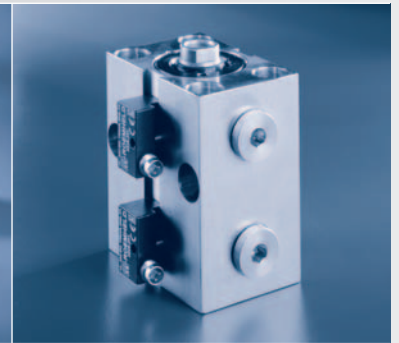




Program summary

Double-acting hydraulic cylinders

Hydro-cylinders
Hydraulic block cylinders



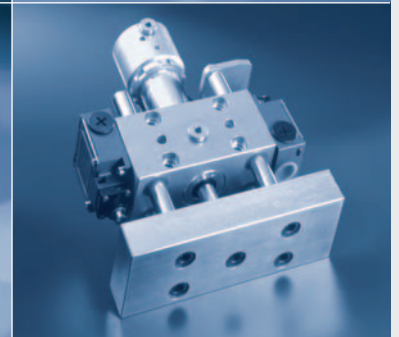
Block cylinders

Threaded-body cylinders



Built-in elements

Universal cylinders



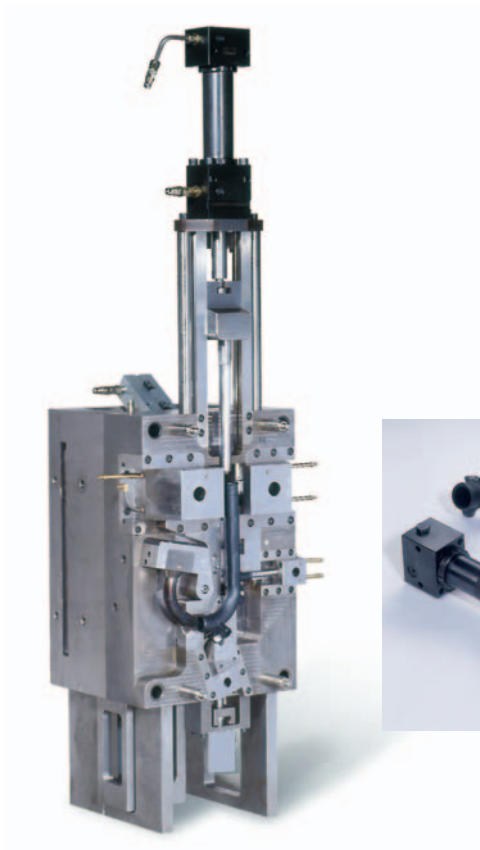
Hydraulic slides



Application examples

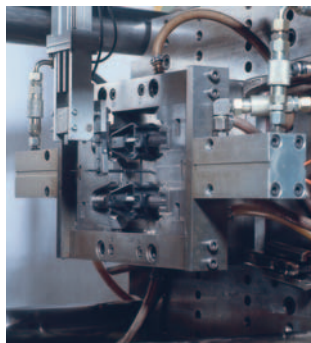
Tool for fabrication of an automotive component.

5 cylinders operate these core-pullers for the required dimensional accuracy of the complex shaping of this elbow tube with two additional tube connections.



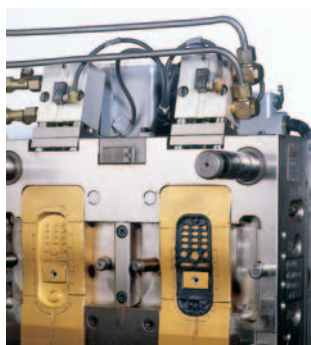
Tool for fabrication of connecting components for children's push chairs.

The core-pullers for injection moulding connecting components made out of plastic materials are inserted and retracted by two aluminium block cylinders for fabrication in exact position.






Tool for fabrication of mobile phone housings.

The exact shaping of the inlet for the later installation of the microphone is made during the injection process by dies, which are operated by aluminium block cylinders with magnetic sensors.





