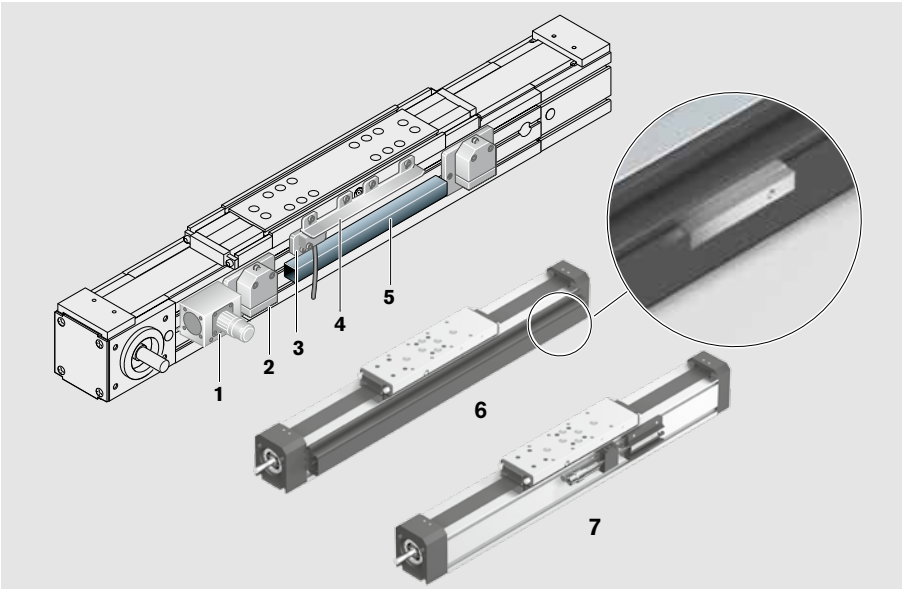
Switching System MKK, MKR, MLR

Overview of Switching System

Overview of the switching system

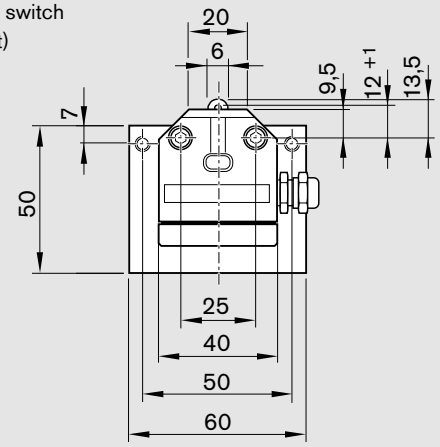
1 Socket and plug
2 Mechanical switch (with mounting accessories)
3 Proximity switch (with mounting accessories)
4 Switching cam
5 Cable duct (aluminum alloy)

6 Magnetic field sensor with mounting duct (MKK/MKR 12-40)
7 Magnetic field sensor with connector and sensor mount (MKK/MKR 12-40)



Mechanical switch (technical data)	
Repeatability	± 0.05 mm
Permissible ambient temperature	–5 °C to +80 °C
Protection class	DIN 40050 IP 67
Bounce time	< 2 ms
Insulation class	Group C as per VDE 0110
Rated voltage	250 V AC
Continuous current	5 A
Switching capacity at 220 V, 40–60 Hz	cosφ = 0.8 at 2 A
Contact resistance when new	< 240 mΩ
Connection type	Screw connector
Contact system	Single-pole changeover
Switching system	Snap-action
B_{10d} as per EN ISO 13849-1	1 000 000 switching cycles

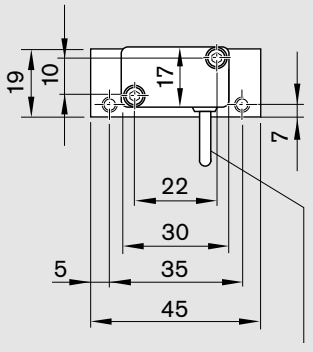
Mechanical switch (with mount)



