HYDRAULIC CLAMPING systems

Swing clamps
Linear cylinders
Locking cylinders
Hydraulic power supplies
Accessories

www.quiri.com

Edition 2012
QUIRI Hydromécanique is a specialist in the design and manufacturing of components and mechanical installations that use high-pressure fluids for process plant applications.

We apply our know-how and experience to small-and medium-scale manufacture of products with high technical added-value, and to installations that are specifically adapted to our client's needs.

To provide our clients with complete solutions, QUIRI Hydromécanique retains control over all the specialist skills involved in hydraulic engineering (electronic and mechanical engineering, computer control) through its engineering design department, in-house precision machining, assembly and testing.

Its extensive research and development activities, combined with over 50 years' experience in hydraulic systems mean that it can incorporate the most effective technology into its products, and apply continuous innovation to provide new solutions.

For every project, each client is assigned a single representative [a Project Engineer or Product Manager] who is responsible for ensuring that orders are fulfilled, right up to the time of delivery. This unique structure makes us more reactive whilst still allowing us to retain control over all those aspects that contribute to the quality of our products [managed through a rigorous quality system certified to ISO 9001, 2000 version].

QUIRI Hydromécanique is based at in France near Strasbourg and exports a great proportion of its production within Europe [Germany, Spain and elsewhere] to Asia [including Japan, China and Korea] and America.

QUIRI Hydromécanique supplies to major industrial groups, who rely on us to provide innovative and competitive solutions in the following sectors:

- Automotive and vehicles
- Aerospace and defence
- Power and transport
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear cylinders</td>
<td>003</td>
</tr>
<tr>
<td>Swing clamps with planar rotation</td>
<td>017</td>
</tr>
<tr>
<td>Swing clamps with helical rotation</td>
<td>041</td>
</tr>
<tr>
<td>Swing clamps with position detection</td>
<td>055</td>
</tr>
<tr>
<td>Accessories for swing clamps</td>
<td>067</td>
</tr>
<tr>
<td>Work supports</td>
<td>075</td>
</tr>
<tr>
<td>Positive locking cylinders</td>
<td>093</td>
</tr>
<tr>
<td>Auto-coupler cylinders</td>
<td>101</td>
</tr>
<tr>
<td>Hydraulic power units and components</td>
<td>107</td>
</tr>
</tbody>
</table>
# Linear cylinders

## Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>Cartridge mount cylinders</td>
<td>004</td>
</tr>
<tr>
<td></td>
<td>- Single acting - Spring return</td>
<td></td>
</tr>
<tr>
<td>CSH</td>
<td>Cartridge mount cylinders</td>
<td>005</td>
</tr>
<tr>
<td></td>
<td>- Single acting - Hexagonal head</td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>Cartridge mount cylinders</td>
<td>006</td>
</tr>
<tr>
<td></td>
<td>- Double acting - Threaded bottom</td>
<td></td>
</tr>
<tr>
<td>CDD</td>
<td>Cartridge mount cylinders</td>
<td>007</td>
</tr>
<tr>
<td></td>
<td>- Double acting - Threaded head</td>
<td></td>
</tr>
<tr>
<td>FS</td>
<td>Threaded cylinders</td>
<td>008</td>
</tr>
<tr>
<td></td>
<td>- Single acting</td>
<td></td>
</tr>
<tr>
<td>FSG</td>
<td>Threaded cylinders</td>
<td>009</td>
</tr>
<tr>
<td></td>
<td>- Single acting - Long stroke</td>
<td></td>
</tr>
<tr>
<td>FD</td>
<td>Threaded cylinders</td>
<td>010</td>
</tr>
<tr>
<td></td>
<td>- Double acting</td>
<td></td>
</tr>
<tr>
<td>FDG</td>
<td>Threaded cylinders</td>
<td>011</td>
</tr>
<tr>
<td></td>
<td>- Double acting - Long stroke</td>
<td></td>
</tr>
<tr>
<td>FDGF</td>
<td>Threaded cylinders</td>
<td>012</td>
</tr>
<tr>
<td></td>
<td>- Double acting - Long stroke - Flanged</td>
<td></td>
</tr>
<tr>
<td>EMF</td>
<td>Nuts for threaded cylinders</td>
<td>013</td>
</tr>
<tr>
<td>RS</td>
<td>Positive clamping spring cylinders</td>
<td>014</td>
</tr>
<tr>
<td>PCS</td>
<td>Hollow piston cylinders</td>
<td>015</td>
</tr>
<tr>
<td></td>
<td>- Single acting</td>
<td></td>
</tr>
<tr>
<td>PCD</td>
<td>Hollow piston cylinders</td>
<td>016</td>
</tr>
<tr>
<td></td>
<td>- Double acting</td>
<td></td>
</tr>
</tbody>
</table>
Cartridge mount cylinder: **CS**

Single acting - Spring return

Max force at 350 bar: 3 to 110 kN

**Characteristics**

- threaded assembly (C-wrench)
- supplied in oil directly through the drilled block
- spring return
- domed or threaded rod end with flats
- supplied with o-ring and anti-extrusion ring

**Design**

- steel body with anti-corrosion treatment
- piston made of treated steel

**Note**

Single acting cylinders should not be used in the presence of cutting fluid.

**Dimensions**

**Example of assembly**

**Order code of seal kit for CS cylinders: 11*****/900**

Example: For a CS 15, the seal kit code is: 111 102/900

<table>
<thead>
<tr>
<th>F max at 350 bar</th>
<th>Stroke</th>
<th>Area extend</th>
<th>Piston øD</th>
<th>Rod ød</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>cm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>2.7</td>
<td>10</td>
<td>0.78</td>
<td>10</td>
<td>5</td>
<td>CS 5 B</td>
<td>111 100/000</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>2.0</td>
<td>16</td>
<td>8</td>
<td>CS 10 B</td>
<td>111 101/000</td>
<td>47</td>
<td>50</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>3.14</td>
<td>20</td>
<td>10</td>
<td>CS 15 B</td>
<td>111 102/000</td>
<td>51</td>
<td>54</td>
</tr>
<tr>
<td>17.1</td>
<td>16</td>
<td>4.9</td>
<td>25</td>
<td>14</td>
<td>CS 25 B</td>
<td>111 103/000</td>
<td>59</td>
<td>62</td>
</tr>
<tr>
<td>28</td>
<td>16</td>
<td>8.0</td>
<td>32</td>
<td>16</td>
<td>CS 40 B</td>
<td>111 104/000</td>
<td>94</td>
<td>67</td>
</tr>
<tr>
<td>44</td>
<td>20</td>
<td>12.56</td>
<td>40</td>
<td>20</td>
<td>CS 65 B</td>
<td>111 105/000</td>
<td>86</td>
<td>89</td>
</tr>
<tr>
<td>68.7</td>
<td>30</td>
<td>19.92</td>
<td>50</td>
<td>25</td>
<td>CS 65 T</td>
<td>112 080/000</td>
<td>89</td>
<td>92</td>
</tr>
<tr>
<td>109</td>
<td>25</td>
<td>31.15</td>
<td>63</td>
<td>32</td>
<td>CS 100 B</td>
<td>112 081/000</td>
<td>104</td>
<td>108</td>
</tr>
</tbody>
</table>
## Cartridge mount cylinder: CSH

**Single acting - Hexagonal head**

Max force at 350 bar: 3 to 110 kN

### Characteristics

- threaded assembly (standard spanner)
- supplied in oil directly through the drilled block
- spring return
- domed or threaded rod end with flats
- supplied with o-ring and anti-extrusion ring

### Design

- steel body with anti-corrosion treatment
- piston made of treated steel

### Note

Single acting cylinders should not be used in the presence of cutting fluid.

