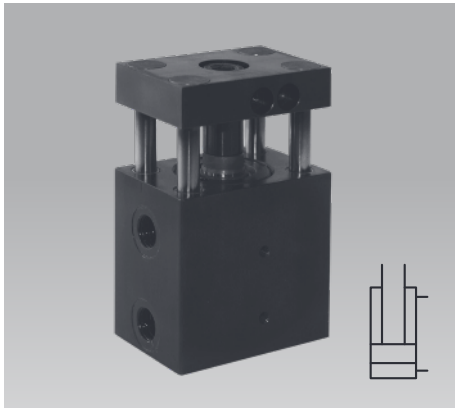


RM Mini Slide with optional position monitoring double acting, max. operating pressure 500 bar



Description

The RM mini slide is a compact block cylinder with 4 integrated guide rods which are also in the position to compensate side loads and moments.

Threads can be provided in the front block for fixing of the working loads or tools (see page 4). To avoid a possible point of squeezing between the front block and the cylinder the safety distance of 25 mm as per DIN EN 349 is maintained.

The RM mini slides can certainly be delivery equipped with position monitoring by limit switches or inductive sensors (see page 6).

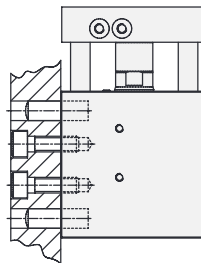
Advantages

- 4 sizes each with 3 stroke lengths
- Compact block design
- 2 fixing possibilities
- 2 connecting possibilities
- Guide rods made of nitriding steel
- Safety distance against squeezing of fingers
- Optional position monitoring with limit switches or inductive sensors
- Standard FKM-seals
- Temperature range -20...+150 °C
- Maintenance free

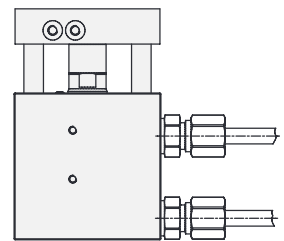
Areas of application

- Tool manufacture
- Mould making
- Metal forming
- Pressing
- Punching
- Deburring
- Perforating
- Power workholding
- Assembly technology

Fixing possibilities



Connecting possibilities



Important notes

The RM mini slide must never be operated with the delivered front block only, i.e. without working load (see application example).

Reason: In order to spare overall length, the guide rods with collar are plugged in from the front into the counterbores of the front block. Locking in the other direction has to be effected by the screwed on working load (tool fixing plate). All 4 counterbores have to be covered at least partially (see page 4).

The safety distance of 25 mm between the front block and the cylinder has to avoid squeezing of the fingers. A complete protection is however only possible by mounting further safety devices, which is the responsibility of the machine tool manufacturer.

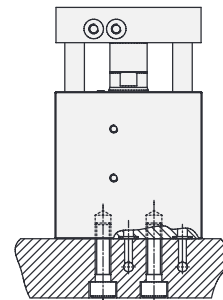
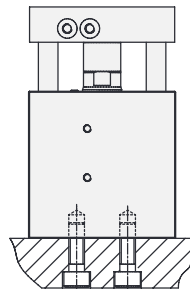
If the RM mini slide is secured so that injuries of the operator are excluded even in the setting mode, the distance bushing between the front block and the piston rod can be removed. The total length is reduced by 15 up to 18 mm (dimension c1).

The RM mini slide has to be efficiently protected against swarf, aggressive coolants and welding spatter.

