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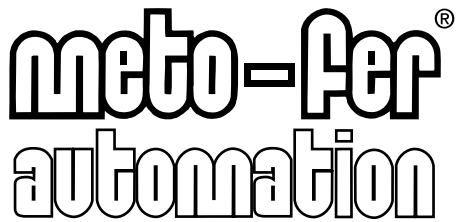
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\*SEE SECTION FOR CONTENTS

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Meto-Fer Automation is your worldwide solution to industrial automation. Notable products include a full line of conveyor systems; linear belt pallet transfer systems (MP), and linear pallet over / under systems.

Our complete line of quality automation components includes linear slides with air cylinder, ball screws or timing belts, alignment slides, grippers, rotary actuators, elastomer - oil cushions, flow controls, height gauge controls, suction cups, mounting brackets, stands and adapter plates, precision stop system with sensing elements, electronic sensors, spring feeders, shaft hoppers, and modular pick and place units.

Meto-Fer products are engineered to provide long lasting trouble-free performance.

## Metric Conversions

| TO CONVERT | TO       | MULTIPLY BY |
|------------|----------|-------------|
| inches     | mm       | 25.4        |
| mm         | Inches   | .0394       |
| lb         | kg       | .4535       |
| kg         | lb       | 2.2050      |
| lb         | N        | 4.4484      |
| N          | lb       | .2248       |
| psi        | bar      | .069        |
| bar        | psi      | 14.5        |
| lb.in      | Nm       | .113        |
| Nm         | lb.in    | 8.85        |
| lb.sq.ft   | kgm2     | .0421       |
| kgm2       | lb.sq.ft | 23.73       |
| scf        | NL       | 28.361      |
| NL         | scf      | .0353       |
| hp         | kW       | .7457       |
| kW         | hp       | 1.341       |

# PNEUMATIC LINEAR ACTUATORS

SECTION 1

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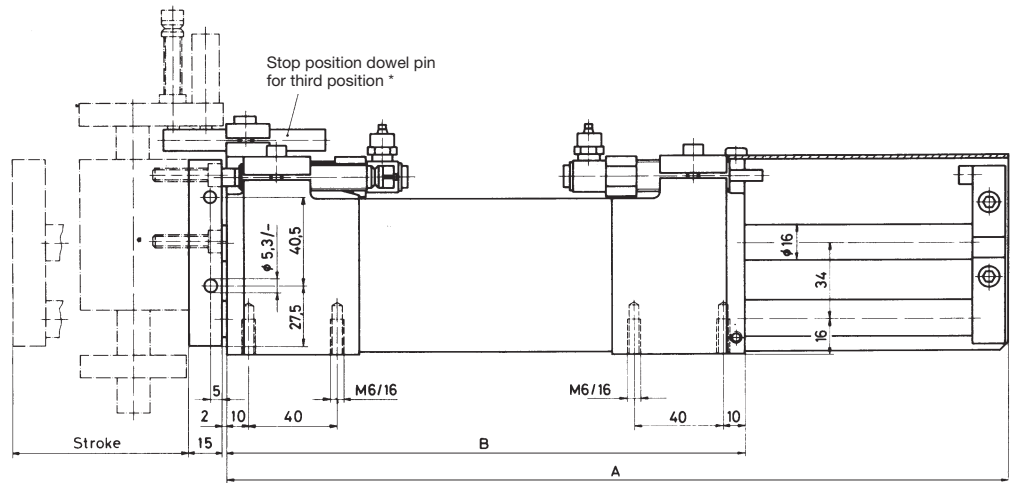
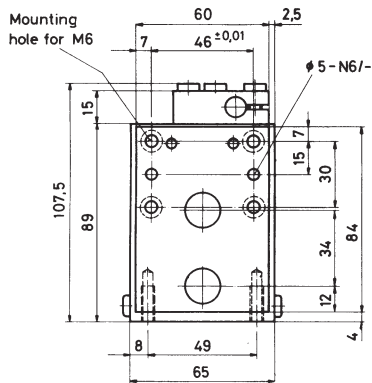
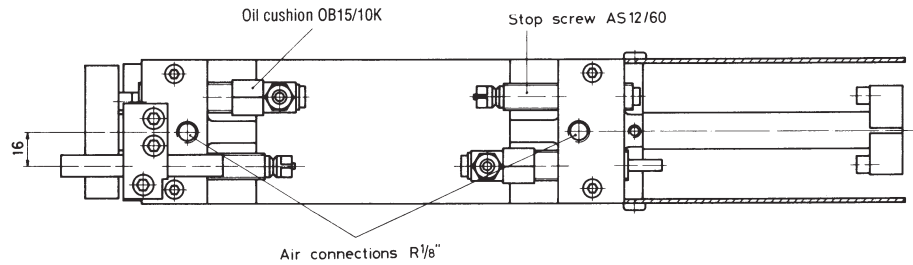
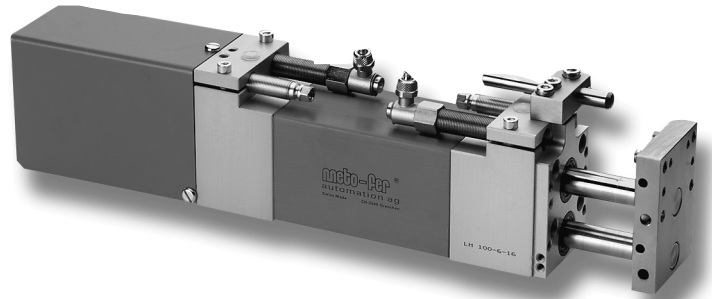
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# Linear units LH

- Progressive working oil cushions, includes oil reservoir KOB 50 (see sheet 6.001)
- Patented stop screws with sensing device
- High repeat accuracy
- Many combination possibilities
- Third position stop dowel pin for use with vertical unit VE \*



| Type   | Stroke (mm) | A (mm) | B (mm) | Piston force at 72.5 psi (5 bar) | Max. Load         | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight           |
|--------|-------------|--------|--------|----------------------------------|-------------------|--|------------------|
| LH 100 | 0 – 100     | 352    | 234    | 51 lb (226 N)                    | 61.7 lb (28.0 kg) | .026 scf (0,73 NL)   | 11.0 lb (5,0 kg) |
| LH 150 | 0 – 150     | 452    | 284    | 51 lb (226 N)                    | 35.3 lb (16.0 kg) | .038 scf (1,09 NL)   | 12.8 lb (5,8 kg) |
| LH 200 | 0 – 200     | 552    | 334    | 51 lb (226 N)                    | 19.8 lb ( 9.0 kg) | .051 scf (1,45 NL)   | 14.6 lb (6,6 kg) |
| LH 300 | 0 – 300     | 752    | 434    | 51 lb (226 N)                    | 9.9 lb (4,5 kg)   | .077 scf (2,18 NL)   | 18.1 lb (8,2 kg) |
| LH 400 | 0 – 400     | 952    | 534    | 51 lb (226 N)                    | 6.6 lb (3,0 kg)   | .102 scf (2,90 NL)   | 21.6 lb (9,8 kg) |

**Technical data:**

- Stroke steplessly adjusted by built in patented stop screws with fine threads.
  - The stop screws can be fitted with patented sensing elements. (see section "Stop Screws with plug-in sensing elements").
  - End position damped with adjustable oil cushions.
  - Designed for high operating rates / long life (expected life 20 million cycles)
  - Seal repair kits available
  - Linear ball bushings.
  - Operating medium
  - Operating pressure
  - Repeatability
  - Air connection
- Compressed air oiled / not oiled  
 43.5 – 116 psi (3 – 8 bar)  
 ± 0.01mm (0.0004")  
 R 1/8" (adapter see sheet 5.032)

**Order No. LH - . . . . .**

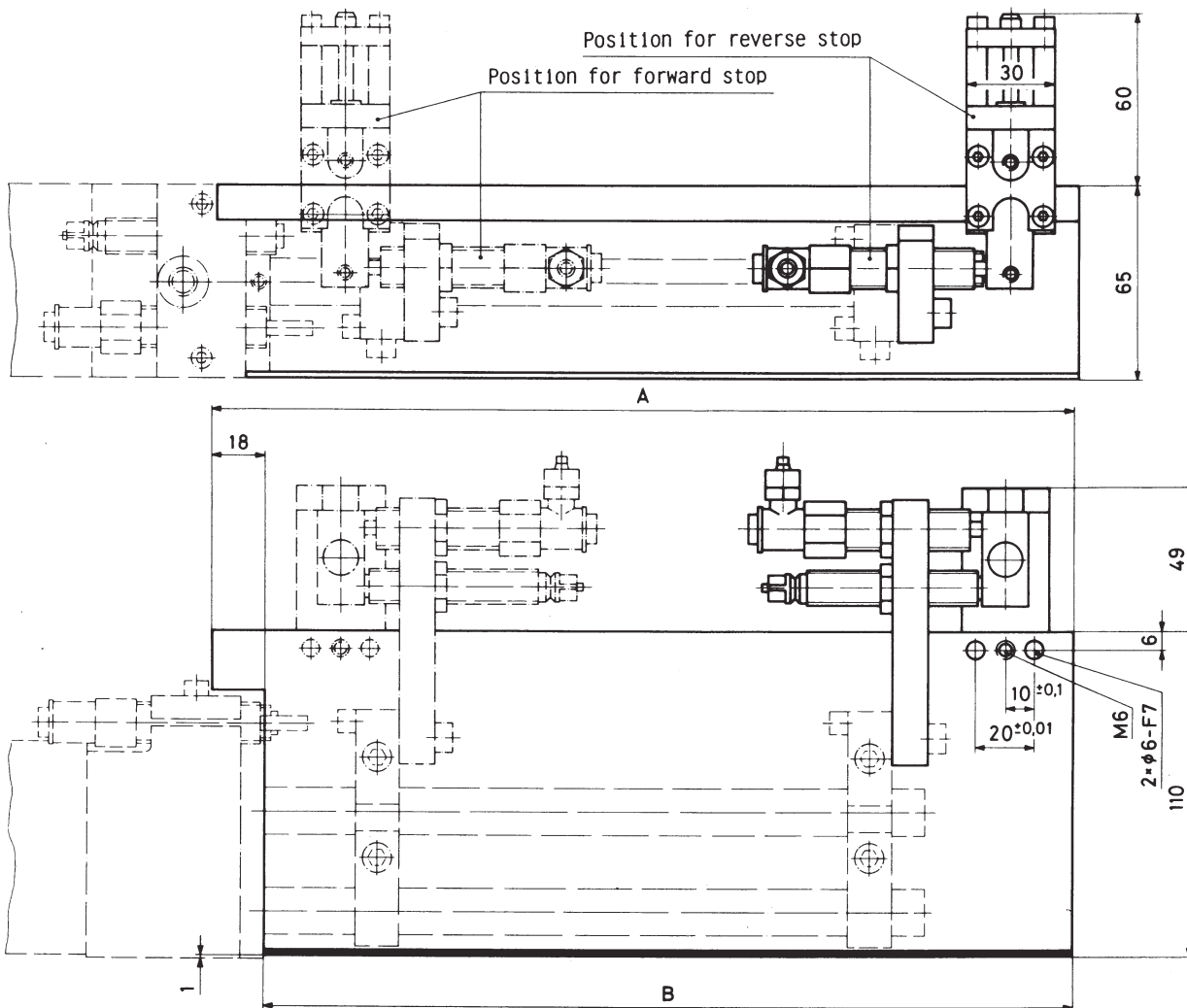
- O=Without cushions
- A=Elastomer cushions (KB08)
- B=Oil cushions and KOB50 (OB15/10K)
- Stroke / mm

# Intermediate position kit for LH

## Description:

The intermediate stop operates via a cylinder introducing a robust stop slide into the path of the horizontal units rear adjustable flange bracket to that is attached the stop screw and oil cushions. This stop assembly can be reversed to operate in either the forward or reverse mode. More than one intermediate stop may be fitted, minimum distance between them 30 mm. They must all operate in the same direction.

The intermediate position can be utilized both in forward or reverse modes.

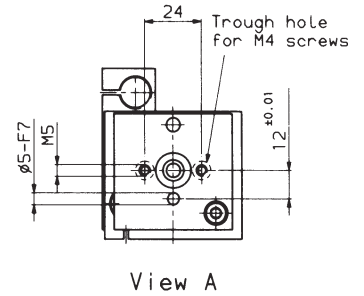
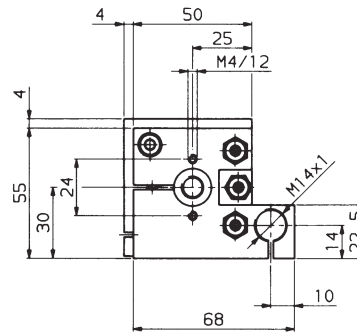
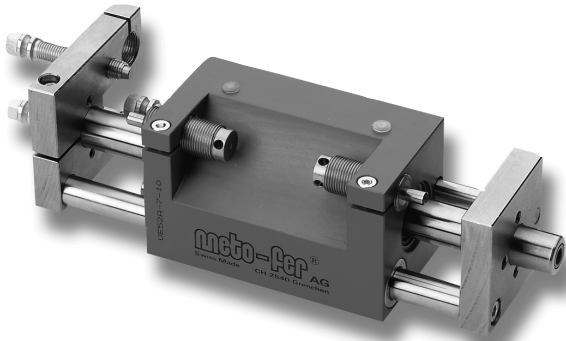


| Intermediate kit complete for: | A (mm) | B (mm) | Intermediate kit with *SA 01 Order No. | Intermediate kit with *SA 01 A Order No. |
|--------------------------------|--------|--------|--|--|
| LH 100                         | 193    | 175    | ZB 03.040                              | ZB 03.040 A                              |
| LH 150                         | 243    | 225    | ZB 03.035                              | ZB 03.035 A                              |
| LH 200                         | 293    | 275    | ZB 03.045                              | ZB 03.045 A                              |
| LH 300                         | 393    | 375    | ZB 03.050                              | ZB 03.050 A                              |
| LH 400                         | 493    | 475    | ZB 03.055                              | ZB 03.055 A                              |

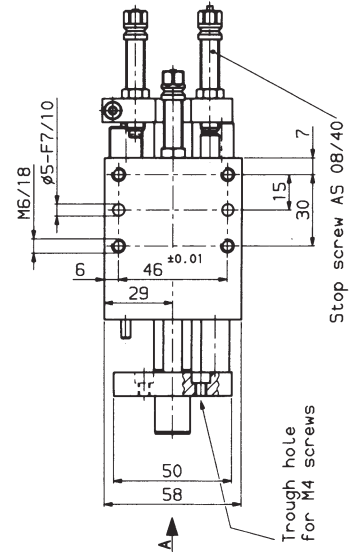
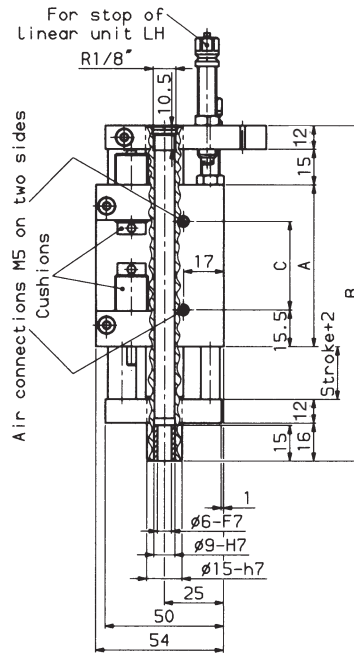
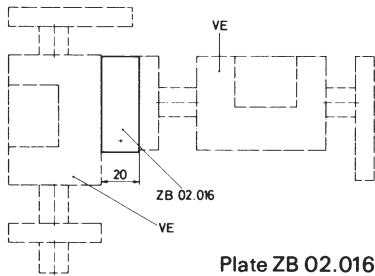
\* SA... = Stop slide see page 1.071

# Vertical Unit VE

In combination with mechanical gripper NW12 order NW25



## Mounting of two vertical units



| Type  | Stroke (mm) | Adjusting range | A   | B   | C  | Piston force at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5bar) | Weight lb (kg) |
|-------|-------------|-----------------|-----|-----|----|----------------------------------|---|----------------|
| VE-22 | 0-20        | 0-20            | 68  | 144 | 32 | 24lb (107N)                      | 0.003scf (0.07NL)   | 2.4 (1.1)      |
| VE-52 | 0-50        | 12-50           | 98  | 204 | 62 | 24lb (107N)                      | 0.006scf (0.17NL)   | 3.1 (1.4)      |
| VE-82 | 0-80        | 42-80           | 128 | 264 | 92 | 24lb (107N)                      | 0.010scf (0.28NL)   | 3.7 (1.7)      |

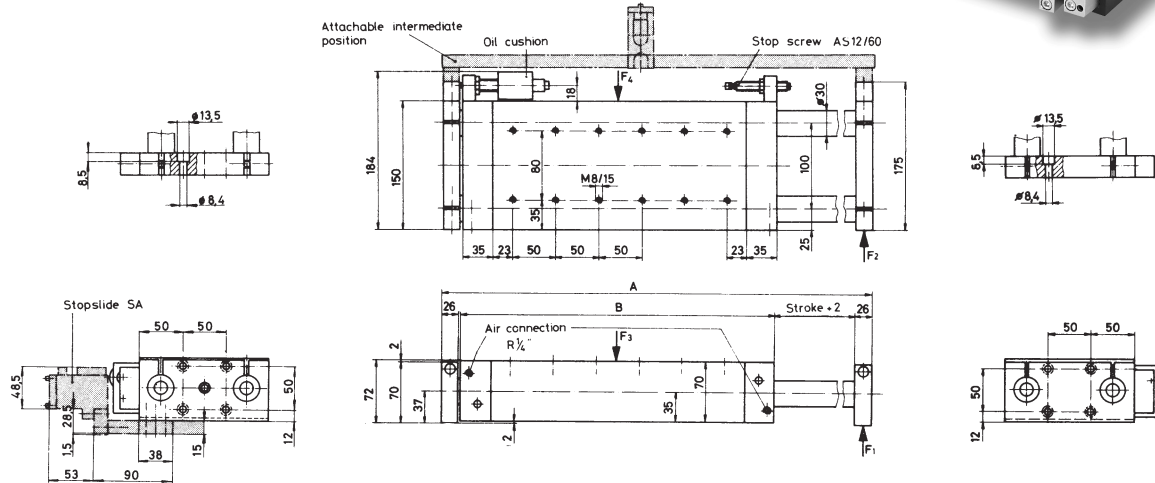
Order No. VE- . . . .  
 └──┬──┬──  
 Type A = Elastomer cushions (Standard type)

## Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8. "Stop system with plug-in sensing elements").
- End position damped with elastomer or oil cushions.
- Bearing: Linear ball bushing
- Positioning holes facilitate the assembly to the linear unit.
- Provision to add
  - Mechanical gripper
  - Vacuum head

- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8bar)
- Piston diameter 25mm (1")
- Repeatability +/- 0.01mm (0.0004")
- Air connection M5

# Linear units LG 50



| Type      | Stroke (mm) | A (mm) | B (mm) | Piston force at 72.5 psi (5 bar) | Max load stat./dyn. |               |                 |                 | Mx (Nm) | My (Nm) | Mz (Nm) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight            |
|-----------|-------------|--------|--------|----------------------------------|---------------------|---------------|-----------------|-----------------|---------|---------|---------|--|-------------------|
|           |             |        |        |                                  | F1                  | F2            | F3              | F4              |         |         |         |  |                   |
| LG 50/200 | 0-200       | 522    | 266    | 156 lb (694 N)                   | 45 lb (200 N)       | 90 lb (400 N) | 225 lb (1000 N) | 292 lb (1300N)  | 50      | 114     | 148.2   | .162 scf ( 4.58 NL)  | 23.4 lb (10.6 kg) |
| LG 50/300 | 0-300       | 722    | 366    | 156 lb (694 N)                   | 34 lb (150 N)       | 70 lb (310 N) | 169 lb ( 750N)  | 219 lb ( 975 N) | 37.5    | 123     | 159.9   | .243 scf ( 6.87 NL)  | 28.7 lb (13.0 kg) |
| LG 50/400 | 0-400       | 922    | 466    | 156 lb (694 N)                   | 27 lb (120 N)       | 56 lb (250 N) | 135 lb ( 600 N) | 175 lb ( 780 N) | 30      | 128.4   | 166.9   | .323 scf ( 9.16 NL)  | 34.0 lb (15.4 kg) |
| LG 50/500 | 0-500       | 1122   | 566    | 156 lb (694 N)                   | 20 lb ( 90N)        | 45 lb (200 N) | 112 lb ( 500 N) | 146 lb ( 650 N) | 25      | 132     | 171.6   | .404 scf (11.45 NL)  | 39.2 lb (17.8 kg) |
| LG 50/600 | 0-600       | 1322   | 666    | 156 lb (694 N)                   | 18 lb ( 80 N)       | 38 lb (170 N) | 90 lb ( 400 N)  | 117 lb ( 520 N) | 20      | 125.6   | 163.6   | .485 scf (13.73 NL)  | 44.5 lb (20.2 kg) |
| LG 50/800 | 0-800       | 1722   | 866    | 156 lb (694 N)                   | 13 lb ( 60 N)       | 29 lb (130 N) | 67 lb ( 300 N)  | 88 lb ( 390 N)  | 15      | 124.2   | 161.5   | .647 scf (18.31 NL)  | 55.1 lb (25.0 kg) |

## Order No.

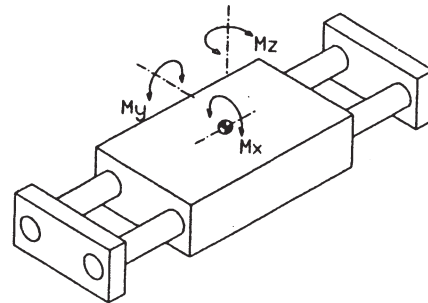
LG 50/ ... - - - - -

C = without support for stopslide  
D = with support for stopslide

2 = Oil cushion OB 15/10 L  
4 = Oil cushion OB 12/20

A = without oil compensation reservoir  
B = with oil compensation reservoir

Type

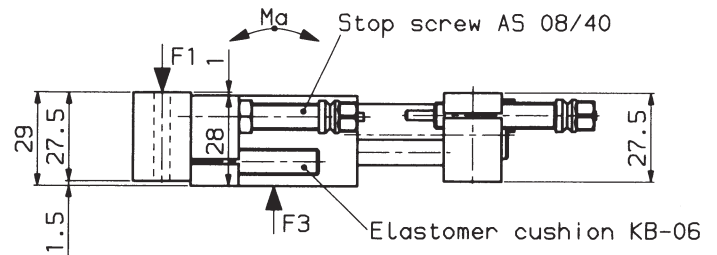
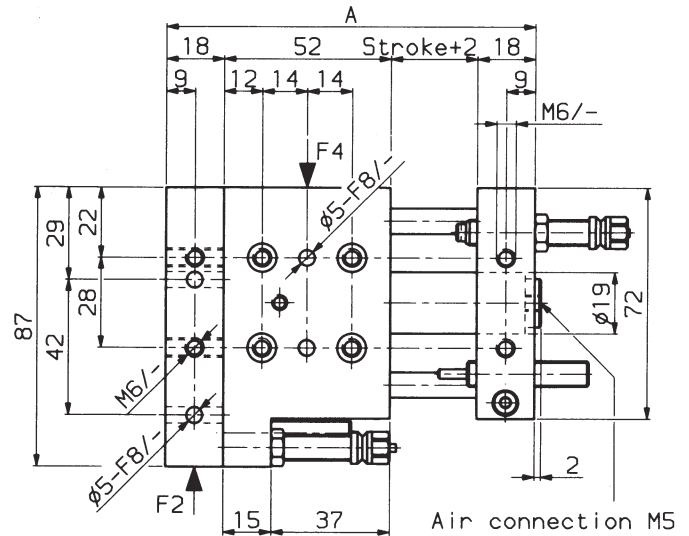
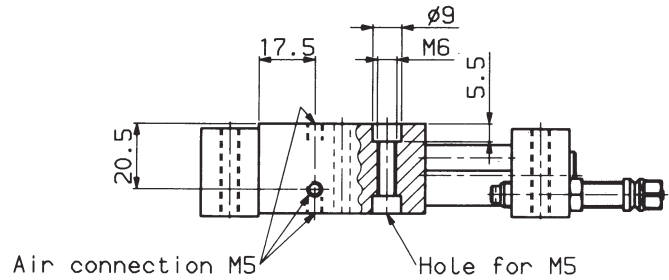
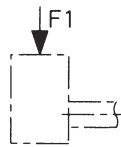
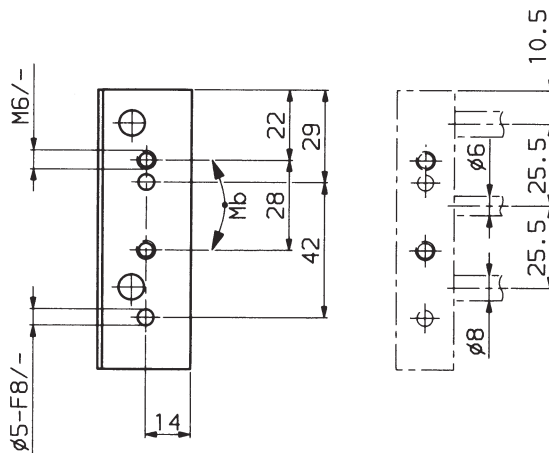
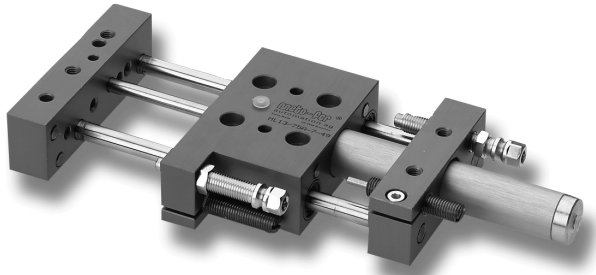


## Technical data:

- Built in stop screws with fine threads provide adjustable, stepless stroke.
  - The stop screws can be fitted with patented sensing elements (see section "Stop screws with plug in sensing elements").
  - End position damped with adjustable oil cushions.
  - Designed for high operating rates and long life.
  - Bearing: Long life sleeve bearing.
  - Attachable intermediate position.
  - Piston  $\varnothing$  50mm (1,96")
  - Operating medium
  - Operating pressure
  - Repeatability
  - Air connection
- Compressed air oiled/ not oiled  
43.5–116 psi (3–8 bar)  
 $\pm 0,01$ mm (.0004")  
R 1/4" (adapter see sheet 5.021)

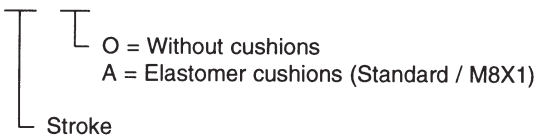


# Mini linear unit ML13



| Type     | Stroke (mm) | Adjusting range (mm) | A   | Piston force at 72.5 psi (5 bar) | Max. load stat./dyn. lb (N) |          |          |          | Ma lb.in (Nm) | Mb lb.in (Nm) | Air consumption for each double stroke at 72.5 psi (5bar) | Weight lb (kg) |
|----------|-------------|----------------------|-----|----------------------------------|-----------------------------|----------|----------|----------|---------------|---------------|---|----------------|
|          |             |                      |     |                                  | F1                          | F2       | F3       | F4       |               |               |   |                |
| ML13-25  | 0-25        | 0-25                 | 115 | 7lb (32N)                        | 29 (131)                    | 31 (137) | 38 (167) | 44 (196) | 40 (4.5)      | 84 (9.5)      | 0.001scf (0.03NL)   | 1.5 (0.70)     |
| ML13-50  | 0-50        | 13-50                | 140 | 7lb (32N)                        | 19 (84)                     | 20 (88)  | 43 (190) | 44 (196) | 40 (4.5)      | 84 (9.5)      | 0.002scf (0.06NL)   | 1.7 (0.76)     |
| ML13-75  | 0-75        | 38-75                | 165 | 7lb (32N)                        | 14 (62)                     | 15 (65)  | 43 (190) | 44 (196) | 40 (4.5)      | 84 (9.5)      | 0.003scf (0.09NL)   | 1.8 (0.82)     |
| ML13-100 | 0-100       | 63-100               | 190 | 7lb (32N)                        | 9 (41)                      | 10 (43)  | 43 (190) | 44 (196) | 40 (4.5)      | 84 (9.5)      | 0.004scf (0.12NL)   | 1.9 (0.88)     |

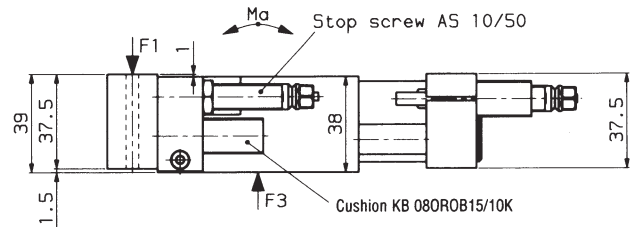
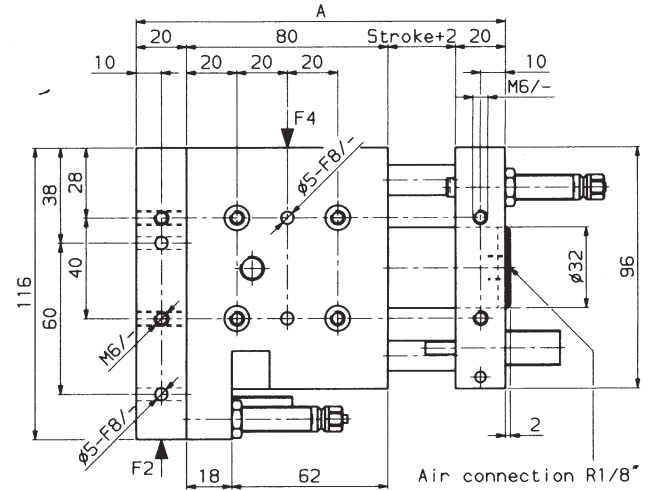
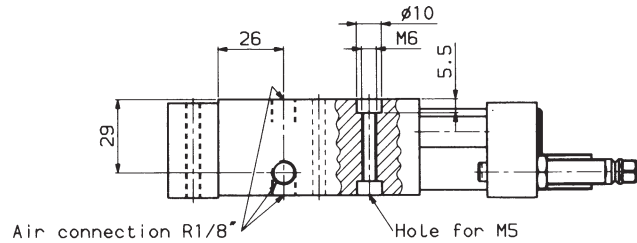
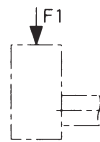
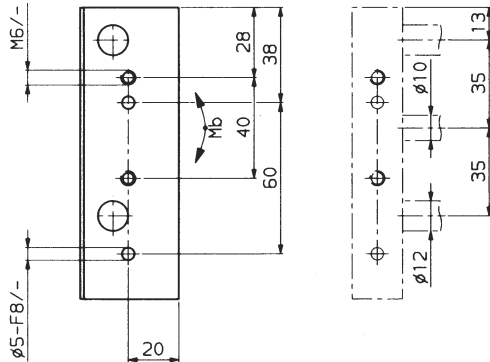
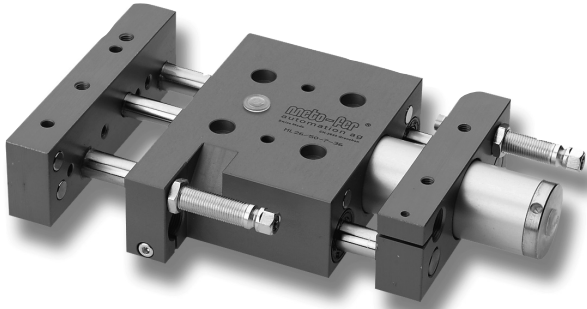
Order No. ML13 - . . . . .



## Technical data:

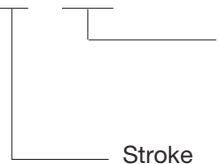
- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8 "Stop system with plug-in sensing elements").
- End position damped with elastomer cushions.
- Bearing: Linear ball bushing.
- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Piston diameter 12mm
- Repeatability +/- 0.01mm (0.0004")
- Air connection M5

# Mini linear unit ML26



| Type     | Stroke | Adjusting range (mm) | A   | Piston force at 72.5 psi (5 bar) | Max. load stat./dyn. lb (N) |           |           |           | Ma lb.in (Nm) | Mb lb.in (Nm) | Air consumption for each double stroke at 72.5 psi (5bar) | Weight lb (kg) |
|----------|--------|----------------------|-----|----------------------------------|-----------------------------|-----------|-----------|-----------|---------------|---------------|---|----------------|
|          |        |                      |     |                                  | F1                          | F2        | F3        | F4        |               |               |   |                |
| ML26-25  | 0-25   | 0-25                 | 147 | 35lb (154N)                      | 162 (721)                   | 170 (754) | 168 (746) | 173 (770) | 248 (28.0)    | 359 (40.5)    | 0.005scf (0.14NL)   | 3.7 (1.7)      |
| ML26-50  | 0-50   | 0-50                 | 172 | 35lb (154N)                      | 91 (404)                    | 95 (422)  | 175 (777) | 179 (794) | 199 (22.5)    | 297 (33.5)    | 0.009scf (0.27NL)   | 4.0 (1.8)      |
| ML26-75  | 0-75   | 24-75                | 197 | 35lb (154N)                      | 67 (297)                    | 70 (311)  | 160 (712) | 165 (734) | 177 (20.0)    | 261 (29.5)    | 0.014scf (0.41NL)   | 4.2 (1.9)      |
| ML26-100 | 0-100  | 49-100               | 222 | 35lb (154N)                      | 49 (216)                    | 51 (226)  | 139 (617) | 143 (636) | 159 (18.0)    | 230 (26.0)    | 0.019scf (0.54NL)   | 4.4 (2.0)      |
| ML26-125 | 0-125  | 74-125               | 247 | 35lb (154N)                      | 36 (162)                    | 38 (169)  | 123 (546) | 127 (563) | 142 (16.0)    | 208 (23.5)    | 0.024scf (0.68NL)   | 4.6 (2.1)      |
| ML26-150 | 0-150  | 99-150               | 272 | 35lb (154N)                      | 31 (136)                    | 32 (143)  | 117 (518) | 123 (548) | 137 (15.5)    | 199 (22.5)    | 0.028scf (0.81NL)   | 4.9 (2.2)      |
| ML26-200 | 0-200  | 149-200              | 322 | 35lb (154N)                      | 22 (99)                     | 23 (104)  | 111 (494) | 115 (509) | 128 (14.5)    | 190 (21.5)    | 0.038scf (1.08NL)   | 5.5 (2.5)      |

Order No. ML 26 - . . . - . . .

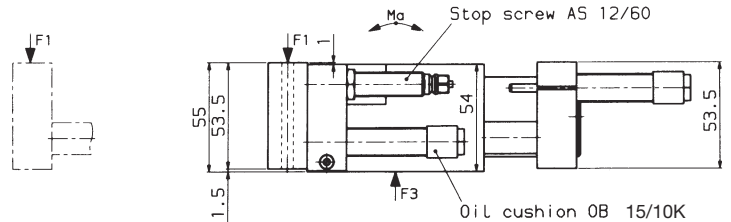
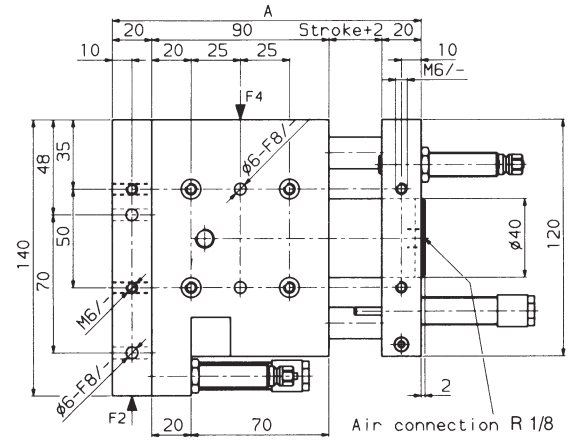
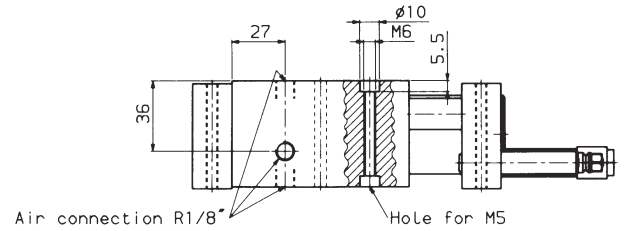
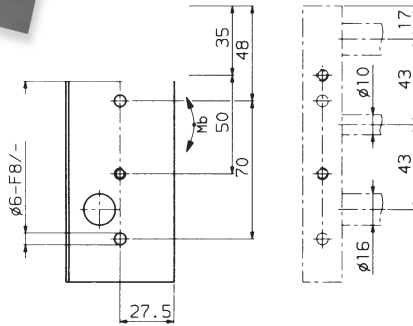


- O=Without cushions
- A=Elastomer cushions (Standard type), KB08
- B=Oil cushions without compensation reservoir, OB 15/10K
- C=Oil cushions with compensation reservoir (KOB50)

## Technical data:

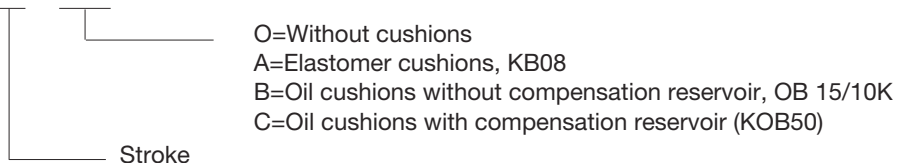
- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements.  
(see section 8. "Stop system with plug-in sensing elements").
- End position damped with elastomer or oil cushion.
- Bearing: Linear ball bushing.
- Operating medium Compressed air oiled / not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Piston diameter 25mm
- Repeatability +/- 0.01mm (0.0004")
- Air connection R1/8"

# Mini linear unit ML33



| Type     | Stroke (mm) | Adjusting range (mm) | A   | Piston force at 72.5 psi (5 bar) | Max. load stat./dyn. lb (N) |           |           |            | Ma lb.in (Nm) | Mb lb.in (Nm) | Air consumption for each double stroke at 72.5 psi (5bar) | Weight lb (kg) |
|----------|-------------|----------------------|-----|----------------------------------|-----------------------------|-----------|-----------|------------|---------------|---------------|---|----------------|
|          |             |                      |     |                                  | F1                          | F2        | F3        | F4         |               |               |   |                |
| ML33-25  | 0-25        | 0-27                 | 157 | 68lb (300N)                      | 185 (823)                   | 194 (861) | 183 (814) | 189 (840)  | 336 (38.0)    | 567 (64.0)    | 0.008scf (0.23NL)   | 8.9 (4.05)     |
| ML33-50  | 0-50        | 0-52                 | 182 | 68lb (300N)                      | 112 (499)                   | 117 (522) | 221 (982) | 228 (1013) | 288 (32.5)    | 482 (54.5)    | 0.016scf (0.45NL)   | 9.4 (4.25)     |
| ML33-75  | 0-75        | 8-77                 | 207 | 68lb (300N)                      | 77 (340)                    | 80 (355)  | 195 (865) | 201 (892)  | 252 (28.5)    | 420 (47.5)    | 0.024scf (0.67NL)   | 9.9 (4.50)     |
| ML33-100 | 0-100       | 33-102               | 232 | 68lb (300N)                      | 63 (281)                    | 66 (295)  | 195 (865) | 201 (892)  | 252 (28.5)    | 420 (47.5)    | 0.032scf (0.90NL)   | 10.4 (4.70)    |
| ML33-125 | 0-125       | 58-127               | 257 | 68lb (300N)                      | 46 (203)                    | 48 (213)  | 164 (728) | 169 (750)  | 212 (24.0)    | 354 (40.0)    | 0.039scf (1.12NL)   | 10.8 (4.90)    |
| ML33-150 | 0-150       | 83-152               | 282 | 68lb (300N)                      | 40 (178)                    | 42 (168)  | 164 (728) | 169 (750)  | 212 (24.0)    | 354 (40.0)    | 0.047scf (1.35NL)   | 11.4 (5.15)    |
| ML33-175 | 0-175       | 108-177              | 307 | 68lb (300N)                      | 33 (148)                    | 35 (155)  | 153 (680) | 158 (702)  | 199 (22.5)    | 332 (37.5)    | 0.055scf (1.57NL)   | 11.8 (5.35)    |
| ML33-200 | 0-200       | 133-202              | 332 | 68lb (300N)                      | 28 (125)                    | 29 (131)  | 143 (637) | 148 (657)  | 181 (20.5)    | 305 (34.5)    | 0.063scf (1.79NL)   | 12.2 (5.55)    |
| ML33-250 | 0-250       | 183-252              | 382 | 68lb (300N)                      | 23 (100)                    | 24 (105)  | 137 (610) | 141 (628)  | 177 (20.0)    | 297 (33.5)    | 0.078scf (2.24NL)   | 13.2 (6.00)    |
| ML33-300 | 0-300       | 233-302              | 432 | 68lb (300N)                      | 18 (79)                     | 19 (83)   | 126 (561) | 130 (578)  | 164 (18.5)    | 270 (30.5)    | 0.094scf (2.69NL)   | 14.1 (6.40)    |
| ML33-350 | 0-350       | 283-352              | 482 | 68lb (300N)                      | 15 (66)                     | 16 (69)   | 120 (532) | 124 (549)  | 155 (17.5)    | 261 (29.5)    | 0.110scf (3.14NL)   | 15.1 (6.85)    |
| ML33-400 | 0-400       | 333-402              | 532 | 68lb (300N)                      | 13 (57)                     | 13 (59)   | 115 (512) | 119 (528)  | 146 (16.5)    | 248 (28.0)    | 0.126scf (3.59NL)   | 16.0 (7.24)    |

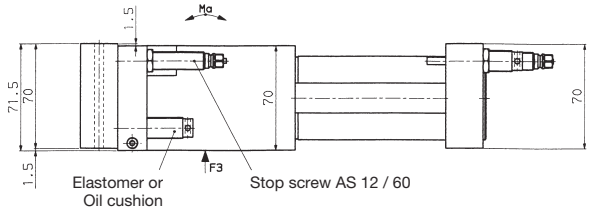
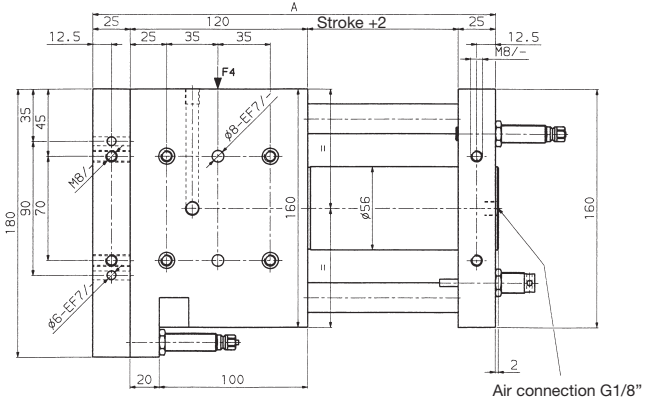
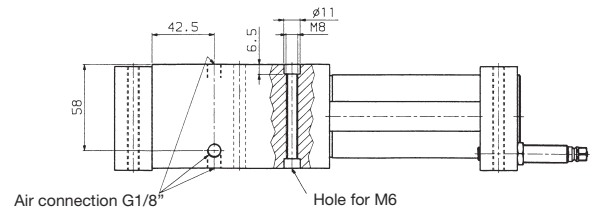
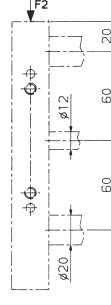
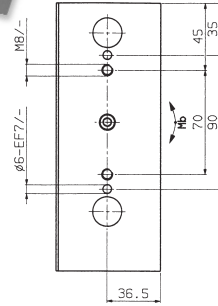
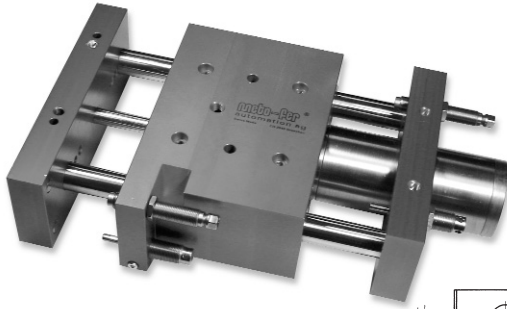
Order No. ML 33 - . . . - . . .



**Technical data:**

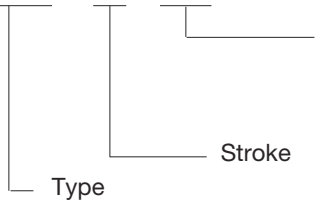
- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8 "Stop system with plug-in sensing elements").
- End position damped with elastomer or oil cushion.
- Bearing: Linear ball bushing.
- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Piston diameter 32mm
- Repeatability +/- 0.01mm (0.0004")
- Air connection R1/8"

# Linear Unit ML 50



| Type      | Stroke (mm) | Adjustable Range (mm) | A (mm) | Piston Force @ 72.5 PSI (5 bar) | F1 lb. (N) | F2 lb. (N) | F3 lb. (N) | F4 lb. (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Air Consumption for each double stroke @ 72.5 PSI (5 bar) | Weight lb (kg) |
|-----------|-------------|-----------------------|--------|---------------------------------|------------|------------|------------|------------|----------------|----------------|---|----------------|
| ML 50-50  | 0-50        | 0-50                  | 222    | 162 LB (722N)                   | 168 (750)  | 168 (750)  | 247 (1100) | 241 (1075) | 371 (42)       | 531 (60)       | 0.040 scf (1.14 NL)                                       | 14.3 (6.5)     |
| ML 50-75  | 0-75        | 25-75                 | 247    | 162 LB (722N)                   | 123 (550)  | 101 (450)  | 236 (1050) | 229 (1020) | 336 (38)       | 513 (58)       | 0.060 scf (1.71 NL)                                       | 14.9 (6.8)     |
| ML 50-100 | 0-100       | 50-100                | 272    | 162 LB (722N)                   | 89 (400)   | 78 (350)   | 220 (980)  | 218 (970)  | 318 (36)       | 487 (55)       | 0.080 scf (2.28 NL)                                       | 15.4 (7.0)     |
| ML 50-150 | 0-150       | 100-150               | 322    | 162 LB (722N)                   | 56 (250)   | 56 (250)   | 197 (880)  | 195 (870)  | 300 (34)       | 442 (50)       | 0.117 scf (3.43 NL)                                       | 16.5 (7.5)     |
| ML 50-200 | 0-200       | 150-200               | 372    | 162 LB (722N)                   | 42 (190)   | 42 (190)   | 170 (760)  | 173 (770)  | 274 (31)       | 416 (47)       | 0.161 scf (4.57 NL)                                       | 17.6 (8.0)     |
| ML 50-250 | 0-250       | 200-250               | 422    | 162 LB (722N)                   | 35 (160)   | 35 (160)   | 160 (710)  | 160 (710)  | 256 (29)       | 389 (44)       | 0.201 scf (5.72 NL)                                       | 17.4 (8.5)     |
| ML 50-300 | 0-300       | 250-300               | 472    | 162 LB (722N)                   | 29 (130)   | 31 (140)   | 146 (650)  | 148 (660)  | 239 (27)       | 354 (40)       | 0.242 scf (6.86 NL)                                       | 19.8 (9.0)     |
| ML 50-400 | 0-400       | 350-400               | 572    | 162 LB (722N)                   | 20 (90)    | 22 (100)   | 128 (570)  | 134 (600)  | 221 (25)       | 336 (38)       | 0.322 scf (9.15 NL)                                       | 22.0 (10.0)    |
| ML 50-500 | 0-500       | 450-500               | 672    | 162 LB (722N)                   | 16 (75)    | 16 (75)    | 121 (540)  | 126 (560)  | 186 (21)       | 327 (37)       | 0.403 scf (11.44 NL)                                      | 24.2 (11.0)    |

Order No. **ML 50** - . . . - . . .



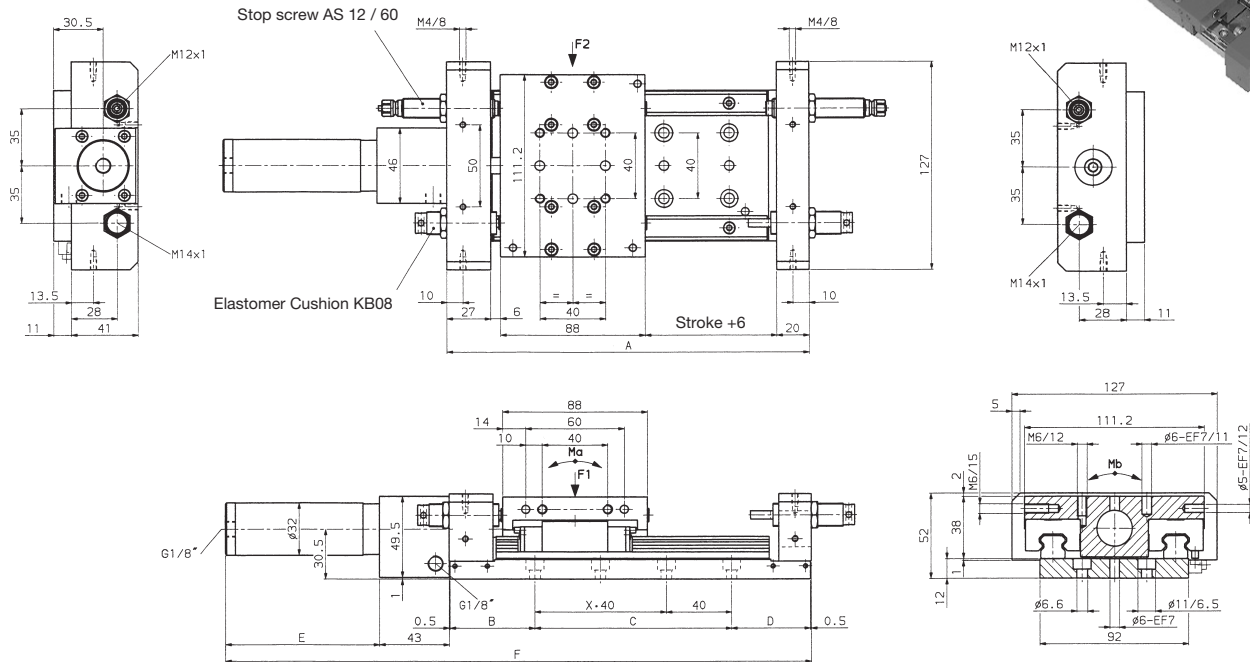
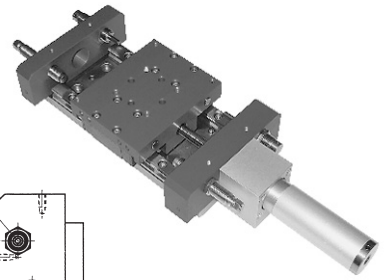
O=Without cushions  
 A=Elastomer cushions, KB08  
 B=Oil cushions without compensation reservoir, OB 15/10K  
 C=Oil cushions with compensation reservoir (KOB50)

## Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8. "stop system with plug-in sensing elements")
- End position damped with elastomer or oil cushion.
- Bearing: Linear ball bushing.
- Operating medium Compressed air oiled / not oiled
- Operating pressure 43.5 – 116 psi (3 – 8bar)
- Piston diameter 50mm
- Repeatability +/- 0.01mm (0.0004")
- Air connection G1/8

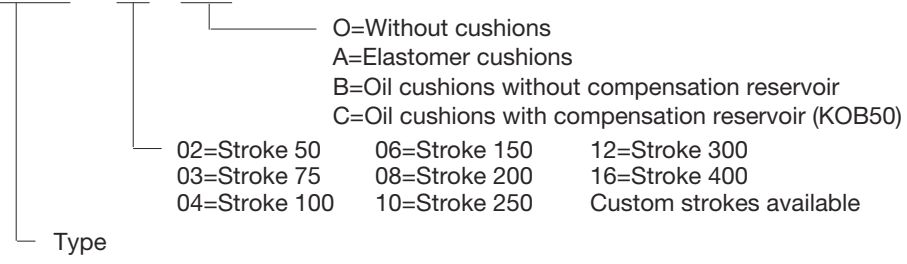
# Linear Unit LMP-60

Twin Rail

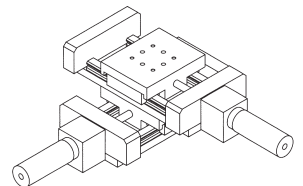


| Stroke mm | Adjusting Range mm | A mm | B mm  | C mm | D mm  | E mm | F mm | X mm | Piston force @ 72.5 PSI (5 bar) lb (N) | F1 lb (N) | F2 lb (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Air Consumption for each double stroke @ 72.5 PSI (5 bar) | Weight lb (kg) |
|-----------|--------------------|------|-------|------|-------|------|------|------|--|-----------|-----------|----------------|----------------|---|----------------|
| 0-50      | 0-50               | 197  | 39.5  | 120  | 36.5  | 70   | 310  | 2    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.009 scf (0.27 NL)                                       | 8.3 (3.8)      |
| 0-75      | 24-75              | 222  | 52.0  | 120  | 49.0  | 95   | 360  | 2    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.014 scf (0.40 NL)                                       | 9.0 (4.1)      |
| 0-100     | 49-100             | 247  | 64.5  | 120  | 61.5  | 120  | 410  | 2    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.019 scf (0.54 NL)                                       | 9.7 (4.4)      |
| 0-150     | 99-150             | 297  | 89.5  | 120  | 86.5  | 170  | 510  | 2    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.065 scf (0.81 NL)                                       | 11.0 (5.0)     |
| 0-200     | 149-200            | 347  | 74.5  | 200  | 71.5  | 220  | 610  | 4    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.038 scf (1.08 NL)                                       | 12.3 (5.6)     |
| 0-250     | 199-250            | 397  | 99.5  | 200  | 96.5  | 270  | 710  | 4    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.047 scf (1.35 NL)                                       | 13.6 (6.2)     |
| 0-300     | 249-300            | 447  | 124.5 | 200  | 121.5 | 320  | 810  | 4    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.057 scf (1.62 NL)                                       | 15.2 (6.9)     |
| 0-400     | 349-400            | 547  | 174.5 | 200  | 171.5 | 420  | 1010 | 4    | 34 lb (154 N)                          | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.76 scf (2.16 NL)  | 17.8 (8.1)     |

Order No. **LMP 60 - . . . . .**



The units can also be used as x-y tables



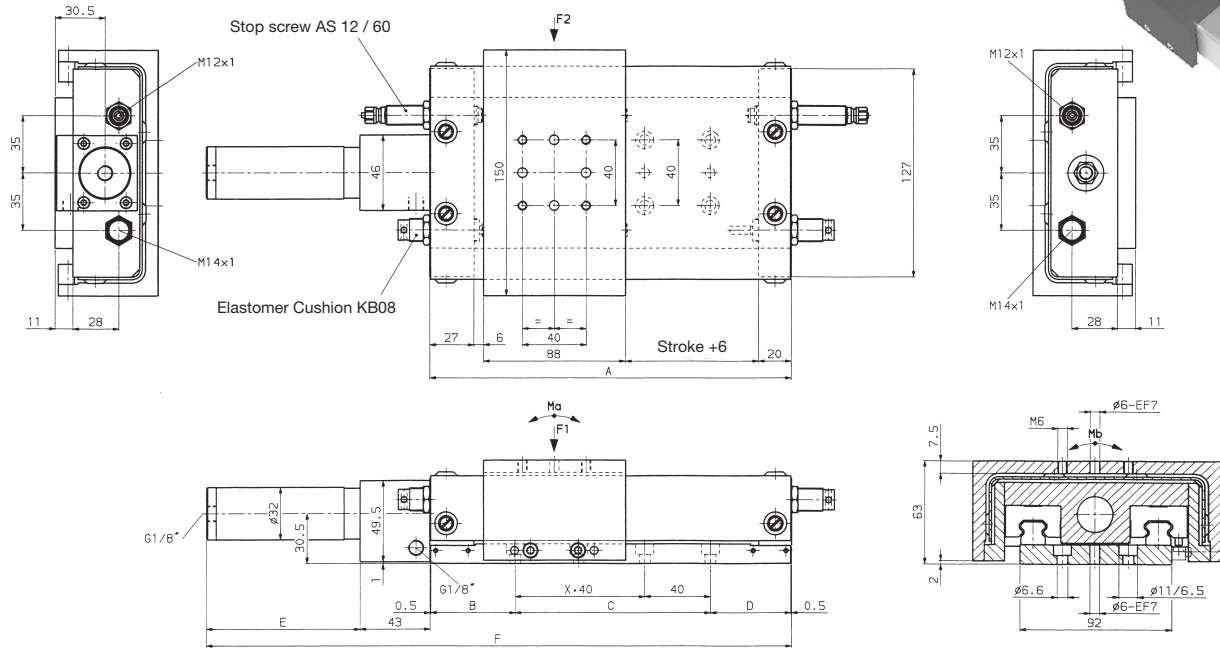
**Technical data:**

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8 "stop system with plug-in sensing elements")
- End position damped with elastomer or oil cushion.
- Linear twin rails with carriage.
- Operating medium                      Compressed air oiled / not oiled
- Operating pressure                      43.5 – 116 PSI (3 – 8 bar)
- Piston diameter                          25 mm
- Repeatability                              +/- 0.01mm (0.0004")
- Air connection                            G1/8"

- Easy mounting with the following units:
- LMP-60
  - LMP-60-A
  - LM-60-RW
  - LM-60-RWA

# Linear Unit LMP-60-A

Twin Rail with cover



| Stroke mm | Adjusting Range mm | A mm | B mm  | C mm | D mm  | E mm | F mm | X mm | Piston force @72.5 PSI (5 bar) lb (N) | F1 lb (N) | F2 lb (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Air Consumption for each double stroke @ 72.5 PSI (5 bar) | Weight lb (kg) |
|-----------|--------------------|------|-------|------|-------|------|------|------|---------------------------------------|-----------|-----------|----------------|----------------|---|----------------|
| 0-50      | 0-50               | 197  | 39.5  | 120  | 36.5  | 70   | 310  | 2    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.009 scf (0.27 NL)                                       | 11.0 (5.0)     |
| 0-75      | 24-75              | 222  | 52.0  | 120  | 49.0  | 95   | 360  | 2    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.014scf (0.40 NL)  | 11.6 (5.3)     |
| 0-100     | 49-100             | 247  | 64.5  | 120  | 61.5  | 120  | 410  | 2    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.019 scf (0.54 NL)                                       | 12.3 (5.6)     |
| 0-150     | 99-150             | 297  | 89.5  | 120  | 86.5  | 170  | 510  | 2    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.065 scf (0.81 NL)                                       | 13.8 (6.3)     |
| 0-200     | 149-200            | 347  | 74.5  | 200  | 71.5  | 220  | 610  | 4    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.038 scf (1.08 NL)                                       | 15.2 (6.9)     |
| 0-250     | 199-250            | 397  | 99.5  | 200  | 96.5  | 270  | 710  | 4    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.047 scf (1.35 NL)                                       | 16.5 (7.5)     |
| 0-300     | 249-300            | 447  | 124.5 | 200  | 121.5 | 320  | 810  | 4    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.057 scf (1.62 NL)                                       | 18.3 (8.3)     |
| 0-400     | 349-400            | 547  | 174.5 | 200  | 171.5 | 420  | 1010 | 4    | 34 lb. (154 N)                        | 168 (750) | 112 (500) | 6.7 (30)       | 6.7 (30)       | 0.76 scf (2.16 NL)  | 21.1 (9.6)     |

Order No. LMP 60A - . . . - . . .

O=Without cushions  
 A=Elastomer cushions  
 B=Oil cushions without compensation reservoir  
 C=Oil cushions with compensation reservoir (KOB50)

02=Stroke 50      06=Stroke 150      12=Stroke 300  
 03=Stroke 75      08=Stroke 200      16=Stroke 400  
 04=Stroke 100    10=Stroke 250      Custom strokes available

Type

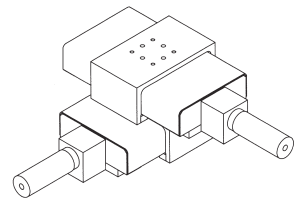
The units can also be used as x-y tables

### Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8. "stop system with plug-in sensing elements")
- End position damped with elastomer or oil cushion.
- Linear twin rails with carriage.
- Operating medium
- Operating pressure
- Piston diameter
- Repeatability
- Air connection

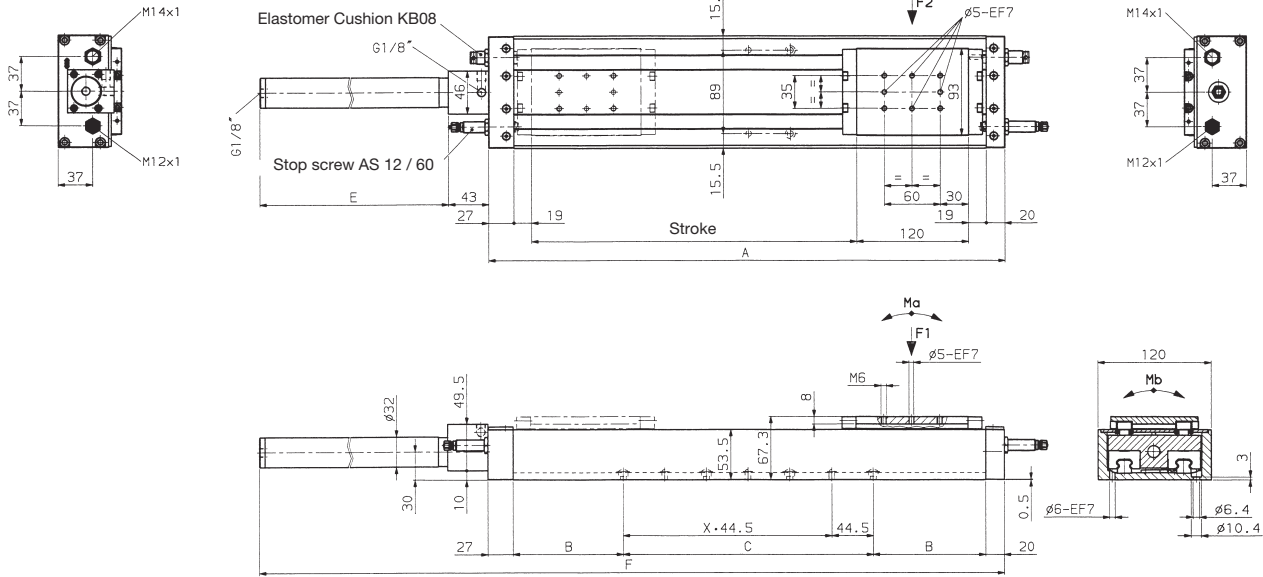
Compressed air oiled / not oiled  
 43.5 – 116 PSI (3 – 8 bar)  
 25 mm  
 +/- 0.01mm (0.0004")  
 G1/8"

Easy mounting with the following units:  
 -LMP-60  
 -LMP-60-A  
 -LM-60-RW  
 -LM-60-RWA



# Linear Unit LKP-100

Twin Rail with band cover



| Stroke mm | Adjusting Range mm | A mm | B mm  | C mm | E mm | F mm | X mm | Piston force@ 72.5PSI(5bar) lb (N) | F1 lb (N) | F2 lb (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Air Consumption for each double stroke @ 72.5 PSI (5 bar) | Weight lb (kg) |
|-----------|--------------------|------|-------|------|------|------|------|------------------------------------|-----------|-----------|----------------|----------------|---|----------------|
| 0-50      | 0-50               | 255  | 59.5  | 89   | 104  | 402  | 1    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.009 scf (0.27 NL)                                       | 13.4 (6.1)     |
| 0-75      | 25-75              | 280  | 72    | 89   | 129  | 452  | 1    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.014 scf (0.40 NL)                                       | 14.5 (6.6)     |
| 0-100     | 50-100             | 305  | 84.5  | 89   | 154  | 502  | 1    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.019 scf (0.54 NL)                                       | 15.4 (7.0)     |
| 0-150     | 100-150            | 355  | 109.5 | 89   | 204  | 602  | 1    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.028 scf (0.81 NL)                                       | 16.5 (7.5)     |
| 0-200     | 150-200            | 405  | 134.5 | 89   | 254  | 702  | 1    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.038 scf (1.08 NL)                                       | 18.7 (8.0)     |
| 0-250     | 200-250            | 455  | 70.5  | 267  | 304  | 802  | 5    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.047 scf (1.35 NL)                                       | 18.7 (8.5)     |
| 0-300     | 250-300            | 505  | 95.5  | 267  | 354  | 902  | 5    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.057 scf (1.62 NL)                                       | 19.8 (9.0)     |
| 0-400     | 350-400            | 605  | 145.5 | 267  | 454  | 1102 | 5    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.76 scf (2.16 NL)  | 21.8 (9.9)     |
| 0-500     | 450-500            | 705  | 195.5 | 267  | 554  | 1302 | 5    | 34 (154 N)                         | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.095 scf (2.71 NL)                                       | 24.0 (10.9)    |

**Order No. LKP 100 - . . . - . . .**

O=Without cushions  
 A=Elastomer cushions  
 B=Oil cushions without compensation reservoir  
 C=Oil cushions with compensation reservoir (KOB50)

02=Stroke 50      06=Stroke 150      12=Stroke 300  
 03=Stroke 75      08=Stroke 200      16=Stroke 400  
 04=Stroke 100    10=Stroke 250      20=Stroke 500

Custom strokes available

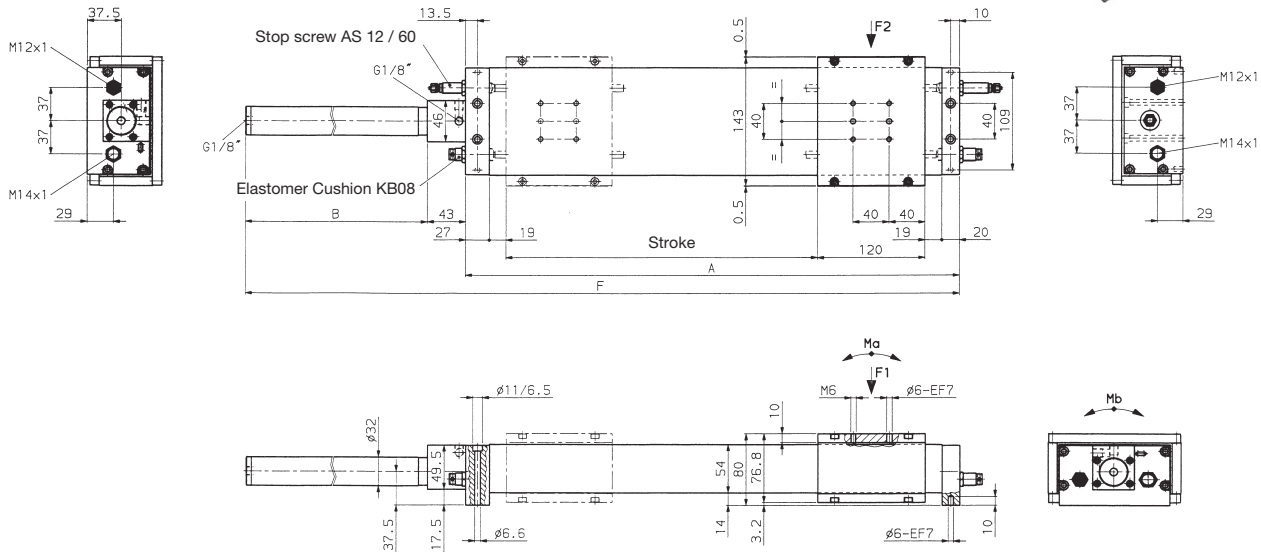
Type

**Technical data:**

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8. "stop system with plug-in sensing elements")
- End position damped with elastomer or oil cushion.
- Twin rails with carriage.
- Operating medium                              Compressed air oiled / not oiled
- Operating pressure                            43.5 – 116 PSI (3 – 8 bar)
- Piston diameter                                25 mm
- Repeatability                                   +/- 0.01mm (0.0004")
- Air connection                                 G1/8"

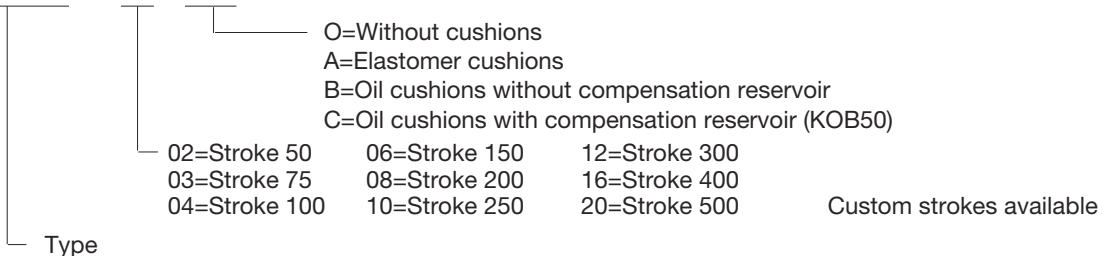
# Linear Unit LKP-100-A

Twin Rails



| Stroke mm | Adjusting Range mm | A mm | B mm  | F mm | X mm | Piston force@ 72.5 PSI (5bar) | F1 lb (N) | F2 lb (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Air Consumption for each double stroke @ 72.5 PSI (5 bar) | Weight lb (kg) |
|-----------|--------------------|------|-------|------|------|-------------------------------|-----------|-----------|----------------|----------------|---|----------------|
| 0-50      | 0-50               | 255  | 59.5  | 402  | 1    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.009 scf (0.27 NL)                                       | 13.8 (6.3)     |
| 0-75      | 25-75              | 280  | 72.0  | 452  | 1    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.014 scf (0.40 NL)                                       | 14.3 (6.5)     |
| 0-100     | 50-100             | 305  | 84.5  | 502  | 1    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.019 scf (0.54 NL)                                       | 14.7 (6.7)     |
| 0-150     | 100-150            | 355  | 109.5 | 602  | 1    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.028 scf (0.81 NL)                                       | 15.6 (7.1)     |
| 0-200     | 150-200            | 405  | 134.5 | 702  | 1    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.038 scf (1.08 NL)                                       | 16.5 (7.5)     |
| 0-250     | 200-250            | 455  | 70.5  | 802  | 5    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.047 scf (1.35 NL)                                       | 17.4 (7.9)     |
| 0-300     | 250-300            | 505  | 95.5  | 902  | 5    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.057 scf (1.62 NL)                                       | 18.5 (8.4)     |
| 0-400     | 350-400            | 605  | 145.5 | 1102 | 5    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.076 scf (2.16 NL)                                       | 20.2 (9.2)     |
| 0-500     | 450-500            | 705  | 195.5 | 1302 | 5    | 34 (154 N)                    | 168 (750) | 112 (500) | 265 (30)       | 265 (30)       | 0.095 scf (2.71 NL)                                       | 22.2 (10.1)    |

Order No. LKP 100A - . . . - . . .