### Dimensions

- **Type CSH__T**
  - Tapped rod end

- **Type CSH__B**
  - Domed rod end

### Housing machining dimensions

- Round off and polish sharp angles
- R 0.5 max.

### Example of assembly

- Cylinder support plane

### Dimensions

```
| Fmax at 350 bar | Stroke | Area extending | Piston diameter | Rod diameter | Type   | Order code  | L1 | L2 | L3 | h1 | h2 | a  | b  | c  | f  | G  | g  | p mini |
|----------------|--------|---------------|-----------------|--------------|--------|-------------|----|----|----|----|----|----|----|----|----|----|-------|
| kN             | mm     | mm²           | mm              | mm           |        |             | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm   |
| 2.7            | 10     | 0.78          | 10              | 5            | CSH B  | 111 100/200| 37 | 40 | 35 | 12 | 17 | 16 | 2  | 12.5| -  | M15 x 1.5 | M3 by 6 | 8    |
| 7              | 12     | 2.0           | 16              | 8            | CSH T  | 111 100/300| 47 | 50 | 44 | 13 | 18.5| 24 | 3  | 18  | -  | M22 x 1.5 | M5 by 10 | 8.5  |
| 11             | 12     | 3.14          | 20              | 10           | CSH 15 B| 111 102/200| 51 | 54 | 47 | 14 | 21  | 28 | 4  | 22  | 8  | M65 x 1.5 | M8 by 12 | 10   |
| 17.1           | 16     | 4.9           | 25              | 14           | CSH 25 B| 111 103/200| 59 | 62 | 55 | 15 | 22  | 34 | 4  | 28  | 11 | M92 x 1.5 | M8 by 12 | 10   |
| 28             | 16     | 8.0           | 32              | 16           | CSH 40 B| 111 104/200| 94 | 73 | 59 | 17 | 24  | 42 | 5  | 32  | 13 | M40 x 1.5 | M10 by 15 | 10   |
| 44             | 20     | 12.56         | 40              | 20           | CSH 65 B| 111 105/200| 86 | 89 | 80.5| 22 | 30  | 52 | 6  | 40  | 17 | M50 x 1.5 | M12 by 20 | 11   |
| 68.7           | 20     | 19.62         | 50              | 25           | CSH 100 B| 112 080/200| 93 | 92 | 81  | 28 | 37  | 64 | 8  | 48  | 19 | M62 x 1.5 | M16 by 22 | 12   |
| 109            | 25     | 31.15         | 63              | 32           | CSH 160 B| 112 081/200| 104| 108| 95 | 30 | 41  | 80 | 10 | 62  | 24 | M78 x 1.5 | M20 by 30 | 14   |
```

### Order code of seal kit for CSH cylinders: 11** * **/900

Example: For a CSH 15, the seal kit code is: 111 102/900.
Cartridge mount cylinder: CD

Double acting - Threaded bottom
Max force at 350 bar: 12 to 115 kN

Characteristics
- threaded assembly (C-wrench)
- supplied in oil directly through the drilled block
- domed or threaded rod end with flats
- supplied with o-ring and anti-extrusion ring

Design
- steel body with anti-corrosion treatment
- piston made of treated steel
- double sealing on rod

Note
These cylinders should not be used in the presence of cutting fluid.

Dimensions

Housing machining dimensions

Order code of seal kit for CD cylinders: 14* ***/900
Example: For a CD 25, the seal kit code is: 141 103/900
Cartridge mount cylinder : CDD

Double acting - Threaded head
Max force at 350 bar : 7 to 28 kN

Characteristics
- threaded assembly [C-wrench]
- supplied in oil directly through the drilled block
- available with Viton seals (100°C < T < 150°C)
- supplied with o-ring and anti-extrusion ring

Design
- steel body with anti-corrosion treatment
- piston made of treated steel
- double sealing on rod

Note
These cylinders may be completely recessed in the drilled block.

Dimensions

Housing machining dimensions

Order code of nitrile seal kit for CDD cylinders : 141  ***/900
Order code of viton seal kit for CDD V cylinders : 141  ***/960

<table>
<thead>
<tr>
<th>F max</th>
<th>Threaded Assembly</th>
<th>Piston</th>
<th>Rod</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 7</td>
<td>T 42</td>
<td>P 2.5</td>
<td>T 1.2</td>
<td>16</td>
<td>141 374/000</td>
<td>65</td>
</tr>
<tr>
<td>P 10.8</td>
<td>T 7</td>
<td>P 3.1</td>
<td>T 2.0</td>
<td>20</td>
<td>141 375/000</td>
<td>67</td>
</tr>
<tr>
<td>P 17.1</td>
<td>T 10.1</td>
<td>P 4.9</td>
<td>T 2.9</td>
<td>25</td>
<td>141 376/000</td>
<td>82</td>
</tr>
<tr>
<td>P 28</td>
<td>T 17.1</td>
<td>P 8.0</td>
<td>T 4.9</td>
<td>32</td>
<td>141 377/000</td>
<td>94</td>
</tr>
</tbody>
</table>
Threaded cylinder: FS

Single acting
Max force at 350 bar: 3 to 110 kN

Characteristics
- spring return
- domed or threaded rod end with flats

Accessories
- fixing nut, see page 13

Design
- steel body with anti-corrosion treatment
- piston made of treated steel

Nota
Single acting cylinders should not be used in presence of cutting fluid.

