

PNEUMATIC LINEAR ACTUATORS (SERIES M25)

- Winner of the IF Design Award in Hannover.
- 25mm Bore.
- 50/100/160/200/300/400 mm strokes.
- Zero backlash.
- Extremely high rigidity.
- 25 million cycles maintenance-free.
- Hydraulic shock absorbers (not supplied with M25...E).
- 6 integrated air leads for compressed air distribution (not supplied with M25...E).
- Optional magnetic sensors.

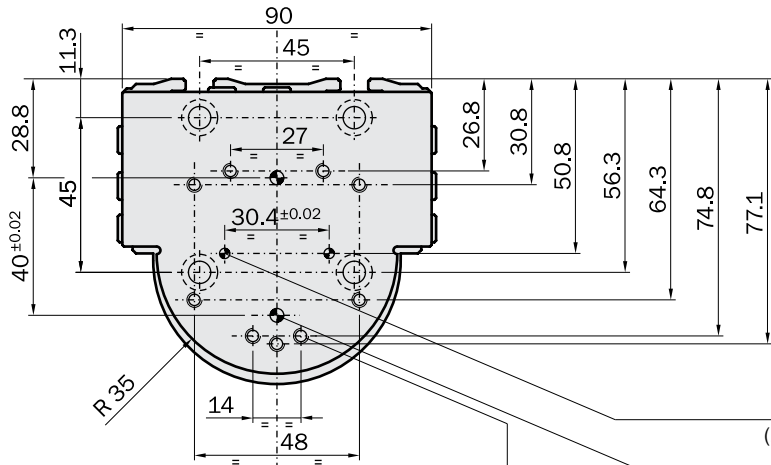


LINEAR ACTUATORS

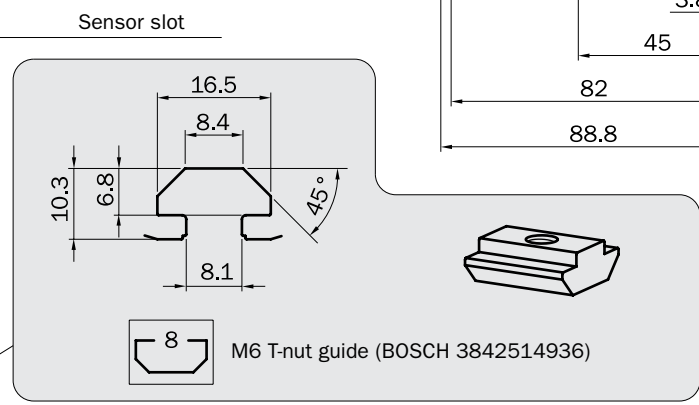
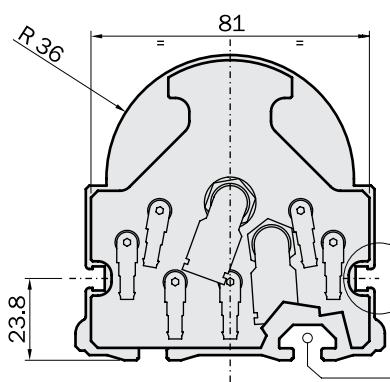
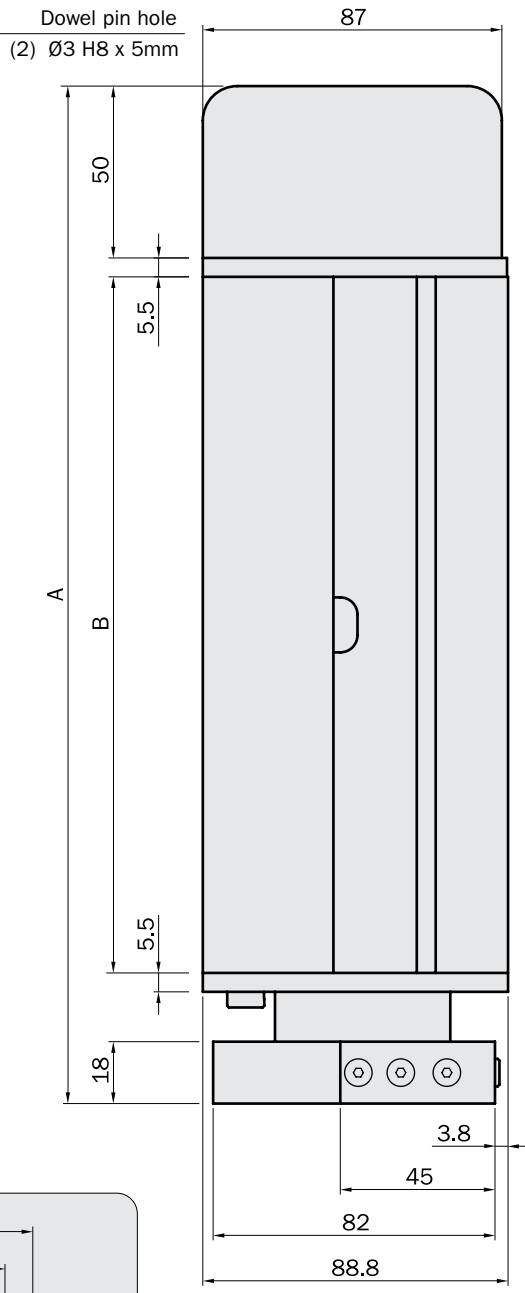
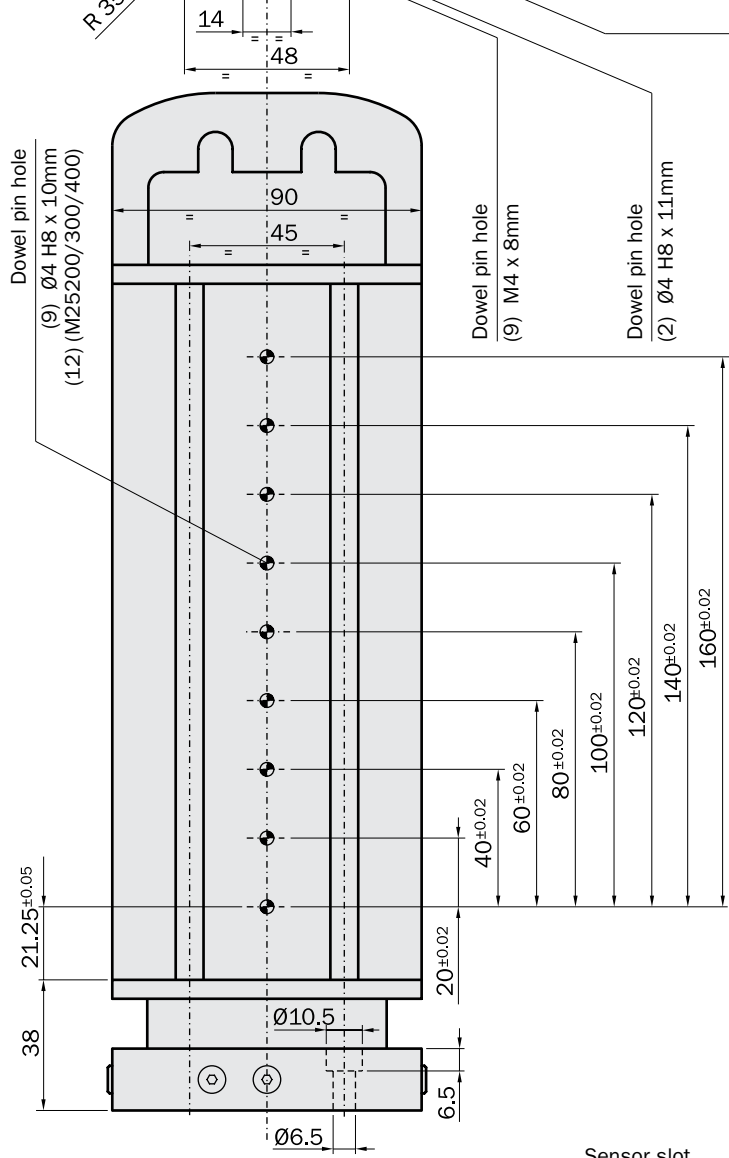
| | M2550 M2550E | M25100 M25100E | M25160 M25160E | M25200 M25200E | M25300 M25300E | M25400 M25400E |
|---------------------------|---|-----------------------|-----------------------|------------------------|------------------------|-----------------------|
| Price | \$1245.00 \$716.00 | \$1343.00 \$813.00 | \$1444.00 \$912.00 | \$1537.00 \$1004.00 | \$1652.00 \$1120.00 | \$1758.00 1223.00 |
| Medium | Filtered compressed air, lubricated or non-lubricated | | | | | |
| Pressure range | 44-116 psi | | | | | |
| Temperature range | 41-140 °F | | | | | |
| Max stroke | 1.968" (50 mm) | 3.937" (100 mm) | 6.299" (160 mm) | 7.874" (200 mm) | 11.811" (300 mm) | 15.748" (400 mm) |
| Max opening adjustment | 0.984" (25 mm) | | | | | |
| Max closing adjustment | 0.984" (25 mm) | | | | | |
| Thrust force | 39.6 lbf (58 psi) | | 59.6 lbf (87 psi) | | 79.6 lbf (116 psi) | |
| Pull force | 33.3 lbf (58 psi) | 49.9 lbf (87 psi) | | 66.7 lbf (116 psi) | 297 N (116 psi) | |
| Repetition accuracy | 0.000787" (0.02 mm) | | | | | |
| Air consumption per cycle | 4.57 in ³ | 7.38 in ³ | 10.74 in ³ | 13.18 in ³ | 18.79 in ³ | 24.34 in ³ |
| Weight | 6.17 lb (2800g) | 7.49 lb (3400g) | 8.59 lb (3900g) | 10.36 lb (4700g) | 12.35 lb (5600g) | 14.11 lb (6400g) |

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DIMENSIONS (mm)



| | A | B |
|--------|-----|-------|
| M2550 | 296 | 202.5 |
| M25100 | 346 | 252.5 |
| M25160 | 406 | 312.5 |
| M25200 | 496 | 402.5 |
| M25300 | 596 | 502.5 |
| M25400 | 696 | 602.5 |



LINEAR ACTUATORS

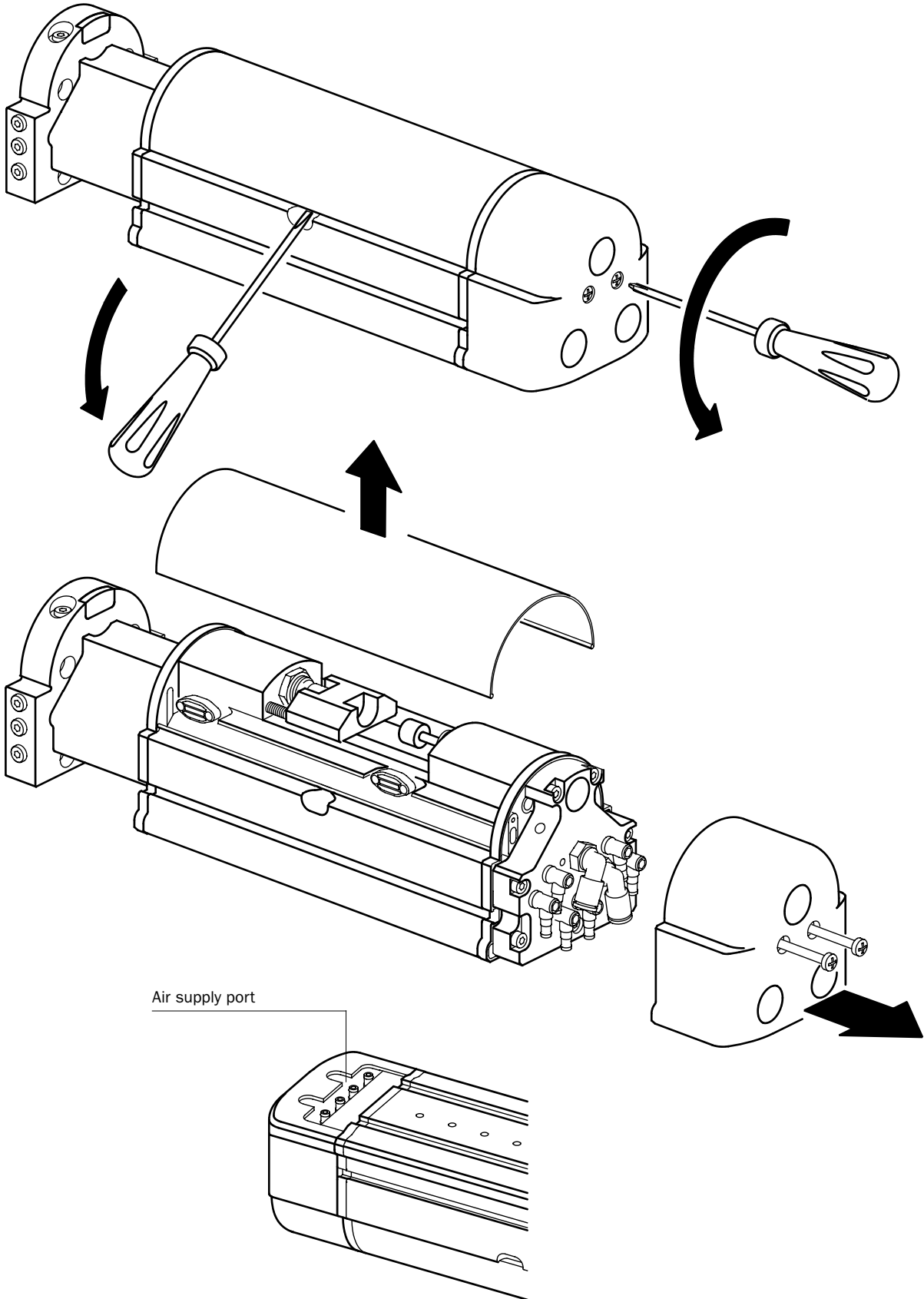
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COVERS

To access the supply area where the air supply fittings are located, remove the (2) bolts and remove the cover.