Program summary Double-acting hydraulic cylinders

| Description | Hydro-cylinders | Hydro-cylinders | Universal cylinders |
|---|---|--|---|
| |  |  |  |
| Data sheet | B 1.2811 | B 1.282 | B 1.309 |
| Piston diameter [mm] | 25 ... 80 | 25 ... 80 | 16 ... 63 |
| Max. operating pressure [bar] | 200 | 200 | 500 |
| Force to push at max. pressure [kN] | 9.8 ... 100.5 | 9.8 ... 100.5 | 10 ... 156 |
| Stroke lengths [mm]: - range - graduation - intermed. strokes | 100 ... 1000 standard strokes special versions | 70 ... 1200 mm standard | 16 ... 100 standard strokes with distance bushing |
| Max. operating temperature (without position control) | +100 °C | with NBR: +100 °C with FKM: +200 °C | with NBR: +100 °C with FKM: +200 °C |
| Admissible side loads | none | little see data sheet | 3% (1) |
| Max. piston speed [m/s] | 0.5 | 0.5 | 0.25 |
| Fixation of the cylinder | internal thread accessory: flange | internal thread accessory: flange or spherical bearing joint | external thread accessory: groove nuts |
| Fixation at the piston rod | external thread | external thread | internal thread |
| Keyway | no | no | no |
| Hydraulic connection | pipe thread G ¼...G ½ | pipe thread G ¼...G ¾ | pipe thread G ¼...G ¼ |
| Space required | medium | medium / large | little |
| Materials: | | | |
| - body | free-cutting steel, galvanized | free-cutting steel, galvanized | high alloy steel, black oxide |
| - piston rod | high alloy steel chromium-plated | high alloy steel chromium-plated | case-hardening steel, hardened |
| - seals | NBR | NBR or FKM | NBR or FKM |
| Stroke end cushioning | no | option, adjustable | no |
| Anti-torsion device | no | no | no |
| Accessory - Position monitoring - Sensor/switch type | no | no | no |
| - Adjustment of monitoring points - Maximum operating temperature | | | |

(1): up to max. 50 mm stroke: 3% of the force to push at max. operating pressure

(2): 500 bar for static, 250 bar for dynamic load

(3): Extend: 500 bar for steel block cylinders, 350 bar for aluminium block cylinders / Retract: 350 bar all versions

| Threaded-body cylinders | Block cylinders | Block cylinders for stroke end control | Block cylinders with stroke end cushioning | Built-in elements |
|---|---|---|---|---|
|  |  |  |  |  |
| B 1.470 | B 1.5094 | B 1.520 | B 1.530 | B 1.5401 |
| 16 ... 40 | 16 ... 200 | 16 ... 100 | 25 ... 100 | 16 ... 100 |
| 500 | 500 | 500 | 500 | 500 |
| 10 ... 62.8 | 10 ... 1570 | 10 ... 392 | 24.5 ... 392 | 10 ... 392 |
| 16 ... 40 standard strokes with distance bushing | 8 ... 200 standard strokes with distance bushing | 16 ... 100 standard strokes with distance bushing | 25 ... 100 standard strokes special version | 16 ... 100 standard strokes with distance bushing |
| with NBR: +100 °C with FKM: +200 °C | with NBR: +100 °C with FKM: +200 °C | +120 °C | with NBR: +100 °C with FKM: +200 °C | with NBR: +100 °C with FKM: +200 °C |
| 3% (1) | 3% (1) | 3% (1) | 3% (1) | 3% (1) |
| 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Built-in type with screw-in thread | through holes variant: internal thread | through holes variant: internal thread | through holes variant: internal thread | – |
| internal thread | internal thread | internal thread | internal thread | internal thread |
| no | variant | variant | variant | – |
| provided by customer drilled channels | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing | provided by customer drilled channels |
| little | little / medium | little / medium | medium | minimal |
| free-cutting steel, galvanized | high alloy steel, black oxide | high alloy steel, black oxide | high alloy steel, black oxide | provided by customer |
| case-hard. steel, hardened | case-hard. steel, hardened | case-hard. steel, hardened | case-hard. steel, hardened | case-hard. steel, hardened |
| NBR or FKM | NBR or FKM | FKM | NBR or FKM | NBR or FKM |
| no | no | no | yes, adjustable | no |
| no | no | no | no | no |
| no | no | yes proximity sensors, inductive, pressure resistant max. 5 mm to stroke end +80 °C or 120 °C | yes proximity sensors, inductive, pressure resistant max. 5 mm to stroke end +80 °C or 120 °C | no |

