# ISO 6432 MINI-CYLINDERS SERIES STD

Mini-cylinders to ISO 6432 with a chamfered stainless steel barrel.
The cylinder head dimensions have been reduced for some sizes so that they can be used where there are space restrictions.
Can be used with different types of sensors.
Available in various versions with a wide range of accessories:

- with or without magnet
- single acting extended, retracted or through piston rod
- double acting, single or through piston rod
- with pneumatic cushioning (Ø 16-20-25)
- gaskets made of NBR, POLYURETHANE, and FKM/FPM (for high temperatures), and low-temperature gaskets
- special executions on request
- fixing accessories, guide units and mechanical rod locking

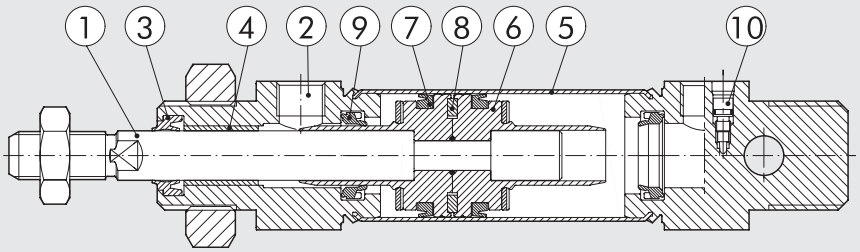
| TECHNICAL DATA | | Polyurethane | NBR | FKM/FPM | Low temperature |
|---|---|---|---|---|---|
| Max operating pressure | bar | 10 | | | |
| | MPa | 1 | | | |
| Temperature range | °C | –10 to +80 | –10 to +80 | –10 to +150 (non-magnetic cylinders) | –35 to +80 |
| Fluid | | Unlubricated air. Lubrication, if used, must be continuous | | | |
| Bores | mm | 8; 10; 12; 16; 20; 25 | | | |
| Design | | Chamfered barrel | | | |
| Standard strokes ✚ | mm | Single-acting: for bores Ø 8 to 25 strokes from 1 to 50 | | | |
| | | Double-acting: for bores Ø 8 to 10 strokes from 1 to 100 | | | |
| | | for bores Ø 12 to 16 strokes from 1 to 200 | | | |
| | | for bores Ø 20 to 25 strokes from 1 to 500 | | | |
| | | Double-acting, cushioned: for bores Ø 16 strokes from 1 to 300 | | | |
| | | for bores Ø 20 to 25 strokes from 1 to 500 | | | |
| Versions | | Double-acting, Double-acting cushioned, Single-acting extended or retracted rod, Through-rod, Through-rod cushioned, Version with piston rod block, no-stick slip | | | |
| Magnet for sensors | | All versions come complete with magnet. Supplied without magnet on request. | | | |

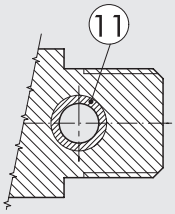
| Inrush pressure | | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
|---|---|---|---|---|---|---|---|
| single piston rod | bar | 0.8 | 0.8 | 0.8 | 0.6 | 0.6 | 0.6 |
| through-rod | bar | 1 | 1 | 1 | 0.8 | 0.8 | 0.8 |

| | |
|---|---|
| Forces generated at 6 bar thrust/retraction | See page 1-7 |
| Weights | See page 1-8 |
| Notes | **For speeds lower than 0.2 m/s to prevent surging, use the version No stick-slip and non-lubricated air.** |
| | ✚ Maximum recommended strokes. Higher values can create operating problems |