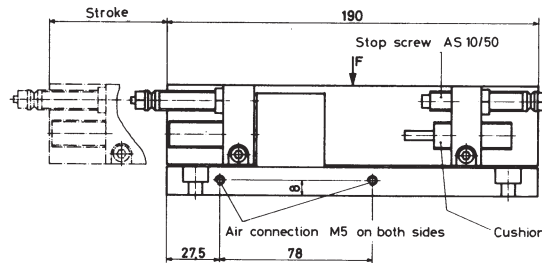
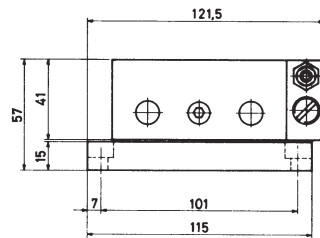
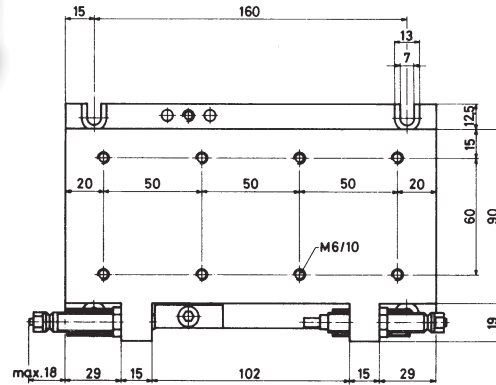
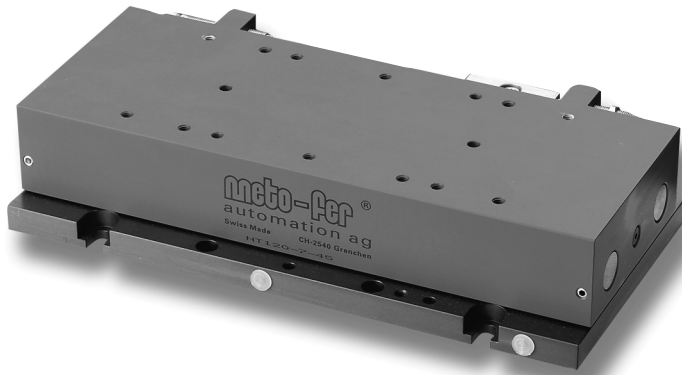


### Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8. "stop system with plug-in sensing elements")
- End position damped with elastomer or oil cushion.
- Twin rails with carriage.
- Operating medium                      Compressed air oiled / not oiled
- Operating pressure                    43.5 – 116 PSI (3 – 8 bar)
- Piston diameter                        25 mm
- Repeatability                            +/- 0.01mm (0.0004")
- Air connection                         G1/8"



# Standard roller slide NT 61



| Type  | Stroke (mm) | Piston force at 72.5 psi (5 bar) | Max. load F stat. | Max. load F dyn. | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight          |
|-------|-------------|----------------------------------|-------------------|------------------|--|-----------------|
| NT 61 | 0-60        | 35 lb (154 N)                    | 337 lb (1500 N)   | 214 lb (950 N)   | .013 scf (0,36 NL)   | 5.5 lb (2,5 kg) |

## Order No.

NT 61 - ...

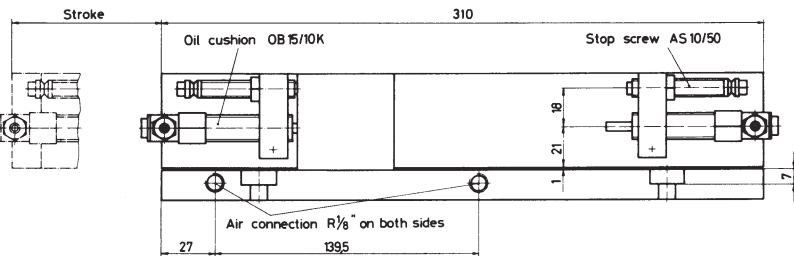
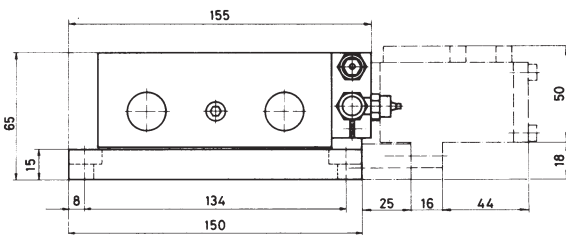
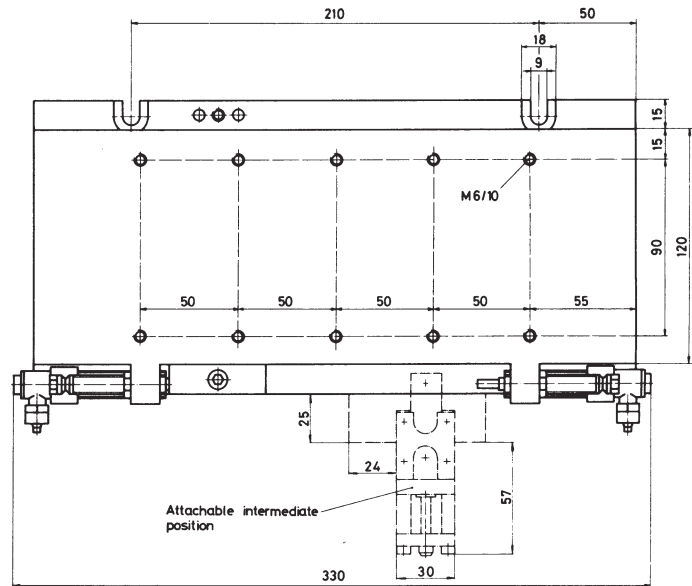
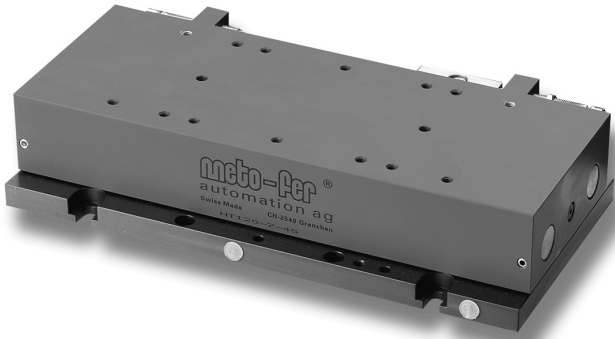
- O = without cushions
- A = with elastomer cushions (standard type)
- B = with oil cushions, without compensation reservoir
- C = with oil cushions, with compensation reservoir (KOB50)

Standard roller slide NT 61

## Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8"Stop system with plug-in sensing elements").
- End position damped with adjustable elastomer or oil cushion.
- Designed for high operating rates and long life
- Bearing: Linear ball bushing.
- Operating medium                      Compressed air or hydraulic oil
- Operating pressure                    43.5 - 116 psi (3 - 8 bar)
- Piston diameter
- Repeatability                            +/- 0.01mm (0.0004")
- Air connection                           M5

# Standard roller slide NT 120



| Type   | Stroke (mm) | Piston force at 72.5 psi (5 bar) | Max. load F stat. | Max. load F dyn. | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight           |
|--------|-------------|----------------------------------|-------------------|------------------|--|------------------|
| NT 120 | 0-120       | 53 lb (235 N)                    | 540 lb (2400 N)   | 360 lb (1600 N)  | .032 scf (0,91 NL)   | 14.3 lb (6,5 kg) |

## Order No.

NT120-0 O = without cushions  
 NT120-A A = with oil cushions, without compensation reservoir  
 NT120-B B = with oil cushions, with compensation reservoir

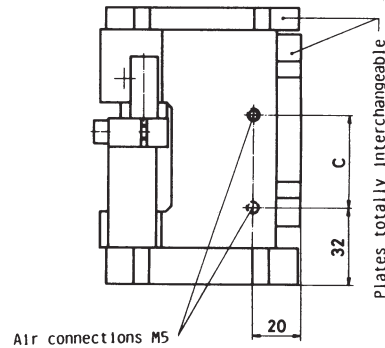
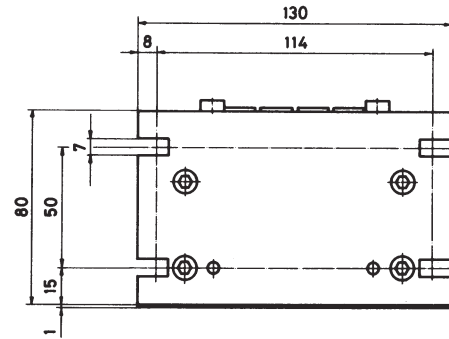
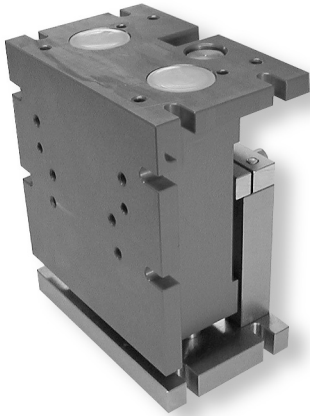
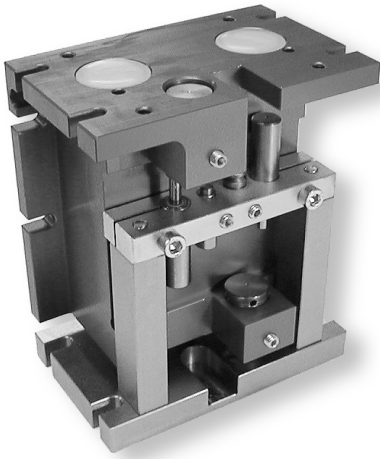
**Intermediate position to NT 120:** Stop screw assembly for NT and stop slide SA

**Order No.** see sheet 1.071

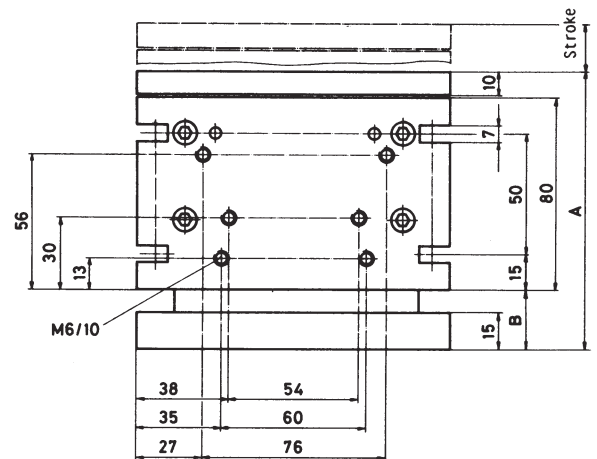
## Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8 "Stop system with plug-in sensing elements").
- End position damped with adjustable oil cushions.
- Designed for high operating rates and long life
- Intermediate position can be added
- Bearing: Linear ball bushing
- Operating medium Compressed air or hydraulic oil
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Repeatability +/- 0.01mm (0.0004")
- Air connections R 1/8"

# Elevating table HT



Air connections M5



| Type    | Stroke (mm) | A   | B  | C  | Piston force at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight           |
|---------|-------------|-----|----|----|----------------------------------|--|------------------|
| HT 20   | 0–20        | 115 | 24 | 38 | 61 lb (272 N)                    | .007 scf (0,19 NL)   | 10.1 lb (4,6 kg) |
| HT 50 K | 0–50        | 147 | 56 | 68 | 61 lb (272 N)                    | .016 scf (0,46 NL)   | 11.2 lb (5,1 kg) |

## Order No.

HT 20 A  
HT 20 B  
HT 20 C

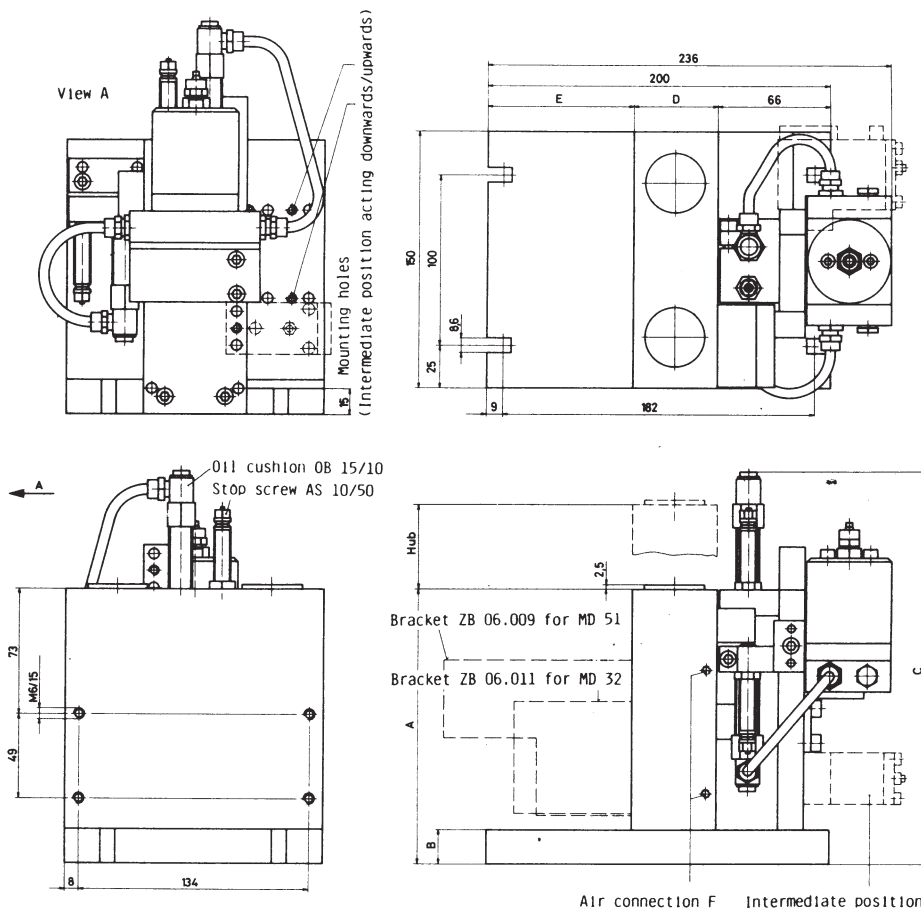
HT 50 KA  
HT 50 KB  
HT 50 KC

A = with elastomer cushions (standard type)  
B = with oil cushions, without compensation reservoir  
C = with oil cushions, with compensation reservoir

## Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
  - The stop screws can be fitted with patented sensing elements. (see section 8"Stop system with plug-in sensing elements").
  - End position damped with adjustable elastomer or oil cushions.
  - Designed for high operating rates and long life
  - Bearing: Linear ball bushing
  - Operating medium
  - Operating pressure
  - Repeatability
  - Air connections
- Compressed air or hydraulic oil  
43.5 - 116 psi (3 - 8 bar)  
+/- 0.01mm (0.0004")  
M5

# Elevating table HT



### Intermediate position to HT 50 & HT 100

Stop screw assembly for HT and stop slide SA

**Order No.** see sheet 1.071

Using an intermediate position the programs featured below can be carried out.

Other programs can also be carried out on this basis.

### HT 100 with intermediate position.

| Type   | Stroke (mm) | A   | B  | C   | D  | E  | F     | Piston force at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight          |
|--------|-------------|-----|----|-----|----|----|-------|----------------------------------|--|-----------------|
| HT 50  | 0-50        | 160 | 20 | 230 | 48 | 86 | M5    | 61 lb (272 N)                    | .016 scf (0,46 NL)   | 22.1 lb (10 kg) |
| HT 100 | 0-100       | 232 | 25 | 302 | 70 | 64 | R 1/8 | 156 lb (694 N)                   | .081 scf (2,29 NL)   | 33.1 lb (15 kg) |

### Order No.

HT 50                    HT 100  
HT 50 A                HT 100 A            A = Intermediate position with \* SA 01  
HT 50 B                HT 100 B            B = Intermediate position with \* SA 01 A

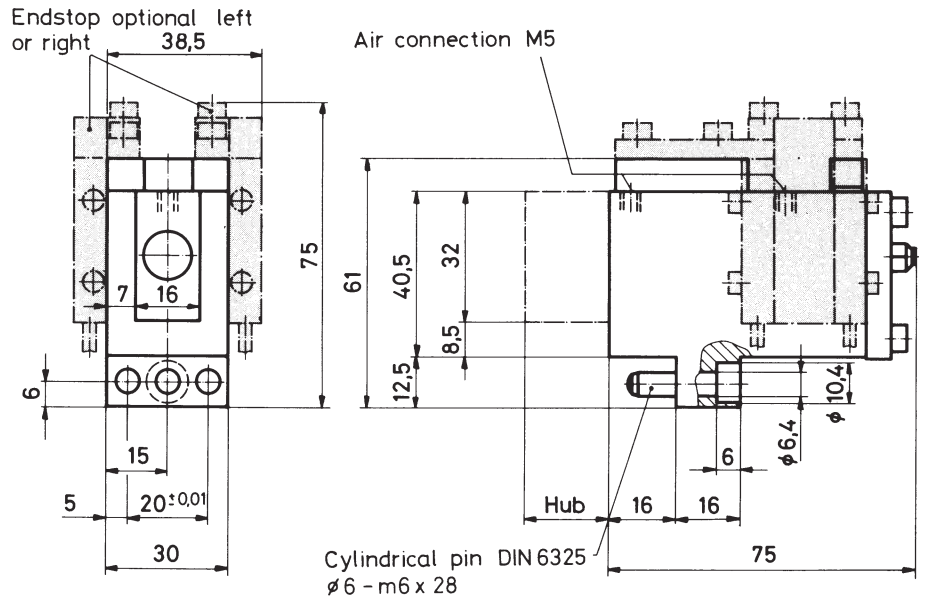
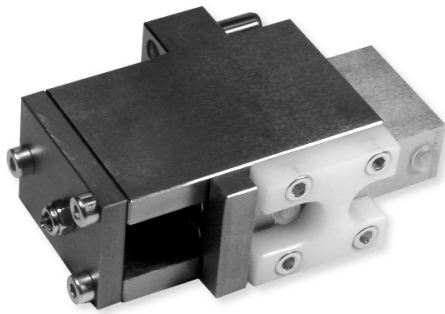
\* SA... = Stop slide see sheet 1.071

### Technical data:

- Built in stop screw with fine threads provide adjustable, stepless stroke.
- The stop screws can be fitted with patented sensing elements. (see section 8"Stop system with plug-in sensing elements").
- End position damped with adjustable oil cushions.
- Designed for high operating rates and long life
- Intermediate position can be added.
- Bearing: Linear ball bushing (HT 50) / Long life sleeve bearing (HT 100)
- Operating medium                                    Compressed air or hydraulic oil
- Operating pressure                                    43.5 - 116 psi (3 - 8 bar)
- Repeatability    +/- 0.01mm (0.0004")
- Air connections                                        See table

# Stopslide SA

The stop slide cylinder is a robust double acting cylinder which may be fitted to most of the linear slide units as an intermediate stop device.



| Type  | Stroke (mm) | Piston force at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight          |
|-------|-------------|----------------------------------|--|-----------------|
| SA 01 | 0–20        | 8 lb (35 N)                      | .001 scf (0,03 NL)   | 1.5 lb (0,7 kg) |

**Order No.**

- SA 01 without bracket
- SA 01 A A = with bracket for sensors (IM008)

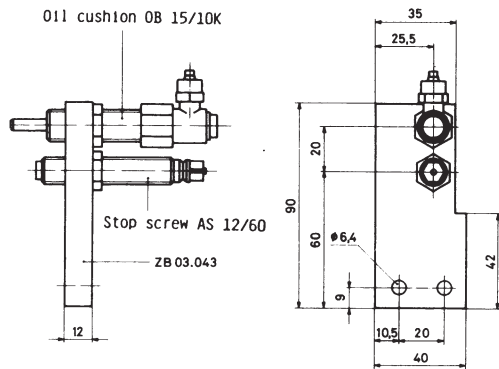
**Technical data:**

- Operating medium Compressed air or hydraulic oil
- Operating pressure 43.5–116 psi (3–8 bar)
- Air connection M5
- Material of construction Steel, slide piston hardened

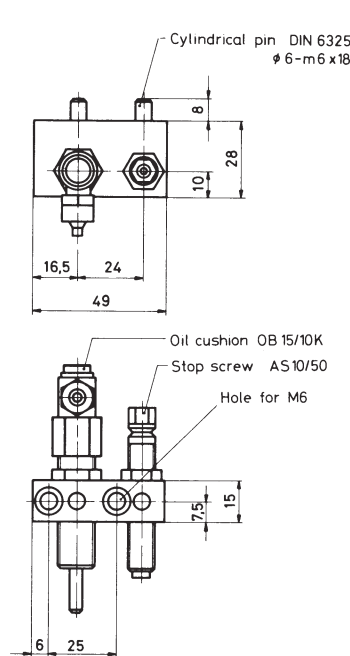
Sensor Order No.: IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

# Stopscrew assembly

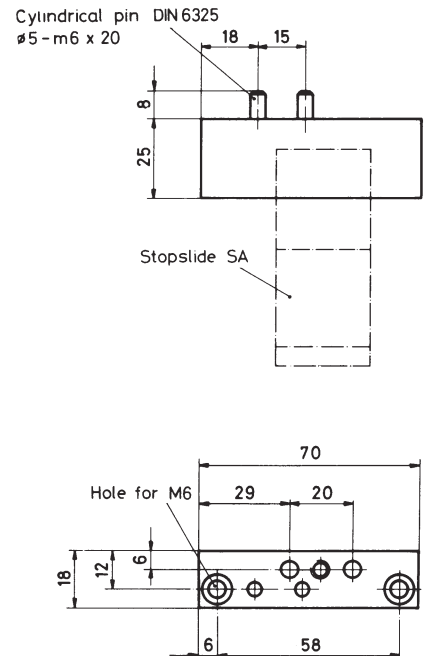
The stopscrew and cushion assembly is available as an accessory.  
The oil reservoir is not included.



**Stopscrew assembly for LH**  
Order No. ZB 03.005



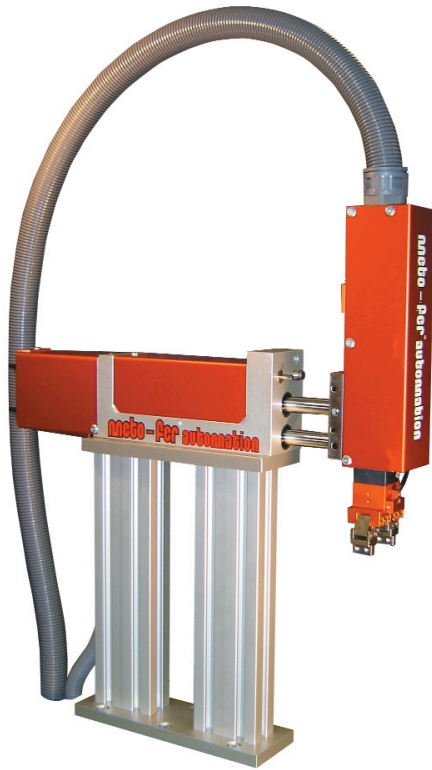
**Stopscrew assembly for HT**  
Order No. ZB 06.015



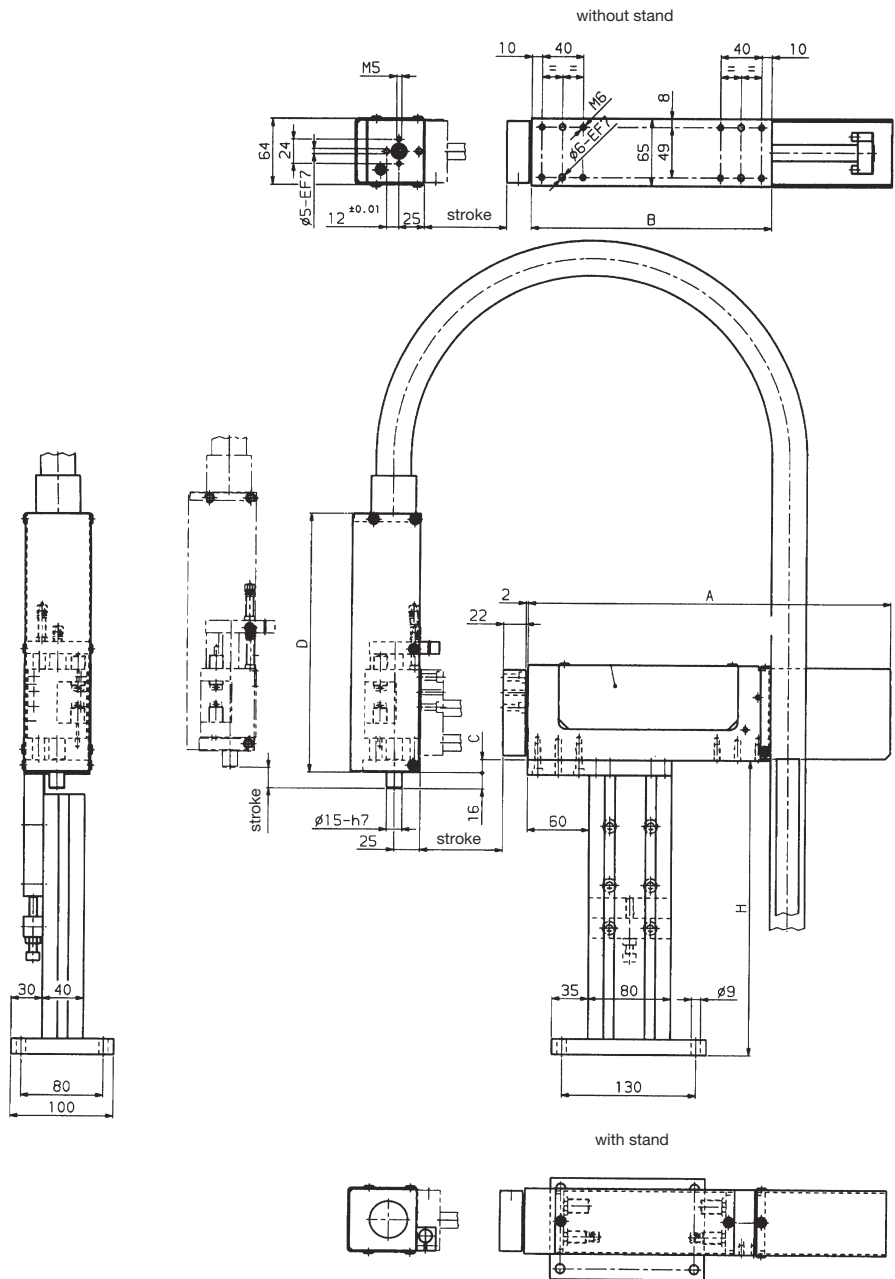
**Stopscrew assembly for NT 120**  
Order No. ZB 16.005

# Pick and Place

Complete station with linear unit, vertical unit and stand



- Linear Unit with integrated flow controls and precision stop system and cushions
- Vertical Unit with cushions and precision stop system (stop screw) third down position on vertical unit in home position of linear unit
- Easy Gripper / Rotary modular assembly with standard components
- Expected life: 20-25 million cycle times
- Seal / Bearing Kits available



| Linear Unit |     |     | Vertical Unit |     |       |
|-------------|-----|-----|---------------|-----|-------|
| Stroke      | A   | B   | Stroke        | C   | D     |
| 100+        | 352 | 234 | 20*           | 13  | 251.5 |
| 150+        | 452 | 284 | 50*           | 73  | 311.5 |
| 200+        | 552 | 334 | 80*           | 133 | 371.5 |

H=Height (adjustable +/- 20 mm)

Order No. **PP** - . . . . .

H=Height of stand in mm  
O=no stand  
Stroke Vertical (\*)  
Stroke Linear (+)  
Pick and Place

## ELECTRIC LINEAR ACTUATORS

SECTION 2

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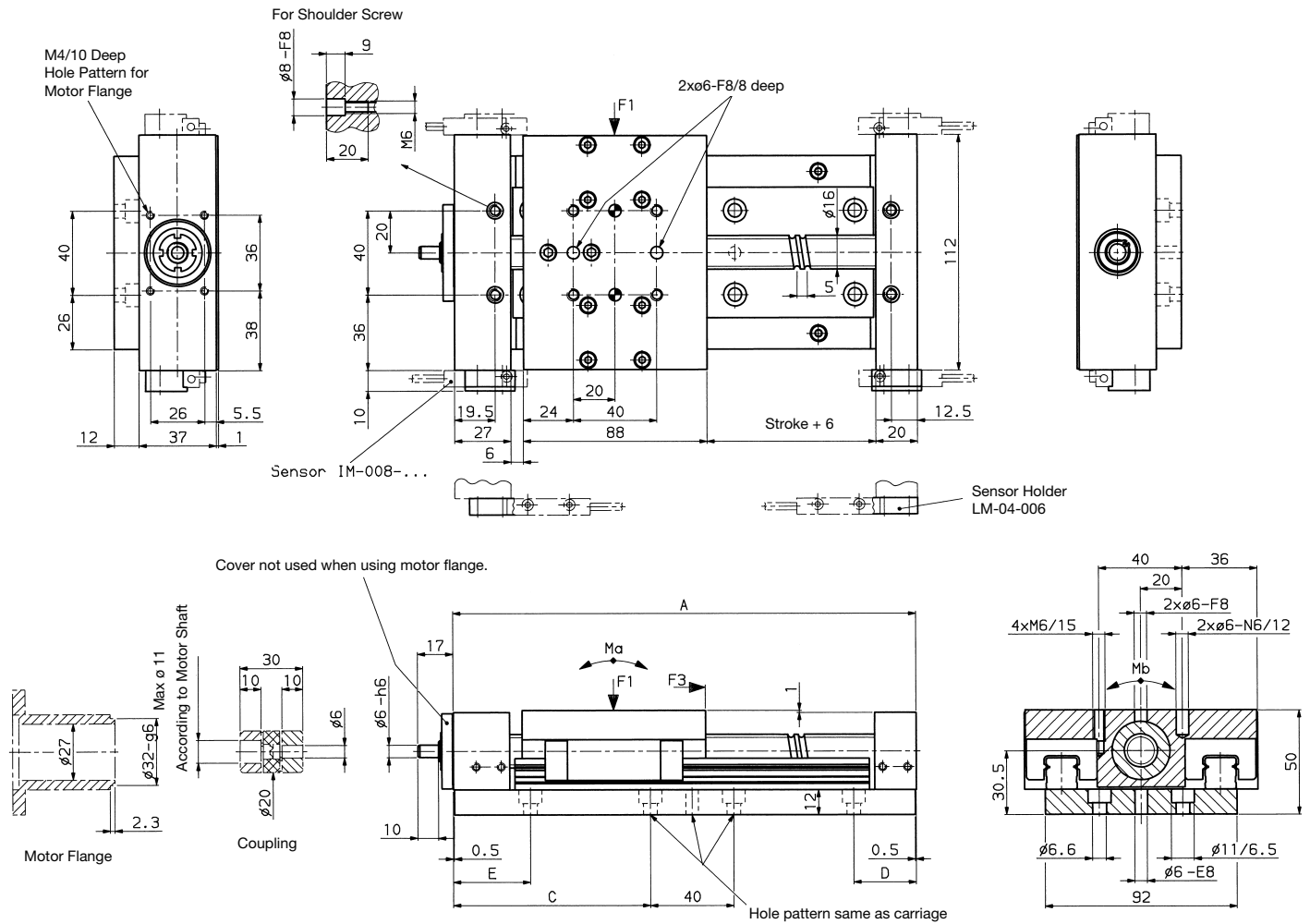
**mf automation, inc.**

[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337

# Linear Unit LM-26-RW Type S

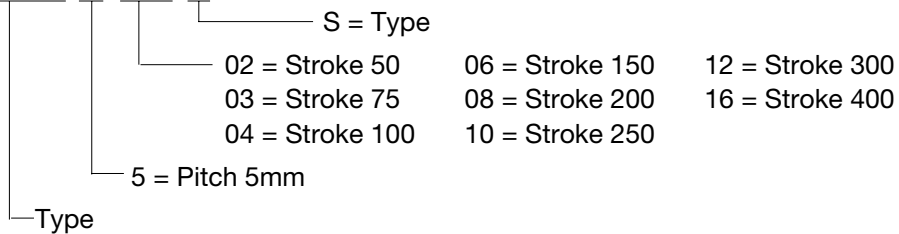
Ball Screw, Twin Rail Positioning (Zero Backlash)



| Stroke | A   | C   | D  | E  | F1 [N]<br>(stat./dyn.) | F3<br>[N] | Ma<br>[Nm] | Mb<br>[Nm] | Weight<br>[lb] (kg) |
|--------|-----|-----|----|----|------------------------|-----------|------------|------------|---------------------|
| 0-50   | 197 | 82  | 35 | 42 | 750                    | *         | 30         | 30         | 8.3 (3.8)           |
| 0-75   | 222 | 95  | 30 | 37 | 750                    | *         | 30         | 30         | 9.0 (4.1)           |
| 0-100  | 247 | 107 | 30 | 37 | 750                    | *         | 30         | 30         | 9.7 (4.4)           |
| 0-150  | 297 | 132 | 30 | 37 | 750                    | *         | 30         | 30         | 11.0 (5.0)          |
| 0-200  | 347 | 157 | 30 | 37 | 750                    | *         | 30         | 30         | 12.3 (5.6)          |
| 0-250  | 397 | 182 | 30 | 37 | 750                    | *         | 30         | 30         | 13.6 (6.2)          |
| 0-300  | 447 | 207 | 30 | 37 | 750                    | *         | 30         | 30         | 15.2 (6.9)          |
| 0-400  | 547 | 257 | 30 | 37 | 750                    | *         | 30         | 30         | 17.8 (8.1)          |

\*see back page

## Order No. LM26RW-5-...-S



**Note:** Sensors, Flange and Coupling need to be ordered separately. See back page.



# Linear Unit LM-26-RW Type S

Ball Screw, Twin Rail Positioning (Zero Backlash)

**Sensor:** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Additional sensor and cables may be found in the Sensor Catalog.

## Motor Flange:

The motor flange is mounted with four M4 screws and serves simultaneously to secure the double race thrust bearing. Standard flanges are available for stepper motors as accessories. Flanges for DC-Motors are manufactured upon request. Please include a sketch of the desired motor pattern.

**Order No.** Motor Flange for LM-26-RW

## Coupling:

It is recommended to mount a high torque flex coupling between motor and unit.

**Order No.** Coupling for LM-26-RW Motor shaft  $\varnothing$  . . . mm

## Inertial mass "J"

The listed inertial mass "J" reflects the entire unit including the coupling (motor not included).

At a stroke of 25mm:  $J = 0.30 \text{ kgcm}^2$

J increases per additional 25mm stroke by  $0.012 \text{ kgcm}^2$

## F5 is dependent upon motor torque Md:

$$\text{By pitch 5mm: } \frac{Md [\text{Ncm}]}{0.08} = N \quad \text{max. allowed 1000 N}$$

## Ball Screw:

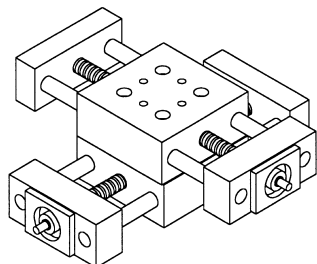
Rolled ball screw, ISO Class 7 (DIN 69051)

Zero clearance ball screw nut

## Bearing of the Ball Screw:

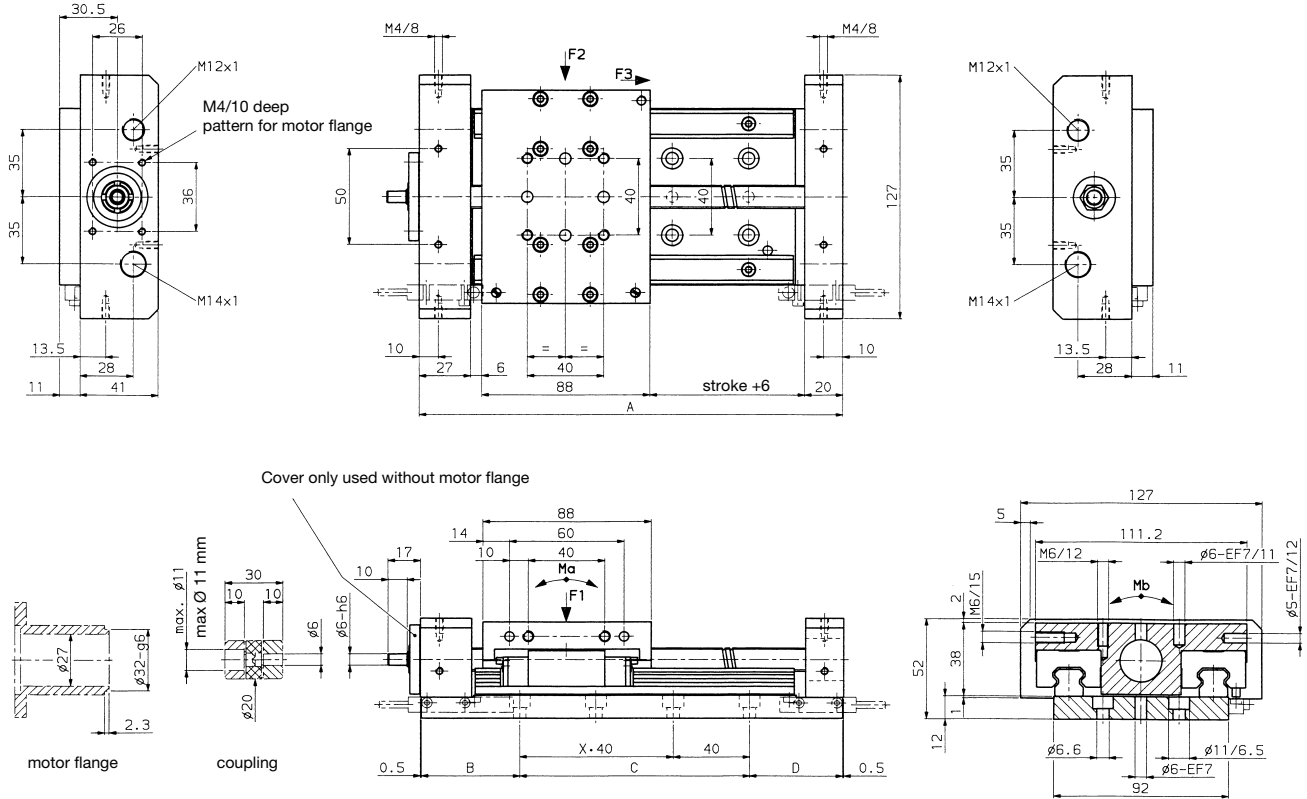
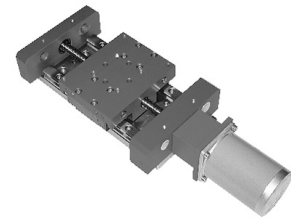
Precision ball bearing, axial play = 0.007 - 0.024mm.

## The units can be used as X-Y Tables:



# Linear Unit LM-60-RW

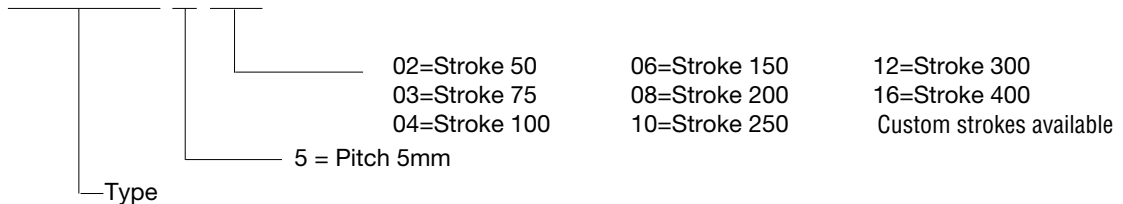
Ball Screw (anti-backlash), Twin Rail



| Stroke mm | A mm | B mm  | C mm | D mm  | X mm | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. in (Nm) | Mb lb. in (Nm) | Weight lb. (kg) |
|-----------|------|-------|------|-------|------|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-50      | 197  | 39.5  | 120  | 36.5  | 2    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 8.3 (3.8)       |
| 0-75      | 222  | 52.0  | 120  | 49.0  | 2    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 9.0 (4.1)       |
| 0-100     | 247  | 64.5  | 120  | 61.5  | 2    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 9.7 (4.4)       |
| 0-150     | 297  | 89.5  | 120  | 86.5  | 2    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 11.0 (5.0)      |
| 0-200     | 347  | 74.5  | 200  | 71.5  | 4    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 12.3 (5.6)      |
| 0-250     | 397  | 99.5  | 200  | 96.5  | 4    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 13.6 (6.2)      |
| 0-300     | 447  | 124.5 | 200  | 121.5 | 4    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 15.2 (6.9)      |
| 0-400     | 547  | 174.5 | 200  | 171.5 | 4    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 17.8 (8.1)      |

\*see back page

Order No. **LM-60-RW-5-...**



**Note:** Sensors, Flange, and Coupling need to be ordered separately-see back page.

# Linear Unit LM-60-RW

Ball Screw, Twin Rail

**Sensor Order No.** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Additional sensor and cables may be found in the Sensor Catalog.

## Motor Flange:

The motor flange is mounted with M4 screws and secures the bearing. Standard flanges are available. Please include a sketch of desired motor pattern.

**Order No.** Motor Flange for LM-26-60-RW

## Coupling:

It is recommended to use a high torque flex coupling.

**Order No.** Coupling for LM-26-60-RW Motor shaft  $\varnothing$  . . . mm

## Inertial mass "J"

The listed inertial mass "J" reflects the entire unit including the coupling (motor not included).

At a stroke of 25mm:  $J = 0.23 \text{ kgcm}^2$

J increases per additional 25mm stroke by  $0.005 \text{ kgcm}^2$

## F5 is dependent upon motor torque Md:

$$\text{By pitch 5mm: } \frac{Md [\text{Ncm}]}{0.08} = N \quad \text{max. allowed 1000 N}$$

## Ball Screw:

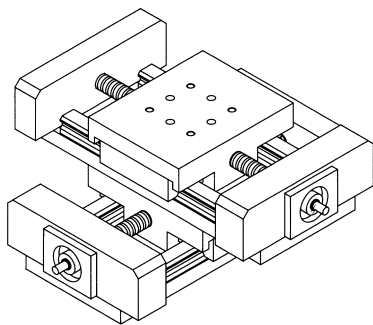
Rolled ball screw, ISO Class 7 (DIN 69051)

Ball screw nut (anti-backlash)

## Ball Screw Bearing:

Precision ball bearing, axial play = 0

## The units can be used as X-Y Tables:

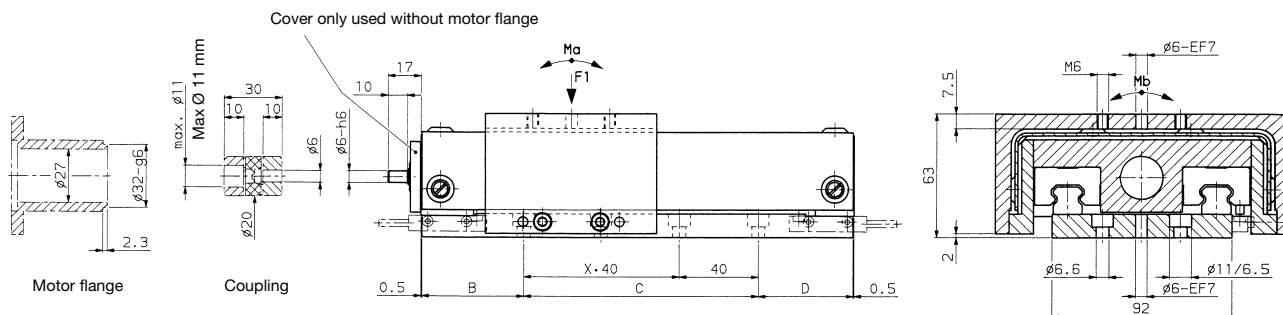
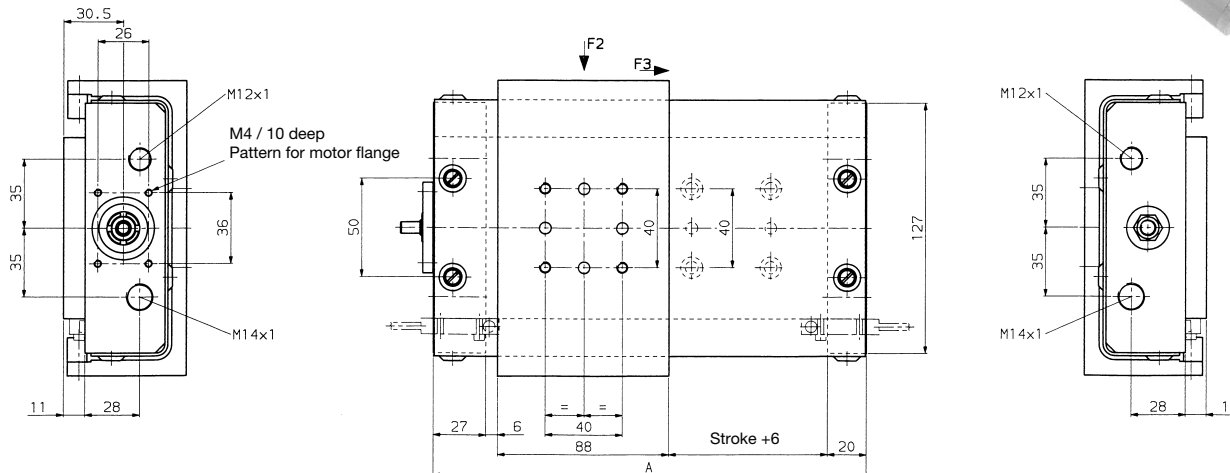
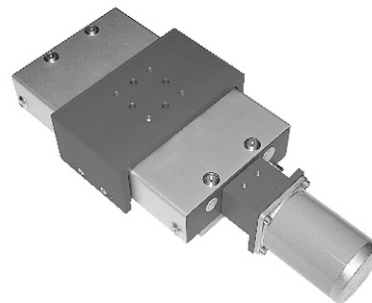


Easy mounting with the following units:

**LMP-60**  
**LMP-60A**  
**LM-60-RW**  
**LM-60-RWA**

# Linear Unit LM-60-RWA

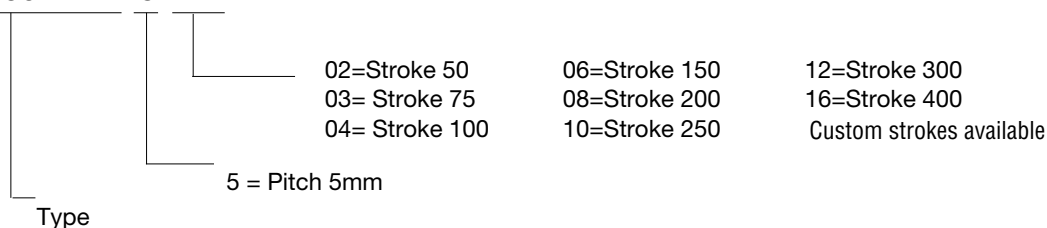
Ball Screw (anti-backlash), Twin Rail, with cover



| Stroke mm | A mm | B mm  | C mm | D mm  | X m | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. In (Nm) | Mb lb. In (Nm) | Weight lb. (kg) |
|-----------|------|-------|------|-------|-----|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-50      | 197  | 39.5  | 120  | 36.5  | 2   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 11.0 (5.0)      |
| 0-75      | 222  | 52.0  | 120  | 49.0  | 2   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 11.6 (5.3)      |
| 0-100     | 247  | 64.5  | 120  | 61.5  | 2   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 12.3 (5.6)      |
| 0-150     | 297  | 89.5  | 120  | 86.5  | 2   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 13.8 (6.3)      |
| 0-200     | 347  | 74.5  | 200  | 71.5  | 4   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 15.2 (6.9)      |
| 0-250     | 397  | 99.5  | 200  | 96.5  | 4   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 16.5 (7.5)      |
| 0-300     | 447  | 124.5 | 200  | 121.5 | 4   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 18.3 (8.3)      |
| 0-400     | 547  | 174.5 | 200  | 171.5 | 4   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 21.1 (9.6)      |

\*see back page

Order No. **LM-60-RWA-5-...**



**Note:** Sensors, Flange, and Coupling need to be ordered separately-see back page.

# Linear Unit LM-60-RWA

Ball Screw, Twin Rail, with cover

**Sensor Order No.** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Additional sensors and cables may be found in the Sensor Catalog.

## Motor Flange:

The motor flange is mounted with M4 screws and also secures the bearing. Standard flanges are available. Please include a sketch of the desired motor pattern.

**Order No.** Motor Flange for LM-60-RWA

## Coupling:

It is recommended to use a high torque flex coupling between motor and LM.

**Order No.** Coupling for LM-60-RWA Motor shaft  $\varnothing$  . . . mm

## Inertial mass "J"

The listed inertial mass "J" reflects the entire unit including the coupling (motor not included).

At a stroke of 25mm:  $J = 0.23 \text{ kgcm}^2$

J increases per additional 25mm stroke by  $0.005 \text{ kgcm}^2$

## F5 is dependent upon motor torque Md:

$$\text{By pitch 5mm: } \frac{Md [\text{Ncm}]}{0.08} = N \quad \text{max. allowed 1000 N}$$

## Ball Screw:

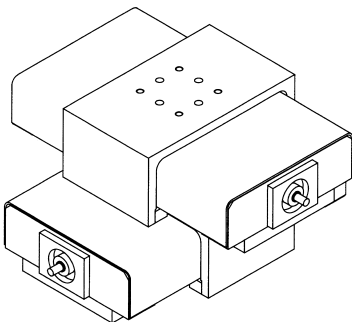
Rolled ball screw, ISO Class 7 (DIN 69051)

Ball screw nut (anti-backlash)

## Ball Screw Bearing:

Precision ball bearing, axial play = 0

## The units can be used as X-Y Tables:

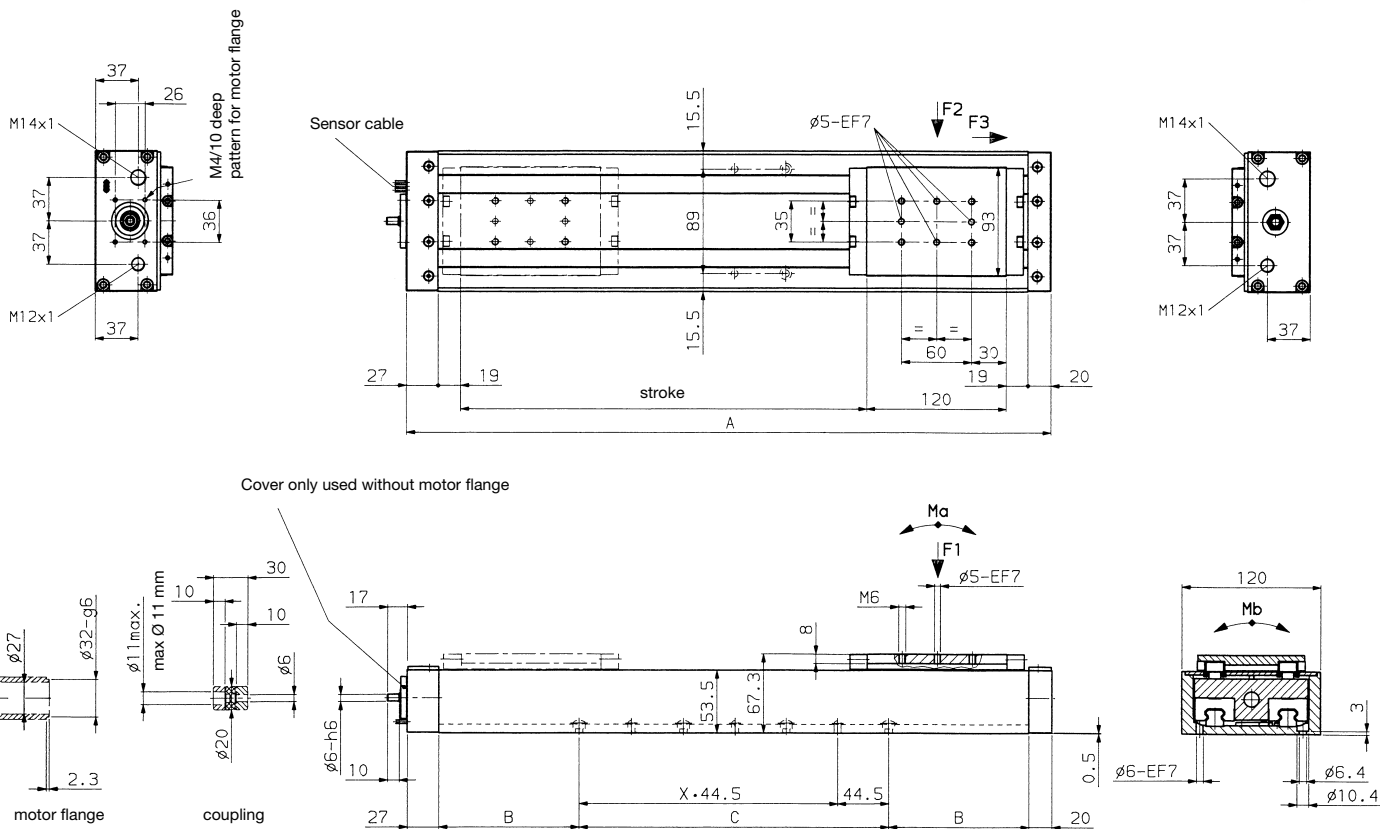


Easy mounting with the following units:

**LMP-60**  
**LMP-60A**  
**LM-60-RW**  
**LM-60-RWA**

# Linear Unit LK 100-RW

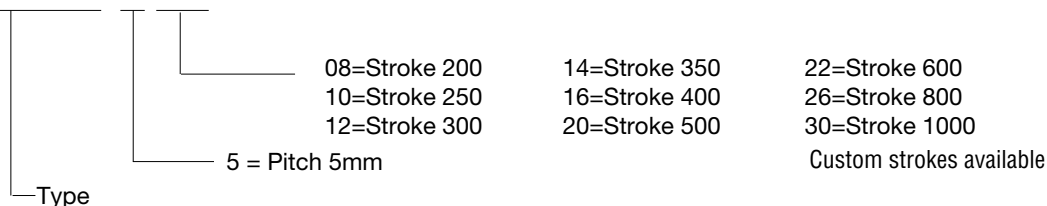
Ball Screw (anti-backlash), Twin Rail, with cover



| Stroke mm | A mm | B mm  | C mm | X mm | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. In (Nm) | Mb lb. In (Nm) | Weight lb. (kg) |
|-----------|------|-------|------|------|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-200     | 405  | 134.5 | 89   | 1    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 17.6 (8.0)      |
| 0-250     | 455  | 70.5  | 267  | 5    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 18.7 (8.5)      |
| 0-300     | 505  | 95.5  | 267  | 5    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 19.8 (9.0)      |
| 0-350     | 555  | 120.5 | 267  | 5    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 20.9 (9.5)      |
| 0-400     | 605  | 145.5 | 267  | 5    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 21.8 (9.9)      |
| 0-500     | 705  | 195.5 | 267  | 5    | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 24.0 (10.9)     |
| 0-600     | 805  | 245.5 | 267  | 5    | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 26.0 (11.8)     |
| 0-800     | 1005 | 345.5 | 267  | 5    | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 29.1 (13.2)     |
| 0-1000    | 1205 | 445.5 | 267  | 5    | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 34.3 (15.6)     |

\*see back page

## Order No. LK-100-RW-5- ...



**Note:** Sensors, Flange, and Coupling need to be ordered separately-see back page.

# Linear Unit LK 100-RW

Ball Screw, Twin Rail, with cover

**Sensor Order No.** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Additional sensor and cables may be found in the Sensor Catalog.

## Motor Flange:

The motor flange is mounted with M4 screws and also secures the bearing. Standard flanges are available. Please include a sketch of desired motor pattern.

**Order No.** Motor Flange for LK-100-RW

## Coupling:

It is recommended to use a high torque flex coupling.

**Order No.** Coupling for LK-100-RW Motor shaft  $\varnothing$  . . . mm

## Inertial mass "J"

The listed inertial mass "J" reflects the entire unit including the coupling (motor not included).

At a stroke of 25mm:  $J = 0.23 \text{ kgcm}^2$

J increases per additional 25mm stroke by  $0.005 \text{ kgcm}^2$

## F3 is dependent upon motor torque Md:

$$\text{By pitch 5mm: } \frac{Md \text{ [Ncm]}}{0.08} = N \quad \text{max. allowed 1000 N}$$

## Ball Screw:

Rolled ball screw, ISO Class 7 (DIN 69051)

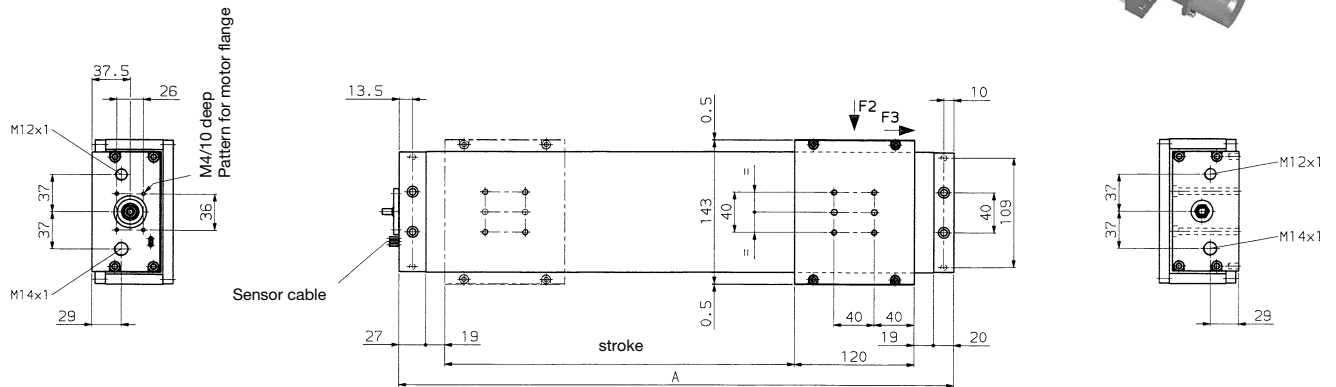
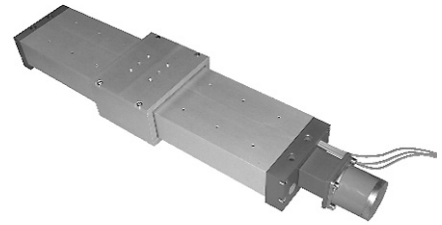
Ball screw nut (anti-backlash)

## Ball Screw Bearing:

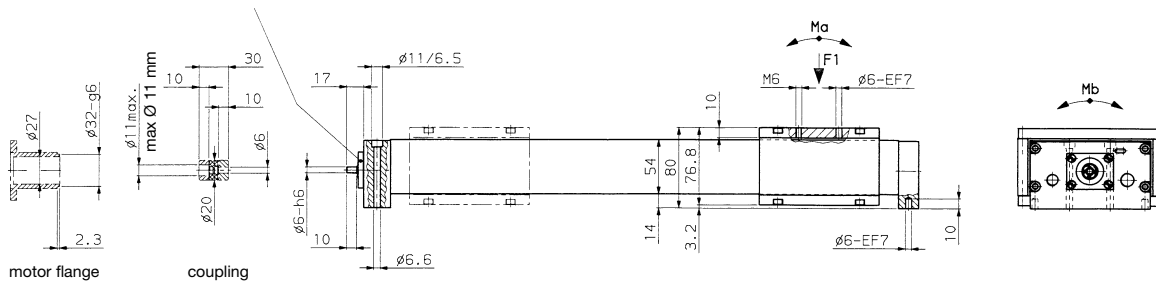
Precision ball bearing, axial play = 0

# Linear Unit LK-100-RWA

Ball Screw (anti-backlash), Twin Rail



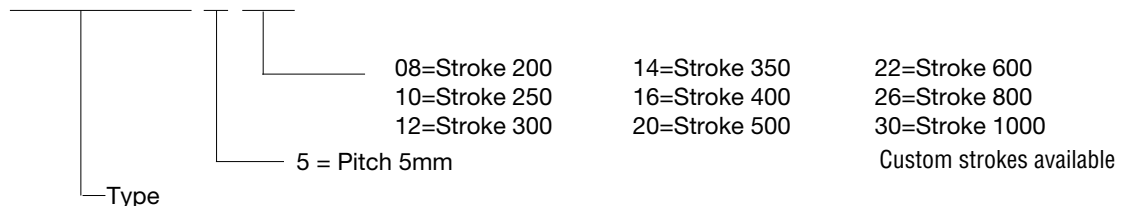
Cover only used without motor flange



| Stroke mm | A mm | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. In (Nm) | Mb lb. In (Nm) | Weight lb. (kg) |
|-----------|------|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-200     | 405  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 16.5 (7.5)      |
| 0-250     | 455  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 17.4 (7.9)      |
| 0-300     | 505  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 18.5 (8.4)      |
| 0-350     | 555  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 19.4 (8.8)      |
| 0-400     | 605  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 20.2 (9.2)      |
| 0-500     | 705  | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 22.2 (10.1)     |
| 0-600     | 805  | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 24.2 (11.0)     |
| 0-800     | 1005 | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 26.9 (12.2)     |
| 0-1000    | 1205 | 146 (650) | 89 (400)  | *         | 265 (30)       | 265 (30)       | 31.9 (14.5)     |

\*see back page

## Order No. LK-100-RWA-5-...



**Note:** Sensors, Flange, and Coupling need to be ordered separately-see back page.



# Linear Unit LK-100-RWA

Ball Screw, Twin Rail

**Sensor Order No.** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Additional sensor and cables may be found in the Sensor Catalog.

## Motor Flange:

The motor flange is mounted with M4 screws and also secures the double race thrust bearing. Standard flanges are available. Please include a sketch of desired motor pattern.

**Order No.** Motor Flange for LK-100-RWA

## Coupling:

It is recommended to use a high torque flex coupling.

**Order No.** Coupling for LK-100-RWA Motor shaft  $\varnothing$  . . . mm

## Inertial mass "J"

The listed inertial mass "J" reflects the entire unit including the coupling (motor not included).

