

Mini slide, Series MSC-MG-HM

R480640173

AVENTICS
Series
MSC Guide
cylinders

2024-04-06

AVENTICS Series MSC Guide cylinders

The AVENTICS Series MSC mini slides have a compact design, require minimal installation space and can be optimally configured for virtually any automated handling task. A wide range of configuration options make the mini slide a truly universal handling component. Precise and reliable operation, coupled with a custom configuration and tailored to the specific application – these attributes allow the mini slides to assume the actuator role in efficient handling. The Series MSC offers high torque absorption and maximum stability. In addition, it provides technical features that guarantee optimally adjusted functions and maintenance-friendly processes. Fast, secure and efficiently connected with the special Easy-2-Combine Interface, the mini slides can be combined with the other components of a handling system without additional mounting plates.



Technical data

| | |
|--------------------------------------|--|
| Industry | Industrial |
| Note | Scope of delivery: incl. centering rings |
| Piston Ø | 12 mm |
| Stroke | 50 mm |
| Functional principle | Double-acting |
| Easy2Combine | capable |
| double piston | with double piston |
| Port | M5 |
| Cushioning | hydraulic |
| Repetitive precision | 0,02 mm |
| Min. working pressure | 1 bar |
| Max. working pressure | 10 bar |
| Min. ambient temperature | 0 °C |
| Max. ambient temperature | 60 °C |
| Medium | Compressed air |
| Retracting piston force, theoretical | 107 N |
| Extracting piston force, theoretical | 143 N |
| Max. speed | 0.8 m/s |
| Cushioning length | 7 mm |

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| | |
|---|--|
| Cushioning energy | 1 J |
| Min. oil content of compressed air | 0 mg/m ³ |
| Max. oil content of compressed air | 1 mg/m ³ |
| Max. particle size | 5 µm |
| Pressure for determining piston forces with integrated ball rail guide | 6,3 bar with integrated ball rail guide |
| Weight | 0.67 kg |

Material

| | |
|--------------------------|----------------------|
| Housing material | Aluminum |
| Surface housing | anodized |
| Material piston rod | Stainless Steel |
| Material front plate | Aluminum |
| Surface front plate | anodized |
| Seal material | Polyurethane |
| Material ball rail table | Aluminum |
| Surface ball rail table | anodized |
| Material guide rail | Steel, chrome-plated |
| Surface guide rail | hardened |
| Material centering rings | Stainless Steel |
| Part No. | R480640173 |

Technical information

Repetitive precision after 100 consecutive strokes: 0,02 mm

Base with air connections at the back and sides

Intermediate strokes can be configured.

Scope of delivery: incl. centering rings

R1 = stroke setting range for forward stroke

R2 = stroke setting range for return stroke

The pressure dew point must be at least 15 °C less than ambient and medium temperature and may not exceed 3 °C.

The oil content of compressed air must remain constant during the life cycle.

Use only the approved oils from AVENTICS. Further information can be found in the "Technical information" document (available in <https://www.emerson.com/en-us/support>).

Dimensions

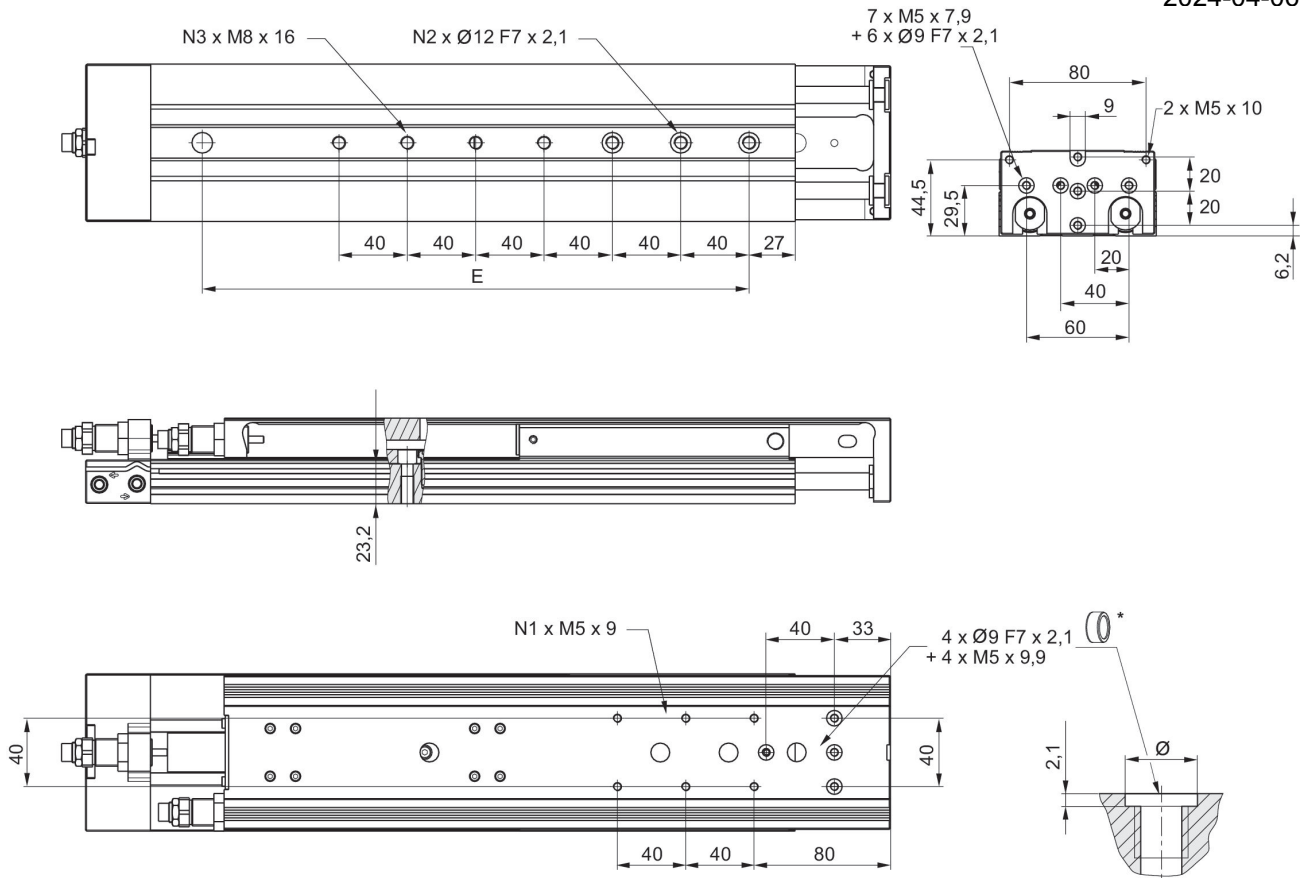
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MSC-20