## COMPONENTS

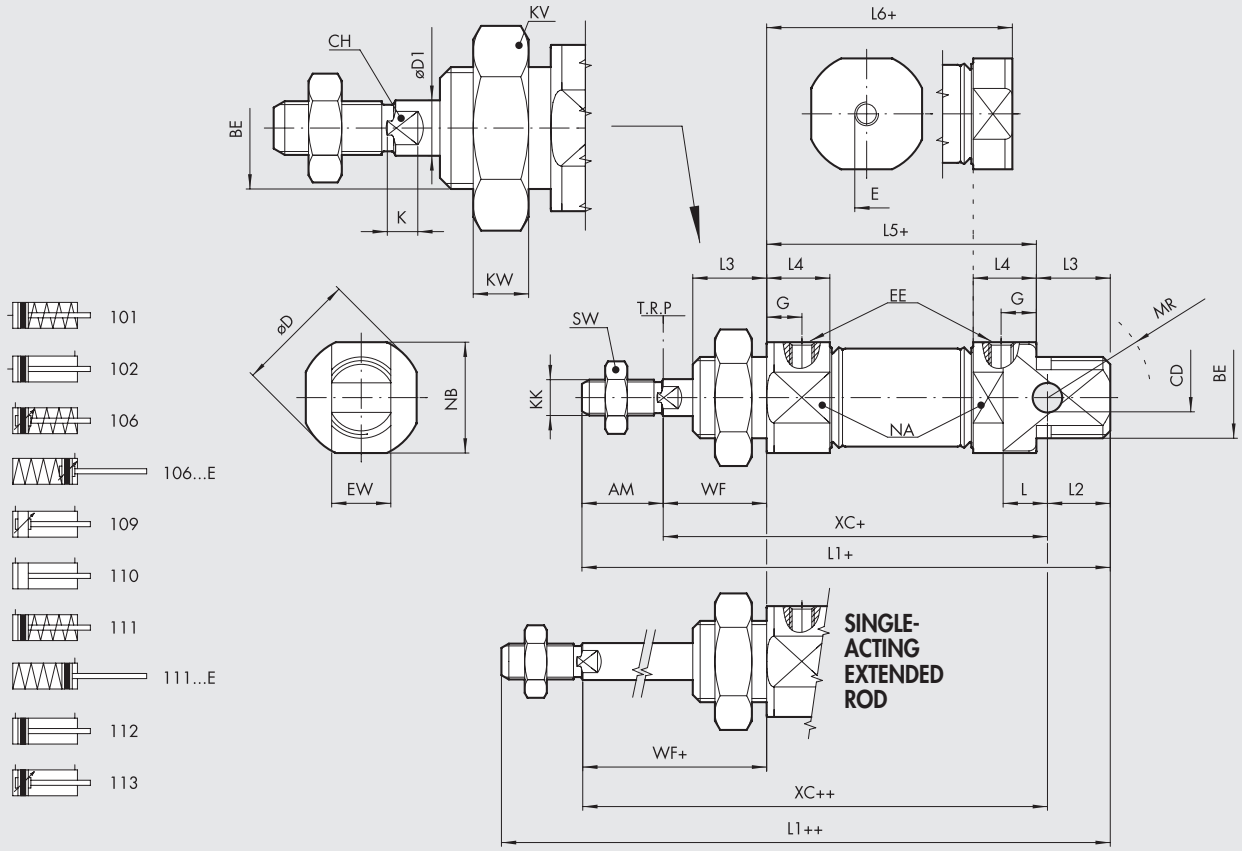
① PISTON ROD: C45 steel or stainless steel, thick chromed
② HEAD: anodised aluminium alloy
③ PISTON ROD GASKET: polyurethane, NBR or FKM/FPM
④ GUIDE BUSHING: steel strip with bronze and PTFE insert
⑤ BARREL: AISI 304 steel
⑥ HALF-PISTON: acetal resin
⑦ PISTON GASKET: polyurethane, NBR or FKM/FPM
⑧ MAGNET: plastoneodymium
⑨ CUSHIONING GASKET: NBR or FKM/FPM
⑩ NEEDLE: OT 58 with needle out movement safety system even when fully open
⑪ BUSHING (optional): self-lubricating bronze