At a stroke of 25mm:  $J = 0.23 \text{ kgcm}^2$

J increases per additional 25mm stroke by  $0.005 \text{ kgcm}^2$

## F5 is dependent upon motor torque Md:

$$\text{By pitch 5mm: } \frac{Md \text{ [Ncm]}}{0.08} = N \quad \text{max. allowed 1000 N}$$

## Ball Screw:

Rolled ball screw, ISO Class 7 (DIN 69051)

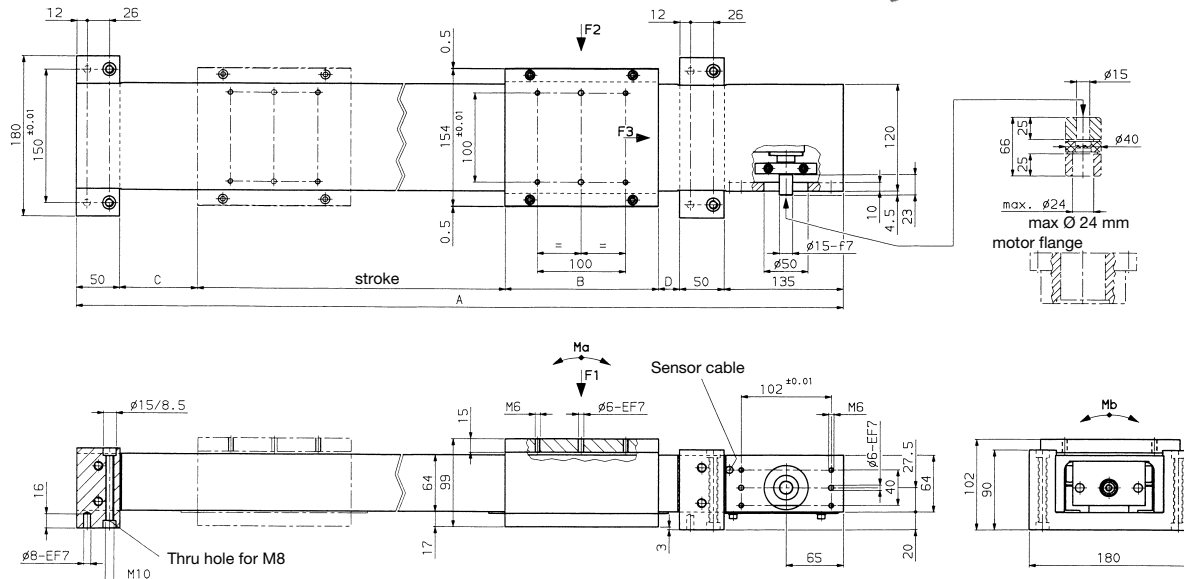
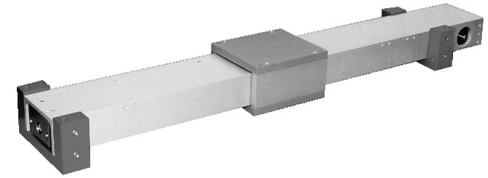
Ball screw nut (anti-backlash)

## Ball Screw Bearing:

Precision ball bearing, axial play = 0

# Linear Unit LK-120-ZR

Timing Belt, Twin Rail



## LK-120-ZR-2 (with 2 carriages)

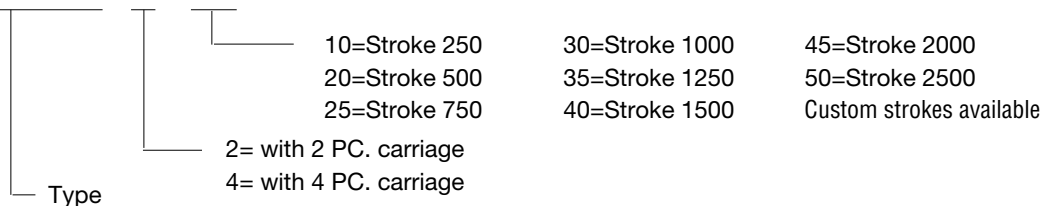
| Stroke mm | A mm | B mm | C mm | D mm | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. In (Nm) | Mb lb. In (Nm) | Weight lb. (kg) |
|-----------|------|------|------|------|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-250     | 772  | 175  | 88   | 24   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 37.0 (16.8)     |
| 0-500     | 1022 | 175  | 88   | 24   | 168 (750) | 112 (500) | *         | 265 (30)       | 265 (30)       | 42.5 (19.3)     |
| 0-750     | 1272 | 175  | 88   | 24   | 146 (650) | 90 (400)  | *         | 265 (30)       | 265 (30)       | 48.2 (21.9)     |
| 0-1000    | 1522 | 175  | 88   | 24   | 146 (650) | 90 (400)  | *         | 265 (30)       | 265 (30)       | 53.8 (24.4)     |
| 0-1250    | 1722 | 175  | 88   | 24   | 134 (600) | 78 (350)  | *         | 265 (30)       | 265 (30)       | 58.8 (26.7)     |
| 0-1500    | 2022 | 175  | 88   | 24   | 123 (550) | 67 (300)  | *         | 265 (30)       | 265 (30)       | 65.0 (29.5)     |
| 0-2000    | 2522 | 175  | 88   | 24   | 112 (500) | 56 (250)  | *         | 265 (30)       | 265 (30)       | 76.2 (34.6)     |
| 0-2500    | 3022 | 175  | 88   | 24   | 101 (450) | 45 (200)  | *         | 265 (30)       | 265 (30)       | 87.5 (39.7)     |

## LK-120-ZR-4 (with 4 carriages)

| Stroke mm | A mm | B mm | C mm | D mm | F1 lb (N) | F2 lb (N) | F3 lb (N) | Ma lb. In (Nm) | Mb lb. In (Nm) | Weight lb. (kg) |
|-----------|------|------|------|------|-----------|-----------|-----------|----------------|----------------|-----------------|
| 0-250     | 832  | 220  | 95.5 | 31.5 | 303(1350) | 202 (900) | *         | 486 (55)       | 486 (55)       | 41.2 (18.7)     |
| 0-500     | 1082 | 220  | 95.5 | 31.5 | 303(1350) | 202 (900) | *         | 486 (55)       | 486 (55)       | 46.7 (21.2)     |
| 0-750     | 1332 | 220  | 95.5 | 31.5 | 269(1200) | 157 (700) | *         | 486 (55)       | 486 (55)       | 52.4 (23.8)     |
| 0-1000    | 1582 | 220  | 95.5 | 31.5 | 269(1200) | 157 (700) | *         | 486 (55)       | 486 (55)       | 57.9 (26.3)     |
| 0-1250    | 1782 | 220  | 95.5 | 31.5 | 224(1000) | 146 (650) | *         | 486 (55)       | 486 (55)       | 63.7 (28.9)     |
| 0-1500    | 2082 | 220  | 95.5 | 31.5 | 224(1000) | 123 (550) | *         | 486 (55)       | 486 (55)       | 69.2 (31.4)     |
| 0-2000    | 2582 | 220  | 95.5 | 31.5 | 20(900)   | 101 (450) | *         | 486 (55)       | 486 (55)       | 80.4 (36.5)     |
| 0-2500    | 3082 | 220  | 95.5 | 31.5 | 180(800)  | 78 (350)  | *         | 486 (55)       | 486 (55)       | 91.7 (41.6)     |

\*see back page

Order No. **LK-120-ZR-...-...**



**Note:** Sensors, Flange, and Coupling need to be ordered separately-see back page.

# Linear Unit LK-120-ZR

Timing Belt, Twin Rail

**Sensor Order No.** IM-008-NS-U2L (NPN)  
IM-008-PS-U2L (PNP)

Please find additional information in our Electronic Catalog.

## Motor Flange:

The motor flange is mounted with M6 screws. To manufacture the flange please include drawing of motor pattern.

**Order No.** Motor Flange for LK-120-ZR

## Coupling:

It is recommended to use a high torque flex coupling.

**Order No.** Coupling for LK-120-ZR Motor shaft  $\varnothing$  . . . mm

## Timing Belt:

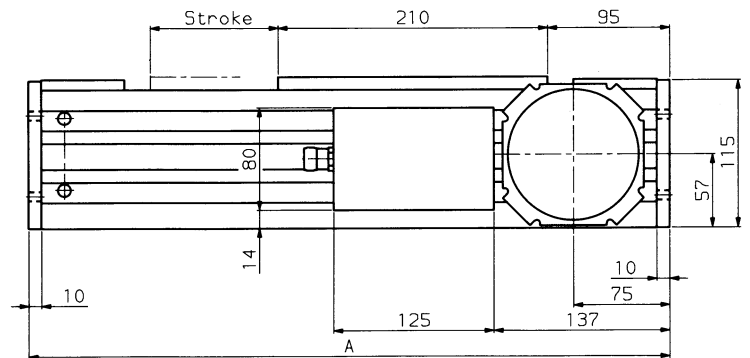
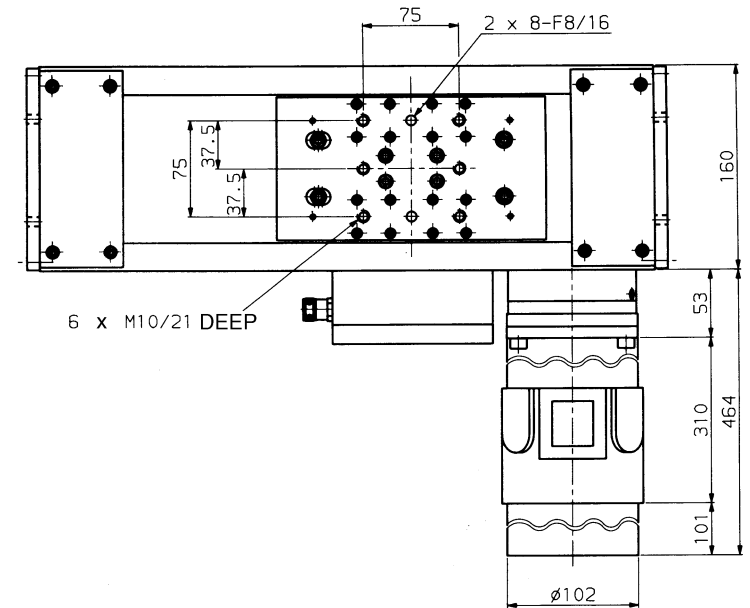
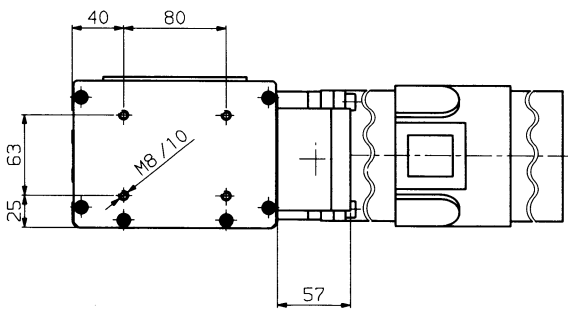
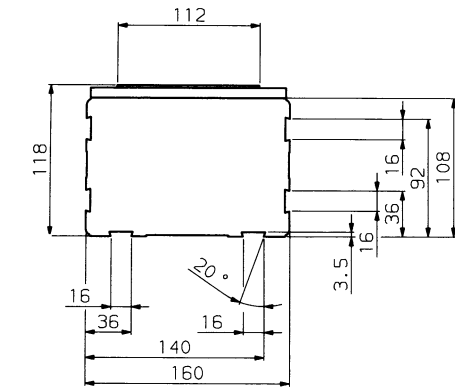
Pitch 5 mm, drive gear 25 teeth, division  $\varnothing=39.78$  mm, stroke per turn=125 mm

**F3 is dependent upon motor torque Md:**

$$F3 = \frac{Md \text{ [Ncm]}}{1.989} = N \quad \text{max. allowed 2,660 N}$$

# Linear Unit LK 160-ZR

Electric Linear Actuator with timing belt



| Type        | Stroke | A    | Weight <sup>1</sup> |
|-------------|--------|------|---------------------|
| LK160-ZR-03 | 0- 300 | 700  | 55.1 lb (25.0 kg)   |
| LK160-ZR-04 | 0- 400 | 800  | 60.6 lb (27.5 kg)   |
| LK160-ZR-05 | 0- 500 | 900  | 66.2 lb (30.0 kg)   |
| LK160-ZR-06 | 0- 600 | 1000 | 71.7 lb (32.5 kg)   |
| LK160-ZR-07 | 0- 700 | 1100 | 77.2 lb (35.0 kg)   |
| LK160-ZR-08 | 0- 800 | 1200 | 82.7 lb (37.5 kg)   |
| LK160-ZR-09 | 0- 900 | 1300 | 88.2 lb (40.0 kg)   |
| LK160-ZR-10 | 0-1000 | 1400 | 93.7 lb (42.5 kg)   |
| LK160-ZR-12 | 0-1200 | 1600 | 104.7 lb (47.5 kg)  |
| LK160-ZR-14 | 0-1400 | 1800 | 115.8 lb (52.5 kg)  |
| LK160-ZR-16 | 0-1600 | 2000 | 126.8 lb (57.5 kg)  |

<sup>1</sup> Without Motor

### Technical data:

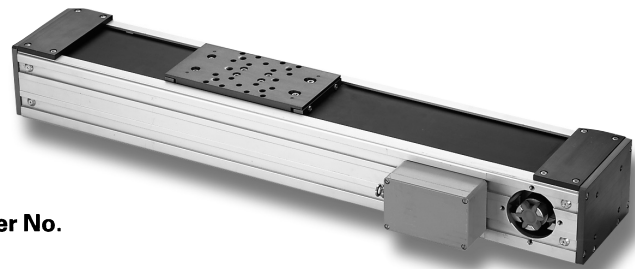
- Timing belt drive
- Self supporting solid Aluminum extrusion
- High load capacity as a result of ball bearings on hardened guide rails
- High speed up to 2.5 m/sec (98.4"/sec)
- High repeatability 0.05 mm (.002")
- High resolution 0.05 mm (.002")
- High cycle rate: The standard motor can be loaded up to 9 Nm (79.65 lb. in) in start-stop cycling when using forced ventilation
- Overtravel switches in both end positions, plus mechanical shock absorbers
- Home position switch
- Easy mounting due to dovetail groove in extrusion
- Stroke per turn 125 mm

### Order No.

LK 160 - ZR - ... - ...

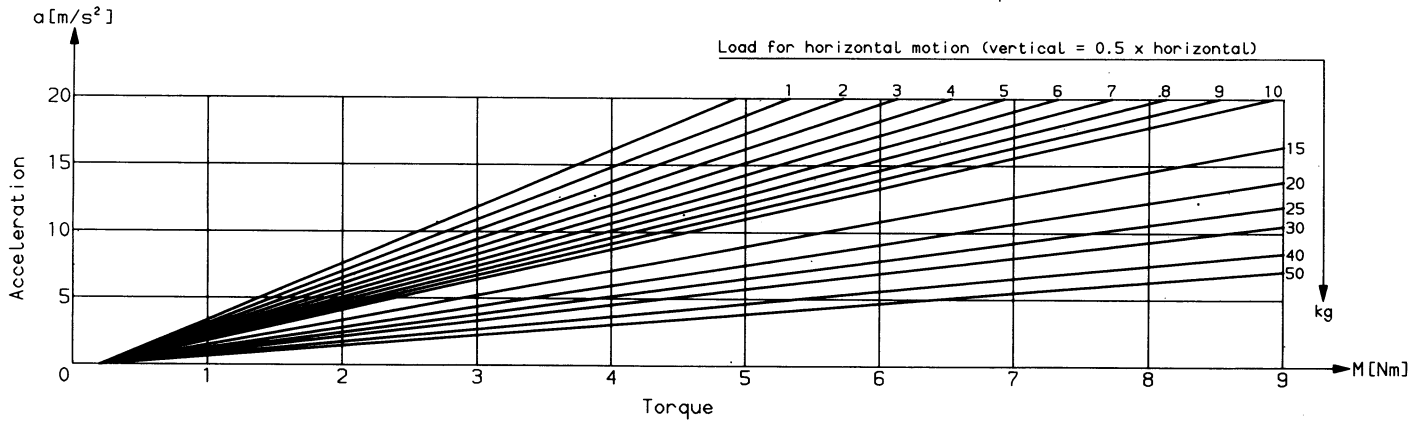
O = Without motor  
M = With DC motor

Typ

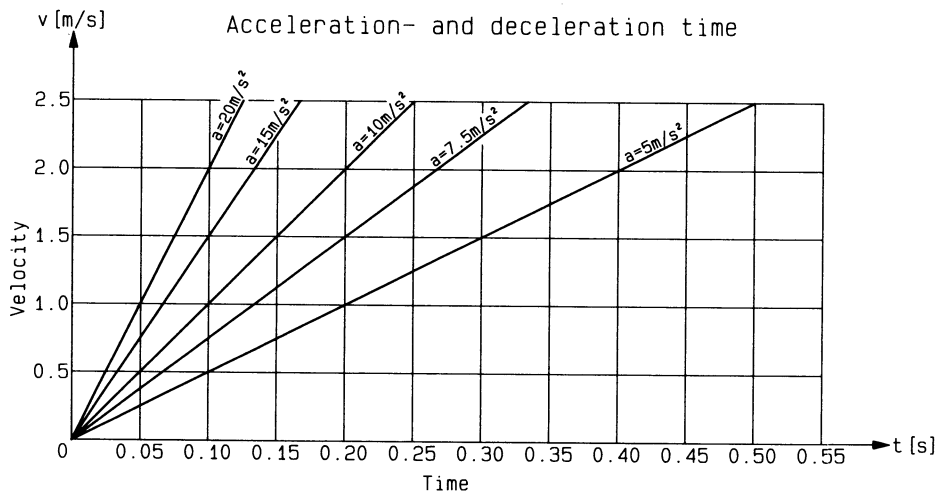


## Max. controllable load parameters

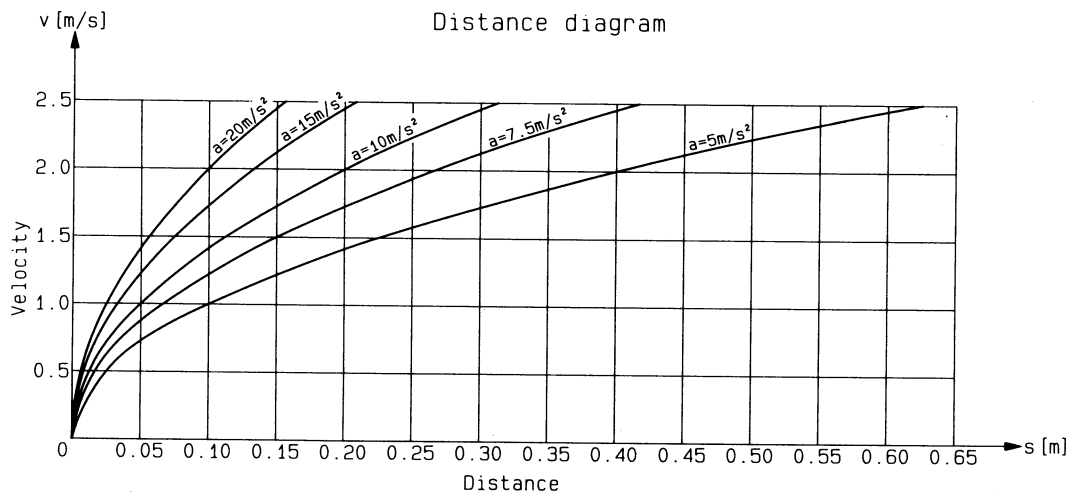
Max. load with acceleration referred to a constant torque of 6Nm (53.1 lb.in)



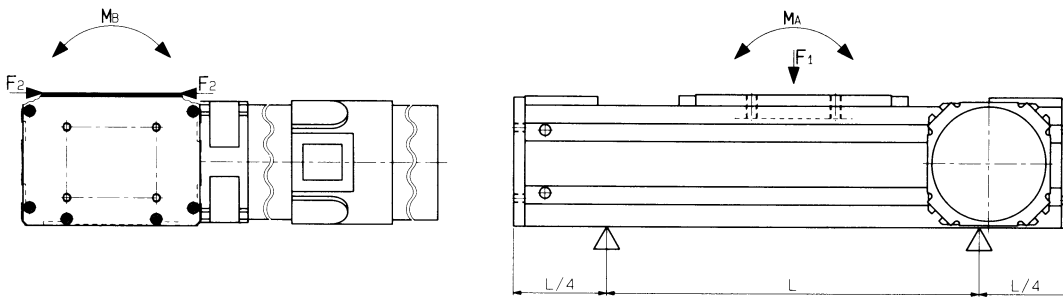
## Acceleration time/deceleration time



## Acceleration distance/deceleration distance



### Dynamic mechanical load capacity for 5000 km (1000 km)



$F_1 = 1500 \text{ N (2590 N)}$   
 $F_2 = 1500 \text{ N (2590 N)}$

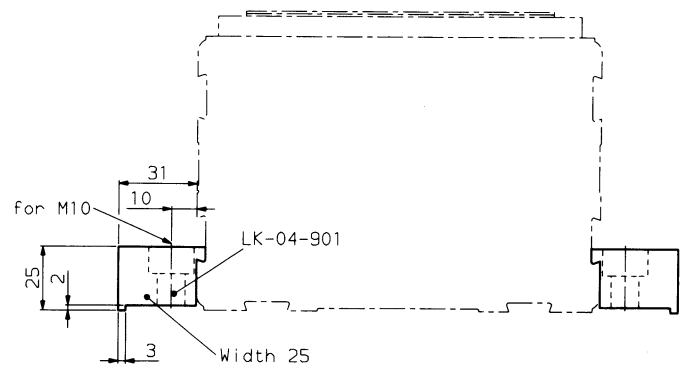
$M_A = 44 \text{ Nm (74 Nm)}$   
 $M_B = 57 \text{ Nm (98 Nm)}$

Deflection of carrier unit with ends supported  
 Deflection  $f < 0.2 \text{ mm (<.008")}$  with  $F_1 = 1500 \text{ N (337.2 lb)}$   
 Support  $L = 1350 \text{ mm (53.15")}$

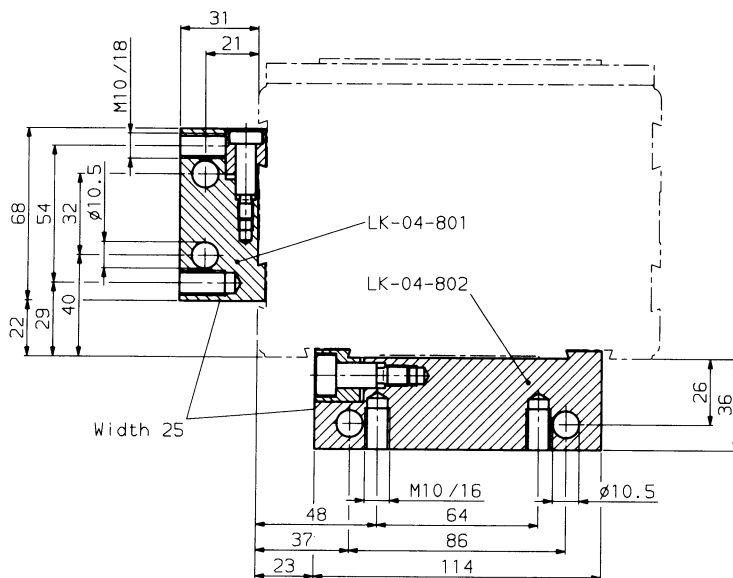
### Mounting options

- Option 1
  - With clamps
- Option 2
  - Tapped mounting plate and through holes
- Option 3
  - Front mounting plate according to data sheet, sheet 2.091
  - Combination: Front mounting and clamp
- Option 4
  - with key

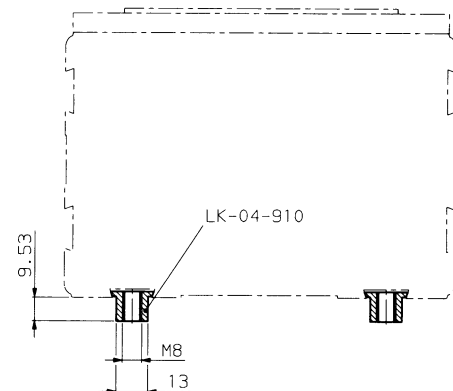
OPTION 1



OPTION 2

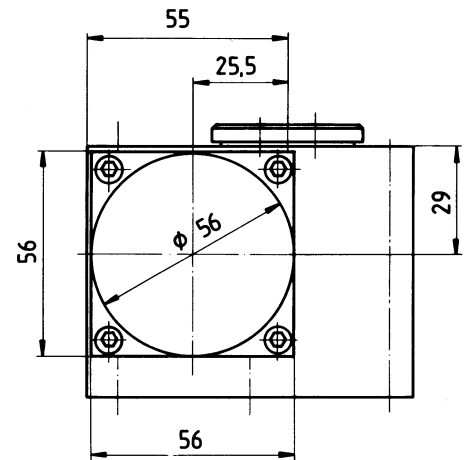
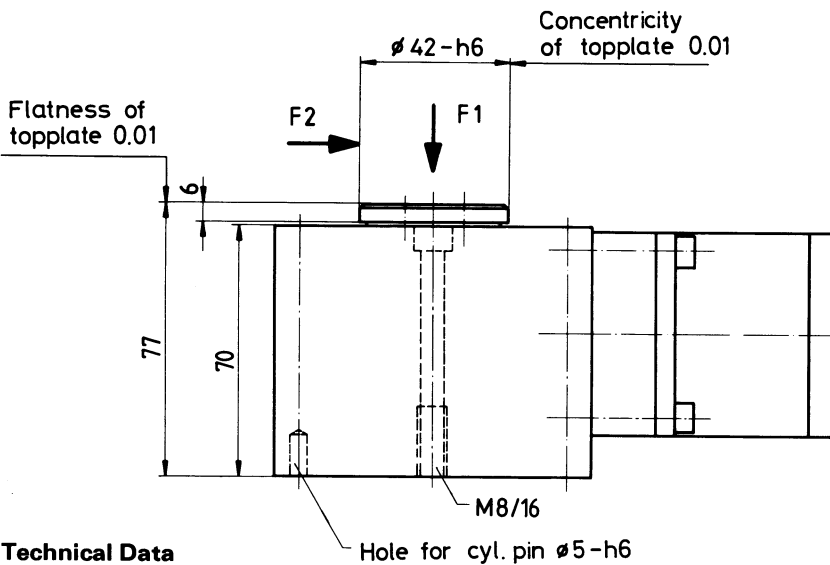
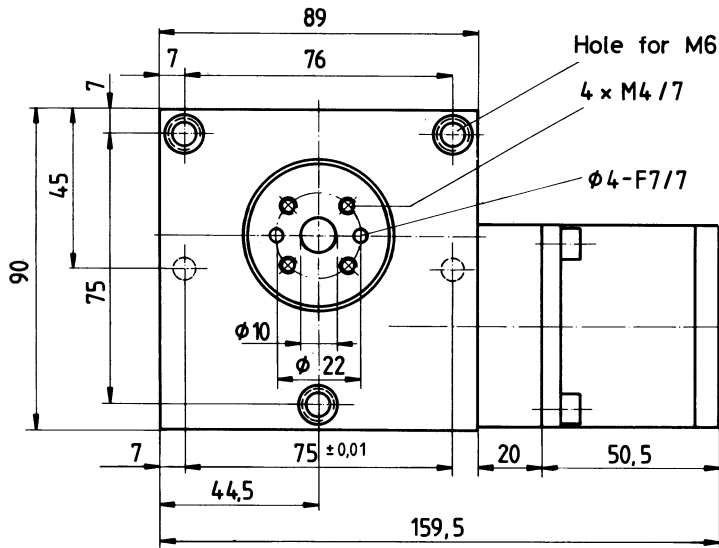


OPTION 3



# Rotary indexing table RE 75

Electrical Actuator



## Technical Data

| Type of drive                            | Stepping motor | DC-motor   |
|--|----------------|------------|
| Procedural mode [°]                      | 360            | 360        |
| Travel per revolution of motor shaft [°] | 24°            | 24°        |
| Drive element                            | worm gear      | worm gear  |
| Transport load [lb (kg)]                 | 110.3 (50)     | 110.3 (50) |
| Carrying power F1 dyn. [lb (N)]          | 124 (550)      | 124 (550)  |
| Radial force F2 dyn. [lb (N)]            | 337 (1500)     | 337 (1500) |
| Dead weight                              |                |            |
| Torque [lb. in (Nm)]                     | 95.58 (10,8)   |            |
| Step angle [°]                           | 0.9            |            |
| Starting frequency [cycles]              | 900            |            |
| Operating frequency [cycles]             | 4800           |            |
| Impulse generator [imp./rev.]            |                | 600        |
| Motor revs. [rpm]                        | 720            |            |
| Motor torque [lb. in (Nm)]               | 1.59 (0,18)    |            |
| Stopping momentum                        | self-locking   |            |
| Acceleration time [s]                    | 0.1            |            |
| Rotating speed [%s]                      | 60             |            |
| Resolution [']                           | 45             | 30         |
| Repeatability [']                        | 45             | 30         |
| Installation position                    | as desired     | as desired |
| Weight (without motor) [lb (kg)]         | 5.1 (2,3)      | 5.1 (2,3)  |

## Order No.

RE 75 — ...

Type of drive: OM = Without motor  
SM = Stepping motor  
DC = DC-motor

## ROTARY ACTUATORS

SECTION 3

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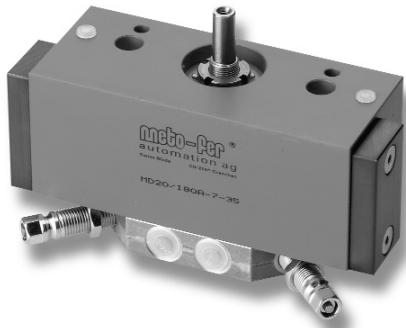
[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337

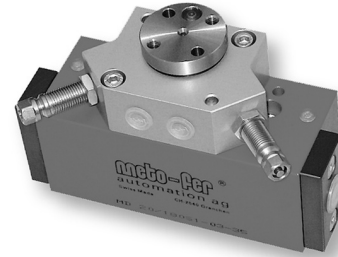


# Rotary Actuators MD

- Features:**
- Backlash free
  - Ball bearings
  - External stops



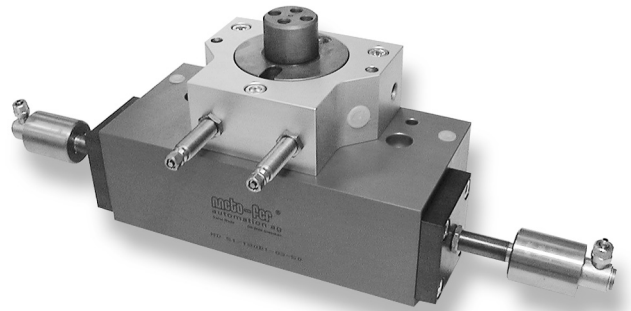
Model A (MD 20)



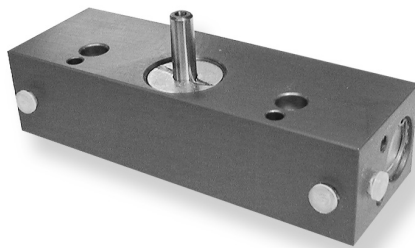
Model V (MD 20)



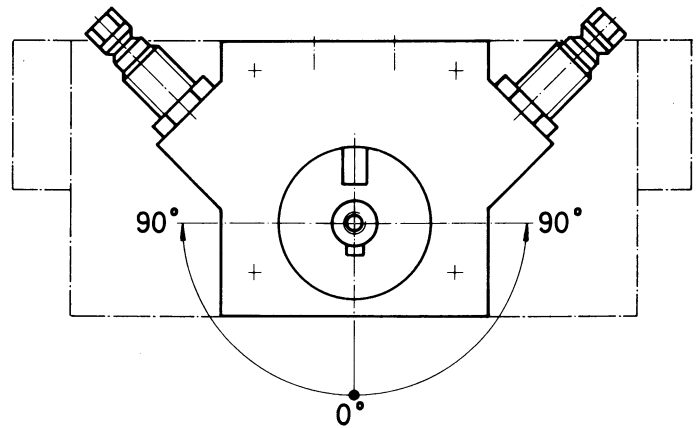
Model B (MD 12)



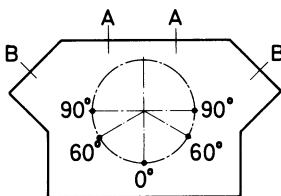
MD51 / 180B1, with oil cushion



Model S (MD 12)

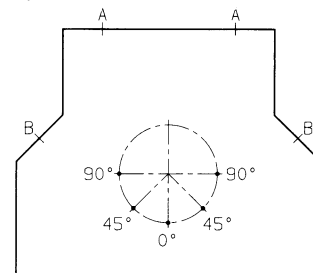


Position of the shaft by MD12, MD20, MD32



Position of the Stop screw by MD12, MD20, MD32

- Angle of rotation: 0 – 60° Stop screw in Pos. B  
 Angle of rotation: 60 – 90° Stop screw in Pos. A

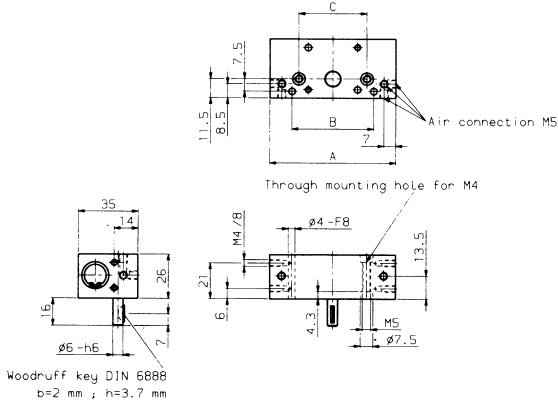


Position of the Stop screw by MD 51

- Angle of rotation: 0 - 45° Stop screw in Pos. A  
 Angle of rotation: 45 - 90° Stop screw in Pos. B

# Rotary Actuator MD 12

## Model S



| Type        | A   | B  | C  | Angle of rotation | Air consumption for each double stroke at 5 bar | Weight (lb (kg)) |
|-------------|-----|----|----|-------------------|---|------------------|
| MD 12/ 90 S | 74  | 48 | 40 | 90°               | .001 scf (0.02 NL)                              | .55 (0.25)       |
| MD 12/180 S | 105 | 60 | 60 | 180°              | .002 scf (0.04 NL)                              | .66 (0.30)       |

Max. load radial to shaft: 67 lb (300 N)

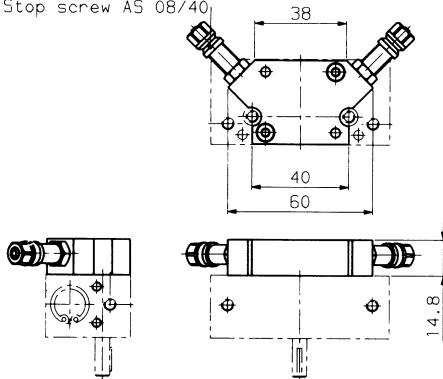
Max. load axial to shaft: 67 lb (300 N)

Torque at 72.5 psi (5 bar) : 3.36 lb.in (0.38 Nm)

Order No. MD 12/ 90 S  
MD 12/180 S

## Model A

Stop screw AS 08/40



| Type        | Angle of rotation | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight           |
|-------------|-------------------|--|------------------|
| MD 12/ 90 A | 0 - 90°           | .001 scf (0.02 NL)   | .73 lb (0.33 kg) |
| MD 12/180 A | 0 - 180°          | .002 scf (0.04 NL)   | .79 lb (0.36 kg) |

Max. load radial to shaft: 67 lb (300 N)

Max. load axial to shaft: 67 lb (300 N)

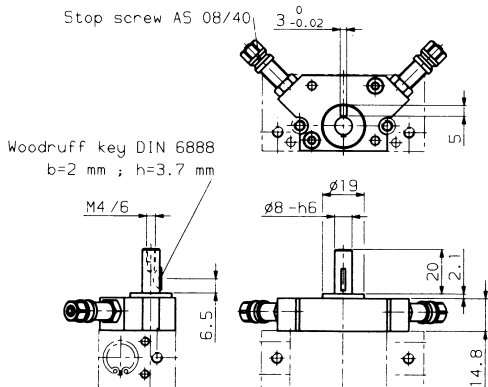
Repeatability: +/- 320 Arc sec

Torque at 72.5 psi (5 bar) : 3.36 lb.in (0.38 Nm)

Order No. MD 12/ 90 A  
MD 12/180 A

## Model B

Stop screw AS 08/40



| Type        | Angle of rotation | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight           |
|-------------|-------------------|--|------------------|
| MD 12/ 90 B | 0 - 90°           | .001 scf (0.02 NL)   | .77 lb (0.35 kg) |
| MD 12/180 B | 0 - 180°          | .002 scf (0.04 NL)   | .88 lb (0.40 kg) |

Max. load radial to shaft: 34 lb (150 N)

Max. load axial to shaft: 54 lb (240 N)

Repeatability: +/- 320 Arc sec

Torque at 72.5 psi (5 bar) : 3.36 lb.in (0.38 Nm)

Order No. MD 12/ 90 B  
MD 12/180 B

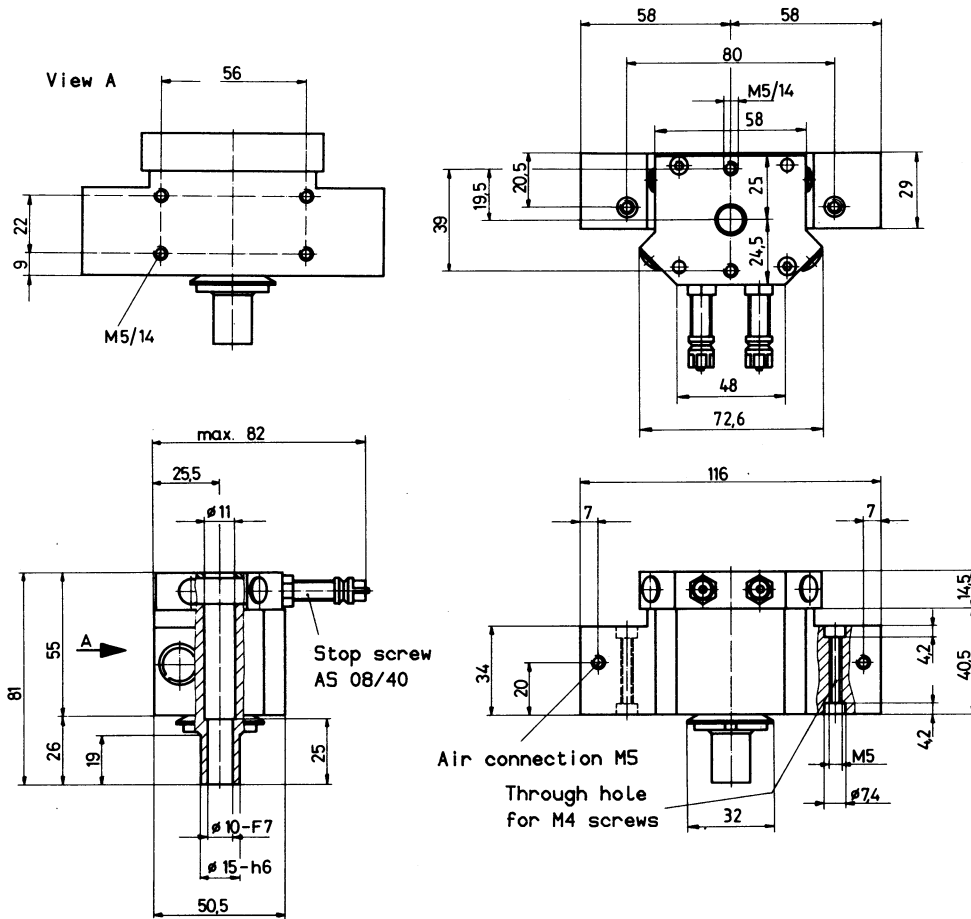
## Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- Intermediate position can be added.
- Designed for high operating rates and long life.

- Operating medium Compressed air or hydraulic oil
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5

# Rotary Actuator MD 12/180 H

Rotary actuator with hollow shaft



| Type        | Angle of rotation | Max. load radial to shaft | Max. load axial to shaft | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight            | Order No.   |
|-------------|-------------------|---------------------------|--------------------------|----------------------------|--|-------------------|-------------|
| MD 12/180 H | 0–180°            | 337 lb (1500 N)           | 34 lb (150 N)            | 4.07 lb.in (0,46 Nm)       | .002 scf (0,04 NL)   | 1.65 lb (0,75 kg) | MD 12/180 H |

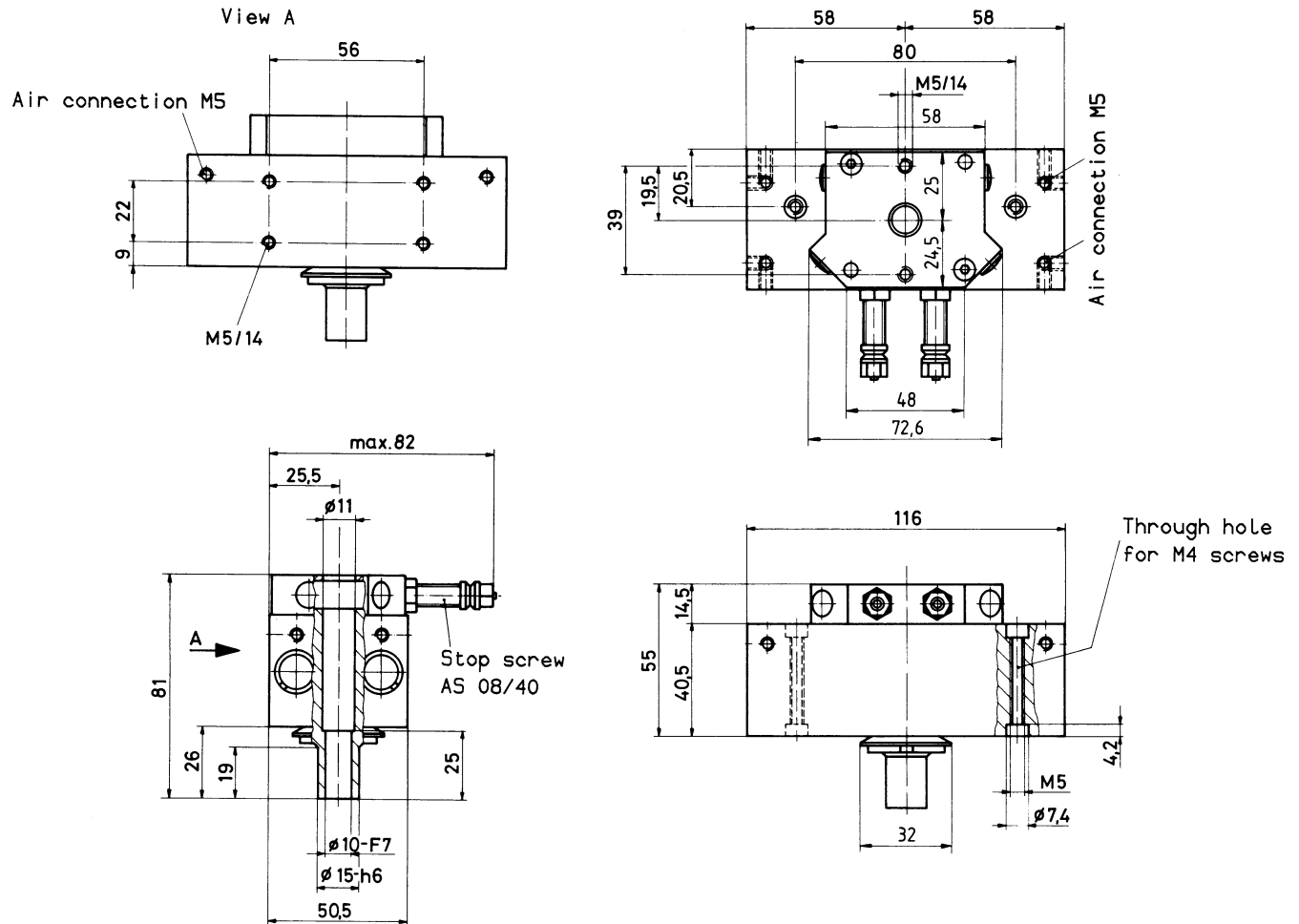
## Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- Intermediate position can be added. (see sheet 3.051)
- Designed for high operating rates and long life.

|                      |                                 |
|----------------------|---------------------------------|
| - Operating medium   | Compressed air or hydraulic oil |
| - Operating pressure | 43.5 - 116 psi (3 - 8 bar)      |
| - Repeatability      | ± 190 Arc sec                   |
| - Air connection     | M5                              |

# Rotary Actuator MD 12 D/180 H

Rotary actuator with hollow shaft and 2 piston



| Type          | Angle of rotation | Max. load radial to shaft | Max. load axial to shaft | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight            | Order No.     |
|---------------|-------------------|---------------------------|--------------------------|----------------------------|--|-------------------|---------------|
| MD 12 D/180 H | 0–180°            | 337 lb (1500 N)           | 34 lb (150 N)            | 8.14 lb.in (0,92 Nm)       | .003 scf (0,08 NL)   | 2.09 lb (0,95 kg) | MD 12 D/180 H |

### Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- Intermediate position can be added. (see sheet 3.051)
- Designed for high operating rates and long life.

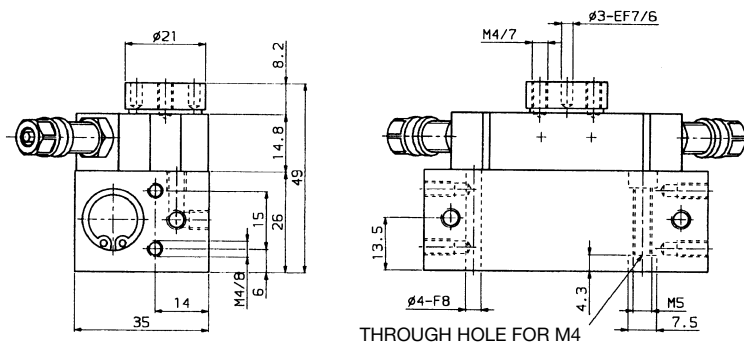
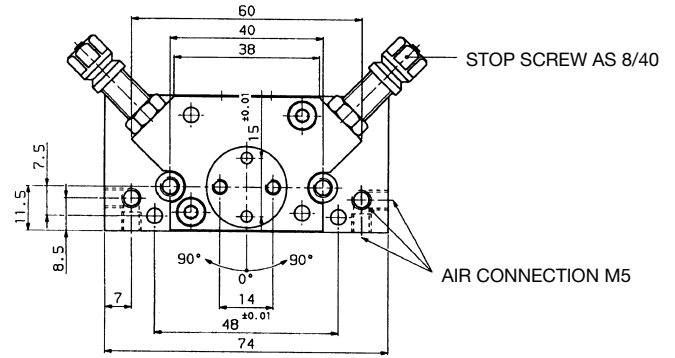
- Operating medium
- Operating pressure
- Repeatability
- Air connection

- Compressed air or hydraulic oil
- 43.5 - 116 psi (3 - 8 bar)
- ± 190 Arc sec
- M5

# Rotary Actuator MD 12/90V

|   |                                 |
|---|---------------------------------|
| Rotation:                               | 0-90 degrees                    |
| Max Load Radial To Shaft:               | 34 lb (150 N)                   |
| Max Load Axial To Shaft:                | 54 lb (240 N)                   |
| Repeatability:                          | ±320 ARC SEC.                   |
| Torque:                                 | 3.36 lb IN (.38 Nm)             |
| Operating Medium:                       | compressed air or hydraulic oil |
| Operating Pressure:                     | 43.5-116 PSI (3-8 bar)          |
| Air Connection:                         | M5                              |
| Air Consumption For Each Double Stroke: | 0.001 scf (0.02 NL)             |
| Weight:                                 | 0.77 lb. (0.35 kg)              |

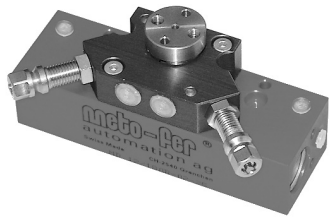
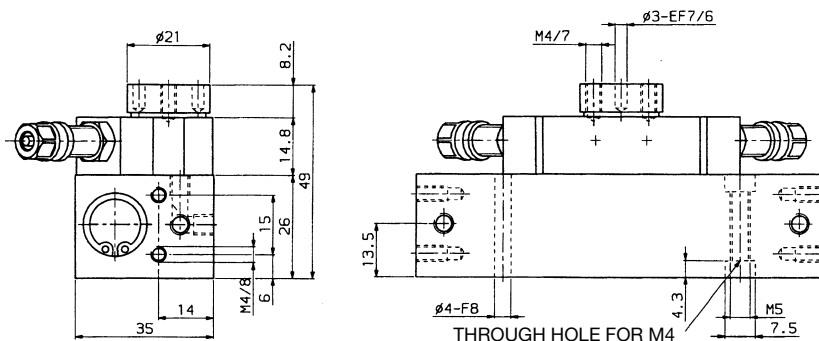
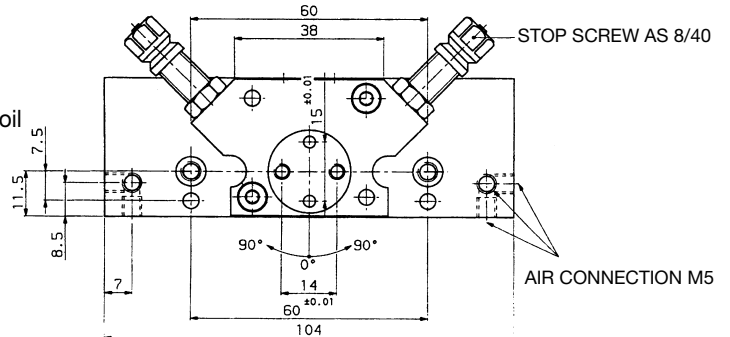
**Order No.:** MD12/90V



# Rotary Actuator MD 12/180V

|   |                                 |
|---|---------------------------------|
| Rotation:                               | 0-180 degrees                   |
| Max Load Radial To Shaft:               | 34 lb (150 N)                   |
| Max Load Axial To Shaft:                | 54 lb (240 N)                   |
| Repeatability:                          | ±320 ARC SEC.                   |
| Torque:                                 | 3.36 lb IN (.38 Nm)             |
| Operating Medium:                       | compressed air or hydraulic oil |
| Operating Pressure:                     | 43.5-116 PSI (3-8 bar)          |
| Air Connection:                         | M5                              |
| Air Consumption For Each Double Stroke: | 0.002 scf (0.04 NL)             |
| Weight:                                 | 0.88 lb. (0.40 kg)              |

**Order No.:** MD12/180V

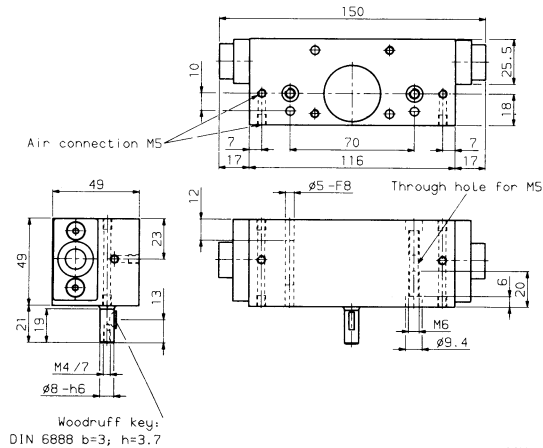


### Technical data:

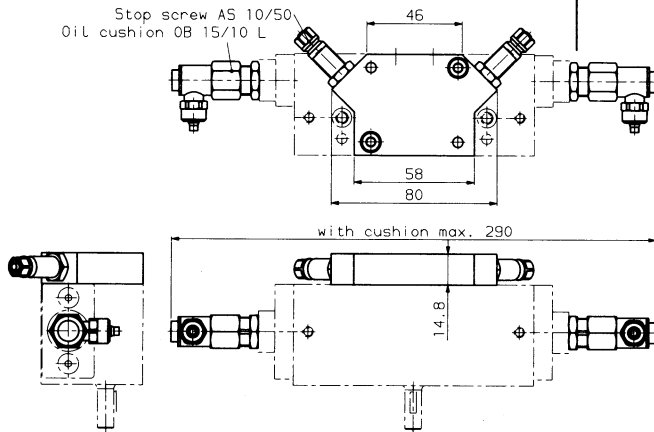
- Built in patented stop screws with fine threads provide adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements")
- Designed for high operating rates

# Rotary Actuator MD 20/180

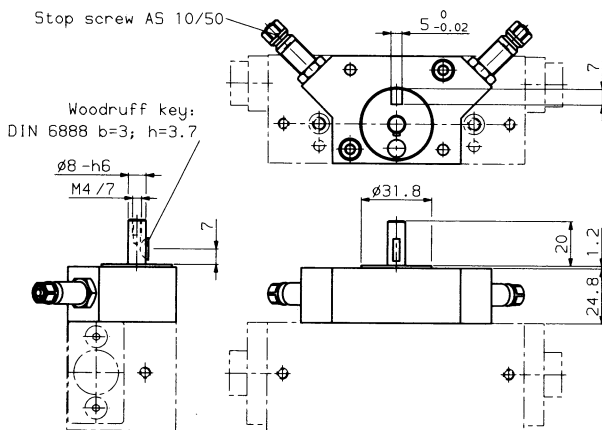
## Model S



## Model A



## Model B



### Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- Intermediate position can be added (on model B).
- Designed for high operating rates and long life.
- Operating medium                           Compressed air or hydraulic oil                           Cushions page 5.001
- Operating pressure                           43.5 - 116 psi (3 - 8 bar)
- Air connection                               M5

| Type        | Angle of rotation | Air consumption for each double stroke at 5 bar | Weight          |
|-------------|-------------------|---|-----------------|
| MD 20/180 S | 180°              | .004 scf (0.12 NL)                              | 2.0 lb (0.9 kg) |

Max. load radial to shaft: 79 lb (350 N)

Max. load axial to shaft: 61 lb (270 N)

Torque at 72.5 psi (5 bar) : 9.74 lb.in (1.1 Nm)

### Order No.

MD 20/180 S

MD 20/180 S1 end cover for oil cushions  
or elastomer cushions

OIL CUSHIONS = OB 15/IOL

ELASTOMER = KB08/M14X1

| Type        | Angle of rotation | Air consumption for each double stroke at 5 bar | Weight          |
|-------------|-------------------|---|-----------------|
| MD 20/180 A | 0 - 180°          | .004 scf (0.12 NL)                              | 2.4 lb (1.1 kg) |

Max. load radial to shaft: 79 lb (350 N)

Max. load axial to shaft: 61 lb (270 N)

Repeatability: +/- 200 Arc sec

Torque at 72.5 psi (5 bar) : 9.74 lb.in (1.1 Nm)

### Order No.

MD 20/180 A

MD 20/180 A1 end cover for oil cushions  
or elastomer cushions

NOTE: when using cushions need 2 nuts, o-rings  
(MU01.008)

| Type        | Angle of rotation | Air consumption for each double stroke at 5 bar | Weight          |
|-------------|-------------------|---|-----------------|
| MD 20/180 B | 0 - 180°          | .004 scf (0.12 NL)                              | 2.6 lb (1.2 kg) |

Max. load radial to shaft: 40 lb (180 N)

Max. load axial to shaft: 67 lb (300 N)

Repeatability: +/- 200 Arc sec

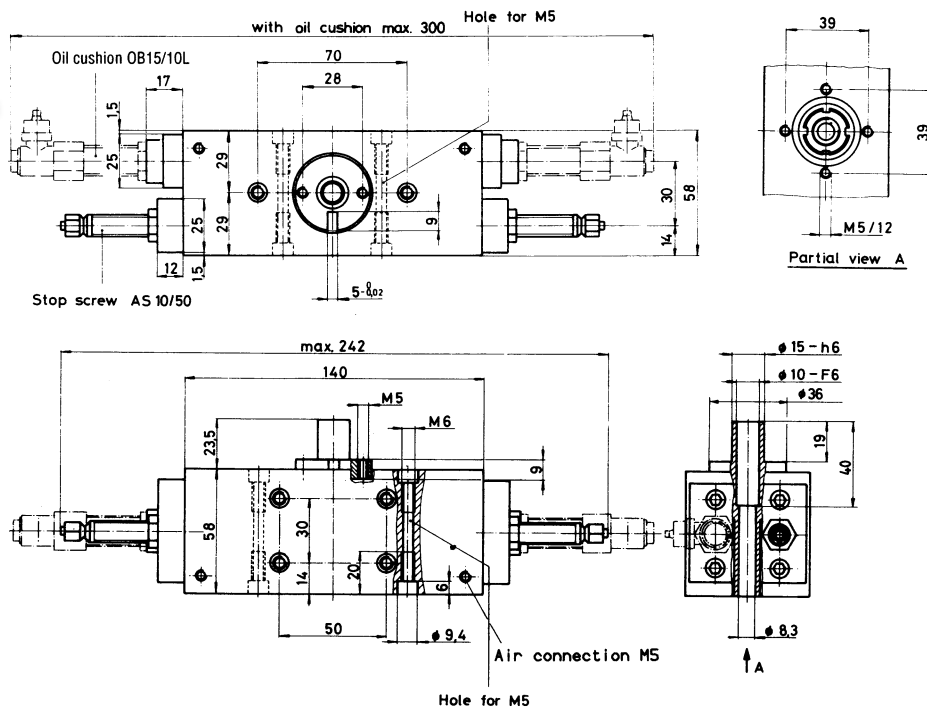
Torque at 72.5 psi (5 bar) : 9.74 lb.in (1.1 Nm)

### Order No.

MD 20/180 B

MD 20/180 B1 end cover for oil cushions  
or elastomer cushions

# Rotary Actuator MD 20/360



| Type      | Angle of rotation | Max. load radial to shaft | Max. load axial to shaft | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke 72.5 psi (5 bar) | Weight          |
|-----------|-------------------|---------------------------|--------------------------|----------------------------|---|-----------------|
| MD 20/360 | 0-360°            | 337 lb (1500 N)           | 34 lb (150 N)            | 7.26 lb.in (0,82 Nm)       | .006 scf (0,17 NL)                                      | 4.0 lb (1,8 kg) |

## Order No.

MD 20/360

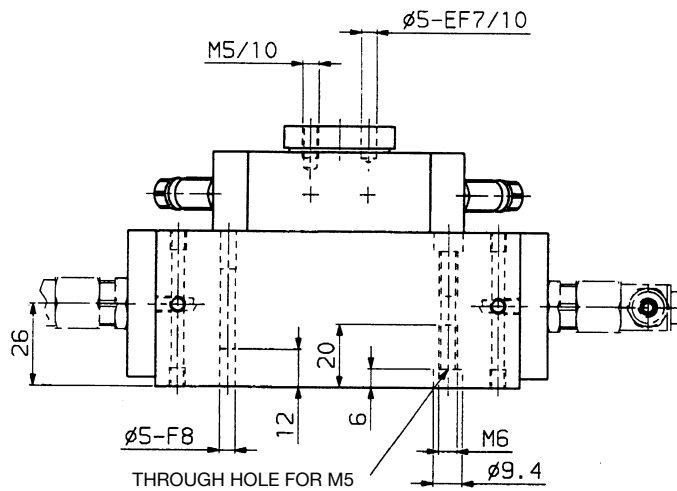
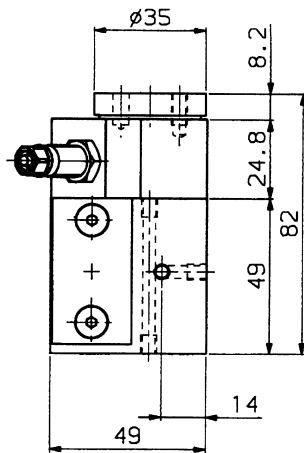
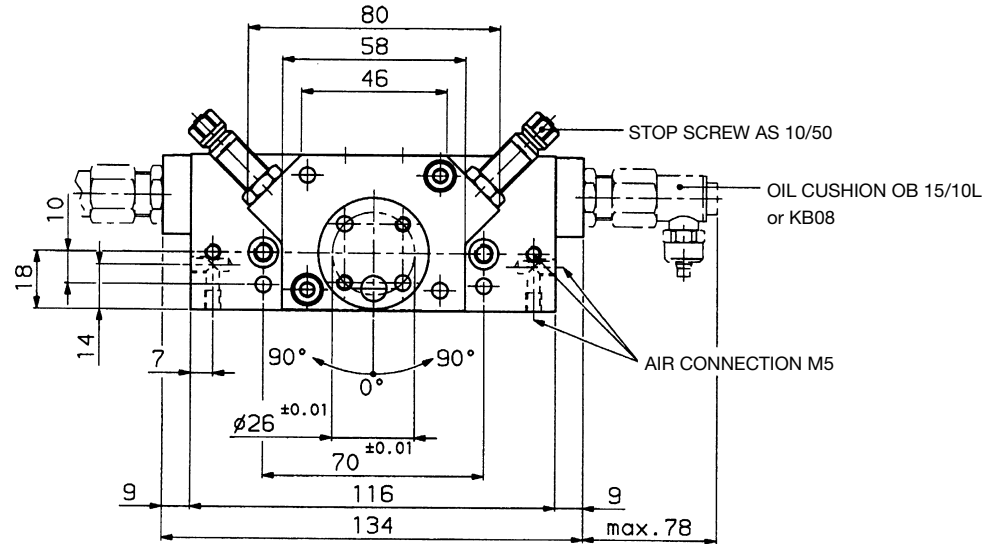
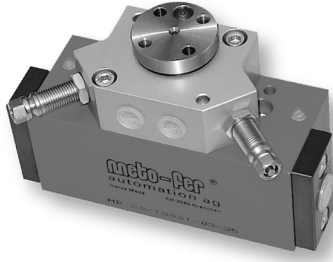
MD 20/360-1 end cover for oil cushions or elastomer cushions

## Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- End position can be damped with adjustable oil cushions.
- Designed for high operating rates and long life.
- Operating medium Compressed air or hydraulic oil
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Repeatability ± 294 Arc sec
- Air connection M5

Cushions page 5.001

# Rotary Actuator MD 20/180V



|   |                                 |
|---|---------------------------------|
| Rotation:                               | 0-180 degrees                   |
| Max Load Radial To Shaft:               | 40 lb (180 N)                   |
| Max Load Axial To Shaft:                | 67 lb (300 N)                   |
| Repeatability:                          | $\pm 200$ ARC SEC.              |
| Torque:                                 | 9.74 lb IN (1.1 Nm)             |
| Operating Medium:                       | compressed air or hydraulic oil |
| Operating Pressure:                     | 43.5-116 PSI (3-8 bar)          |
| Air Connection:                         | M5                              |
| Air Consumption For Each Double Stroke: | 0.004 scf (0.12 NL)             |
| Weight:                                 | 2.6 lb. (1.20 kg)               |

**Order No.:** MD20/180V  
 MD20/180V1 WITH END COVER FOR OIL OR ELASTOMER CUSHIONS

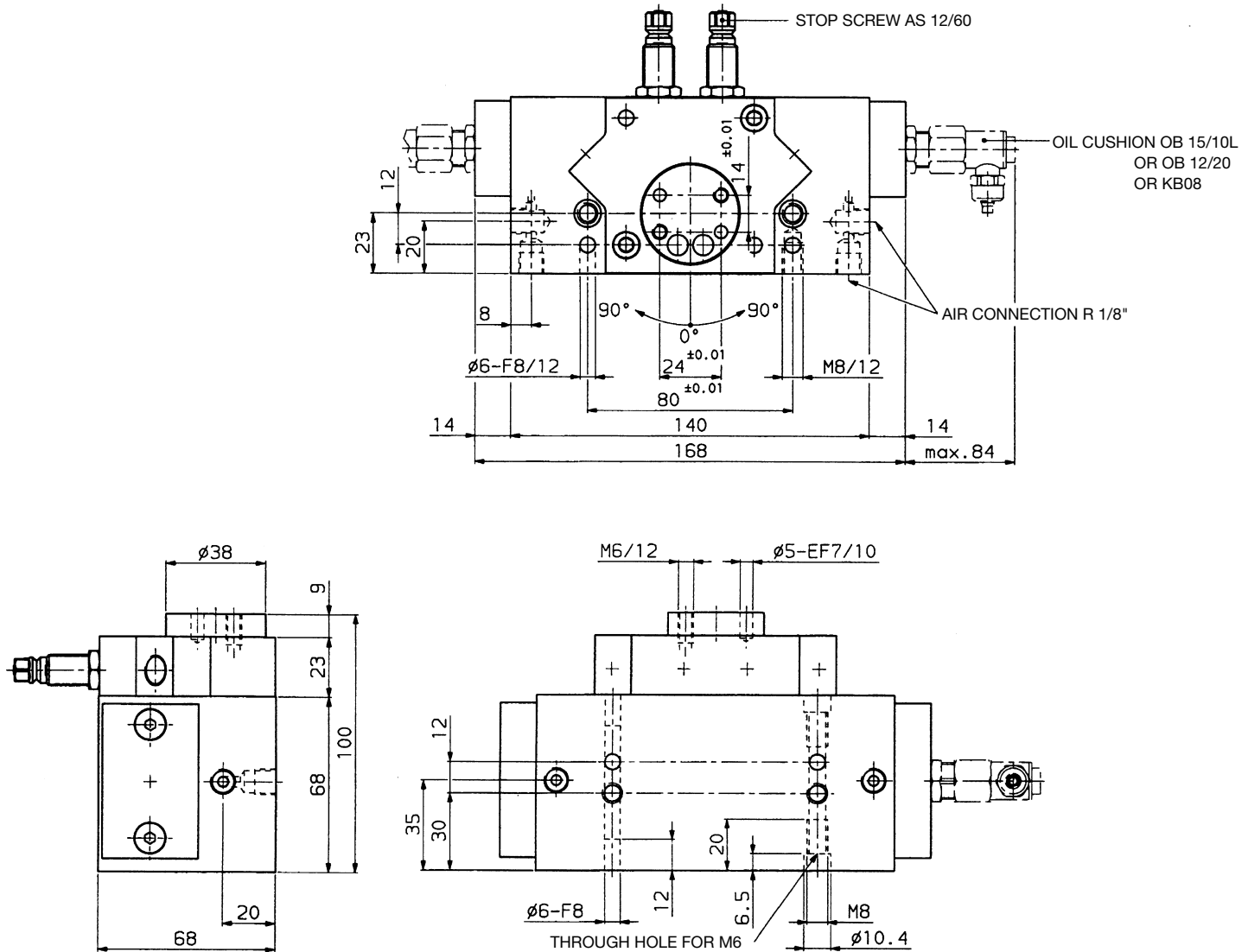
### Technical data:

- Built in patented stop screws with fine threads provide adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements")
- End position can be damped with adjustable oil cushions. (OB15/10L) or Elastomer (KB08)
- Designed for high operating rates





# Rotary Actuator MD 32/180V



|   |                                       |
|---|---------------------------------------|
| Rotation:                               | 0-180 degrees                         |
| Max Load Radial To Shaft:               | 124 lb (550 N)                        |
| Max Load Axial To Shaft:                | 169 lb (750 N)                        |
| Repeatability:                          | ±150 ARC SEC.                         |
| Torque:                                 | 31.86 lb IN (3.6 Nm) 72.5 PSI (5 bar) |
| Operating Medium:                       | compressed air or hydraulic oil       |
| Operating Pressure:                     | 43.5-116 PSI (3-8 bar)                |
| Air Connection:                         | G 1/8"                                |
| Air Consumption For Each Double Stroke: | 0.013 scf (0.37 NL) 72.5 PSI (5 bar)  |
| Weight:                                 | 5.9 lb. (2.70 kg)                     |

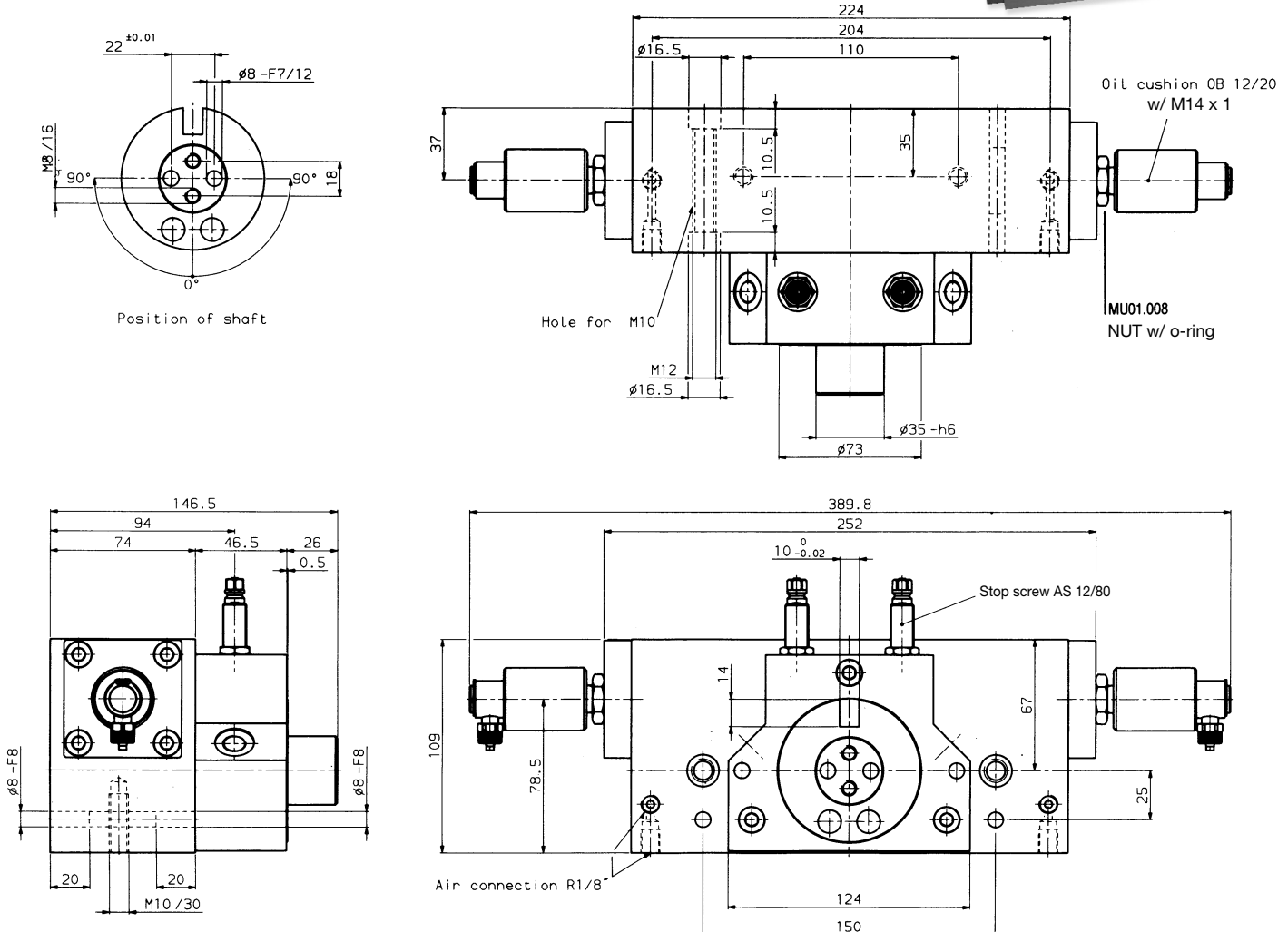
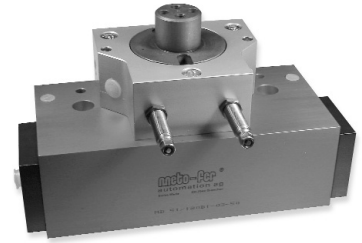


**Order No.:** **MD32/180V**  
**MD32/180V1 WITH END COVER FOR OIL OR ELASTOMER CUSHIONS**

### Technical data:

- Built in patented stop screws with fine threads provide adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements")
- End position can be damped with adjustable oil cushions. (OB15/10L or OB12/20) or Elastomer (KB08)
- Designed for high operating rates

# Rotary Actuator MD 51/180 B



| Type       | Angle of rotation | Max. load radial to shaft | Max. load axial to shaft | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|------------|-------------------|---------------------------|--------------------------|----------------------------|---|------------------|
| MD 51/180B | 0-180°            | 1124 lb (5000 N)          | 629 lb (2800 N)          | 117.3 lb.in (13.25 Nm)     | 0.048 scf (1.35 NL)                             | 17.9 lb (8.1 kg) |

### Order No.

MD 51/180 B

MD 51/180 B1 with end cover for oil cushions

### Technical data:

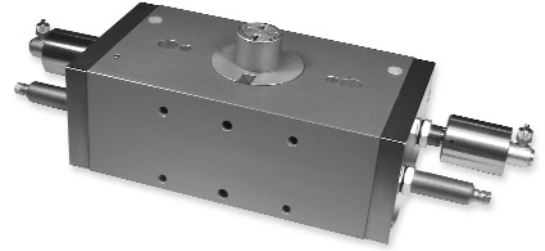
- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- End position can be damped with adjustable oil cushions.
- Intermediate position can be added.
- Designed for high operating rates and long life.