| Block cylinders with piston rod with external thread | Block cylinders with extended piston rod | Block cylinders with bronze housing | Block cylinders with aluminium housing | Block cylinders with anti-rotation piston with aluminium housing |
|---|---|---|---|---|
|  |  |  |  |  |
| B 1.542 | B 1.552 | B 1.553 | B 1.554 | B 1.560 |
| 25 ... 63 | 25 ... 125 | 25 ... 63 | 25 ... 63 | 32 ... 50 |
| 500 | 500 | 500 | 350 | 350 |
| 24.5 ... 156 | 20.6 ... 610 | 24.5 ... 156 | 17.1 ... 109 | 28.1 ... 68.7 |
| 50 ... 63 standard strokes with distance bushing | 20 ... 50 standard strokes with distance bushing | 20 ... 100 standard strokes with distance bushing | 20 ... 100 standard strokes with distance bushing | 25 ... 100 standard strokes with distance bushing |
| with NBR: +100 °C with FKM: +200 °C | +200 °C | with NBR: +100 °C with FKM: +120 °C | with NBR: +100 °C with FKM: +120 °C | +100 °C |
| 3% (1) | 3% (1) | 3% (1) | 3% (1) | high see data sheet |
| 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| through holes variant: internal thread | through holes variant: internal thread | through holes variant: internal thread | through holes variant: internal thread | through holes variant: internal thread |
| external thread | internal thread | internal thread | internal thread | cone 1:10 with internal thread |
| variant | variant | variant | variant | variant |
| pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G ¼ |
| little / medium | medium | little / medium | little / medium | little / medium |
| high alloy steel, black oxide | high alloy steel, black oxide | bronze alloy | aluminium alloy anodized | aluminium alloy anodized |
| high alloy steel, nitrated | case-hard. steel, hardened | case-hard. steel, hardened option: stainless | case-hard. steel, hardened option: stainless | case-hard. steel, hardened |
| NBR or FKM | FKM | NBR or FKM | NBR or FKM | NBR |
| no | no | no | no | no |
| no | no | no | no | yes, radial clearan. max. ±0,3° |
| no | yes proximity sensors, inductive | yes magnetic sensors, | yes magnetic sensors, | yes magnetic sensors |
| | over the complete stroke +70 °C or +120 °C | over the complete stroke +100 °C | over the complete stroke +100 °C | over the complete stroke +100 °C |



| Built-in elements with anti-rotation piston | Hydraulic block cylinders | Block cylinders with guide housing | RM mini slides | RS hydraulic slides |
|---|---|---|--|---|
|  |  |  |  |  |
| B 1.5601 | B 1.590 | B 1.738 | B 1.7384 | B 1.7385 |
| 32 ... 50 | 25 ... 80 | 25 ... 63 | 25 ... 50 | 25 ... 100 |
| 350 | 250 | 500 / 350 (3) | 500 | 250 |
| 28.1 ... 68.7 | 12.3 ... 126 | 17.1 ... 156 | 24.5 ... 98.5 | 12.3 ... 196 |
| 25 ... 100 standard strokes with distance bushing | 70 ... 1200 mm standard | 20 ... 63 standard strokes with distance bushing | 20 ... 100 standard strokes with distance bushing | 50 ... 200 25 mm variant |
| +100 °C | +200 °C | aluminium: +120 °C steel + 200 °C | +150 °C | with NBR: +100 °C with FKM: +180 °C |
| high see data sheet | little see data sheet | very high | medium see data sheet | very high see data sheet |
| 0.25 | 0.5 | 0.25 | 0.25 | 0.5 |
| – | through holes variant: internal thread | through holes | internal thread | through holes or internal thread |
| cone 1:10 with internal thread | internal thread or external thread | guide bolts: with internal thread | front block | front block |
| – | standard | drill bushings | dowel holes | standard and dowel holes |
| provided by customer drilled channels | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G ¼...G ½ | pipe thread G manifold-mount. connection with O-ring sealing | pipe thread G manifold-mount. connection with O-ring sealing |
| minimal | large | large | little / medium | large |
| provided by customer | free-cutting steel, galvan. | free-cutting steel, galvan. or aluminium alloy | high alloy steel, black oxide | free-cutting steel, galvan. |
| case-hard. steel, hardened | high alloy steel chromium-plated | guide bolts: case-hard. steel, hardened | case-hard. steel, hardened | high alloy steel chromium-plated |
| NBR | FKM | FKM | FKM | NBR or FKM |
| no | option, adjustable | no | no | option, not adjustable |
| no | no | no | yes, without clearance | yes, without clearance |
| no | yes proximity sensors, ind., pressure resistant | yes ind. proximity sensors or magnetic sensors | yes ind. proximity sensors or mechanical switches | yes mechanical switches |
| | max. 5 mm to stroke end +80 °C or 120 °C | over the complete stroke +70°C, +100°C or +120°C | over the complete stroke +70°C, +100°C or +120°C | no, only for stroke ends +70 °C |



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for adjustable magnetic sensors

With cylinder housing of a non-magnetizable special bronze alloy. Stable as steel. For more process safety even with strongest loads. With continuous control of the piston position by magnetic sensors.



Polygon block cylinders B 1.560

with anti-rotation piston

Block cylinder with aluminium housing and piston rod with polygonal profile to prevent rotation. The installed guide is in the position to compensate torques and side loads. With continuous control of the piston rod by magnetic sensors.

Also available as built-in element (data sheet B 1.5601).



RM mini slides B 1.7384

with 4 guide rods and front block

Small and compact hydraulic slide with 4 guide rods and front block to compensate side loads and torques.

Position monitoring by limit switches or inductive sensors.



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Römheld GmbH
Friedrichshütte
Römheldstraße 1-5
35321 Laubach
Germany
Tel.: +49 (0) 6405 / 89-0
Fax: +49 (0) 6405 / 89-211
E-Mail: info@roemheld.de
www.roemheld.com