Order code of seal kit for FS cylinders: 11* *** / 900
Example: For a FS 40, the seal kit code is: 111 110/900

<table>
<thead>
<tr>
<th>F max at 350 bar (kN)</th>
<th>Stroke (mm)</th>
<th>Area (cm²)</th>
<th>Piston øD (mm)</th>
<th>Rod ød (mm)</th>
<th>Type</th>
<th>Order code</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>L3 (mm)</th>
<th>b (mm)</th>
<th>c (mm)</th>
<th>f (mm)</th>
<th>G</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.7</td>
<td>10</td>
<td>0.78</td>
<td>10</td>
<td>5</td>
<td>FS B</td>
<td>111 106/200</td>
<td>48.5</td>
<td>52.5</td>
<td>48.5</td>
<td>2</td>
<td>125</td>
<td>-</td>
<td>M6 x 1.5</td>
<td>M3 lg. 6</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>2.0</td>
<td>16</td>
<td>8</td>
<td>FS T</td>
<td>111 106/300</td>
<td>58.5</td>
<td>61.5</td>
<td>57.5</td>
<td>3</td>
<td>18</td>
<td>-</td>
<td>M8 x 1.5</td>
<td>M6 lg. 10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>3.14</td>
<td>20</td>
<td>10</td>
<td>FS T</td>
<td>111 106/300</td>
<td>63.5</td>
<td>66.5</td>
<td>61</td>
<td>4</td>
<td>22</td>
<td>8</td>
<td>M10 x 1.5</td>
<td>M6 lg. 12</td>
</tr>
<tr>
<td>17.1</td>
<td>16</td>
<td>4.9</td>
<td>25</td>
<td>14</td>
<td>FS B</td>
<td>111 109/200</td>
<td>71.5</td>
<td>74.5</td>
<td>69</td>
<td>4</td>
<td>28</td>
<td>11</td>
<td>M12 x 1.5</td>
<td>M8 lg. 12</td>
</tr>
<tr>
<td>20</td>
<td>18</td>
<td>8.0</td>
<td>32</td>
<td>16</td>
<td>FS T</td>
<td>111 109/300</td>
<td>76.5</td>
<td>79.5</td>
<td>73</td>
<td>5</td>
<td>32</td>
<td>13</td>
<td>M12 x 1.5</td>
<td>M10 lg. 15</td>
</tr>
<tr>
<td>44</td>
<td>20</td>
<td>12.56</td>
<td>40</td>
<td>20</td>
<td>FS B</td>
<td>111 110/200</td>
<td>98.5</td>
<td>101.5</td>
<td>94.5</td>
<td>8</td>
<td>40</td>
<td>17</td>
<td>M16 x 1.5</td>
<td>M12 lg. 20</td>
</tr>
<tr>
<td>68.7</td>
<td>20</td>
<td>19.62</td>
<td>50</td>
<td>25</td>
<td>FS T</td>
<td>112 082/200</td>
<td>101.5</td>
<td>104.5</td>
<td>95</td>
<td>8</td>
<td>48</td>
<td>19</td>
<td>M16 x 1.5</td>
<td>M16 lg. 22</td>
</tr>
<tr>
<td>109</td>
<td>25</td>
<td>31.15</td>
<td>63</td>
<td>32</td>
<td>FS B</td>
<td>112 083/300</td>
<td>117.5</td>
<td>120.5</td>
<td>108.5</td>
<td>10</td>
<td>62</td>
<td>24</td>
<td>M20 x 2</td>
<td>M20 lg. 30</td>
</tr>
<tr>
<td>147</td>
<td>30</td>
<td>43.7</td>
<td>75</td>
<td>39</td>
<td>FS T</td>
<td>112 083/300</td>
<td>134.5</td>
<td>137.5</td>
<td>130.5</td>
<td>12</td>
<td>74</td>
<td>30</td>
<td>M24 x 2</td>
<td>M24 lg. 30</td>
</tr>
</tbody>
</table>
Threaded cylinder: FSG

Single acting - Long stroke
Max force at 350 bar: 17 to 110 kN

Characteristics
- return using rectangular cross-section spring

Accessories
- fixing nut, see page 13

Design
- steel body with anti-corrosion treatment
- piston made of treated steel

Nota
The spring is only designed for the return of the rod. If a return force is required, use the FDG type double acting cylinder.
Single acting cylinders should not be used in presence of cutting fluid.

Order code of seal kit for FSG cylinders: \(11^{*} ***/900\)
Example: For a FSG 40, the seal kit code is: 111 113/900

<table>
<thead>
<tr>
<th>F max at 350 bar</th>
<th>Stroke</th>
<th>Area extend</th>
<th>Piston øD</th>
<th>Rod ød</th>
<th>Type</th>
<th>Order code</th>
<th>L1</th>
<th>L2</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>f</th>
<th>m</th>
<th>n</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.1</td>
<td>25</td>
<td>4.9</td>
<td>25</td>
<td>10</td>
<td>FSG 25</td>
<td>111 112/000</td>
<td>128</td>
<td>122</td>
<td>34</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>28</td>
<td>M6 x 1.5</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>35</td>
<td>8.0</td>
<td>32</td>
<td>12</td>
<td>FSG 40</td>
<td>111 113/000</td>
<td>181</td>
<td>155</td>
<td>42.5</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>32</td>
<td>M4 x 1.5</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>45</td>
<td>12.56</td>
<td>40</td>
<td>16</td>
<td>FSG 65</td>
<td>111 114/000</td>
<td>202</td>
<td>195</td>
<td>49</td>
<td>5</td>
<td>13</td>
<td>6</td>
<td>40</td>
<td>M5 x 1.5</td>
<td></td>
</tr>
<tr>
<td>68.7</td>
<td>60</td>
<td>19.62</td>
<td>50</td>
<td>20</td>
<td>FSG 100</td>
<td>112 094/000</td>
<td>241</td>
<td>234</td>
<td>77</td>
<td>6</td>
<td>17</td>
<td>8</td>
<td>48</td>
<td>M7 x 1.5</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>80</td>
<td>31.15</td>
<td>63</td>
<td>25</td>
<td>FSG 160</td>
<td>112 095/000</td>
<td>306</td>
<td>296</td>
<td>81</td>
<td>8</td>
<td>19</td>
<td>10</td>
<td>62</td>
<td>M8 x 2</td>
<td></td>
</tr>
</tbody>
</table>
Threaded cylinder: FD

Double acting
Maxi force at 350 bar: 11 to 112 kN

Characteristics
- domed or threaded rod end with flats

Design
- steel body with anti-corrosion treatment
- piston made of treated steel

Accessories
- fixing nut, see page 13

Order code of seal kit for FD cylinders: 14* ***/900
Example: For a FD 40, the seal kit code is: 141 108/900
Threaded cylinder: **FDG**