To access the shock absorbers, insert a screwdriver under the edge shown in the drawing below, bend the cover by just a few millimeters and remove it.

Sensor cables can be housed under the cover.



STROKE ADJUSTMENT

The stroke can be reduced by 25mm on both directions, by adjusting the position of the hydraulic shock absorbers (E). To change the position of the shock absorber, (E), loosen the nut (D), adjust the shock absorber with a screw driver and re-tighten the nut.

The bolts (C) are used as position settings only when a shock absorber needs to be replaced to avoid re-setting of the actuator.

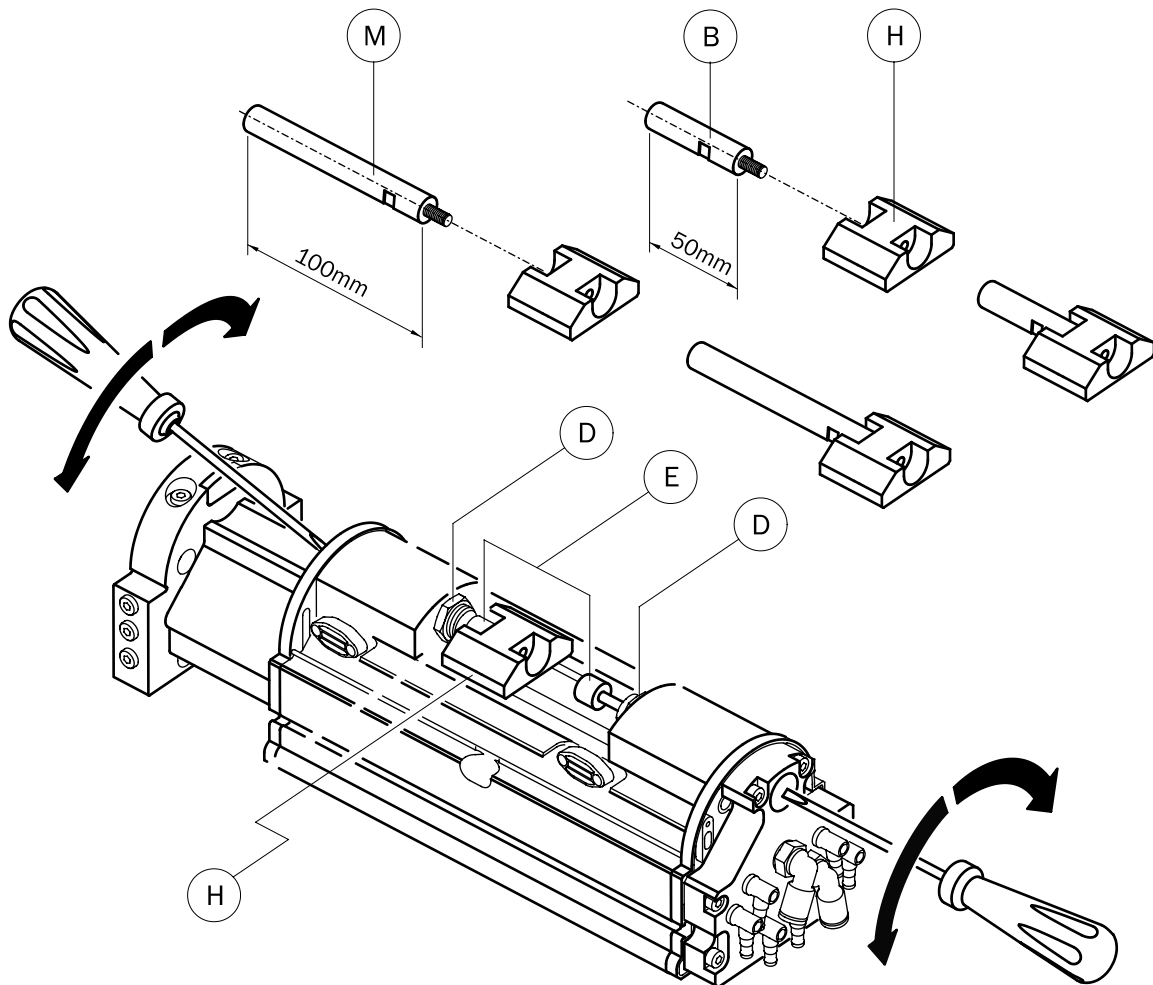
The bolts should never be used as mechanical stops. Loosen the grub screw (F), put the bolt (C) against the block (H), and tighten the grub screw (F).

Replace the shock absorber and then replace the bolt (C) to its original position.

During normal operation, the screws (C) must not come into contact with the block (H) and do not use them as mechanical stops.

If necessary, the stroke can be further reduced by using the optional pins M2550-25 (B) or M2550-27 (M). These pins can be mounted on either side of the block (H).

The M25...E version is not provided with shock absorbers; they must be ordered separately. Never use the unit without shock absorbers.



PIPING THE UNIT

The pneumatic cylinder that drives the linear movement is supplied by the air fittings P and R, which can be accessed after removing the cover.

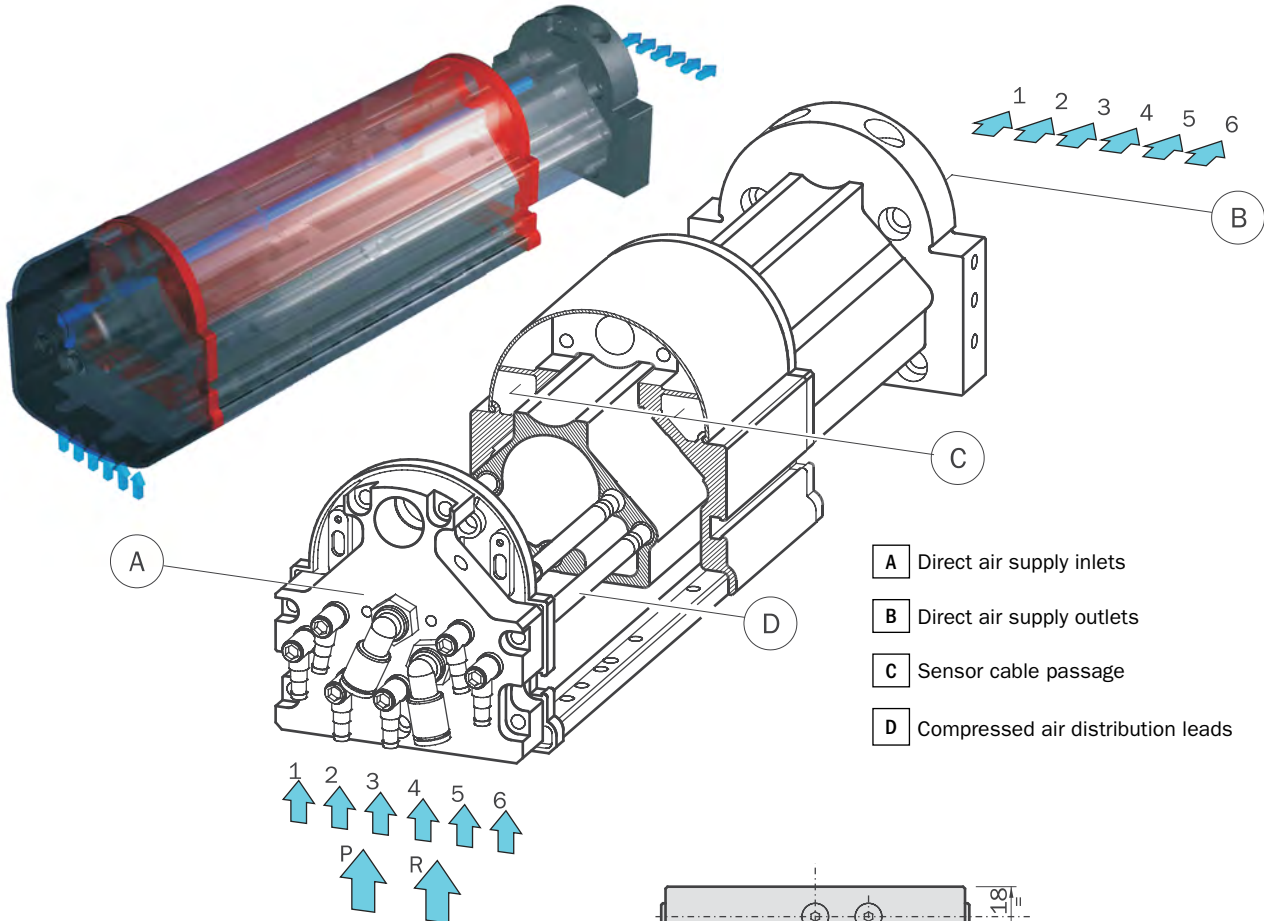
Compressed air in P: opening stroke of the moving part (pushing).

Compressed air in R: closing stroke of the moving part (pulling).

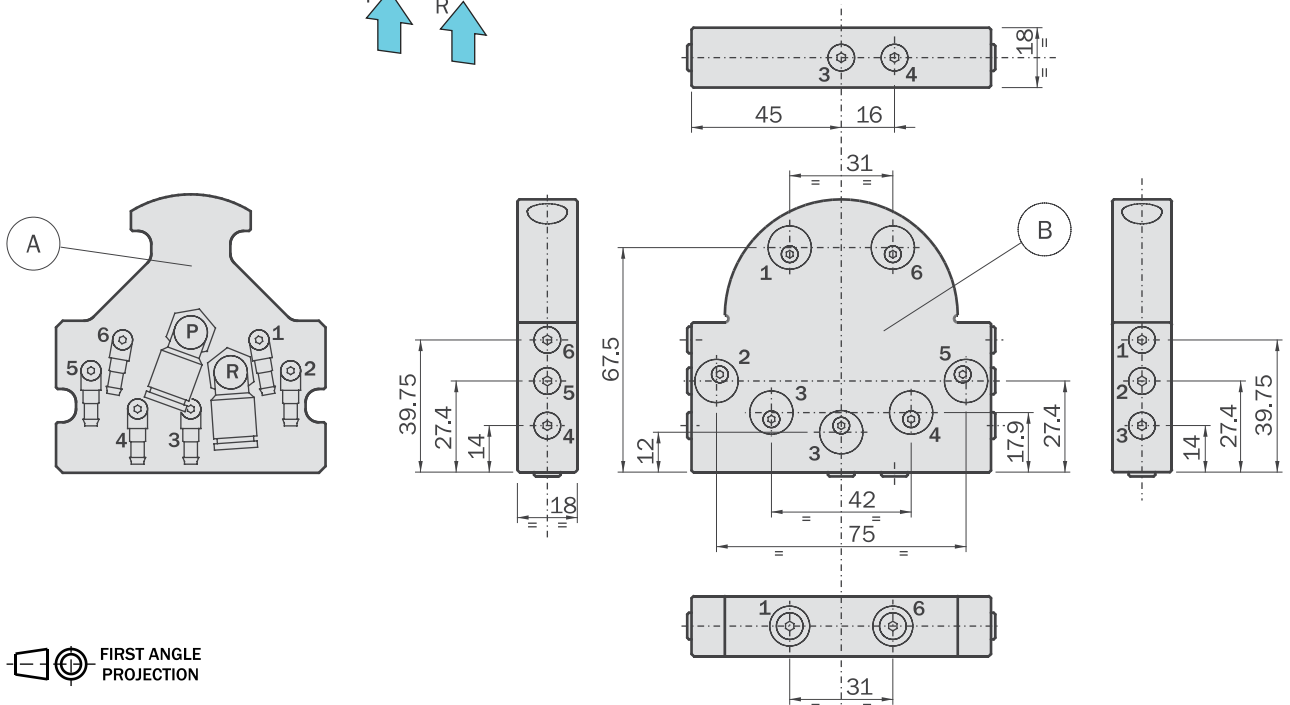
As the unit is provided with six integrated air leads, external tubings are not necessary.

The air ports are numbered (1, 2, 3, 4, 5, 6) and each inlet corresponds to an outlet with the same number.

The M25...E versions are not provided with the integrated air leads.



