Hydro-Cylinder
max. operating pressure 200 bar

Particular characteristics
● Max. piston speed 0,5 m/s.
● Low wear and friction Glydring seals.
● High service life due to the use of guide rings at the piston and the piston rod.
● Negligible leakage by double sealing piston rod.
● Piston rod induction hardened and chromium-plated.
● Effective wiper seal.
● Self-centring cushioning discs (dampening discs) with relief valve function for unthrottled cylinder start.
● Fixing thread and centring spigot at both cylinder heads allow mounting of non standard accessories.
● Particularly suitable for fixture building by direct mounting on cylinder head (small pitch circle dia.) and accurate centring.
● Compact design.

Important notes
Operating conditions, tolerances and other data see data sheet A 0.100.

Fixing possibilities

Connecting dimensions as per DIN ISO 6020
Only exception is the shorter overall length. This should be noted particularly with the spherical bearing joint type.
On request also available in the longer version as per DIN ISO 6020.

Application example
Application of hydraulic cylinders for series assembly of hydro-mechanical linear units.
The element to be assembled is located in the required position in an assembly fixture and clamped with hydraulic swing clamps. See data sheet B 1.891.
The assembly fixture can be rotated according to the assembly process and locked by means of an hydraulic block cylinder. See data sheet B 1.509.
Pressing of the components can be made by use of an hydraulic cylinder.
### Dimensions

#### Part-nos.

<table>
<thead>
<tr>
<th>Nominal force</th>
<th>Forward thrust [kN]</th>
<th>Pull thrust [kN]</th>
</tr>
</thead>
<tbody>
<tr>
<td>at 200 bar</td>
<td>9.8</td>
<td>5.7</td>
</tr>
</tbody>
</table>

#### Dimensions

- **Cushioning stroke**
  - L1 = stroke + [mm]: 108 (150), 121 (170), 149 (190), 162 (205), 189 (224), 226 (250)
  - L2 = stroke + [mm]: 120 (162), 137 (186), 165 (206), 182 (225), 214 (249), 258 (282)
  - L3 = stroke + [mm]: 140 (178), 162 (206), 195 (231), 219 (257), 259 (289), 313 (332)

- **Ø a f7** [mm]: 32, 40, 50, 60, 70, 85
- **Ø c** [mm]: 35, 42, 50, 60, 75, 95
- **Ø d1** [mm]: 15, 19, 24, 31, 39, 48.5

- **ø d** [mm]: G 1/4, G 1/4 (3/8), G 1/4 (1/2), G 1/2, G 1/2 (3/4), G 1/2 (3/4)

- **ø j H7** [mm]: 12, 16, 20, *) 20, *) 24, *) 29, *) 37, *)

- **ø n** [mm]: 45, 58, 68, 82, 95, 115
- **ø o** [mm]: 61, 73, 86, 104, 119, 144

- **p x depth of thread** [mm]: M 6 x 12, M 8 x 15, M 8 x 15, M 10 x 20, M 12 x 20, M 16 x 28

- **ø r** [mm]: 90, 110, 125, 150, 170, 195

- **ø u** [mm]: 75, 92, 106, 126, 145, 165

- **ø v** [mm]: 7, 9, 9, 11, 14, 18

- **ø w** [mm]: 20, 25, 30, 37, 45, 55

- **ø x** [mm]: 16, 20, 23.5, 29, 35, 44.5

- **ø y** [mm]: 10.5, 13, 17, 21, 27, 32

- **ø z** [mm]: 12, 16, 20, 25, 32, 40

- **SW** [mm]: 13, 17, 22, 27, 36, 46

- **Minimum stroke ± 1.5** [mm]: 70, 70, 60, 70, 80, 80

- **Maximum stroke ± 1.5** [mm]: 750, 950, 1200, 1200, 1200, 1200

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#### Part-no.

- **Cylinder**
  - Perbunan without cushioning: 1293-10-XXXX
  - VITON® without cushioning: 1293-11-XXXX
  - Perbunan with cushioning: 1293-12-XXXX
  - VITON® with cushioning: 1293-13-XXXX

- **Flange**
  - 1283-910

- **Spherical bearing joint**
  - at front: 1293-930
  - at rear: 1293-940

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**Important note:**

For stroke selection consider buckling load and transverse force on page 3.

Dimensions marked by *) are not as per DIN ISO 6020
Buckling load

Flange mounting at front
Limit values for stroke and operating pressures at buckling load
(safety against buckling = 3.5)

Flange mounting at rear
Limit values for stroke and operating pressures at buckling load
(safety against buckling = 3.5)

Spherical bearing joint
Limit values for stroke and operating pressures at buckling load
(safety against buckling = 3.5)

Admissible transverse force
with extended piston rod

Guide lines for spherical bearing joint

1. Admissible load
DIN ISO 6020 is valid for hydro-cylinders with 160 bar nominal pressure. The manufacturers of spherical bearing joints have designed products for this load. To achieve a satisfactory live, the oil pressure should not exceed 160 bar during the cylinder movement, i.e., when the joints are swivelling. When the cylinder has completed its stroke the oil pressure is then allowed to rise to the admissible operating pressure of 200 bar.

2. Service life
Service life of the spherical bearing eye is dependent upon specific bearing load, load direction, angle of rotation, tilt angle, and lubrication. A general statement is impossible due to the number of these factors. Adequate service life will be obtained under “normal” operating conditions. If in doubt, please check with us.

3. Lubrication
Lubrication intervals must be adapted to existing operating conditions. If operation is near the load limit, daily lubrication is recommended, opposed to weekly lubrication, life is then increased 7-fold.

4. Design of clevis pin
Clevis pin fit to be m6 (DIN). Exceptionally, f7 may be used for a casehardened pin with lubrication through the pin.

5. Assembly of the front spherical bearing joint
Before finally securing the spherical bearing joint by means of the two clamping screws it should be torqued firmly against the piston rod shoulder. Thereby the thread receives a certain initial tension which prevents loosening with alternating loads.

Proceed as follows:
5.1. Tighten clamping screws so that the ball-and-socket joint can be returned on the piston rod thread.
5.2. Clamp spherical bearing joint carefully into a vice and tighten piston rod firmly with fork spanner. Tighten clamping screws.

Important note:
Transverse forces have to be avoided, if possible, otherwise life of piston and piston rod guide are reduced.
Examples for ordering

Application example

Use of hydro-cylinders in hydraulic presses.

The shown C-frame press unit is delivered ready for connection. The press unit is equipped with an electrical control (at the front) and the corresponding hydraulic power unit (at the top of the C-frame).

See data sheet M 6.6040.

Examples for ordering:

Example 1

1 off hydro-cylinder, Ø 32/20 x 85 stroke with VITON® seal, without cushioning

Text: 1 off hydro-cylinder

Part-no. 1294-11-0085

Example 2

2 off hydro-cylinders, Ø 50/32 x 1150 stroke with VITON® seal, with cushioning both with flange at front

Text: 2 off hydro-cylinders

Part-no. 1296-13-1150

2 off flange at front

Part-no. 1286-910

Example 3

2 off hydro-cylinders, Ø 80/50 x 480 stroke with Perbunan seal, with cushioning

1 off with flange at rear

1 off with spherical bearing joint at front and at rear

Text: 1 off hydro-cylinder

Part-no. 1298-12-0480

1 off flange at rear

Part-no. 1298-930

1 off hydro-cylinder

Part-no. 1298-12-0480

1 off spherical bearing joint at front

Part-no. 1298-930

1 off spherical bearing joint at rear

Part-no. 1298-940