**Double acting - Long stroke**

Max force at 350 bar: 11 to 112 kN

### Characteristics
- domed or threaded rod end with flats

### Design
- steel body with anti-corrosion treatment
- piston made of treated steel

### Accessories
- fixing nut, see page 13

### Threaded cylinder: FDG

**Type FDG**
- Threaded rod end

**Type FDG**
- Tapped rod end

### Order code of seal kit for FDG cylinders: 14* ***/900

Example: For a FDG 40, the seal kit code is: 141 112/900

<table>
<thead>
<tr>
<th>F max at 350 bar (kN)</th>
<th>Stroke (mm)</th>
<th>Area (cm²)</th>
<th>Piston ø (mm)</th>
<th>Rod ø (mm)</th>
<th>Type</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 5.6</td>
<td>40</td>
<td>3.14</td>
<td>20</td>
<td>14</td>
<td>FDG 15 F</td>
<td>141 110/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>141 110/100</td>
</tr>
<tr>
<td>17.5 10.1</td>
<td>60</td>
<td>4.9</td>
<td>25</td>
<td>16</td>
<td>FDG 25 F</td>
<td>141 111/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>141 111/100</td>
</tr>
<tr>
<td>28.7 17.1</td>
<td>60</td>
<td>4.9</td>
<td>32</td>
<td>20</td>
<td>FDG 40 F</td>
<td>141 112/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>141 112/100</td>
</tr>
<tr>
<td>44.8 27</td>
<td>80</td>
<td>12.5</td>
<td>40</td>
<td>25</td>
<td>FDG 65 F</td>
<td>141 113/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>141 113/100</td>
</tr>
<tr>
<td>70 40.6</td>
<td>80</td>
<td>19.6</td>
<td>50</td>
<td>32</td>
<td>FDG 100 F</td>
<td>142 204/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>142 204/100</td>
</tr>
<tr>
<td>111.3 65.1</td>
<td>100</td>
<td>31.1</td>
<td>63</td>
<td>40</td>
<td>FDG 160 F</td>
<td>142 205/000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>142 205/100</td>
</tr>
</tbody>
</table>

Dimensions:
- A = Extension
- B = Return
Threaded cylinder : FDGF

Double acting - Long stroke - Flanged
Max force at 350 bar : 11 to 112 kN

Characteristics

• domed or threaded rod end with flats

Accessories

• bottom with 6 smooth holes or 6 tapped holes
• fixing nut, see page 13

Design

• steel body with anti-corrosion treatment
• piston made of treated steel

Order code of seal kit for FDGF cylinders : 14* ***/900
Example : For a FDGF 40, the seal kit code is : 141 112/900
**Nut for threaded cylinders:** EMF

**Fine pitch metric thread**

M22 x 1,5 to M105 x 2

---

**Type** | **Order code** | **Threads d** | **D** | **d2** | **Dimensions** | **h** | **b** | **t** | **n**
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
EMF 2215 | B11 120/000 | M22 x 1.5 | 40 | 34 | 9 | 6 | 2.5 | 4
EMF 3015 | B11 121/000 | M30 x 1.5 | 50 | 43 | 10 | 7 | 3 | 4
EMF 3615 | B11 122/000 | M36 x 1.5 | 58 | 50 | 11 | 8 | 3.5 | 4
EMF 4215 | B11 123/000 | M42 x 1.5 | 62 | 54 | 12 | 8 | 3.5 | 4
EMF 4515 | B11 124/000 | M45 x 1.5 | 68 | 60 | 12 | 8 | 3.5 | 4
EMF 5015 | B11 125/000 | M50 x 1.5 | 75 | 67 | 13 | 8 | 3 | 8
EMF 5215 | B11 126/000 | M52 x 1.5 | 80 | 70 | 13 | 10 | 4 | 6
EMF 5615 | B11 127/000 | M56 x 1.5 | 90 | 80 | 13 | 10 | 4 | 6
EMF 7015 | B11 128/000 | M70 x 1.5 | 100 | 90 | 14 | 10 | 4 | 6
EMF 7220 | B11 166/000 | M72 x 2 | 110 | 100 | 14 | 10 | 4 | 6
EMF 7515 | B11 129/100 | M75 x 1.5 | 110 | 100 | 14 | 10 | 4 | 6
EMF 8020 | B11 130/000 | M80 x 2 | 115 | 105 | 16 | 10 | 4 | 6
EMF 8520 | B11 167/000 | M85 x 2 | 120 | 110 | 16 | 10 | 4 | 6
EMF 9520 | B11 132/000 | M95 x 2 | 135 | 120 | 16 | 12 | 5 | 6
EMF 10020 | B11 133/100 | M100 x 2 | 145 | 130 | 16 | 12 | 5 | 6
EMF 10520 | B11 133/000 | M105 x 2 | 155 | 140 | 16 | 12 | 5 | 6
EMF 11520 | B11 133/200 | M115 x 2 | 165 | 150 | 18 | 12 | 5 | 6

**n = number of slots**
Positive clamping spring cylinder: RS
Thrust or traction
Max force: 26 to 130 kN

Characteristics
- disk spring maintain the clamping force
- force released by hydraulic pressure
- used to push or pull
- threaded body allowing numerous positioning options
- threaded holes on the head

Design
- steel body with anti-corrosion treatment
- piston made of treated steel

Options
- special models on request

Order code of seal kit for RS cylinders: 11*  ***/900
Example: For a RS 26, the seal kit code is: 111 130/900
Maximum pressure inside the cylinder: 350 bar (internal mechanical end-stop)

<table>
<thead>
<tr>
<th>F max</th>
<th>Stroke</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td></td>
<td></td>
<td>mm mm mm mm mm mm mm mm mm mm</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>RS 26 C2</td>
<td>111 130/000</td>
<td>75 20 18 13 M52 x 1.5 M12 lg. 20 M6 lg. 15 104 168 70 5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>RS 26 C4</td>
<td>111 130/100</td>
<td>90 30 25 14 M75 x 1.5 M16 lg. 25 M10 lg. 20 111 170 70 5</td>
</tr>
<tr>
<td>38</td>
<td>2</td>
<td>RS 38 C2</td>
<td>111 131/000</td>
<td>105 40 30 18 M85 x 2 M18 lg. 30 M12 lg. 25 145 200 139 244 70 5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>RS 38 C4</td>
<td>111 131/100</td>
<td>120 60 40 23 M115 x 2 M24 lg. 30 M14 lg. 25 163 249 154 240 106 8</td>
</tr>
<tr>
<td>82</td>
<td>2</td>
<td>RS 82 C2</td>
<td>112 103/000</td>
<td>130 50 40 23 M115 x 2 M24 lg. 30 M14 lg. 25 163 249 154 240 106 8</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>RS 82 C4</td>
<td>112 103/100</td>
<td>145 60 50 23 M115 x 2 M24 lg. 30 M14 lg. 25 163 249 154 240 106 8</td>
</tr>
<tr>
<td>130</td>
<td>2</td>
<td>RS 130 C2</td>
<td>112 104/000</td>
<td>160 70 50 23 M115 x 2 M24 lg. 30 M14 lg. 25 163 249 154 240 106 8</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>RS 130 C4</td>
<td>112 104/100</td>
<td>170 80 60 23 M115 x 2 M24 lg. 30 M14 lg. 25 163 249 154 240 106 8</td>
</tr>
</tbody>
</table>
Hollow piston cylinder : PCS

Single acting - Spring return
Max force at 350 bar : 13 to 131 kN

Characteristics
- threaded holes at the base [standard]
- piston which includes a Heli-Coil ring, suffix HC

Design
- steel body with anti-corrosion treatment
- piston made of treated steel
- thread for 8.8 standard quality screws

Order code of seal kit for PCS cylinders : 171 0**/900
Example : For a PCS 20, the seal kit code is : 171 035/900