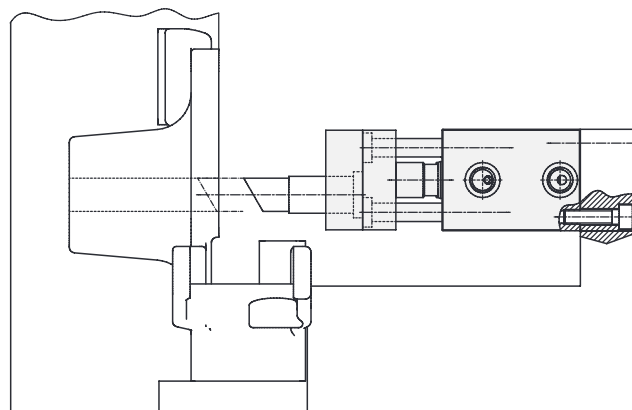
Operating conditions, tolerances and other data see data sheet A 0.100.

See also recommendations on page 5.

Cylinders must be backed up for operating pressures exceeding 100 bar or secured by dowel pins.

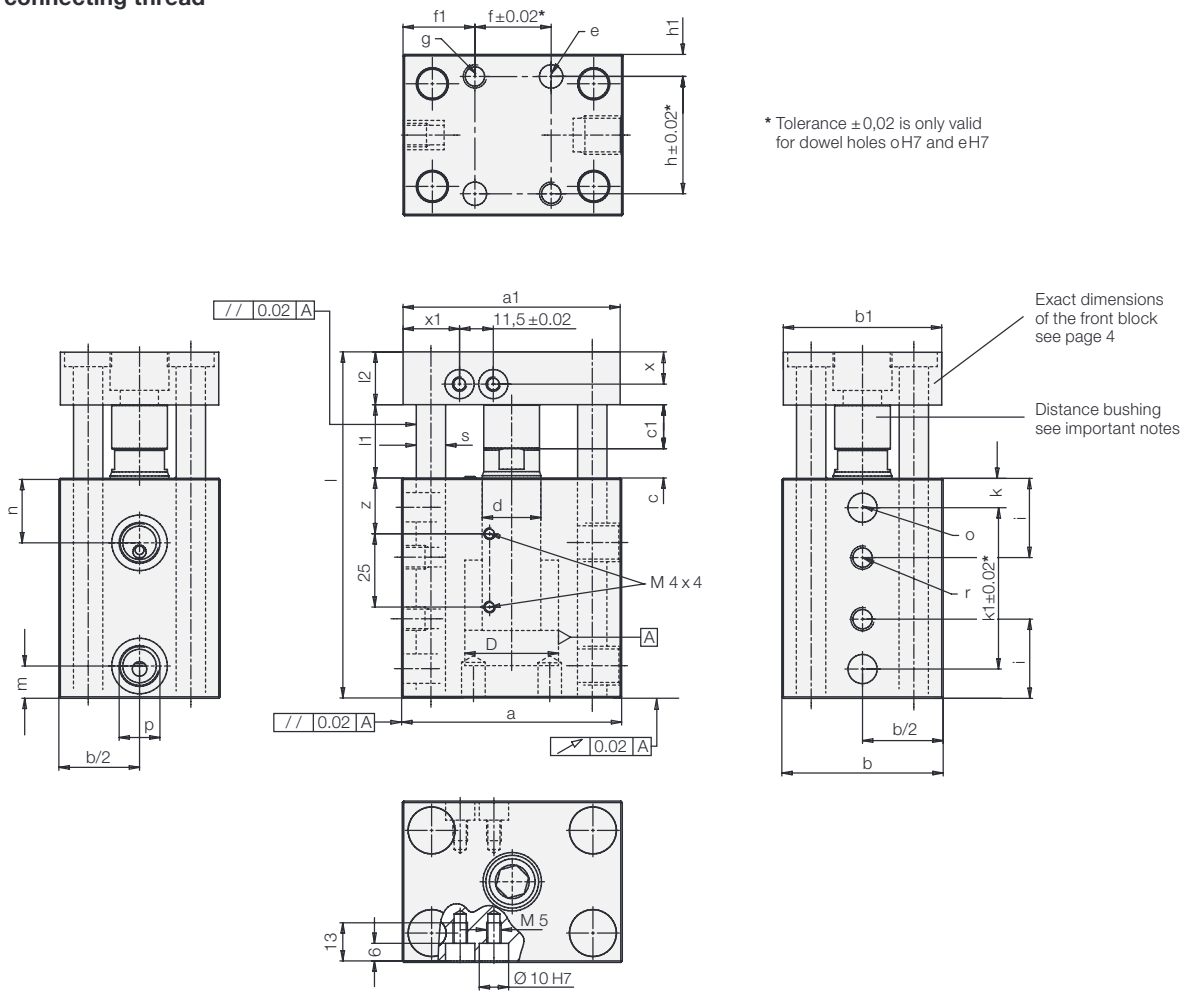


Application example for deburring tools

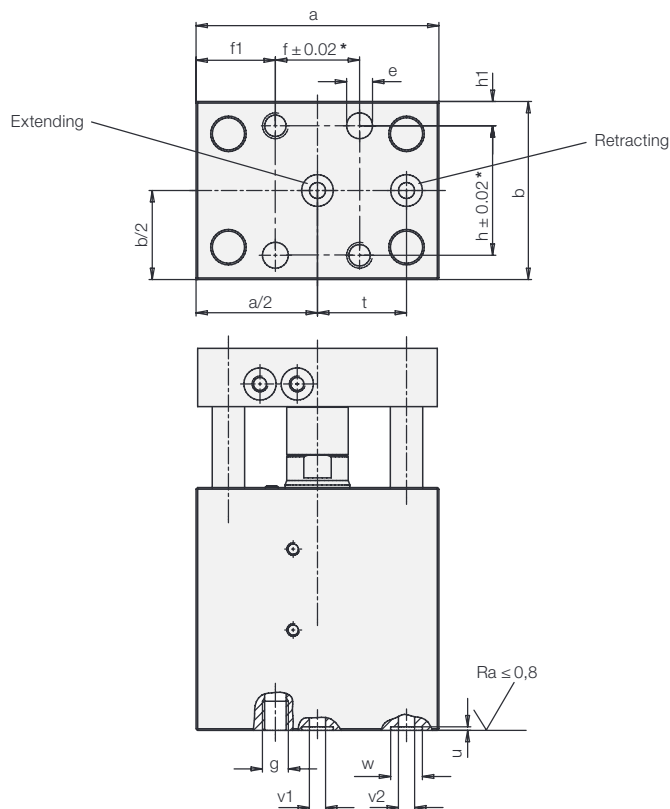


Technical data and dimensions

Versions with connecting thread



Version for manifold mounting with O-ring sealing



Part numbers

| | | | | | | |
|--------------------------------|-------------------|--------------------|----------------|----------------|----------------|----------------|
| Piston Ø D | | [mm] | 25 | 32 | 40 | 50 |
| Rod Ø d | | [mm] | 16 | 20 | 25 | 32 |
| Force to push at | 100 bar | [kN] | 4.9 | 8 | 12.6 | 19.5 |
| | 500 bar | [kN] | 24.5 | 40.2 | 62.8 | 98.5 |
| Force to pull at | 100 bar | [kN] | 2.9 | 4.9 | 7.7 | 11.6 |
| | 500 bar | [kN] | 14.5 | 24.5 | 38.3 | 57.9 |
| Oil volume per 10 mm stroke | Stroke to extend | [cm ³] | 4.91 | 8.05 | 12.56 | 19.63 |
| | Stroke to retract | [cm ³] | 2.9 | 4.9 | 7.7 | 11.6 |
| a | | [mm] | 65 | 75 | 85 | 100 |
| a1 | | [mm] | 64 | 74 | 84 | 99 |
| b | | [mm] | 45 | 55 | 63 | 75 |
| b1 | | [mm] | 44 | 54 | 62 | 74 |
| c | | [mm] | 7 | 10 | 10 | 10 |
| c1 | | [mm] | 18 | 15 | 15 | 15 |