- Operating medium
- Operating pressure
- Repeatability
- Air connection

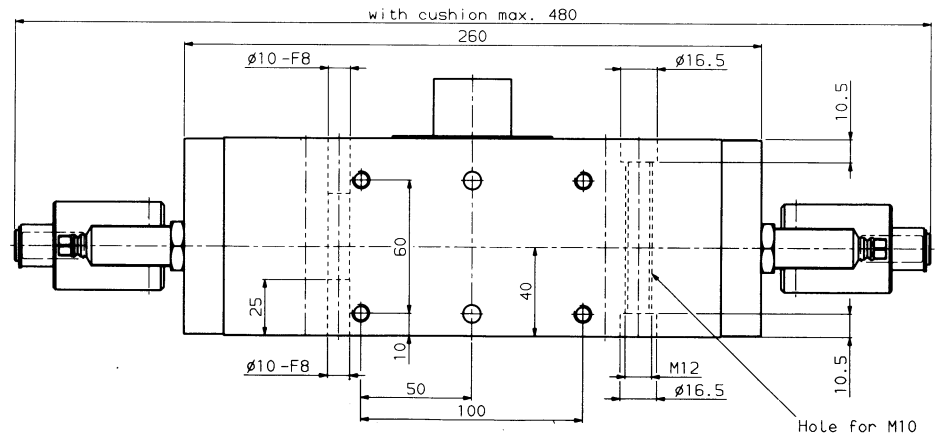
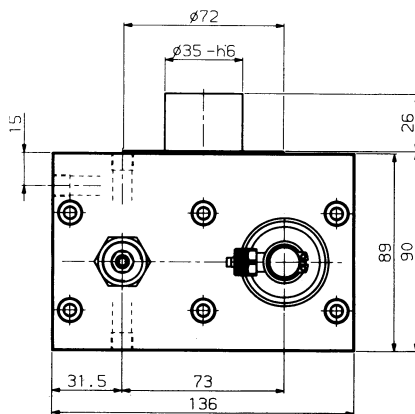
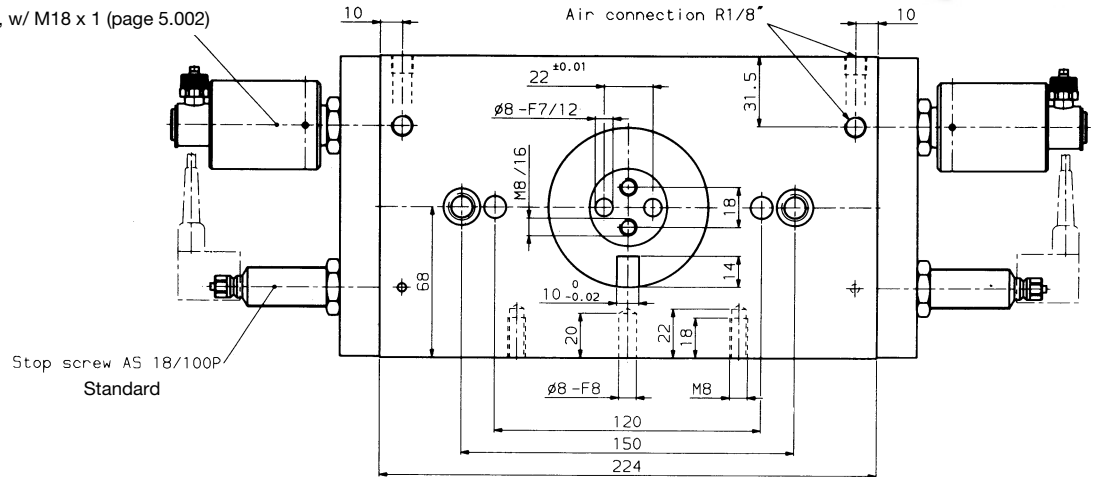
Compressed air or hydraulic oil  
 43.5 - 116 psi (3 - 8 bar) Cushions page 5.001  
 +/- 75 Arc sec  
 R 1/8"

# Rotary Actuator MD 51 D/180

## Rotary actuator with 2 piston



OIL CUSHION OB 15/20, w/ M18 x 1 (page 5.002)



| Type        | Angle of rotation | Max. load radial to shaft | Max. load axial to shaft | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight            |
|-------------|-------------------|---------------------------|--------------------------|----------------------------|---|-------------------|
| MD 51 D/180 | 0-180°            | 1124 lb (5000 N)          | 629 lb (2800 N)          | 234.5 lb.in (26.50 Nm)     | 0.060 scf (1.70 NL)                             | 22.4 lb (10.2 kg) |

Order No.: **MD 51D/180 - O**  
**MD 51D/180 - A**  
**MD 51D/180 - B**

O = without oil cushions  
 A = with oil cushions  
 B = with oil cushions and KOB (page 5.001)

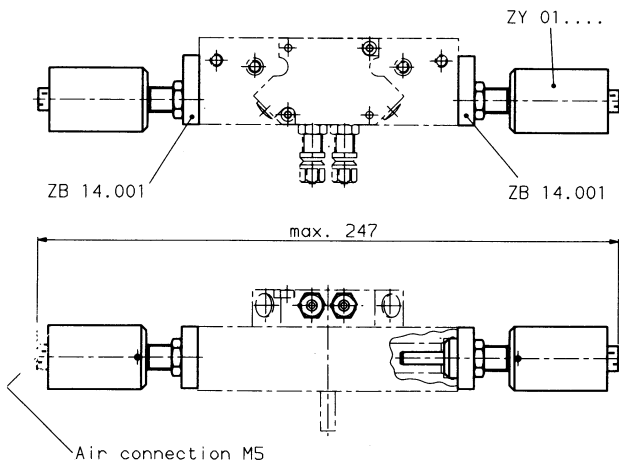
### Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- End position can be damped with adjustable oil cushions.
- Intermediate position can be added.
- Designed for high operating rates and long life.

|                     |                                 |
|---------------------|---------------------------------|
| -Operating medium   | Compressed air or hydraulic oil |
| -Operating pressure | 43.5 - 116 psi (3 - 8 bar)      |
| -Repeatability      | +/- 190 Arc sec                 |
| -Air connection     | R 1/8"                          |

### Intermediate position

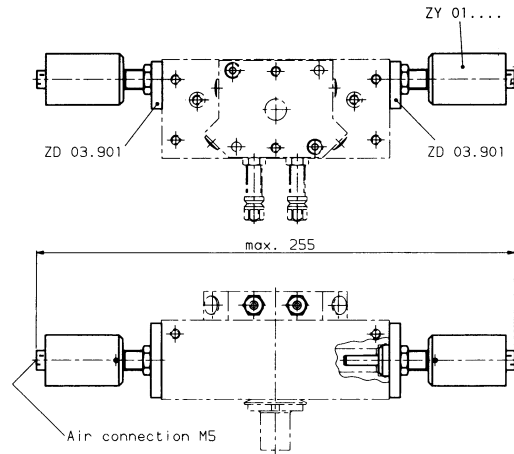
for MD12/180



**Order No.**  
 Cylinder ZY 01....  
 End cover ZB 14.001

### Intermediate position

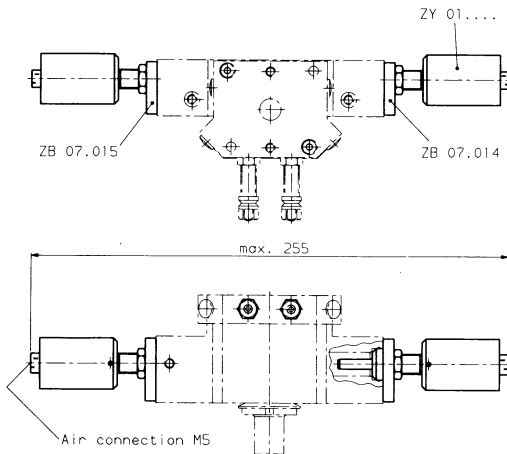
for MD12D/180H and ZD12D/180



**Order No.**  
 Cylinder ZY 01....  
 End cover ZD 03.901

### Intermediate position

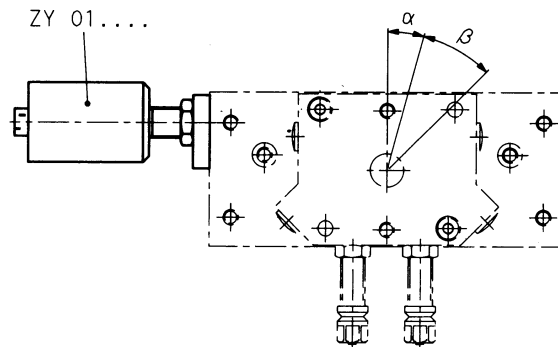
for MD12/180H and ZD12/180



**Order No.**  
 Cylinder ZY 01....  
 End cover ZB 07.014  
 End cover ZB 07.015

### Intermediate position

Possible adjustments

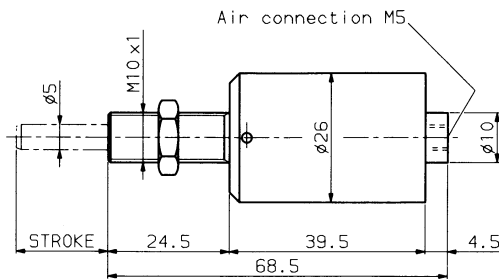


Dimensions of  $\alpha$  and  $\beta$  see table of Cylinder ZY

### Cylinder ZY

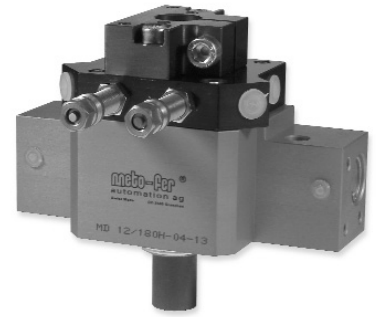
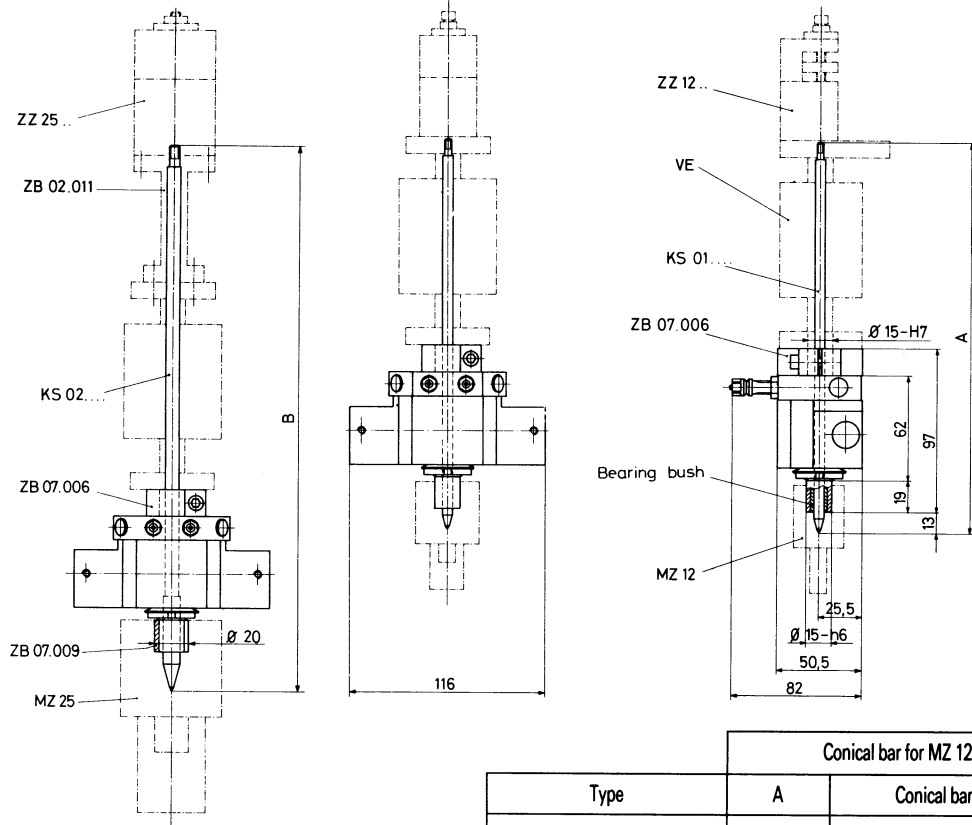
**Technical data:**

- Stroke return movement has to occur mechanical (Piston of rotary drive)
- Operating medium Compressed air
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5



| Type      | Stroke | $\alpha$ | $\beta$ | Piston force at 72.5 psi (5 bar) | Air consumption for each stroke at 72.5 psi (5 bar) | Weight            | Order No. |
|-----------|--------|----------|---------|----------------------------------|---|-------------------|-----------|
| ZY 01.000 | 18.5   | 0°       | 0-30°   | 27 lb (118 N)                    | 0.0012 scf (0.035 NL)                               | 0.11 lb (0.05 kg) | ZY 01.000 |
| ZY 02.000 | 15.5   | 15°      | 0-30°   | 27 lb (118 N)                    | 0.0010 scf (0.029 NL)                               | 0.11 lb (0.05 kg) | ZY 02.000 |
| ZY 03.000 | 12.5   | 30°      | 0-30°   | 27 lb (118 N)                    | 0.0008 scf (0.024 NL)                               | 0.11 lb (0.05 kg) | ZY 03.000 |
| ZY 04.000 | 9.5    | 45°      | 0-30°   | 27 lb (118 N)                    | 0.0006 scf (0.018 NL)                               | 0.11 lb (0.05 kg) | ZY 04.000 |
| ZY 05.000 | 6.5    | 60°      | 0-30°   | 27 lb (118 N)                    | 0.0004 scf (0.012 NL)                               | 0.11 lb (0.05 kg) | ZY 05.000 |

# Rotary gripper head ZD 12/180 Rotary gripper head for Vertical units VE



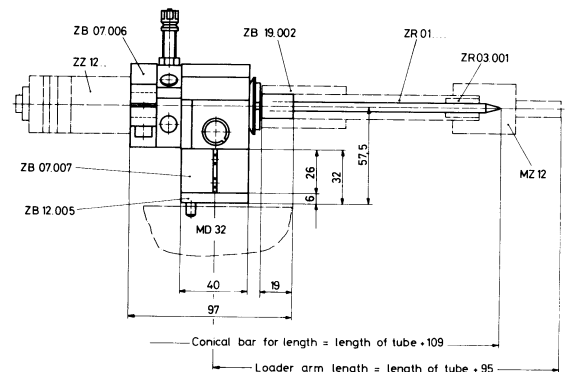
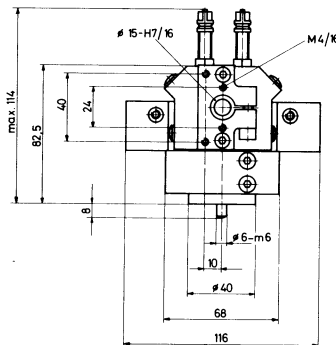
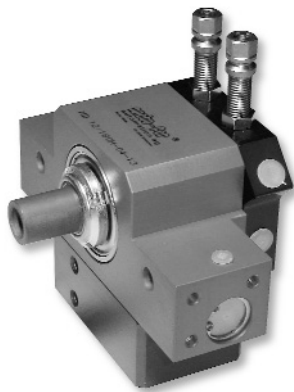
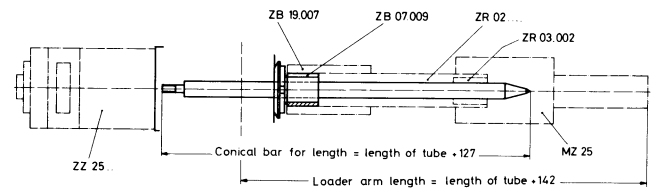
| Type            | Conical bar for MZ 12 |                 | Conical bar for MZ 25 |                 |
|-----------------|-----------------------|-----------------|-----------------------|-----------------|
|                 | A                     | Conical bar No. | B                     | Conical bar No. |
| ZD 12/180       | —                     | —               | —                     | —               |
| ZD 12/180 VE 22 | 231                   | KS 01.017       | 324                   | KS 02.004       |
| ZD 12/180 VE 52 | 291                   | KS 01.018       | 384                   | KS 02.008       |
| ZD 12/180 VE 82 | 351                   | KS 01.019       | 444                   | KS 02.000       |

**Technical data:** Sheet 3.011

Rotary gripper head and support must be ordered separately.  
**Order No.** for Rotary gripper head (delivery as per photo) ZD 12/180  
**Order No.** for Split sleeve ZB 07.009  
**Order No.** for Conical bar KS .....

Rotary gripper head for use with rotary loader arms

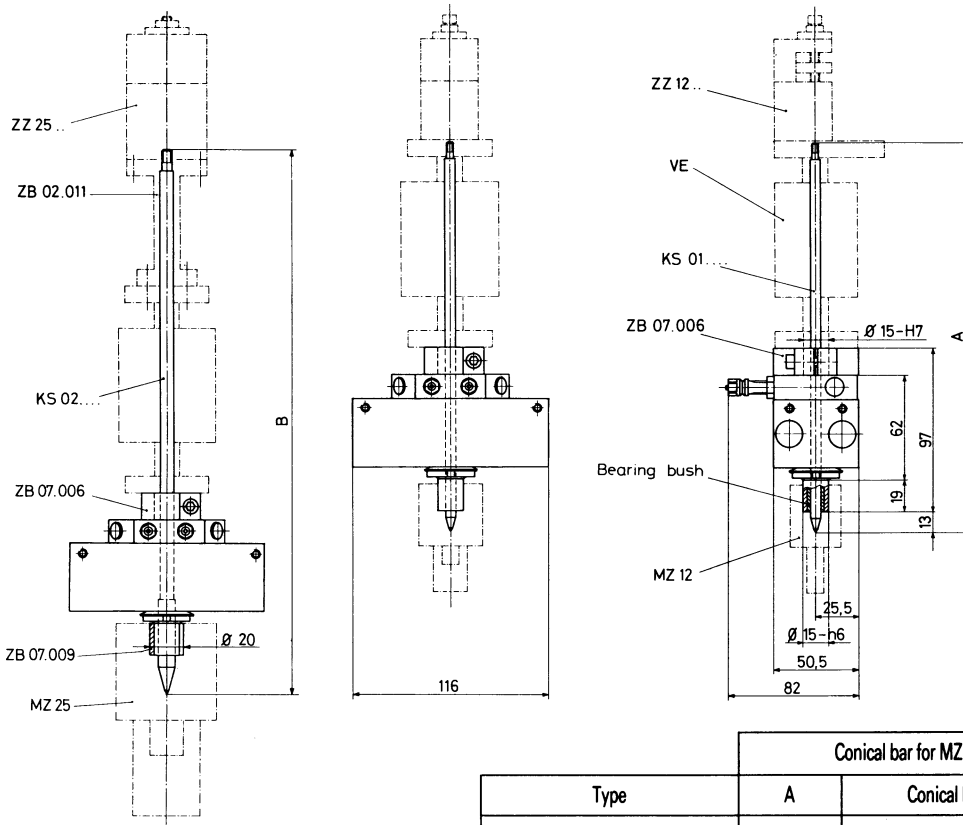
No. of Conical bar



**Technical data:** Sheet 3.011

Rotary gripper head and support must be ordered separately.  
**Order No.** for Rotary gripper head (delivery as per photo) ZD 12/180L  
**Order No.** for Conical bar see sheet 8.022  
**Order No.** for Gripper mounting tubes see sheet 8.022

# Rotary gripper head ZD 12D/180 Rotary gripper head for Vertical units VE



| Type             | Conical bar for MZ 12 |                 | Conical bar for MZ 25 |                 |
|------------------|-----------------------|-----------------|-----------------------|-----------------|
|                  | A                     | Conical bar No. | B                     | Conical bar No. |
| ZD 12D/180       | —                     | —               | —                     | —               |
| ZD 12D/180 VE 22 | 231                   | KS 01.017       | 324                   | KS 02.004       |
| ZD 12D/180 VE 52 | 291                   | KS 01.018       | 384                   | KS 02.008       |
| ZD 12D/180 VE 82 | 351                   | KS 01.019       | 444                   | KS 02.000       |

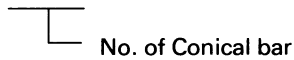
**Technical data:** Sheet 3.012

Rotary gripper head and support must be ordered separately.

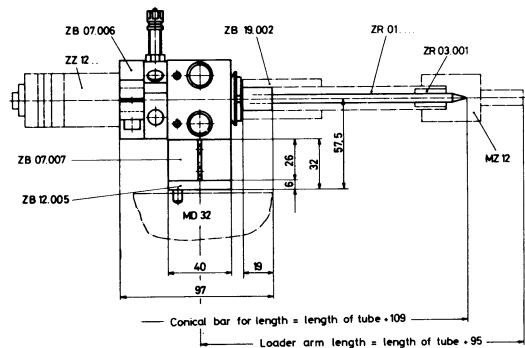
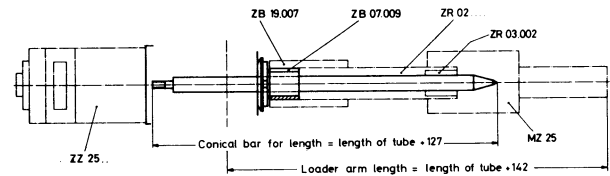
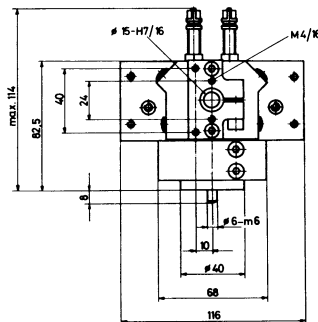
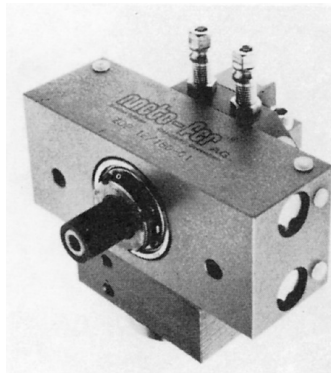
**Order No.** for Rotary gripper head (delivery as per photo) ZD 12D/180

**Order No.** for Split sleeve ZB 07.009

**Order No.** for Conical bar KS . . . . .



Rotary gripper head for use with rotary loader arms



**Technical data:** Sheet 3.012

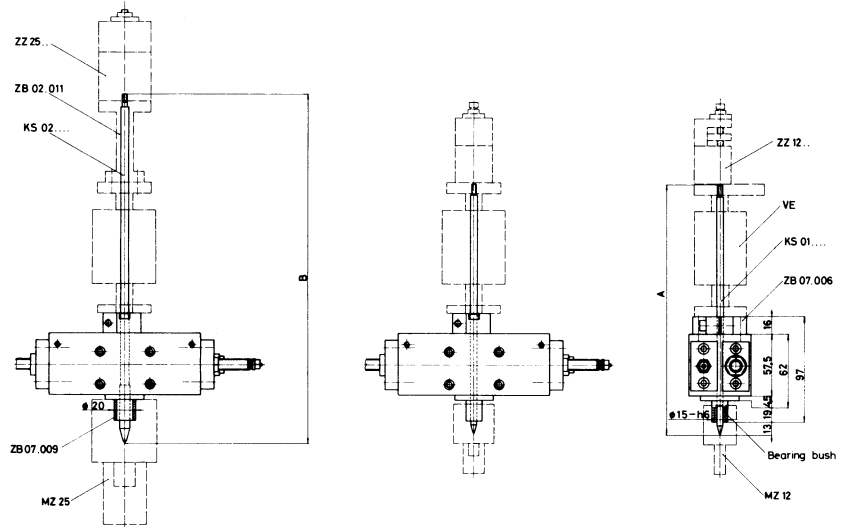
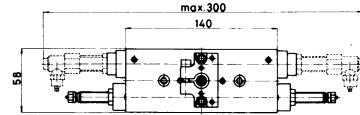
Rotary gripper head and support must be ordered separately.

**Order No.** for Rotary gripper head (delivery as per photo) ZD 12/180L

**Order No.** for Conical bar see sheet 8.022

**Order No.** for Gripper mounting tubes see sheet 8.022

# Rotary gripper head ZD 20/360



| Type      | Angle of rotation | Max. load radial | Max. load axial | Torque at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight          |
|-----------|-------------------|------------------|-----------------|----------------------------|--|-----------------|
| ZD 20/360 | 0–360°            | 337 lb (1500 N)  | 34 lb (150 N)   | 7.26 lb. in (0,82 Nm)      | .006 scf (0,17 NL)   | 4.2 lb (1,9 kg) |

| Type            | Conical bar for MZ 12 |                 | Conical bar for MZ 25 |                 |
|-----------------|-----------------------|-----------------|-----------------------|-----------------|
|                 | A                     | Conical bar No. | B                     | Conical bar No. |
| ZD 20/360       | —                     | —               | —                     | —               |
| ZD 20/360 VE 22 | 231                   | KS 01.017       | 324                   | KS 02.004       |
| ZD 20/360 VE 52 | 291                   | KS 01.018       | 384                   | KS 02.008       |
| ZD 20/360 VE 82 | 351                   | KS 01.019       | 444                   | KS 02.000       |

Rotary gripper head and support must be ordered separately.

### Order No.

ZD 20/360

ZD 20/360-1 end cover for oil cushions or elastomer cushions

### Order No. for Conical bar

KS.....

— No. of Conical bar

### Order No. for Split sleeve

ZB 07.009

### Technical data:

- Built in patented stop screws with fine threads provide for stepless adjustable angle of rotation.
- The stop screws can be fitted with patented sensing elements (see section "Stop Screws with plug-in sensing elements").
- Designed for high production rates and long life.
- Ball bearings

|                     |                                 |
|---------------------|---------------------------------|
| -Operating medium   | Compressed air or hydraulic oil |
| -Operating pressure | 43.5 - 116 psi (3 - 8 bar)      |
| -Repeatability      | +/- 294 Arc sec                 |
| -Air connection     | M5                              |

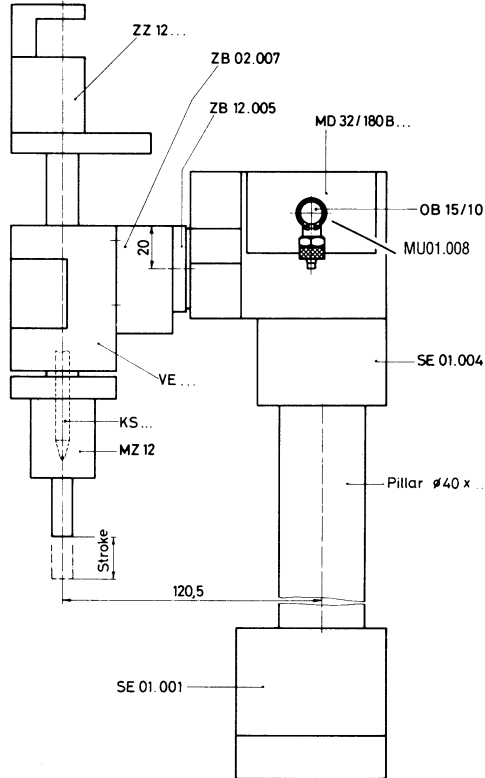
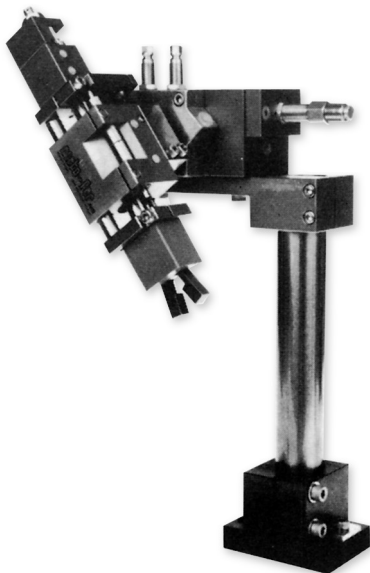


# Angle Loader WL

Individual angle loader components are available in various versions and should, therefore, be ordered separately. Components can be determined with the aid of the following list according to the description.

| Description                      | Sheet | Description                     | Sheet |
|----------------------------------|-------|---------------------------------|-------|
| KOB Compensation reservoir.....  | 5.001 | SD 01.001 Stand base .....      | 6.002 |
| * KS... Conical bar .....        |       | SD 01.005 Mounting plate .....  | 6.002 |
| LH... Linear unit .....          | 1.001 | SE 01.001 Stand base .....      | 6.001 |
| MD 32/180 B... Rotary drive..... | 3.031 | SE 01.004 Mounting plate .....  | 6.001 |
| MD 51/180 B... Rotary drive..... | 3.041 | VE... Vertical unit.....        | 1.011 |
| * MZ 12 Mechanical gripper ..... | 4.001 | ZB 02.007 Plate .....           |       |
| OB 15/10L Oil cushion .....      | 5.001 | ZB 11.021 Plate .....           |       |
| OB 12/20 Oil cushion .....       | 5.001 | ZB 12.005 Flange (MD 32) .....  |       |
| Pillar ø 40 x... Pillar .....    | 6.002 | ZZ 12... Gripper cylinder ..... | 4.001 |

\* KS, MZ 12 und ZZ 12 can be ordered as NW... (Sheet 4.001).



The oil cushions and the compensation reservoir for the rotary drive have to be ordered separately. Page 5.001

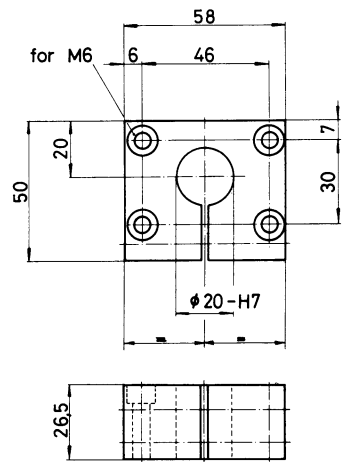
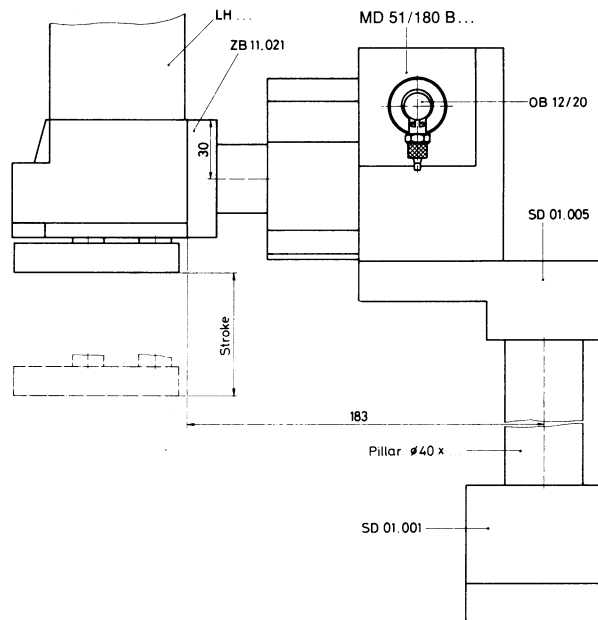
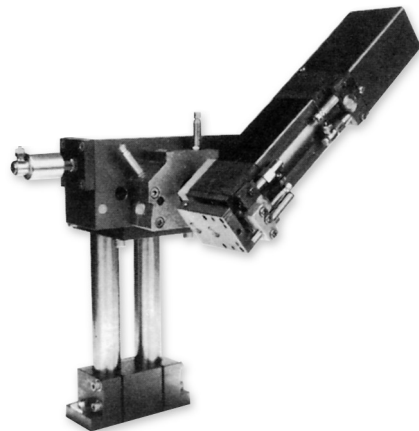


Plate  
Order No. ZB 02.007

WL 32



The oil cushions for the rotary drive must be ordered separately. The compensation reservoir is included with the linear unit.

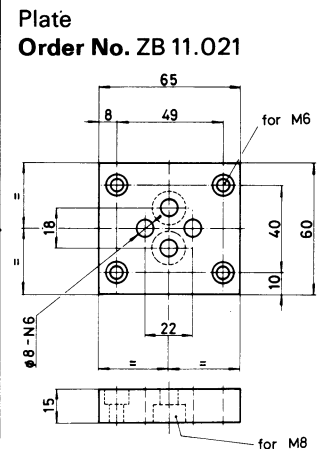


Plate  
Order No. ZB 11.021

WL 51

**GRIPPERS: ANGULAR, SEMI-PARALLEL, 180° ANGULAR, PARALLEL,  
THREE FINGER ANGULAR**

**SECTION 4**

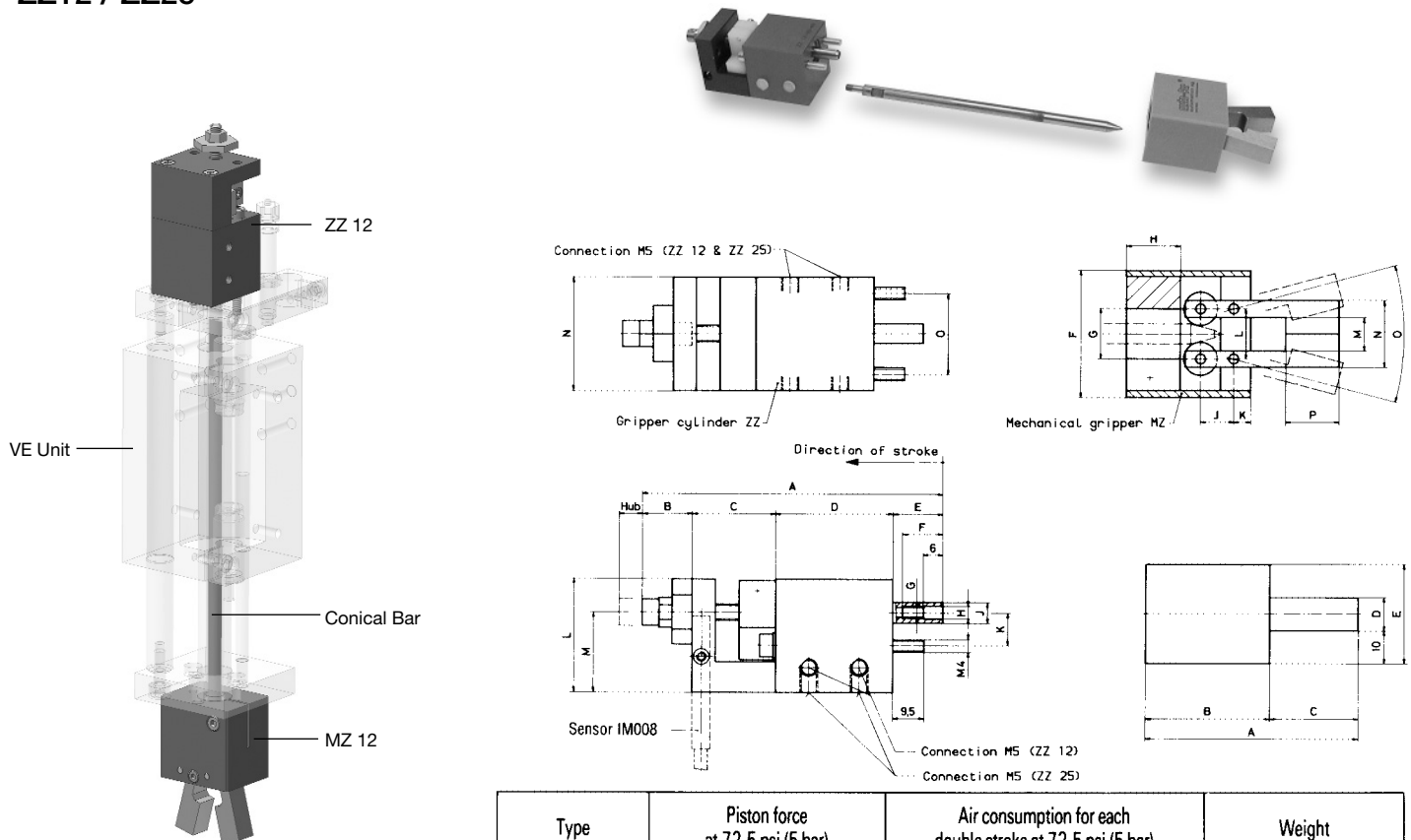
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**Mechanical Gripper (use with Hollow Shaft Units)****ZZ12 / ZZ25**

| Type  | Piston force at 72.5 psi (5 bar) | Air consumption for each double stroke at 72.5 psi (5 bar) | Weight          |
|-------|----------------------------------|--|-----------------|
| ZZ 12 | 7 lb (31 N)                      | .00025 scf (0,007 NL)                                      | .4 lb (0,2 kg)  |
| ZZ 25 | 35 lb (154 N)                    | .00177 scf (0,05 NL)                                       | 1.1 lb (0,5 kg) |

| Type  | Stroke | A  | B   | C  | D  | E    | F  | G  | ∅ H  | ∅ J   | K  | L  | M  | N  | O  |
|-------|--------|----|-----|----|----|------|----|----|--|---|----|----|----|----|----|
| ZZ 12 | 0-7    | 90 | 15  | 25 | 35 | 15   | 12 | M4 | 4 $\begin{matrix} +0,06 \\ +0,04 \end{matrix}$ | 6 $\begin{matrix} -0,010 \\ -0,025 \end{matrix}$  | —  | 34 | 24 | 34 | 24 |
| ZZ 25 | 0-10   | 94 | 9,5 | 29 | 45 | 10,5 | 14 | M5 | 6 $\begin{matrix} +0,04 \\ +0,02 \end{matrix}$ | 10 $\begin{matrix} -0,005 \\ -0,020 \end{matrix}$ | 10 | 46 | 29 | 48 | 40 |

**Order No.** ZZ12 ZZ25

Sensor IM-008-NS-U2L (1 pc. to sense when gripper is closed)

Order No. IM-008-PS-U2L

**Technical data:**

- Operating medium Compressed air oiled / not oiled
- Operating pressure 42.5 – 116 psi (3 – 8 bar)
- Air connection M5

**Mechanical gripper MZ**

| Typ   | A    | B  | C    | D  | E  | F  | ∅G      | H  | J  | K | L  | M  | N  | O   | P  | Weight            | Clamping force at 72.5 psi (5 bar) | Order No. |
|-------|------|----|------|----|----|----|---------|----|----|---|----|----|----|-----|----|-------------------|------------------------------------|-----------|
| MZ 12 | 63.5 | 37 | 26.5 | 10 | 30 | 38 | 15 - H7 | 16 | 10 | 5 | 15 | 10 | 20 | 29° | 16 | 0.27 lb (0.12 kg) | 4 lb (18 N)                        | MZ 12     |
| MZ 25 | 114  | 57 | 57   | 20 | 40 | 60 | 20 - H7 | 19 | 20 | 6 | 30 | 20 | 40 | 23° | 36 | 1.45 lb (0.66 kg) | 20 lb (90 N)                       | MZ 25     |

**Mechanical gripper for vertical units****Order No.**

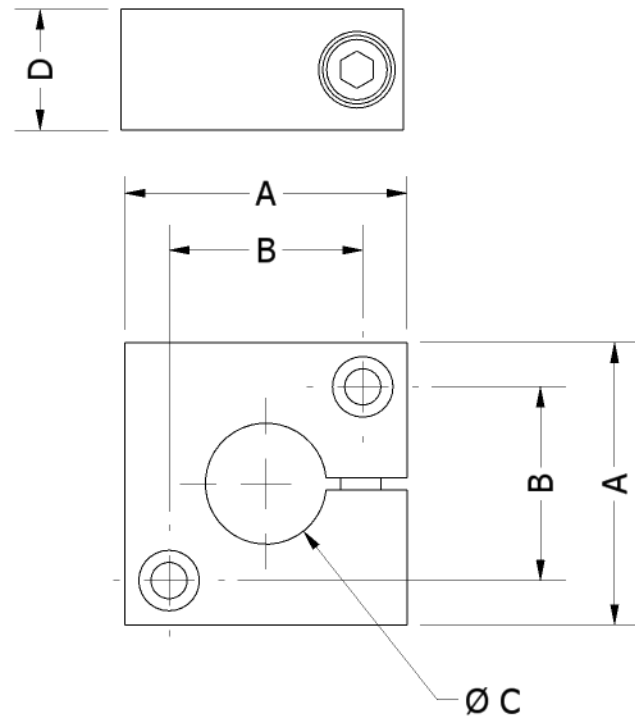
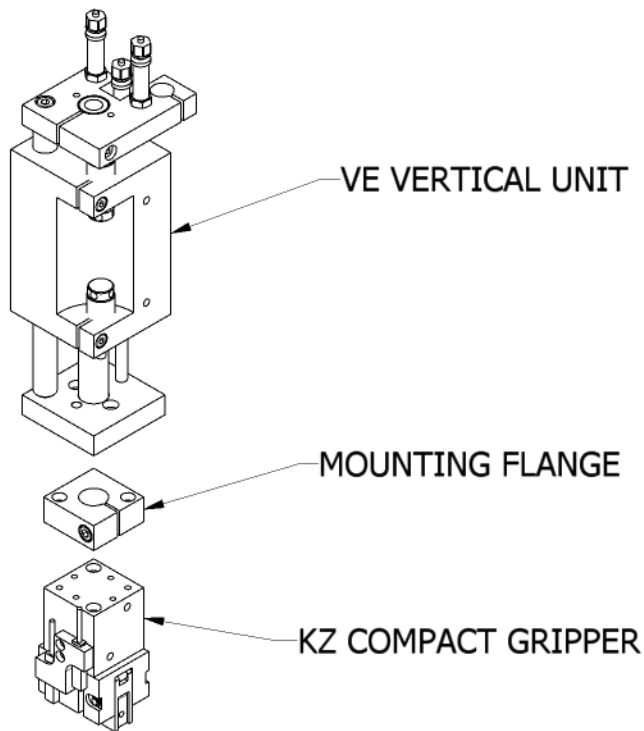
NW ... VE ...

Vertical unit VE 22, VE 52, VE 82

Gripper cylinder ZZ12 or ZZ 25

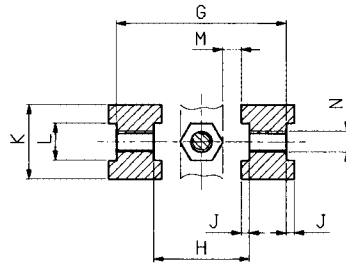
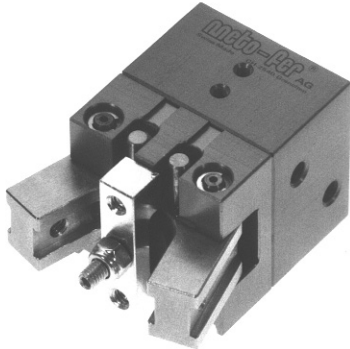
**Ordering example:**NW 12 VE 22 NW 12 consists of:  
MZ 12, ZZ 12 and Conical barNW 25 VE 22 NW 25 consists of:  
MZ 25, ZZ 25 and Conical bar,  
Adapter ZB 02.011 and  
Gripper bracket ZB 02.012

# Mounting flange for compact grippers

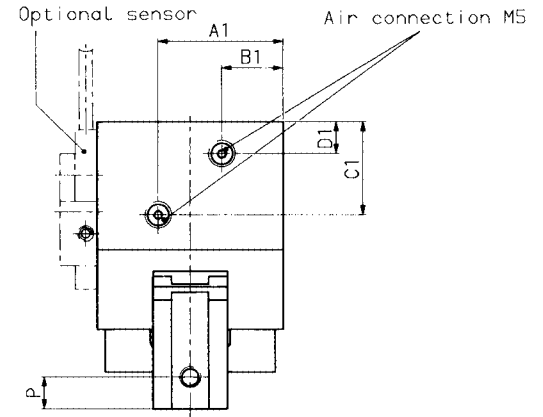
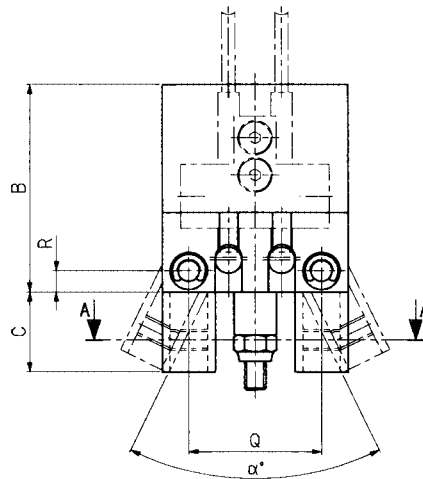
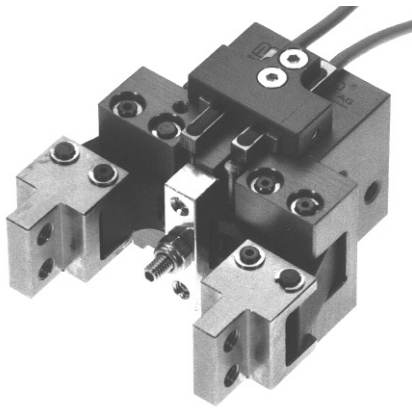
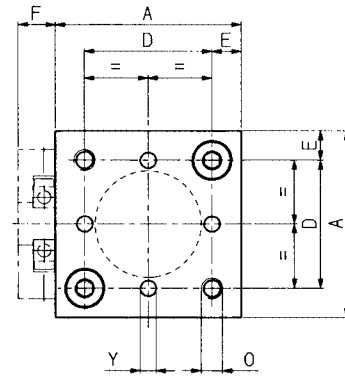


| GRIPPER | A  | B  | C     | D  | ORDER NO. |
|---------|----|----|-------|----|-----------|
| ...12   | 28 | 20 | 15-H7 | 12 | ZB.08.010 |
| ...20   | 35 | 24 | 15-H7 | 15 | ZB.08.001 |
| ...25   | 40 | 30 | 15-H7 | 15 | ZB.08.002 |
| ...32   | 60 | 40 | 15-H7 | 15 | ZB.08.003 |
| ...50   | 70 | 50 | 15-H7 | 15 | ZB.08.008 |

# Angular Gripper KZ



Section A-A



Mounting flange for KZ see sheet 4.013

| Dimensions for air connections |       |      |      |    |
|--------------------------------|-------|------|------|----|
| Type                           | A1    | B1   | C1   | D1 |
| KZ 12                          | 18.25 | 9.75 | 14.5 | 6  |
| KZ 20                          | 23.5  | 11.5 | 17.5 | 6  |
| KZ 25                          | 26    | 14   | 19.5 | 5  |
| *KZ 32                         | 30    | 30   | 34   | 8  |
| *KZ 50                         | 35    | 35   | 33   | 8  |

| Type  | Clamping force at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|-------|------------------------------------|---|------------------|
| KZ 12 | 4 lb (19 N)                        | .0002 scf (0.004 NL)                            | 0.3 lb (0.12 kg) |
| KZ 20 | 7 lb (30 N)                        | .0005 scf (0.014 NL)                            | 0.6 lb (0.25 kg) |
| KZ 25 | 11 lb (48 N)                       | .0010 scf (0.027 NL)                            | 0.8 lb (0.35 kg) |
| KZ 32 | 19 lb (85 N)                       | .0025 scf (0.072 NL)                            | 2.4 lb (1.10 kg) |
| KZ 50 | 49 lb (220 N)                      | .0079 scf (0.224 NL)                            | 3.6 lb (1.65 kg) |

\*for these types, the dimensions A1 & B1 are equal

| Type | A  | B    | C    | D  | E   | F | G  | H  | J   | K  | L     | M   | N  | O     | P  | Q  | R   | Y        | $\alpha$ |
|------|----|------|------|----|-----|---|----|----|-----|----|-------|-----|----|-------|----|----|-----|----------|----------|
| KZ12 | 28 | 31.5 | 14.5 | 20 | 4   | 7 | 25 | 16 | 1.5 | 12 | 6-H7  | 3   | M3 | M4/8  | 5  | 20 | 3.5 | ø2-EF7/5 | 52°      |
| KZ20 | 35 | 39   | 15   | 24 | 5.5 | 7 | 32 | 18 | 1.5 | 14 | 7-H7  | 3.5 | M4 | M4/12 | 6  | 25 | 4   | ø3-EF7/5 | 52°      |
| KZ25 | 40 | 44   | 20   | 30 | 5   | 7 | 37 | 23 | 1.5 | 14 | 7-H7  | 5   | M4 | M5/15 | 8  | 30 | 4   | ø4-EF7/5 | 58°      |
| KZ32 | 60 | 72   | 32   | 40 | 10  | 8 | 56 | 32 | 2   | 25 | 12-H7 | 9   | M6 | M6/15 | 10 | 45 | 7   | ø5-EF7/4 | 56°      |
| KZ50 | 70 | 72   | 40   | 50 | 10  | 8 | 66 | 38 | 2   | 30 | 15-H7 | 9.5 | M6 | M8/17 | 15 | 55 | 9   | ø5-EF7/4 | 60°      |

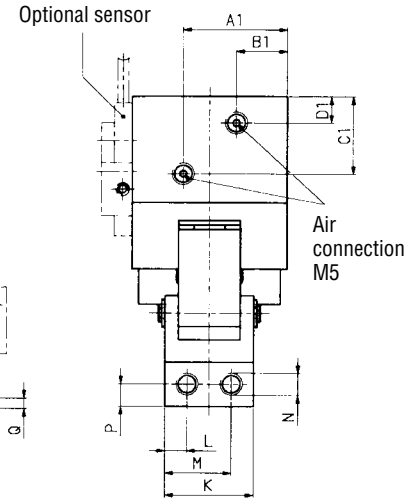
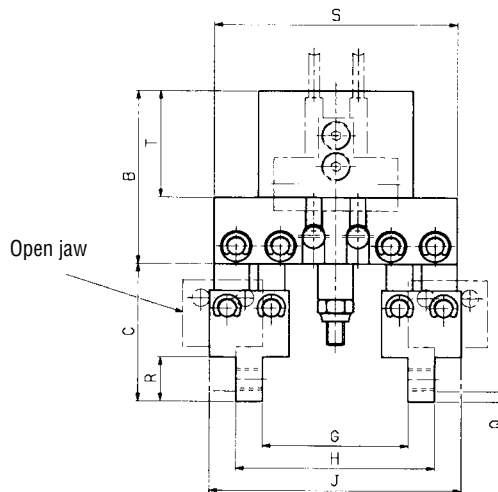
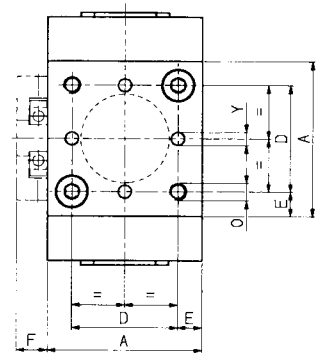
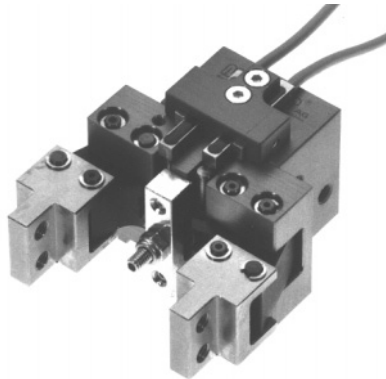
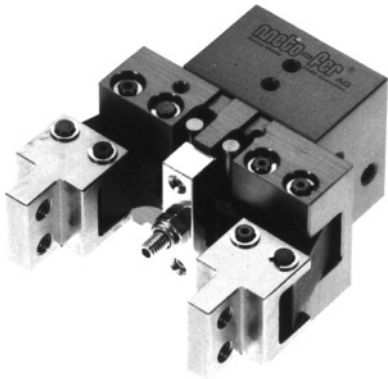
**Order No.** KZ12 KZ20 KZ25 KZ32 KZ50 without sensor bracket  
 KZ12D KZ20D KZ25D KZ32D KZ50D D = with sensor bracket  
 (IM... sensors not included)

**Order No.** KZ12D KZ25D KZ25D **Order No.** KZ32D KZ50D  
 (Sensors) IM-004-NS-U2L (NPN) (Sensors) IM-006-NS-U2L (NPN)  
 IM-004-PS-U2L (PNP) IM-006-PS-U2L (PNP)

## Technical data:

- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5
- Sensor option: Two IM...proximity sensors...gripper open/ gripper closed

# Semi-Parallel Gripper KZP



Mounting flange for KZP see sheet 4.013

| Dimensions for air connections |       |      |      |    |
|--------------------------------|-------|------|------|----|
| Type                           | A1    | B1   | C1   | D1 |
| KZP 12                         | 18.25 | 9.75 | 14.5 | 6  |
| KZP 20                         | 23.5  | 11.5 | 17.5 | 6  |
| KZP 25                         | 26    | 14   | 19.5 | 5  |
| *KZP 32                        | 30    | 30   | 34   | 8  |
| *KZP 50                        | 35    | 35   | 33   | 8  |

| Type   | Clamping force at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|--------|------------------------------------|---|------------------|
| KZP 12 | 4 lb (19 N)                        | .0002 scf (0.004 NL)                            | 0.4 lb (0.18 kg) |
| KZP 20 | 7 lb (30 N)                        | .0005 scf (0.014 NL)                            | 0.7 lb (0.30 kg) |
| KZP 25 | 11 lb (48 N)                       | .0010 scf (0.027 NL)                            | 1.0 lb (0.45 kg) |
| KZP 32 | 19 lb (85 N)                       | .0025 scf (0.072 NL)                            | 3.7 lb (1.70 kg) |
| KZP 50 | 49 lb (220 N)                      | .0079 scf (0.224 NL)                            | 5.1 lb (2.30 kg) |

\*For these types, the dimensions A1 & B1 are equal.

| Type  | A  | B    | C    | D  | E   | F | G min. | G max. | H min. | H max. | J min. | J max. | K  | L   | M    | N  | O     | P   | Q   | R  | S   | T    | Y        |
|-------|----|------|------|----|-----|---|--------|--------|--------|--------|--------|--------|----|-----|------|----|-------|-----|-----|----|-----|------|----------|
| KZP12 | 28 | 31.5 | 20.5 | 20 | 4   | 7 | 22.5   | 31     | 33.5   | 42     | 41.5   | 50     | 17 | 3.5 | 13.5 | M4 | M4/8  | 4   | 1.1 | 8  | 41  | 19.5 | ø2-EF7/5 |
| KZP20 | 35 | 39   | 31   | 24 | 5.5 | 7 | 33     | 45     | 45     | 57     | 57     | 69     | 20 | 5   | 15   | M5 | M4/12 | 5   | 2.3 | 10 | 55  | 24   | ø3-EF7/5 |
| KZP25 | 40 | 44   | 31   | 30 | 5   | 7 | 38     | 51.5   | 50     | 63.5   | 62     | 75.5   | 20 | 5   | 15   | M5 | M5/15 | 5   | 2.7 | 10 | 60  | 28   | ø4-EF7/5 |
| KZP32 | 60 | 72   | 49   | 40 | 10  | 8 | 47     | 68     | 75     | 96     | 95     | 116    | 35 | 10  | 25   | M6 | M6/15 | 7.5 | 2.7 | 15 | 95  | 44   | ø5-EF7/4 |
| KZP50 | 70 | 72   | 47   | 50 | 10  | 8 | 50     | 74     | 82     | 106    | 102    | 126    | 40 | 10  | 30   | M6 | M8/17 | 7.5 | 3   | 15 | 105 | 42   | ø5-EF7/4 |

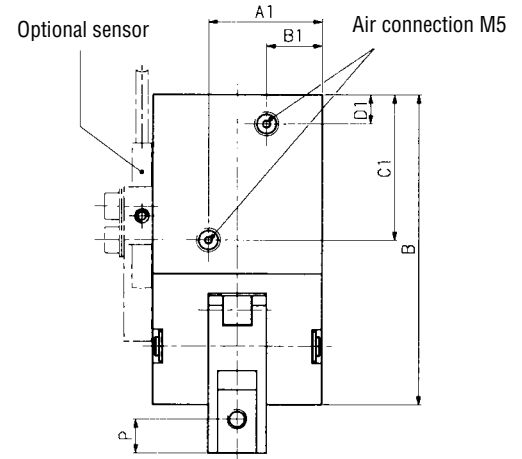
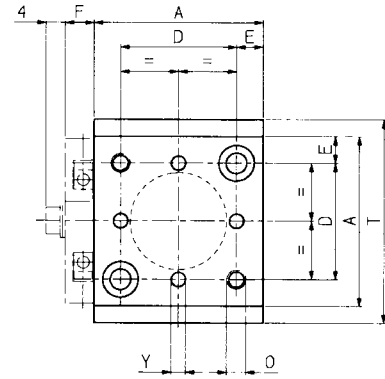
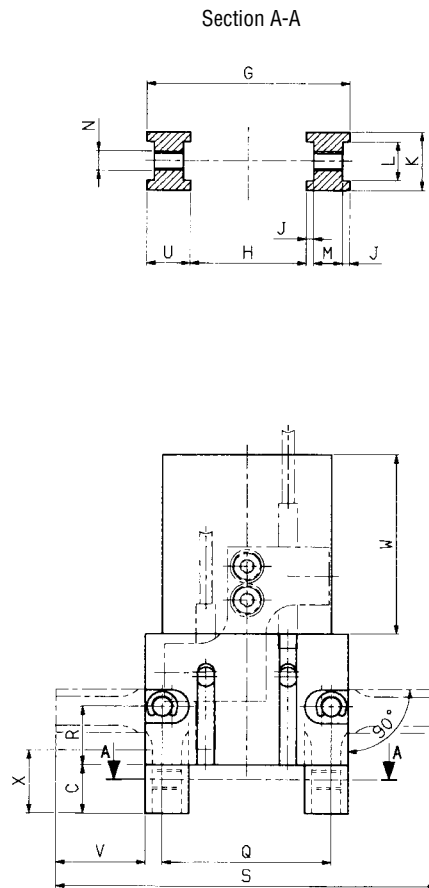
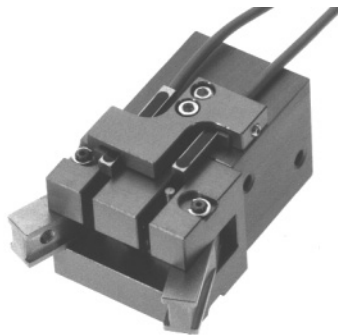
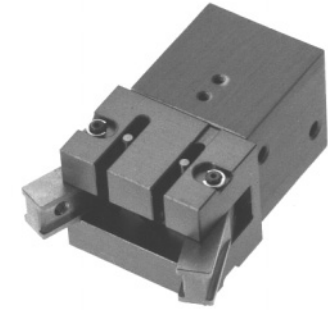
**Order No.** KZP12 KZP20 KZP25 KZP32 KZP50 without sensor bracket  
 KZP12D KZP20D KZP25D KZP32D KZP50D D = with sensor bracket  
 (IM... sensors not included)

**Order No.** KZP12D KZP20D KZP25D **Order No.** KZP32D KZP50D  
 (Sensors) IM-004-NS-U2L (NPN) (Sensors) IM-006-NS-U2L (NPN)  
 IM-004-PS-U2L (PNP) IM-006-PS-U2L (PNP)

## Technical data:

- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5
- Sensor option: Two IM...proximity sensors...gripper open/ gripper closed

# 180° Angular Gripper KZ 180



Mounting flange for KZ 180 see sheet 4.013

| Dimensions for air connections |       |      |      |     |
|--------------------------------|-------|------|------|-----|
| Type                           | A1    | B1   | C1   | D1  |
| KZ 180/12                      | 18.25 | 9.75 | 24.5 | 6   |
| KZ 180/20                      | 23.5  | 11.5 | 30   | 6   |
| KZ 180/25                      | 26    | 14   | 35   | 5   |
| *KZ 180/32                     | 30    | 30   | 50.5 | 7.2 |
| *KZ 180/50                     | 35    | 35   | 58.5 | 8.5 |

| Type      | Clamping force at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|-----------|------------------------------------|---|------------------|
| KZ 180/12 | 4 lb (16 N)                        | .0006 scf (0.016 NL)                            | 0.3 lb (0.15 kg) |
| KZ 180/20 | 11 lb (49 N)                       | .0022 scf (0.063 NL)                            | 0.7 lb (0.30 kg) |
| KZ 180/25 | 20 lb (87 N)                       | .0038 scf (0.108 NL)                            | 1.0 lb (0.45 kg) |
| KZ 180/32 | 30 lb (135 N)                      | .0095 scf (0.269 NL)                            | 2.6 lb (1.25 kg) |
| KZ 180/50 | 65 lb (291 N)                      | .0276 scf (0.782 NL)                            | 4.5 lb (2.05 kg) |