<table>
<thead>
<tr>
<th>F max at 350 bar</th>
<th>Stroke</th>
<th>Area [cm²]</th>
<th>Piston øD</th>
<th>Rod ød</th>
<th>Type</th>
<th>Order code</th>
<th>d1</th>
<th>d2</th>
<th>d3</th>
<th>d4</th>
<th>g</th>
<th>HC</th>
<th>G</th>
<th>k</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>10</td>
<td>3.77</td>
<td>25</td>
<td>16</td>
<td>PCS20</td>
<td>171 035/000</td>
<td>40</td>
<td>12</td>
<td>8.2</td>
<td>50</td>
<td>M8</td>
<td>M40 x 1.5</td>
<td>35</td>
<td>59</td>
<td>60</td>
<td>36</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td>6.03</td>
<td>32</td>
<td>20</td>
<td>PCS20 HC</td>
<td>171 035/200</td>
<td>45</td>
<td>16</td>
<td>10.2</td>
<td>55</td>
<td>M10</td>
<td>M45 x 1.5</td>
<td>40</td>
<td>64</td>
<td>65</td>
<td>41</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>12</td>
<td>9.42</td>
<td>40</td>
<td>25</td>
<td>PCS50 HC</td>
<td>171 037/300</td>
<td>55</td>
<td>20</td>
<td>12.2</td>
<td>65</td>
<td>M12</td>
<td>M55 x 1.5</td>
<td>45</td>
<td>71</td>
<td>72</td>
<td>45</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>12</td>
<td>14.72</td>
<td>50</td>
<td>32</td>
<td>PCS80 HC</td>
<td>171 039/300</td>
<td>65</td>
<td>25</td>
<td>16.2</td>
<td>70</td>
<td>M16</td>
<td>M65 x 1.5</td>
<td>50</td>
<td>77</td>
<td>78</td>
<td>50</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>18</td>
<td>23.12</td>
<td>63</td>
<td>40</td>
<td>PCS120 HC</td>
<td>171 040/300</td>
<td>80</td>
<td>32</td>
<td>20.2</td>
<td>80</td>
<td>M20</td>
<td>M80 x 2</td>
<td>60</td>
<td>95</td>
<td>96</td>
<td>95</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>16</td>
<td>37.7</td>
<td>80</td>
<td>50</td>
<td>PCS200 HC</td>
<td>171 040/300</td>
<td>100</td>
<td>40</td>
<td>26.2</td>
<td>100</td>
<td>M27</td>
<td>M100 x 2</td>
<td>75</td>
<td>109</td>
<td>110</td>
<td>109</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>
Hollow piston cylinder: PCD

Double acting
Max force at 350 bar: 13 to 131 kN

Characteristics

- threaded holes at the base (standard)
- piston which includes a Heli-Coil ring, suffix HC

Design

- steel body with anti-corrosion treatment
- piston made of treated steel
- thread for 8.8 standard quality screws

Order code of seal kit for PCD cylinders: 171 O**/900
Example: For a PCD 20, the seal kit code is: 171 041/900
# Swing clamp with planar rotation

## Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Double acting swing clamp</td>
<td>023</td>
</tr>
<tr>
<td></td>
<td>- Threaded - Gas thread feeding</td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Double acting swing clamp</td>
<td>024</td>
</tr>
<tr>
<td></td>
<td>- Supply through threads under the head</td>
<td></td>
</tr>
<tr>
<td>PF</td>
<td>Double acting swing clamp</td>
<td>025</td>
</tr>
<tr>
<td></td>
<td>- Flanged base</td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>Double acting swing clamp</td>
<td>026</td>
</tr>
<tr>
<td></td>
<td>- Threaded - Supply through threads</td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>Double acting swing clamp</td>
<td>027</td>
</tr>
<tr>
<td></td>
<td>- Supply through counter-bores</td>
<td></td>
</tr>
<tr>
<td>PLF</td>
<td>Double acting swing clamp</td>
<td>028</td>
</tr>
<tr>
<td></td>
<td>- Flanged cylindrical base</td>
<td></td>
</tr>
<tr>
<td>PBF</td>
<td>Double acting swing clamp</td>
<td>029</td>
</tr>
<tr>
<td></td>
<td>- Flanged block shape</td>
<td></td>
</tr>
<tr>
<td>PCB</td>
<td>Double acting swing clamp</td>
<td>030</td>
</tr>
<tr>
<td></td>
<td>- Cartridge - Screw mounting</td>
<td></td>
</tr>
<tr>
<td>PCV</td>
<td>Double acting swing clamp</td>
<td>032</td>
</tr>
<tr>
<td></td>
<td>- Cartridge - Threaded body</td>
<td></td>
</tr>
<tr>
<td>PL26</td>
<td>Double acting swing clamp</td>
<td>035</td>
</tr>
<tr>
<td></td>
<td>- Feeding through counter-bores under head</td>
<td></td>
</tr>
<tr>
<td>PT26</td>
<td>Double acting swing clamp</td>
<td>036</td>
</tr>
<tr>
<td></td>
<td>- Feeding through threads on the head side</td>
<td></td>
</tr>
<tr>
<td>PF26</td>
<td>Double acting swing clamp</td>
<td>037</td>
</tr>
<tr>
<td></td>
<td>- Feeding through counter-bores on the base side</td>
<td></td>
</tr>
<tr>
<td>PS26</td>
<td>Double acting swing clamp</td>
<td>039</td>
</tr>
<tr>
<td></td>
<td>- Feeding through threads on the base side</td>
<td></td>
</tr>
<tr>
<td>PLS26X</td>
<td>Double acting swing clamp</td>
<td>035</td>
</tr>
<tr>
<td></td>
<td>- Feeding through counter-bores under ring</td>
<td></td>
</tr>
</tbody>
</table>
Swing clamps characteristics

Double acting
Rotation in the plane

General points

The swing clamps can clear the working area to facilitate components loading and un-loading operations. Designed for self-controlled systems, they reduce non-productive time.

The rotation in the plane, an exclusive system, reduces the space required for the movement.

The design of this cylinder ensures optimum allocation of internal efforts, increasing longevity and reliability.

Construction

- all parts are in high-strength steel.
- rod treated anti-seizure and anti-corrosion.
- the body is protected by an anti-corrosion treatment.
- all our swing clamps include venting port.
- damage is avoided in the event of impeded rotation.
- no translation during pivoting therefore reduced rod seal wear.
- easy removal of clamping arm.
- all cylinders include an index on the rod.

Special features of the system

The swing clamp rod rotates in a plane, thus allowing the clamping arm to move in restricted space. This rotation phase is followed by translation for clamping.

Both chambers of the double acting cylinder are continually full of oil, which means that the system is unaffected by external contamination.

Operations

Clamping phase : Supply at A

During the pressurisation of the cylinder, the piston item [1], which includes helical gear teeth, performs a translation movement downwards, transformed into rotation at the rod item [2] through the reversible nut-screw system : this is the spinning top principle.

During this rotation, the rod item [2] pivots on ball bearing item [4] [rotation in the plane].