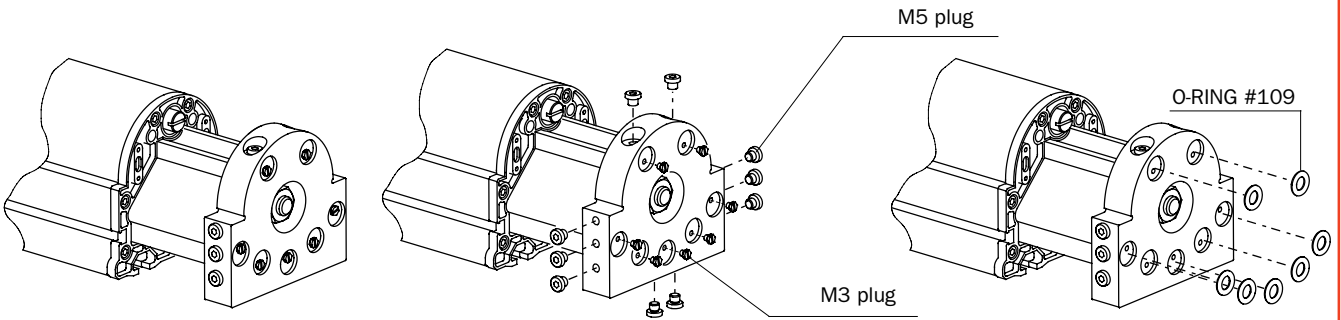
- A** Direct air supply inlets
- B** Direct air supply outlets
- C** Sensor cable passage
- D** Compressed air distribution leads



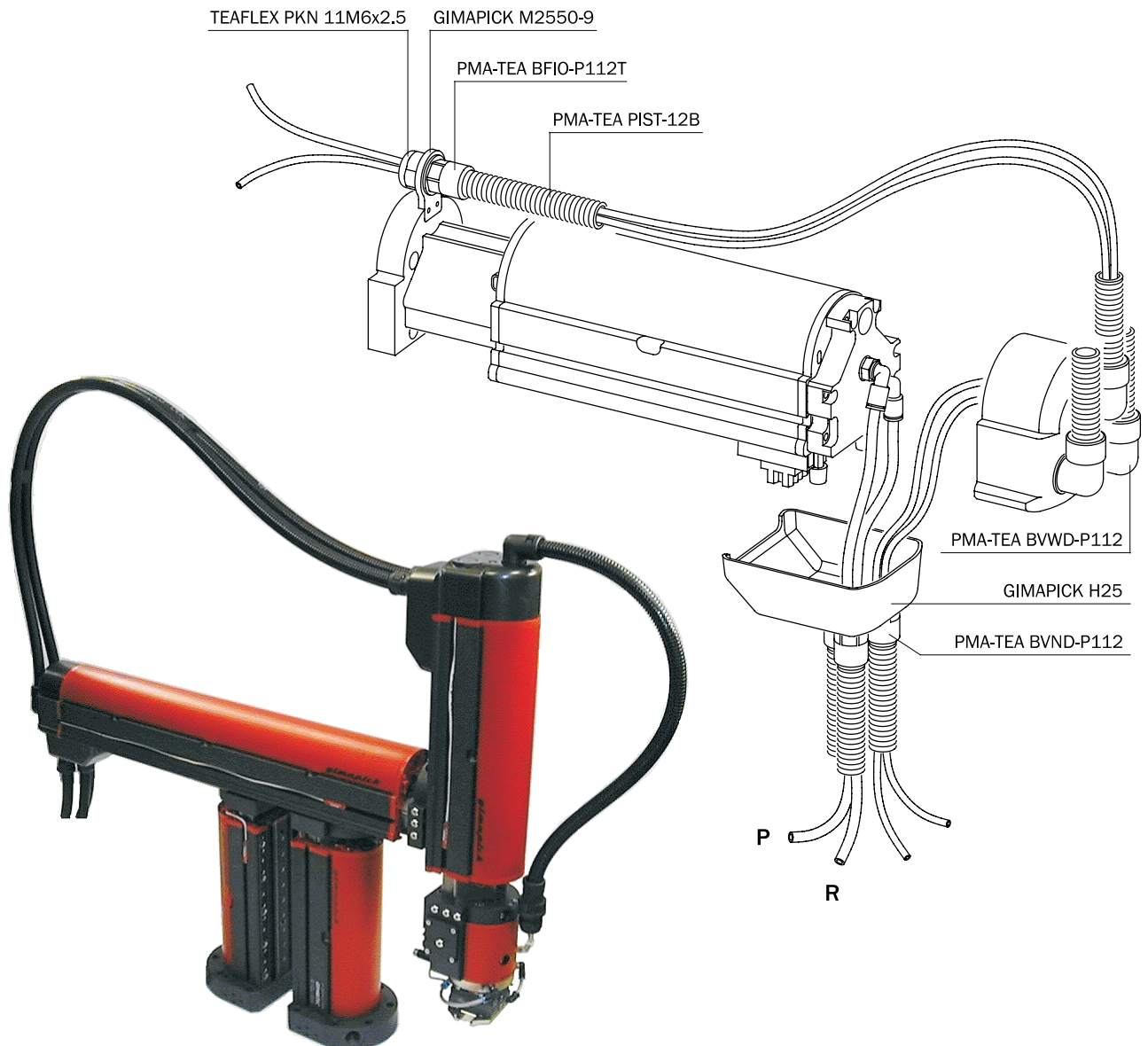
FIRST ANGLE PROJECTION

DIRECT AIR SUPPLY OF GIMAPICK COMPONENTS

The linear actuator is provided with plugs on every air port. If a direct supply from the front plate is required, when Gimapick components are used, plugs must be removed and O-Ring gaskets must be used.



The M25...E versions are not provided with the integrated compressed air distribution, however specific accessories are available to make the connections easier.



LINEAR ACTUATORS

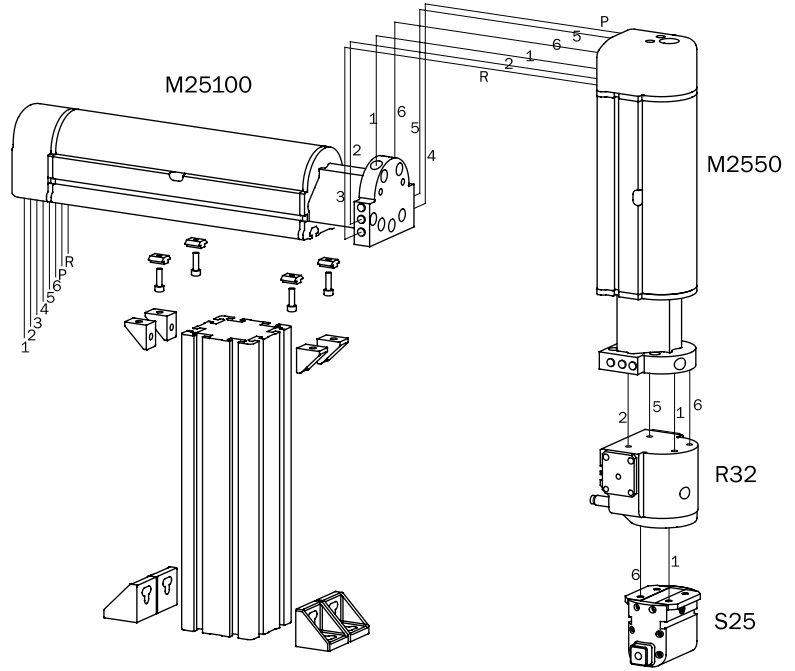
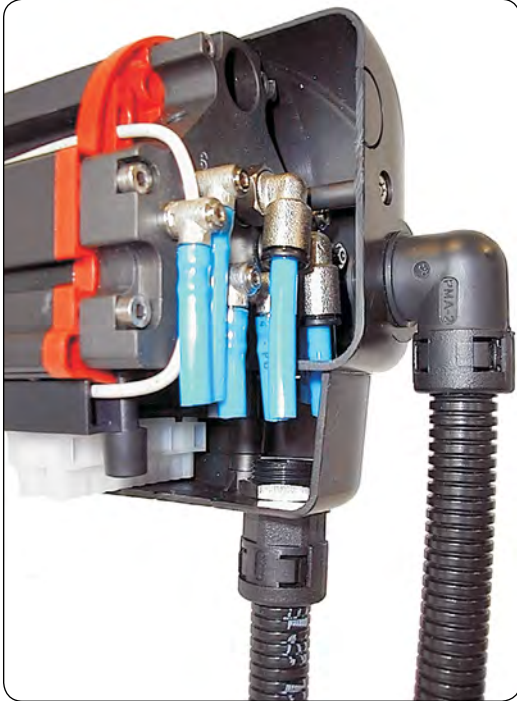
PNEUMATIC CIRCUIT

Possible problems on a compressed air circuit:

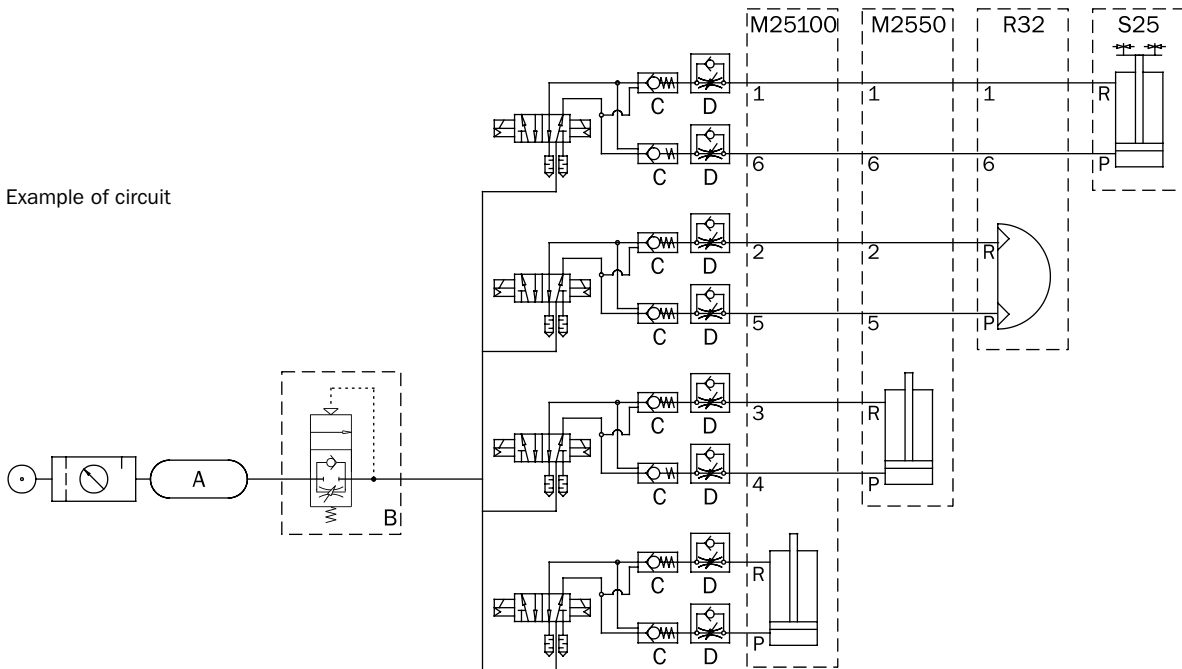
- 1- Pressure variations.
- 2- Pressurizing the actuator at start-up.
- 3- Sudden lack of pressure.
- 4- Excessive drive speed.

Possible solutions to the above issues:

- 1- External compressed air storage (A).
- 2- Start-up valve (B).
- 3- Safety valves (C).
- 4- Flow controllers (D).



Example of circuit

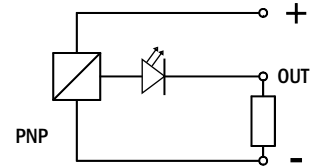
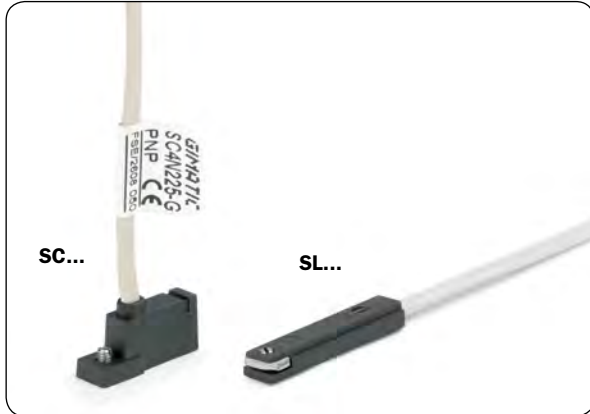


SENSORS

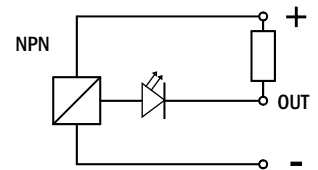
The operating position is detected by one or more magnetic proximity sensors (optional) through a magnet placed on the piston.

Magnetic proximity sensors should not be used in the vicinity of large masses of ferromagnetic material or intense magnetic fields as this may cause detection problems and jeopardize proper operation.