| e | | [mm] | 8H7 x 8 deep | 8H7 x 8 deep | 10H7 x 10 deep | 12H7 x 12 deep |
| f | | [mm] | 26 | 26 | 33 | 40 |
| f1 | | [mm] | 19.5 | 24.5 | 26 | 30 |
| g | | [mm] | M8x9 | M8x9 | M10x10 | M12x12 |
| h | | [mm] | 32 | 40 | 48 | 57 |
| h1 | | [mm] | 6.5 | 7.5 | 7.5 | 9 |
| i | | [mm] | 24 | 27 | 28 | 34 |
| k | | [mm] | 10 | 10 | 11 | 14 |
| k1 | | [mm] | 24 + stroke | 30 + stroke | 32 + stroke | 37 + stroke |
| l1 | | [mm] | 25 | 25 | 25 | 25 |
| l2 | | [mm] | 15 | 18 | 25 | 28 |
| m | | [mm] | 11 | 11 | 11 | 13 |
| n | | [mm] | 18 | 22 | 24 | 27 |
| o | | [mm] | 8H7 x 8 deep | 10H7 x 10 deep | 12H7 x 10 deep | 16H7 x 13 deep |
| p | | | G 1/4 | G 1/4 | G 1/4 | G 1/4 |
| r | | [mm] | M 8x8 | M 8x8 | M 10x10 | M 12x12 |
| s | | [mm] | 8 | 10 | 12 | 16 |
| t | | [mm] | 25 | 27.5 | 31.5 | 38 |
| w +0.2 | | [mm] | 9.8 | 9.8 | 9.8 | 10.8 |
| u ±0.05 | | [mm] | 1.1 | 1.1 | 1.1 | 1.1 |
| v1 extend | | [mm] | 4 | 5 | 6 | 6 |
| v2 retract | | [mm] | 4 | 4.5 | 4.5 | 6 |
| z ±0.2 | | [mm] | 25 | 19 | 22 | 32 |
| Dimensions O-ring | | | 7x1.5 | 7x1.5 | 7x1.5 | 8x1.5 |
| Part no. O-Ring (FKM) | | | 3001077 | 3001077 | 3001077 | 3000275 |

Part no. double acting with connecting thread

| | | | | | |
|--------------------|------|------------------|------------------|------------------|------------------|
| Stroke ± 1 | [mm] | 20 | 25 | 25 | 25 |