* = centering rings

| Part No. | Piston Ø | Stroke | N1 | N2 | N3 |
|------------|----------|--------|----|----|----|
| R480640185 | 20 | 30 | 2 | 2 | 2 |
| R480640186 | 20 | 40 | 2 | 2 | 2 |
| R480640187 | 20 | 50 | 2 | 2 | 2 |
| R480640188 | 20 | 80 | 4 | 3 | 3 |
| R480640189 | 20 | 100 | 4 | 3 | 3 |

Dimensions

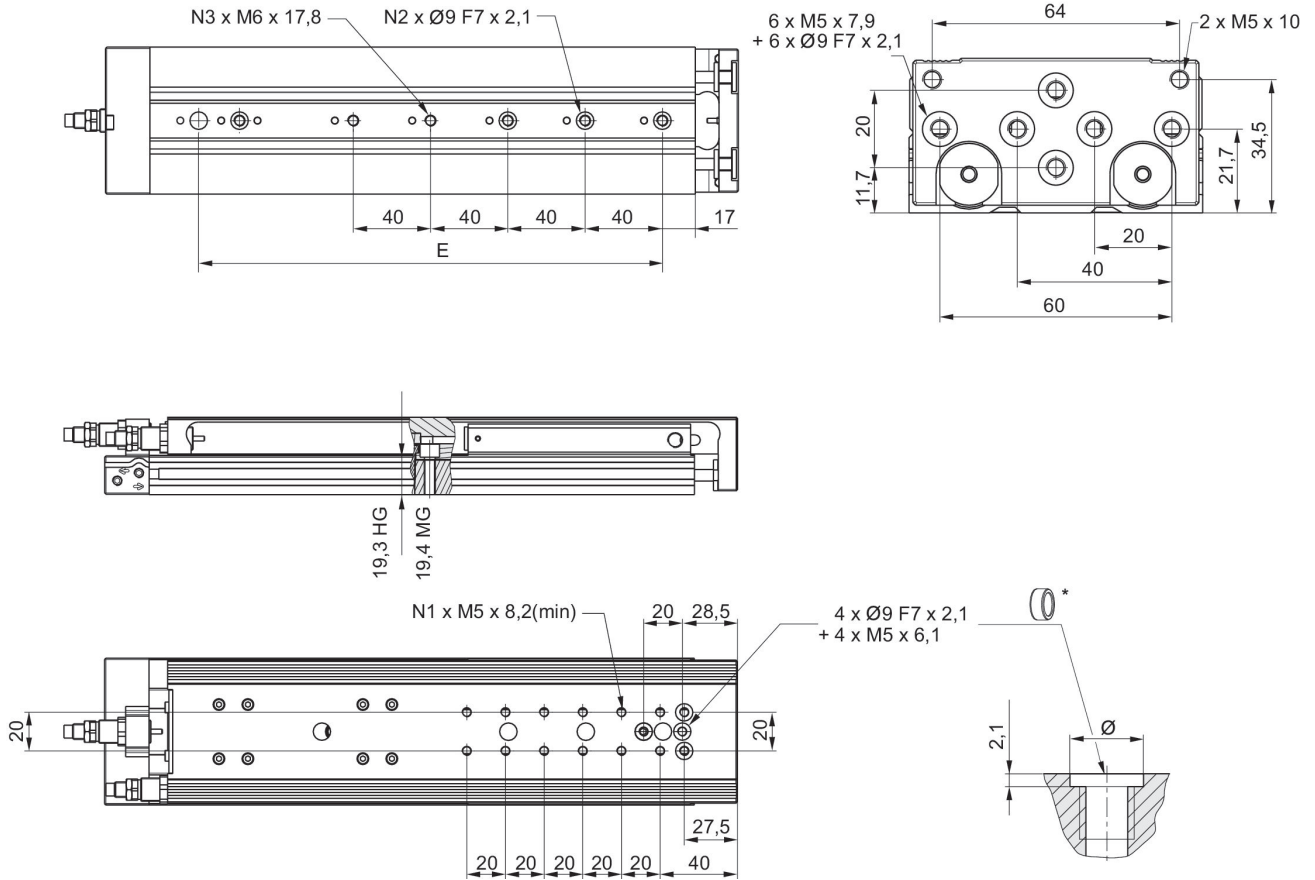
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* = centering rings

| Part No. | Piston Ø | S | N1 | N2 | N3 | X |
|------------|----------|-----|----|----|----|---|
| R480640178 | 16 | 30 | 2 | 2 | 2 | |
| R480640179 | 16 | 40 | 4 | 2 | 2 | |
| R480640180 | 16 | 50 | 4 | 2 | 2 | |
| R480640181 | 16 | 80 | 6 | 3 | 3 | |
| R480640182 | 16 | 100 | 8 | 3 | 3 | |