The sensors that can be used are:



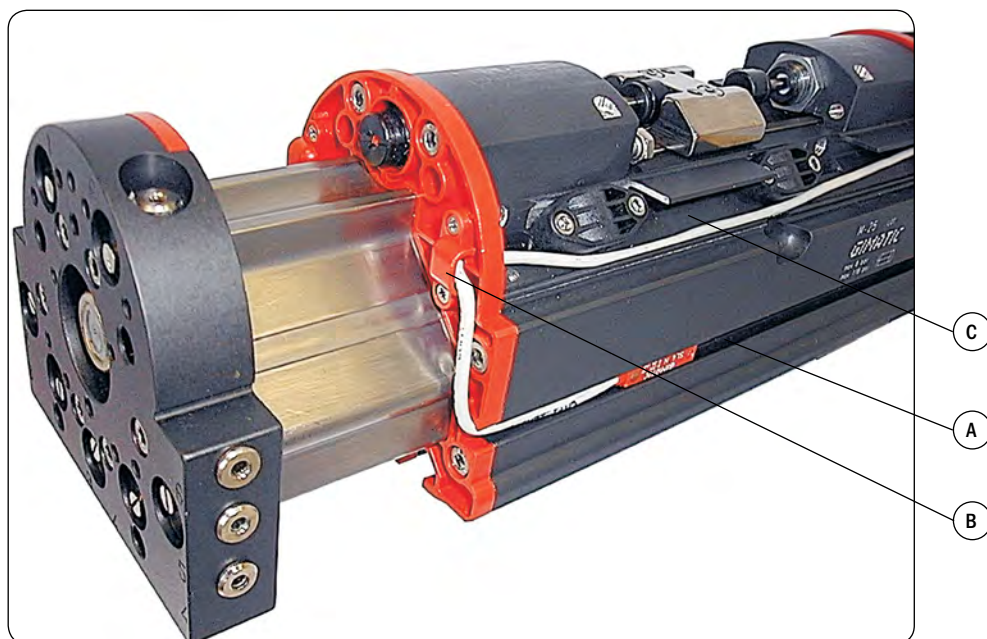
Magneto-resistive



| | | | | M2550 | M25100 | M25160 | M25200 | M25300 | M25400 |
|----------|-----|------------------------|---------|-------|--------|--------|--------|--------|--------|
| SC4N225G | PNP | 2.5m cable | \$33.29 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SC3N203G | PNP | M8 snap plug connector | \$29.13 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SL4N225Y | PNP | 2.5m cable | \$26.14 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SL4M225Y | NPN | 2.5m cable | \$26.14 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SL3N203Y | PNP | M8 snap plug connector | \$29.96 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SL3M203Y | NPN | M8 snap plug connector | \$29.96 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

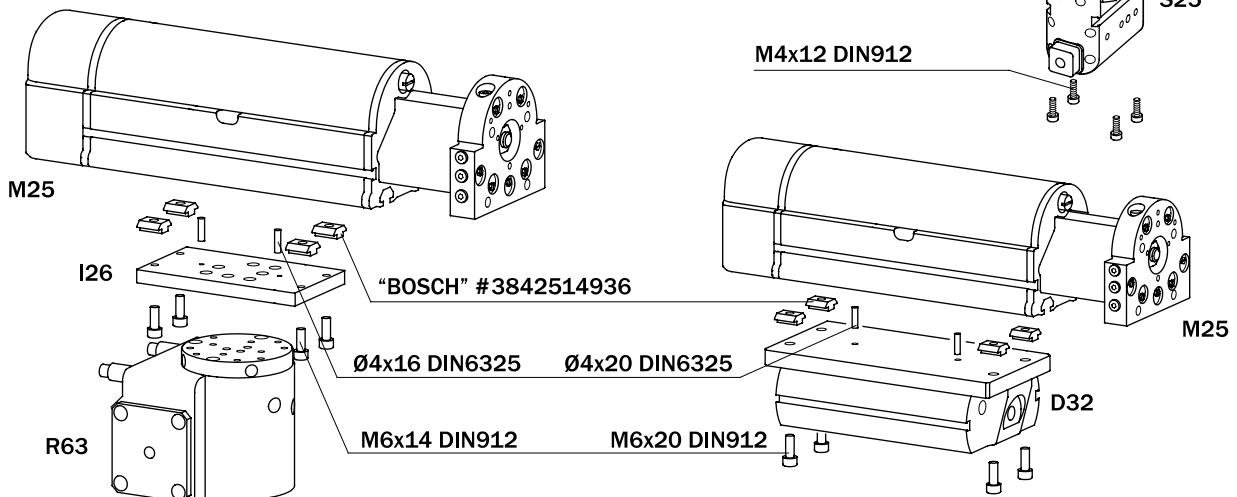
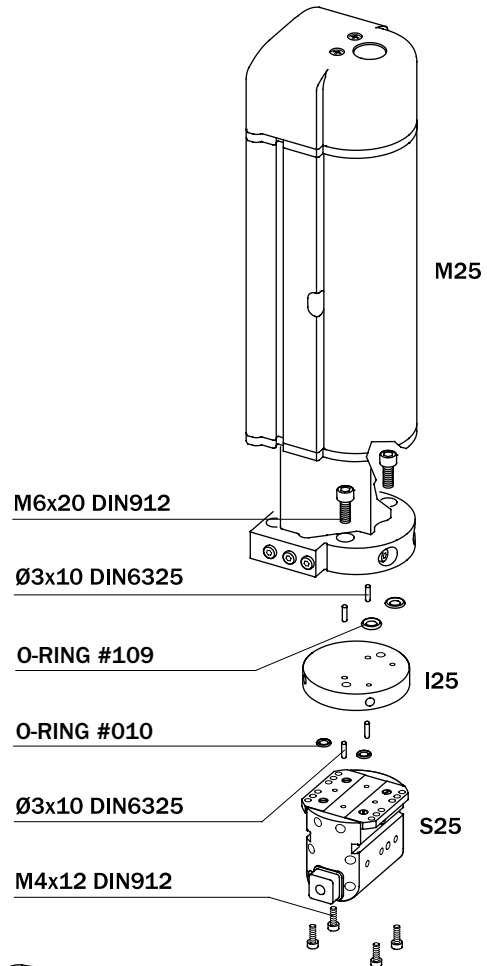
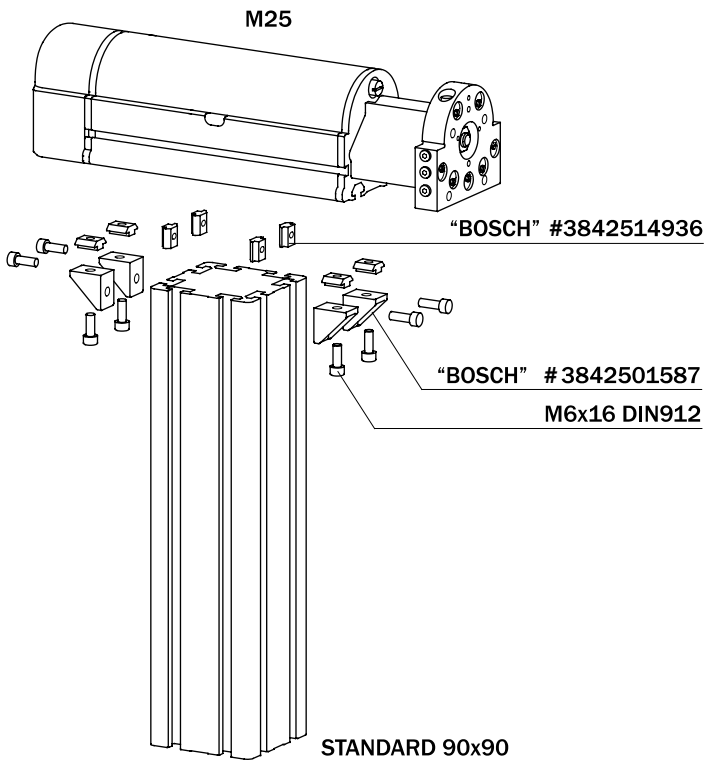
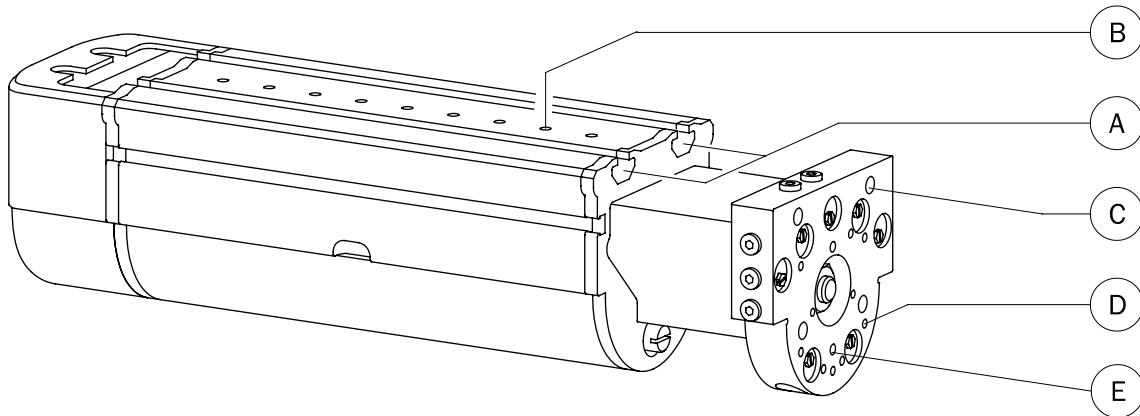
Both are provided with LED and three-wire cable: they differ in dimensions.

The sensors must be placed in the slots (A) and therefore the cables of the sensors can be housed internally (C) under the cover and clamped with the special fastenings (B).



MOUNTING

To mount the actuator, use normal M6 "T" nuts inserted into the grooves (A) located in the lower part.
 The dowel pin holes (B) serve as a positioning reference.
 To mount the accessories on the front head, use the thru holes (C) or the threaded holes (D).
 The dowel pin holes (E) serve as a positioning reference.

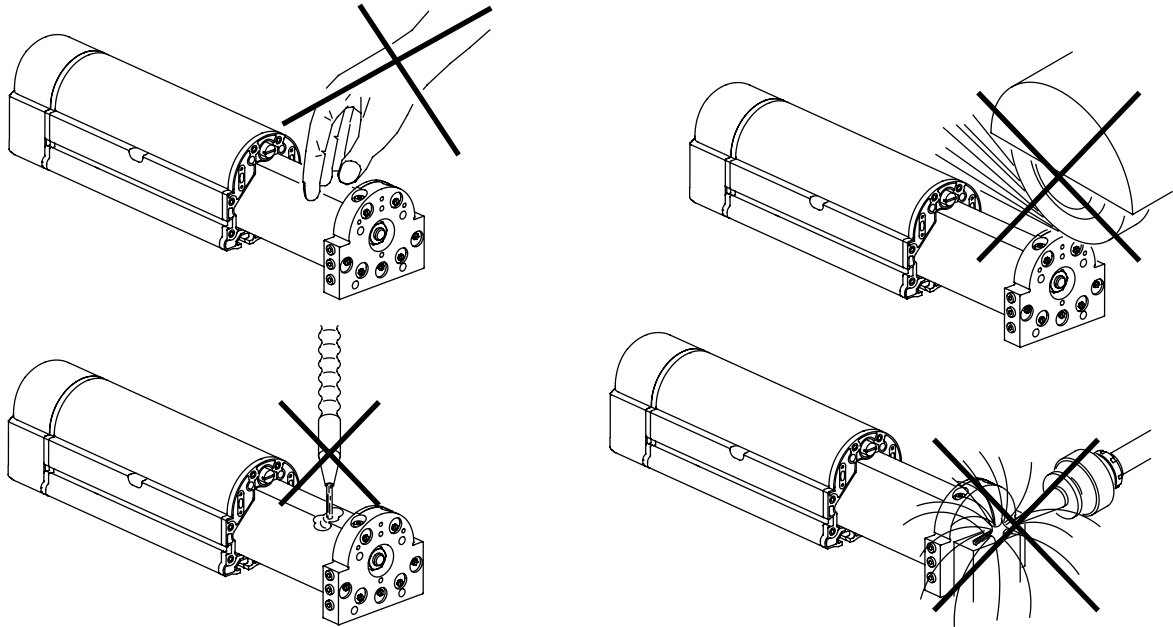


CAUTION

Never let the unit come into contact with corrosive substances, powders, or soldering or welding spatter as they will damage the linear actuator.

Never let non-authorized persons or objects be within the operating range of the linear actuator.

Never operate the linear actuator on a machine that does not comply with the safety standards and laws of your country.



MAINTENANCE

The M25 actuator does not require any maintenance for the first (25) million cycles.

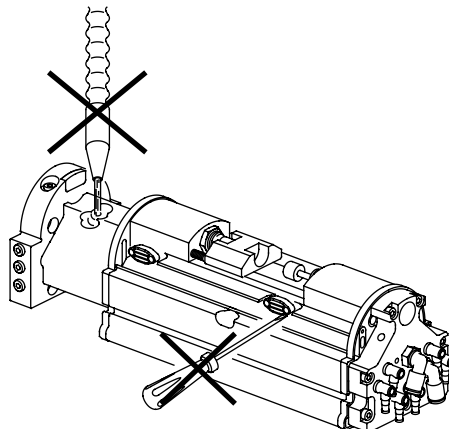
After the first (25) million cycles the unit can be serviced at the factory to restore the correct backlash of sliding shoes and ball bearings.

The internal parts, (gaskets) will be lubricated with Molykote PG75.

Periodically check the efficiency of the shock-absorbers and replace them immediately if their damping performances decrease.