| Total length l ± 1 | [mm] | 104 | 118 | 129 | 143 |
| Weight | [kg] | 1.6 | 2.8 | 4.1 | 6.4 |
| Part no. | | RM3020 10 | RM4025 10 | RM5025 10 | RM6025 10 |
| Stroke ± 1 | [mm] | 50 | 50 | 50 | 50 |
| Total length l ± 1 | [mm] | 134 | 143 | 154 | 168 |
| Weight | [kg] | 2.2 | 3.7 | 5.1 | 7.8 |
| Part no. | | RM3050 10 | RM4050 10 | RM5050 10 | RM6050 10 |
| Stroke ± 1 | [mm] | 100 | 100 | 100 | 100 |
| Total length l ± 1 | [mm] | 184 | 193 | 204 | 218 |
| Weight | [kg] | 3.8 | 5.5 | 7.1 | 10.8 |
| Part no. | | RM3100 10 | RM4100 10 | RM5100 10 | RM6100 10 |

Temperature range -20... +150 °C

For versions with position monitoring consider environmental temperature of the switches indicated on page 6.

Order number key:

RMXXX 10 - version without position monitoring

RMXXX 11 - version with 1 inductive sensor at the right side

RMXXX 12 - version with 2 inductive sensors at the right side

RMXXX 13 - version with 1 limit switch at the right side

RMXXX 14 - version with 2 limit switches at the right side

RMXXX 15 - version with 1 inductive sensor at the left side

RMXXX 16 - version with 2 inductive sensors at the left side

RMXXX 17 - version with 1 limit switch at the left side

RMXXX 18 - version with 2 limit switches at the left side

Versions for manifold mounting with O-ring sealing at the bottom (O-rings are included in the delivery).