\*for these types, the dimensions A1 & B1 are equal

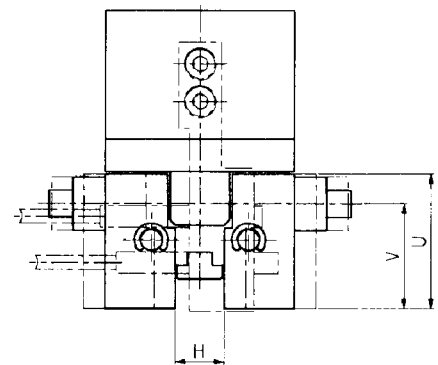
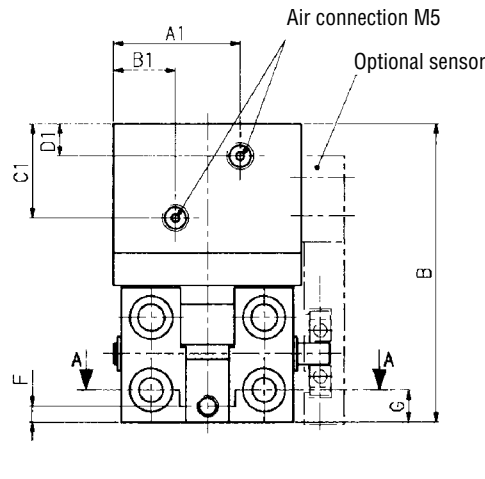
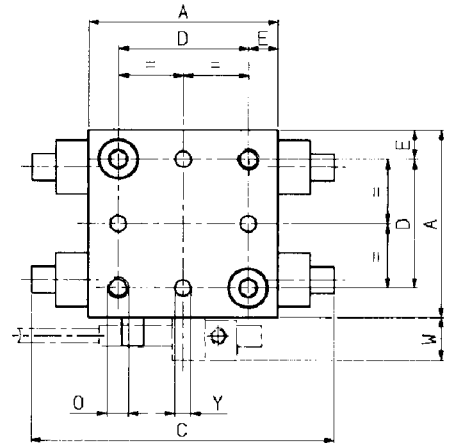
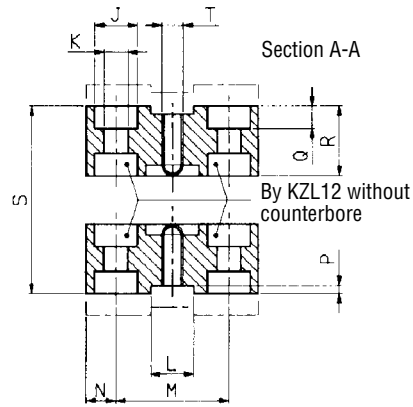
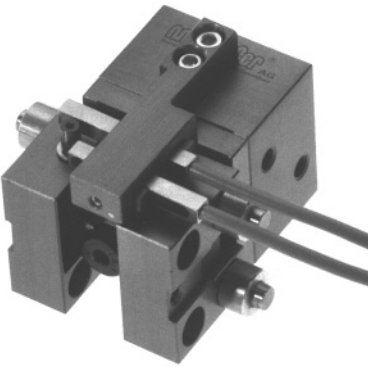
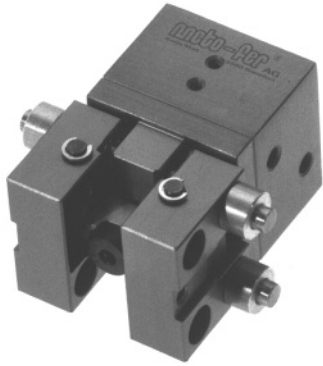
| Type     | A  | B     | C  | D  | E   | F | G  | H  | J   | K  | L     | M  | N  | O     | P  | Q  | R    | S   | T  | U  | V    | W    | X    | Y        |
|----------|----|-------|----|----|-----|---|----|----|-----|----|-------|----|----|-------|----|----|------|-----|----|----|------|------|------|----------|
| KZ180/12 | 28 | 52    | 10 | 20 | 4   | 6 | 30 | 18 | 1   | 12 | 8-H7  | 4  | M4 | M4/8  | 5  | 25 | 9    | 63  | 30 | 6  | 16   | 29.5 | 10.5 | ø2-EF7/5 |
| KZ180/20 | 35 | 64    | 10 | 24 | 5.5 | 6 | 42 | 24 | 1.5 | 12 | 8-H7  | 6  | M4 | M4/12 | 7  | 35 | 12   | 79  | 42 | 9  | 18.5 | 37   | 13   | ø3-EF7/5 |
| KZ180/25 | 40 | 76.5  | 13 | 30 | 5   | 6 | 47 | 29 | 1.5 | 14 | 10-H7 | 6  | M5 | M5/15 | 8  | 40 | 13.5 | 93  | 50 | 9  | 21.5 | 43.5 | 15   | ø4-EF7/5 |
| KZ180/32 | 60 | 108.5 | 20 | 40 | 10  | 8 | 65 | 39 | 2   | 25 | 12-H7 | 9  | M6 | M6/15 | 10 | 55 | 20   | 135 | 68 | 13 | 33.5 | 59.5 | 24   | ø5-EF7/4 |
| KZ180/50 | 70 | 125.5 | 33 | 50 | 10  | 8 | 77 | 47 | 2.5 | 30 | 15-H7 | 10 | M6 | M8/17 | 15 | 65 | 23.5 | 178 | 80 | 15 | 49   | 67.5 | 35   | ø5-EF7/4 |

|                  |                     |           |           |                  |                     |                              |
|------------------|---------------------|-----------|-----------|------------------|---------------------|------------------------------|
| <b>Order No.</b> | KZ180/12            | KZ180/20  | KZ180/25  | KZ180/32         | KZ180/50            | without sensor bracket       |
|                  | KZ180/12D           | KZ180/20D | KZ180/25D | KZ180/32D        | KZ180/50D           | D = with sensor bracket      |
| <b>Order No.</b> | KZ180/12D           | KZ180/20D | KZ180/25D |                  |                     | (IM... sensors not included) |
| (Sensors)        | IM-004-NS-U2L (NPN) |           |           | <b>Order No.</b> | KZ180/32D           | KZ180/50D                    |
|                  | IM-004-PS-U2L (PNP) |           |           | (Sensors)        | IM-006-NS-U2L (NPN) | IM-006-PS-U2L (PNP)          |

**Technical data:**

- Operating medium: Compressed air oiled/ not oiled
- Operating pressure: 43.5 - 116 psi (3 - 8 bar)
- Air connection: M5
- Sensor option: Two IM...proximity sensors...gripper open/ gripper closed

# Parallel Gripper KZL



Mounting flange for KZL see sheet 4.013

| Dimensions for air connections |       |      |      |    |
|--------------------------------|-------|------|------|----|
| Type                           | A1    | B1   | C1   | D1 |
| KZL 12                         | 18.25 | 9.75 | 14.5 | 6  |
| KZL 20                         | 23.5  | 11.5 | 17.5 | 6  |
| KZL 25                         | 26    | 14   | 19.5 | 5  |
| *KZL 32                        | 30    | 30   | 34   | 8  |
| *KZL 50                        | 35    | 35   | 33   | 8  |

\*for these types, the dimensions A1 & B1 are equal

| Type   | Clamping force at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|--------|------------------------------------|---|------------------|
| KZL 12 | 7 lb (31 N)                        | .0002 scf (0.004 NL)                            | 0.3 lb (0.15 kg) |
| KZL 20 | 20 lb (88 N)                       | .0005 scf (0.014 NL)                            | 0.4 lb (0.20 kg) |
| KZL 25 | 31 lb (137 N)                      | .0010 scf (0.027 NL)                            | 0.8 lb (0.35 kg) |
| KZL 32 | 51 lb (225 N)                      | .0025 scf (0.072 NL)                            | 2.1 lb (0.95 kg) |
| KZL 50 | 124 lb (550 N)                     | .0079 scf (0.224 NL)                            | 3.3 lb (1.50 kg) |

| Type  | A  | B    | C   | D  | E   | F   | G   | H min. | H max. | J  | K   | L     | M  | N   | O     | P   | Q   | R    | S min. | S max. | T  | U  | V    | W   | Y        |
|-------|----|------|-----|----|-----|-----|-----|--------|--------|----|-----|-------|----|-----|-------|-----|-----|------|--------|--------|----|----|------|-----|----------|
| KZL12 | 28 | 49.5 | 48  | 20 | 4   | 7.5 | 7.5 | 8      | 15     | 6  | 3.5 | 6-H7  | 17 | 5.5 | M4/8  | 1.2 | 3.2 | 10   | 28     | 35     | M3 | 25 | 20   | 8   | ø2-EF7/5 |
| KZL20 | 35 | 55.5 | 56  | 24 | 5.5 | 3   | 6   | 9.5    | 17.5   | 8  | 4.5 | 8-H7  | 21 | 5.5 | M4/12 | 1.5 | 4.2 | 13   | 35.5   | 43.5   | M4 | 25 | 19.5 | 8   | ø3-EF7/5 |
| KZL25 | 40 | 65.5 | 60  | 30 | 5   | 4   | 7   | 10     | 20     | 8  | 4.5 | 10-H7 | 26 | 5.2 | M5/15 | 1.5 | 4.2 | 15   | 40     | 50     | M5 | 30 | 22.5 | 8   | ø4-EF7/5 |
| KZL32 | 60 | 87.5 | 90  | 40 | 10  | 8   | 8   | 15     | 31     | 10 | 5.5 | 12-H7 | 28 | 14  | M6/15 | 2.5 | 5.2 | 22.5 | 60     | 76     | M6 | 35 | 26.5 | 9.5 | ø5-EF7/4 |
| KZL50 | 70 | 102  | 107 | 50 | 10  | 16  | 16  | 20     | 40     | 11 | 6.6 | 15-H7 | 40 | 13  | M8/17 | 2.5 | 6.2 | 25   | 70     | 90     | M6 | 50 | 39   | 9.5 | ø5-EF7/4 |

**Order No.** KZL12 KZL20 KZL25 KZL32 KZL50 without sensor bracket  
 KZL12D KZL20D KZL25D KZL32D KZL50D D = with sensor bracket  
 (IM... sensors not included)

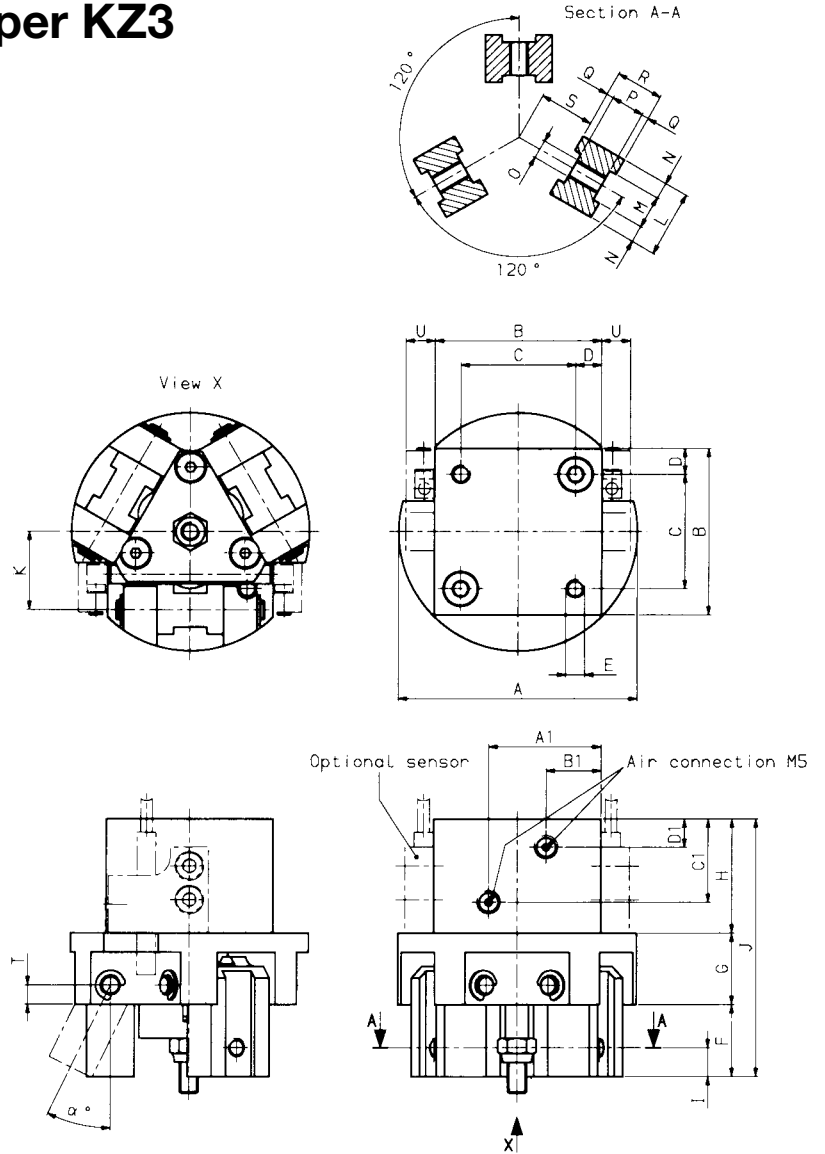
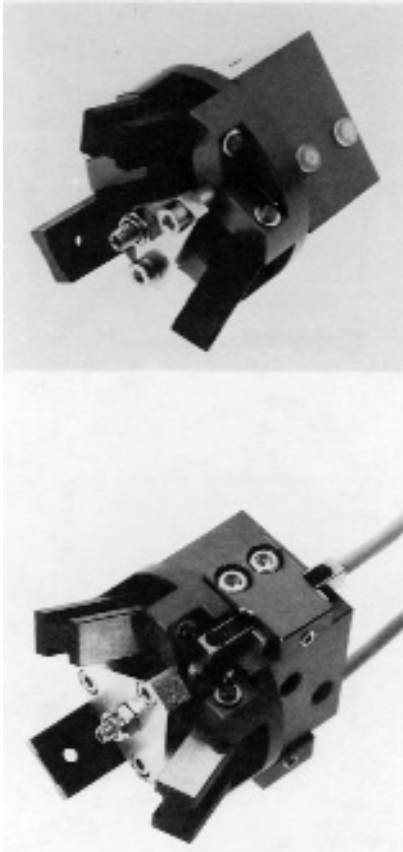
**Order No.** KZL12D KZL20D KZL25D **Order No.** KZL32D, KZL50D  
 (Sensors) IM-004-NS-U2L (NPN) (Sensors) IM-006-NS-U2L (NPN)  
 IM-004-PS-U2L (PNP) IM-006-PS-U2L (PNP)

## Technical data:

- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5
- Sensor option: Two IM...proximity sensors... gripper open / gripper closed



# Three Finger Angular Gripper KZ3



Mounting flange for KZ3 see sheet 4.013

| Dimensions for air connections |       |      |      |    |
|--------------------------------|-------|------|------|----|
| Type                           | A1    | B1   | C1   | D1 |
| KZ 3/12                        | 18.25 | 9.75 | 14.5 | 6  |
| KZ 3/20                        | 23.5  | 11.5 | 17.5 | 6  |
| KZ 3/25                        | 26    | 14   | 19.5 | 5  |
| *KZ 3/32                       | 30    | 30   | 34   | 8  |
| *KZ 3/50                       | 35    | 35   | 33   | 8  |

\*for these types, the dimensions A1 & B1 are equal

| Type    | Clamping force at 72.5 psi (5 bar) | Air consumption for each double stroke at 5 bar | Weight           |
|---------|------------------------------------|---|------------------|
| KZ 3/12 | 4 lb (19 N)                        | .0002 scf (0.004 NL)                            | 0.3 lb (0.15 kg) |
| KZ 3/20 | 7 lb (30 N)                        | .0005 scf (0.014 NL)                            | 0.6 lb (0.25 kg) |
| KZ 3/25 | 11 lb (48 N)                       | .0010 scf (0.027 NL)                            | 0.9 lb (0.40 kg) |
| KZ 3/32 | 19 lb (85 N)                       | .0025 scf (0.072 NL)                            | 3.1 lb (1.40 kg) |
| KZ 3/50 | 49 lb (220 N)                      | .0079 scf (0.224 NL)                            | 4.4 lb (2.00 kg) |

| Type    | A   | B  | C  | D   | E     | F    | G  | H    | I  | J   | K    | L  | M     | N   | O  | P   | Q   | R   | S    | T   | U | $\alpha$ |
|---------|-----|----|----|-----|-------|------|----|------|----|-----|------|----|-------|-----|----|-----|-----|-----|------|-----|---|----------|
| KZ 3/12 | 40  | 28 | 20 | 4   | M4/8  | 14.5 | 12 | 19.5 | 5  | 46  | 13.5 | 12 | 6-H7  | 3   | M3 | 4.5 | 1.5 | 7.5 | 10   | 3.5 | 6 | 26°      |
| KZ 3/20 | 50  | 35 | 24 | 5.5 | M4/12 | 15   | 15 | 24   | 6  | 54  | 16.5 | 14 | 7-H7  | 3.5 | M4 | 7   | 1.5 | 10  | 11.5 | 4   | 6 | 26°      |
| KZ 3/25 | 55  | 40 | 30 | 5   | M5/15 | 20   | 16 | 28   | 8  | 64  | 19.5 | 14 | 7-H7  | 3.5 | M4 | 7   | 1.5 | 10  | 14.5 | 4   | 6 | 29°      |
| KZ 3/32 | 90  | 60 | 40 | 10  | M6/15 | 32   | 28 | 44   | 10 | 104 | 30   | 25 | 12-H7 | 6.5 | M6 | 12  | 2   | 16  | 21.5 | 7   | 8 | 28°      |
| KZ 3/50 | 100 | 70 | 50 | 10  | M8/17 | 40   | 30 | 42   | 15 | 112 | 36   | 30 | 15-H7 | 7.5 | M6 | 14  | 2   | 18  | 25.5 | 9   | 8 | 30°      |

**Order No.** KZ3/12 KZ3/20 KZ3/25 KZ3/32 KZ3/50 without sensor bracket  
 KZ3/12D KZ3/20D KZ3/25D KZ3/32D KZ3/50D D = with sensor bracket  
 (IM... sensors not included)

**Order No.** KZ3/12D KZ3/20D KZ3/25D **Order No.** KZ3/32D KZ3/50D  
 (Sensors) IM-004-NS-U2L (NPN) (Sensors) IM-006-NS-U2L (NPN)  
 IM-004-PS-U2L (PNP) IM-006-PS-U2L (PNP)

**Technical data:**

- Operating medium Compressed air oiled/ not oiled
- Operating pressure 43.5 - 116 psi (3 - 8 bar)
- Air connection M5
- Sensor option: Two IM...proximity sensors... gripper open / gripper closed

**ACCESSORIES**

**SECTION 5**



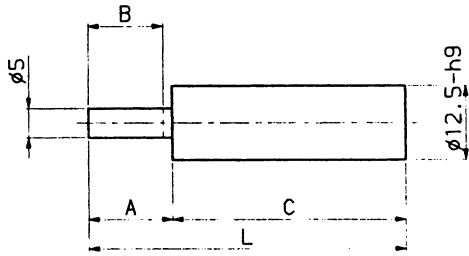
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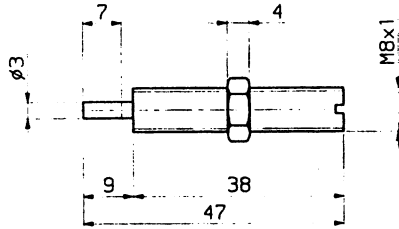
[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337

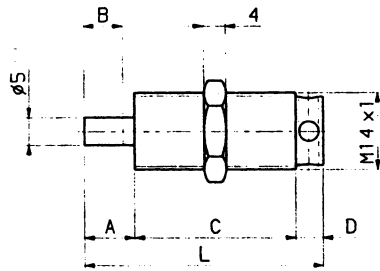
# Elastomer cushion KB



| Type      | A  | B    | C  | L  | Force KE<br>Lb. in (Nm) | Weight<br>ounces (g) | Order No. |
|-----------|----|------|----|----|-------------------------|----------------------|-----------|
| KB07/12.5 | 7  | 6.5  | 39 | 46 | 17.7 (2.0)              | 0.78 (22)            | KB07/12.5 |
| KB08/12.5 | 7  | 6.5  | 34 | 41 | 17.7 (2.0)              | 0.71 (20)            | KB08/12.5 |
| KB14/12.5 | 14 | 12.5 | 39 | 53 | 39.8 (4.5)              | 0.82 (23)            | KB14/12.5 |



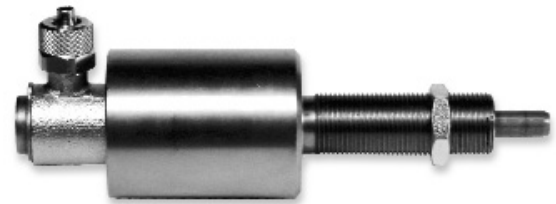
| Type | Force KE<br>Lb. in (Nm) | Weight<br>ounces (g) | Order No. |
|------|-------------------------|----------------------|-----------|
| KB06 | 17.7 (2.0)              | 0.32 (g)             | KB06      |



| Type | A  | B    | C  | D | L  | Force KE<br>Lb. in (Nm) | Weight<br>ounces (g) | Order No. |
|------|----|------|----|---|----|-------------------------|----------------------|-----------|
| KB07 | 9  | 7    | 29 | 5 | 43 | 39.8 (4.5)              | 0.96 (27)            | KB07      |
| KB08 | 14 | 12.5 | 43 | 7 | 64 | 39.8 (4.5)              | 1.42 (40)            | KB08      |



KOB 50

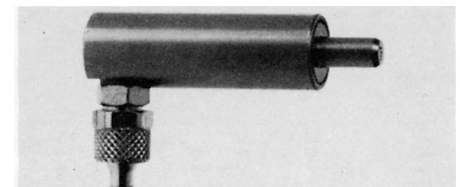


OB 12/20

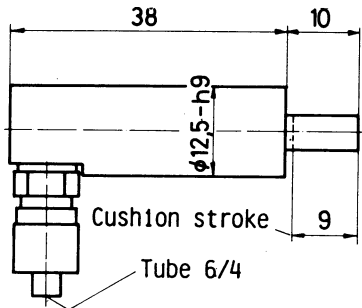


OB 15/10K and OB 15/10L

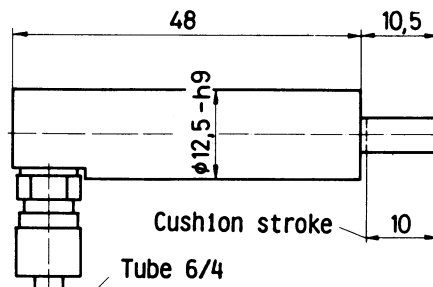
The oil cushions are intended to absorb the kinetic energy of a moving mass and arrest the momentum in a progressive manner. They provide stable motion of slide ways and rotary units by bringing them to a gentle stop without undue wear on the stops. The oil cushion should be adjusted such that it is not used as the final stop, only the stop screws are designed for this purpose.



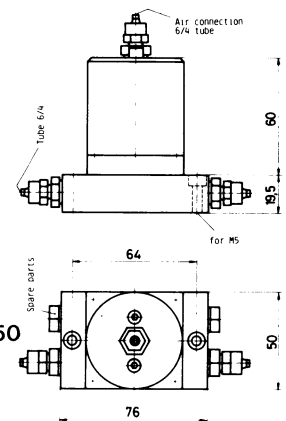
OB 9/10 and OB 10/10



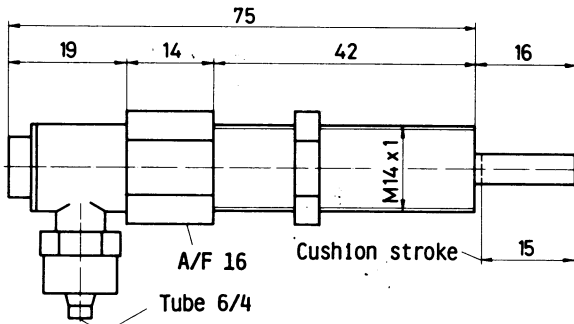
Order No. OB 9/10



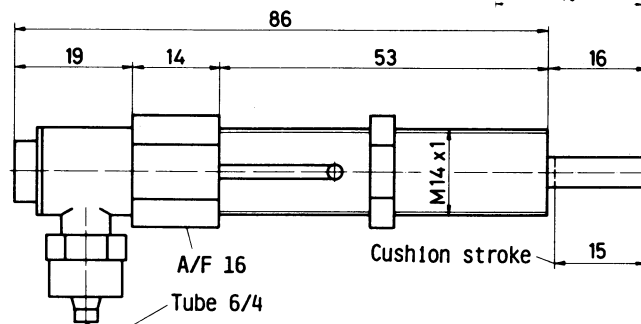
Order No. OB 10/10



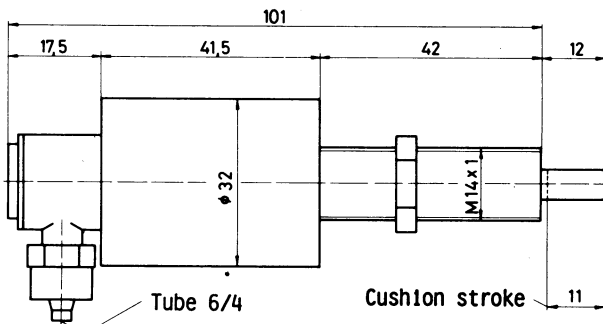
Order No. KOB 50



Order No. OB 15/10 K

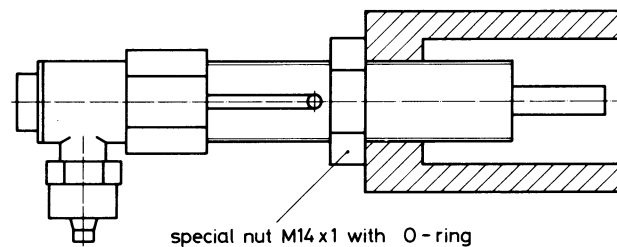


Order No. OB 15/10 L

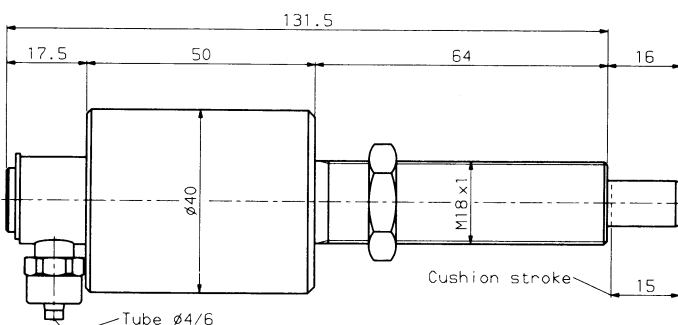


Order No. OB 12/20

Installation of the oil cushion in the cylinder



Order No. MU 01.008



Order No. OB 15/20

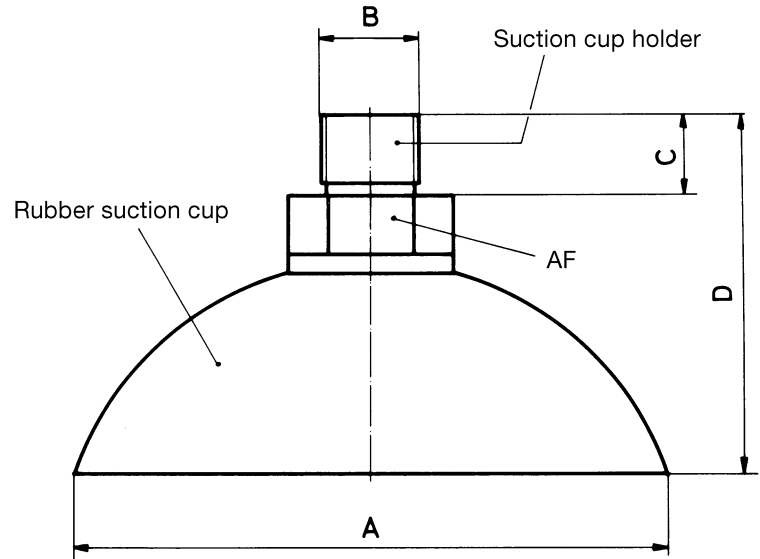
**Note:** The cushion must not be used as a final stop.

**Function of the cushion**

The cushion is like a hydraulic cylinder with a built in one way restrictor. It is charged with oil from the compensating reservoir. When a mass approaches and depresses the piston rod the oil is displaced through an orifice plate which reduces progressively with the movement. The displaced oil returns to the reservoir at high speed. The reservoir must not be filled more than half full. Use light hydraulic oil. Ensure all trapped air is expelled from the cushion by cycling. An air supply of 43.5–87.0 psi (3–6 bar) must be connected to the top of the reservoir to keep the cushions charged. Provision is made for up to 4 cushions to be connected, more may be connected provided the kinetic energy generated does not cause over heating. The only adjustment is by varying the point of initial contact. The mounting clamp must be robust and able to absorb three times the power of the cushion. (Momentum =  $K_e / \text{stop distance}$ ). Collision speed should be 0,4–3,8 m/s.

| Type       | Momentum KE/s in lb (N) | Force KE in lb. in (Nm)  | Max. No. double strokes per min | Max. output in Watt |
|------------|-------------------------|--------------------------|---------------------------------|---------------------|
| OB 9/10    | 31 – 540 (140–2400)     | 13.28 – 194.70 (1,5–22)  | 240                             | 90                  |
| OB 10/10   | 31 – 540 (140–2400)     | 13.28 – 194.70 (1,5–22)  | 240                             | 90                  |
| OB 15/10 K | 31 – 618 (140–2750)     | 13.28 – 265.50 (1,5–30)  | 240                             | 120                 |
| OB 15/10 L | 31 – 618 (140–2750)     | 13.28 – 265.50 (1,5–30)  | 240                             | 120                 |
| OB 12/20   | 90 – 1349 (400–6000)    | 39.83 – 619.50 (4,5–70)  | 180                             | 210                 |
| OB 15/20   | 90 – 2023 (400–9000)    | 39.83 – 929.25 (4,5–105) | 90                              | 315                 |

## Suction cups



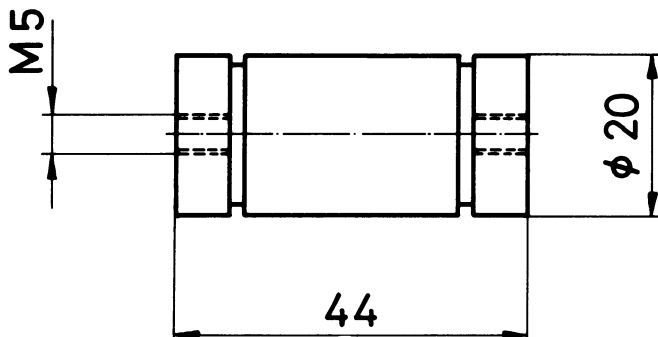
| Type     | A (mm) | B (mm) | C (mm) | D (mm) | AF (mm) | Suction force     | Cup only Order No. | Suction cup holder Order No. | Complete Order No. |
|----------|--------|--------|--------|--------|---------|-------------------|--------------------|------------------------------|--------------------|
| VA 10.06 | 6      | M5     | 6      | 18     | 8       | .2 lb (0,7 N)     | VA-SN-06           | VA 03.001                    | VA-SK-06           |
| VA 10.08 | 8      | M5     | 6      | 19     | 8       | .3 lb (1,2 N)     | VA-SN-08           | VA 03.002                    | VA-SK-08           |
| VA 10.12 | 12     | M5     | 6      | 23     | 10      | .6 lb (2,8 N)     | VA-SN-12           | VA 03.003                    | VA-SK-12           |
| VA 10.15 | 15     | M5     | 6      | 24     | 10      | 1.0 lb (4,4 N)    | VA-SN-15           | VA 03.003                    | VA-SK-15           |
| VA 10.18 | 18     | M5     | 6      | 24     | 10      | 1.4 lb (6,3 N)    | VA-SN-18           | VA 03.003                    | VA-SK-18           |
| VA 10.22 | 22     | M5     | 6      | 25     | 10      | 2.1 lb (9,5 N)    | VA-SN-22           | VA 03.003                    | VA-SK-22           |
| VA 10.25 | 25     | M5     | 6      | 28     | 10      | 2.8 lb (12,3 N)   | VA-SN-25           | VA 03.004                    | VA-SK-25           |
| VA 10.30 | 30     | M5     | 6      | 28     | 10      | 4.0 lb (17,6 N)   | VA-SN-30           | VA 03.004                    | VA-SK-30           |
| VA 10.45 | 45     | R½''   | 8      | 34     | 15      | 8.9 lb (39,8 N)   | VA-SN-45           | VA 03.007                    | VA-SK-45           |
| VA 10.60 | 60     | R½''   | 8      | 36     | 15      | 15.9 lb (70,6 N)  | VA-SN-60           | VA 03.007                    | VA-SK-60           |
| VA 10.85 | 85     | R½''   | 8      | 58     | 22      | 31.9 lb (141,8 N) | VA-SN-85           | VA 03.010                    | VA-SK-85           |

Suction refers to components with a flat ground surface at max. vacuum of  $-10.2$  psi ( $-0,7$  bar).

### Technical data:

- Temperature range -4° to 158° F (-20° to 70° C)
- Oil-resistant yes
- Acid-resistant no
- Hardness 60 Shore
- Good mechanical properties

### Air filter (vacuum)



In locations where dirt particles can be picked up by vacuum generators it is recommended that a filter is used.

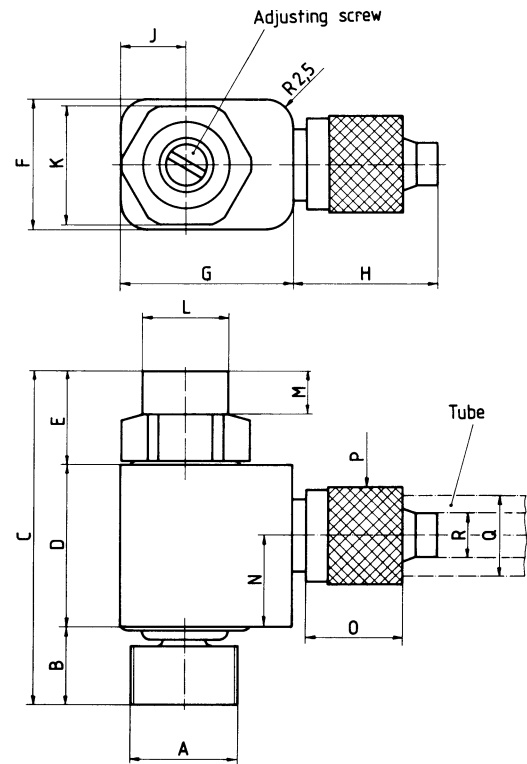
Replacement filter **Order No.** VA 06 E

## Flow control valve DV

Adjustable, with swivel connector

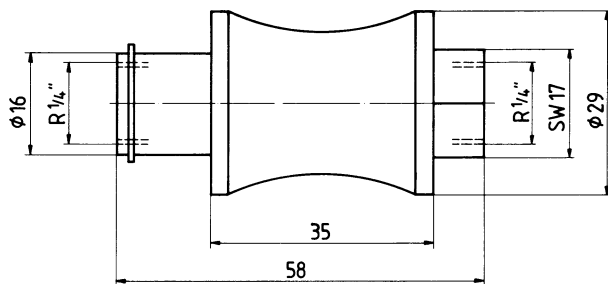


These valves are used to regulate exhaust airflow. For example: to control the piston on double-acting cylinders. An adjustment screw allows variable flow in one direction (arrow) and permits air to flow freely in the opposite direction. These space saving valves mount directly into the cylinder port. The body can be rotated 360° for optimum alignment.



| Type     | Orifice | A     | B   | C    | D  | E    | F  | G  | H    | J | K  | L  | M   | N    | O  | P  | Q | R | Weight              | Order No. |
|----------|---------|-------|-----|------|----|------|----|----|------|---|----|----|-----|------|----|----|---|---|---------------------|-----------|
| DV-M5    | 2.5     | M5    | 5.5 | 29.5 | 15 | 9    | 14 | 17 | 13.5 | 7 | 11 | 8  | 4   | 8.5  | 9  | 9  | 6 | 4 | .45 ounces (13 g)   | DV-M5     |
| DV-R1/8" | 2.5     | R1/8" | 7   | 31   | 15 | 9    | 14 | 17 | 13.5 | 7 | 11 | 8  | 4   | 8.5  | 9  | 9  | 6 | 4 | .55 ounces (15.5 g) | DV-R1/8"  |
| DV-R1/4" | 4       | R1/4" | 9   | 44.5 | 20 | 15.5 | 18 | 18 | 16   | 9 | 15 | 11 | 8.5 | 12.5 | 10 | 14 | 8 | 6 | 1.45 ounces (41 g)  | DV-R1/4"  |

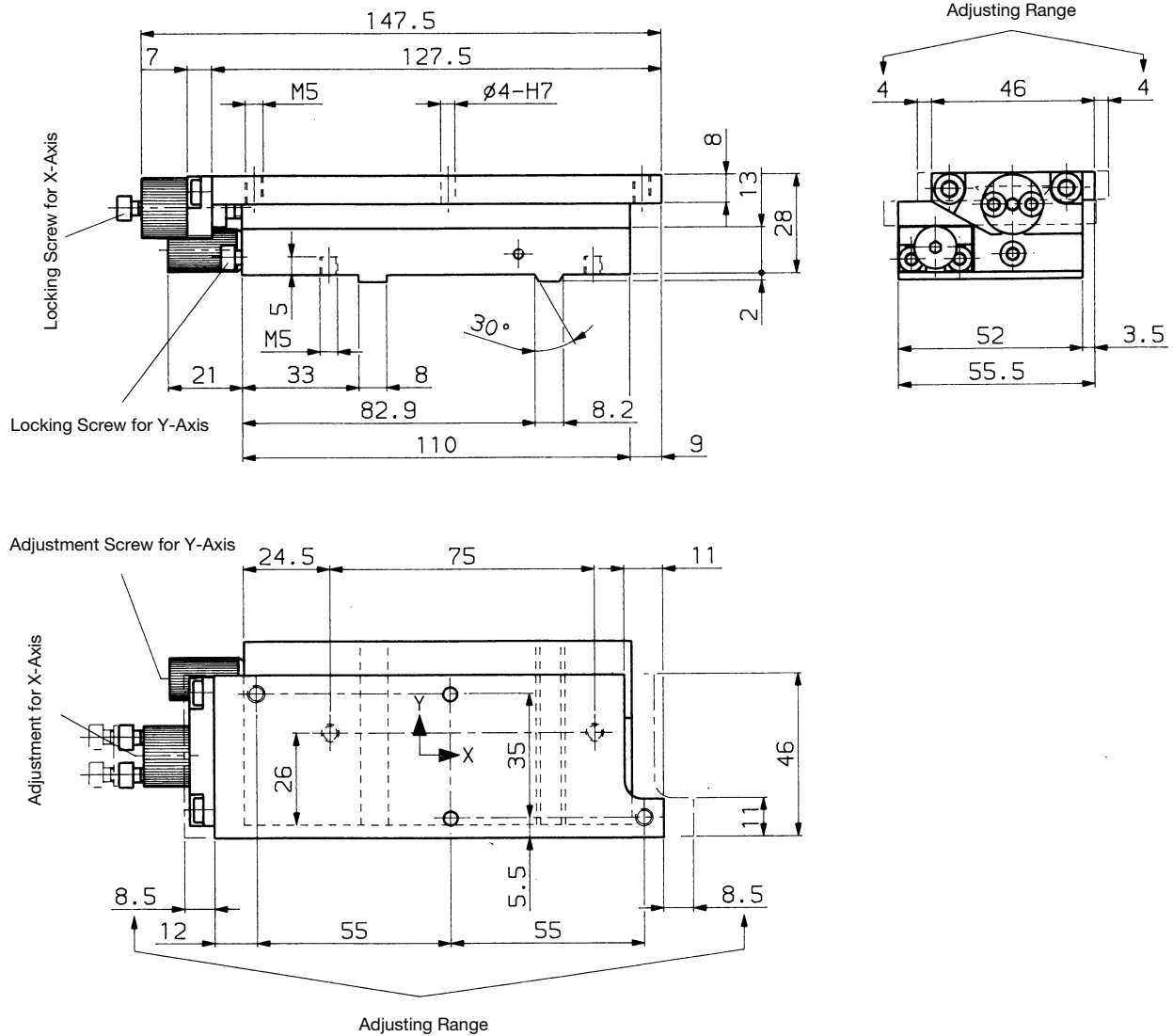
## Hand slide valve HV



Order No. HV-R1/4"

# X-Y Axis Alignment Slides (X-Y stage)

The X-Y Axis Alignment Slide has the advantage of one side operation for both axes. This is especially beneficial for use in small spaces. These X-Y slides are being used extensively in inkjet printers and other standard printer applications. Very fine adjustments are possible from one side by means of an adjusting screw, allowing adjustment in both directions as well as locking of the spindle.

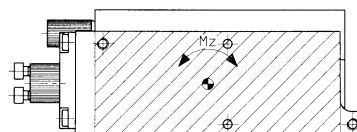
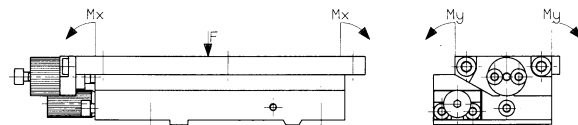


**Order No:** KK-8.5-4.0

**Adjusting Range:** X-Axis  $\pm 8.5$ mm 1mm per one revolution  
Y-Axis  $\pm 4.0$ mm 1mm per one revolution

**Max Load:** F=200N  
M<sub>x</sub>=1.5Nm  
M<sub>y</sub>=0.5Nm  
M<sub>z</sub>=1.0Nm

**Angularity:** Z-Axis  $\pm 3^\circ$



**STANDS & MODULAR MOUNTING BRACKETS & ADAPTER PLATES**

**SECTION 6**



**Your complete source for industrial automation and electronics**

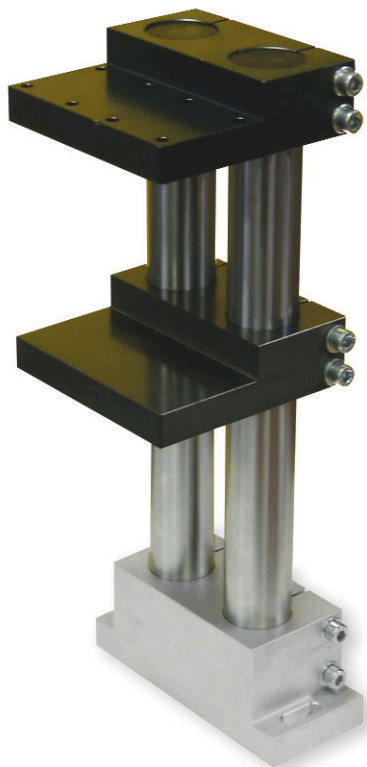
**mf automation, inc.**

[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337



# Stands and Modular Mounting Brackets and Adapter Plates



To achieve peak operation of precise, dynamic handling systems, a robust, vibration resistant supporting structure is essential. Only with such a structure is it possible to exploit the high repeat accuracies and speeds of the individual elements.

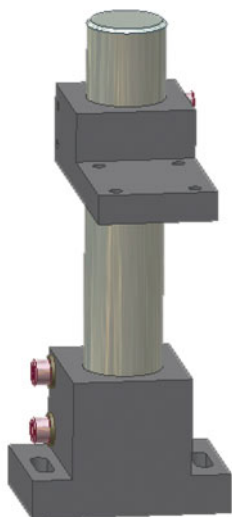
Our ground, chromium plated single and double columns allow precise, simple clamping and adjustment of mounting plates and transverse connectors. Through the use of these standard modular components, a wide range of mounting arrangements can be easily configured.

## Product features:

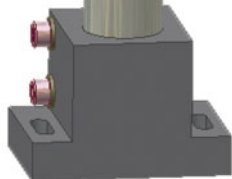
- Chrome-Plated Shafting, diameter 40 mm
- Standard Lengths or custom lengths available
- Simple, Precise and Secure
- Easy height adjustment
- No need to design; use standard modular assembly blocks
- Precision components
- Grey anodized mounting blocks  
Order 20 pc. or more choose your color; black, red, green, blue, purple, or gold)

## Application:

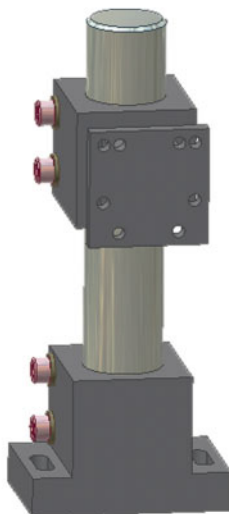
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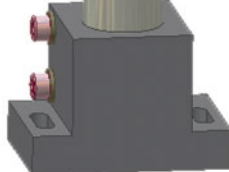
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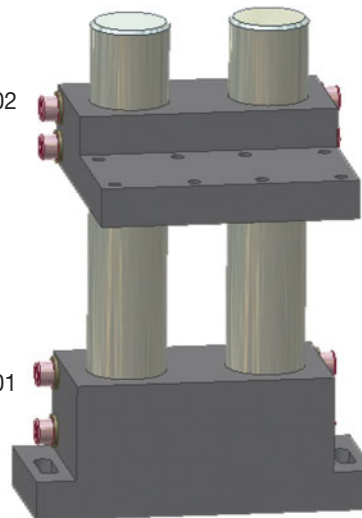
SE01.010



SE01.001



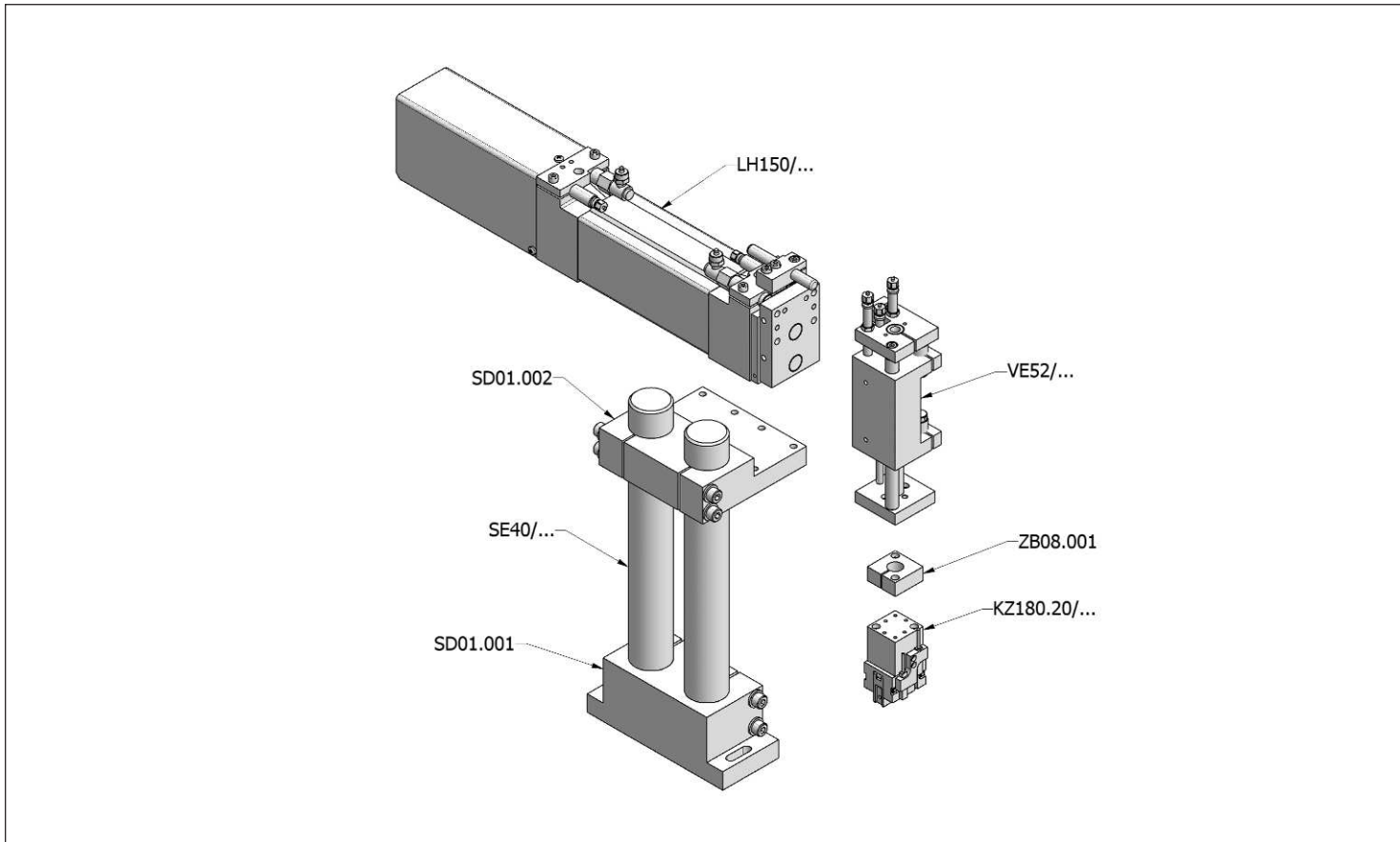
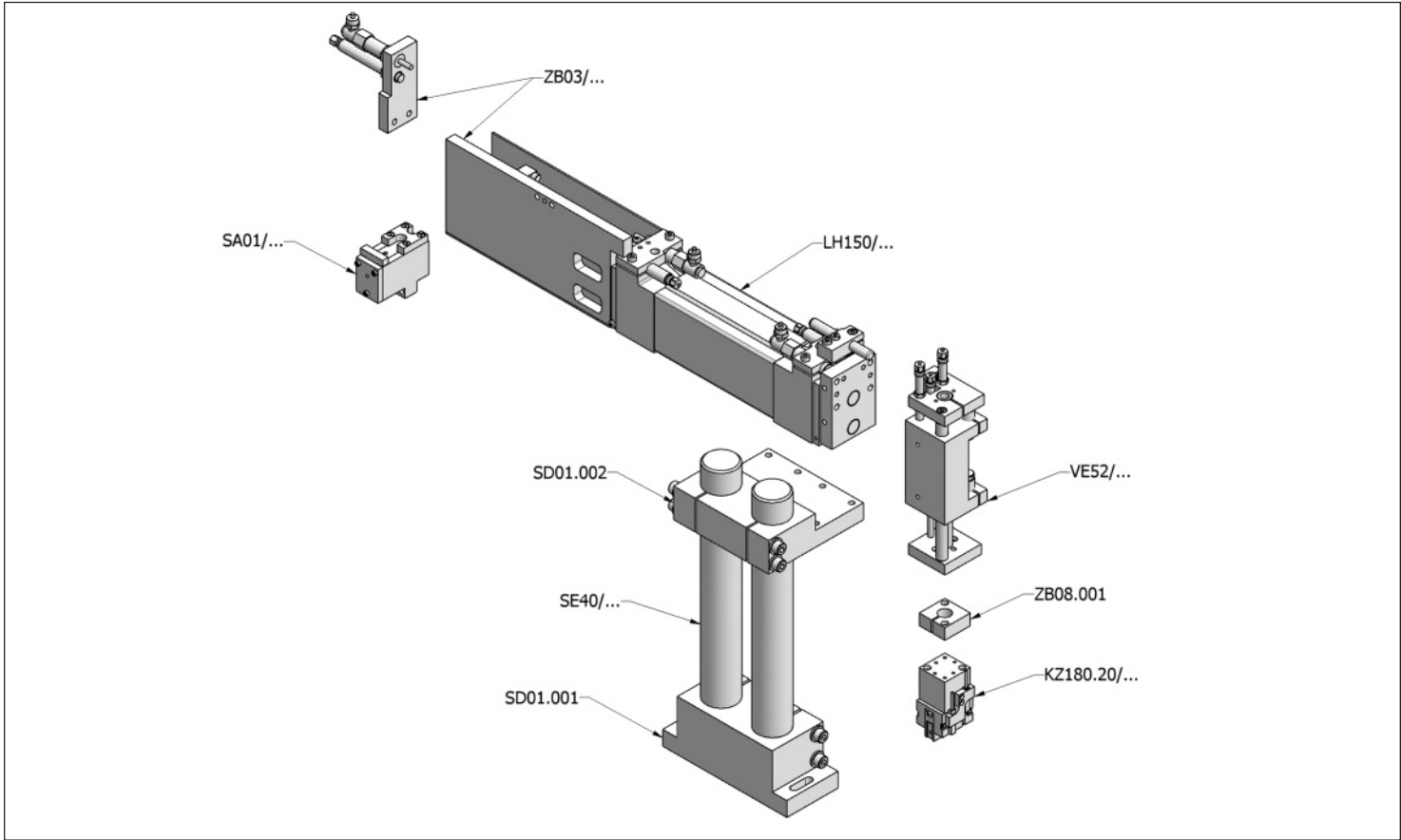
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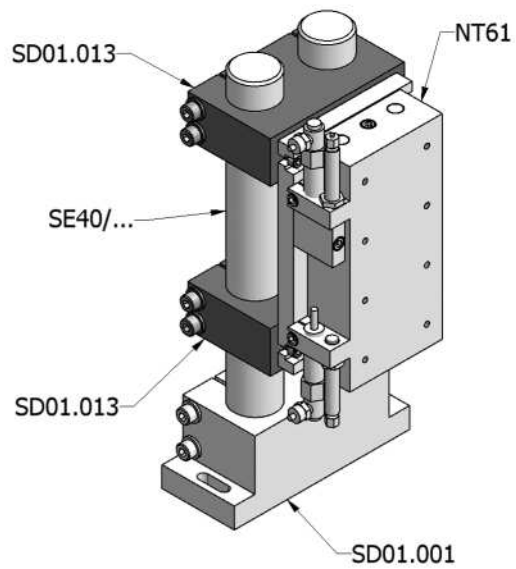
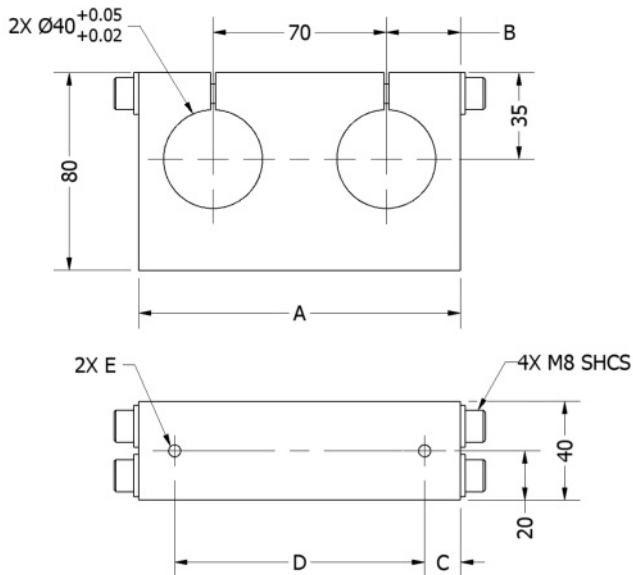
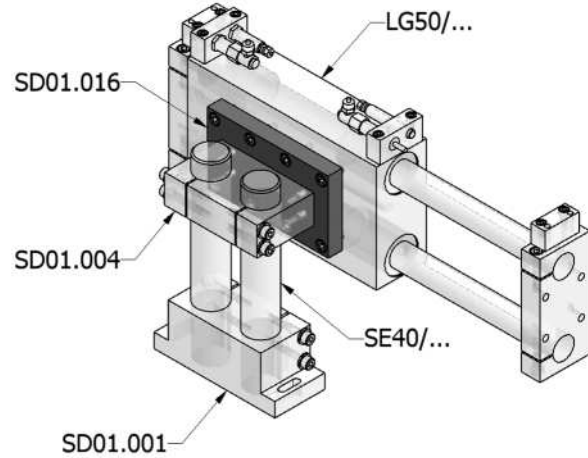
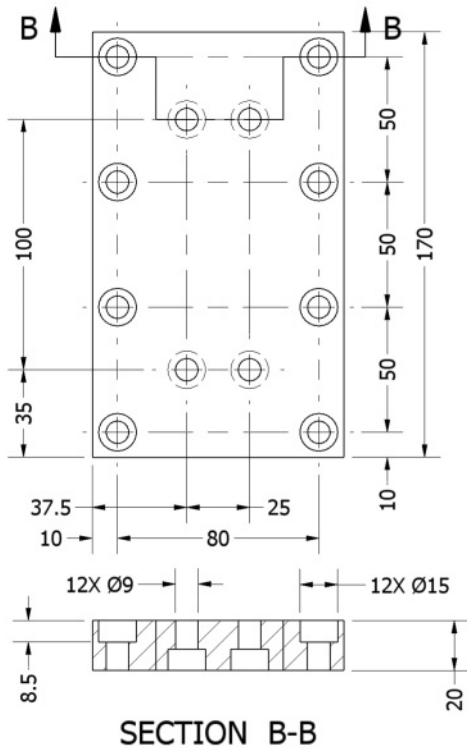
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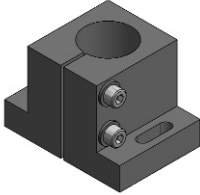
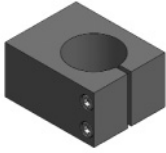
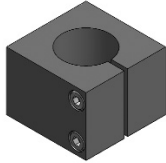
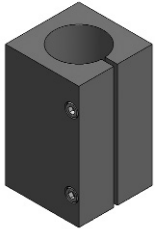
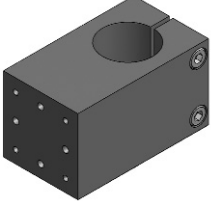
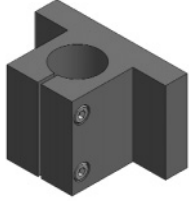
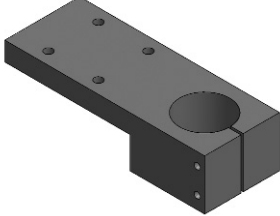
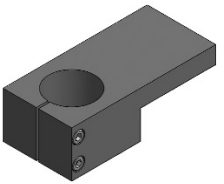



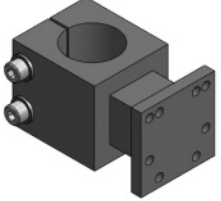
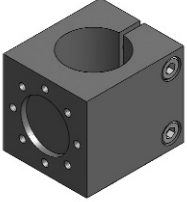
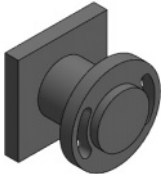
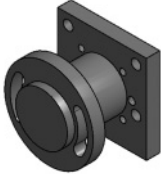
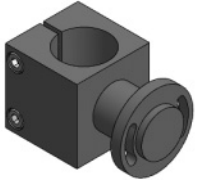
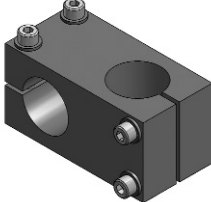
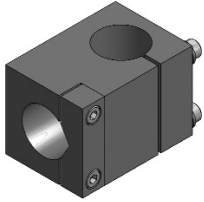
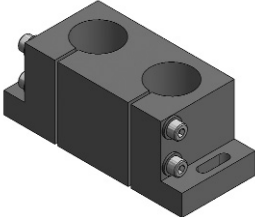
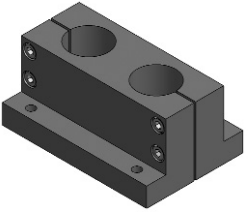
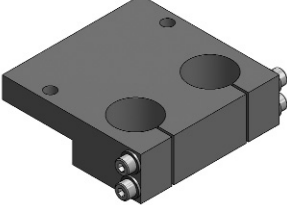
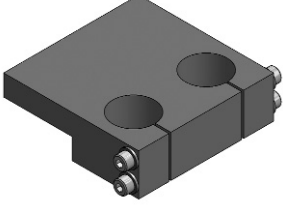
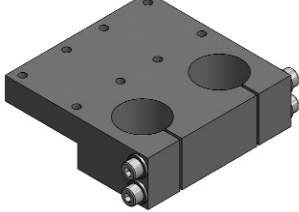
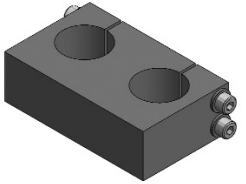
# Stands and Mounting Brackets – Examples of Application



# Stands and Mounting Brackets – Examples of Application

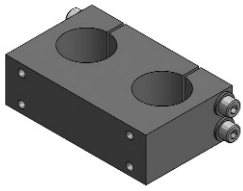


# Stands & Modular Mounting Brackets & Adapter Plates

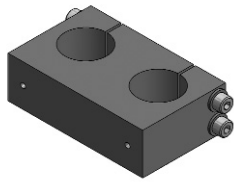
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| <p><b>SE01.060</b></p>    | <p><b>SE03.001</b></p>    | <p><b>SE01.027</b></p>    | <p><b>SE01.008</b></p>    |
| <p><b>SE01.014</b></p>   | <p><b>SE01.023</b></p>   | <p><b>SE01.024</b></p>   | <p><b>SE01.010</b></p>   |
| <p><b>SE01.018</b></p>  | <p><b>SE01.055</b></p>  | <p><b>SE01.054</b></p>  | <p><b>SE01.019</b></p>  |
| <p><b>SE01.003</b></p>  | <p><b>SE01.030</b></p>  | <p><b>SD01.001</b></p>  | <p><b>SD03.001</b></p>  |
| <p><b>SD01.005</b></p>  | <p><b>SD01.003</b></p>  | <p><b>SD01.002</b></p>  | <p><b>SD01.006</b></p>  |

# Stands & Modular Mounting Brackets & Adapter Plates

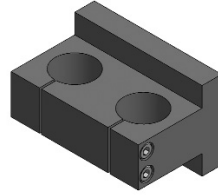
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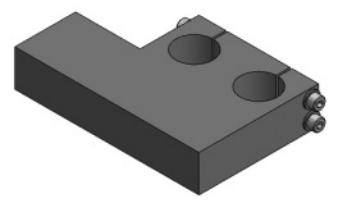
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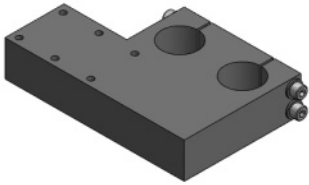
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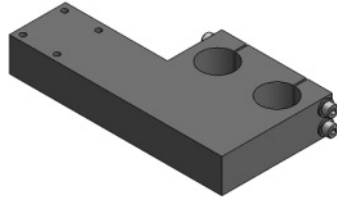
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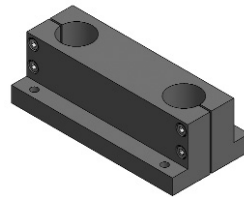
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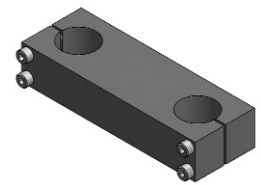
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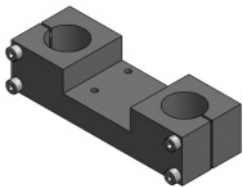
SD01.200



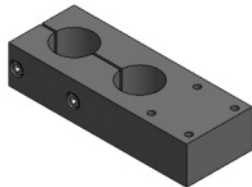
SD01.201



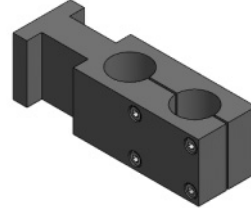
SD01.202



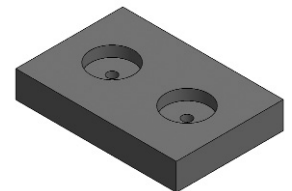
SD01.190



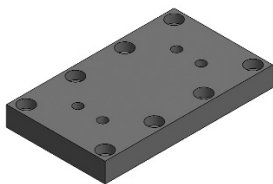
SD01.011



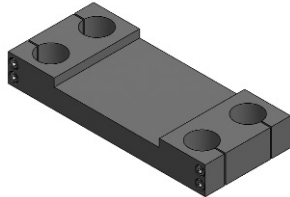
SD01.012



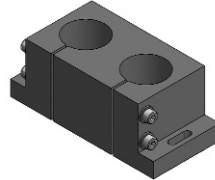
SD01.016



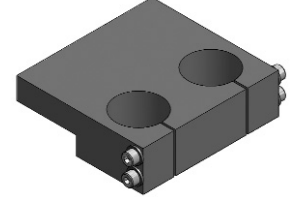
SE03.300



SD50.001



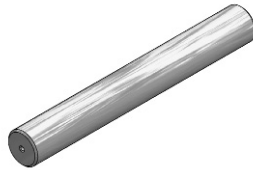
SD50.140



SE40.300



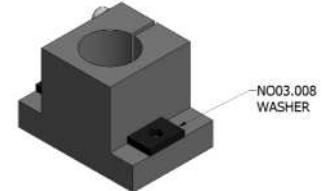
SE40.M06



SE50.300



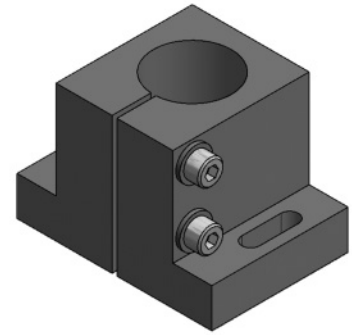
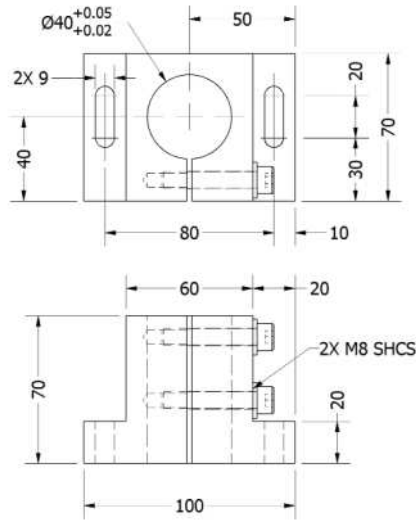
N003.008