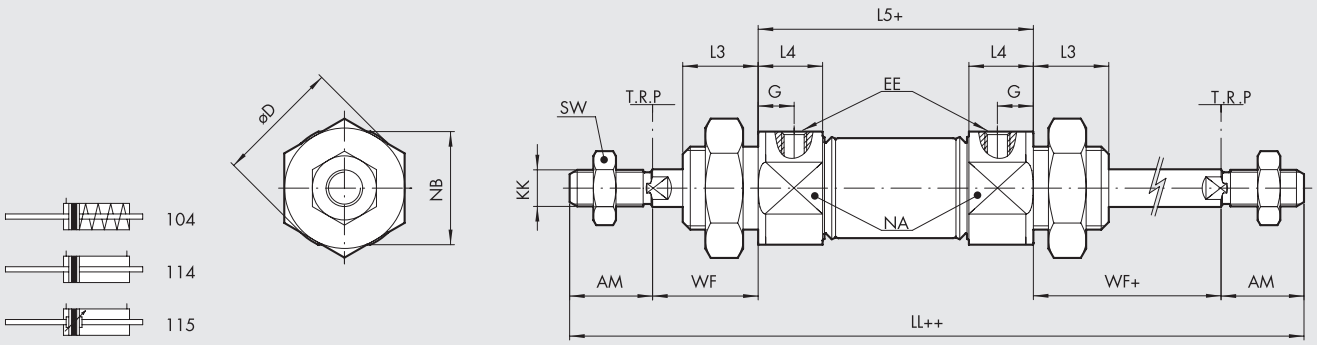
## DIMENSIONS

### STANDARD VERSION




+ = ADD STROKE
++ = ADD TWICE THE STROKE

### THROUGH-ROD VERSION




| Ø | AM +0.0;-2.0 | BE | øCD H9 | øD | øD1 | E | G | EE | EW d13 | L | LL | L1 | L2 | L3 | L4 | L5 | L6 | KK | XC ±1 | WF ±1,2 | KW | KV | MR | NA | NB | SW | CH | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **8** | 12 | M12x1.25 | 4 | 16.7 | 4 | M5 | 6 | M5 | 8 | 6.5 | 102 | 86 | 10 | 12 | 10 | 46 | 46 | M4 | 64 | 16 | 7 | 19 | 12 | 15 | 15 | 7 | 3 | 3 |
| **10** | 12 | M12x1.25 | 4 | 16.7 | 4 | M5 | 6 | M5 | 8 | 6.5 | 102 | 86 | 10 | 12 | 10 | 46 | 46 | M4 | 64 | 16 | 7 | 19 | 12 | 15 | 15 | 7 | 3 | 3 |
| **12** | 16 | M16x1.5 | 6 | 19 | 6 | M5 | 6 | M5 | 12 | 9 | 125 | 104 | 13 | 17 | 10 | 49 | 47 | M6 | 75 | 22 | 8 | 24 | 16 | 17 | 17 | 10 | 5 | 3.5 |
| **16** | 16 | M16x1.5 | 6 | 19.7 | 6 | 1/8 | 6 | M5 | 12 | 9 | 132 | 111 | 13 | 17 | 10 | 56 | 53 | M6 | 82 | 22 | 8 | 24 | 16 | 18 | 18 | 10 | 5 | 3.5 |
| **20** | 20 | M22x1.5 | 8 | 27.9 | 8 | 1/8 | 8 | G 1/8 | 16 | 12 | 156 | 129 | 14 | 17 | 15.5 | 68 | 61 | M8 | 95 | 24 | 7 | 32 | 18 | 24 | 24 | 13 | 7 | 4.6 |
| **25** | 22 | M22x1.5 | 8 | 33 | 10 | 1/8 | 9 | G 1/8 | 16 | 12 | 173 | 143 | 17 | 20 | 17.1 | 73 | 66.5 | M10x1.25 | 104 | 28 | 7 | 32 | 21 | 30 | 30 | 17 | 8 | 5 |

### VERSION 106...E (SINGLE-ACTING EXTENDED ROD, CUSHIONED)
### VERSION 111...E (SINGLE-ACTING EXTENDED ROD)

| Ø | Stroke | L1 | L5 | XC |
|---|---|---|---|---|
| **16** | 0 - 25 | 115.4 | 60.4 | 86.4 |
| **16** | 26 - 50 | 135.4 | 80.4 | 106.4 |

| Ø | Stroke | L1 | L5 | XC |
|---|---|---|---|---|
| **20** | 0 - 25 | 133.4 | 72.4 | 99.4 |
| **20** | 26 - 50 | 154.4 | 93.4 | 120.4 |

| Ø | Stroke | L1 | L5 | XC |
|---|---|---|---|---|
| **25** | 0 - 25 | 146 | 76.1 | 107 |
| **25** | 26 - 50 | 169 | 99 | 130 |