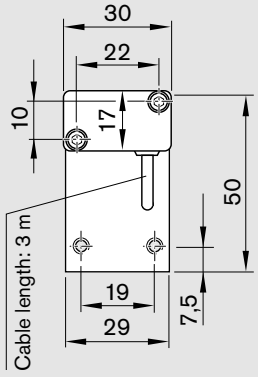
Further connection dimensions ☞ 112-113

Proximity switch with potted cable (3 x 0.14 mm² Unitronic) Technical data	
Housing form	NO
Minisensor	Form A DIN 41635
Operating voltage	10 ... 30 V DC
Residual ripple	≤ 10%
Load	200 mA
No-load current	≤ 20 mA
Switching frequency	max. 1500 Hz
Temperature-related shift in make point	≤ 4 µm/K
Output signal steepness	≥ 1V/µs
Repeatability of make point per EN 50008	≤ 0.1 mm
Cable length	3 m
$MTTF_d$ as per EN ISO 13849-1	30 – 100 years

Proximity switch (with mount) for frame sizes -40, -65, -80, -165



Proximity switch (with mount) for frame size -110



Further connection dimensions ☞ 112-113

Switch Mounting Arrangements MKK/MKR 12-40

Switch mounting arrangements for magnetic field sensors with mounting duct

1 Switch (magnetic field sensor) with potted cable
2 Cable
3 Mounting/cable duct

The switch activator is a magnet integrated in the carriage (no switching cam necessary).
The switch activation points can be positioned anywhere along the stroke.

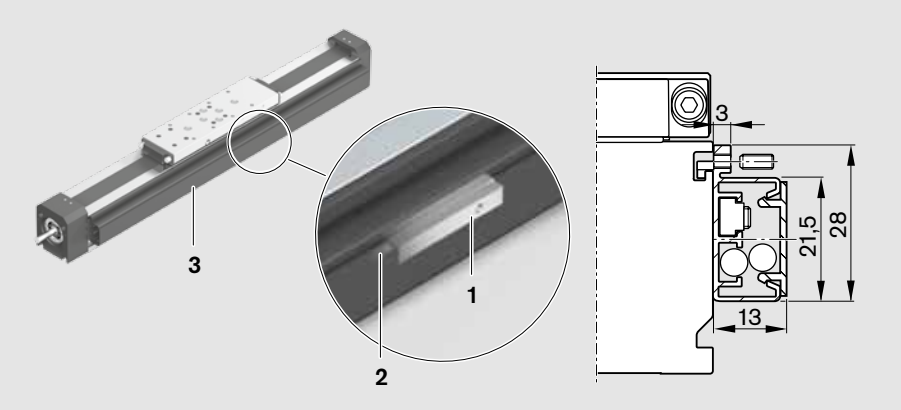
Version

– Hall sensor (PNP NC) or
– Reed sensor (changeover)

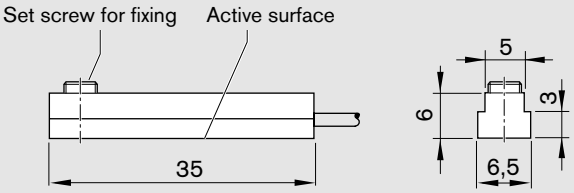
For technical data, see “Magnetic field sensor” on the next page.

Notes for mounting

The magnetic field sensors are pushed into the top T-slot in the cable duct and fixed with set screws. The cables are routed along the side of the T-slot.
For details regarding mounting and switch activation points, see mounting instructions. Sensors may only be mounted on one side (left or right) of the Linear Module and should not be installed until the Linear Module has been screwed down on its base.



Magnetic field sensor with potted cable



Switch mounting arrangements for magnetic field sensor with connector and sensor mount

