PE2
PÜ1**



PUI-R



OU1-R



**PA2-R
PE2-R
PÜ1-R**

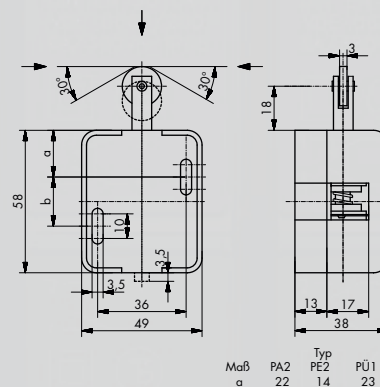









Illustration	Dimensions	Description	Type
		Actuator: rotary lever with spring rod for the EKU.. and K.. series	KDF
		Actuator: rotary lever with fibreglass rod for the EKU.. and K.. series	KDH
		Actuator: sliding lever for the EKU.. and K.. series	KG
		Actuator: lever for the EKU.. and K.. series	KH
		Actuator: toggle lever for the EKU.. and K.. series	KK
		Actuator: short roller set lever for the EKU.. and K.. series	KRH
		Actuator: adjustable roller set lever for the EKU.. and K.. series	KRHV

Illustration	Dimensions	Description	Type
		Actuator: angular lever for the EKU.. and K.. limit switches	KW
		Actuator: lever for the GW.. series	GWH
		Actuator: lever für Baureihe PW	PWH
		Dummy Plug for the EKU series	BS-EK
		cable feedthrough for the K.. series	KD-K
		Screwed cable gland with insulation displacement connection (IDC) for the EKU... series	SNT
		Cable Gland M16x1,5 M20x1,5 M25x1,5	KV-M16x1,5 KV-M20x1,5 KV-M25x1,5
		Screw plug M16x1,5 M20x1,5 M25x1,5	VS-M16x1,5 VS-M20x1,5 VS-M25x1,5