# Stands and Modular Mounting Brackets

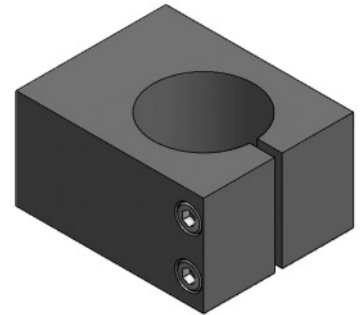
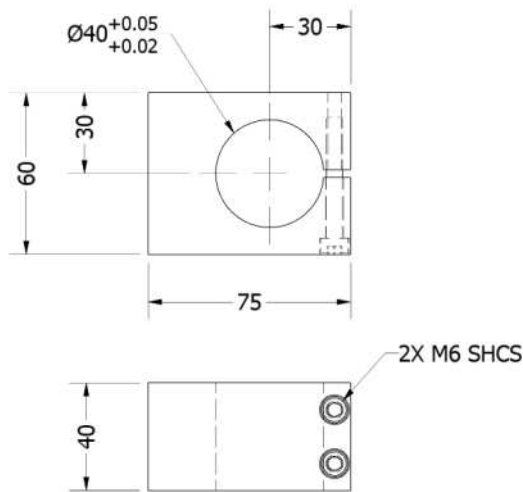
## Stand Base

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.001    | 100 X 70 mm |



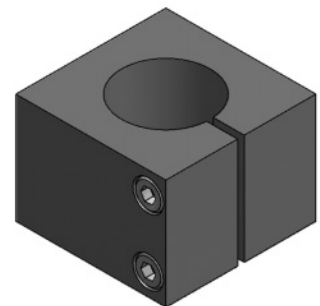
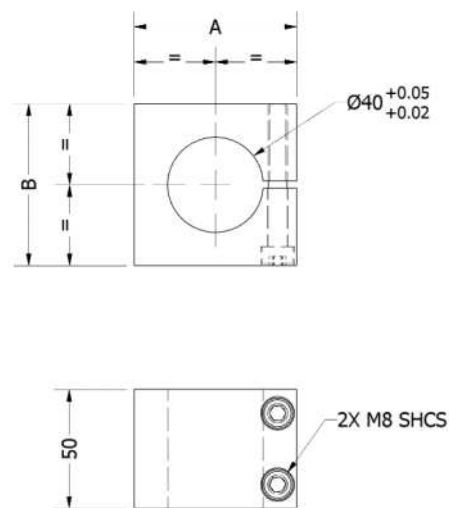
## Mounting Bracket

| Order Number | Dimension  |
|--------------|------------|
| SE 01.017    | 75 x 60 mm |



## Mounting Block

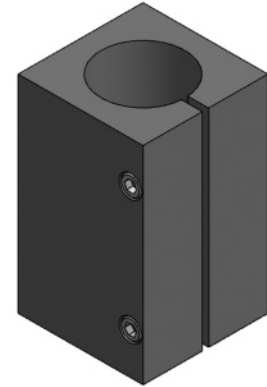
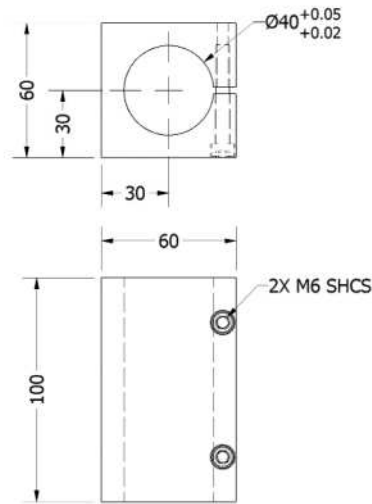
| Order Number | Dimension  |
|--------------|------------|
| SE 01.068    | 68 x 68 mm |
| SE 01.088    | 88 x 68 mm |



# Stands and Modular Mounting Brackets

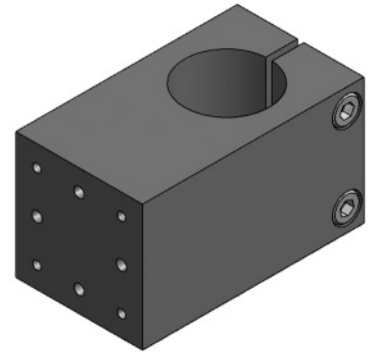
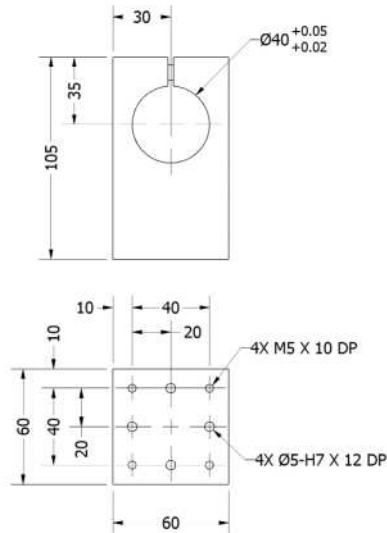
## Mounting Bracket

| Order Number | Dimension  |
|--------------|------------|
| SE 01.007    | 60 x 60 mm |



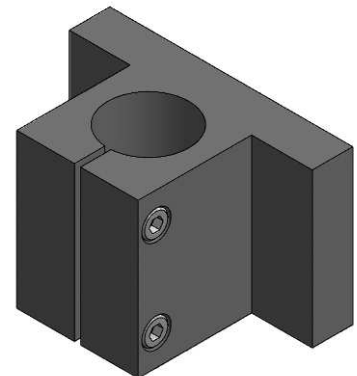
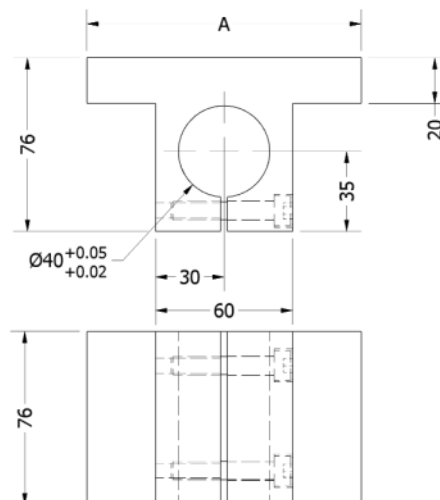
## Mounting Bracket

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.060    | 105 x 60 mm |



## Mounting Bracket

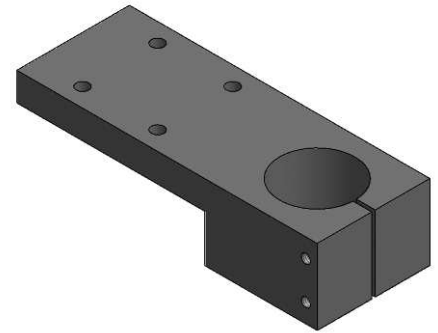
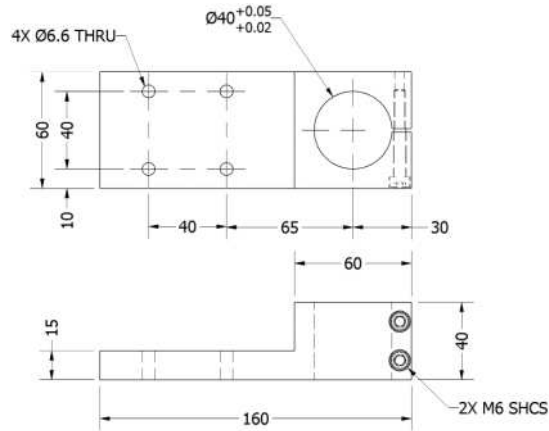
| Order Number | Dimension A |
|--------------|-------------|
| SE 03.001    | 100 mm      |
| SE 03.002    | 120 mm      |
| SE 03.003    | 140 mm      |



# Stands and Modular Mounting Brackets

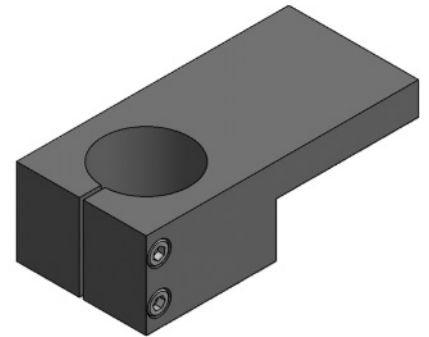
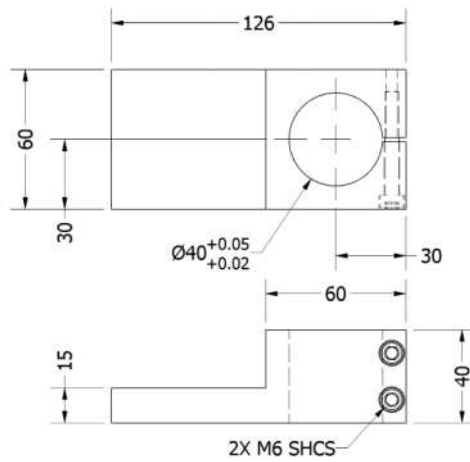
## Mounting Bracket for ML 26

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.027    | 160 x 60 mm |



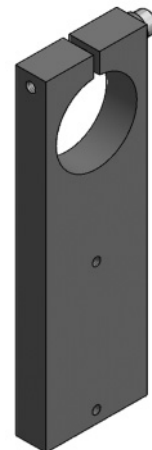
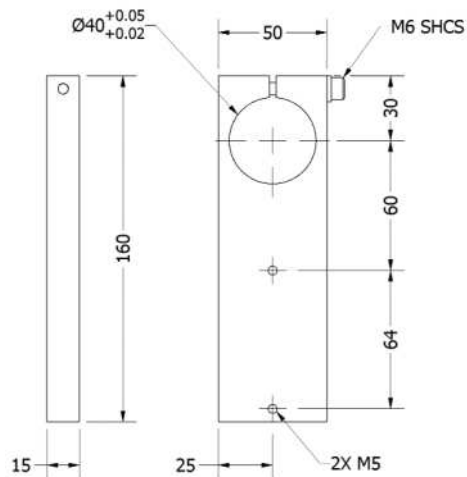
## Mounting Bracket

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.008    | 126 x 60 mm |



## Mounting Plate for KOB50

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.014    | 160 x 50 mm |

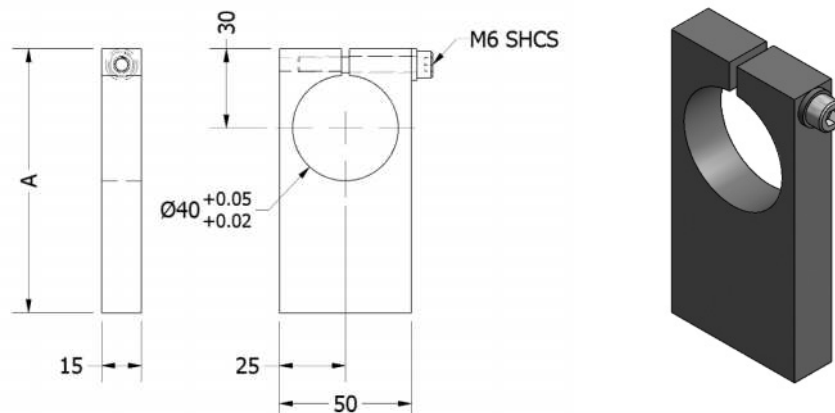




# Stands and Modular Mounting Brackets

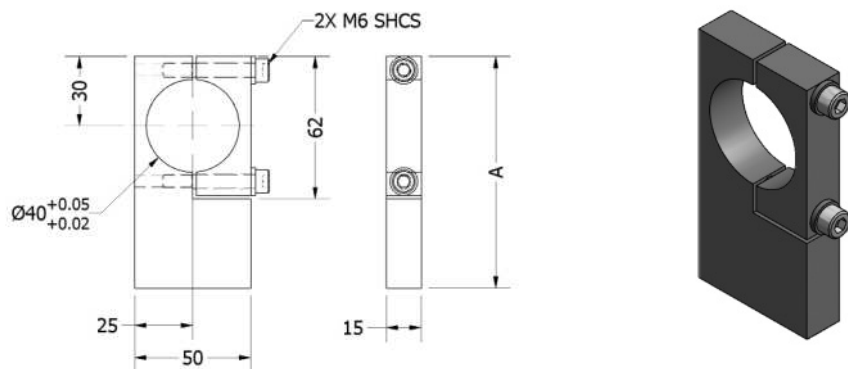
## Mounting Plate

| Order Number | Dimension A |
|--------------|-------------|
| SE 01.023    | 100 mm      |
| SE 01.022    | 160 mm      |
| SE 01.021    | 200 mm      |
| SE 01.020    | 250 mm      |
| SE 01.012    | 278 mm      |



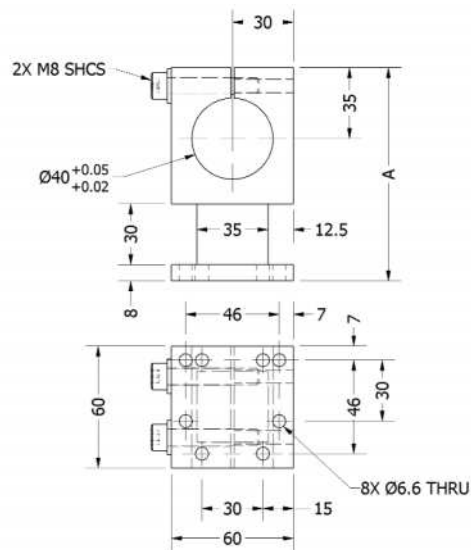
## Mounting Plate

| Order Number | Dimension A |
|--------------|-------------|
| SE 01.024    | 100 mm      |
| SE 01.025    | 160 mm      |
| SE 01.026    | 200 mm      |



## Mounting Bracket for VE

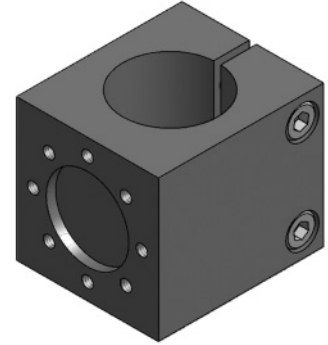
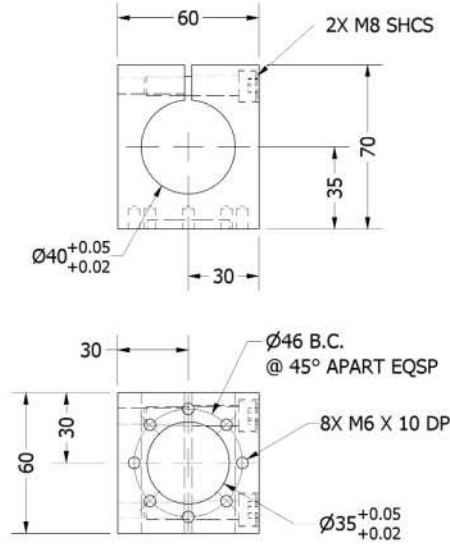
| Order Number | Dimension A |
|--------------|-------------|
| SE 01.010    | 105 mm      |
| SE 01.016    | 180 mm      |



# Stands and Modular Mounting Brackets

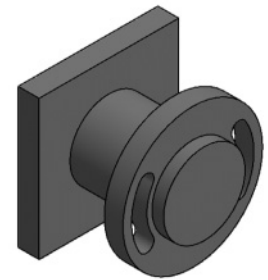
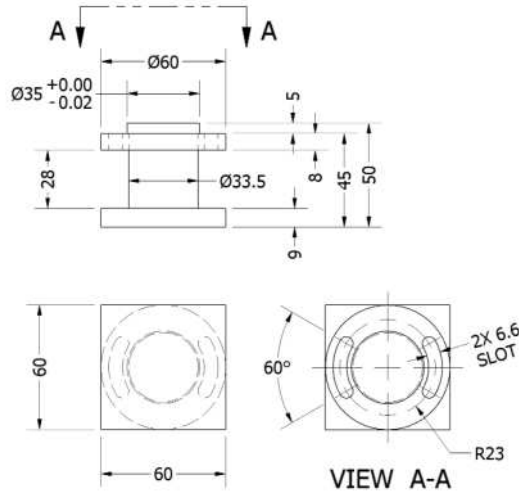
## Support Block

| Order Number | Dimension  |
|--------------|------------|
| SE 01.018    | 70 X 60 mm |



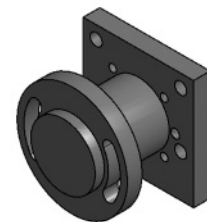
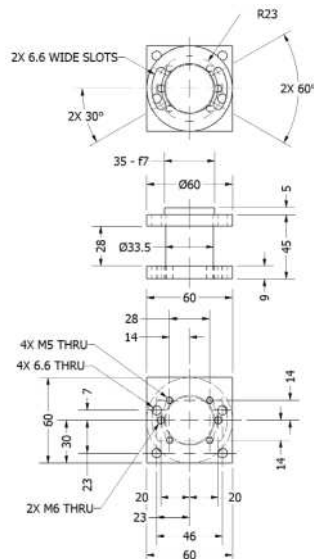
## Mounting Bracket

| Order Number | Dimension  |
|--------------|------------|
| SE 01.055    | 50 x 60 mm |



## Mounting Bracket

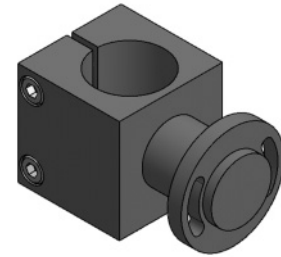
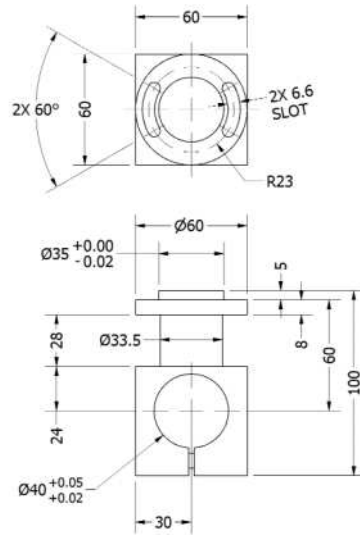
| Order Number | Dimension  |
|--------------|------------|
| SE 01.054    | 50 X 60 mm |



# Stands and Modular Mounting Brackets

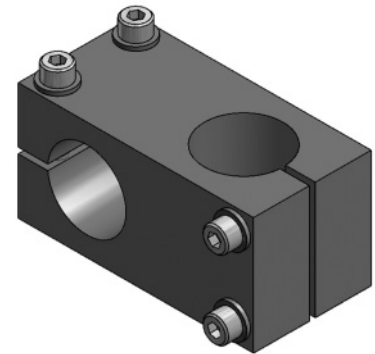
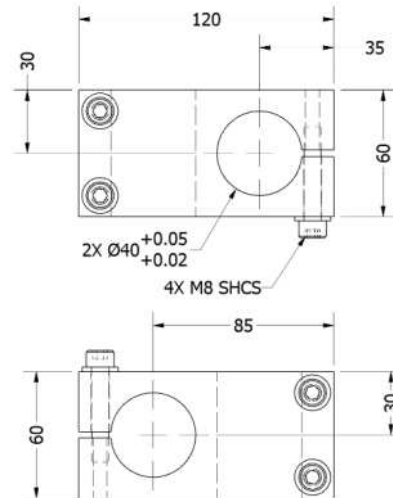
## Mounting Bracket

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.019    | 100 x 60 mm |



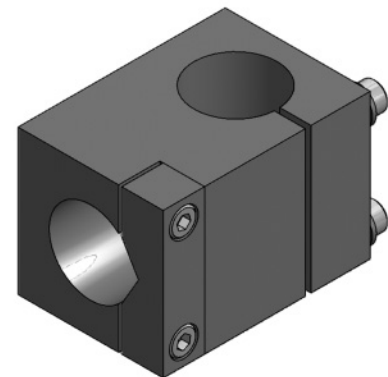
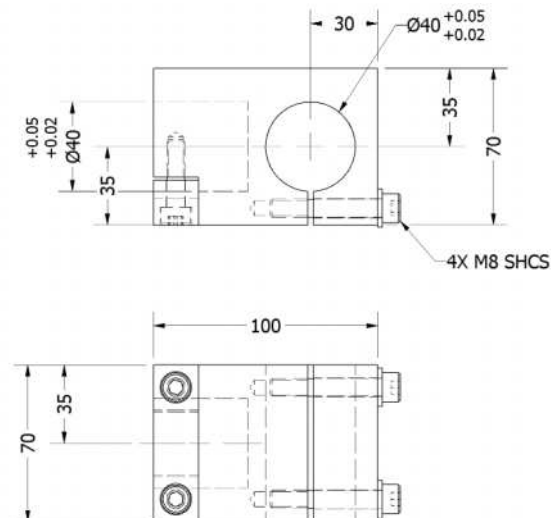
## Mounting Bracket

| Order Number | Dimension   |
|--------------|-------------|
| SE 01.003    | 120 X 60 mm |



## Mounting Bracket

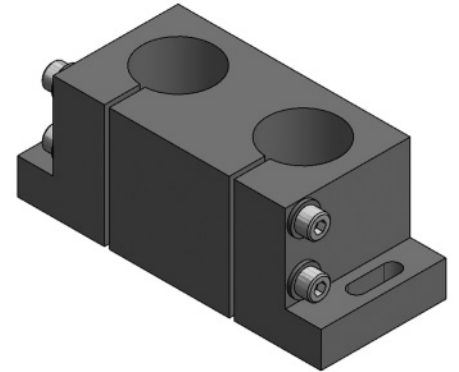
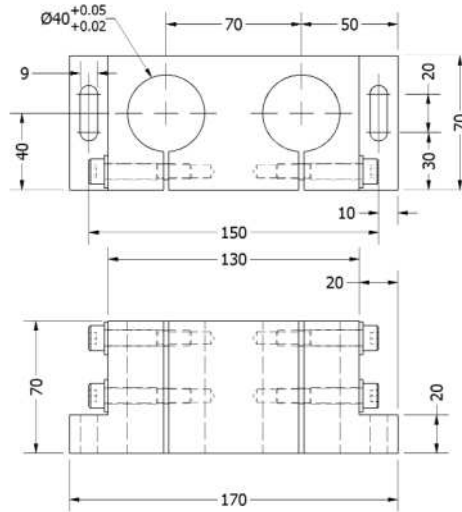
| Order Number | Dimension   |
|--------------|-------------|
| SE 01.030    | 160 X 70 mm |



# Stands and Modular Mounting Brackets

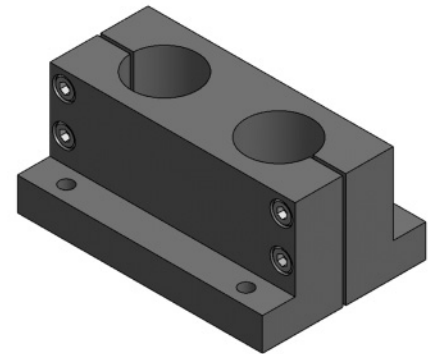
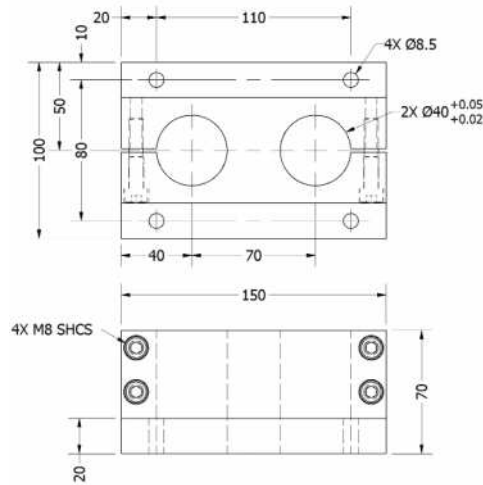
## Stand Base

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.001    | 170 x 70 mm |



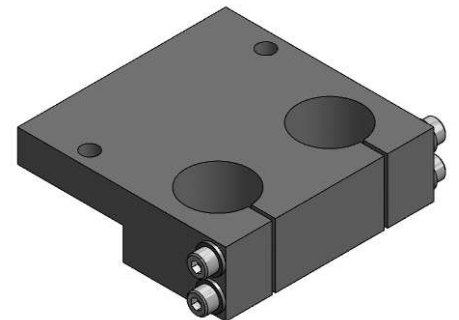
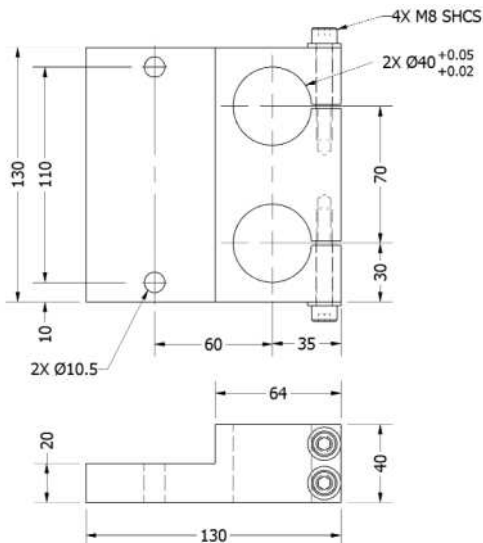
## Stand Base

| Order Number | Dimension   |
|--------------|-------------|
| SD 03.001    | 140 X 88 mm |



## Mounting Plate for Angle Loader

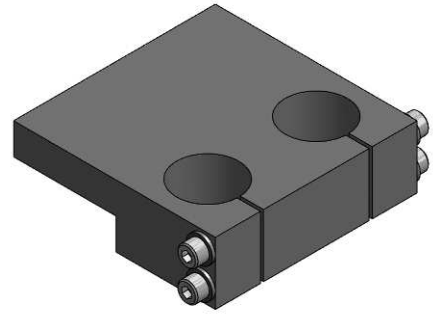
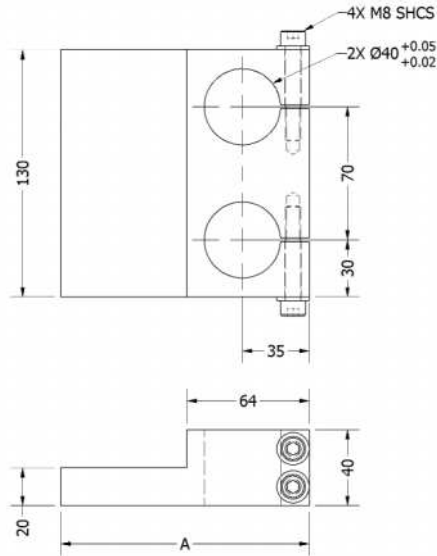
| Order Number | Dimension    |
|--------------|--------------|
| SD 01.005    | 130 x 130 mm |



# Stands and Modular Mounting Brackets

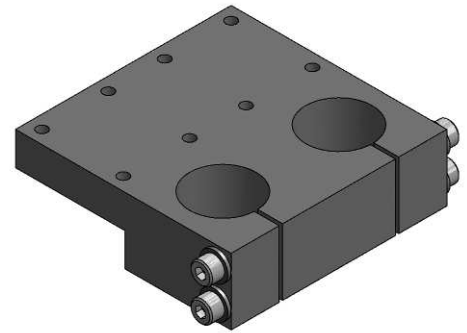
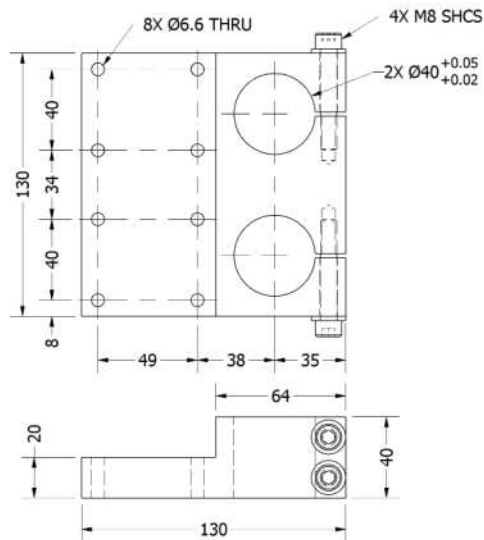
## Mounting Plate

| Order Number | Dimension A |
|--------------|-------------|
| SD 01.003    | 130 mm      |
| SD 01.010    | 160 mm      |
| SD 01.007    | 200 mm      |



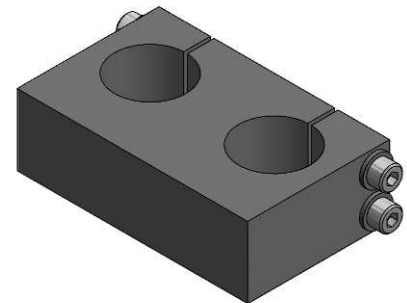
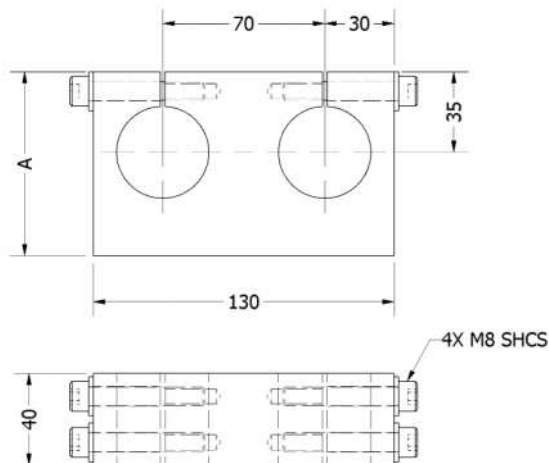
## Mounting Plate for LH

| Order Number | Dimension    |
|--------------|--------------|
| SD 01.002    | 130 x 130 mm |



## Mounting Bracket

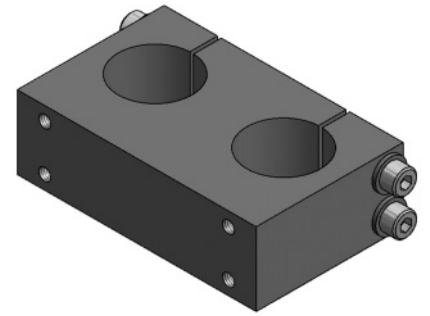
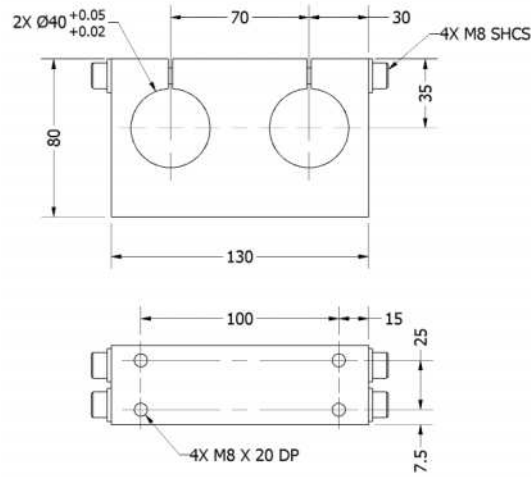
| Order Number | Dimension A |
|--------------|-------------|
| SD 01.006    | 80 mm       |
| SD 01.060    | 100 mm      |
| SD 01.066    | 120 mm      |



# Stands and Modular Mounting Brackets

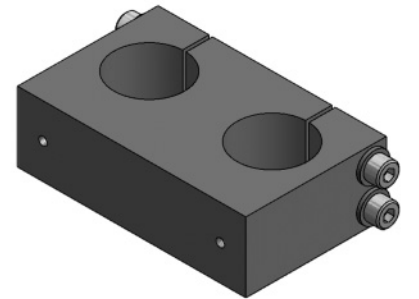
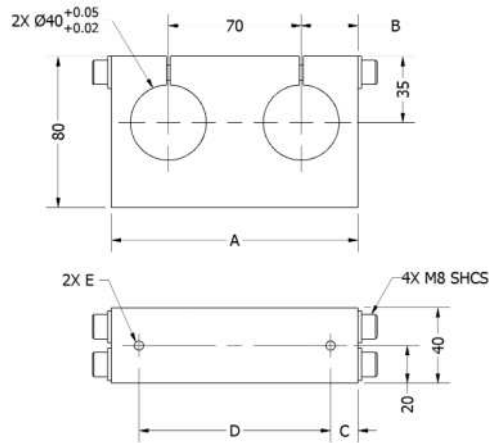
## Mounting Block

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.004    | 130 X 80 mm |



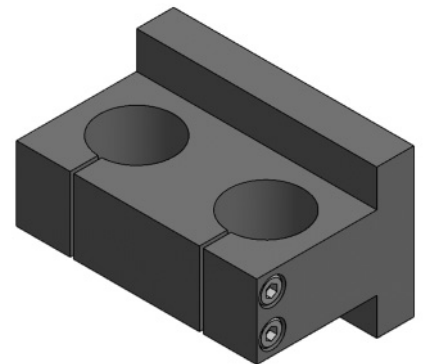
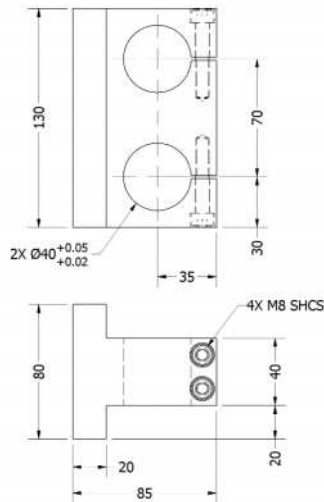
## Mounting Bracket

| Order Number | Dimension |    |      |     |       |
|--------------|-----------|----|------|-----|-------|
|              | A         | B  | C    | D   | E     |
| SD 01.013    |           |    |      |     |       |
| NT 61        | 130       | 30 | 14.5 | 101 | M6/18 |
| SD 01.014    |           |    |      |     |       |
| NT 120       | 150       | 40 | 8    | 134 | M8/20 |



## Mounting Block

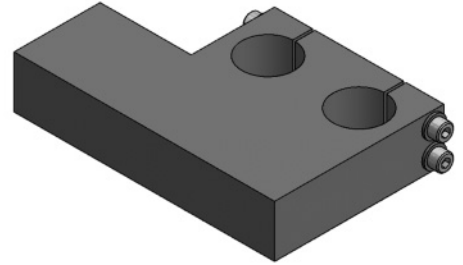
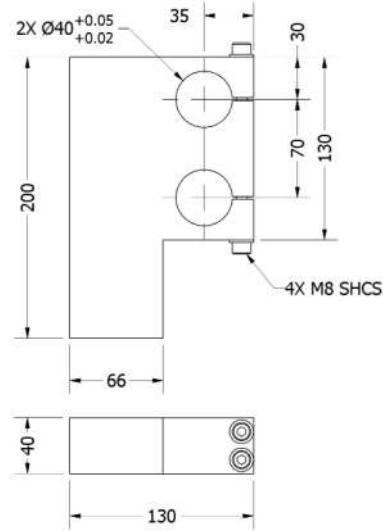
| Order Number | Dimension   |
|--------------|-------------|
| SD 01.032    | 130 x 85 mm |



# Stands and Modular Mounting Brackets

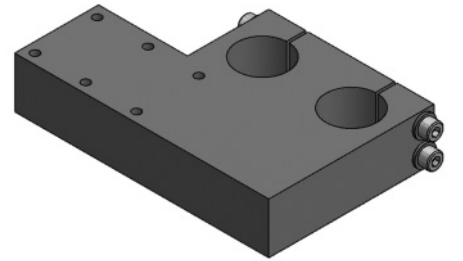
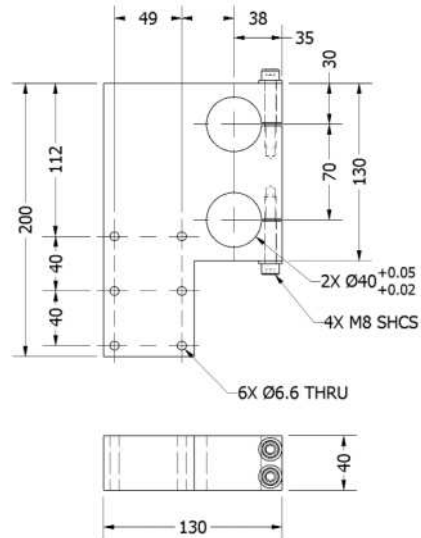
## Mounting Plate

| Order Number | Dimension    |
|--------------|--------------|
| SD 01.008    | 130 x 200 mm |



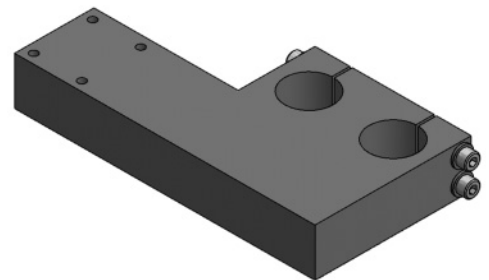
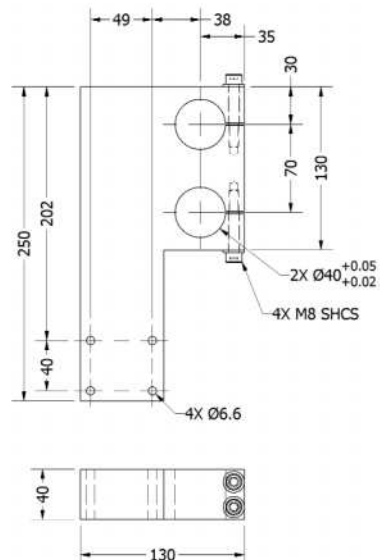
## Mounting Plate / LH

| Order Number | Dimension |
|--------------|-----------|
| SD 01.009    | 200 mm    |



## Mounting Plate / LH

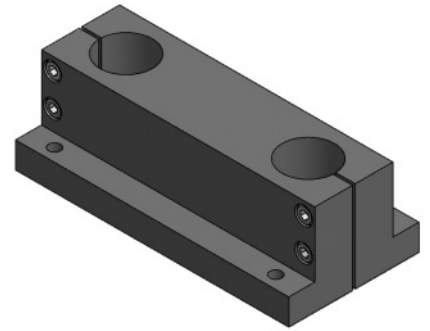
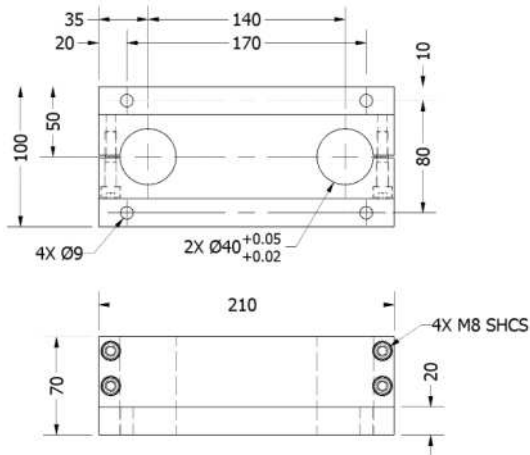
| Order Number | Dimension |
|--------------|-----------|
| SD 01.025    | 130 X 250 |



# Stands and Modular Mounting Brackets

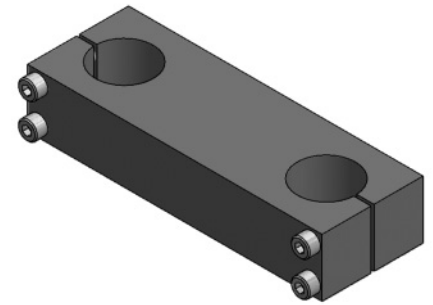
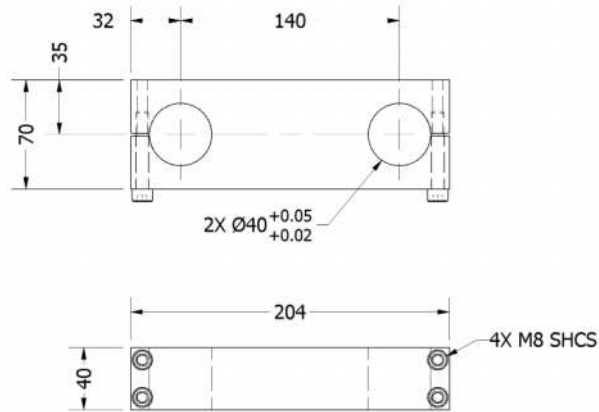
## Stand Base

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.200    | 204 X 88 mm |



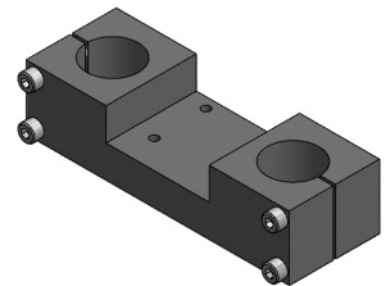
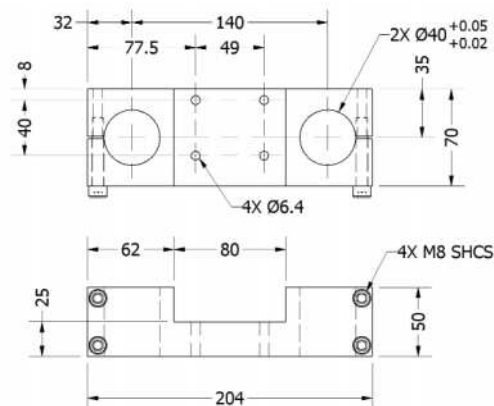
## Mounting Bracket

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.201    | 204 X 70 mm |



## Mounting Block / LH

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.202    | 204 X 70 mm |

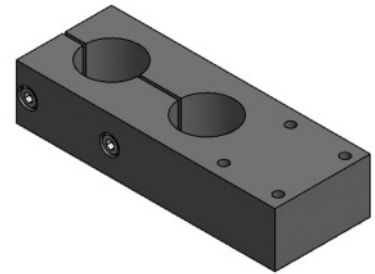
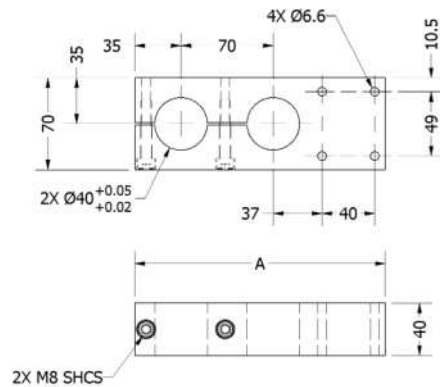




# Stands and Modular Mounting Brackets

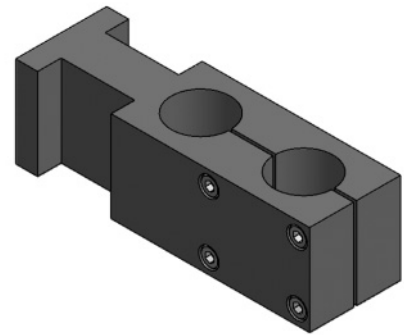
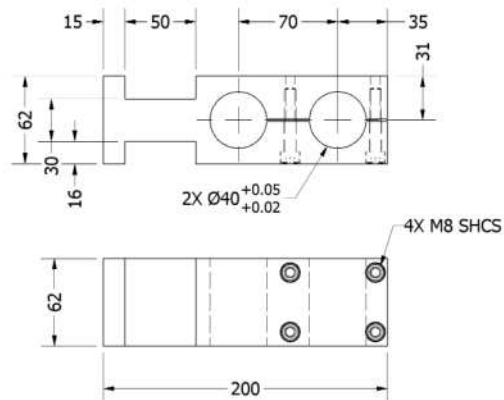
## Mounting Block / LH

| Order Number | Dimension A |
|--------------|-------------|
| SD 01.190    | 190 mm      |
| SD 01.220    | 220 mm      |
| SD 01.250    | 250 mm      |



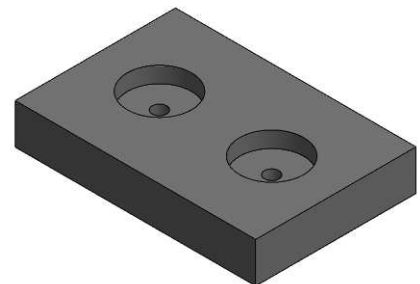
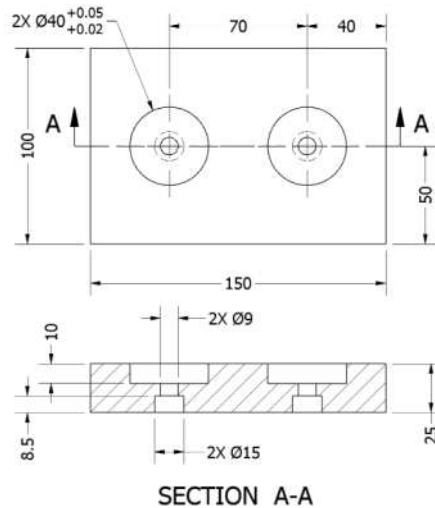
## Mounting Block

| Order Number | Dimension   |
|--------------|-------------|
| SD 01.011    | 200 X 62 mm |



## Mounting Plate

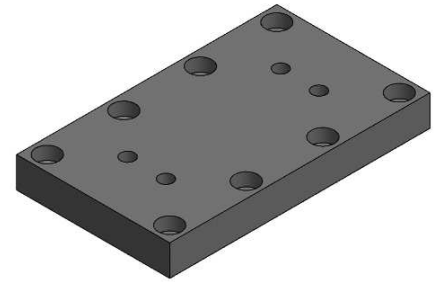
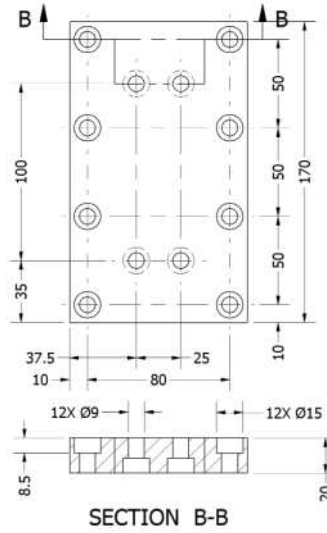
| Order Number | Dimension    |
|--------------|--------------|
| SD 01.012    | 150 x 100 mm |



# Stands and Modular Mounting Brackets

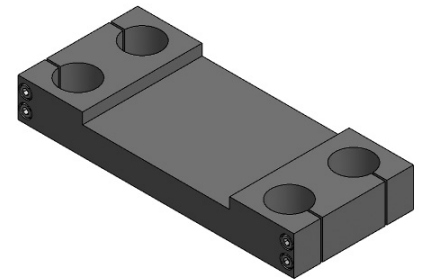
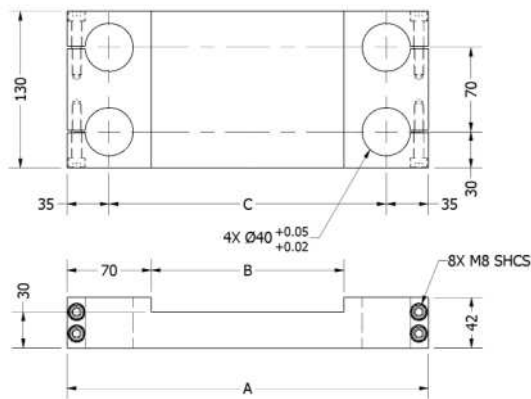
## Mounting Plate / LG

| Order Number | Dimension    |
|--------------|--------------|
| SD 01.016    | 170 x 100 mm |



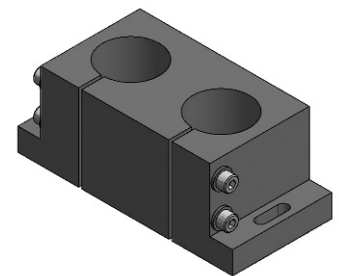
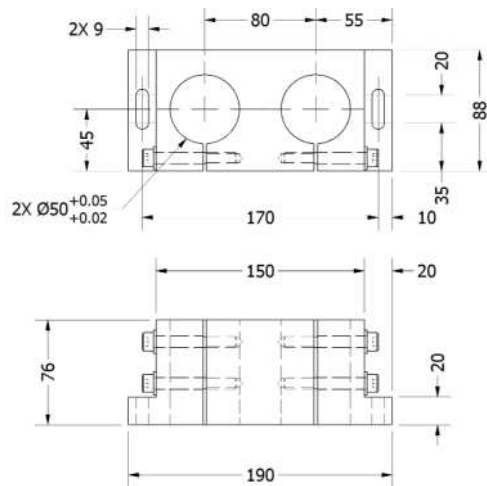
## Mounting Plate

| Order Number | Dimension |        |
|--------------|-----------|--------|
|              | A         | B      |
| SE 03.300    | 300 mm    | 160 mm |
| SE 03.400    | 400 mm    | 260 mm |
| SE 03.500    | 500 mm    | 360 mm |



## Mounting Plate

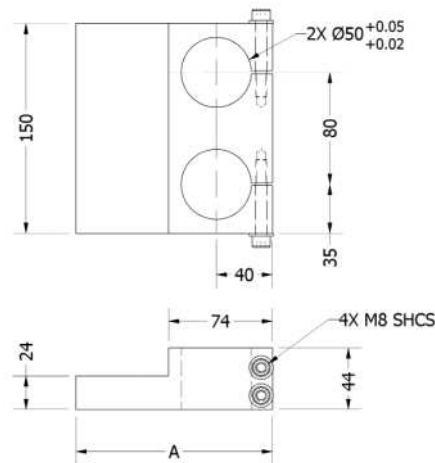
| Order Number | Dimension   |
|--------------|-------------|
| SD 50.001    | 190 x 88 mm |



# Stands and Modular Mounting Brackets

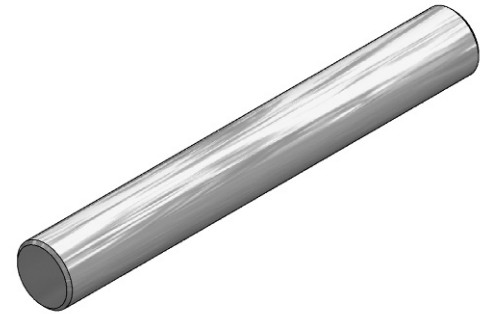
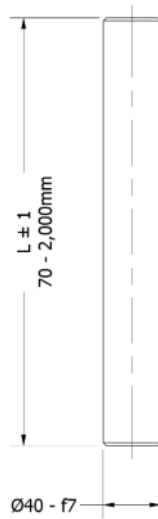
## Mounting Plate

| Order Number | Dimension A |
|--------------|-------------|
| SD 50.140    | 140 mm      |
| SD 50.180    | 180 mm      |
| SD 50.220    | 220 mm      |
| SD 50.260    | 260 mm      |



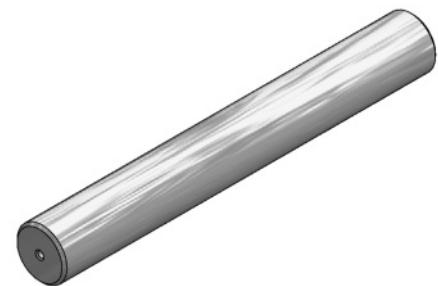
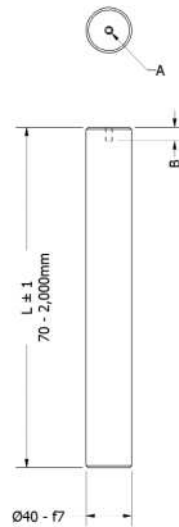
## Pillar

| Order Number  |                   |
|---------------|-------------------|
| SE 40 x ..... | any custom length |



## M6, M8, M12

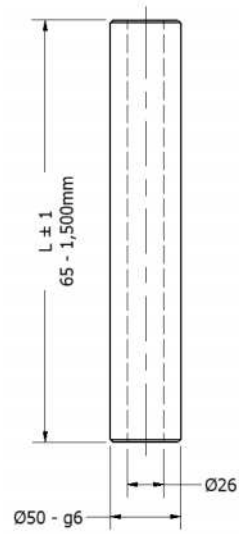
| Order Number |  |
|--------------|--|
| SE 40M06-    |  |
| SE 40M08-    |  |
| SE 40M12-    |  |



# Stands and Modular Mounting Brackets

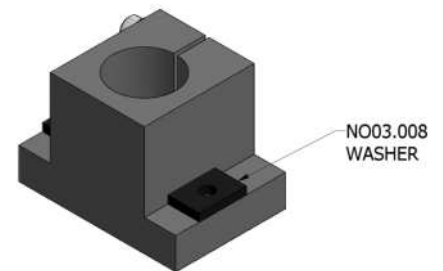
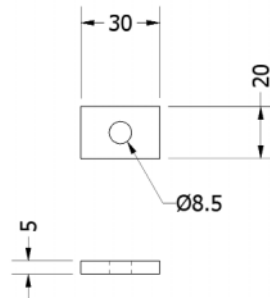
## Pillar

| Order Number | L      |
|--------------|--------|
| SE 50 x 300  | 300 mm |
| SE 50 x ...  | Custom |



## Washer

| Order Number |
|--------------|
| NO 03.008    |



## HANDLING SYSTEMS AND SPRING FEEDER

SECTION 7

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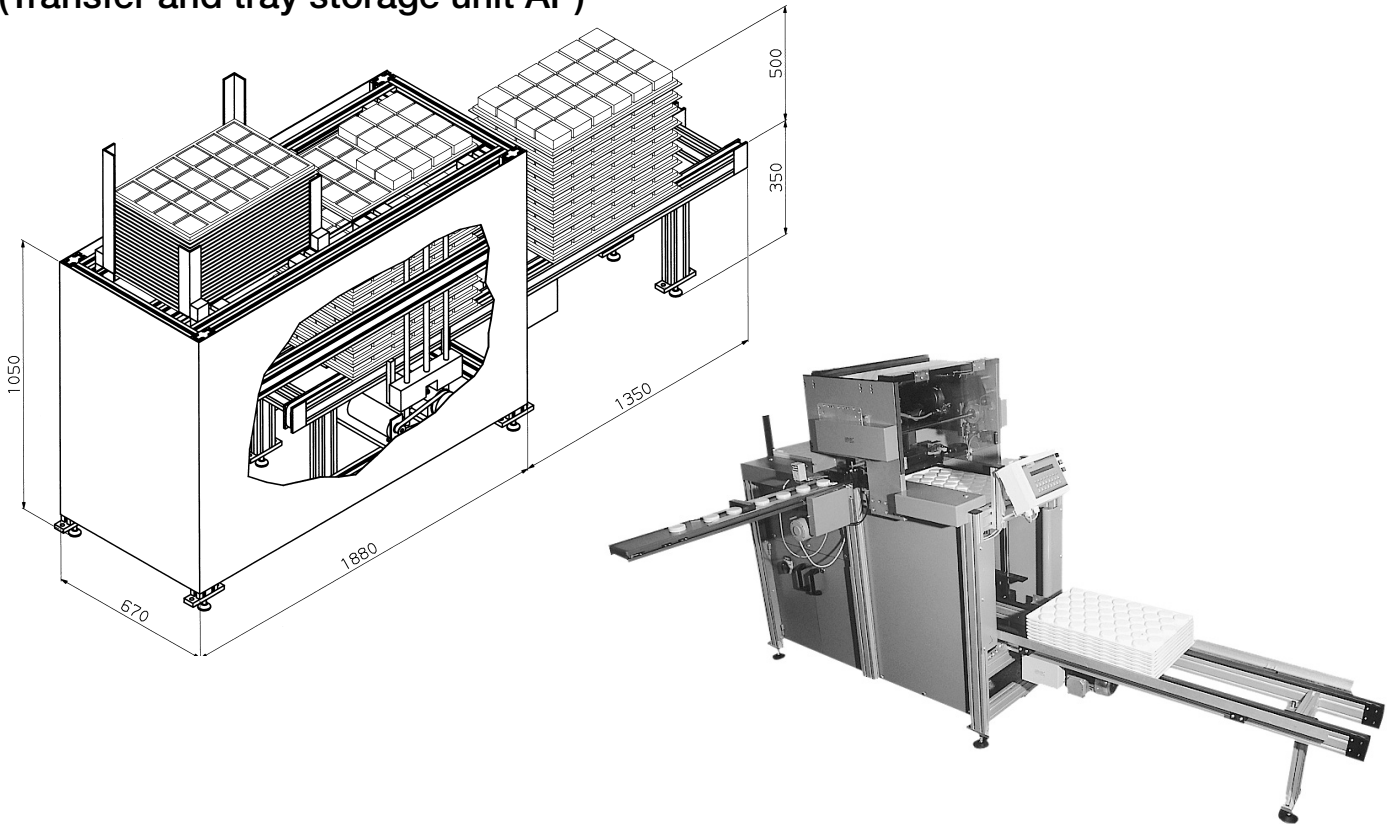
**mf automation, inc.**

[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337

# Automated Tray Changer

## (Transfer and tray storage unit AP)



### Description

The transfer and tray storage unit is used for automatic loading/unloading of trays.

The tray to be loaded is singled out on the tray stack downward and is brought into the loading position by the electrical drive unit.

The advance of the trays is programmable to your choice and programs can be stored in the controller unit.

The loaded trays are stacked onto each other and lowered within the unit downward to the transfer unit.

This transfer unit moves the whole stack of trays out of the system.

This unit is designed to allow the procedure described above also to be carried out in reverse order.

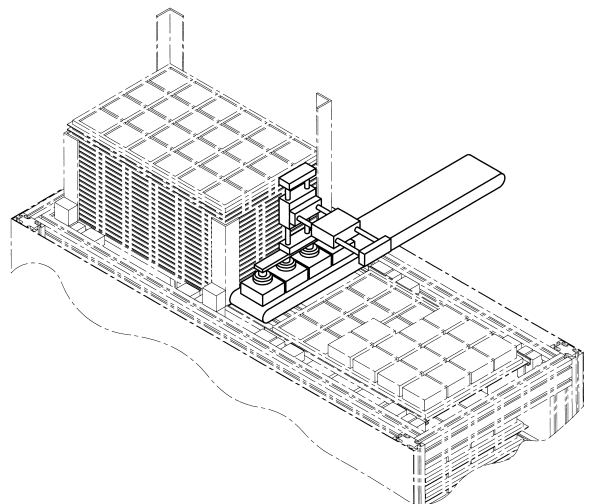
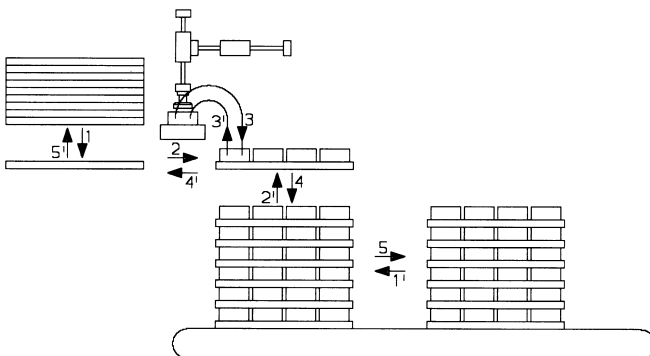
This unit is equipped with an individual controller, which also allows the controlling of the handling unit.

In addition, this transfer and tray storage unit can be equipped with any automation component of modular design within our range of products. The parts can then be loaded/unloaded individually or serially.

Typical applications are: difficult parts to sort out, or parts which must not be scratched, e.g. cosmetic products.

### Technical Data:

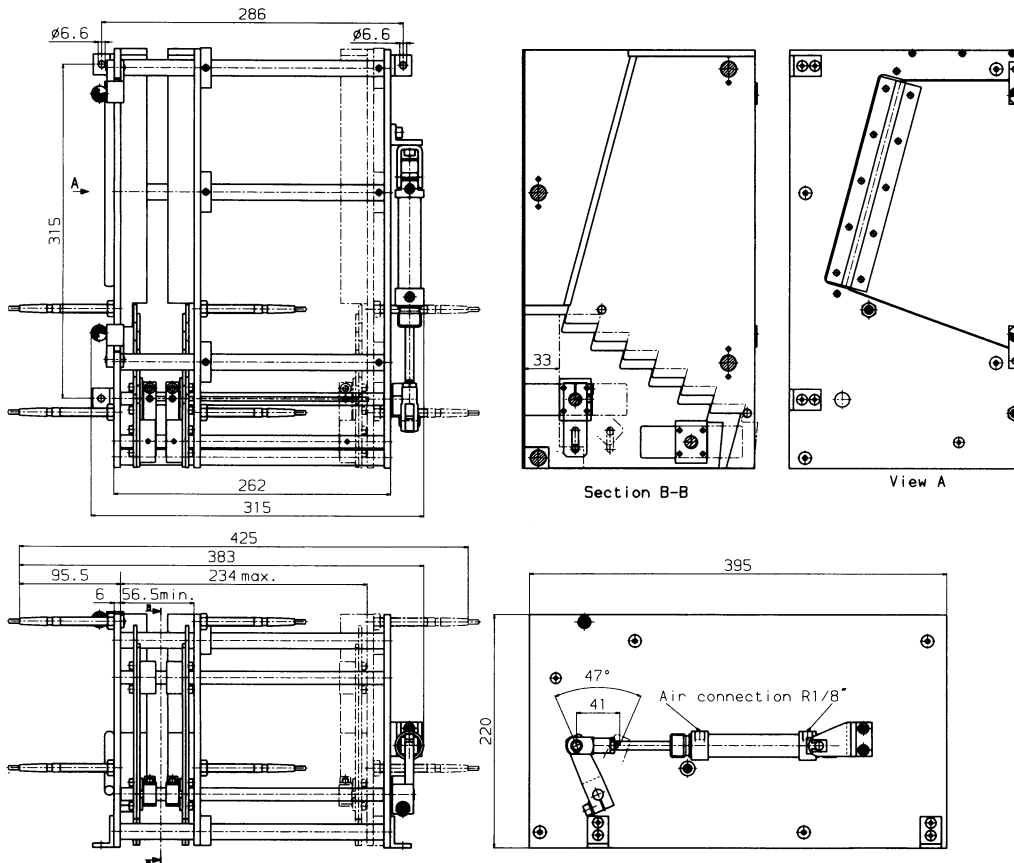
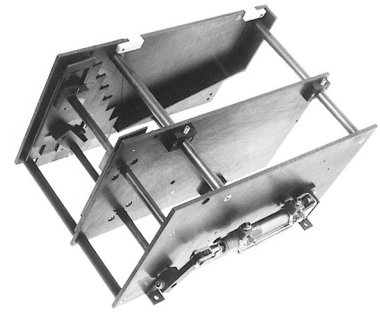
- Tray size 400 x 600 mm (other dimensions are also possible)
- Tray changing time approx.. 5 seconds
- Stack height 400 mm
- Total weight of tray stack approx.. 30 kgs



# Shaft Hopper WM-01

Order No. WM-01 - . . .

O = No sensors  
 N = Sensors NPN (M8x1)  
 P = Sensors PNP (M8x1)



The shaft hopper separates and prepositions shafts with a diameter from 6 to 26mm. The length of the work pieces can range from 56 to 254mm. (2,2" to 10")

Parts must have the same length and the same orientation. A simple shifting of the internal partitioning adjusts to a different work piece length.

A stepped mechanic that moves up and down separates the shafts. It is driven by a pneumatic cylinder. The uppermost step can be used as an unloading position for the parts; but it is also possible to convey the shafts to another suited installation (for example transport device) without using an unloading device.

The shaft hopper is equipped with a level measuring device and a control for the unloading position. A flap at the side allows to magazine even short shafts without problems.

Weight of the hopper approx. 44 lb (20 kg)

# Spring feeder FG

For disentangling and feeding of cylindrical springs with air.

**NOTE:** Each spring must be checked out individually for feed suitability. About 0.3 liter (.33 quarts) of regular production springs are needed for evaluation.

## SPRING:

- Outer spring diameter 2-8mm (0.0788" - 0,3152")
- Length up to 30mm (1,182")
- Special version up to  $\varnothing$  18mm (0.708")
- Length 5-45mm (0.196" - 1,771")

## Technical data:

- Simple and quick refill of springs
- *Hopper for additional bulk quantity of springs (see back page)*
- 1-6 outputs (dependant on feed rate, dimension and form of spring)
- Rate per output: up to 100 PCS/ min.
- Air connection: R 1/8"
- Operating medium: compressed air / oil free
- Operating pressure: 2-6 bar (30-90 psi)
- Air consumption: per operating cycle at 72.5 psi (5 bar): .883 scf (25 NL)
- Volume: 0,5 litre (.55 quarts)
- Weight: 30 kg (66.2 lb)

The unit is supplied with a matching nozzle, tube mount and 2-meter tube.

## CONTROL UNIT:

The control unit is equipped with an automatic on / off (FG will switch on only as required)  
Voltage: 24 volts DC

## Order No.

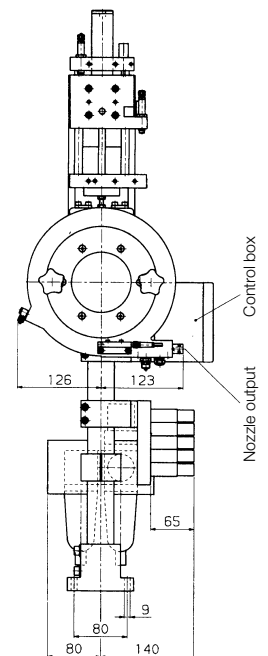
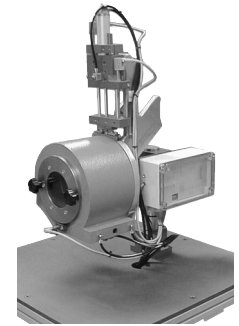
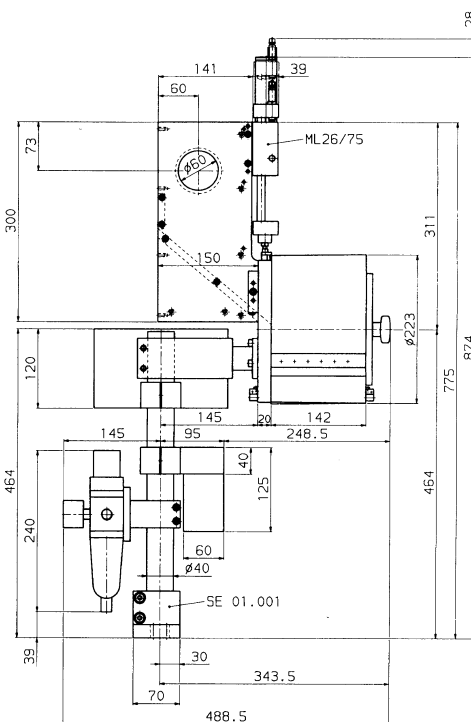
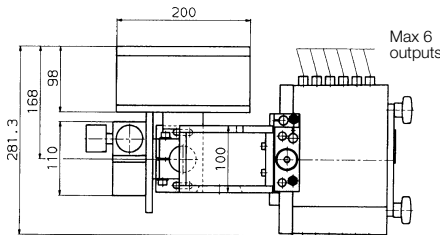
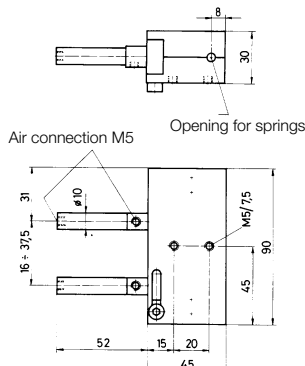
- FG - -
- A = valves, regulator, compl. with tubing, without ring initiator
  - B = valves, regulator, compl. with tubing with control unit, with ring initiator (1 pc. per output)
- Number of outputs 1-6

Ring initiator version PNP

Order No. IR\_\_PSK-IBS

Ring Diameter (I.D.)