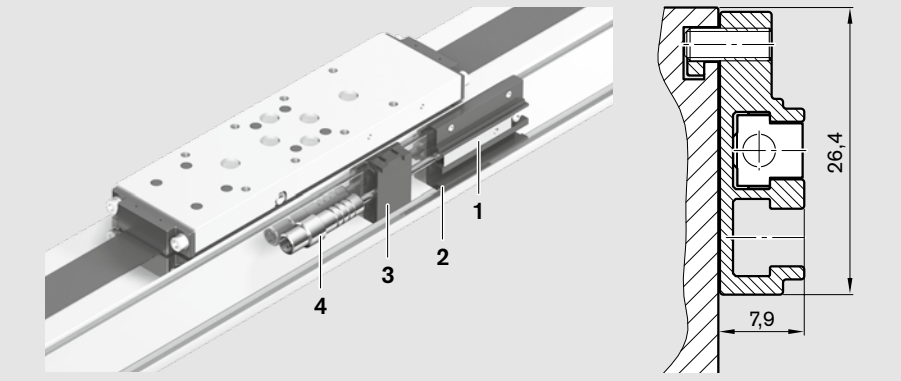
Sensor mounting kit

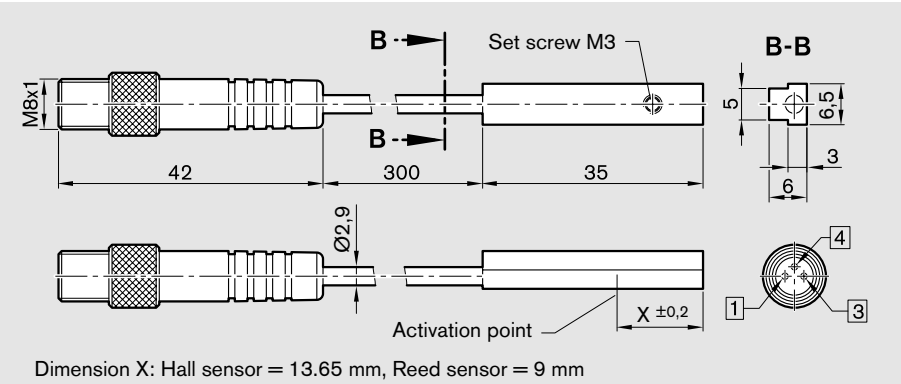
1 Sensor (Hall or Reed)
2 Sensor mount incl. set screws (loose) and square nut
3 Cable holder (3 pcs) incl. set screw (loose)
4 Plug

The switch activator is a magnet integrated in the carriage (no switching cam necessary).
The switch activation points can be positioned anywhere along the stroke.

Notes for mounting

Sensors may only be mounted on one side (left or right) of the Linear Module and should not be installed until the Linear Module has been screwed down on its base.
For a description of the mounting procedure and determination of the switch activation points, see the mounting instructions for Linear Modules.





Dimension X: Hall sensor = 13.65 mm, Reed sensor = 9 mm

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Switch Mounting Arrangements MKK/MKR 12-40

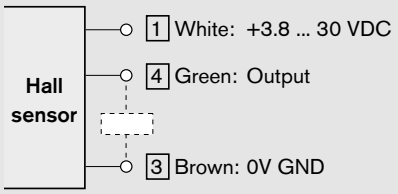
Magnetic field sensor

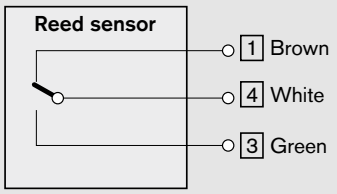
Technical data

Hall sensor	
Contact type	PNP NC
Operating voltage	3.8–30 V DC
Current consumption	max. 10 mA
Output current	max. 20 mA
Cable length	2 m /10 m
Protection class	IP 66
Short-circuit protection	No
Max. travel speed	2 m/s
$MTTF_d$	10 years
Part number	**Cable length**
R3476 010 03	2 m
R3476 017 03	10 m

Reed sensor	
Contact type	Changeover
Switching voltage	max. 100 V DC
Switching current	max. 0.5 mA
Cable length	2 m /10 m
Protection class	IP 66
Max. travel speed	2 m/s
Switching points	2
$MTTF_d$	10 years
Part number	**Cable length**
R3476 009 03	2 m
R3476 015 03	10 m

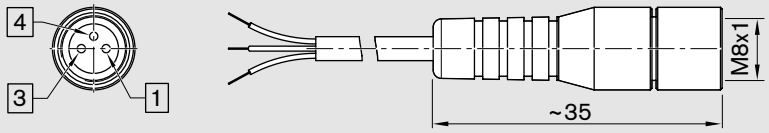
Pin assignment





Extension cable for sensor (Hall / Reed) with connector

The extension cable (approx. 5 m) is supplied complete with a female connector M8x1 for connection to the sensor.



Extension cable					
Part number	**Connector contact**	**1**	**3**	**4**	**Protection class**
R3476 025 03	to core	brown	blue	black	IP 66 when connected