RMXXXXXB

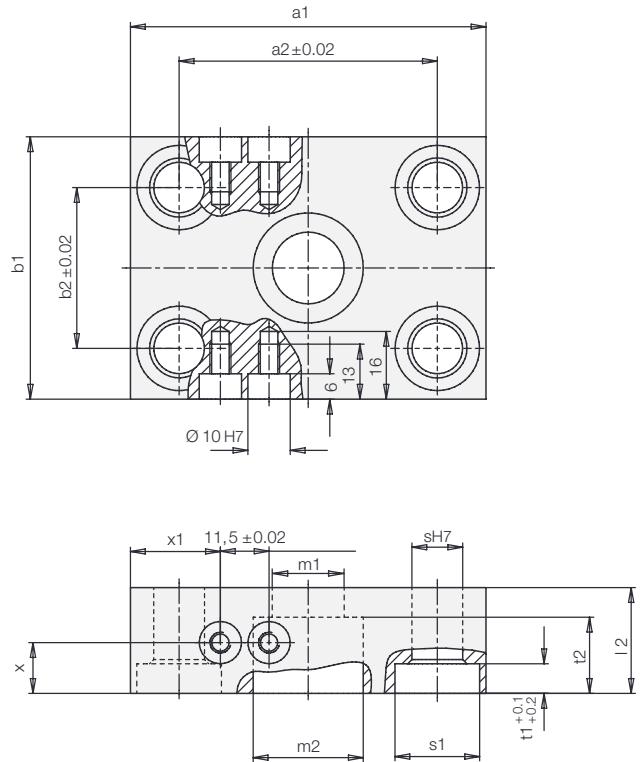
Dimensioning of the front block Position of the position monitoring

Dimensioning of the front block

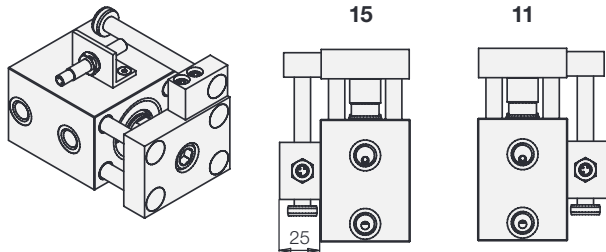
To fix the working load (tool fixing plate) threads and possibly dowel holes have to be provided in the front block. The exact dimensioning of the front plate facilitates their arrangement so that a collision with existing bore holes can be avoided.

The tool fixing plate has to cover at least partially the 4 counterbores.

| | RM3 | RM4 | RM5 | RM6 |
|-----------------|----------------|----------------|----------------|----------------|
| a1 | 64 | 74 | 84 | 99 |
| a2 | 48 | 55 | 61 | 74 |
| b1 | 44 | 54 | 62 | 74 |
| b2 | 28 | 35 | 38 | 45 |
| l2 | 15 | 18 | 25 | 28 |
| t1 | 5 | 5 | 7 | 7 |
| t2 | 11 | 13 | 18 | 22 |
| m1 | 10.5 | 13 | 17 | 21 |
| m2 | 18 | 20 | 26 | 33 |
| s | 8 | 10 | 12 | 16 |
| s1 | 14 | 16 | 18 | 22 |
| x | 9 | 11 | 12 | 11 |
| x1 | 19.25 | 19.25 | 21.25 | 24.25 |
| Weight [kg] | 0.25 | 0.44 | 0.80 | 1.20 |
| Part no. | 3538568 | 3538569 | 3538570 | 3538571 |