Once the rotation is completed, the balls item [4] retract into the groove item [5] and release the lock on translation movement, allowing the rod to freely move though it’s downwards travel : the balls are not subject to any forces during clamping. The piston transmits the force to the rod through a plane-to-plane contact.

Release phase : Supply at B

Supplying the return port B causes a translation movement of the rod item [2] upwards, followed by a rotation movement in a plane in order to return to its initial position.
Swing clamps characteristics

Direction and angle of rotation

The direction of rotation is indicated from the initial «unclamped» position with the rod extended to the «clamped» position with the rod retracted, rod viewed from top.

Right = clockwise direction
Left = anti-clockwise direction

Standard angle of rotation : 90° ± 2°.
All angle of rotation values between 0° and 90° are available on request.

Determination of cylinder characteristics

The maximum forces are given for a pressure of 250 bar. This pressure is only authorised if the shortest of the three available standard arms is used.

The max force (therefore the max pressure) decreases proportionally with the length of the arm : please see graphs on page 21.

The max flow also decreases with the inertia of the arm ; refer to the values indicated in the graphs for standard arms. Please contact if you need special arms.

<table>
<thead>
<tr>
<th>Maximum pressure / Standard clamping arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum pressure</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>bar</td>
</tr>
<tr>
<td>250</td>
</tr>
<tr>
<td>175</td>
</tr>
<tr>
<td>125</td>
</tr>
</tbody>
</table>

Minimum using pressure : 30 bar

The use of a double symetric arm allows operation at 250 bar, but you must use the following formula :

\[
\text{Force} \,(\text{daN}) / 2 = \text{Pressure} \,(\text{bar}) \times \text{Section} \,(\text{cm}^2) \div 2 \\
( A \text{ in table on page 20})
\]

Examples :

P11 : \( F/2 = P \times 2.36 \div 2 \quad P31 : \( F/2 = P \times 9.45 \div 2 \)

P21 : \( F/2 = P \times 4.71 \div 2 \quad P41 : \( F/2 = P \times 14.12 \div 2 \)

Example of using diagrams

The diagram on the right indicates the maximum force developed by the cylinder and the max pressure for the type of arm used : BC, BM, or BL. They also indicate the limit values of Q flow.

The maximum force developed by a P21 type cylinder with a BL 21 75 mm long arm is 4 kN at 120 bar with maximum Q flow of 0.81/mn per cylinder.

For the determination of special arm characteristics, please use the graphs on page 21
Swing clamps characteristics

Important recommendations

Characteristics

Input pressure
- minimum: 30 bar
- maximum: 250 bar with short arms (see graphs)

Maximum temperature
- 70°C
- for temperatures higher than 70°C please contact us

Important recommendations

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod ed.</th>
<th>Stroke</th>
<th>Max flow A</th>
<th>Swept volume A/B</th>
<th>Direction of rotation</th>
<th>Type</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>l/mm</td>
<td>cm³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>8</td>
<td>0.4</td>
<td>5.30/7.40</td>
<td>right</td>
<td>P 11 DX</td>
<td>191157/050</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A This value allows an initial approach to be made in selecting cylinder. Always ensure that you refer to the diagram of forces present on the cylinder page to specify the max force and pressure as a function of length y for the arm.

B The rod has a conical end and is threaded for fixing the clamping arm with braking. When locking the nut, the rod must be prevented from rotating in order not to transmit the tightening torque to the internal mechanism.

There are two way of doing this:
- restrain the rod using a hex wrench (see figure 1)
- maintain the rod in the vice

C The indicated value corresponds to the max stroke of the cylinder. For clamping a component, the useful stroke is between the minimum and the maximum values indicated in the table of characteristics below.

D The max recommended flow will vary with the type of cylinder and inertia of the clamping arm. Refer to the table and if possible provide a nozzle or flow control valve in the distribution circuit. The flow must be multiplied by the number of cylinders operating at the same time: ensure that minimum flows are observed.

E This is the volume of oil displaced during total stroke.

F Direction of rotation of the rod from the unclamped position to the clamped one. Rod viewed from above.

Characteristics

Please see opposite table.

WARNING
Opposite table is given for information purpose.
To determine actual forces, please use the graphs located on page 21 which take the yield into account.
Swing clamps characteristics
Definition of the special arms
Graphs

These graphs take the cylinder yield into account.
Examples of mounting
Double acting swing clamp - 250 bar
Types P, PT, PBF, PF, PL, PS, PLF, PBF, PCB and PCV

**Type P**
- Fixing: nuts on body
- Supply: through threads

**Type PT**
- Fixing: 4 screws on head
- Supply: through threads

**Type PBF**
- Fixing: 4 screws on body
- Supply: counter-bores on side

**Type PF**
- Fixing: 4 screws on base
- Supply: counter-bores on base

**Type PL**
- Fixing: 4 screws on head
- Supply: counter-bores under head

**Type PS**
- Fixing: 4 screws on base
- Supply: through threads

**Type PLF**
- Fixing: 4 screws on base
- Supply: counter-bores on base

**Type PCB**
- Fixing: 4 screws on head
- Supply: cartridge type

**Type PCV**
- Fixing: threaded body
- Supply: cartridge type
Swing clamp: P

Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Threaded body
Supply through threads
Fixing using nut on body

Characteristics
- Rotation in a plane left or right 90°±2°
- Index on the rod
- Venting ports
- For machining of indexing on the clamping arm, see pages 69 to 71

Options
- Clamping arm: see accessories heading
- Rotation 60°, 45° or 0° on request

Note
Cylinders are supplied with locking nut and lock washer (dimensions and torques: see page 72).

Definition of forces as function of clamping arm: see page 21

Important recommendations: see page 20

NON-INDEXED: the pin may be removed using a pin punch

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod</th>
<th>Stroke</th>
<th>Max flow A</th>
<th>Area extend A B</th>
<th>Dir of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>a</th>
<th>c</th>
<th>D</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>ak1</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>18</td>
<td>8</td>
<td>0.4</td>
<td>5.3</td>
<td>7.4</td>
<td>P 11 DX</td>
<td>191 157/050</td>
<td>13</td>
<td>10</td>
<td>M36 x 1.5</td>
<td>152</td>
<td>121</td>
<td>86</td>
<td>66</td>
<td>32</td>
<td>18</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>0.9</td>
<td>15</td>
<td>21</td>
<td>P 21 DX</td>
<td>191 157/150</td>
<td>16</td>
<td>14</td>
<td>M52 x 1.5</td>
<td>152</td>
<td>152</td>
<td>107</td>
<td>81</td>
<td>41</td>
<td>25</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>35</td>
<td>12</td>
<td>2</td>
<td>41</td>
<td>53</td>
<td>P 31 DX</td>
<td>191 057/150</td>
<td>18</td>
<td>20</td>
<td>M72 x 2</td>
<td>152</td>
<td>195</td>
<td>142</td>
<td>114</td>
<td>43</td>
<td>35</td>
<td>12</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>42</td>
<td>12</td>
<td>3</td>
<td>74</td>
<td>88</td>
<td>P 41 DX</td>
<td>191 058/150</td>
<td>20</td>
<td>22</td>
<td>M85 x 2</td>
<td>152</td>
<td>218</td>
<td>161</td>
<td>131</td>
<td>45</td>
<td>42</td>
<td>12</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp : PT
Double acting - Rotation in a plane
Max force at 250 bar : 4 to 24 kN

Supply through threads
Fixing by 4 screws on head ring

Characteristics
- rotation in a plane left or right 90°±2°
- index on the rod
- venting ports
- for machining of indexing on the clamping arm see pages 69 to 71

Options
- clamping arm : see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders are supplied with locking nut and lock washer (dimensions and torques : see page 72).