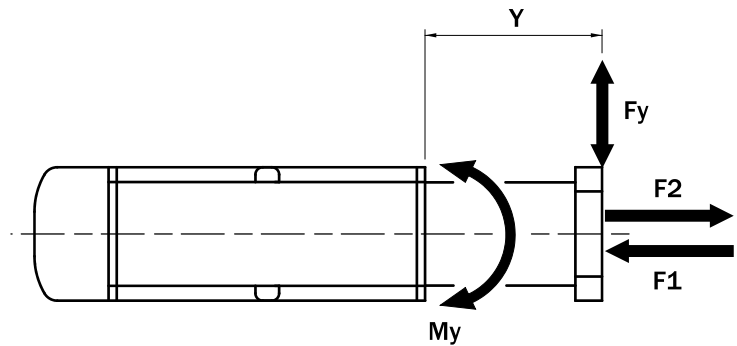
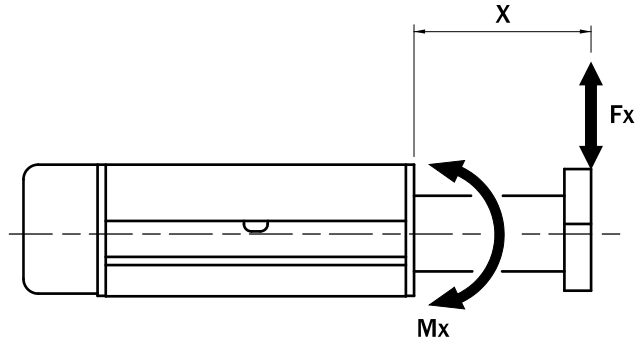
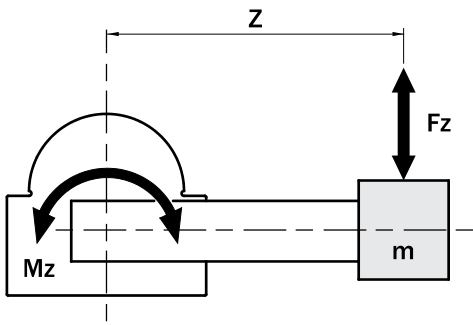
The backlash of the moving part in its guides is set at the factory. Never use the adjusting screws to modify it.

If the work environment is dirty, use a soft, dry cloth to clean the outside of the sliding part. Never lubricate the sliding part.



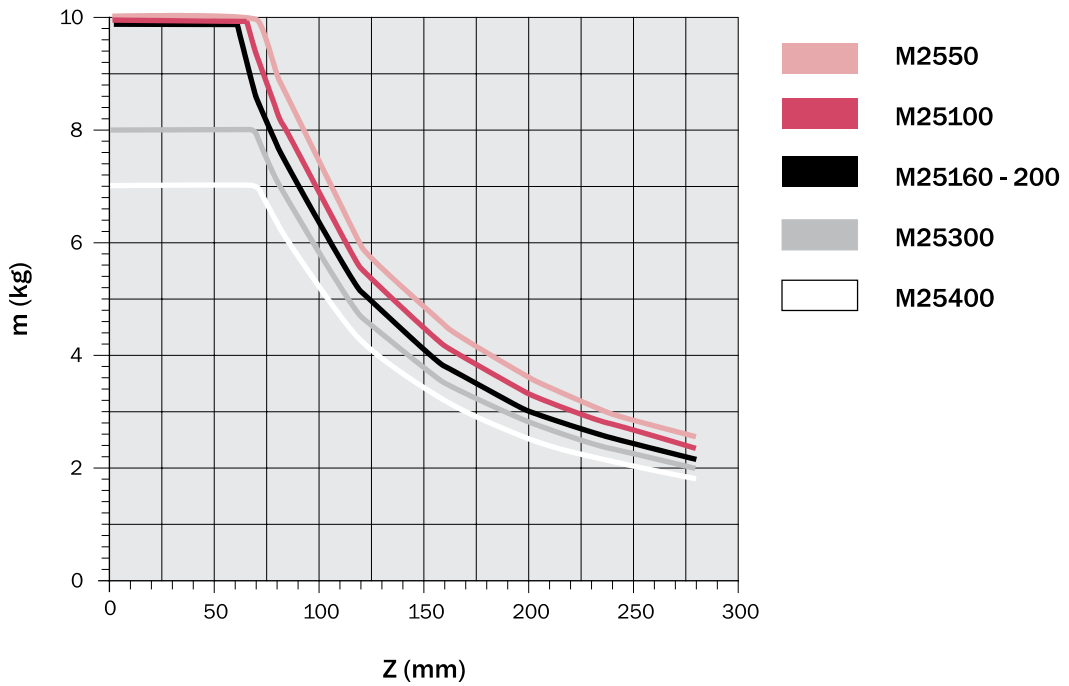
SAFETY LOADS

Check the table for maximum permitted loads.
Excessive loads can damage the linear actuator, cause malfunctions and endanger the safety of the operator.

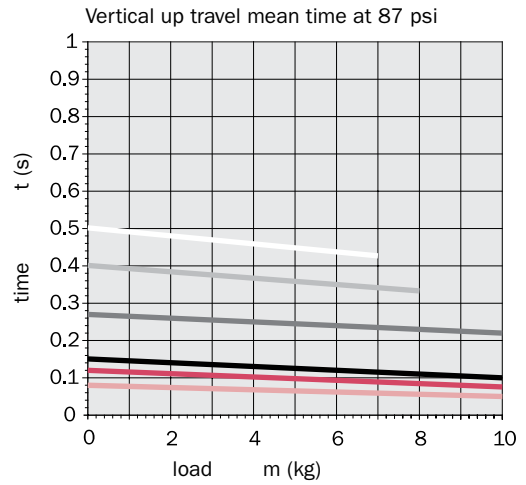
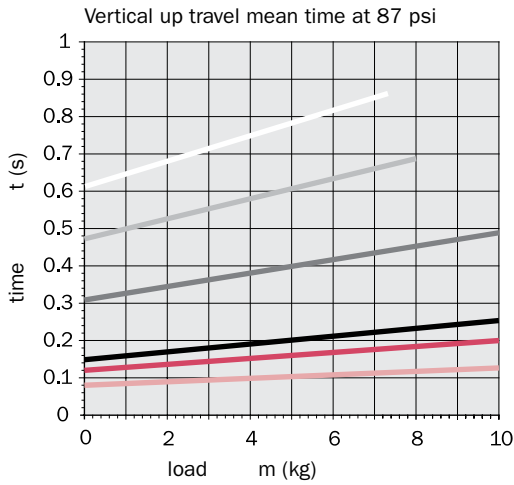
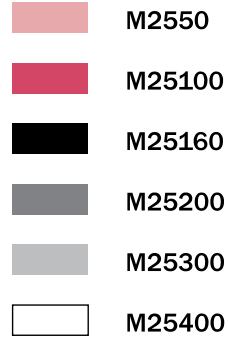
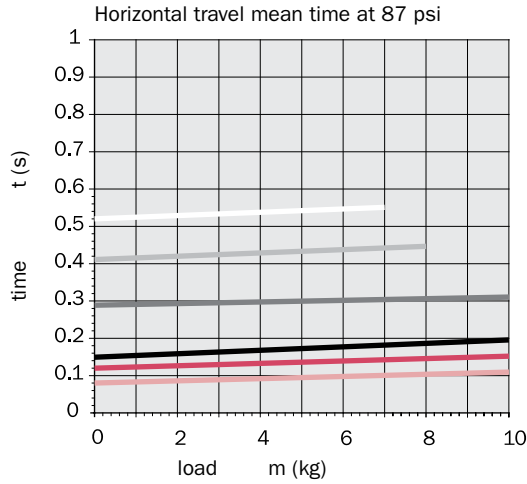


| | M25 |
|---------------------|-------|
| F1 | 172 N |
| F2 | 144 N |
| $F_x \cdot X = M_x$ | 40 Nm |
| $F_y \cdot Y = M_y$ | 60 Nm |
| $F_z \cdot Z = M_z$ | 20 Nm |

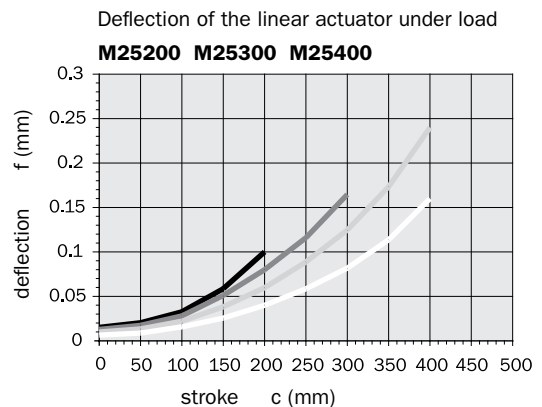
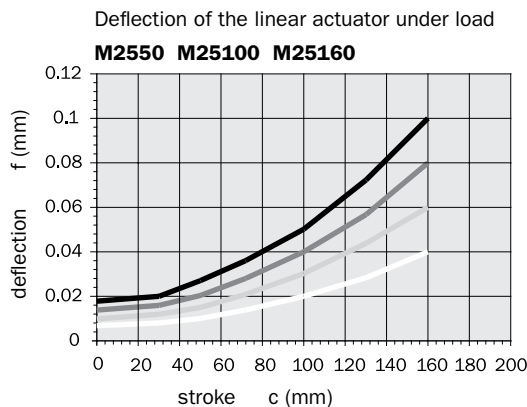
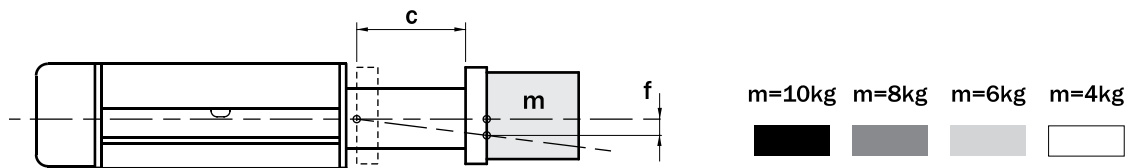
Possible load as a function of the axis misalignment Z.



TRAVEL TIME



DEFLECTION

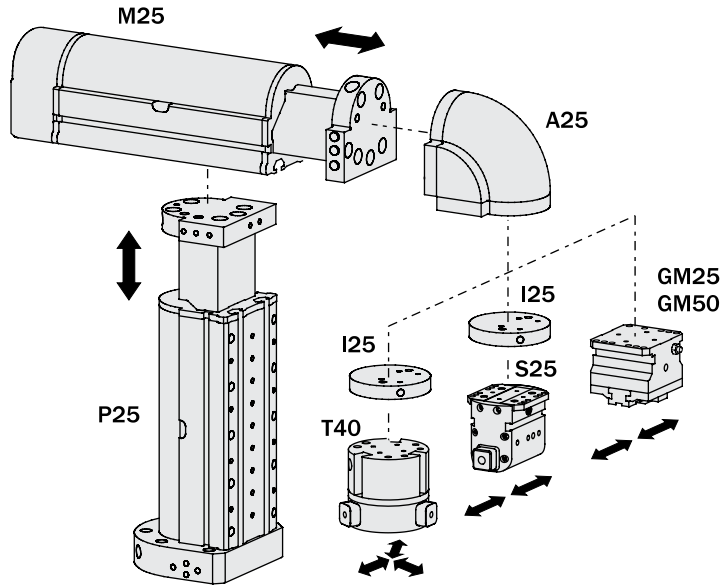


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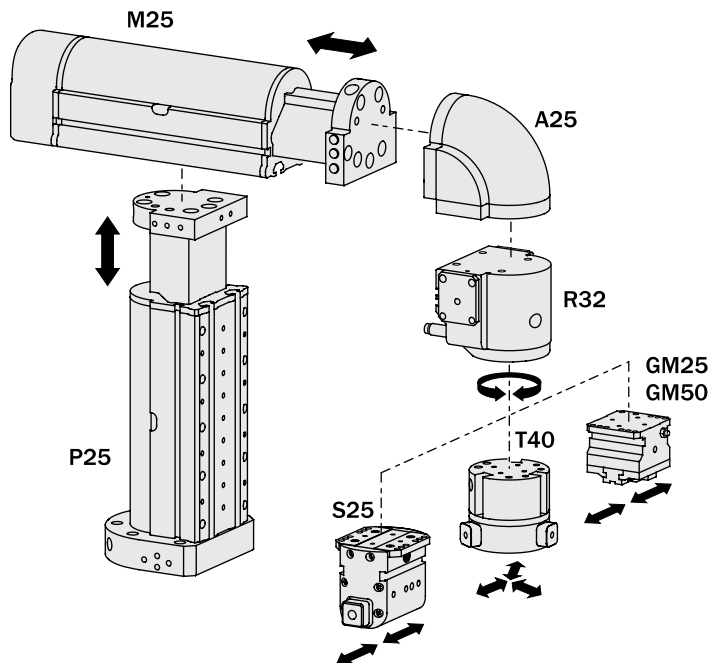
APPLICATION EXAMPLE

Handling with two axes (vertical and horizontal) and gripper.



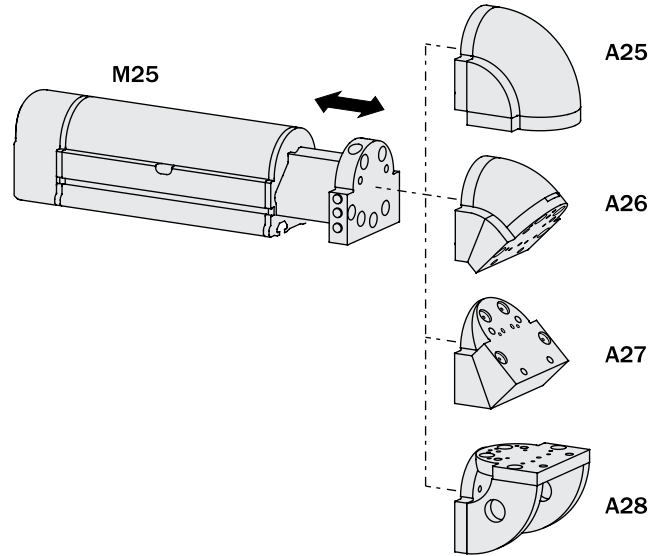
APPLICATION EXAMPLE

Two axes and swiveling gripper.