## KEY TO CODES

| CYL | 1 1 2<br>TYPE | 0 | 16<br>BORE | 0020<br>STROKE | C<br>MATERIAL | P<br>GASKETS | ▶ E |
|---|---|---|---|---|---|---|---|
| | **101** SE axial coupling<br>**102** DEM axial coupling<br>**104** SE through-rod<br>■◀ **106** SE cushioned<br>■ **109** DEA<br>**110** DE<br>◀ **111** SE<br>**112** DEM<br>■ **113** DEMA<br>✱▼ **114** DEM through-rod<br>✱▼■ **115** DEMA through-rod<br>◆ **116** DEM for mechanical lock<br>■ **117** DEMA for mechanical lock | **0** Standard<br>**U** Bronze rear head bushing<br>**V** Without head nut<br>**S** Non-magnetic<br>▲ **G** No stick slip | ▼ 08<br>▼ 10<br>▼ 12<br>16<br>20<br>25 | For the maximum suppliable strokes, look at the technical data | **A** C45 chrome rod, aluminium piston rod<br>**C** C45 chrome rod, technopolymer piston rod<br>**Z** Stainless steel piston rod and nut aluminium piston<br>**X** Stainless steel piston rod and nut technopolymer piston | **P** Polyurethane<br>**N** NBR<br>● **V** FKM/FPM<br>● **B** Low temperature | **E** Single-acting extended rod |

DE: Double-acting (non-cushioned, not magnetic)
DEM: Magnetic double-acting (non-cushioned)
DEMA: Magnetic double-acting (cushioned)
DEA: Cushioned double-acting (non-magnetic)
SE: Single-acting (magnetic)

● Only available for non-magnetic versions (S) and with aluminium piston (A or Z)
▲ **For speeds lower than 0.2m/s, to prevent surging. Use no-lubricated air only**
▼ Stainless steel piston rod
■ Available from Ø 16
◆ Available from Ø 12
✱ For ø16 to 25 aluminium piston, stainless stell piston rod
◀ 106... single-acting retracted rod, cushioned
106...E single-acting extended rod, cushioned available in Ø 16 - Ø 20 - Ø 25
111... single-acting retracting piston rod
111...E single-acting extended piston rod, available in Ø 16 - Ø 20 - Ø 25
▶ Letter to be added only to the single acting extended rod version