Definition of forces as function of clamping arm : see page 21
Important recommendations : see page 20
NON-INDEXED : the pin may be removed using a pin punch
Swing clamp: PF
Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Supply through counter-bores under base
Fixing using 4 screws on the rectangular base

Characteristics
- rotation in a plane left or right 90°±2°
- index on the rod
- venting ports
- standard and long strokes
- for machining of indexing on the clamping arm
  see pages 63 to 71

Options
- nozzle on counter-bores port
- clamping arm: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders are supplied with locking nut and lock washer
(dimensions and torques: see page 72).
Seals: or 7,65 x 1,78 90 NBR

Definition of forces as function of clamping arm: see page 21
Important recommendations: see page 20
NON-INDEXED: the pin may be removed using a pin punch
**Swing clamp : PS**

Double acting - Rotation in a plane  
Max force at 250 bar : 4 to 24 kN

**Threaded body**  
Supply through threads on base  
Fixing using screws on rectangular base or nut on the body

**Characteristics**
- rotation in a plane left or right 90°±2°
- index on the rod
- venting ports
- for machining of indexing on the clamping arm see pages 69 to 71

**Options**
- clamping arm : see accessories heading
- rotation 60°, 45° or 0° on request

**Note**
Cylinders are supplied with locking nut and lock washer (dimensions and torques : see page 72).

---

**Definition of forces as function of clamping arm : see page 21**

**Important recommendations : see page 20**

**NON-INDEXED :** the pin may be removed using a pin punch

---

**Characteristics**

| F max at 250 bar | Rod | Stroke | Max flow A | Area extend A | B | Dir. of rotation | Type | Order code | Dimensions | a | c | D | e | f (key) | g | h | L | L1 | L2 | L3 | k1 | k2 | p1 | p2 | p3 |
| kN | mm | mm | l/mm | cm² | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 18 | 8 | 0.4 | 5.3 | 74 | right | left | P5 11 DX | 191 115/050 | 13 | 10 | M45 x 1.5 | M12 x 1.5 | 5 | G1/8'' | 6 | 121 | 98 | 22 | 98 | 65 | 45 | 50 | |
| 8 | 25 | 12 | 0.9 | 15 | 21 | right | left | P5 11 GX | 191 115/150 | 16 | 14 | M50 x 1.5 | M16 x 1.5 | 8 | G1/4'' | 6 | 152 | 107 | 22 | 122 | 63 | 53 | 63 | 65 |
| 16 | 36 | 12 | 2 | 41 | 53 | right | left | P6 31 DX | 192 118/050 | 18 | 20 | M80 x 2 | M64 x 1.5 | 10 | G1/4'' | 12 | 195 | 142 | 25 | 157 | 110 | 80 | 86 | |
| 24 | 42 | 12 | 3 | 74 | 89 | right | left | P6 41 DX | 192 118/150 | 20 | 22 | M95 x 2 | M80 x 1.5 | 12 | G1/4'' | 16 | 219 | 181 | 25 | 176 | 120 | 95 | 95 | 96 |
Swing clamp: PL
Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Supply through counter-bores under ring
Fixing using screw on ring

Characteristics:
- Rotation in a plane left or right 90° ± 2°
- Index on the rod
- Venting ports
- Standard and long strokes
- For machining of indexing on the clamping arm, see pages 69 to 71

Options:
- Nozzle on counter-bores port
- Clamping arm: see accessories heading
- Rotation 60°, 45° or 0° on request

Note:
Cylinders are supplied with o-ring seals, locking nut and lockwasher [dimensions and torques: see page 72]. Seals: or 5.28 x 1.78 for PL11 and PL21 90 NBR or 7.65 x 1.78 for PL31 and PL41 90 NBR

Definition of forces as function of clamping arm: see page 21
Important recommendations: see page 20
Non-indexed: the pin may be removed using a pin punch

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod ed.</th>
<th>Stroke</th>
<th>Max flow</th>
<th>Area extend</th>
<th>Dir of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td>mm</td>
</tr>
<tr>
<td>mm</td>
<td>mm</td>
<td>l/mm</td>
<td>mm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>0.4</td>
<td>5.3</td>
<td>74</td>
<td>10.9</td>
<td>13</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>0.9</td>
<td>15</td>
<td>21</td>
<td>9.9</td>
<td>16</td>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>2</td>
<td>41</td>
<td>53</td>
<td>20.2</td>
<td>18</td>
<td>20</td>
<td>72</td>
</tr>
<tr>
<td>24</td>
<td>42</td>
<td>3</td>
<td>74</td>
<td>88</td>
<td>32.5</td>
<td>20</td>
<td>22</td>
<td>85</td>
</tr>
</tbody>
</table>


Seals: or 5.28 x 1.78 for PL11 and PL21 90 NBR or 7.65 x 1.78 for PL31 and PL41 90 NBR
Swing clamp: PLF
Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Supply through counter-bore on base
Fixing using screws

Characteristics
- rotation in a plane left or right 90°±2°
- index on the rod
- venting ports
- for machining of indexing on the clamping arm
  see pages 69 to 71

Options
- nozzle on counter-bore port
- clamping arm: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders are supplied with o-ring seals, locking nut and lock-washer [dimensions and torques: see page 72].
Seals: or 5.28 x 1.78 for PLF11 and PLF21 90 NBR
or 7.65 x 1.78 for PLF31 and PLF41 90 NBR