## Single escapement EF for springs and cylindrical pins



The single escapement must be matched to the spring diameter.

## Technical data:

- Outer spring diameter 2-8mm (0,078" - 0,315")
- Spring length 5 to 40mm (.196"-1,574")
- Call us for details about your custom size
- Air connection M5 Operating medium: compressed air/ oil free
- Operating pressure: 2-6 bar (30-90 psi)
- Air Consumption: per operating cycle at 72.5 psi: 0.014 NL
- Weight: 0,85 kg (1.87lb)

Order No. EF 01.000



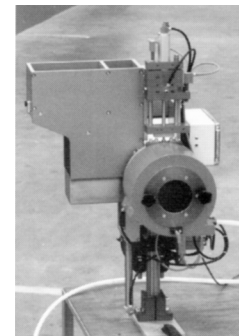
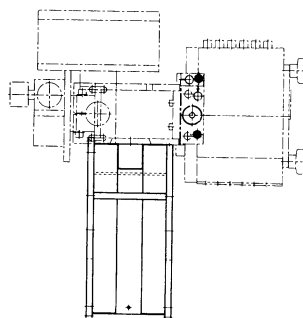
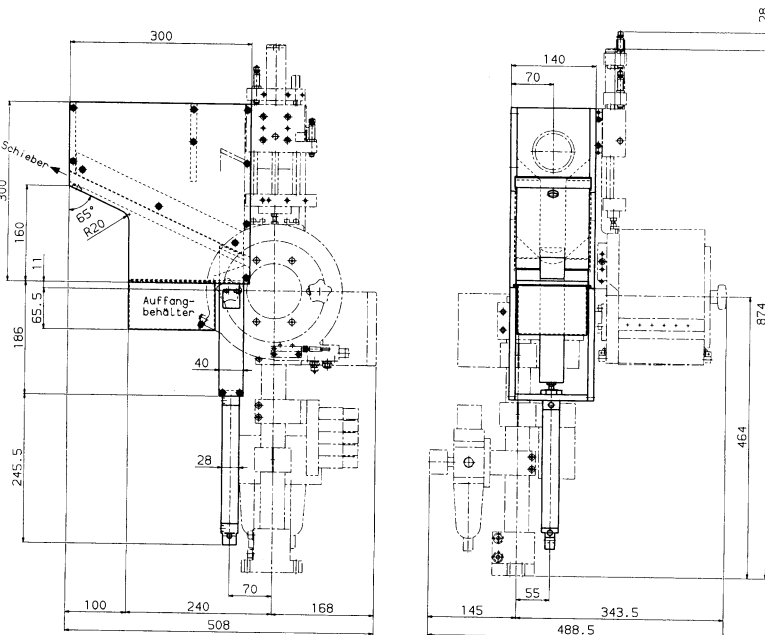
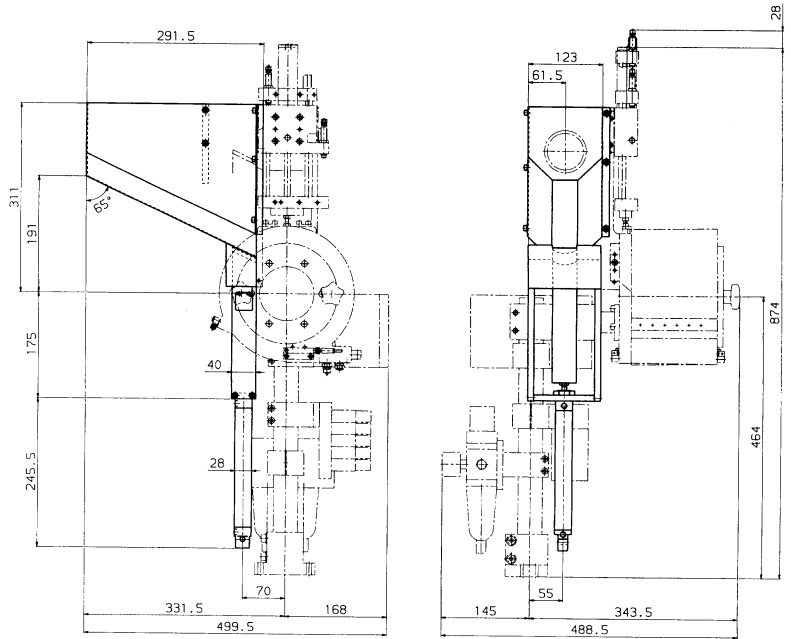
# Hopper FG

Available in two models, the Hopper holds a bulk quantity of springs and easily facilitates automatic refilling of the Spring Feeder.

## MODEL – S

This model does not have a quick empty feature.

Order No.: FG-Hopper-S



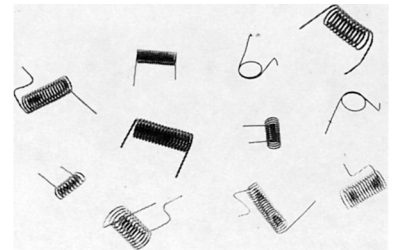
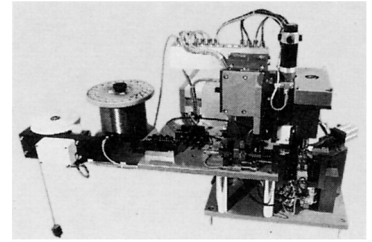
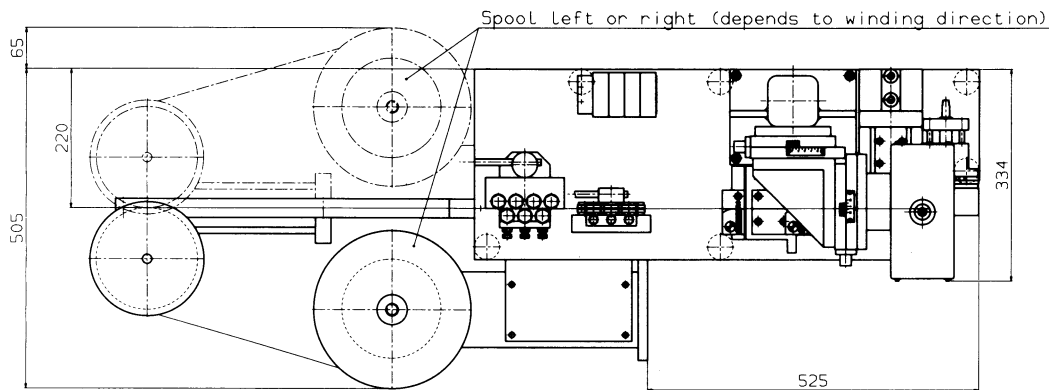
## MODEL – L

FG-Hopper-L is recommended when your application requires feeding various types of springs with the same spring feeder. Model – L also provides a Quick-Empty feature, by simply pulling the drawer.

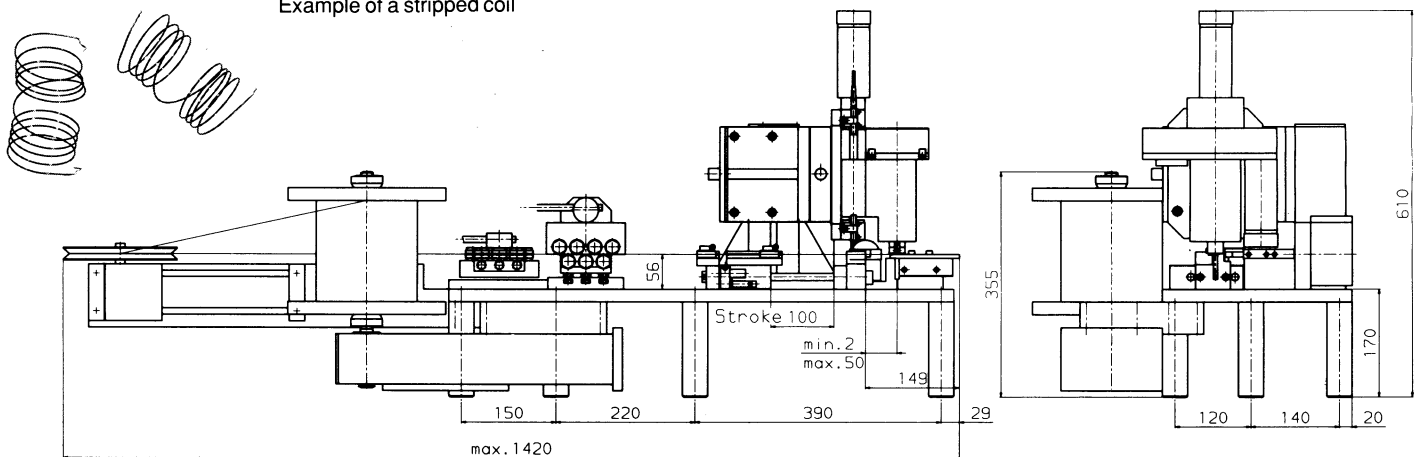
Order No.: FG-Hopper-L

# NC-Winding Machine FW-01

for spiral torque springs



Example of a stripped coil



The Meto-Fer NC-winding machine produces spiral springs with legs, for use in torquing applications, and coiled resistance wires directly from a spool. The machine can be integrated directly into an assembly installation, or used as a stand-alone machine.

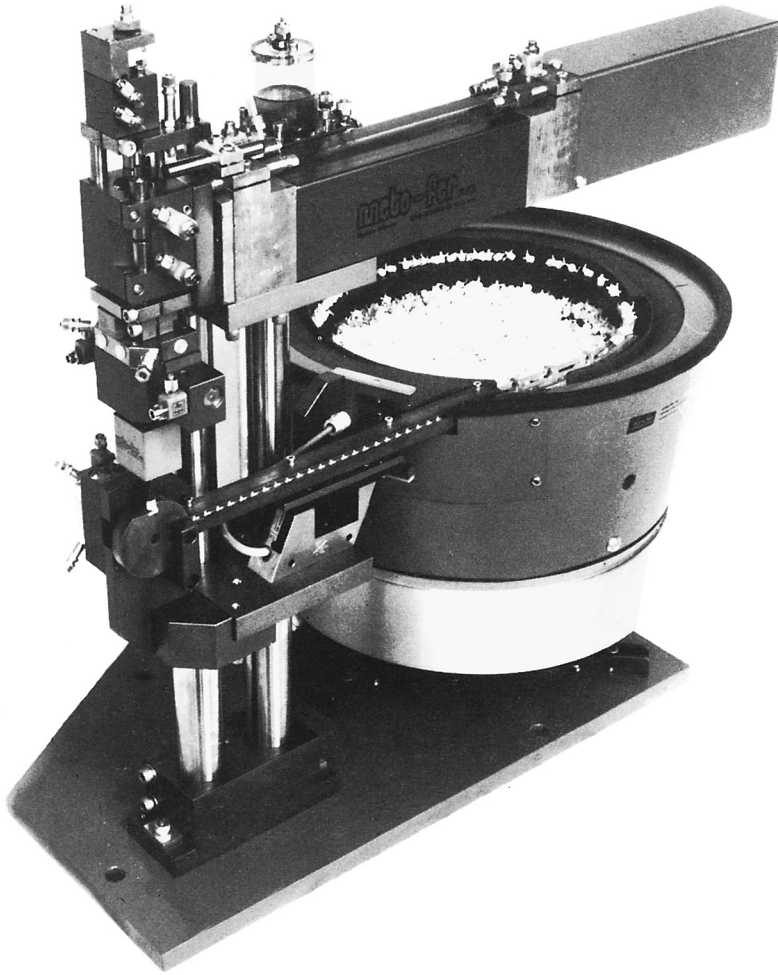
A traversing spindle is used to wind the springs. Two programmable DC motor driven CNC-axes drive the winding process. All other movements are controlled pneumatically. The CNC control unit is an integral part of the spring winding machine.

Tooling adjusts to accommodate different coil lengths. Simple tooling changes accommodate different coil diameters and leg lengths. If necessary, additional tools can be used to bend and form the legs of the springs. Please note that this standard machine is optimized to produce spiral springs with legs, and is not intended to be used to produce compression springs or tension springs.

|                        |   |         |                  |                                  |
|------------------------|---|---------|------------------|----------------------------------|
| <b>Technical Data:</b> | Smallest wire diameter                            | approx. | 0.2              | mm                               |
|                        | Largest wire diameter                             | approx. | 1.5              | mm (depends on torque)           |
|                        | Smallest coil diameter (centerline to centerline) | approx. | 2                | mm                               |
|                        | Largest coil diameter (centerline to centerline)  | approx. | 30               | mm (depends on torque)           |
|                        | Minimum length of legs                            |         | 1/2              | of outside diameter              |
|                        | Maximum length of legs                            |         | 50               | mm                               |
|                        | Maximum total length of both legs                 |         | 100              | mm (legs 2 x 50 mm)              |
|                        | Maximum length of coil                            |         | 42               | mm                               |
|                        | Nominal RPM of winding spindle                    |         | 300              | RPM                              |
|                        | Nominal torque                                    |         | 33.6             | lb.in (3.8 Nm)                   |
|                        | Fast vertical motion of winding spindle           |         | 49.2             | ft/min (15 m/min )               |
|                        | Force of cutting tool                             |         | 562              | lb at 72.5 psi (2500 N at 5 bar) |
|                        | Pneumatic operating pressure                      |         | 58 - 116         | psi (4 - 8 bar)                  |
|                        | Electrical power requirements                     | approx. | 1.341            | hp (1 kW)                        |
|                        | Overall dimensions (Length x Width x Height)      |         | 1420 x 505 x 610 | mm                               |
|                        | Weight  | approx. | 200              | lb (90 kg)                       |

# Pick and Place Load Station

(with Vibratory Bowl Feeder)



## Complete Pick and Place Station

- Linear Unit (LH), Vertical Unit (VE), Rotary Actuator (ZD12/180), Mechanical Gripper (ZZ12, MZ 12)
- Vibratory Feeder with incline track and Rotary Actuator with single escapement
- Standard modular components (no custom adapter plates needed)
- Stroke and rotation adjustable with stop screws (also used for output signal)
- Up to 25 million cycle times
- Seal / Bearing Kits available for all meto-fer components
- PLC for Pick and Place available

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## Sensor reference codes

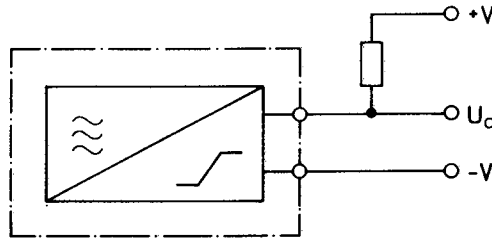
| Designation  | Casing form   | Output technique  | Switching function   | Cable or connector   | Status indicator                          | Option  |
|--|---|---|--|--|---|---|
| <b>XX</b> - <b>XXX</b>   | <b>X</b>  | <b>X</b> - <b>XX</b>  | <b>X</b> - <b>X</b>  |  |   |   |
| <b>IR</b> Inductive round<br><b>IM</b> Inductive quadratic<br><b>QE</b> Sensing elements<br><b>RL</b> Reflex light barrier | <b>003</b> Ø 3 mm<br><b>004</b> Ø 4 mm<br>4x4 mm<br><b>005</b> M5<br><b>006</b> 6 x 6 mm<br><b>065</b> Ø 6.5 mm<br><b>008</b> 8 x 8 mm<br>M8 x 1<br><b>010</b> Ø 10 mm<br><b>012</b> M12 x 1<br><b>018</b> M18 x 1<br><b>022</b> 12 x 22 mm<br><b>812</b> 8 x 12 mm<br><b>525</b> | <b>A</b> Analog<br><b>N</b> NPN Output<br><b>P</b> PNP Output<br><b>E</b> Electromechanical<br><b>R</b> Controllable extern<br><b>D</b> Digital | <b>S</b> Normally open<br><b>O</b> Normally closed<br><b>H</b> Light on<br><b>D</b> Dark on<br><b>B</b> Normally open and Normally closed<br><b>X</b> Vacant | <b>U2</b> Cable PUR 2 meter<br><b>U5</b> Cable PUR 5 meter<br><b>U9</b> Cable PUR 9 meter<br><b>01</b> Connector Meto-Fer<br><b>02</b> Connector Meto-Fer threaded connection<br><b>10</b> 3-Channel connector<br><b>11</b> 3-Channel connector threaded connection<br><b>30</b> 4-Channel connector threaded connection | <b>L</b> with LED<br><b>0</b> without LED | <b>A</b> without corporate name Meto-FerElektronik AG |

## Cable reference codes

| Designation  | Connector form | Number of leads                                 | Cable cross section                  | Cable and length  | Status indicator     |
|--|----------------|---|--------------------------------------|---|----------------------|
| <b>XX</b> - <b>XXX</b>   | -              | <b>X</b>  | <b>X</b> - <b>XX</b>                 |   | <b>X</b>             |
| <b>ST</b> Cable<br><b>01G</b> Meto-Fer connector straight<br><b>02G</b> Meto-Fer connector straight threaded connection<br><b>10G</b> 3 Channel connector straight<br><b>10W</b> 3 Channel connector right angle<br><b>11G</b> 3 Channel connector straight threaded connection<br><b>11W</b> 3 Channel connector right angle threaded connection<br><b>30G</b> 4 Channel connector straight threaded connection<br><b>30W</b> 4 Channel connector right angle threaded connection |                | <b>2</b> Lead<br><b>3</b> Lead<br><b>4</b> Lead | <b>A</b> 0.14 mm<br><b>B</b> 0.25 mm | <b>U2</b> Cable PUR 2 meter<br><b>U5</b> Cable PUR 5 meter<br><b>U9</b> Cable PUR 9 meter | <b>X</b> without LED |

# NAMUR, PNP and NPN Information

NAMUR Proximity Switch:



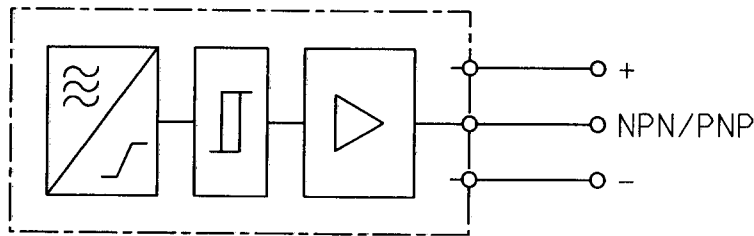
NAMUR-proximity switches have 2 wires which are connected to the supply with a current limiting resistor. The value of the limiting resistor depends on the supply voltage. According to NAMUR, the limiting resistor has a value of 1kOhm at a supply voltage of 8.2V (Temp = +20°C (+68°F)).

When the load is activated, the current consumption of the proximity switch is small; i.e. the voltage drop over the sensor element is large.

When the load is not activated, the current consumption of the proximity switch is large; i.e. the voltage drop over the sensor element is small.

Caution: A serial mounting of NAMUR proximity switches is not allowed!

LOGIC Proximity Switch:



All logic proximity switches that are alternatively available in PNP or NPN version have 3 wires. The PNP-output signal is measured between the PNP-output wire and the negative-voltage supply-wire (blue). The NPN-output signal is measured between the NPN-output wire and the positive-voltage supply-wire (brown).

The parallel-, as well as the serial mounting of 3-wire or 4-wire proximity switches is allowed. The maximum number of serial mounted proximity switches varies depending on the value of the supply voltage and is limited by the value of the respective voltage drop of the elements.

# Precision Stop System With Sensing Element

For monitoring mechanical motions, Meto-Fer has a patented Stop System that provides fine stroke adjustment of the stop position and simultaneously provides an output in electrical, electronic, or pneumatic form to confirm that the stop position has been met.

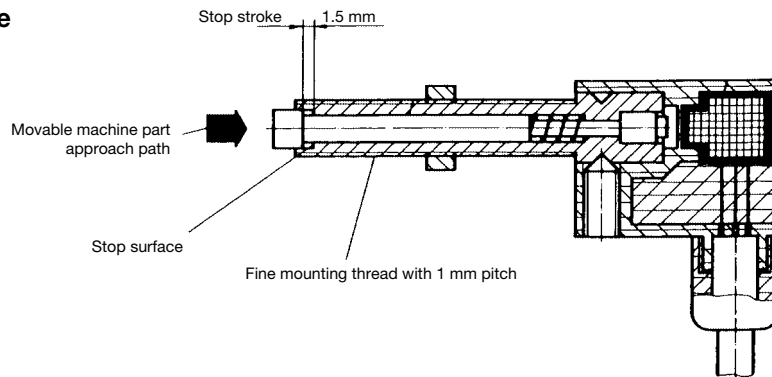
Stop screw with locknut



Plug-in sensing element



## Functional Principle

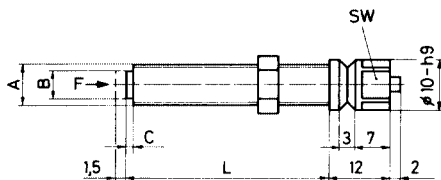


\* Please note additional information on page 12 / 13

- The stop screw is used to adjust the mechanical end-position of the motion.
- The fine thread of the stop screw allows exact adjustment of the mechanical end position. The locknut secures the adjusted position.
- The stop screw contains a spring and hardened stop pin, which operates the attached sensing element when the pin is driven to the end position.
- The stroke of the hardened stop striker is 1.5 mm.
- This combination eliminates the need for a secondary sensor adjustment after the hard stop adjustment has been made.
- They come standard on all our rotary and linear actuators, or they can be integrated into your design as stand alone products whenever precision feedback and adjustment are required.

## Stop Screw AS

| Dimension |     |     |     |                   | Part No.   |
|-----------|-----|-----|-----|-------------------|------------|
| A         | B   | C   | L   | LB (N)            |            |
| M8x1      | 5.5 | 1.5 | 15  | 450 (2,000 N)     | AS 08/15   |
| M8x1      | 5.5 | 1.5 | 40  | 450 (2,000 N)     | AS 08/40   |
| M10x1     | 7.5 | 2.5 | 50  | 2,135 (9,500 N)   | AS 10/50   |
| M12x1     | 9   | 2.5 | 60  | 4,600 (20,500 N)  | AS 12/60   |
| M12x1     | 9   | 2.5 | 80  | 4,600 (20,500 N)  | AS 12/80   |
| M18x1     | 14  | 2.5 | 100 | 10,100 (45,000 N) | AS 18/100  |
| 1/2-20    | 9   | 2.5 | 60  | 4,600 (20,500 N)  | AS 1/2-20  |
| 5/16-24   | 5.5 | 1.5 | 40  | 450 (2,000 N)     | AS 5/16-20 |



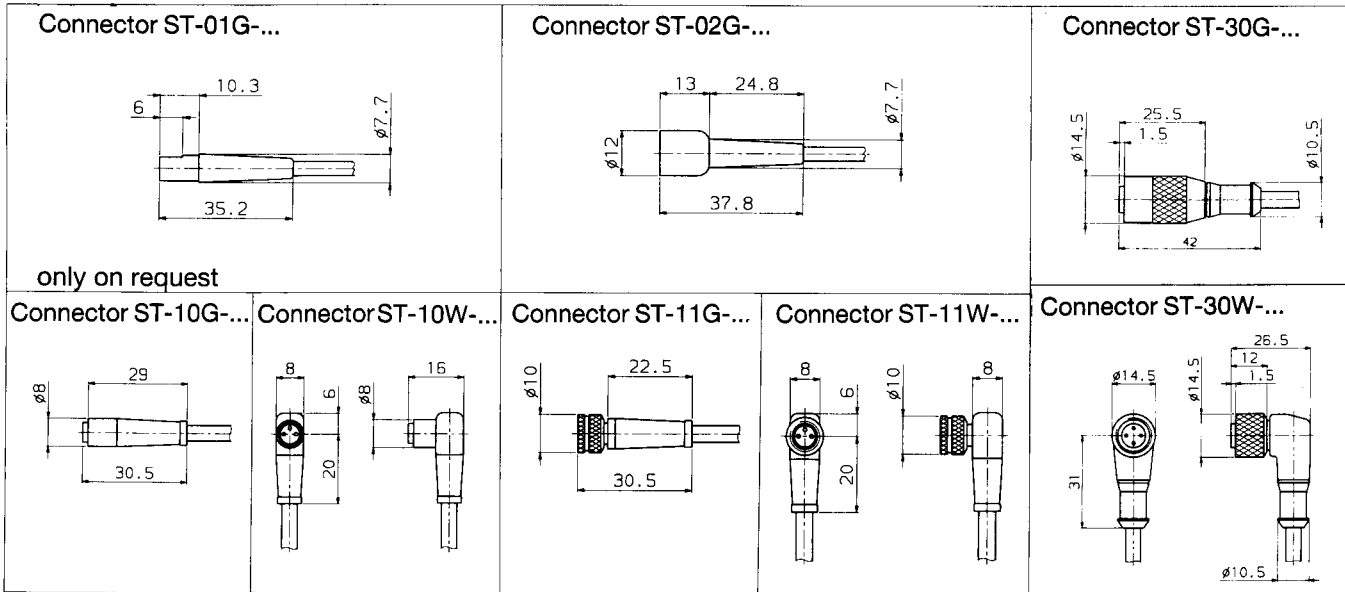
F = force or load (N)  $F = m \times a$   
 M = mass (kg)  $a = \text{acceleration (m/s)}$



# Marking of cables and connectors

Important: Sensors and cables have to be ordered separately. All the indicated part numbers of the sensors in the catalogue which do not have an incorporated cable refer only to the sensor - the corresponding cable is not included in this part-number

The corresponding cable has to be ordered separately according the following table.



Part-Number of cables which correspond to the Meto-Fer connector 01 and 02 (cable cross section: 0.14mm<sub>2</sub>)

| straight plug |        |
|---------------|--------|
| ST-02G-3A-U2X | U2X=2m |
| ST-02G-3A-U5X | U5X=5m |
| ST-02G-3A-U9X | U9X=9m |

Part-Number of cables which correspond to the Standard-Connector 10 (cable cross section: 0.25mm<sub>2</sub>)

| straight plug (NAMUR / LOGIC) | right angle plug (90°) (NAMUR / LOGIC) | Length |
|-------------------------------|--|--------|
| ST-10G-3B-U2X                 | ST-10W-3B-U2X                          | U2X=2m |
| ST-10G-3B-U5X                 | ST-10W-3B-U5X                          | U5X=5m |
| ST-10G-3B-U9X                 | ST-10W-3B-U9X                          | U9X=9m |

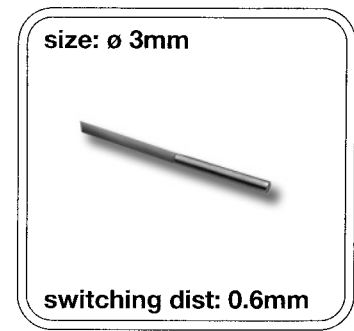
Part-Number of cables which correspond to the Standard-Connector 11 (cable cross section: 0.25mm<sub>2</sub>)

| straight plug (NAMUR / LOGIC) | right angle plug (90°) (NAMUR / LOGIC) | Length |
|-------------------------------|--|--------|
| ST-11G-3B-U2X                 | ST-11W-3B-U2X                          | U2X=2m |
| ST-11G-3B-U5X                 | ST-11W-3B-U5X                          | U5X=5m |
| ST-11G-3B-U9X                 | ST-11W-3B-U9X                          | U9X=9m |

Part-Number of cables which correspond to the Standard-Connector 30 (cable cross section: 0.25mm<sub>2</sub>)

| straight plug (NAMUR / LOGIC) | right angle plug (90°) (NAMUR / LOGIC) | Length |
|-------------------------------|--|--------|
| ST-30G-4B-U2X                 | ST-30W-4B-U2X                          | U2X=2m |
| ST-30G-4B-U5X                 | ST-30W-4B-U5X                          | U5X=5m |
| ST-30G-4B-U9X                 | ST-30W-4B-U9X                          | U9X=9m |

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- smallest size
- flush mount
- easily mounted
- IP 67 system of protection
- LED status indicator



|   |                           |
|---|---------------------------|
| <p>Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010</p>       | <p><b>ø 3mm LOGIC</b></p> |
| <p>wiring diagram<br/>br = brown      sw = black<br/>bl = blue</p> <p>wires are color coded according to EN 50044</p> | <br>                      |
| <b>TECHNICAL DATA</b>   |                           |
| switching hysteresis  | <10%                      |
| repeatability   | <0.01mm                   |
| supply voltage  | 10V.....30V DC            |
| residual ripple per DIN 41755   | 20%                       |
| load current (-10%, +25%)   | 100mA                     |
| current drain, activated  | <10mA                     |
| current drain, not activated  | <2mA                      |
| overvoltage spike protection  | yes                       |
| polarity protection   | yes                       |
| short circuit protection / overvoltage protection   | yes                       |
| switching function  | normally open             |
| output type   | NPN or PNP                |
| LED status indicator  | yes                       |
| switching rate  | 3 kHz                     |
| operating temperature range   | -20°C.....+70°C           |
| casing material   | metal                     |
| cable cross section   | 0.14mm <sup>2</sup>       |
| cable: -standard PUR cable<br>-special length on request  | cable integral molded     |
| system of protection per DIN 40050  | IP 67                     |
| color of active surface   | black                     |

|  |  |
|--|--|
| <p>remarks to the part-number</p>        | <p><b>Part Number</b></p>                            |
| <p><b>Reference codes see page 1</b></p> | <p><b>IR-003-NS-U2L</b><br/><b>IR-003-PS-U2L</b></p> |

size:  $\varnothing$  4mm

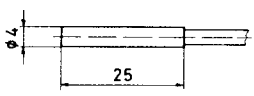
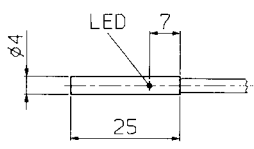
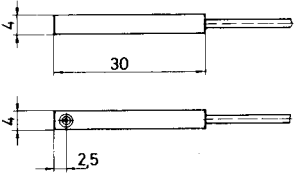
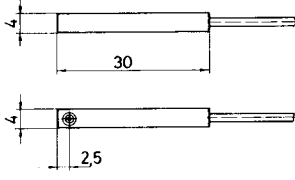
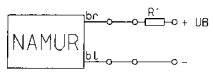
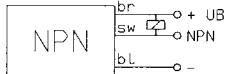
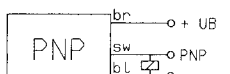
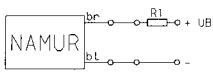
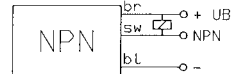
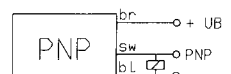


switching distance: 0.8mm

size: 4mm x 4mm



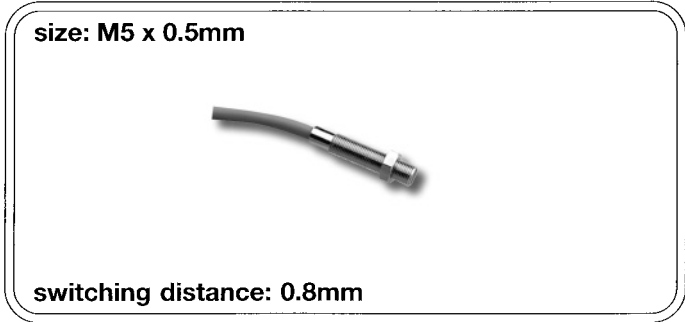
switching distance: 0.8mm

| $\varnothing$ 4mm NAMUR   | $\varnothing$ 4mm LOGIC  | 4 x 4mm NAMUR  | 4 x 4mm LOGIC  |
|---|--|--|--|
|  |   |  |   |
|  | <br> |  | <br> |
|   | <10%   |  | <10%   |
| <0.01mm   | <0.01mm  | <0.01mm  | <0.01mm  |
| 5V.....24 V DC  | 8V.....30V DC  | 5V.....24V DC  | 8V.....30V DC  |
| 10%   | 10%  | 10%  | 10%  |
|   | 200mA  |  | 200mA  |
| <1mA  | <15mA  | <1mA   | <15mA  |
| <4mA  | <2mA   | <4mA   | <2mA   |
|   | yes  |  | yes  |
|   | yes  |  | yes  |
|   | yes  |  | yes  |
| analog  | normally open  | analog   | normally open  |
| Namur per DIN 19234   | NPN or PNP   | Namur per DIN 19234  | NPN or PNP   |
|   | yes  |  | yes  |
| 2 kHz   | 2 kHz  | 2 kHz  | 2 kHz  |
| -20°C.....+70°C   | -20°C.....+70°C  | -20°C.....+70°C  | -20°C.....+70°C  |
| metal   | metal  | metal  | metal  |
| 0.14mm <sup>2</sup>   | 0.14mm <sup>2</sup>  | 0.14mm <sup>2</sup>  | 0.14mm <sup>2</sup>  |
| cable integral molded   | cable integral molded  | cable integral molded  | cable integral molded  |
| IP 67   | IP 67  | IP 67  | IP 67  |
| NAMUR = blue  | NPN = red / PNP = green  | NAMUR = blue   | NPN = red / PNP = green  |

| Part Number   | Part Number                    | Part Number   | Part Number                    |
|---------------|--------------------------------|---------------|--------------------------------|
| IR-004-AX-U20 | IR-004-NS-U2L<br>IR-004-PS-U2L | IM-004-AX-U20 | IM-004-NS-U2L<br>IM-004-PS-U2L |

Reference codes see page 1

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- smallest size
- large switching distances
- easily mounted
- IP 67 system of protection (plug: IP 65)
- LED status indicator



|  | M5 x 0.5mm NAMUR      | M5 x 0.5mm LOGIC        |
|--|-----------------------|-------------------------|
| Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010           |                       |                         |
| wiring diagram<br>br = brown sw = black<br>we = white bl = blue<br><br>wires are color coded according to EN 50044 |                       |                         |
| <b>TECHNICAL DATA</b>  |                       |                         |
| switching hysteresis   |                       | <10%                    |
| repeatability  | <0.01mm               | <0.01mm                 |
| supply voltage   | 5V.....24V DC         | 8V.....30V DC           |
| residual ripple per DIN 41755  | 10%                   | 10%                     |
| load current (-10%, +20%)  |                       | 200mA                   |
| current drain, activated   | <1mA                  | <15mA                   |
| current drain, not activated   | <4mA                  | <2mA                    |
| overvoltage spike protection   |                       | yes                     |
| polarity protection  |                       | yes                     |
| short circuit protection / overvoltage protection  |                       | yes                     |
| switching rate   | analog                | normally open (NO)      |
| output type  | NAMUR per DIN 19234   | NPN or PNP              |
| LED status indicator   |                       | yes                     |
| switching rate   | 2 kHz                 | 2 kHz                   |
| operating temperature range  | -20°C.....+70°C       | -20°C.....+70°C         |
| casing material  | metal                 | metal                   |
| cable cross section  | 0.14mm <sup>2</sup>   | 0.14mm <sup>2</sup>     |
| cable: -PUR cable is standard<br>-cable has to be ordered separately (page 12)                                     | integral molded cable | integral molded cable   |
| system of protection per DIN 40050   | IP 67                 | IP 67                   |
| color of the active surface  | NAMUR = blue          | NPN = red / PNP = green |

| remarks to the part number | Part Number   | Part Number                    |
|----------------------------|---------------|--------------------------------|
| Reference codes see page 1 | IR-005-AX-U20 | IR-005-NS-U2L<br>IR-005-PS-U2L |

size: 6 x 6mm



switching distance: NAMUR 1.5mm / Logic 2mm

size: ø 6.5mm



switching distance: NAMUR 1.5mm / Logic 2mm

| 6 x 6mm NAMUR         | 6 x 6mm LOGIC           | ø 6.5mm NAMUR                                    | ø 6.5mm LOGIC                                    |
|-----------------------|-------------------------|--|--|
|                       |                         |  |  |
|                       |                         |  |  |
|                       |                         |  |  |
|                       |                         |  |  |
|                       | <10%                    |  | <10%   |
| <0.01mm               | <0.01mm                 | <0.01mm  | <0.01mm  |
| 5V.....24V DC         | 8V.....30V DC           | 5V.....24V DC                                    | 8V.....30V DC                                    |
| 10%                   | 10%                     | 10%  | 10%  |
|                       | 200mA                   |  | 200mA  |
| <1mA                  | <15mA                   | <1mA   | <15mA  |
| <4mA                  | <2mA                    | <4mA   | <2mA   |
|                       | yes                     |  | yes  |
|                       | yes                     |  | yes  |
|                       | yes                     |  | yes  |
| analog                | normally open           | analog   | normally open                                    |
| Namur per DIN 19234   | NPN or PNP              | Namur per DIN 19234                              | NPN or PNP                                       |
|                       |                         |  | yes (plug version only)                          |
| 2 kHz                 | 2 kHz                   | 2 kHz  | 2 kHz  |
| -20°C.....+70°C       | -20°C.....+70°C         | -20°C.....+70°C                                  | -20°C.....+70°C                                  |
| metal                 | metal                   | metal  | metal  |
| 0.14mm <sup>2</sup>   | 0.14mm <sup>2</sup>     | 0.14mm <sup>2</sup>                              | 0.14mm <sup>2</sup>                              |
| integral molded cable | integral molded cable   | integral molded cable or connector (see page 12) | integral molded cable or connector (see page 12) |
| IP 67                 | IP 67                   | IP 67 (with plug = IP 65)                        | IP 67 (with plug = IP 65)                        |
| Namur = blue          | NPN = red / PNP = green | Namur = blue                                     | NPN = red / PNP=green                            |

| Part Number   | Part Number                    | Part Number                                     | Part Number  |
|---------------|--------------------------------|---|--|
| IM-006-AX-U20 | IM-006-NS-U2L<br>IM-006-PS-U2L | IR-065-AX-U20<br>IR-065-AX-010<br>IR-065-AX-100 | IR-065-NS-10L<br>IR-065-PS-10L<br>IR-065-NS-01L<br>IR-065-PS-01L<br>IR-065-NS-U2L<br>IR-065-PS-U2L |

Reference codes see page 1

- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- easily mounted
- large switching distances
- cable- and plug version
- IP 67 system of protection (plug version: IP 65)
- LED status indicator

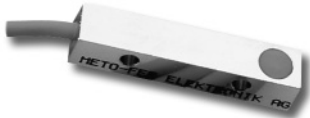
size: M8 x 1mm



switching dist: NAMUR = 1.5mm / Logic = 2mm

|  | M8 x 1mm NAMUR                                   | M8 x 1mm LOGIC   |
|--|--|--|
| Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010 |  |  |
|  |  |  |
| wiring diagram<br>br = brown    sw = black<br>we = white    bl = blue                                    |  |  |
| wires are color coded according to EN 50044  |  |  |
| <b>TECHNICAL DATA</b>  |  |  |
| switching hysteresis   |  | <10%   |
| repeatability  | <0.01mm  | <0.01mm  |
| supply voltage   | 5V.....24V DC                                    | 8V.....30V DC  |
| residual ripple per DIN 41755  | 10%  | 10%  |
| load current (-10%, +20%)  |  | 200mA  |
| current drain, activated   | <1mA   | <15mA  |
| current drain, not activated   | <4mA   | <2mA   |
| overvoltage spike protection   |  | yes  |
| polarity protection  |  | yes  |
| short circuit protection / overvoltage protection  |  | yes  |
| switching protection   | analog   | normally open  |
| output type  | NAMUR per DIN 19234                              | NPN or PNP   |
| LED status indicator   |  | yes (plug version)   |
| switching rate   | 2 kHz  | 2 kHz  |
| operating temperature range  | -20°C.....+70°C                                  | -20°C.....+70°C  |
| casing material  | metal  | metal  |
| cable cross section  | 0.14mm <sup>2</sup>                              | 0.14mm <sup>2</sup>  |
| cable: -PUR cable is standard<br>-cable has to be ordered separately ( page4 )                           | integral molded cable or connector (see page 4 ) | integral molded cable or connector (see page 4 )   |
| system of protection per DIN 40050   | IP 67 (plug version =IP 65)                      | IP 67 (plug version =IP 65)  |
| color of the active surface  | NAMUR = blue                                     | NPN = red / PNP = green  |
| remarks to the part number   | <b>Part Number</b>                               | <b>Part Number</b>   |
| <b>Reference codes see page 1</b>  | IR-008-AX-U20<br>IR-008-AX-010<br>IR-008-AX-110  | IR-008-NS-11L<br>IR-008-PS-11L<br>IR-008-NS-01L<br>IR-008-PS-01L<br>IR-008-NS-U2L<br>IR-008-PS-U2L |

size: 8 x 8mm



switching distance: NAMUR = 1.5mm / Logic = 2mm

size: M12 x 1mm



switching distance: NAMUR = 3mm / Logic = 3mm

| 8 x 8mm NAMUR  |  | 8 x 8mm LOGIC  |  | M12 x 1mm NAMUR                                      |  | M12 x 1mm LOGIC                                      |  |
|--|--|--|--|--|--|--|--|
| U20  |  | U20  |  | U20  |  | U20  |  |
| 01   |  | 01   |  | 02   |  | 02   |  |
| 10   |  | 10   |  | 30   |  | 30   |  |
|  |  |  |  |  |  |  |  |
|  |  | <10%   |  |  |  | <10%   |  |
| <0.02mm  |  | <0.02mm  |  | <0.05mm  |  | <0.05mm  |  |
| 5V.....24VDC   |  | 8V.....30V DC  |  | 5V.....24V DC  |  | 8V.....30V DC  |  |
| 10%  |  | 10%  |  | 10%  |  | 10%  |  |
|  |  | 200mA  |  |  |  | 200mA  |  |
| <1mA   |  | <15mA  |  | <1mA   |  | <15mA  |  |
| <4mA   |  | <2mA   |  | <4mA   |  | <2mA   |  |
|  |  | yes  |  |  |  | yes  |  |
|  |  | yes  |  |  |  | yes  |  |
|  |  | yes  |  |  |  | yes  |  |
| analog   |  | normally open  |  | analog   |  | normally open/closed                                 |  |
| Namur per DIN 19234                                  |  | NPN or PNP   |  | Namur per DIN 19234                                  |  | NPN or PNP   |  |
|  |  | yes (plug version)                                   |  |  |  | yes (plug version)                                   |  |
| 1 kHz  |  | 1 kHz  |  | 1 kHz  |  | 1 kHz  |  |
| -20°C.....+70°C                                      |  | -20°C.....+70°C                                      |  | -20°C.....+70°C                                      |  | -20°C.....+70°C                                      |  |
| metal  |  | metal  |  | metal  |  | metal  |  |
| 0.14mm <sup>2</sup>                                  |  | 0.14mm <sup>2</sup>                                  |  | 0.14mm <sup>2</sup>                                  |  | 0.14mm <sup>2</sup>                                  |  |
| integral cable or cable with connector (see page 4 ) |  | integral cable or cable with connector (see page 4 ) |  | integral cable or cable with connector (see page 4 ) |  | integral cable or cable with connector (see page 4 ) |  |
| IP 67 (with plug = IP 65)                            |  | IP 67 (with plug = IP 65)                            |  | IP 67 (with plug = IP 65)                            |  | IP 65 (with plug = IP 65)                            |  |
| NAMUR = blue   |  | NPN = red / PNP = green                              |  | NAMUR = blue   |  | NPN = red / PNP = green                              |  |

| Part Number   | Part Number   | Part Number   | Part Number   |
|---------------|---------------|---------------|---------------|
| IM-008-AX-100 | IM-008-NS-10L | IR-012-AX-U20 | IR-012-NB-30L |
| IM-008-AX-010 | IM-008-PS-10L | IR-012-AX-300 | IR-012-PB-30L |
| IM-008-AX-U20 | IM-008-NS-01L | IR-012-AX-020 | IR-012-NS-02L |
|               | IM-008-PS-01L |               | IR-012-PS-02L |
|               | IM-008-NS-U2L |               | IR-012-NS-U2L |
|               | IM-008-PS-U2L |               | IR-012-PS-U2L |

Reference codes see page 1

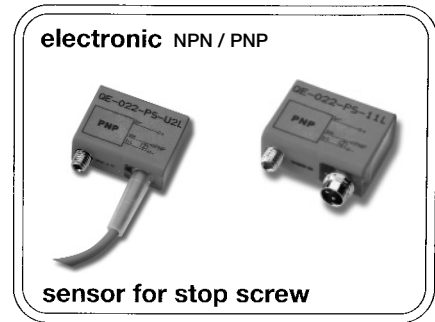
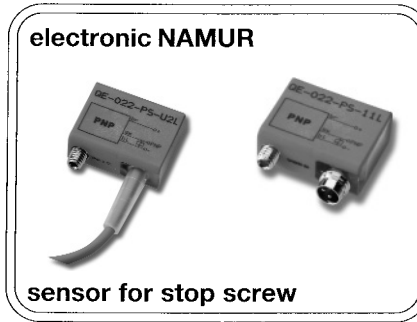
- for non-contact detection of all ferrous- and non-ferrous metals
- highest precision
- large switching distances
- plug version (IP 65)
- easily mounted
- LED status indicator



|   |  |    |  |    |  |
|---|--|----|--|----|--|
| <p>Meto-Fer sensors meet and in most cases exceed the required minimal switching distances per DIN EN 50010</p>                   | <b>M 18 x 1mm LOGIC</b>  |    |  |    |  |
|   | <table border="1" style="width: 100%;"> <tr> <td style="text-align: center; vertical-align: middle;">02</td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center; vertical-align: middle;">30</td> <td style="text-align: center;"> </td> </tr> </table> | 02 |  | 30 |  |
| 02  |  |    |  |    |  |
| 30  |  |    |  |    |  |
| <p>wiring diagram<br/>br = brown    sw = black<br/>we = white    bl = blue</p> <p>wires are color coded according to EN 50044</p> | <table border="1" style="width: 100%;"> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> </tr> </table>   |    |  |    |  |
|   |  |    |  |    |  |
|   |  |    |  |    |  |
| <b>TECHNICAL DATA</b>   |  |    |  |    |  |
| switching hysteresis  | <10%   |    |  |    |  |
| repeatability   | <0.1mm   |    |  |    |  |
| supply voltage  | 8V.....30V DC  |    |  |    |  |
| residual ripple DIN 41755   | 10%  |    |  |    |  |
| load current (-10%, +25%)   | 200mA  |    |  |    |  |
| current drain, activated  | <15mA  |    |  |    |  |
| current drain, not activated  | <2mA   |    |  |    |  |
| overvoltage spike protection  | yes  |    |  |    |  |
| polarity protection   | yes  |    |  |    |  |
| short circuit protection / overvoltage protection   | yes  |    |  |    |  |
| switching function  | normally open/closed   |    |  |    |  |
| output type   | NPN or PNP   |    |  |    |  |
| LED status indicator  | yes  |    |  |    |  |
| switching rate  | 500 Hz   |    |  |    |  |
| operating temperature range   | -20°C.....+70°C  |    |  |    |  |
| casing material   | metal  |    |  |    |  |
| cable cross section   |  |    |  |    |  |
| cable: - cable has to be ordered separately (see page 4 )   |  |    |  |    |  |
| system of protection per DIN 40050  | IP 65  |    |  |    |  |
| color of active surface (NPN = red / PNP = green)   | depend on output function  |    |  |    |  |
| remarks to the part number  | <b>Part-Number</b>   |    |  |    |  |
| <b>Reference codes see page 1</b>   | <p><b>IR-018-NB-30L</b><br/> <b>IR-018-PB-30L</b><br/> <b>IR-018-NS-02L</b><br/> <b>IR-018-PS-02L</b></p>  |    |  |    |  |

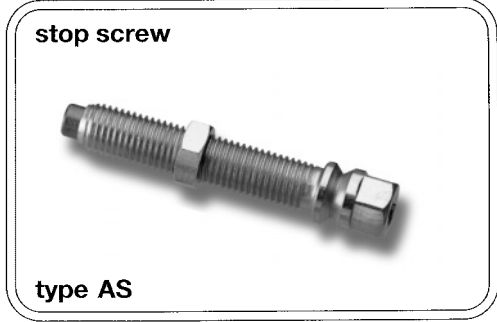
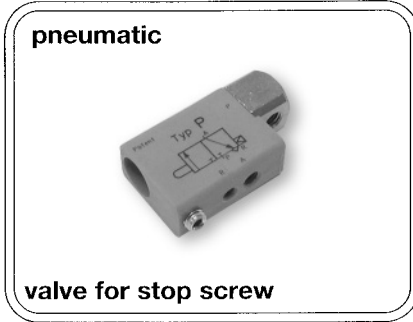
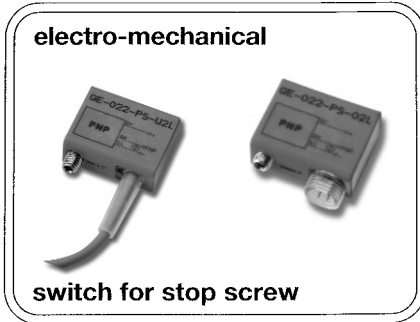


- mechanically adjust stroke limit with electronic or pneumatic sensing device
- element can be plugged on
- Type ..-NS,-PS.: sense with inductive proximity switch
- Type ..-EB: electro-mech. switch
- Type P: 3/2 directional control valve



|   | 22 x 12mm NAMUR   | 22 x 12mm LOGIC   |
|---|---|---|
| Plug on to any stop screw and secure with set screw.                  |   |   |
| wiring diagram<br>br = brown    sw = black<br>we = white    bl = blue |   |   |
| wires are color coded according to EN 50044                           |   |   |
| TECHNICAL DATA  |   |   |
| supply voltage  | 5V.....24V DC   | 8V.....30V DC   |
| residual ripple per DIN 41755   | 10%   | 10%   |
| load current  |   | 200mA   |
| current drain, activated  | <1mA  | <15mA   |
| current drain, not activated  | <4mA  | <2mA  |
| Max. switching current (AC and DC)                                    |   |   |
| Max. switching voltage DC   |   |   |
| Max. switching voltage AC   |   |   |
| polarity protection   |   | yes   |
| short circuit prot. / overvoltage prot.                               |   | yes   |
| switching function  | analog  | normally open   |
| output type   | NAMUR   | NPN or PNP  |
| LED status indicator  |   | yes   |
| switching rate  | 2 kHz   | 2 kHz   |
| operating temperature range   | -20°C.....+70°C   | -20°C.....+70°C   |
| casing material   | plastic   | plastic   |
| cable cross section   | 0.14mm <sup>2</sup>                                       | 0.14mm <sup>2</sup>                                       |
| cable: -PUR cable is standard<br>-cable info - (see page 4 )          | integral molded cable or<br>cable with plug (see page 4 ) | integral molded cable or<br>cable with plug (see page 4 ) |
| system of protection per DIN 40050                                    | IP 67 (plug version = IP 65)                              | IP 67 (plug version = IP 65)                              |
| signal transmitter  | stop screw  | stop screw  |

| remarks to the part number | Part Number                                     | Part Number<br>Sensor  | Cable (2m.6FT)<br><i>*5m and 9m also available</i>         |
|----------------------------|---|--|--|
| Reference codes see page 1 | QE-022-AX-110<br>QE-022-AX-020<br>QE-022-AX-U20 | QE-022-NS-11L<br>QE-022-PS-11L<br>QE-022-NS-02L<br>QE-022-PS-02L<br>QE-022-NS-U2L<br>QE-022-PS-U2L | ST-11G-3B-U2X<br>ST-02G-3A-U2X<br>INTEGRAL<br>MOLDED CABLE |



**electro-mechanical**

U20/02

1.5 A  
48 VDC  
230 VAC ( only for cable version)

change over contact  
el. mechanical change over switch

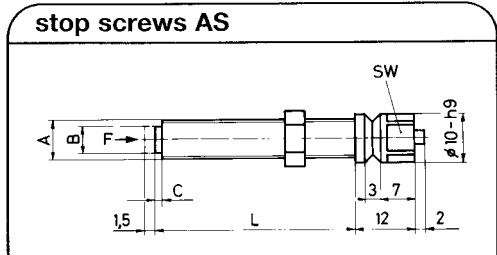
20 Hz  
-20C.....+70C

plastic  
0.14mm<sup>2</sup>  
3-wire cable integral molded  
or cable with plug  
IP 41  
stop screw

**type P = pneumatic**

supply pressure P = 1 - 8 bar  
signal pressure A = P  
nominal width NW = 2.5mm  
pneumatic connection = M5

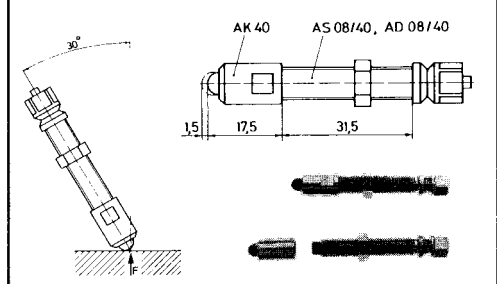
plastic  
stop screw



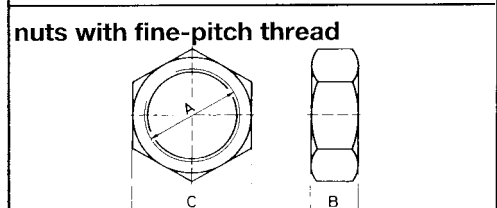
| dimensionen |     |     |     |        | Part No.         |
|-------------|-----|-----|-----|--------|------------------|
| A           | B   | C   | L   | F max. |                  |
| M8x1        | 5.5 | 1.5 | 15  | 2000N  | <b>AS 08/15</b>  |
| M8x1        | 5.5 | 1.5 | 40  | 2000N  | <b>AS 08/40</b>  |
| M10x1       | 7.5 | 2.5 | 50  | 9500N  | <b>AS 10/50</b>  |
| M12x1       | 9   | 2.5 | 60  | 20500N | <b>AS 12/60</b>  |
| M12x1       | 9   | 2.5 | 80  | 20500N | <b>AS 12/80</b>  |
| M18x1       | 14  | 2.5 | 100 | 45000N | <b>AS 18/100</b> |

F = force or load (N) F = m x a  
m = mass (kg)  
a = acceleration (m/s<sup>2</sup>)

**spherical head type AK 40 for operating the stop screw AS 08/40 at an off centre angle**



**Part Number: AK 40**



| dimensionen |     |    | Part No.         |
|-------------|-----|----|------------------|
| A           | B   | C  |                  |
| M5x0.5      | 2.5 | 8  | <b>MU 01.001</b> |
| M6x0.5      | 2.5 | 8  | <b>MU 01.002</b> |
| M8x1        | 4   | 10 | <b>MU 01.003</b> |
| M10x1       | 4   | 13 | <b>MU 01.004</b> |
| M12x1       | 4   | 15 | <b>MU 01.005</b> |
| M14x1       | 4   | 16 | <b>MU 01.006</b> |
| M18x1       | 6   | 22 | <b>MU 01.007</b> |

| Part Number                      | Cable (2m.6FT)               | Part Number   |
|----------------------------------|------------------------------|---|
| <i>*5m and 9m also available</i> |                              |   |
| <b>QE-022-EB-110</b>             | <b>ST-11G-3B-U2X</b>         | <b>P</b><br>the pneumatic element is available in one type only |
| <b>QE-022-EB-020</b>             | <b>ST-02G-3A-U2X</b>         |   |
| <b>QE-022-EB-U20</b>             | <b>INTEGRAL MOLDED CABLE</b> |   |

Reference codes see page 1

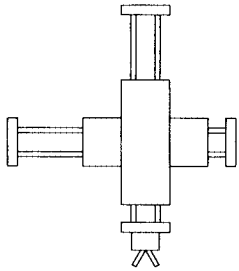
# StopScrew AS (with extended stroke)

Use of the StopScrew with Extended Stroke and the QE-OSN-PS-11L Sensing Unit (see QE022-PS-11L data on page 12) enables achievement of shorter cycle times.

Depending on designated stroke (5, 10 or 20mm) the signal is advanced accordingly by 5, 10 or 20mm before the end stop. (The signal will be held).

Early signal compensation will be allowed for the start delay of a motion (approx. 0.1 sec.) through values and air flow.

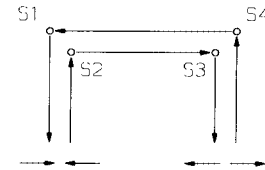
Motion Example:



Motion Curve  
"AS Standard  
StopScrew"

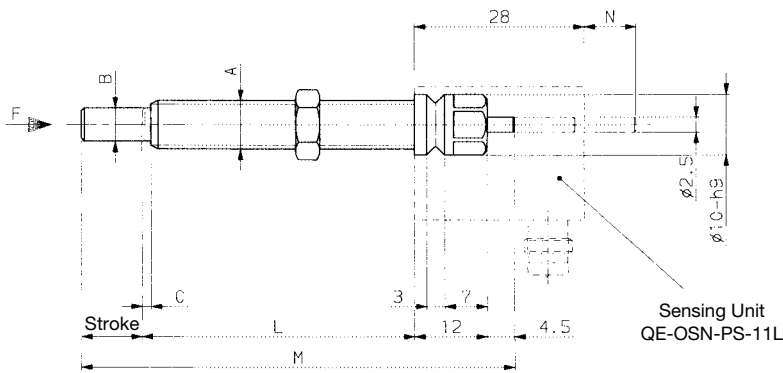


Motion Curve  
"AS StopScrew with  
Extended Stroke"



Example of 4 Cycle Positions (S1, S2, S3, S4) with time savings

**Time savings of approx. 0.5 sec.**



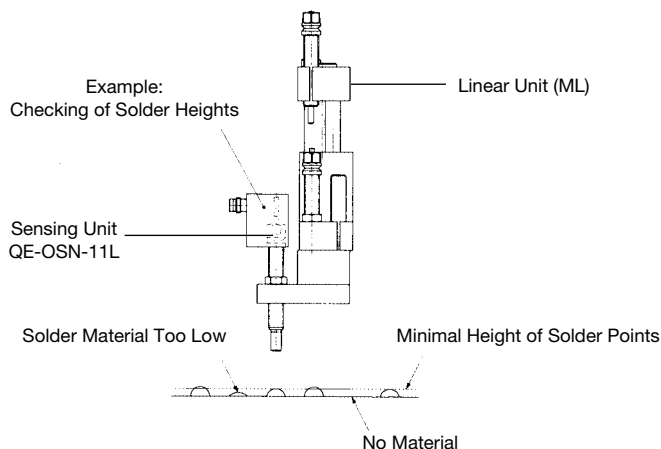
Sensing Unit  
QE-OSN-PS-11L

| A     | B   | C   | L  | Stroke | M    | N | F [N] |       | Order No.  |
|-------|-----|-----|----|--------|------|---|-------|-------|------------|
|       |     |     |    |        |      |   | min.  | max.  |            |
| M8x1  | 5.5 | 1.5 | 45 | 10     | 71.5 | - | 6     | 2000  | AS08/45-10 |
| M10x1 | 7.5 | 2.5 | 50 | 10     | 76.5 | - | 10    | 9500  | AS10/50-10 |
| M12x1 | 9.0 | 2.5 | 60 | 10     | 86.5 | - | 10    | 20500 | AS12/60-10 |

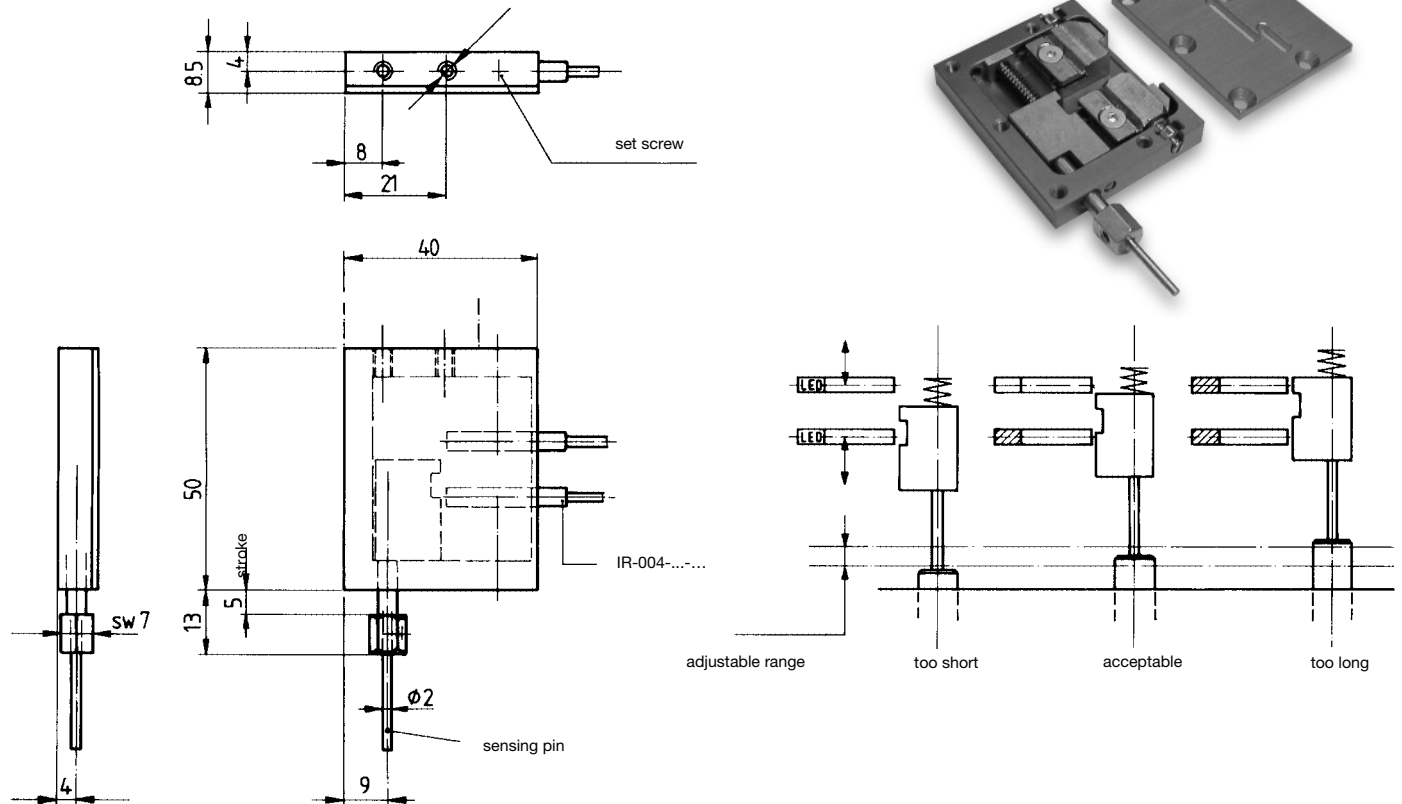
Sensing Unit



**Order No:**  
QE-OSN-PS-11L



# Height Gauge KV (precision sensing unit)



## Application:

- Tolerance control with output signal for too short, acceptable, too long
- Check for failure
- Presence control

The height gauge KV is used for the control of two adjustable positions with a range from 0.03 to 5 mm.

Whenever precision feedback and adjustment are required.  
Output signal; when the preset limiting values are reached.