S = stroke

1) Access to the through hole only after removal of the stroke limitation bolts

Dimensions

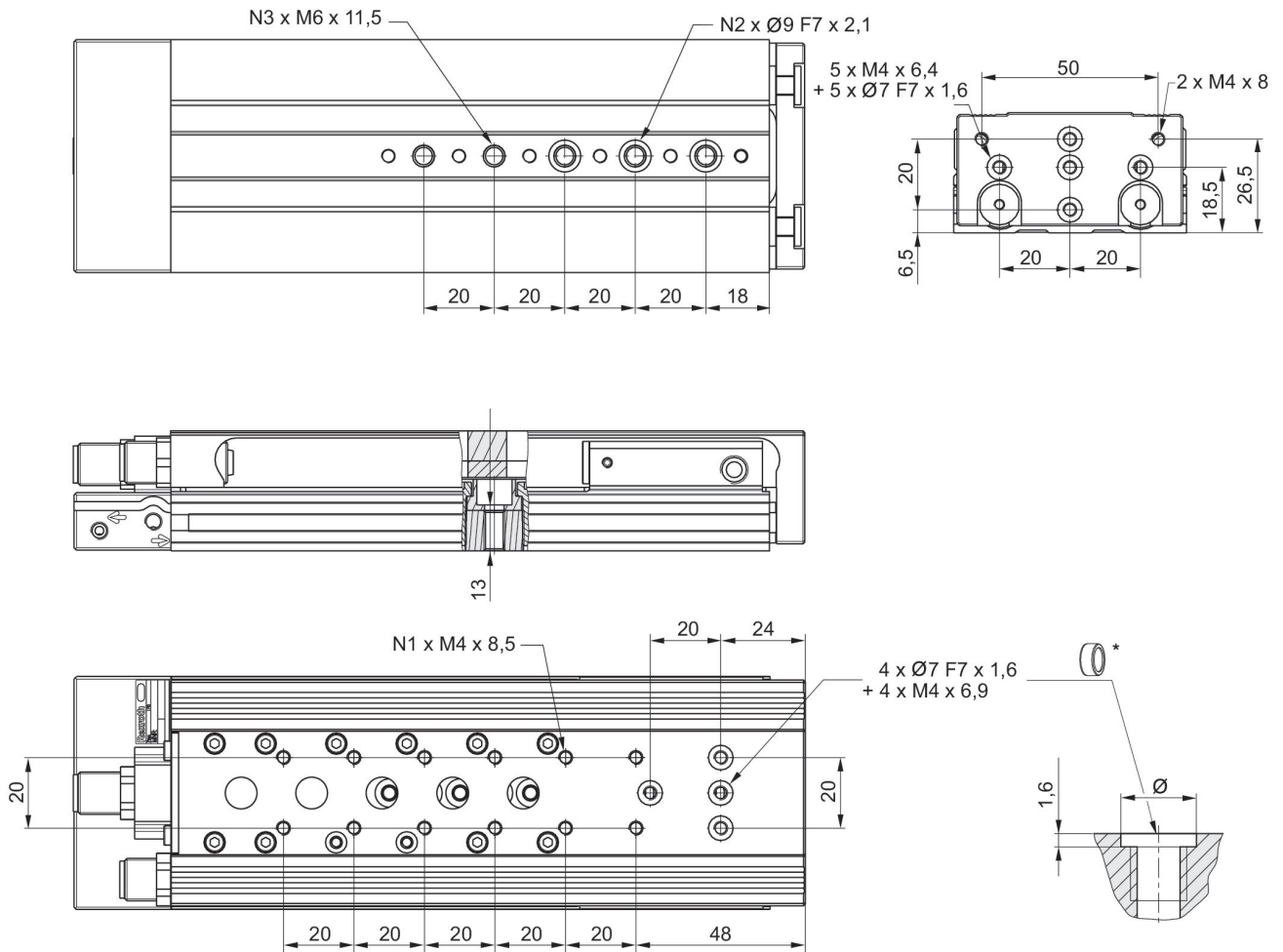
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MSC-12

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* = centering rings

| Part No. | Piston \varnothing | S | N1 | N2 | N3 |
|------------|----------------------|-----|----|----|----|
| R480640171 | 12 | 30 | 2 | 2 | 2 |
| R480640172 | 12 | 40 | 2 | 2 | 2 |
| R480640173 | 12 | 50 | 4 | 3 | 3 |
| R480640174 | 12 | 80 | 6 | 3 | 5 |
| R480640175 | 12 | 100 | 8 | 3 | 5 |

S = stroke

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* = centering rings

| Part No. | Piston Ø | S | N1 | N2 | N3 | X |
|------------|----------|-----|----|----|----|----|
| R480640192 | 25 | 30 | 2 | 2 | 2 | 1) |
| R480640193 | 25 | 40 | 2 | 2 | 2 | |
| R480640194 | 25 | 50 | 4 | 2 | 2 | |
| R480640195 | 25 | 80 | 4 | 3 | 3 | |
| R480640196 | 25 | 100 | 4 | 3 | 3 | |

S = stroke

1) Access to the through hole only after removal of the stroke limitation bolts

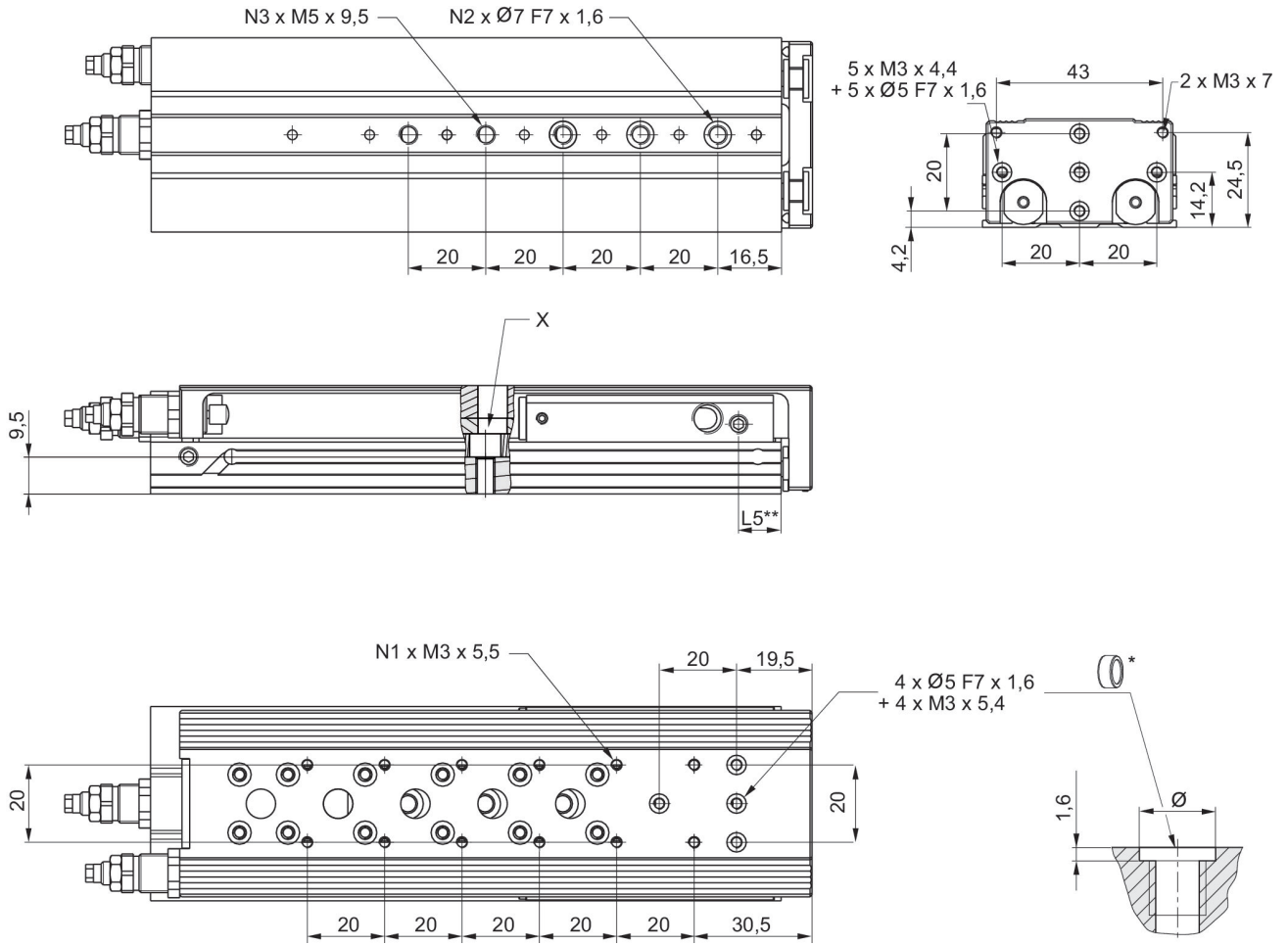
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MSC-08