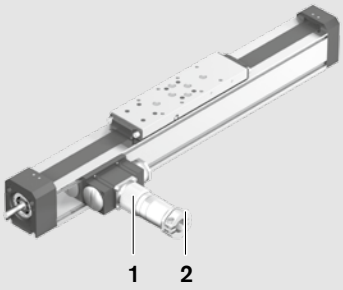
Socket-plug MKK/MKR 12-40

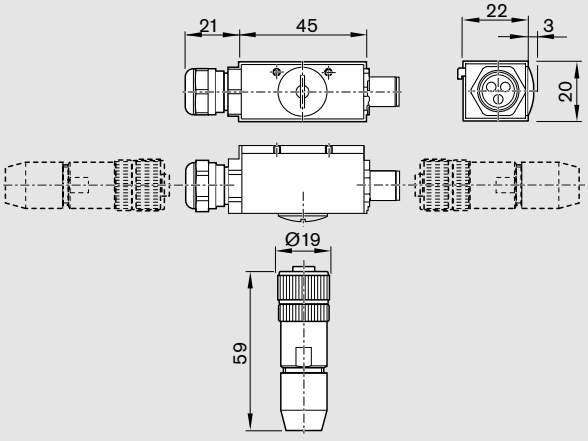
1 Socket
2 Plug

Notes
The socket and plug have 16 pins.
The socket and plug are not pre-wired.

Since the mounting arrangements allow shifting of the switches, the switch activation points can be optimized during start-up.
The plug can be mounted in three directions.

Part number
R1175 601 02



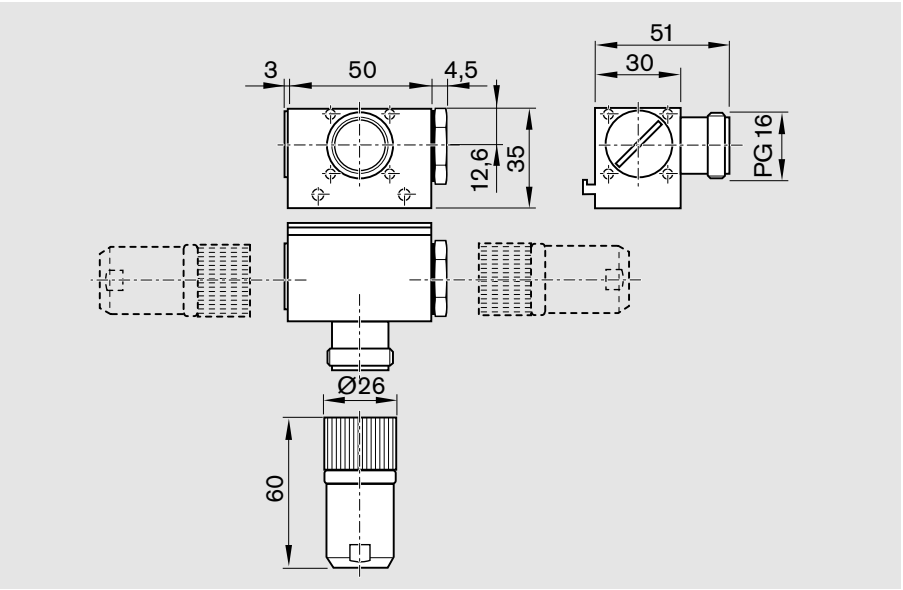


Switch Mounting Arrangements MKK/MKR/MLR 15-65 to 35-165

Socket-plug

- Attach the socket at the end with the most switches. (See example on next page.)

The socket and switch are not pre-wired. The switch activation points can thus be optimized during start-up. A plug is provided.
The plug can be mounted in three directions (see diagram).



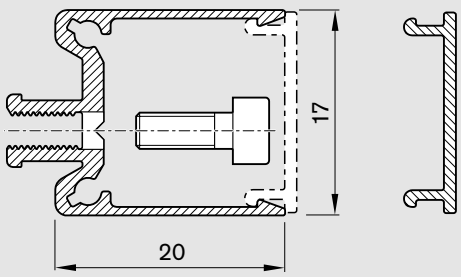
Ordering the switches and accessories

Item		Frame size				
		-40	-65	-80	-110	-165
1	Socket-plug	R1175 601 02	R1175 001 53			
2	Mechanical switch with accessories		R1175 001 51			
	Mechanical switch alone		R3453 040 16			
3	Proximity switch					
	– Accessories without switch	R1175 001 52	R1175 001 52	R1175 001 52	R1175 201 52	R1175 001 52
	– PNP NC	R3453 040 01	R3453 040 01			
	– NPN NC	R3453 040 02	R3453 040 02			
	– PNP NO	R3453 040 03	R3453 040 03			
	– NPN NO	R3453 040 04	R3453 040 04			
4	Switching cam	R1175 001 50	R1175 001 50			
5	Cable duct	R0396 620 18	R0396 620 17			

Cable duct

- The cable duct is fastened in the T-slots on the side of the frame. Fastening screws widen the profile and give the cable duct a secure hold.