Position of the position monitoring

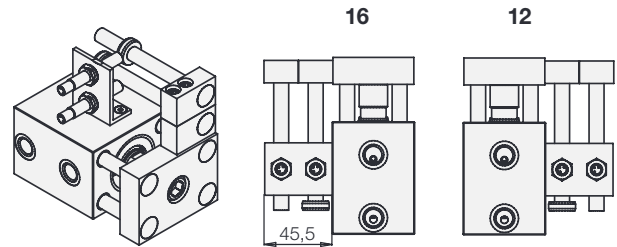


Single inductive monitoring

RMXXX11 = monitoring at the right side

RMXXX15 = monitoring at the left side

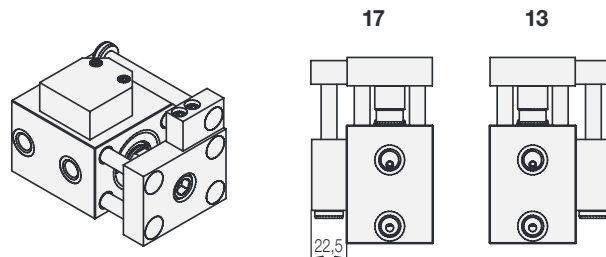
The switching point is selectable by displacing the control cam on the switch rod.



Double inductive monitoring

RMXXX12 = monitoring at the right side

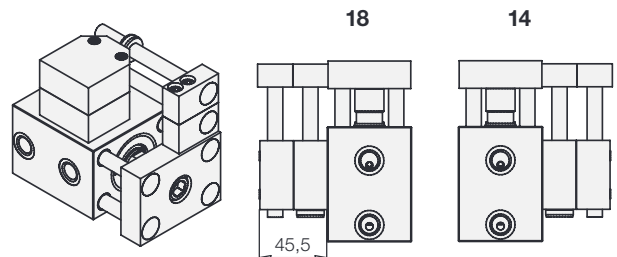
RMXXX16 = monitoring at the left side



Single limit switch monitoring

RMXXX13 = monitoring at the right side

RMXXX17 = monitoring at the left side



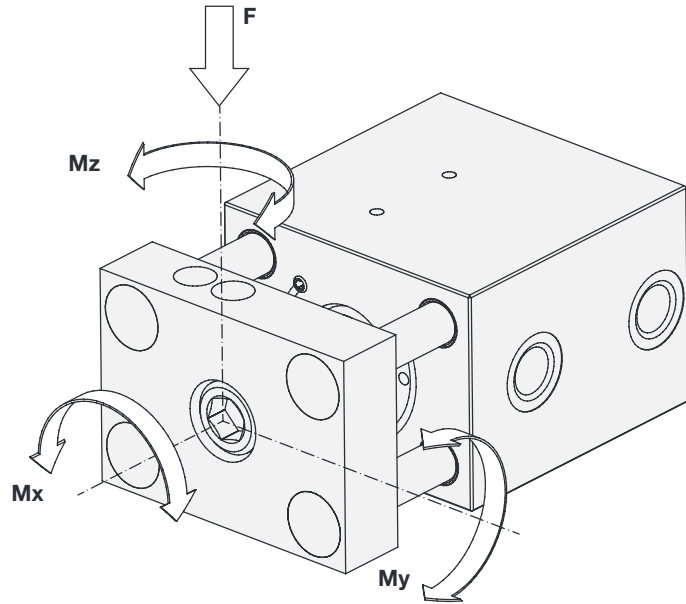
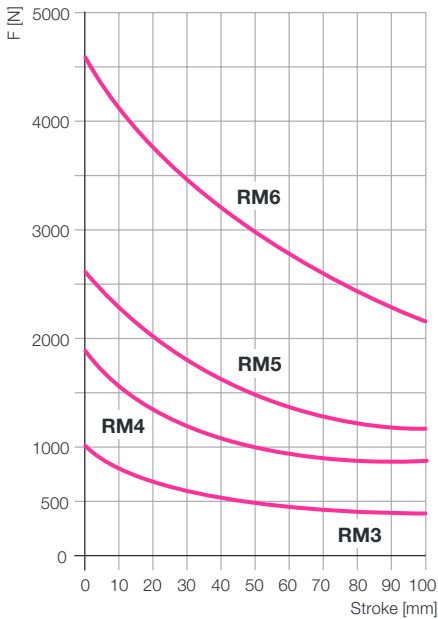
Double limit switch monitoring