## Order No.

**KV 01- ...**

O-without proximity switches

A-with 2 inductive proximity switches IR-004-NS-U2L (NPN, normally open)

B-with 2 inductive proximity switches IR-004-PS-U2L (PNP, normally open)

C-with 2 inductive proximity switches IR-004-AX-U20 (NAMUR, analog)

\*All proximity switches have molded cable, see page 6

## Technical data:

- Control range is adjustable with two set screws (sensor position 1 and 2)
- Adjustable range: 0.03 - 5 mm (0.00118-0.196 inch)
- Spring force: 140 - 210 g (0.308-0.463 lb)
- Repeatability: +/- 0.03 mm (+/-0.00118 inch)
- Weight: 0.07 kg (0.154 lb)
- For horizontal and vertical applications

# LINEAR TRANSFER SYSTEMS

SECTION 10



Your complete source for industrial automation and electronics

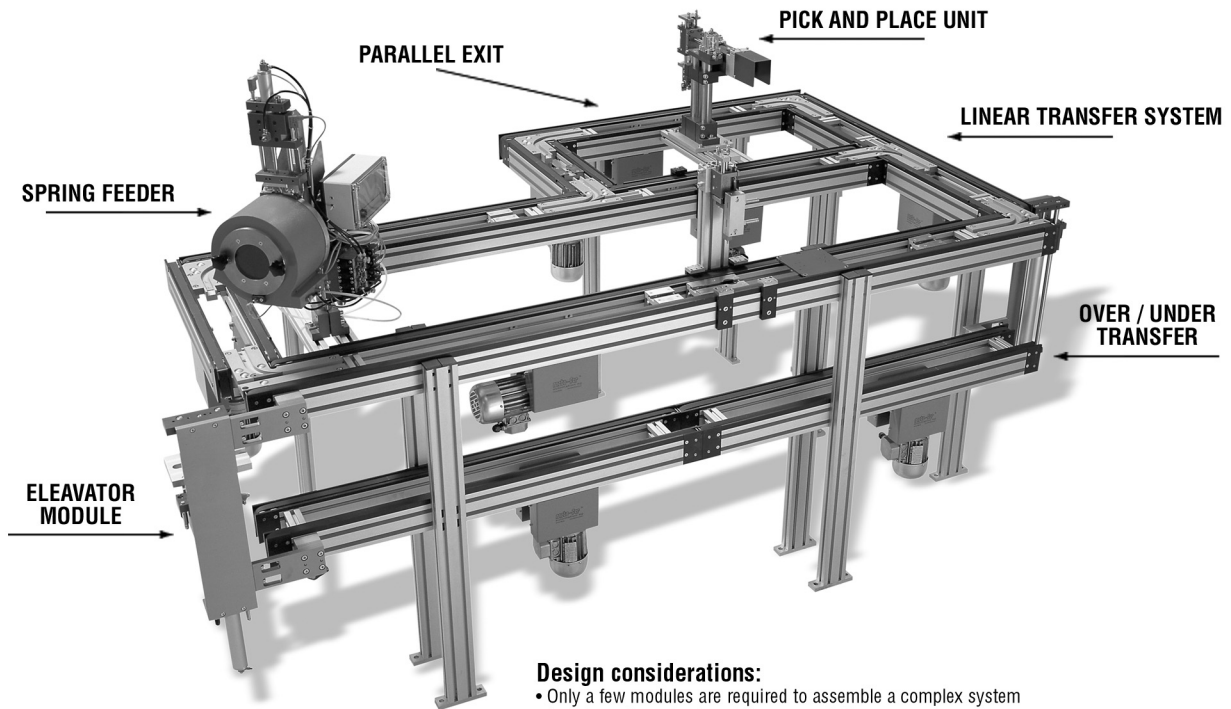
**mf automation, inc.**

[www.meto-fer.com](http://www.meto-fer.com)

1-888-638-6337

# Linear Transfer System MP

## Linear Pallet Transfer System Two-Belt System



### Design considerations:

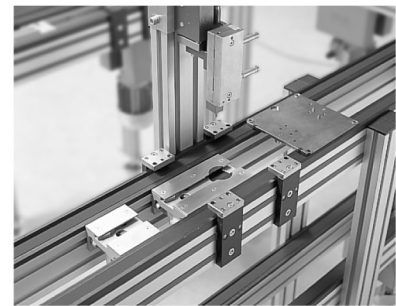
- Only a few modules are required to assemble a complex system
- A variety of standard modules are available
- The MP System supports manual, semi-automatic or fully automatic operation
- The MP System can be easily expanded and all modules can be entirely re-used
- The MP System facilitates fast and reliable transport of aluminum pallets
- Any number of manual work modules can be directly integrated into the main system



Switch Point



Partial Track Connection



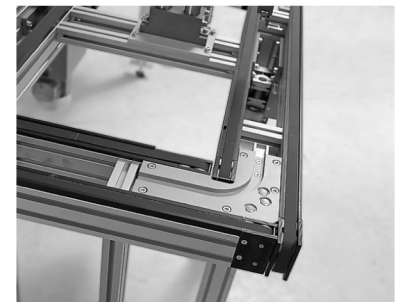
Position Station



Partial Track with Drive Unit





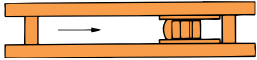

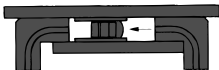
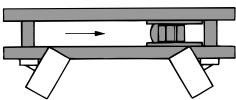
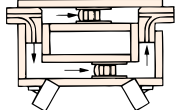
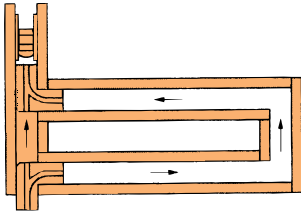
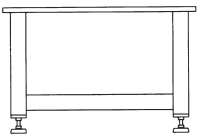
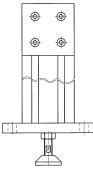
Vertical End Module with Lift



End Module

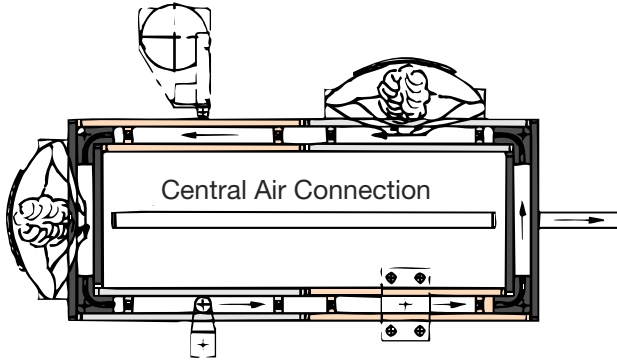
See web page: [www.meto-fer.com/2LTSSub.html](http://www.meto-fer.com/2LTSSub.html)

## Following is the list of components used in the Modular Assembly System:

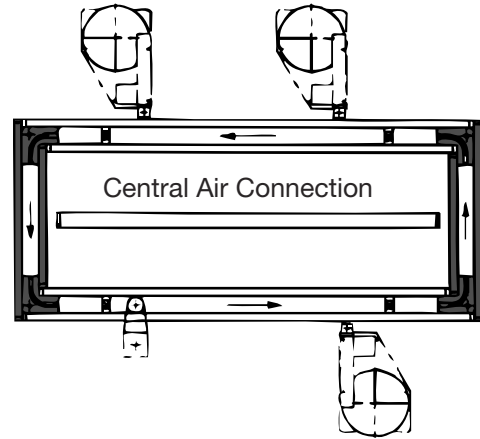
|   | Component No.   | Page No. |
|---|---|----------|
| Pallet (Coding "MC")<br>                                      | ① ②<br>MPA-010-xxx-xxx<br>① = Pallet Length in mm<br>② = Pallet Width in mm | 10.003   |
| Positioning for automation workstation/manual workstation<br> | MPA-020-xxx-xxx<br>MPA-025-xxx-xxx  | 10.004   |
| Partial transport tracks<br>                                  | MPA-030-xxx-xxx   | 10.005   |
| Connecting transport tracks<br>                               | MPA-040-xxx-xxx<br>MPA-045-xxx-xxx  | 10.005   |
| End modules<br>   | MPA-050-xxx-xxx<br>MPA-051-xxx-xxx  | 10.006   |
| Manual workstation A (in line)<br>                           | MPA-060-xxx-xxx   | 10.006   |
| Manual workstation B (parallel exit)<br>                    | MPA-070-xxx-xxx   | 10.007   |
| Manual workstation C (perpendicular exit)<br>               | MPA-080-xxx-xxx   | 10.007   |
| Base table<br>  | MPA-090-xxx-xxx<br>MPA-091-xxx-xxx<br>MPA-092-xxx-xxx<br>MPA-093-xxx        | 10.008   |
| Support stands<br>  | MPA-110-xxx   | 10.008   |

# Combination Examples of MP Systems

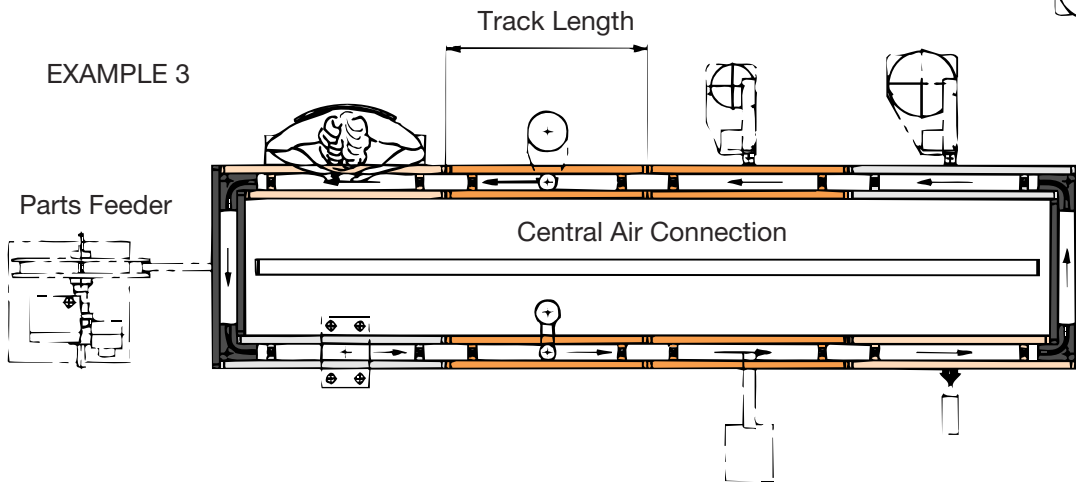
EXAMPLE 1



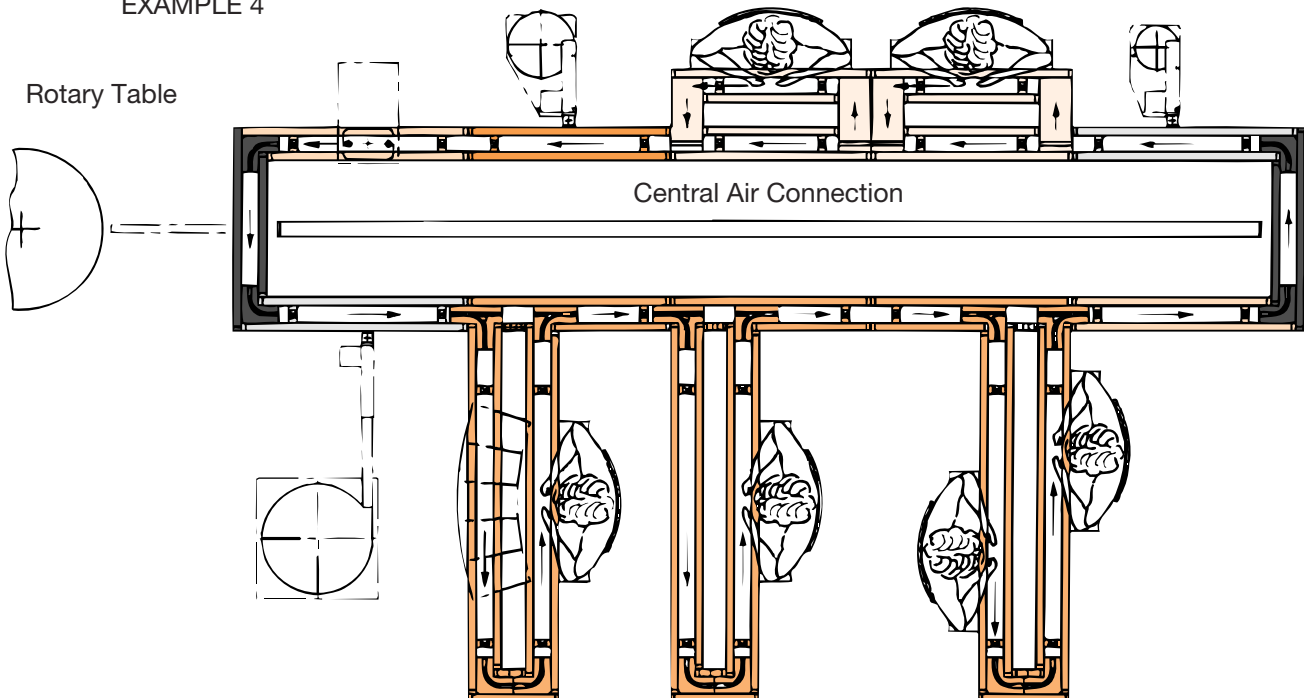
EXAMPLE 2



EXAMPLE 3



EXAMPLE 4





**INQUIRY SHEET: Pallet / Chain Transporter or MP-System (2 belt)**

COMPANY: \_\_\_\_\_ PHONE: \_\_\_\_\_

CONTACT NAME: \_\_\_\_\_ FAX: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ EMAIL: \_\_\_\_\_

CITY / STATE / ZIP: \_\_\_\_\_

**SYSTEM DATA INFO:**

Approximate Length of system: \_\_\_\_\_

Approximate Width of system: \_\_\_\_\_

Dimensions of product to be handled:

Length: \_\_\_\_\_

Width: \_\_\_\_\_

Height: \_\_\_\_\_

Weight of product: \_\_\_\_\_

Weight of work piece holder per pallet: \_\_\_\_\_

Pallet size: Length: \_\_\_\_\_

Width: \_\_\_\_\_

Number of Pallets: \_\_\_\_\_

Chain/Belt Speed: \_\_\_\_\_

Direction of travel:  Clockwise  Counter clockwiseIncluding proximity switch:  YES  NO  NPN or  PNP

Automatic Workstation: (1pc. Pre-stop, 1pc. Stop, 1pc. lift) \_\_\_\_\_ pc. (+ / - 0.02 mm accuracy)

Manual Workstation: (1pc. Pre-stop and 1pc. Stop) \_\_\_\_\_ pc. (+ / - 0.5 mm accuracy)

Height of system: \_\_\_\_\_ (Top of Chain/Belt)

Coding systems:  YES  NO

Additional comments:

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PLEASE SEND OR FAX INQUIRY REQUEST TO:

mf automation, Inc.  
 355 Wyoming Street • Pittsburgh, PA 15211  
 Phone: 412-488-3488  
 Fax: 412-488-3498

## Pallets

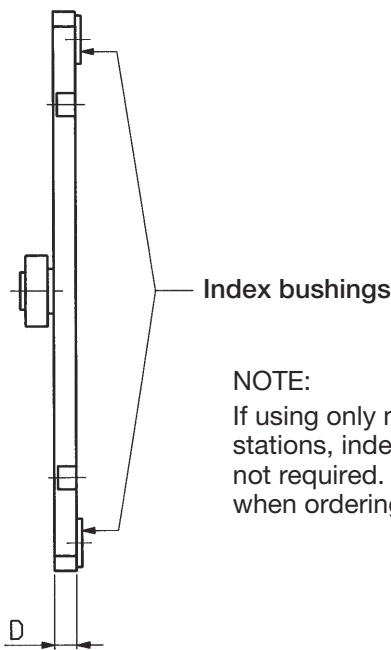
- The pallets provide a platform for fixtures and coding system.
- Meto-Fer® offers a mechanical coding system ("MC").
- The positioning accuracy of the pallets is 0.02mm (standard).  
Option: Positioning accuracy for pallet size up to 200 x 200 mm, 0.01mm.
- The wide range of pallets allows for optimal adaptation to your product.

### Standard Sizes

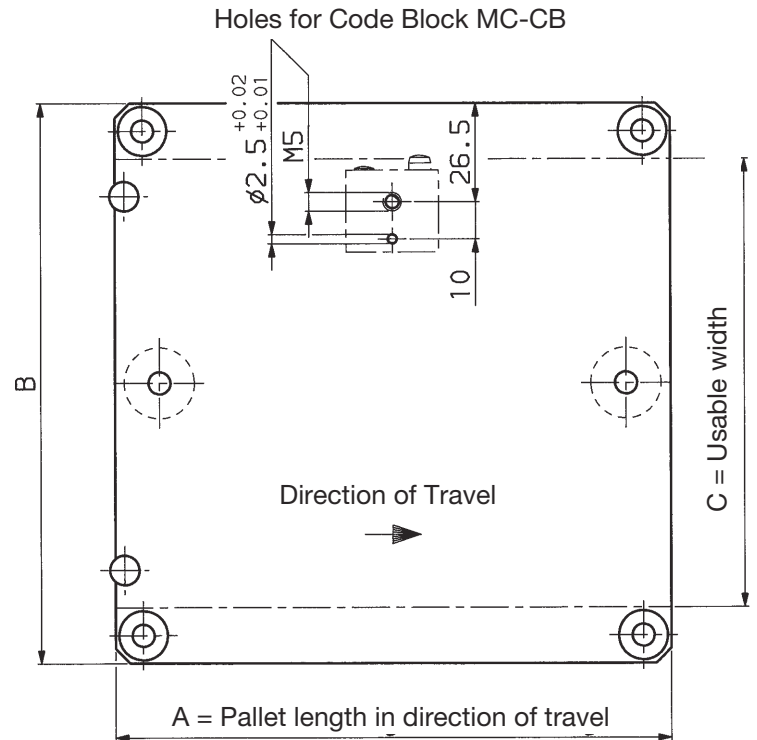
| Pallet Size<br>AxB                    | C   | D  | Pallet Interchange<br>Time (sec.) | Material                            |
|---------------------------------------|-----|----|-----------------------------------|-------------------------------------|
| 150x100                               | 82  | 10 | 1.2                               | Aluminum<br>(AlMg4.5Mn<br>No. 5083) |
| 150x150                               | 120 | 10 | 1.2                               |                                     |
| 200x150                               | 120 | 10 | 1.4                               |                                     |
| 200x200                               | 170 | 10 | 1.4                               |                                     |
| 250x200                               | 170 | 10 | 1.6                               |                                     |
| 250x250                               | 220 | 10 | 1.6                               |                                     |
| 300x200                               | 170 | 10 | 1.8                               |                                     |
| 300x300                               | 270 | 10 | 1.8                               |                                     |
| 400x300                               | 270 | 10 | 2.2                               |                                     |
| 400x400                               | 370 | 10 | 2.2                               |                                     |
| 500x400                               | 370 | 10 | 2.6                               |                                     |
| 500x500                               | 470 | 10 | 2.6                               |                                     |
| Option up to 1,500 x 1,000mm possible |     |    |                                   |                                     |

**Recommendation for number of pallets per systems:**

3 pcs. per station + an additional 6 pcs.



**NOTE:**  
If using only manual work-stations, index bushings are not required. Please specify when ordering.



**Order No.** for Pallets

**MPA-010-xxx-xxx** ① = Pallet Length in mm  
② = Pallet Width in mm

## Mechanical Coding System MC

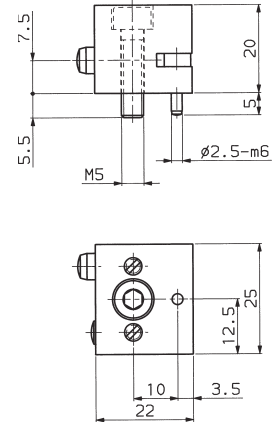
The Coding System transfers information regarding the status of assembly, such as:

- acceptable / failure
- part present/not present
- status of process
- transportation destination (exit, straight forward)

### Coding Block: Type MC-CB

This is the information carrier about the status of the work piece which circulates on the MP-System from station to station. In each coding block are 2 coding pins. One pin is for the "Set", the other for the "Read" and reserve. The mechanical coding system requires that each pallet is equipped with a minimum of one coding block. Several coding blocks can be mounted next to each other.

Order No. MC-CB-01-06



### Coding Setter: Type MC-CS

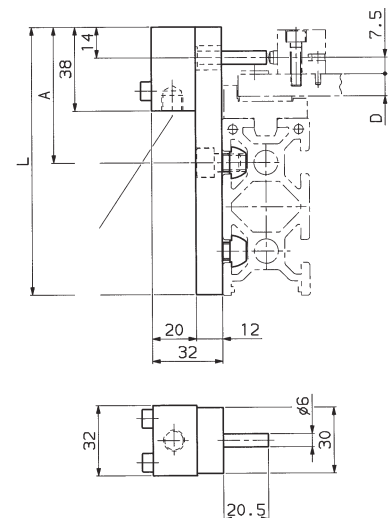
The Coding Setter serves to "Set" and "Reset" of the coding pin. It consists of a single acting cylinder which is mounted to the MP-profile by an adapter. To "Set" the coding pin, the pallets have to be stopped.

| Pallet Thickness—D | L   | A    |
|--------------------|-----|------|
| 10                 | 121 | 61.5 |

Air consumption per stroke 0.1 ml

Amount: 1 pc. per station

Order No. MC-CS-01-10 (for pallet thickness 10mm)



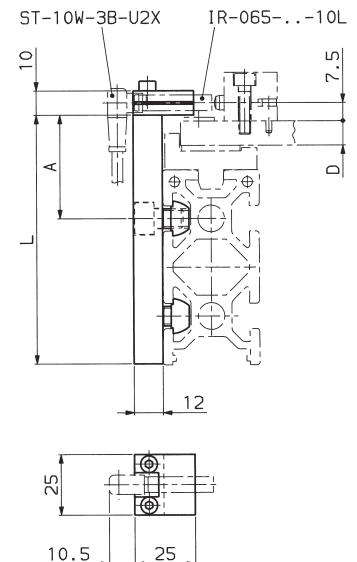
### Code Reader: Type MC-CL

The code reader is used to read the coding pins. The reading is done by inductive proximity switch with LED display.

| Pallet Thickness—D | L   | A    |
|--------------------|-----|------|
| 10                 | 102 | 42.5 |

Amount: 1 pc. per station

Order No. MC-CL-01-10 (for pallet thickness 10mm)



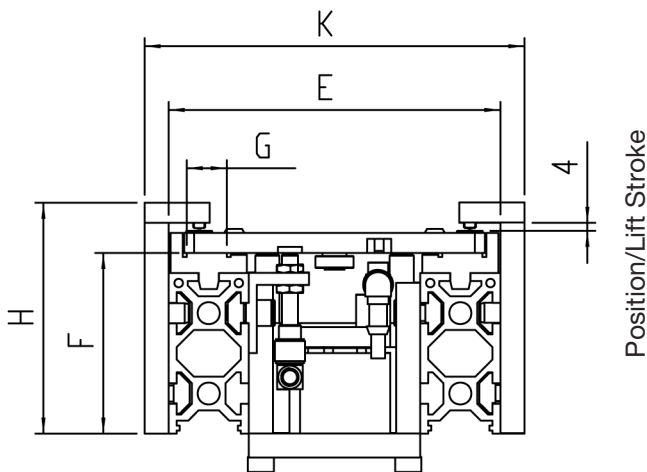
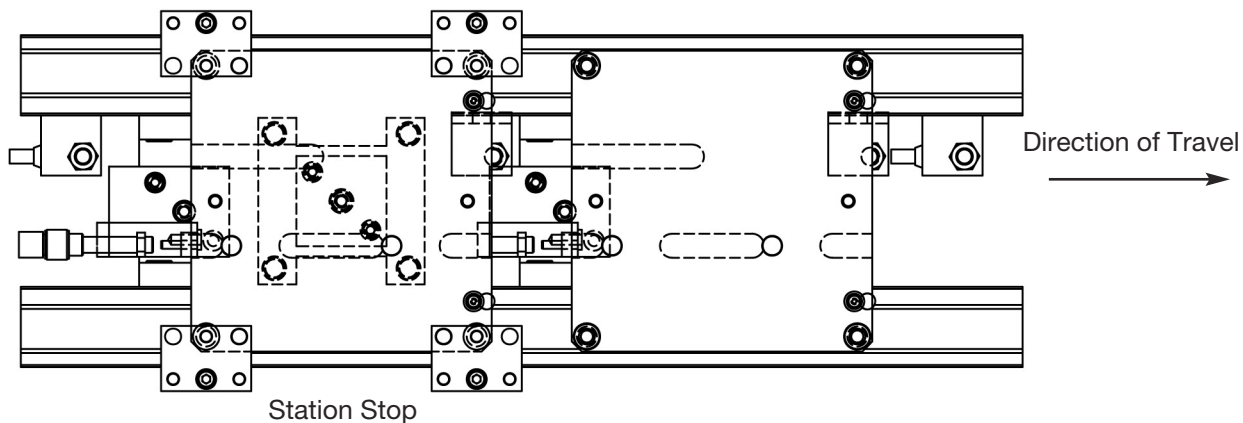
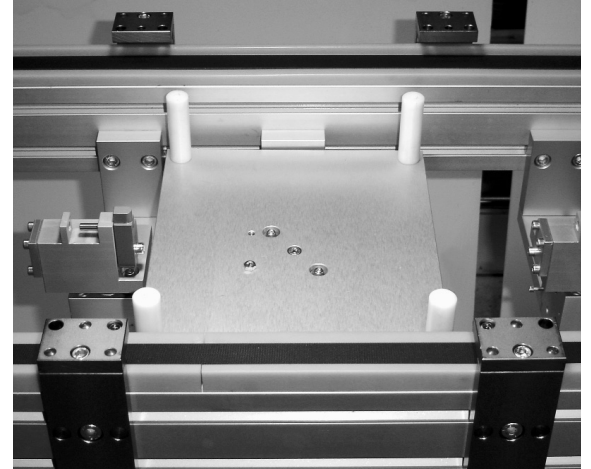
**NOTE:** Sensors and cables are not included with the pallet system and need to be ordered separately.

Sensor: Order No. IR-065-NS-10L (NPN) or IR-065-PS-10L (PNP)

Cable: Order No. ST-10W-3B-U2X (2m) ST-10W-3B-U5X (5m)

## Positioning (Automatic Workstation)

- For accurate positioning, the pallets are lifted from the transport belts and positioned with pins/cones.
- The positioning accuracy is +/- 0.02mm in the standard version. We offer options up to 200 x 200 pallet size with a positioning accuracy of +/- 0.01mm.
- The positionings can be fixed at any place over the entire length of the lateral transport without any mechanical modifications.
- 2 or more workstations can be set up per partial lateral transport.
- The pallets are cushioned in the end position.
- If required, positioning stations are available for:
  - access from underneath (working from below possible)
  - the pallet supported from underneath (press from above possible)
  - the pallet to be changed by quick exchange (short pallet changing times)



Air Consumption per Stroke 0.4 NL  
3 Cyl. diameter 32 with 5mm stroke

| Pallet Size<br>AxB | E   | F  | G  | H   | K   |
|--------------------|-----|----|----|-----|-----|
| 150x100            | 111 | 60 | 14 | 80  | 135 |
| 150x150            | 165 | 90 | 20 | 115 | 189 |
| 200x150            | 165 | 90 | 20 | 115 | 189 |
| 200x200            | 215 | 90 | 20 | 115 | 239 |
| 250x200            | 215 | 90 | 20 | 115 | 239 |
| 250x250            | 265 | 90 | 20 | 115 | 289 |
| 300x200            | 215 | 90 | 20 | 115 | 239 |
| 300x300            | 315 | 90 | 20 | 115 | 339 |
| 400x300            | 315 | 90 | 20 | 115 | 339 |
| 400x400            | 415 | 90 | 20 | 115 | 439 |
| 500x400            | 415 | 90 | 20 | 115 | 439 |
| 500x500            | 515 | 90 | 20 | 115 | 539 |

**NOTE:** Sensors (4 pieces) and cables are not included with the pallet system and need to be ordered separately.

**Sensor:**      **Order No.**      IR-008-NS-11L (NPN) or  
IR-008-PS-11L (PNP)

**Cable:**        **Order No.**        ST-11W-3B-U2X

**Order No.**      for Positioning Automatic Station:

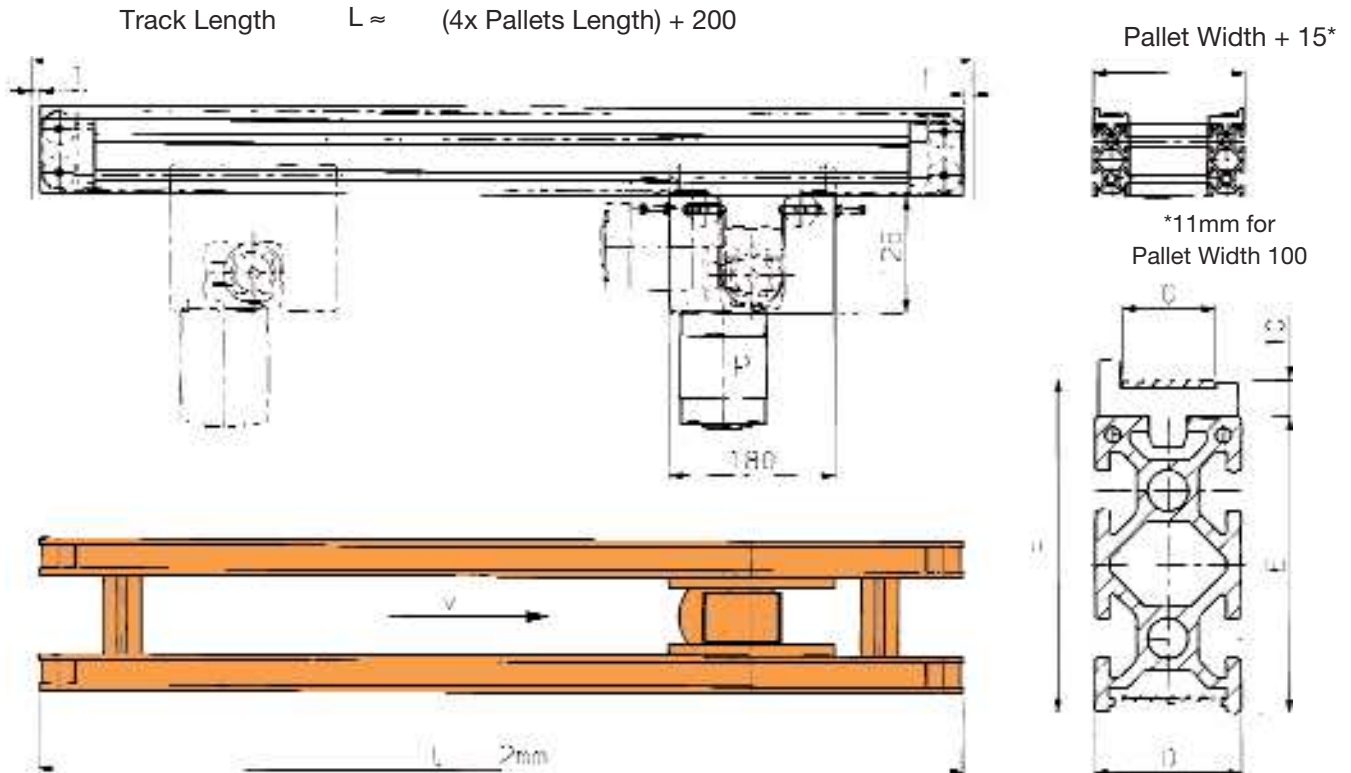
**MPA-020-xxx-xxx**

① = Pallet Length in mm  
② = Pallet Width in mm



## Partial Transport Track

- A partial transport track consists of 2 equal length transport belts and a common drive with rubber coated drive pulley. The belts of the transport tracks can be separately tightened and exchanged.
- The drive can be fixed at any place of the partial track.
- In addition to standard lengths of partial tracks, special lengths between 300mm and 5000mm are available.
- Several stations can be mounted on a partial track.



### Standard - Track Length

| Pallet Length | Track Length | D  | E  | F  | G  | v* [mm/s] |
|---------------|--------------|----|----|----|----|-----------|
| 100           | 1000         | 25 | 50 | 60 | 14 | 300       |
| 150           | 1000         | 40 | 80 | 90 | 20 | 300       |
| 200           | 1000         | 40 | 80 | 90 | 20 | 300       |
| 250           | 1200         | 40 | 80 | 90 | 20 | 300       |
| 300           | 1400         | 40 | 80 | 90 | 20 | 200       |
| 400           | 1800         | 40 | 80 | 90 | 20 | 200       |
| 500           | 2200         | 40 | 80 | 90 | 20 | 200       |

3 Phase AC Motor  
208

\* faster or slower transport speeds available (max.500mm/s, depending on transport weight)

Order No. for Partial Transport Track:

MPA-030-<sup>①</sup>xxx-<sup>②</sup>xxx

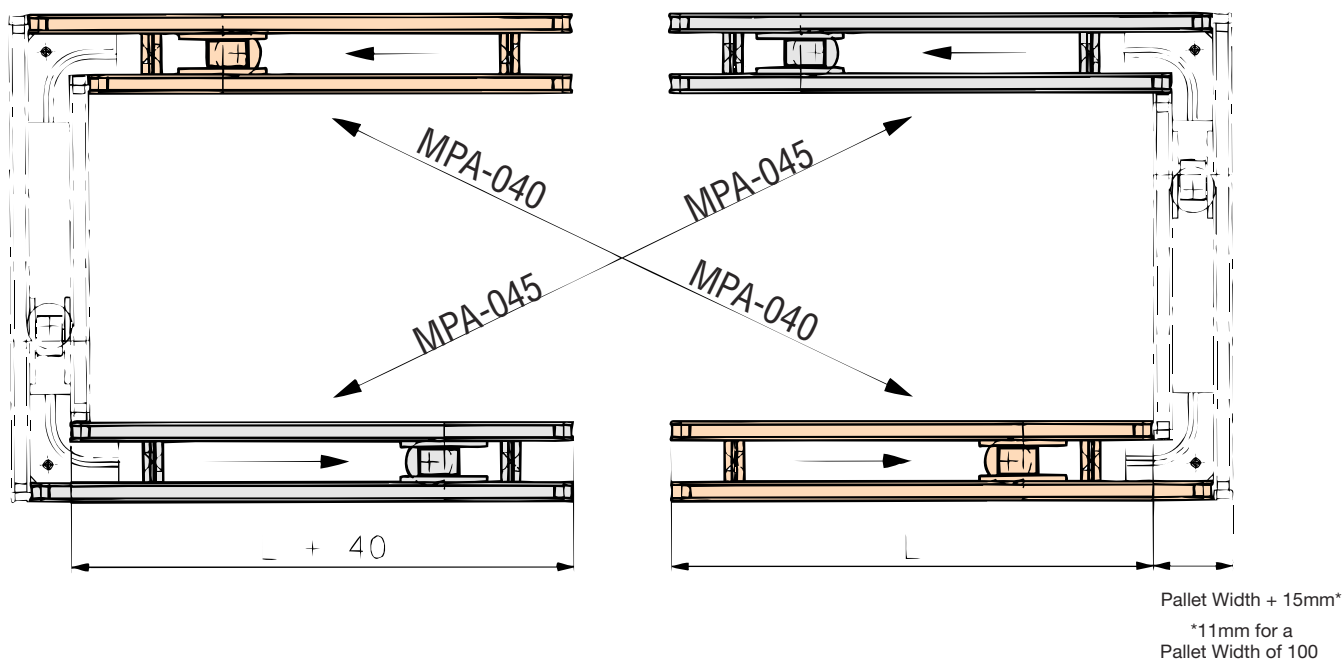
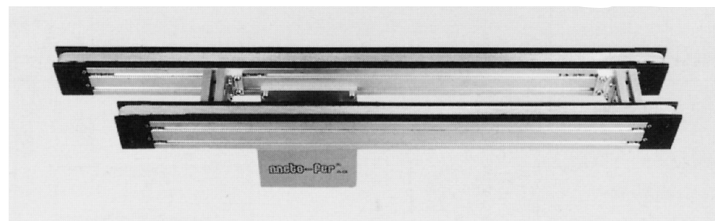
① = Pallet Length in mm  
② = Pallet Width in mm

## Connecting Transport Tracks

- Each connecting transport track consists of two transport belts of different lengths and one common drive as similar to the partial transport track.
- Two each connecting tracks are identical.
- Special lengths up to 5000 mm are available.
- Small single purpose systems can be constructed using only one drive. See example 2 on page 10.002.
- Automatic stations and manual stations can be integrated into the connecting transport tracks

### Standard Dimension:

| Pallet Length | L    |
|---------------|------|
| 100           | 1000 |
| 150           | 1000 |
| 200           | 1000 |
| 250           | 1200 |
| 300           | 1400 |
| 400           | 1800 |
| 500           | 2200 |



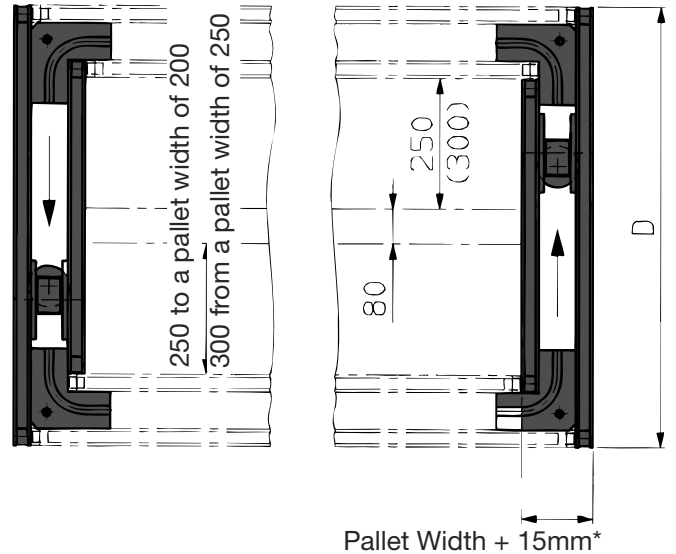
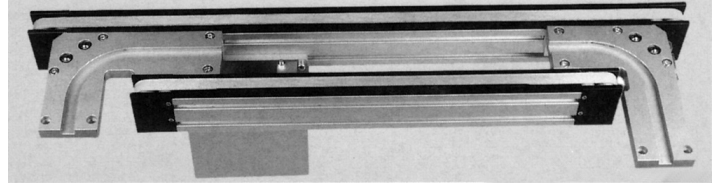
**Order No.** for One Connecting Transport Track:

① ②  
**MPA-040-xxx-xxx**  
**MPA-045-xxx-xxx**

① = Pallet Length in mm  
 ② = Pallet Width in mm

## End Module

- Each turn-around consists of two transport belts of different lengths and a common drive as on the partial transport track.
- The turn-around to the left and right are identical.
- Each turn-around contains tow angles with guiding track and support transfers for the transport pallets.
- The End Modules are directly assembled to the connecting transport tracks.
- Automatic Stations and manual stations can be integrated into the end modules. (Dimension D; Change)



\*11mm for a pallet width of 100

### Standard Dimensions:

| Pallet Width B | D    |
|----------------|------|
| 100            | 810  |
| 150            | 910  |
| 200            | 1010 |
| 250            | 1210 |
| 300            | 1310 |
| 400            | 1510 |
| 500            | 1710 |

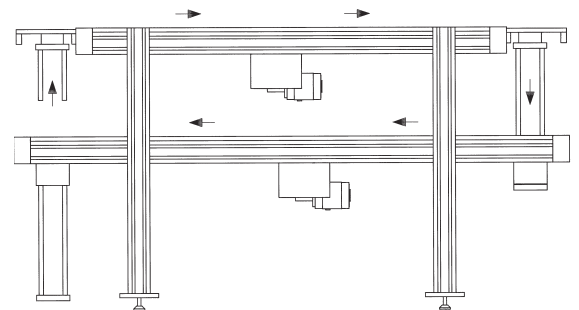
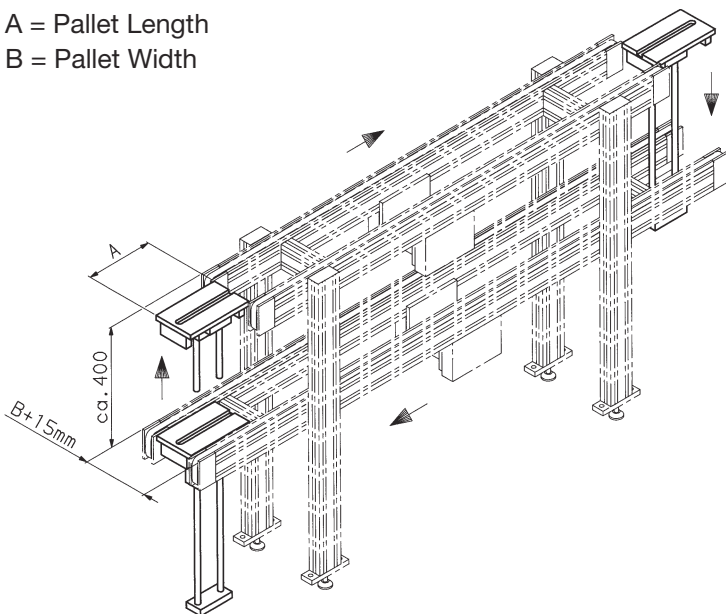
Order No. for End Module:

MPA-050-<sup>①</sup>xxx-<sup>②</sup>xxx

- ① = Pallet Length in mm  
② = Pallet Width in mm

## End Module Vertical

A = Pallet Length  
B = Pallet Width



Order No. for End Module Vertical:

MPA-051-<sup>①</sup>xxx-<sup>②</sup>xxx

- ① = Pallet Length in mm  
② = Pallet Width in mm



## Manual Workstation “A”

### “In Line”

- This workstation is “in line” assembled and fulfills all ergonomic and economical requirements.
- The transport track is mounted on a stand which is directly integrated into the assembly line.
- The arm- and feet rests are adjustable. The feet rest is coated with a slip resistant, black rubber.
- The pallets can be positioned with either manual or automatic workstations (Sheet 10.004).
- The throughput of the system can be influenced with this workstation. The working content should not exceed the throughput of the slowest automatic station.

**Order No.** for Manual Workstation A:  
(without positioning)

① ②  
**MPA-060-xxx-xxx**

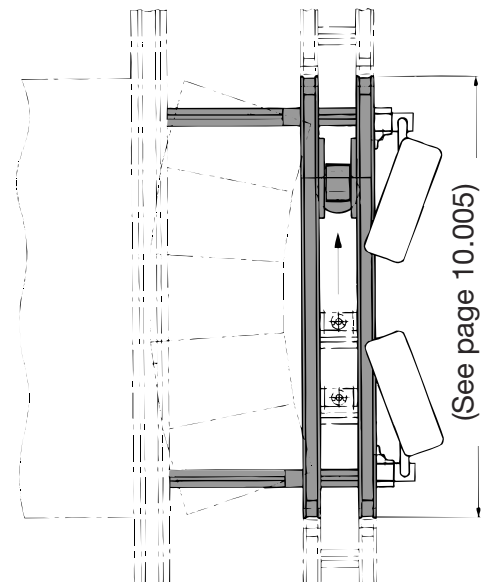
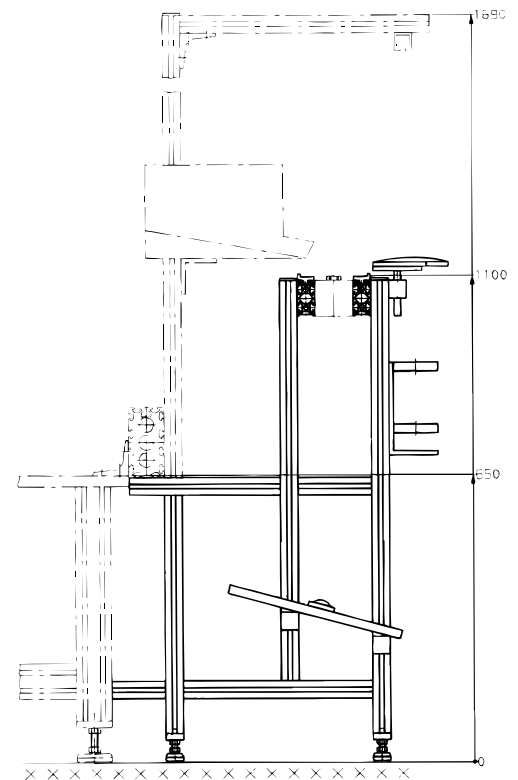
**Order No.** Automatic Workstation Positioning  
(Sheet 10.004)

① ②  
**MPA-020-xxx-xxx**

**Order No.** Manual Workstation Positioning  
(Sheet 10.004)

① ②  
**MPA-025-xxx-xxx**

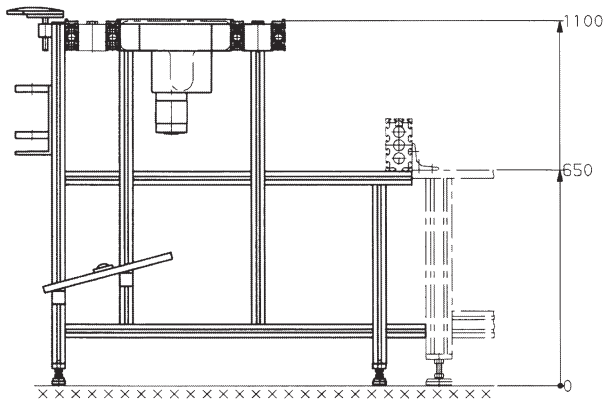
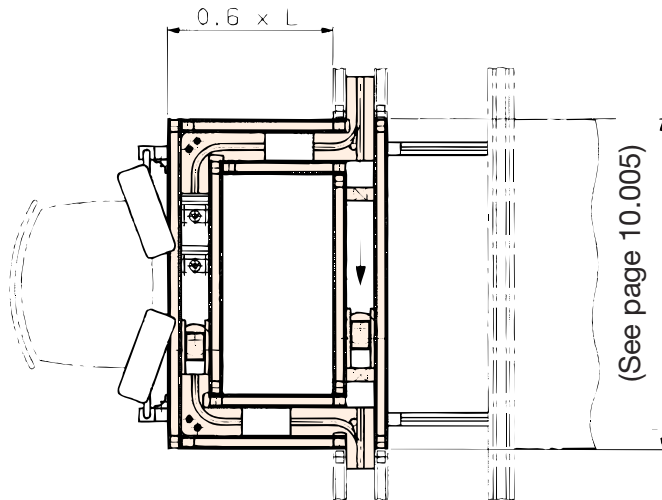
- ① = Pallet Length in mm  
② = Pallet Width in mm



# Manual Workstation "B"

"PARALLEL EXIT"

- Ideal for repair or random check working place, or if several working places in sequence are needed.
- This requirement does not influence the throughput directly.
- Random checks/tests also can be executed with Automatic Stations. Air consumption per positioning 0.26 ml, 2 cylinders diameter 12mm with 15mm stroke



**Order No.** for Manual Workstation "B":  
(without positioning)

① ②  
**MPA-070-xxx-xxx**

**Order No.** Automatic Workstation Positioning  
(Sheet 10.004)

① ②  
**MPA-020-xxx-xxx**

**Order No.** Manual Workstation Positioning  
(Sheet 10.004)

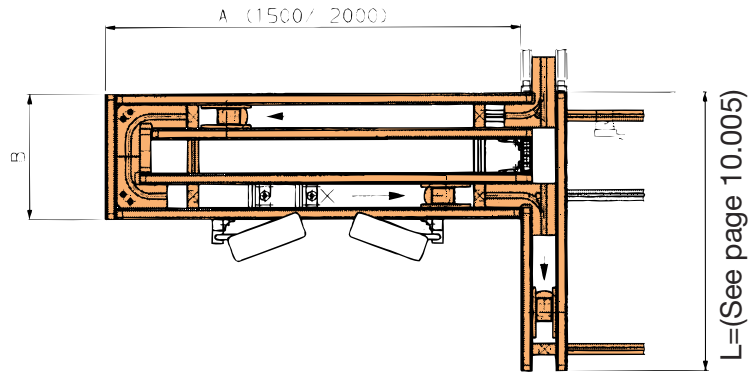
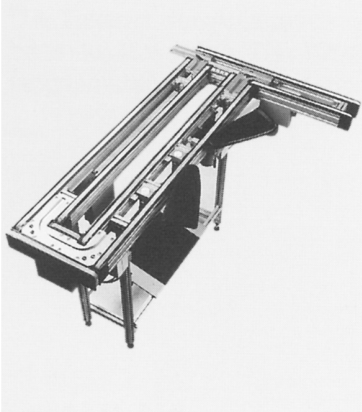
① ②  
**MPA-025-xxx-xxx**

① = Pallet Length in mm  
② = Pallet Width in mm

## Manual Workstation “C”

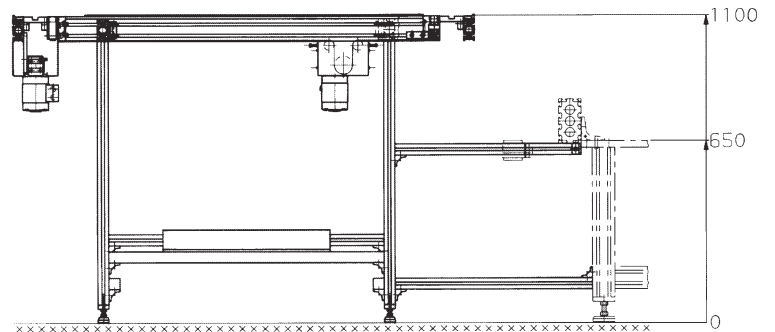
### “PERPENDICULAR EXIT”

- This kind of exit can be used by manual as well as by automatic workstations.
- Length A and width B basically can be configured of any size, whereby the minimum dimension for  $B = 2 \times (\text{Pallet width} + 15) + 120\text{mm}$ .
- Standard dimensions for A = 1500 or 2000 mm.



**Order No.** for Manual Workstation “C”:  
(without Positioning)

① ②  
**MPA-080-xxx-xxx**



**Order No.** Automatic Workstation Positioning  
(Sheet 10.004)

① ②  
**MPA-020-xxx-xxx**

Air consumption per positioning  
0.26 ml, 2 Cyl. diameter 12mm with  
15mm stroke

| Pallet Length | A    | B        |
|---------------|------|----------|
| 100 - 300     | 1500 | See Text |
| 300 - 500     | 2000 | See Text |

**Order No.** Manual Workstation Positioning  
(Sheet 10.004)

① ②  
**MPA-025-xxx-xxx**

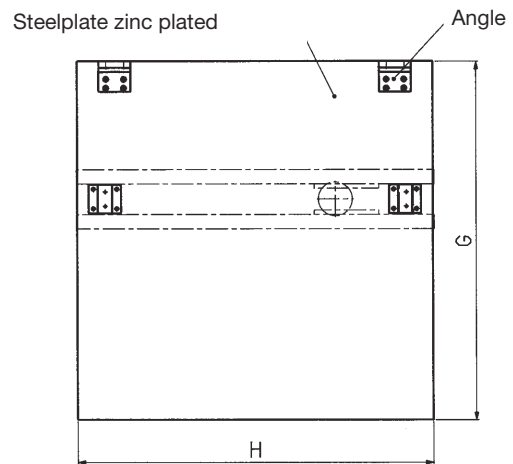
- ① = Pallet Length in mm  
② = Pallet Width in mm

## Base Table

- The table top of the Base Table consists of a 25mm thick ground and zinc plated steel plate.
- The lower frame consists of MFP-080-080 profiles and is screw assembled.
- Two angled brackets on the rear of the plate are for the mounting and positioning of a pneumatic channel profile.

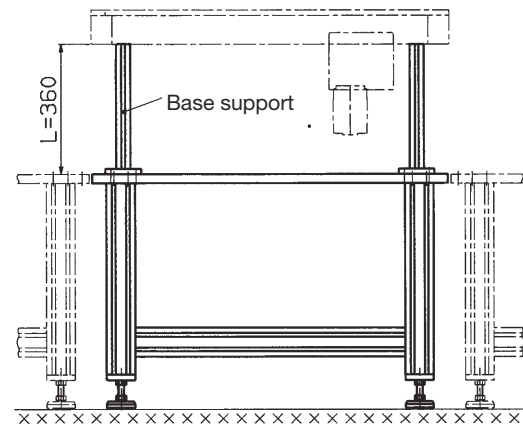
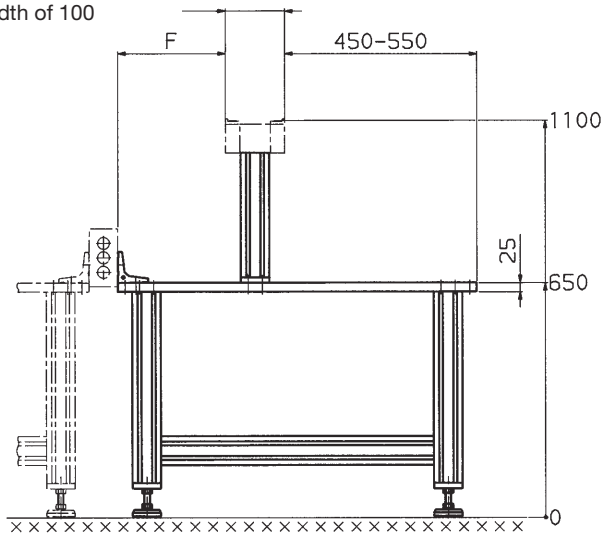
### Standard Dimension:

| Pallet width | F   | G    | H    |
|--------------|-----|------|------|
| 150 - 200    | 250 | 900  | 992  |
| 250 - 300    | 300 | 1050 | 1000 |
| 350 - 400    | 300 | 1150 | 1000 |
| 450 - 500    | 300 | 1300 | 1100 |



\* 11mm by a pallet width of 100

Pallet width + 15mm\*

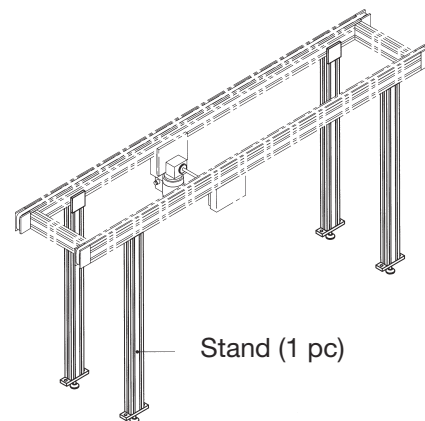
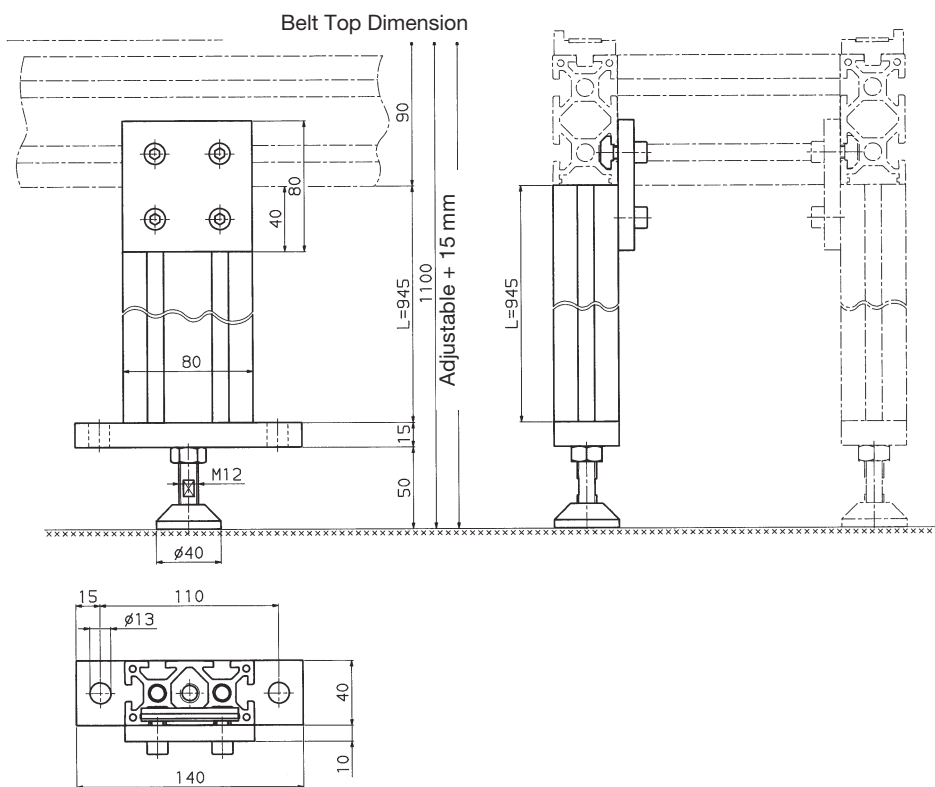


**Order No.** For Base Table with Stand:  
 For Base Table without Stand:  
 For Base Table without Steel plate,  
 with Stand:  
 For a Stand:

① ②  
**MPA-090-xxx-xxx**  
**MPA-091-xxx-xxx** ① = Pallet Length in mm  
 ② = Pallet Width in mm  
**MPA-092-xxx-xxx**  
**MPA-093-\_\_\_\_\_** — Length in mm (standard 360 mm)

## Stand

- The stands are used as support of the tracks.
- After assembly the stands can be anchored to the floor.
- The stands can be adjusted in height +/- 15mm  
Standard 945mm, top of belt



Example of Track with 4 Stands

Order No. For Stand:

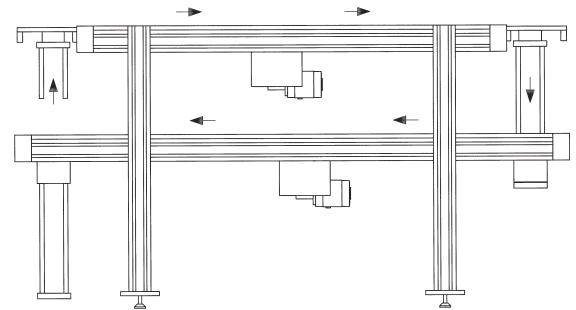
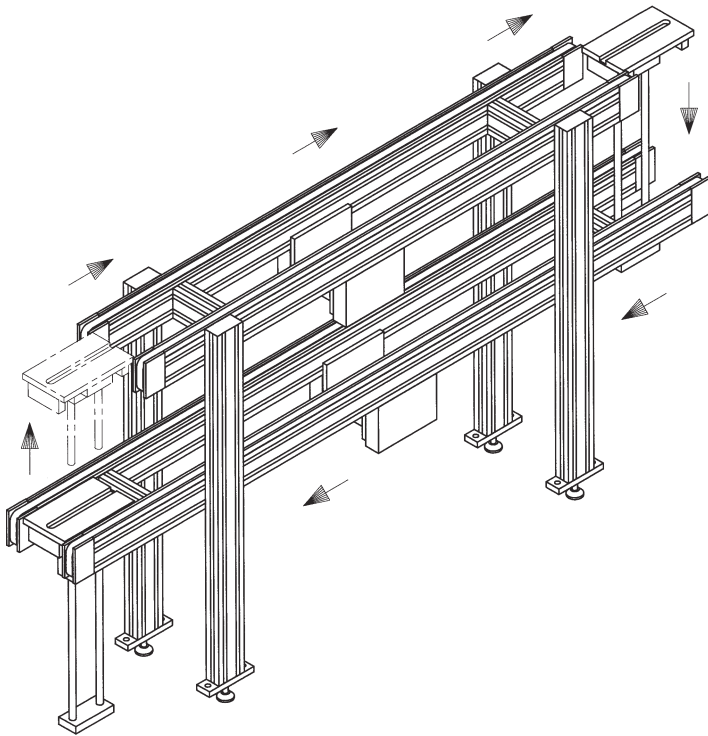
MPA-110-

Length in mm (Standard 945 mm)

## Example of Pallet Transfer System OVER / UNDER (with Elevators)

Meto-Fer Automation's modular, non-synchronous Pallet Transfer Systems incorporate a dual belt conveyor with manual or fully automatic assembly stations.

Pallets, which contain the work piece, travel from assembly station to station, pallets can accumulate in front of every work place for maximum efficiency and system flexibility. Our elevators specifically designed for over / under systems, reduce your lines overall floor space requirements, and any elevator stroke is possible.



**Order No.**

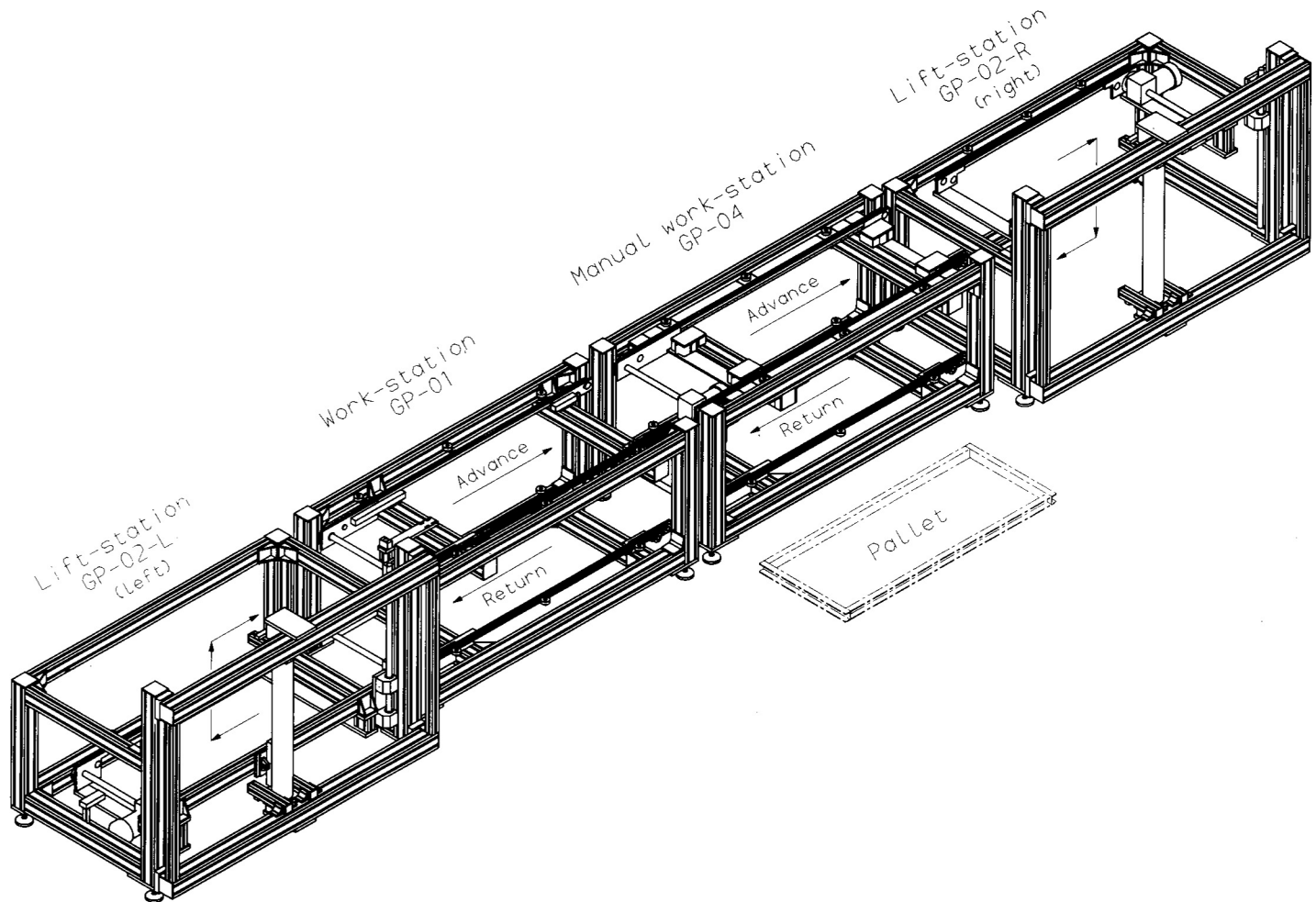
Elevator

MPA-051-<sup>①</sup>xxx-<sup>②</sup>xxx

(Additional information for price: stroke length, cycle time and pallet load)

① = Pallet Length in mm  
② = Pallet Width in mm

# Large Pallet System GP (Over-Under System)



## Design and Function:

- The GP-System consists of 3 exchangeable elements:
  - GP-01 Work Station
  - GP-02 Lift Station
  - GP-04 Manual Work Station
- Length of the linear transport system: as required
- Linear travel by a two-belt-system

## Technical data:

- Size of pallets (area)
 

|      |                |  |
|------|----------------|--|
| min. | 400 x 1000 mm  |  |
| max. | 1000 x 2000 mm |  |
- velocity, standard conveyor belt
 

|  |          |  |
|--|----------|--|
|  | 36 m/min |  |
|--|----------|--|
- Max. pallet load
 

|  |       |          |
|--|-------|----------|
|  | 80 kg | (176 lb) |
|--|-------|----------|
- Positioning accuracy (on work station GP-02)
 

|  |            |  |
|--|------------|--|
|  | +/- 0.2 mm |  |
|--|------------|--|
- Height of transport belt from floor (standard)
 

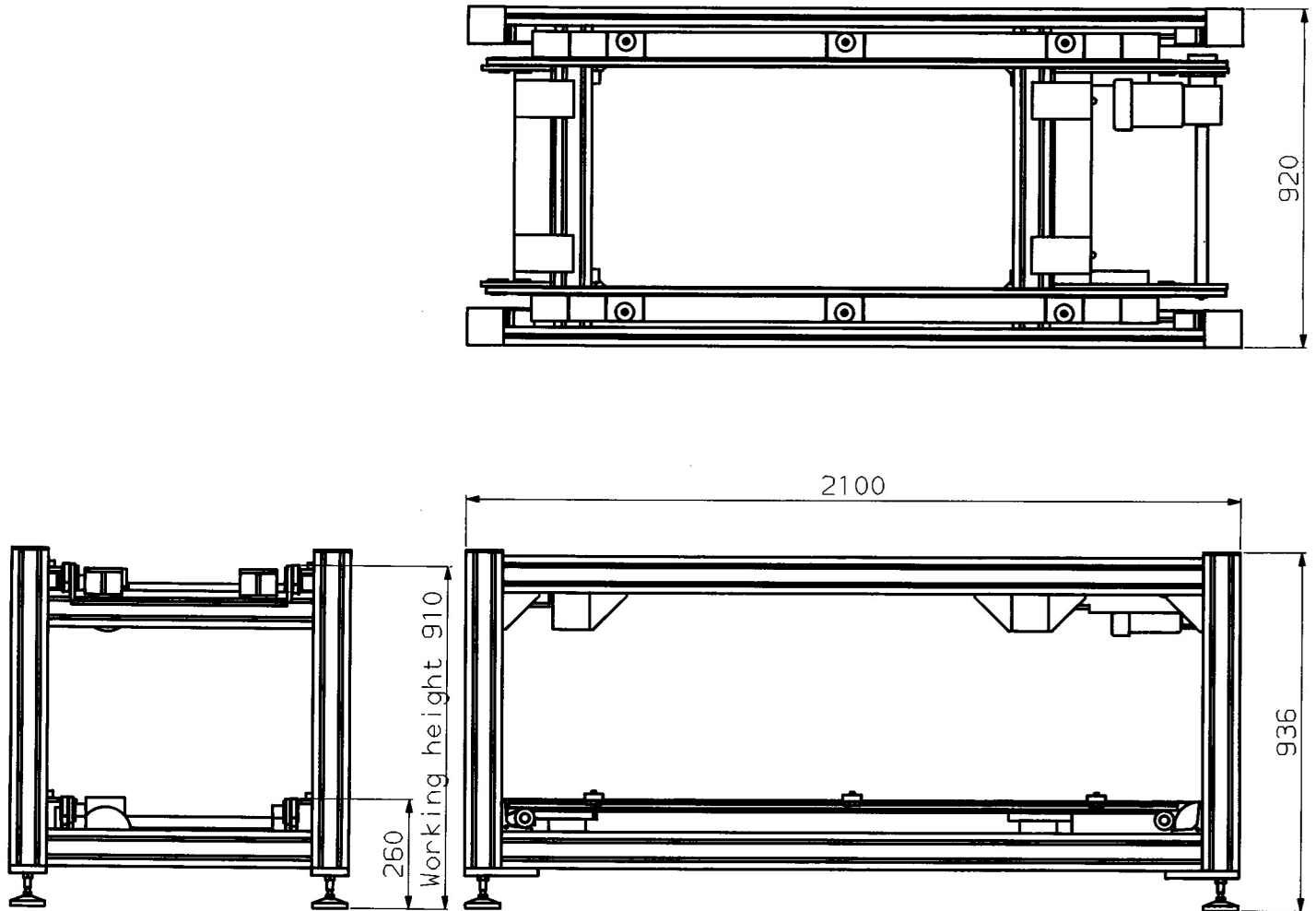
|  |        |  |
|--|--------|--|
|  | 900 mm |  |
|--|--------|--|

(This height can be adapted to the customers requirements)

# Large Pallet System GP

## Work Station GP-01

At this station, the pallets are singled out (with initiators and pneumatic cylinders) and indexed into the work station.  
The maximum force of pressure of one station is 1000 N.



**Order No.** GP-01

### Technical data:

- Operating medium
- Operating pressure
- Air connections
- Positioning accuracy
- Electrical connection

Compressed air  
43.5 - 116 psi (3-8 bar)  
R1/4"

+/- 0.2 mm

Please specify on order: Voltage, Number of phases, and Frequency  
(Standard: 3 phase / 208 / 50 Hz)