* = centering rings

** $\varnothing 8$ has a different reference plane.

| Part No. | Piston \varnothing | S | N1 | N2 | N3 | L5 | X |
|------------|----------------------|----|----|----|----|----|----|
| R480640164 | 8 | 20 | 4 | 2 | 2 | 11 | |
| R480640165 | 8 | 30 | 4 | 2 | 2 | 11 | |
| R480640166 | 8 | 40 | 6 | 2 | 2 | 11 | |
| R480640167 | 8 | 50 | 8 | 3 | 3 | 11 | 1) |
| R480640168 | 8 | 80 | 12 | 3 | 5 | 11 | |

S = stroke

1) Access to the through hole only after removal of the stroke limitation bolts

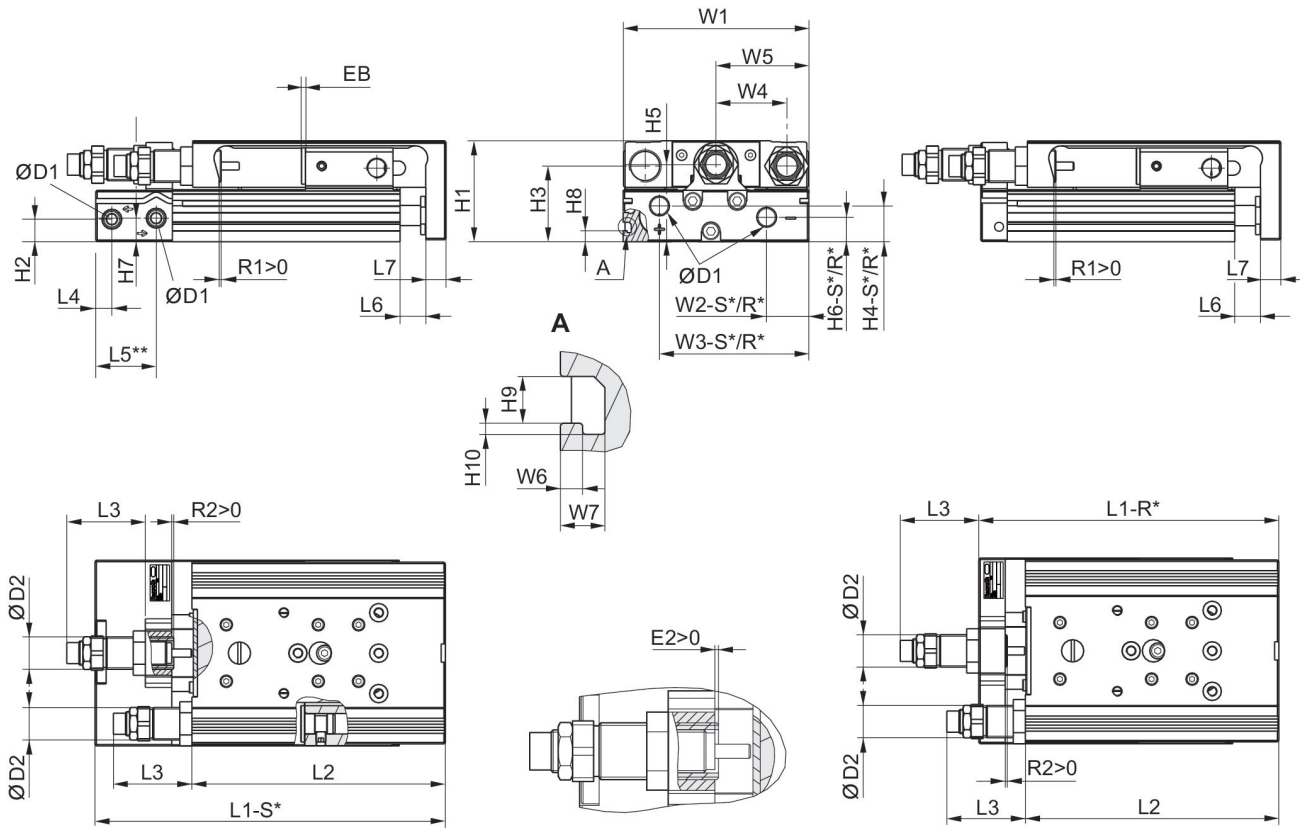
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Dimensions



R*: base with air connections only at the back
S*: base with air connections at the back and sides
** Ø 8 has a different reference plane.

Correction factor (a)

| Part No. | Piston Ø | Stroke | a [mm] | d [mm] | Mx0 Static moment M [Nm] | My0 Static moment M [Nm] | Mz0 Static moment M [Nm] | Mx Dynamic moment M [Nm] | My Dynamic moment M [Nm] |
|------------|----------|--------|--------|--------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| R480640164 | 8 | 20 | 69.5 | 12 | 5.8 | 5.9 | 5.9 | 1.1 | 1.7 |
| R480640165 | 8 | 30 | 69.5 | 12 | 5.8 | 5.9 | 5.9 | 1.1 | 1.7 |
| R480640166 | 8 | 40 | 69.5 | 12 | 5.8 | 5.9 | 5.9 | 1.1 | 1.7 |
| R480640167 | 8 | 50 | 83 | 12 | 5.8 | 5.9 | 5.9 | 1.3 | 1.7 |
| R480640168 | 8 | 80 | 121 | 12 | 8 | 14.6 | 14.6 | 1.3 | 3.7 |
| R480640171 | 12 | 30 | 77 | 15 | 13.8 | 6.45 | 6.45 | 3.5 | 1.6 |
| R480640172 | 12 | 40 | 77 | 15 | 13.8 | 6.45 | 6.45 | 3.5 | 1.6 |
| R480640173 | 12 | 50 | 81 | 15 | 13.8 | 6.45 | 6.45 | 3.5 | 1.6 |
| R480640174 | 12 | 80 | 117 | 15 | 17.3 | 15.6 | 15.6 | 5.2 | 3.5 |
| R480640175 | 12 | 100 | 137 | 15 | 17.3 | 15.6 | 15.6 | 5.2 | 3.5 |
| R480640178 | 16 | 30 | 65 | 15 | 31.6 | 11.95 | 11.95 | 6.5 | 3.2 |
| R480640179 | 16 | 40 | 75 | 15 | 31.6 | 11.95 | 11.95 | 6.5 | 3.2 |
| R480640180 | 16 | 50 | 86 | 15 | 31.6 | 11.95 | 11.95 | 7 | 3.2 |
| R480640181 | 16 | 80 | 123 | 15 | 45 | 27.3 | 27.3 | 8.7 | 6.3 |
| R480640182 | 16 | 100 | 144 | 15 | 45 | 27.3 | 27.3 | 8.7 | 6.3 |