RMXXX14 = monitoring at the right side

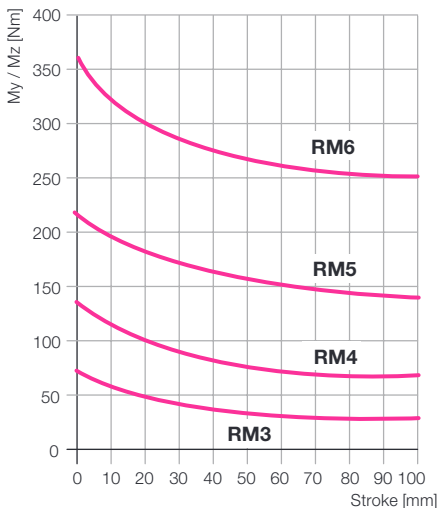
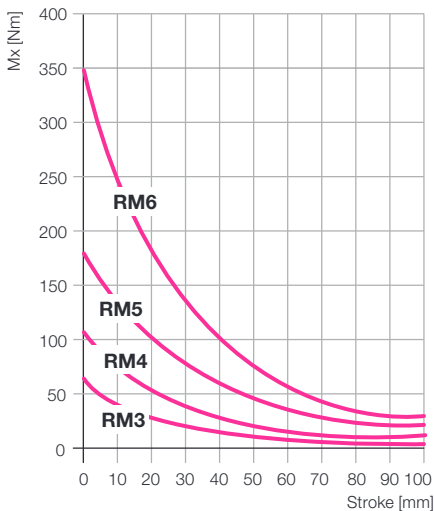
RMXXX18 = monitoring at the left side

Moments and side loads Recommendations

Maximum side load F as a function of the stroke



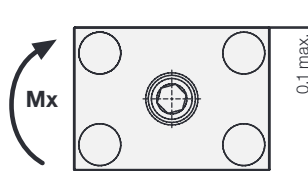
Recommended maximum moments as a function of the stroke



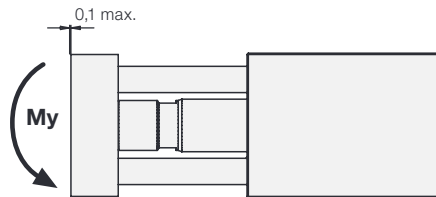
Load of the front block

If the front block is loaded with side loads and moments, guide rods will be deformed. This deformation is as bigger as longer the stroke. The following assumptions are valid for the maximum moments and side loads recommended in the diagrams:

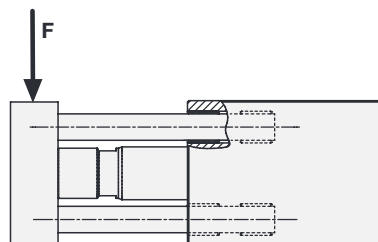
1. Moment M_x must distort the front block by maximally 0.1 mm.



2. The moments M_y or M_z may tilt the front block by maximally 0.1 mm.



3. The maximum side load F must not exceed the admissible load of the rod guide.



The maximum side load as per diagram utilizes the whole capacity of the guide rods regardless of their deflection. For the recommended moments a limit value of 0.1 mm is assumed. Certainly the system will withstand considerably higher values, but the deformations are no longer acceptable in applications. Here the RM mini slide reaches its limits.

Recommendations:

1. Introduce the forces in the centre of the guide plate to use the force potential of the RM mini slide.
2. Select the cylinder stroke as short as possible.
3. Keep the working load (tool weight) as low as possible.
4. The RM mini slide has no stroke end cushioning. Therefore do not use the whole stroke, but push the tool against an external stop. This is above all indicated for high loads and/or high piston speed.