For the slot position, see “Components and Ordering Data” tables and “Dimensions”. The cable duct will accommodate up to two cables for mechanical switches and three cables for proximity switches. Fastening screws and cable grommets are included.

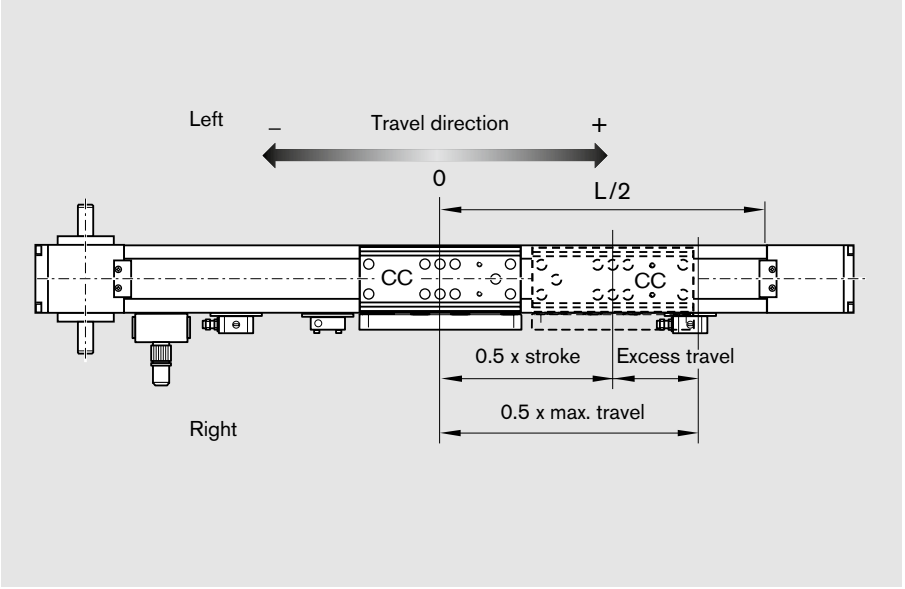


Switching System MKK, MKR, MLR

Mounting Examples for Mechanical/Proximity Switches

Determining the switch activation points

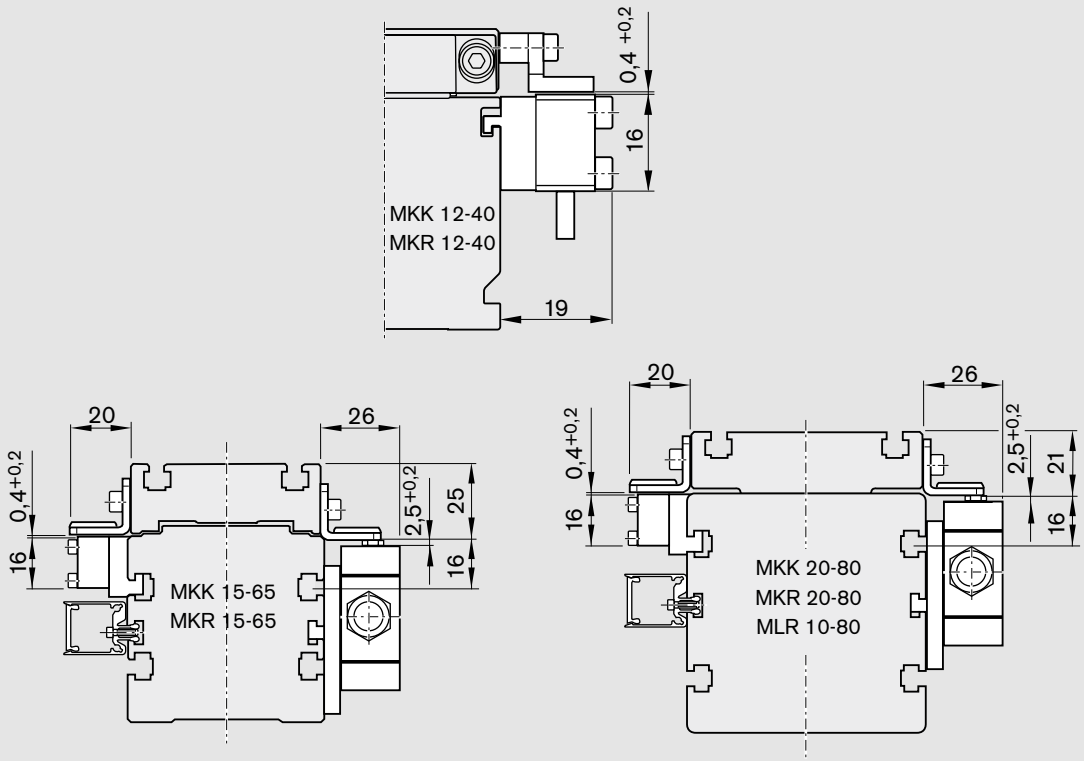
Switching distance: The switching distance is the distance between the carriage center (CC) and the zero point (0) when a switch is activated (given in mm).
Example for a mechanical limit switch (provided the zero point is at L/2):
Maximum switching distance =
= 0.5 x (max. travel) – excess travel
= 0.5 x stroke
For safe operation of the Linear Module, the excess travel must be longer than the braking distance.
For MKR... and MLR...:
The acceleration travel s_a can be taken as a guideline value for the braking distance.
For MKK...:
In most cases the recommended limit for excess travel (braking path) is:
Excess travel = 2 x screw lead P