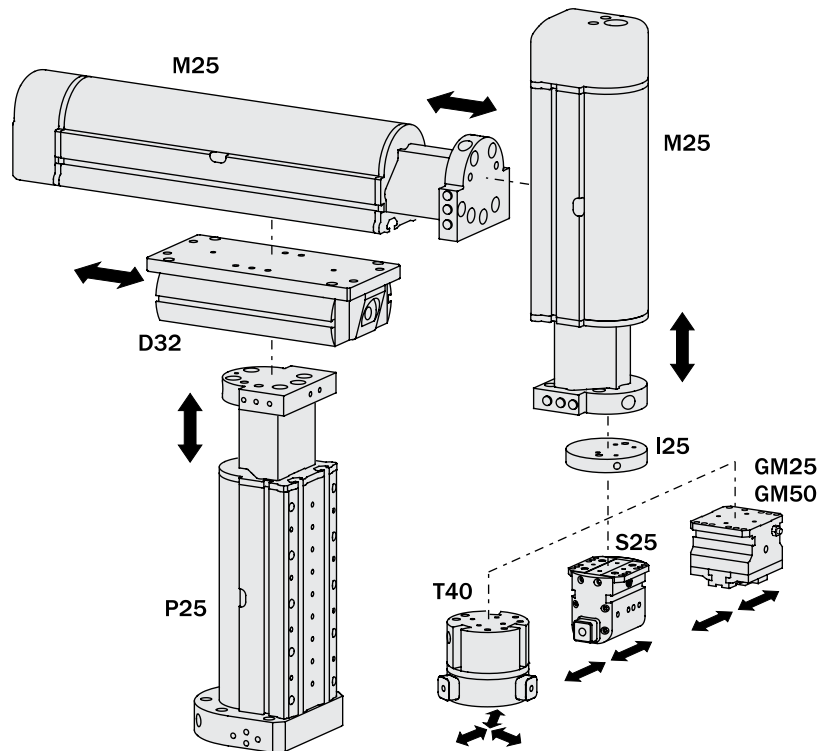
APPLICATION EXAMPLE

Interfaces to be mounted on linear actuators for angles of +90°, +45°, -45° and -90°.



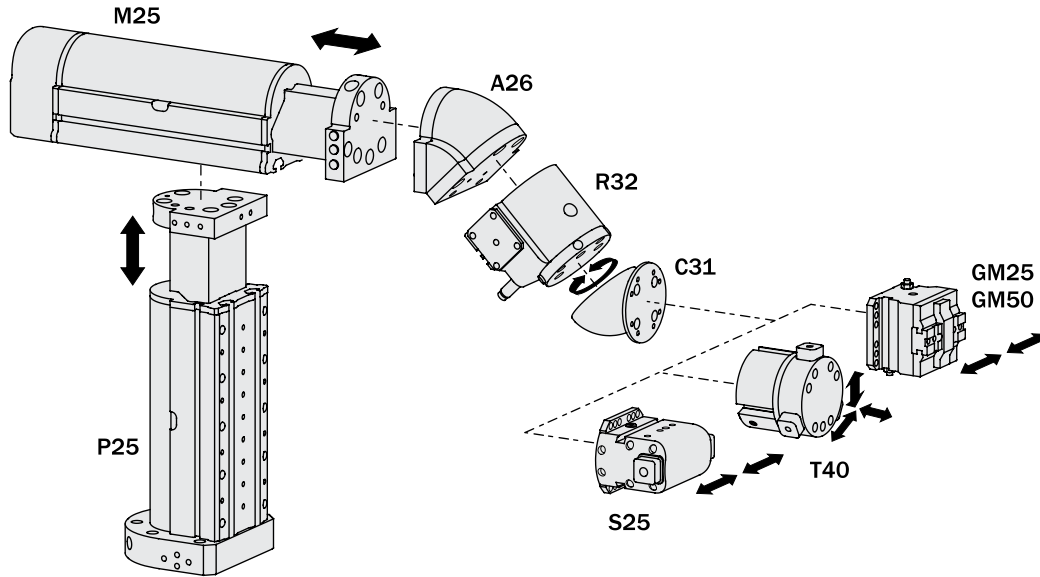
APPLICATION EXAMPLE

Two double stroke axes with a gripper. This example allows for (4) horizontal positions and (4) vertical positions.



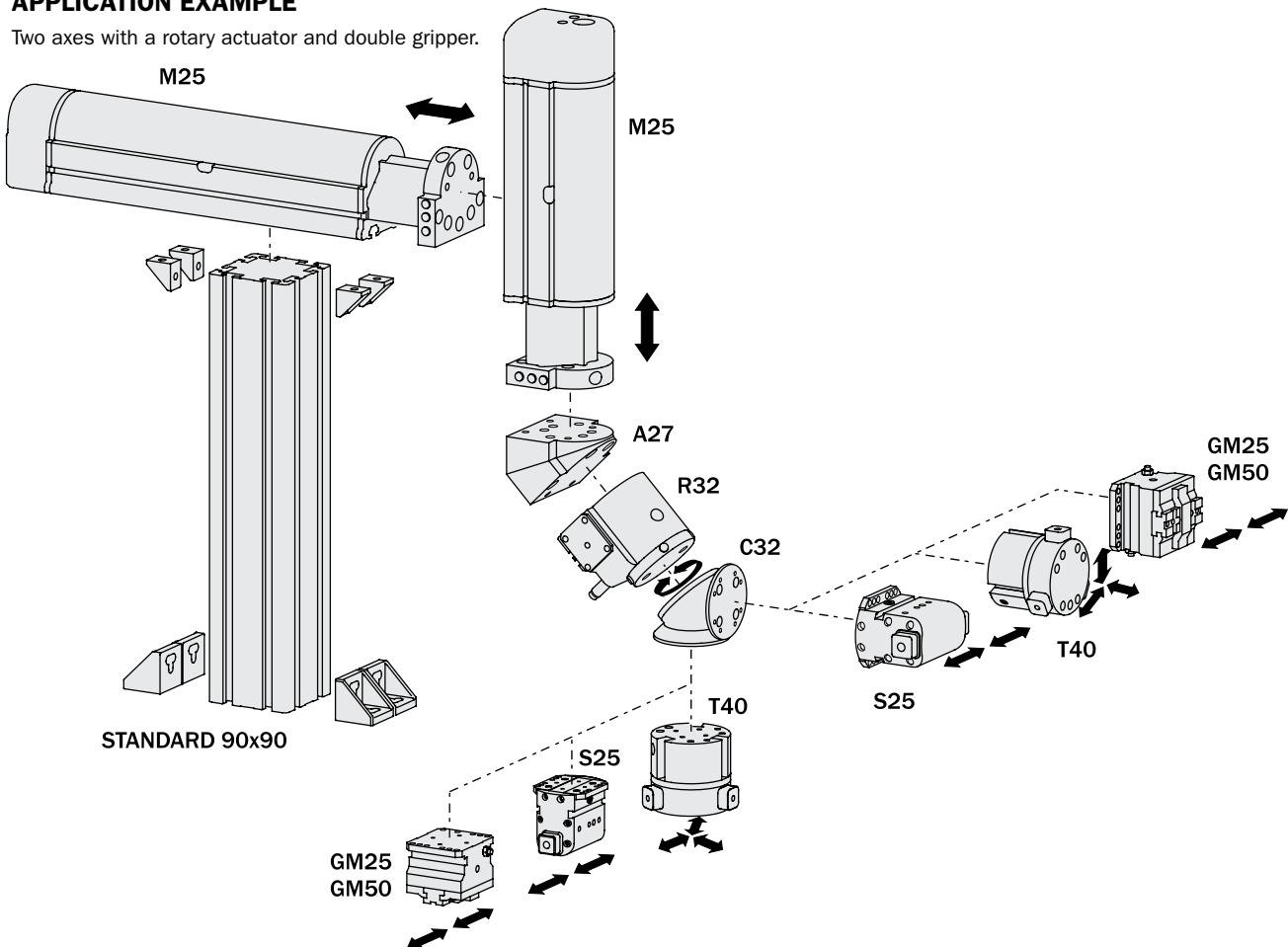
APPLICATION EXAMPLE

Two axes with a rotary actuator and gripper to grip from a vertical plane and place on a horizontal plane.



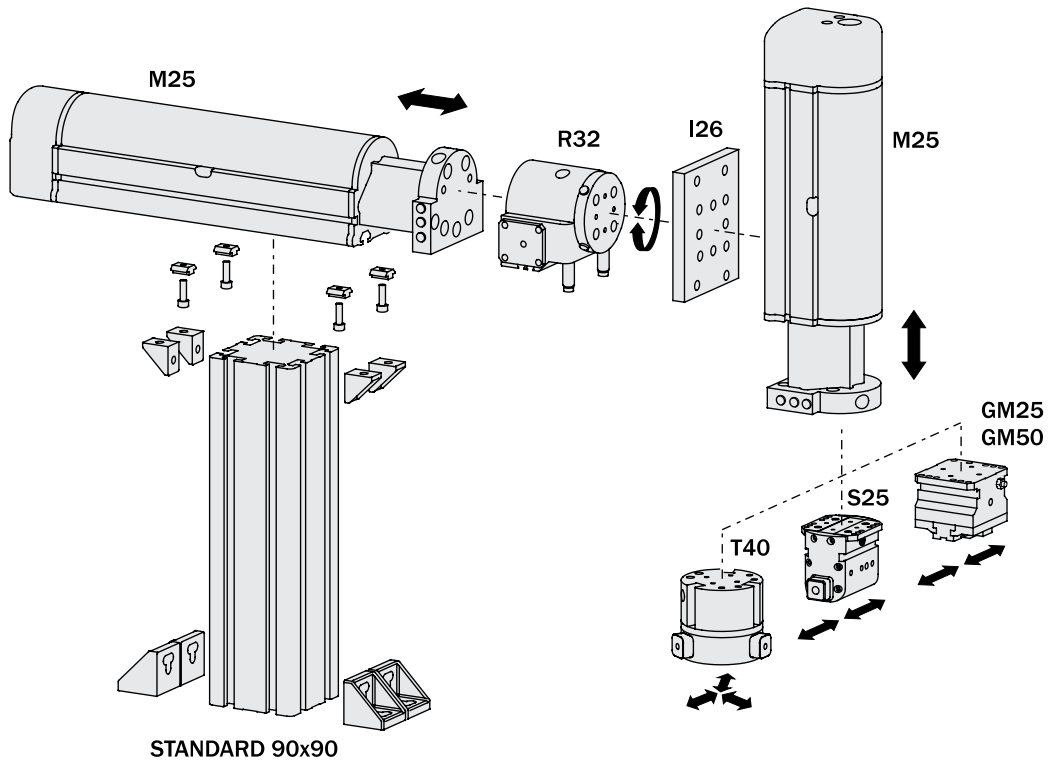
APPLICATION EXAMPLE

Two axes with a rotary actuator and double gripper.



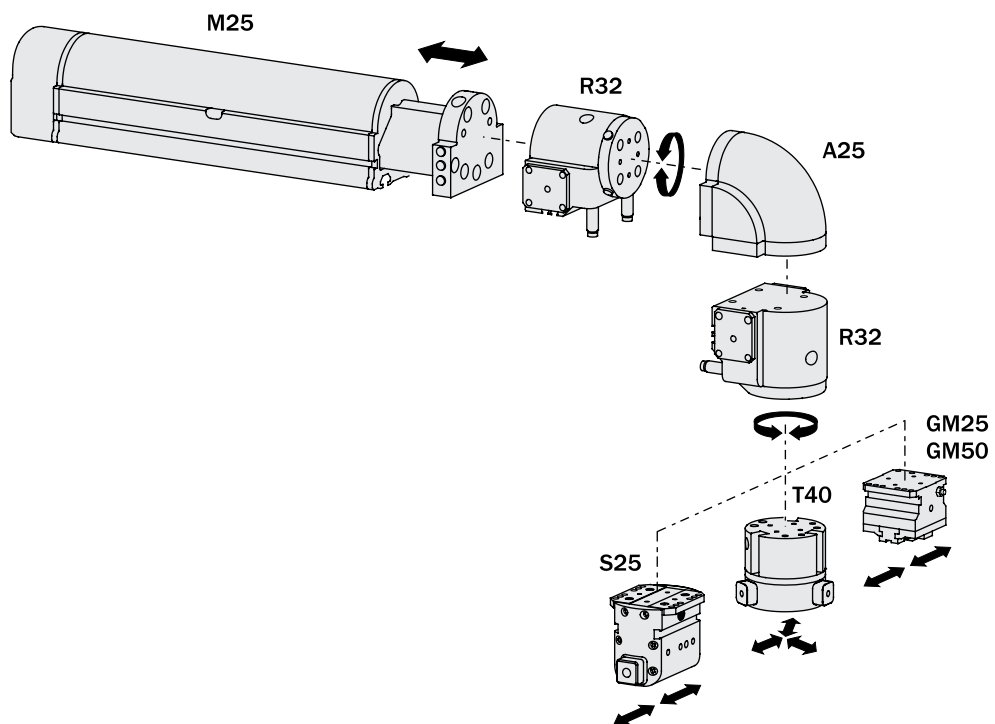
APPLICATION EXAMPLE

Horizontal axis with a second rotating axis and gripper.