## NOTES

## CONSUMPTION OF AIR IN THE CYLINDERS

| Cylinder bore D mm | Piston rod diameter d mm | Motion | Useful area cm² | Air consumption during thrust and traction in Nl/cm of stroke, depending on the working pressure P in bar at 20°C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1 bar | 2 bar | 3 bar | 4 bar | 5 bar | 6 bar | 7 bar | 8 bar | 9 bar | 10 bar |
| 8 | 4 | thrust | 0.50 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 |
| | | traction | 0.38 | 0.0008 | 0.0011 | 0.0015 | 0.0019 | 0.0023 | 0.0026 | 0.0030 | 0.0034 | 0.0038 | 0.0041 |
| 10 | 4 | thrust | 0.79 | 0.0016 | 0.0024 | 0.0031 | 0.0039 | 0.0047 | 0.0055 | 0.0063 | 0.0071 | 0.0079 | 0.0086 |
| | | traction | 0.66 | 0.0013 | 0.0020 | 0.0026 | 0.0033 | 0.0040 | 0.0046 | 0.0053 | 0.0059 | 0.0066 | 0.0073 |
| 12 | 6 | thrust | 1.13 | 0.0023 | 0.0034 | 0.0045 | 0.0057 | 0.0068 | 0.0079 | 0.0090 | 0.0102 | 0.0113 | 0.0124 |
| | | traction | 0.85 | 0.0017 | 0.0025 | 0.0034 | 0.0042 | 0.0051 | 0.0059 | 0.0068 | 0.0076 | 0.0085 | 0.0093 |
| 16 | 6 | thrust | 2.01 | 0.0040 | 0.0060 | 0.0080 | 0.0101 | 0.0121 | 0.0141 | 0.0161 | 0.0181 | 0.0201 | 0.0221 |
| | | traction | 1.73 | 0.0035 | 0.0052 | 0.0069 | 0.0086 | 0.0104 | 0.0121 | 0.0138 | 0.0156 | 0.0173 | 0.0190 |
| 16 | 8 | thrust | 2.01 | 0.0040 | 0.0060 | 0.0080 | 0.0101 | 0.0121 | 0.0141 | 0.0161 | 0.0181 | 0.0201 | 0.0221 |
| | | traction | 1.51 | 0.0030 | 0.0045 | 0.0060 | 0.0075 | 0.0090 | 0.0106 | 0.0121 | 0.0136 | 0.0151 | 0.0166 |
| 20 | 8 | thrust | 3.14 | 0.0063 | 0.0094 | 0.0126 | 0.0157 | 0.0188 | 0.0220 | 0.0251 | 0.0283 | 0.0314 | 0.0346 |
| | | traction | 2.64 | 0.0053 | 0.0079 | 0.0106 | 0.0132 | 0.0158 | 0.0185 | 0.0211 | 0.0237 | 0.0264 | 0.0290 |
| 20 | 10 | thrust | 3.14 | 0.0063 | 0.0094 | 0.0126 | 0.0157 | 0.0188 | 0.0220 | 0.0251 | 0.0283 | 0.0314 | 0.0346 |
| | | traction | 2.36 | 0.0047 | 0.0071 | 0.0094 | 0.0118 | 0.0141 | 0.0165 | 0.0188 | 0.0212 | 0.0236 | 0.0259 |
| 25 | 10 | thrust | 4.91 | 0.0098 | 0.0147 | 0.0196 | 0.0245 | 0.0295 | 0.0344 | 0.0393 | 0.0442 | 0.0491 | 0.0540 |
| | | traction | 4.12 | 0.0082 | 0.0124 | 0.0165 | 0.0206 | 0.0247 | 0.0289 | 0.0330 | 0.0371 | 0.0412 | 0.0454 |
| 32 | 12 | thrust | 8.04 | 0.0161 | 0.0241 | 0.0322 | 0.0402 | 0.0483 | 0.0563 | 0.0643 | 0.0724 | 0.0804 | 0.0885 |
| | | traction | 6.91 | 0.0138 | 0.0207 | 0.0276 | 0.0346 | 0.0415 | 0.0484 | 0.0553 | 0.0622 | 0.0691 | 0.0760 |
| 40 | 12 | thrust | 12.57 | 0.0251 | 0.0377 | 0.0503 | 0.0628 | 0.0754 | 0.0880 | 0.1005 | 0.1131 | 0.1257 | 0.1382 |
| | | traction | 11.44 | 0.0229 | 0.0343 | 0.0457 | 0.0572 | 0.0686 | 0.0800 | 0.0915 | 0.1029 | 0.1144 | 0.1258 |
| 40 | 16 | thrust | 12.57 | 0.0251 | 0.0377 | 0.0503 | 0.0628 | 0.0754 | 0.0880 | 0.1005 | 0.1131 | 0.1257 | 0.1382 |
| | | traction | 10.56 | 0.0211 | 0.0317 | 0.0422 | 0.0528 | 0.0633 | 0.0739 | 0.0844 | 0.0950 | 0.1056 | 0.1161 |
| 50 | 16 | thrust | 19.63 | 0.0393 | 0.0589 | 0.0785 | 0.0982 | 0.1178 | 0.1374 | 0.1571 | 0.1767 | 0.1963 | 0.2160 |
| | | traction | 17.62 | 0.0352 | 0.0529 | 0.0705 | 0.0881 | 0.1057 | 0.1234 | 0.1410 | 0.1586 | 0.1762 | 0.1939 |
| 50 | 20 | thrust | 0.50 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 |
| | | traction | 16.49 | 0.0330 | 0.0495 | 0.0660 | 0.0825 | 0.0990 | 0.1155 | 0.1319 | 0.1484 | 0.1649 | 0.1814 |
| 63 | 16 | thrust | 31.17 | 0.0623 | 0.0935 | 0.1247 | 0.1559 | 0.1870 | 0.2182 | 0.2494 | 0.2805 | 0.3117 | 0.3429 |
| | | traction | 29.16 | 0.0583 | 0.0875 | 0.1166 | 0.1458 | 0.1750 | 0.2041 | 0.2333 | 0.2624 | 0.2916 | 0.3208 |
| 63 | 20 | thrust | 31.17 | 0.0623 | 0.0935 | 0.1247 | 0.1559 | 0.1870 | 0.2182 | 0.2494 | 0.2805 | 0.3117 | 0.3429 |
| | | traction | 28.03 | 0.0561 | 0.0841 | 0.1121 | 0.1402 | 0.1682 | 0.1962 | 0.2242 | 0.2523 | 0.2803 | 0.3083 |
| 80 | 20 | thrust | 50.26 | 0.1005 | 0.1508 | 0.2011 | 0.2513 | 0.3016 | 0.3518 | 0.4021 | 0.4524 | 0.5026 | 0.5529 |
| | | traction | 47.12 | 0.0942 | 0.1414 | 0.1885 | 0.2356 | 0.2827 | 0.3299 | 0.3770 | 0.4241 | 0.4712 | 0.5183 |
| 80 | 25 | thrust | 50.26 | 0.1005 | 0.1508 | 0.2011 | 0.2513 | 0.3016 | 0.3518 | 0.4021 | 0.4524 | 0.5026 | 0.5529 |
| | | traction | 45.36 | 0.0907 | 0.1361 | 0.1814 | 0.2268 | 0.2721 | 0.3175 | 0.3628 | 0.4082 | 0.4536 | 0.4989 |
| 100 | 25 | thrust | 78.54 | 0.1571 | 0.2356 | 0.3142 | 0.3927 | 0.4712 | 0.5498 | 0.6283 | 0.7068 | 0.7854 | 0.8639 |
| | | traction | 73.63 | 0.1473 | 0.2209 | 0.2945 | 0.3681 | 0.4418 | 0.5154 | 0.5890 | 0.6627 | 0.7363 | 0.8099 |
| 125 | 32 | thrust | 122.71 | 0.2454 | 0.3681 | 0.4909 | 0.6136 | 0.7363 | 0.8590 | 0.9817 | 1.1044 | 1.2271 | 1.3499 |
| | | traction | 114.67 | 0.2293 | 0.3440 | 0.4587 | 0.5734 | 0.6880 | 0.8027 | 0.9174 | 1.0321 | 1.1467 | 1.2614 |
| 160 | 40 | thrust | 201.06 | 0.4021 | 0.6032 | 0.8042 | 1.0053 | 1.2063 | 1.4074 | 1.6084 | 1.8095 | 2.0106 | 2.2116 |
| | | traction | 188.49 | 0.3770 | 0.5655 | 0.7540 | 0.9425 | 1.1309 | 1.3194 | 1.5079 | 1.6964 | 1.8849 | 2.0734 |
| 200 | 40 | thrust | 314.15 | 0.6283 | 0.9425 | 1.2566 | 1.5708 | 1.8849 | 2.1991 | 2.5132 | 2.8274 | 3.1415 | 3.4557 |
| | | traction | 301.58 | 0.6032 | 0.9048 | 1.2063 | 1.5079 | 1.8095 | 2.1111 | 2.4127 | 2.7143 | 3.0158 | 3.3174 |