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| Part No. | Piston Ø | Stroke | a [mm] | d [mm] | Mx0 Static moment M [Nm] | My0 Static moment M [Nm] | Mz0 Static moment M [Nm] | Mx Dynamic moment M [Nm] | My Dynamic moment M [Nm] |
|------------|----------|--------|--------|--------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| R480640185 | 20 | 30 | 75 | 20 | 31.6 | 11.95 | 11.95 | 9.6 | 4 |
| R480640186 | 20 | 40 | 75 | 20 | 31.6 | 11.95 | 11.95 | 9.6 | 4 |
| R480640187 | 20 | 50 | 92 | 20 | 31.6 | 11.95 | 11.95 | 10 | 4 |
| R480640188 | 20 | 80 | 125 | 20 | 45 | 27.3 | 27.3 | 11.7 | 8 |
| R480640189 | 20 | 100 | 143 | 20 | 45 | 27.3 | 27.3 | 11.7 | 8 |
| R480640192 | 25 | 30 | 85 | 24 | 87 | 24.5 | 24.5 | 22.9 | 6.6 |
| R480640193 | 25 | 40 | 85 | 24 | 87 | 24.5 | 24.5 | 22.9 | 6.6 |
| R480640194 | 25 | 50 | 102 | 24 | 87 | 24.5 | 24.5 | 15.3 | 6.6 |
| R480640195 | 25 | 80 | 134 | 24 | 110 | 62.5 | 62.5 | 18.8 | 14.5 |
| R480640196 | 25 | 100 | 152 | 24 | 110 | 62.5 | 62.5 | 18.8 | 14.5 |

| Part No. | Mz Dynamic moment M [Nm] |
|------------|--------------------------|
| R480640164 | 1.7 |
| R480640165 | 1.7 |
| R480640166 | 1.7 |
| R480640167 | 1.7 |
| R480640168 | 3.7 |
| R480640171 | 1.6 |
| R480640172 | 1.6 |
| R480640173 | 1.6 |
| R480640174 | 3.5 |
| R480640175 | 3.5 |
| R480640178 | 3.2 |
| R480640179 | 3.2 |
| R480640180 | 3.2 |
| R480640181 | 6.3 |
| R480640182 | 6.3 |
| R480640185 | 4 |
| R480640186 | 4 |
| R480640187 | 4 |
| R480640188 | 8 |
| R480640189 | 8 |
| R480640192 | 6.6 |
| R480640193 | 6.6 |
| R480640194 | 6.6 |
| R480640195 | 14.6 |
| R480640196 | 14.6 |

Weight of moving parts [kg]

| Piston Ø | S=10 | S=20 | S=30 | S=40 | S=50 | S=80 | S=100 | S=125 | S=150 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 8 | 0.165 | 0.165 | 0.165 | 0.165 | 0.195 | 0.265 | – | – | – |
| 12 | 0.28 | 0.28 | 0.28 | 0.28 | 0.315 | 0.403 | 0.46 | – | – |

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| Piston Ø | S=10 | S=20 | S=30 | S=40 | S=50 | S=80 | S=100 | S=125 | S=150 |
|----------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| 16 | 0.375 | 0.375 | 0.375 | 0.4 | 0.45 | 0.615 | 0.65 | 0.725 | 0.785 |
| 20 | 0.655 | 0.655 | 0.655 | 0.69 | 0.765 | 0.985 | 1.035 | 1.2 | 1.29 |
| 25 | 1.1 | 1.1 | 1.1 | 1.1 | 1.225 | 1.45 | 1.625 | 1.885 | 2.085 |

| Piston Ø | S=200 |
|----------|-------|
| 8 | - |
| 12 | - |
| 16 | - |
| 20 | 1.54 |
| 25 | 2.445 |

Stroke-dependent dimensions

| Piston Ø | S=10 EB | S=20 EB | S=30 EB | S=40 EB | S=50 EB | S=80 EB | S=100 EB | S=10 L1-R | S=20 L1-R |
|----------|---------|---------|---------|---------|---------|---------|----------|-----------|-----------|
| 8 | 32 | 22 | 12 | 2 | 2 | 2 | - | - | - |
| 12 | | | | | | | | | |
| 16 | 22 | 12 | 2 | 2 | 2 | 2 | 2 | 101.8 | 101.8 |
| 20 | 22 | 12 | 2 | 2 | 2 | 2 | 2 | 112.9 | 112.9 |
| 25 | 32 | 22 | 12 | 2 | 2 | 2 | 2 | 136.1 | 136.1 |

| Piston Ø | S=30 L1-R | S=40 L1-R | S=50 L1-R | S=80 L1-R | S=100 L1-R | S=10 L1-S | S=20 L1-S | S=30 L1-S | S=40 L1-S |
|----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|
| 8 | - | - | - | - | - | 100.7 | 100.7 | 100.7 | 100.7 |
| 12 | | | | | | | | | |
| 16 | 101.8 | 111.8 | 126.8 | 172.8 | 192.8 | 112.7 | 112.7 | 112.7 | 122.7 |
| 20 | 112.9 | 122.9 | 137.9 | 182.9 | 202.9 | 137.8 | 137.8 | 137.8 | 147.8 |
| 25 | 136.1 | 136.1 | 149.1 | 195.1 | 215.1 | 159.8 | 159.8 | 159.8 | 159.8 |

| Piston Ø | S=50 L1-S | S=80 L1-S | S=100 L1-S | S=10 L2 | S=20 L2 | S=30 L2 | S=40 L2 | S=50 L2 | S=80 L2 |
|----------|-----------|-----------|------------|---------|---------|---------|---------|---------|---------|
| 8 | 120.7 | 170.7 | - | 93.5 | 93.5 | 93.5 | 93.5 | 113.5 | 163.5 |
| 12 | | | | | | | | | |
| 16 | 137.7 | 183.7 | 203.7 | 90.4 | 90.4 | 90.4 | 100.4 | 115.4 | 161.4 |
| 20 | 162.8 | 207.8 | 227.8 | 100.5 | 100.5 | 100.5 | 110.5 | 125.5 | 170.5 |
| 25 | 172.8 | 218.8 | 238.8 | 121.5 | 121.5 | 121.5 | 121.5 | 134.5 | 180.5 |