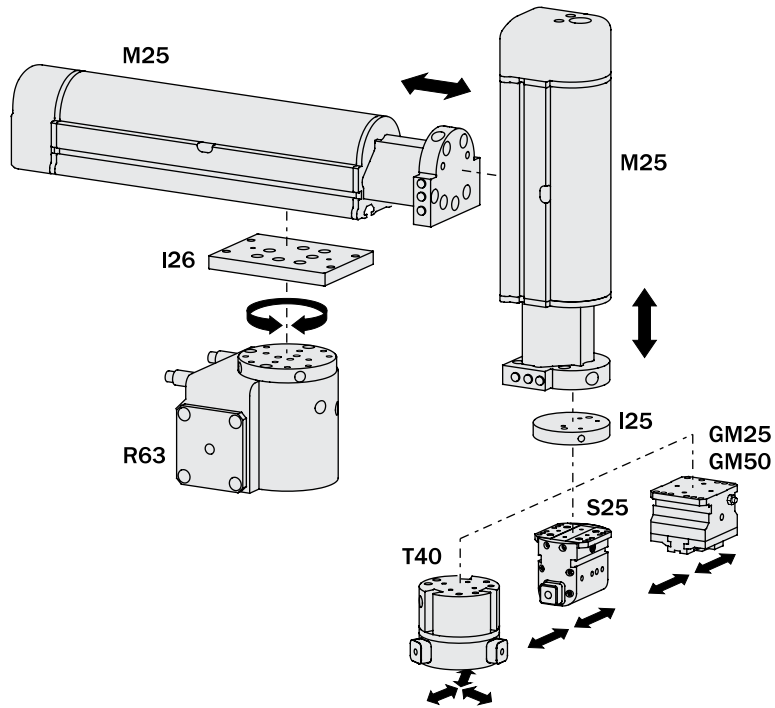
APPLICATION EXAMPLE

Horizontal axis with gripper rotating on two perpendicular rotation axes.



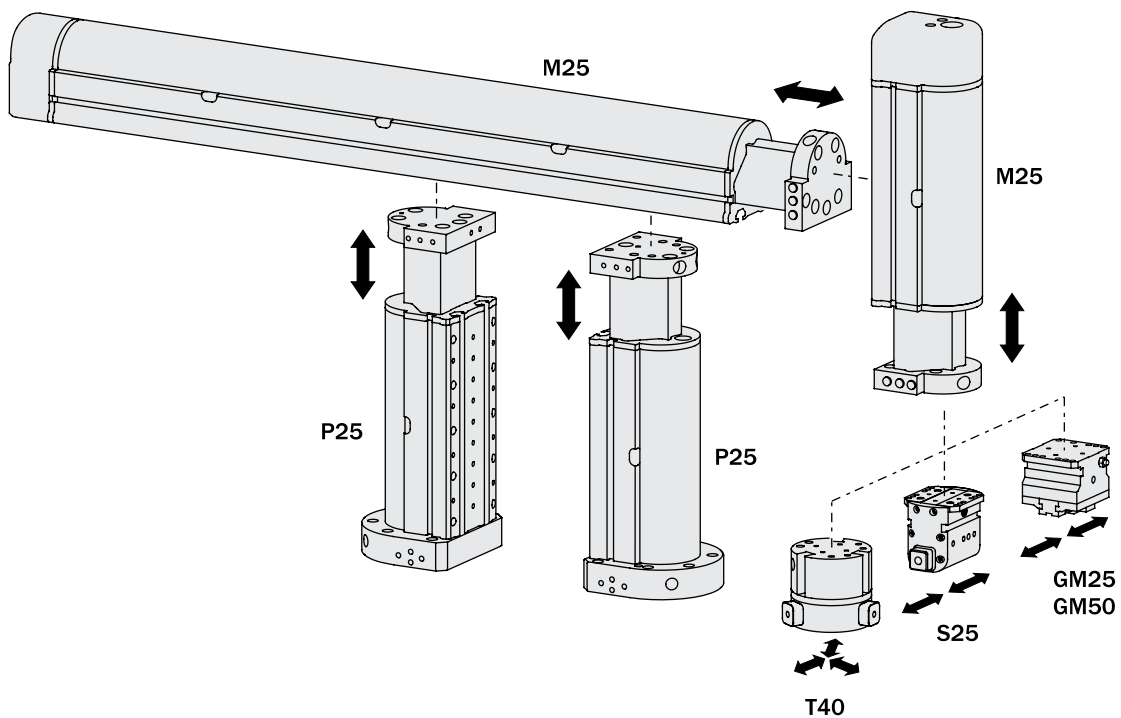
APPLICATION EXAMPLE

Two axes with gripper, all on a swiveling unit with vertical axis.



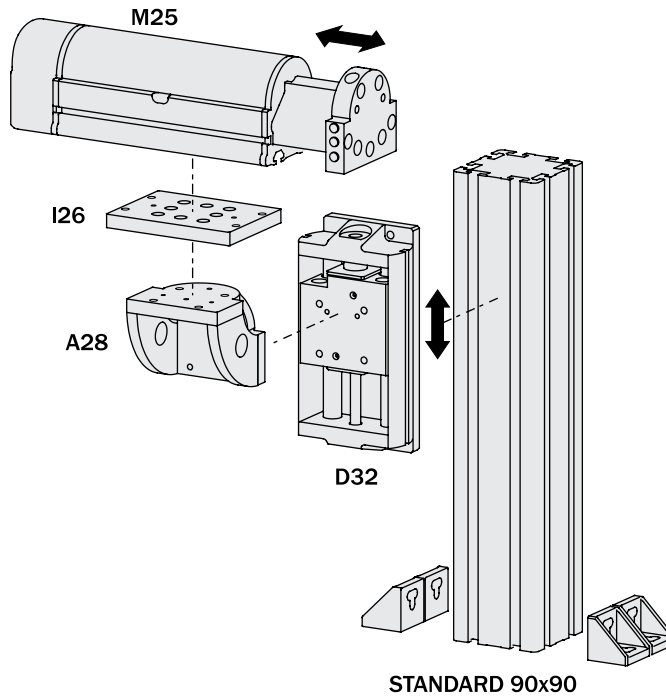
APPLICATION EXAMPLE

Long horizontal axis with double lifter, vertical axis and gripper.



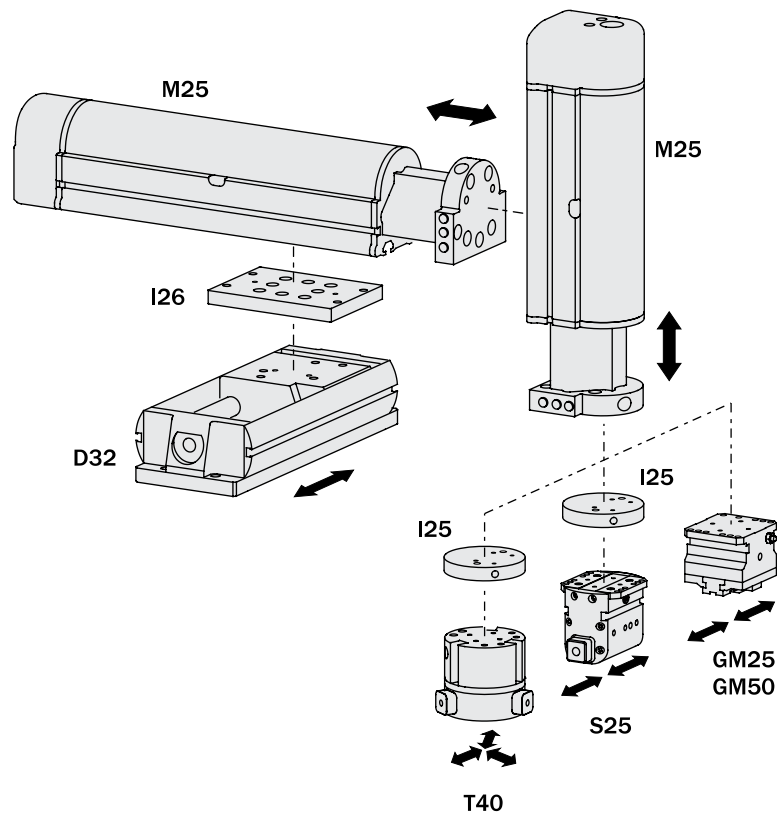
APPLICATION EXAMPLE

Two axes.



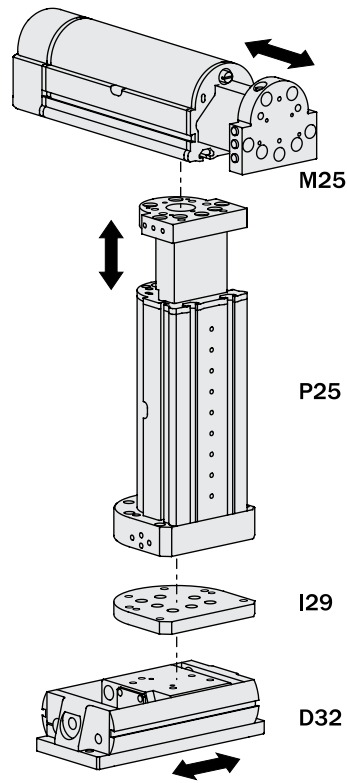
APPLICATION EXAMPLE

Three axes with gripper.



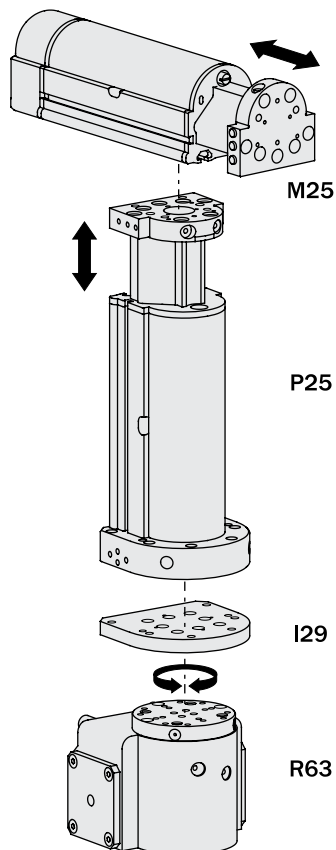
APPLICATION EXAMPLE

Three axes.



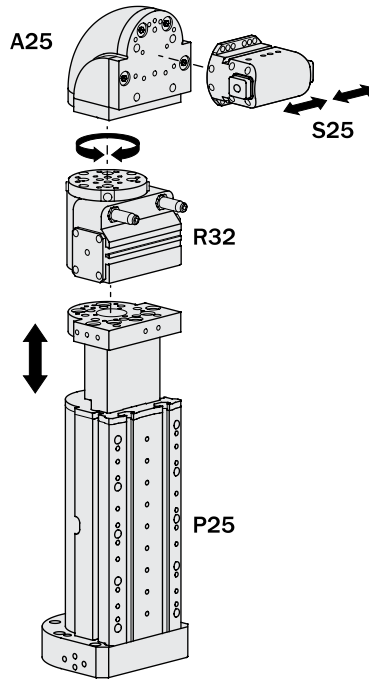
APPLICATION EXAMPLE

Two axes on a swiveling unit with vertical axis.



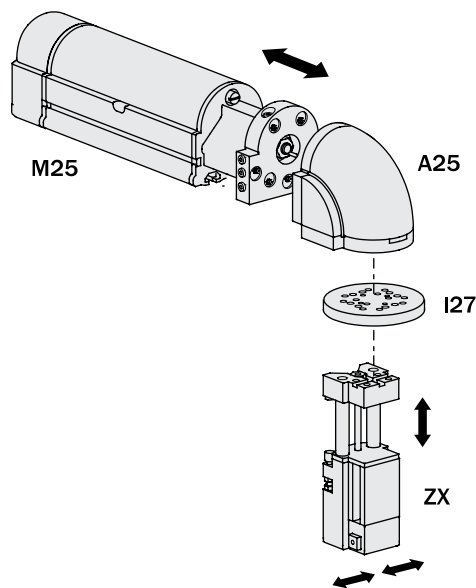
APPLICATION EXAMPLE

Vertical axis with swiveling gripper.



APPLICATION EXAMPLE

Two axes with integrated gripper.