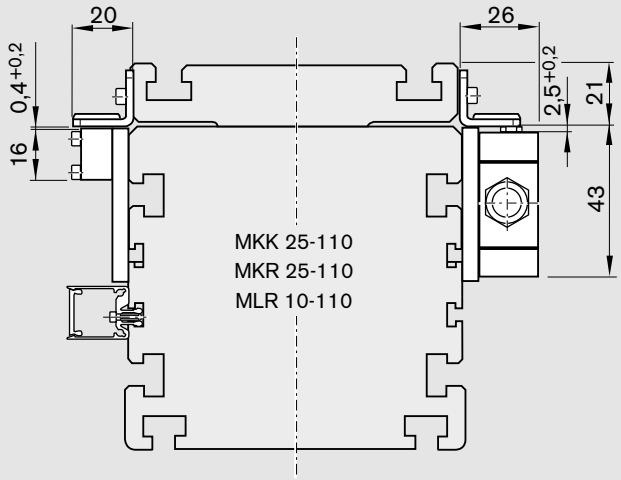


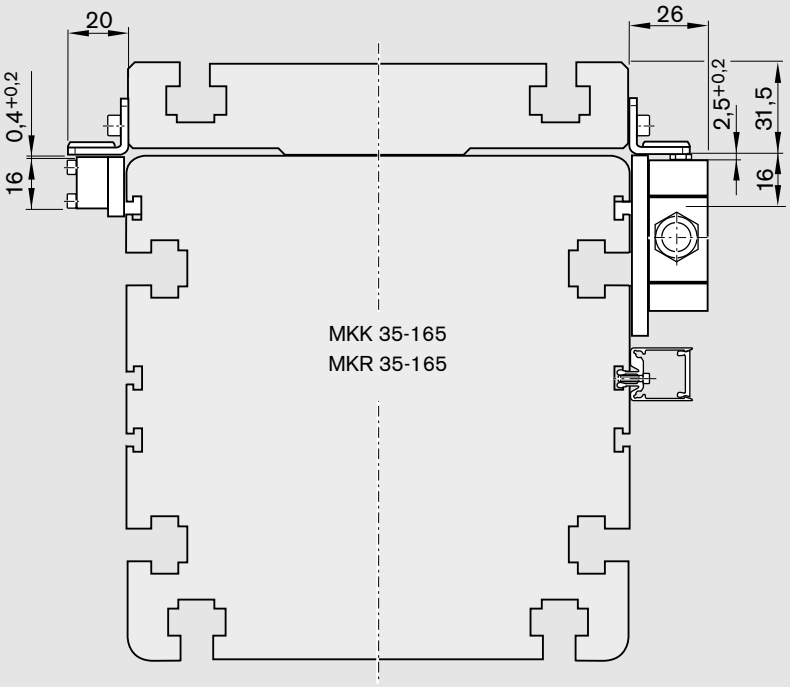
Recommended standard configuration:
– 2 mechanical switches
– 1 proximity switch
Slide the mounting plates with switches into the slot and fix with two set screws.

Take note of the minimum switching distance (determined by the mounting accessories):

mechanical-mechanical	=	60 mm
mechanical-proximity	=	45 mm
proximity-proximity	=	28 mm




20
26
0,4+0,2
16
2,5+0,2
21
43
MKK 25-110
MKR 25-110
MLR 10-110


20
26
0,4+0,2
16
2,5+0,2
31,5
16
MKK 35-165
MKR 35-165