## FORCE OF SPRINGS IN SINGLE-ACTING CYLINDERS (THEORETICAL)

**ISO 15552 SINGLE-ACTING CYLINDERS**

| Bore mm | Force with spring compressed N | Max. stroke mm | Force with spring extended N |
|---|---|---|---|
| 32 | 63 | 250 | 35 |
| 40 | 88 | 250 | 51 |
| 50 | 102 | 250 | 64 |
| 63 | 102 | 250 | 64 |

**ROUND SINGLE-ACTING CYLINDERS**

| Bore mm | Force with spring compressed N | Max. stroke mm | Force with spring extended N |
|---|---|---|---|
| 32 | 86 | 250 | 34 |
| 40 | 95 | 250 | 50 |
| 50 | 108 | 250 | 62 |

**ISO 6432 SINGLE-ACTING CYLINDERS**

| Bore mm | Force with spring compressed N | Max. stroke mm | Force with spring extended N |
|---|---|---|---|
| 8 | 3 | 50 | 1 |
| 10 | 5 | 50 | 1 |
| 12 | 7 | 50 | 3 |
| 16 | 21 | 50 | 5 |
| 20 | 25 | 50 | 12 |
| 25 | 25 | 50 | 18 |

**SSC SINGLE-ACTING CYLINDERS**

| Bore mm | Force with spring compressed N | Max. stroke mm | Force with spring extended N |
|---|---|---|---|
| 12 | 6 | 25 | 1.5 |
| 16 | 7 | 25 | 3 |
| 20 | 12 | 25 | 4 |
| 25 | 14 | 25 | 5 |
| 32 | 33 | 50 | 6 |
| 40 | 45 | 50 | 15 |
| 50 | 70 | 50 | 20 |
| 63 | 81 | 50 | 25 |