| Piston Ø | S=100 L2 | S=10 R1 max. | S=20 R1 max. | S=30 R1 max. | S=40 R1 max. | S=50 R1 max. | S=80 R1 max. | S=100 R1 max. | S=10 R2 max. |
|----------|----------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|
| 8 | - | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | - | 4.1 |
| 12 | | | | | | | | | |
| 16 | 181.4 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 1.5 |
| 20 | 190.5 | 12.4 | 12.4 | 12.4 | 12.4 | 12.4 | 12.4 | 12.4 | 1.5 |
| 25 | 200.5 | 11.5 | 11.5 | 11.5 | 11.5 | 10.5 | 11.5 | 11.5 | 7.5 |

| Piston Ø | S=20 R2 max. | S=30 R2 max. | S=40 R2 max. | S=50 R2 max. | S=80 R2 max. | S=100 R2 max. |
|----------|--------------|--------------|--------------|--------------|--------------|---------------|
| 8 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | - |
| 12 | | | | | | |
| 16 | 1.5 | 1.5 | 1.5 | 6 | 7 | 5.7 |

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| Piston Ø | S=20 R2 max. | S=30 R2 max. | S=40 R2 max. | S=50 R2 max. | S=80 R2 max. | S=100 R2 max. |
|----------|--------------|--------------|--------------|--------------|--------------|---------------|
| 20 | 1.5 | 1.5 | 11.5 | 9.5 | 14 | 14 |
| 25 | 7.5 | 7.5 | 7.5 | 3.3 | 7.5 | 9.2 |

| Piston Ø | Ø D1 | Ø D2 | H1 | H2 | H3 | H4-R | H4-S | H5 | H6-R |
|----------|-------|---------|----|------|------|------|------|------|------|
| 8 | M5 | M10x1 | 28 | 9.6 | 20.5 | - | 7.5 | 19.5 | - |
| 12 | M5 | M12x1 | 34 | 5.7 | 25 | 11.2 | 11.2 | 24.5 | 5.7 |
| 16 | M5 | M12x1 | 40 | 7.2 | 29 | 12.2 | 12.2 | 31 | 7.7 |
| 20 | G 1/8 | M16x1,5 | 50 | 11.2 | 37.5 | 17.3 | 17.3 | 38.2 | 11.7 |
| 25 | G 1/8 | M18x1,5 | 60 | 14.2 | 44 | 15.5 | 22.9 | 46.5 | 13.2 |

| Piston Ø | H6-S | H7 | H8 | H9 | H10 | L3 max. | L4 | L5 2) | L6 |
|----------|------|------|-----|-----|-----|---------|-----|-------|-----|
| 8 | 5.5 | 18 | - | - | - | 31 | 9.8 | - | 1.9 |
| 12 | 5.7 | 8.3 | - | - | - | 46.7 | 7.2 | 22.5 | 2 |
| 16 | 7.7 | 11.2 | - | - | - | 44.9 | 6.5 | 17.7 | 2 |
| 20 | 12.2 | 11.7 | 5.5 | 4.2 | 1 | 48.9 | 8 | 30 | 2.1 |
| 25 | 21.7 | 16.2 | 6.9 | 5.2 | 1.5 | 67.7 | 9 | 31 | 2.1 |

| Piston Ø | L7 | R2 | W1 | W2-R | W2-S | W3-R | W3-S | W4 | W5 |
|----------|----|-----|------|------|------|------|------|------|------|
| 8 | 6 | 1.9 | 50.2 | - | 19.3 | - | 30.5 | 18 | W1/2 |
| 12 | 8 | 2 | 66 | 28.8 | 28.8 | 53 | 53 | 24.5 | W1/2 |
| 16 | 10 | 2 | 76 | 31 | 31 | 60.5 | 60.5 | 30 | W1/2 |
| 20 | 10 | 2.1 | 92 | 10 | 21 | 74 | 74 | 35 | W1/2 |
| 25 | 12 | 2.1 | 112 | 11 | 14 | 92 | 92 | 44 | W1/2 |

| Piston Ø | W6 | W7 |
|----------|-----|-----|
| 8 | - | - |
| 12 | - | - |
| 16 | - | - |
| 20 | 2 | 4 |
| 25 | 2.5 | 4.8 |

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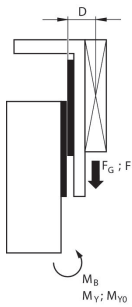
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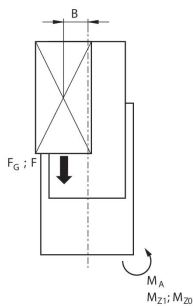
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Correction factor (a, d)

vertical



| | |
|-------|------------------------------|
| stat. | $M_{B0} = (F_G + F) \cdot D$ |
| dyn. | $M_B = F_G \cdot D$ |



| | |
|-------|------------------------------|
| stat. | $M_{A0} = (F_G + F) \cdot B$ |
| dyn. | $M_A = F_G \cdot B$ |

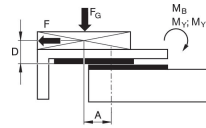
| | |
|-------|--|
| dyn. | $\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$ |
| stat. | $\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} \leq 1$ |

$F = m \cdot a$ $F_G = m \cdot g$ $a = 1250 \cdot V^2 / H$

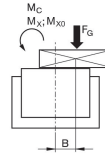
F = deceleration force [N] F_G = force due to weight [N] m = load mass [kg] a = deceleration [m/s²] g = gravitational acceleration 9,81 [m/s²] V = velocity [m/s] H = stroke length of shock absorber [mm]

Correction factor (a, d)

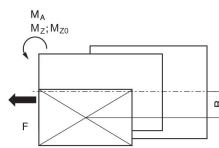
horizontal



| | |
|-------|------------------------------------|
| stat. | $M_{B0} = F_G \cdot A + F \cdot D$ |
| dyn. | $M_B = F_G \cdot A$ |



| | |
|-------|------------------------|
| stat. | $M_{C0} = F_G \cdot B$ |
| dyn. | $M_C = F_G \cdot B$ |