LINEAR ACTUATORS

PARTS LIST

| | | M2550 | M25100 | M25160 | M25200 | M25300 | M25400 | | |
|----|-------------------------------------|--------------------------|-------------|-------------|----------------------------|-----------------------|-----------------------|--|----|
| 1 | Machined base plate | M2550-1 | M25100-1 | M25160-1 | M25200-1 | M25300-1 | M25400-1 | | 1 |
| 2 | Internal machined extrusion | M2550-2 | M25100-2 | M25160-2 | M25200-2 | M25300-2 | M25400-2 | | 2 |
| 3 | External machined extrusion | M2550-3 | M25100-3 | M25160-3 | M25200-3 | M25300-3 | M25400-3 | | 3 |
| 4 | Interface plate | M2550-4 | | | | | | | 4 |
| 5 | Profile | M2550-5 | | | | | | | 5 |
| 6 | Bottom cup | M2550-6 | | | | | | | 6 |
| 7 | Cylinder holder | M2550-7 | | | M25400-7 | | | | 7 |
| 8 | Stroke end block | M2550-8 | | | | | | | 8 |
| 9 | Bridge | - | M25400-16 | | | | | | 9 |
| 10 | Sliding shoe | M2550-10-S M2550-10-D | | | M2550-10-SX M2550-10-DX | | | | 10 |
| 11 | Cover | M2550-11 | M25100-11 | M25160-11 | M25200-11 | M25300-11 | M25400-11 | | 11 |
| 12 | Protection | M2550-12 | | | | | | | 12 |
| 13 | Cover | M2550-13 | | | | | | | 13 |
| 14 | Sliding shoe | M2550-14 | | | | | | | 14 |
| 15 | Extension | - | - | - | M25200-15 | M25300-15 | M25400-15 | | 15 |
| 16 | Protection | M2550-16 | | | | | | | 16 |
| 17 | Magnet housing | PE-1610-05 | | | | | | | 17 |
| 18 | Magnet | PAR-06-7 | | | | | | | 18 |
| 19 | Hex nut | M10x1.25 UNI5589 Z/B | | | | | | | 19 |
| 20 | Dowel pin | Ø3x10 mm DIN 6325 | | | | | | | 20 |
| 21 | M5 plug | 107-M5 | | | | | | | 21 |
| 22 | O-ring gasket | Ø1.78x6.07 (GUAR-039) | | | | | | | 22 |
| 23 | Bolt | INOX A2 M4x10 mm DIN 912 | | | | | | | 23 |
| 24 | Pneumatic cylinder | SP50625-50 | SP50625-100 | SP50625-160 | SP50625-200 | SP50625-300 | SP50625-400 | | 24 |
| 25 | Hex nut | DEK196 | | | | | | | 25 |
| 26 | O-ring gasket | Ø1.78x12.42 (GUAR-047) | | | | | | | 26 |
| 27 | M5 end fitting | - | - | - | 6x3x2.5 (GUAR-046) | 6x3x2.5 (GUAR-046) | DT-189 | | 27 |
| 28 | Gasket | - | - | - | 6x3x2.5 (GUAR-046) | 6x3x2.5 (GUAR-046) | 6x3x2.5 (GUAR-046) | | 28 |
| 29 | Bolt | INOX A2 M5x50 mm DIN 933 | | | | | | | 29 |
| 30 | Grub screw | INOX A2 M5x5 mm DIN 913 | | | | | | | 30 |
| 31 | Hydraulic shock absorber M14x1.5 | SPM25MC-1B-SP21365B | | | | | | | 31 |
| 32 | Bolt | INOX A2 M3x10 mm DIN 912 | | | | | | | 32 |

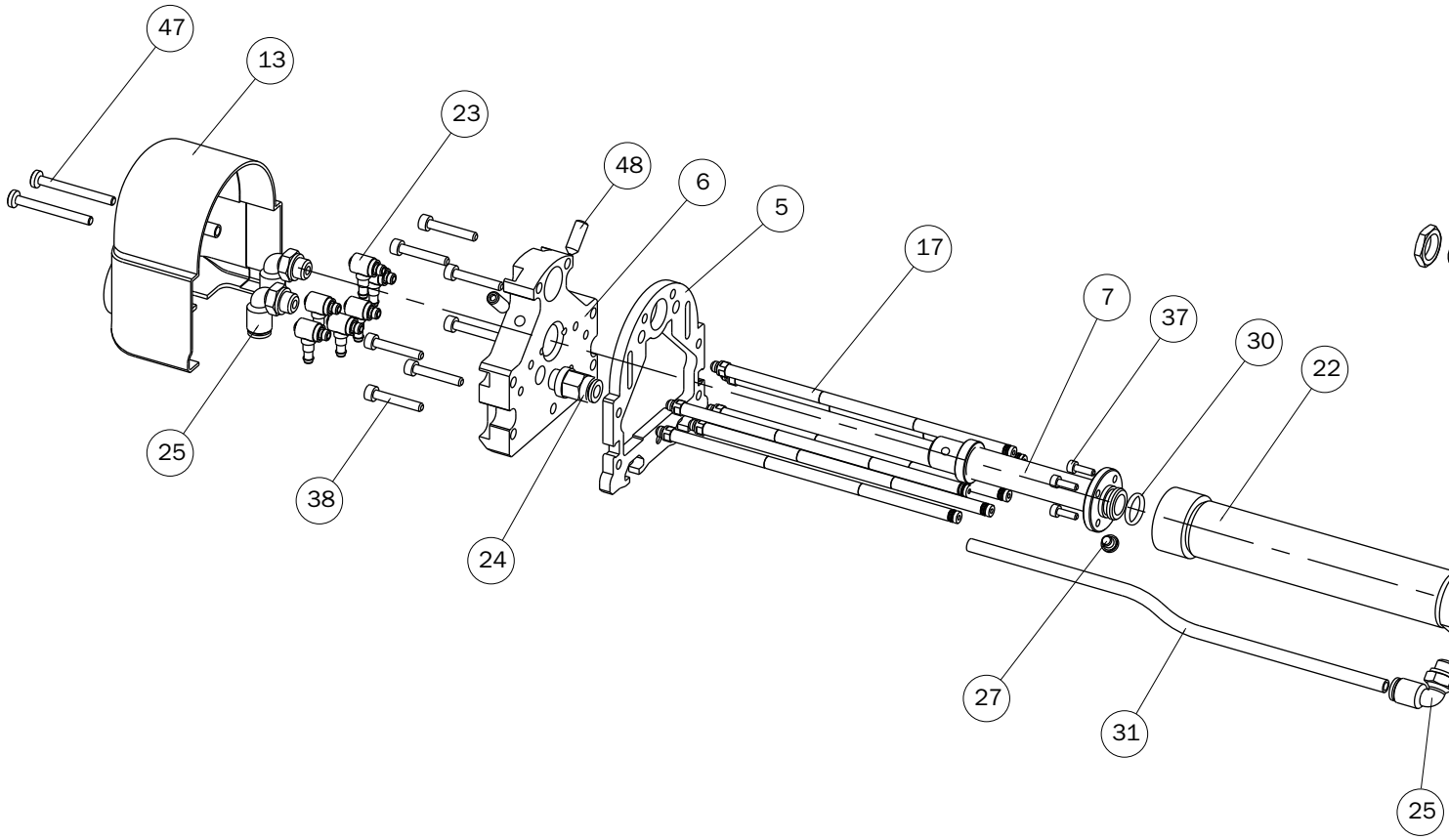
PARTS LIST

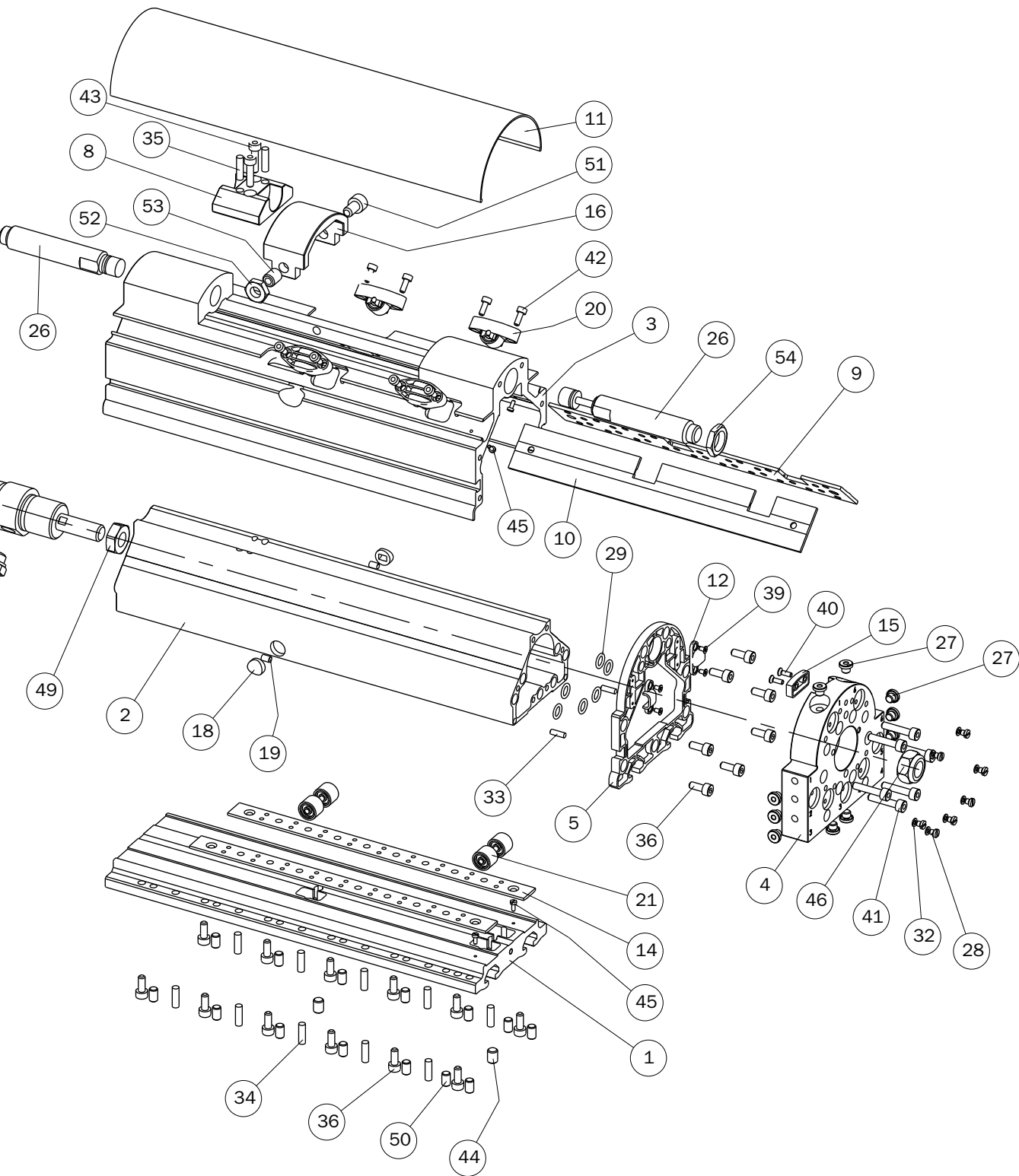
| | | M2550 | M25100 | M25160 | M25200 | M25300 | M25400 | | |
|----|--------------------------|----------------------------|---------------------------|-----------|------------------------|------------------------|------------------------|--|----|
| 33 | Push-on nipple M5 CH Q6 | - | - | - | Ø6xØ4 (GUAR-059-28) | Ø6xØ4 (GUAR-059-28) | DT-186 | | 33 |
| 34 | Hose | - | - | - | Ø6xØ4 (GUAR-059-28) | Ø6xØ4 (GUAR-059-28) | Ø6xØ4 (GUAR-059-28) | | 34 |
| 35 | Bolt | INOX A2 M4x25 mm DIN 912 | | | | | | | 35 |
| 36 | M5 fitting - Ø6 tubing | AR15-M5S | | | | | | | 36 |
| 37 | Bolt | INOX A2 M4x40 mm DIN 7985A | | | | | | | 37 |
| 38 | Dowel pin | Ø4x14 mm DIN 6325 | | | | | | | 38 |
| 39 | Grub screw | INOX A2 M5x8 mm DIN 913 | | | | | | | 39 |
| 40 | Socket head screw | INOX A2 M2x5 mm DIN 84A | | | | | | | 40 |
| 41 | Plug | XP-25-11 | | | | | | | 41 |
| 42 | Self-tapping screw | 2.2x5.5 mm DIN 7982 | | | | | | | 42 |
| 43 | Connection pin | Ø4x16 mm DIN 6325 | | | | | | | 43 |
| 44 | Bolt | INOX A2 M4x16 mm DIN 912 | | | | | | | 44 |
| 45 | 1/8" fitting - Ø6 tubing | 202203 | | | | | | | 45 |
| 46 | Tubing Ø6xØ4 | L=175mm | L=225mm | L=285mm | L=375mm | L=475mm | L=575mm | | 46 |
| 47 | M3 plug | DT-205 | | | | | | | 47 |
| 48 | Bolt | INOX A2 M2.5x8 mm DIN 965A | | | | | | | 48 |
| 49 | Bolt | INOX A2 M4x20 mm DIN 912 | | | | | | | 49 |
| 50 | Grub screw | - | INOX A2 M8x12 mm DIN 914 | | | | | | 50 |
| 51 | Bearing holder wheel | M2550-18 | | | | | | | 51 |
| 52 | Spacer washer | M2550-24 | | | | | | | 52 |
| 53 | Bolt | - | INOX A2 M6x10 mm DIN 912 | | | | | | 53 |
| 54 | Hex nut | - | INOX A2 M8 H=4mm DIN 439B | | | | | | 54 |
| 55 | 1/8" fitting - Ø6 tubing | 200107 | | | | | | | 55 |
| 56 | Grub screw | INOX A2 M6x8 mm DIN 913 | | | | | | | 56 |
| 57 | Radial bearing | Ø3xØ10x4 | | | | | | | 57 |
| 58 | Dowel pin | Ø3x28 mm DIN 6325 | | | | | | | 58 |
| 59 | Dowel pin | Ø3x14 mm DIN 6325 | | | | | | | 59 |
| 60 | Bearing holder | M2550-23 | | | | | | | 60 |
| 61 | Bolt | INOX A2 M3x8 mm DIN 912 | | | | | | | 61 |
| 62 | Self-locking hex nut | M10x1.25 DIN 985 Z/B | | | | | | | 62 |
| 63 | Grub screw | M6x16 mm DIN 914 | | | | | | | 63 |
| 64 | Tube subassembly | M2550-30 | M25100-16 | M25160-16 | - | - | - | | 64 |

LINEAR ACTUATORS

01/2017

EXPLODED VIEW





LINEAR ACTUATORS