Technical data

Inductive sensor • Limit switch

Inductive sensor

General data

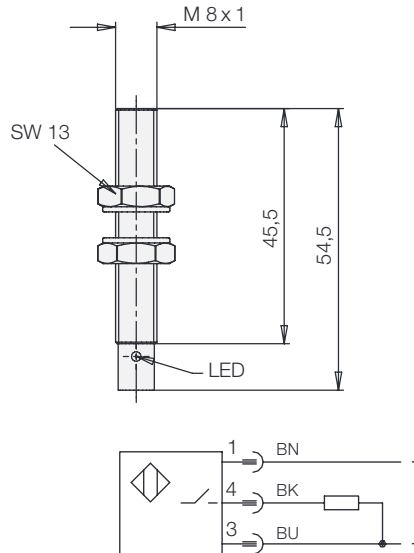
| | | |
|----------------------------------|------|----------------|
| Type of installation | | flush mounting |
| Rated operating distance S_n | [mm] | 1,5 |
| Secured operating distance S_a | [mm] | 0... 1.2 |
| Repeatability | [%] | ≤ 5 |
| Hysteresis | [%] | ≤ 15 |
| Environmental temperature | [°C] | -25... +70 |
| Degree of contamination | | 3 |
| Stand-by delay | [ms] | ≤ 10 |

Mechanical data

| | | |
|--------------------------|------|-----------------|
| Shape in mm | [mm] | M 8 |
| Material of the body | | stainless steel |
| Material of sensing face | | PBTP |
| Code class | [IP] | IP 67 |
| Connection | | plug S49 |

Electrical data

| | | |
|------------------------------------|------------|----------------|
| Voltage | | DC |
| Wiring | | 3 wires |
| Switching function | | interlock |
| Output signal | | pnp |
| Rated operating voltage | [V] | 24 DC |
| Rated operating current | [mA] | 200 |
| Operating voltage U_b | [V] | 10...30 DC |
| Residual ripple | % v. U_b | ≤ 15 |
| Mains frequency | [Hz] | |
| Switching frequency | [Hz] | 3000 |
| No-load current | [mA] | ≤ 8/≤ 1 |
| Voltage drop | [V] | ≤ 1,5/- |
| Short circuit protection | | yes |
| Protection against reverse battery | | yes |
| Part no. | | 3829164 |



Accessories for inductive sensor

Connecting cable with right angle plug

| | | |
|-----------------------------|--|----------------|
| Voltage | 10 – 30 V DC | |
| Protection as per DIN 40050 | IP 67 | |
| Environmental temperature | -25 °C up to +90 °C | |
| Plug connection | M8 plug | |
| LED | Voltage (green) Function display (yellow) | |
| Cable, length of cable | PUR, 5 m | |
| Output, interlock | pnp | nnp |
| Part no. (1 off) | 3829099 | 3829124 |

Limit switch

| | | |
|---|----------------------|--|
| Material of the body | | aluminium diecasting |
| Code class as per DIN 40050 | | IP67 |
| Class as per VDE 0660 part 200 | | 30x10 ⁶ mechanical switching examples |
| Environmental temperature | [°C] | -5 up to +80 |
| Switching principle | | snap switch |
| Switching elements | | 1 make contact + 1 break contact |
| Connection | | soldered connection |
| Cross section of the connection max. | [mm ²] | 1 |
| Make time | [ms] | < 5 |
| Bounce time | [ms] | < 3 |
| Max. switching frequency | [min ⁻¹] | 200 |
| Nominal switch off capacity | | 24V/2A |
| Switching voltage min. | [V] | 12 |
| Min. switching current at 12 V | [mA] | 10 |
| Short circuit protection (control fuse) | | 6A slow – 10A fast |
| Part no. | | 3829222 |