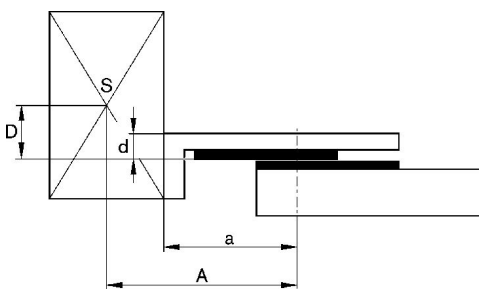
| | |
|-------|----------------------|
| stat. | $M_{A0} = F \cdot B$ |
| dyn. | $M_A = 0$ |

| | |
|-------|--|
| dyn. | $\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$ |
| stat. | $\frac{M_{A0}}{M_{Z0}} + \frac{M_{B0}}{M_{Y0}} + \frac{M_{C0}}{M_{X0}} \leq 1$ |

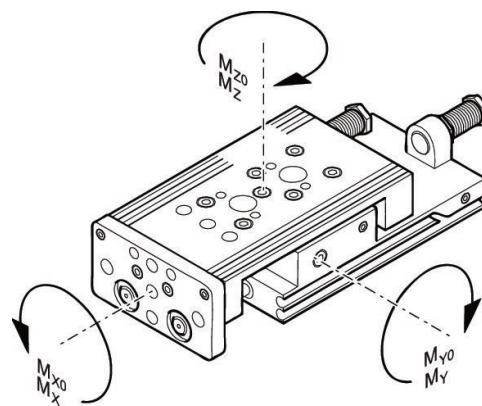
$F = m \cdot a$ $F_G = m \cdot g$ $a = 1250 \cdot V^2 / H$

F = deceleration force [N] F_G = force due to weight [N] m = load mass [kg] a = deceleration [m/s²] g = gravitational acceleration 9,81 [m/s²] V = velocity [m/s] H = stroke length of shock absorber [mm]

Correction factor (a, d)



Load capacity



M = max. permissible torque

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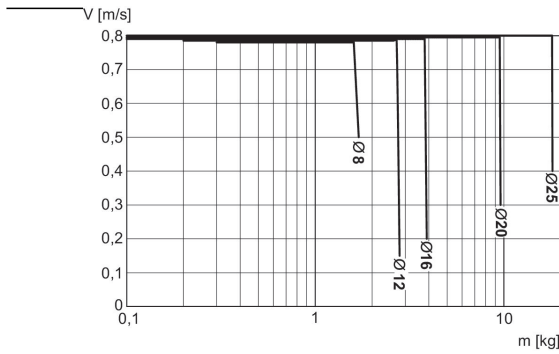
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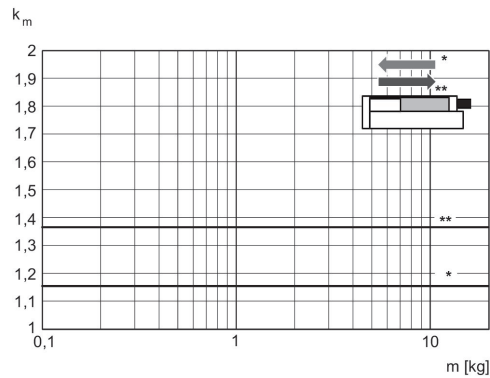
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Minimum and maximum moving mass

Correction factor for required speed: retracting and extending, horizontal



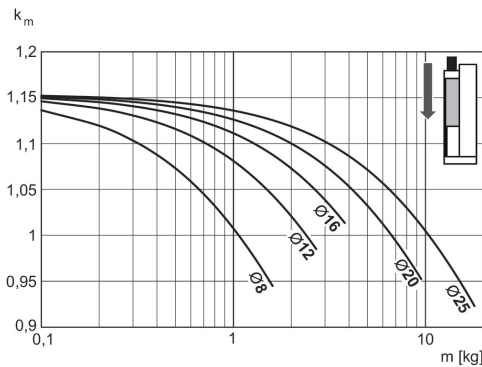
V = velocity [m/s]
m = mass



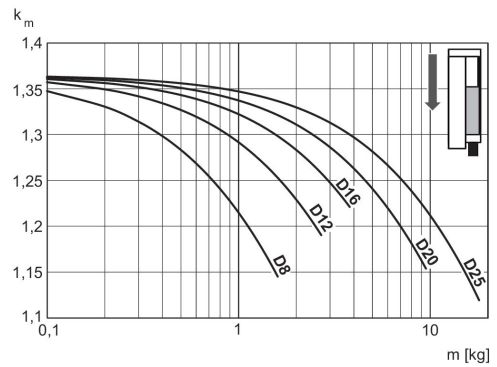
* retracting
** extracting
 $V = s/1000 \cdot t \cdot km$
V = velocity [m/s]
S = stroke

Correction factor for required speed: extending, vertical, downwards

Correction factor for required speed: retracting, vertical, downwards



$V = s/1000 \cdot t \cdot km$
V = velocity [m/s]
S = stroke [mm]
t = time [s] for one stroke
m = mass



$V = s/1000 \cdot t \cdot km$
V = velocity [m/s]
S = stroke [mm]
t = time [s] for one stroke
m = mass

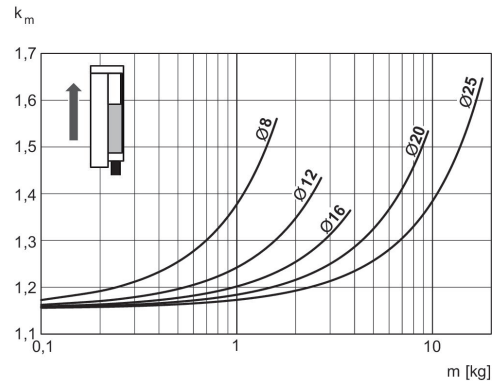
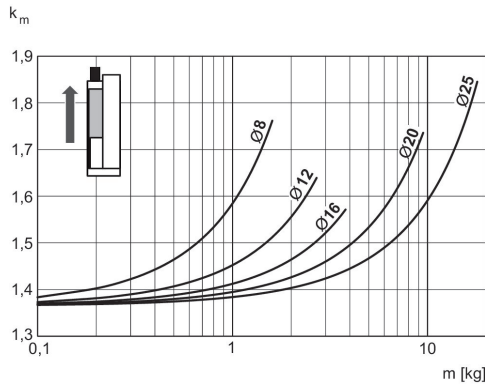
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Correction factor for required speed:
retracting, vertical, upwards

Correction factor for required speed:
extending, vertical, upwards

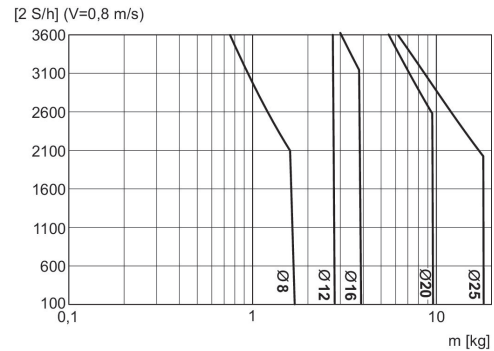
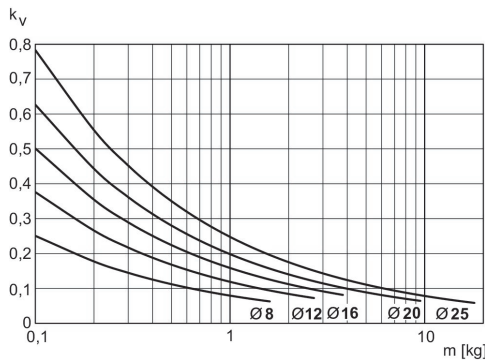


$V = s/1000 \cdot t \cdot k_m$
V = velocity [m/s]
S = stroke [mm]
t = time [s] for one stroke
m = mass

$V = s/1000 \cdot t \cdot k_m$
V = velocity [m/s]
S = stroke [mm]
t = time [s] for one stroke
m = mass

Max. extracting speed

Max. additional moving mass, vertical



$V = \sqrt{s \cdot k_v}$
V = velocity [m/s]
S = stroke [mm]
m = mass

S = stroke [mm]
 $2 \times S = 1 \text{ cycle}$
V = velocity [m/s]
m = mass

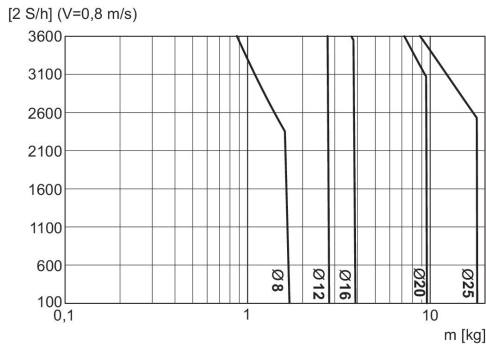
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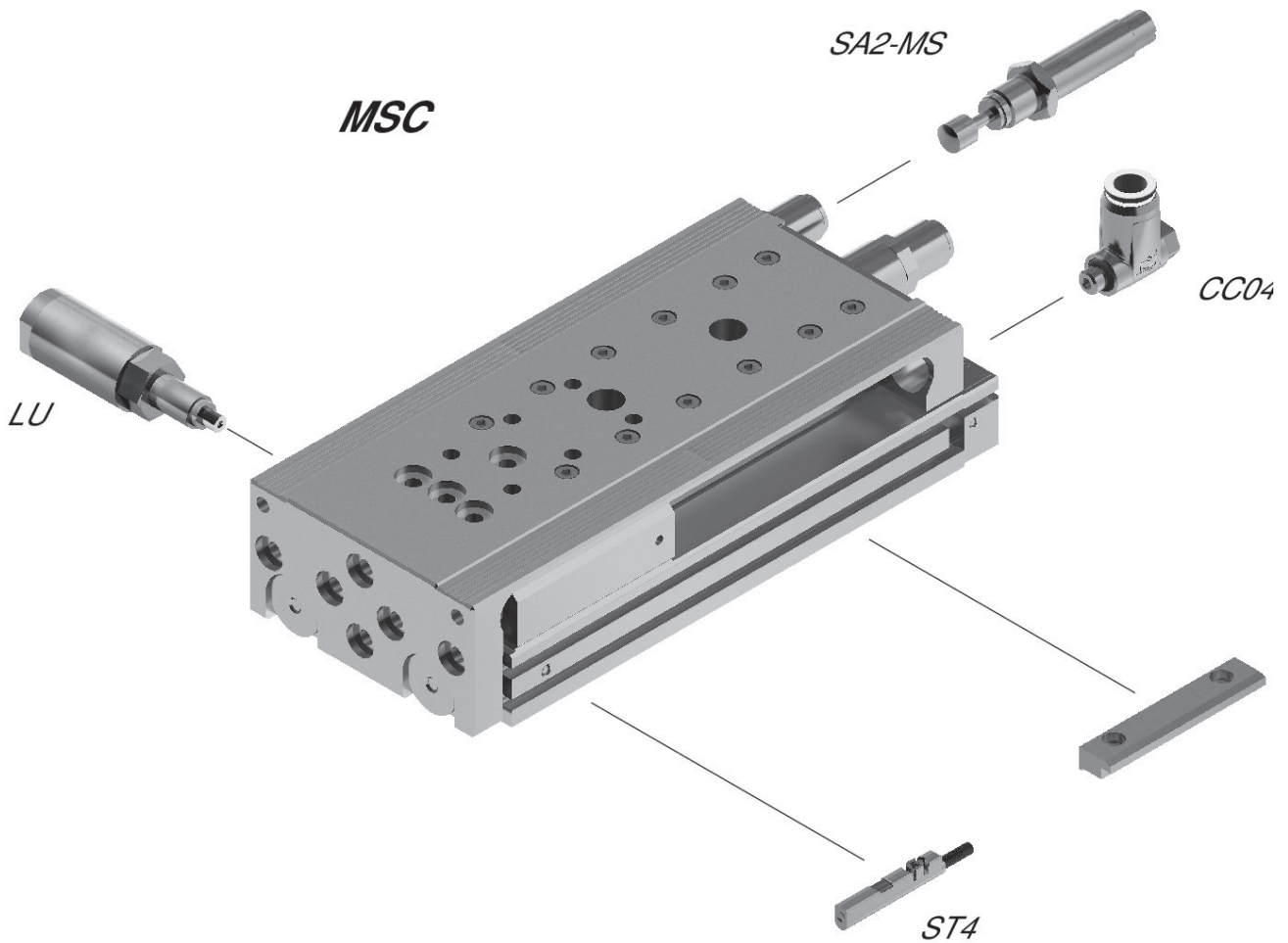
2024-04-06

Max. additional moving mass,
horizontal



S = stroke [mm]
2 x S = 1 cycle
V = velocity [m/s]
m = mass

Overview drawing



NOTE: This overview drawing is only for orientation to indicate where the various accessory parts can be fastened to the cylinder. The illustration has been simplified for this purpose. It is thus not possible to derive the dimensions from this overview.

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| Part No. | Piston Ø | S | N1 | N2 | N3 | X |
|------------|----------|-----|----|----|----|---|
| R480640185 | 20 | 30 | 2 | 2 | 2 | |
| R480640186 | 20 | 40 | 2 | 2 | 2 | |
| R480640187 | 20 | 50 | 2 | 2 | 2 | |
| R480640188 | 20 | 80 | 4 | 3 | 3 | |
| R480640189 | 20 | 100 | 4 | 3 | 3 | |

S = stroke

1) Access to the through hole only after removal of the stroke limitation bolts