Definition of forces as function of clamping arm: see page 21
Important recommendations: see page 20
NON-INDEXED: the pin may be removed using a pin punch

| F max at 250 bar | Rod ed | Stroke | Max flow A | Area extend A | B | Dir of rotation | Type | Order code | a | c | aD | a2 | e | f | h | l | ak1 | ak2 | L1 | L2 | L3 | m1 | m2 | p1 | p2 | p3 |
|-----------------|--------|--------|------------|---------------|---|----------------|------|------------|---|---|----|----|---|---|---|---|-----|-----|----|----|----|----|----|----|----|----|----|----|
| kN              | mm     | mm     | /mm        | mm²           |    |                |      |            | mm| mm| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| 4               | 18     | 8      | 0.4        | 5.3           | 7.4| right          | PLF 11 DX | 191 166/050 | 13 | 10 | 36 | M12 x 1.5 | 5  | 20 | 58 | 47 | 121 | 88 | 40 | 98 | 8.8 | 4  | 5.5 | 9  | 35 |
| 8               | 25     | 12     | 0.9        | 15            | 21 | right          | PLF 11 GX | 191 166/150 | 16 | 14 | 52 | M16 x 1.5 | 6  | 26 | 79 | 63 | 152 | 107 | 50 | 122 | 8.8 | 4  | 6.5 | 10.5 | 44 |
| 16              | 36     | 12     | 2          | 41            | 53 | left           | PLF 21 DX | 191 115/050 | 18 | 20 | 72 | M24 x 1.5 | 10 | 36 | 110 | 90 | 195 | 142 | 59 | 157 | 11.1 | 5 | 10.5 | 17 | 48 |
| 24              | 42     | 12     | 3          | 74            | 89 | left           | PLF 21 GX | 192 063/050 | 20 | 22 | 65 | M30 x 1.5 | 12 | 45 | 125 | 105 | 218 | 161 | 65 | 176 | 11.1 | 5 | 10.5 | 17 | 55 |

Notes:
- Dimensions: ak₁/ak₂
- Dimensions: L1, L2, L3
- Dimensions: m1, m2
- Dimensions: p1, p2, p3
Swing clamp: PBF

Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Flanged block
Supply through counter-bores on side
Fixing using 4 screw on the body

Characteristics

- rotation in a plane left or right 90°±2°
- index on the rod
- venting ports
- for machining of indexing on the clamping arm
  see pages 69 to 71

Options

- nozzle on counter-bores port
- clamping arm: see accessories heading
- rotation 60°, 45° or 0° on request

Note

Cylinders are supplied with o-ring seals, locking nut and lock-washer [dimensions and torques: see page 72].
Seals: or 7,65 x 1,78 90 NBR

Definition of forces as function of clamping arm: see page 21

Important recommendations: see page 20

NON-INDEXED: the pin may be removed using a pin punch

| F max at 250 bar | Red | Stroke | Max flow A | Area extend A | Dir. of rotation | Type          | Order code   | a   | c   | e   | f   | g   | h   | ak1 | e2 | k3 | L  | L1 | L3 | m1 | m2 | p1 | p2 | p3 | p4 | p5 | p6 | t1 | t2 | t3 |
|------------------|-----|--------|------------|---------------|-----------------|---------------|--------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| kN   | mm | mm    | mm         | mm            |                 | PBF 11 DX     | 191 162/050 | 13  | 10  | M12 x 1.5 | 5  | 36  | 60  | 121 | 88  | 48.5 | 24.5 | 59  | 8.5 | 10  | 8   | 11  | 87  | 4   | 45  | 6.5 | 4.5 | 10  | 8   |
| 4    | 18 | 8     | 0.4        | 5.3           | right           | PBF 11 DX     | 191 162/150 | 16  | 14  | M16 x 1.5 | 6  | 52  | 75  | 152 | 107 | 59.5 | 28  | 68.5 | 95  | 14  | 12  | 10  | 77  | 5   |
| 8    | 25 | 12    | 0.9        | 15            | right           | PBF 21 DX     | 191 072/050 | 18  | 20  | M64 x 1.5 | 10 | 72  | 96  | 195 | 142 | 75   | 34  | 94   | 115 | 17  | 155 | 14  | 11  | 76  | 10  | 15  | 7   | 11  |
| 16   | 36 | 12    | 2          | 21            | right           | PBF 31 DX     | 191 078/050 | 20  | 22  | MO0 x 1.5 | 12 | 85  | 116 | 218 | 161 | 85   | 40  | 107  | 123 | 13  | 20  | 16  | 120 | 8   |
| 24   | 42 | 12    | 3          | 53            | right           | PBF 41 DX     | 191 081/050 | 22  | 25  | MO0 x 1.5 | 12 | 85  | 116 | 218 | 161 | 85   | 40  | 107  | 123 | 13  | 20  | 16  | 120 | 8   |
| 30   | 48 | 12    | 3.5        | 74            | right           | PBF 41 DX     | 191 081/150 | 24  | 30  | MO0 x 1.5 | 12 | 85  | 116 | 218 | 161 | 85   | 40  | 107  | 123 | 13  | 20  | 16  | 120 | 8   |

Dimensions

- a, c, e, f, g: mm
- h, ak1, e2, k3, L, L1, L3, m1, m2, p1, p2, p3, p4, p5, p6, t1, t2, t3: mm
Swing clamp: PCB
Double acting - Rotation in a plane
Max force at 250 bar: 4 to 24 kN

Cartridge type supply
Fixing using 4 screw on ring

Characteristics
- rotation in a plane left or right 90° ± 2°
- index on the rod
- venting ports
- for machining of indexing on the clamping arm
  see pages 69 to 71

Options
- clamping arm: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders are supplied with seals, locking nut and lock-washer
(dimensions and torques: see page 72).

Housing machining dimensions: see page 31
Definition of forces as function of clamping arm: see page 21
Important recommendations: see page 20

NON-INDEXED: the pin may be removed using a pin punch

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod ed</th>
<th>Stroke</th>
<th>Max flow A</th>
<th>Area restand A B</th>
<th>Dir of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d0</th>
<th>e</th>
<th>f</th>
<th>h</th>
<th>ak1</th>
<th>ak2</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>m1</th>
<th>m2</th>
<th>p1</th>
<th>p2</th>
<th>p3</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>l/mm</td>
<td>mm²</td>
<td>right</td>
<td>left</td>
<td>PCB 11 DX</td>
<td>191 161/050</td>
<td>13</td>
<td>10</td>
<td>36</td>
<td>M12 x 1.5</td>
<td>5</td>
<td>20</td>
<td>58</td>
<td>47</td>
<td>121</td>
<td>105</td>
<td>77.5</td>
<td>20.5</td>
<td>14</td>
<td>49</td>
<td>5.5</td>
<td>9</td>
<td>5.5</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>8</td>
<td>0.4</td>
<td>5.3</td>
<td>7.4</td>
<td>night</td>
<td>PCB 11 GX</td>
<td>191 161/150</td>
<td>16</td>
<td>14</td>
<td>52</td>
<td>M16 x 1.5</td>
<td>6</td>
<td>29</td>
<td>76</td>
<td>63</td>
<td>152</td>
<td>12</td>
<td>95</td>
<td>27</td>
<td>16</td>
<td>56</td>
<td>6.5</td>
<td>10.5</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>0.9</td>
<td>15</td>
<td>21</td>
<td>night</td>
<td>PCB 21 DX</td>
<td>191 169/050</td>
<td>16</td>
<td>14</td>
<td>52</td>
<td>M16 x 1.5</td>
<td>6</td>
<td>29</td>
<td>76</td>
<td>63</td>
<td>152</td>
<td>12</td>
<td>95</td>
<td>27</td>
<td>16</td>
<td>56</td>
<td>6.5</td>
<td>10.5</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>12</td>
<td>2</td>
<td>41</td>
<td>53</td>
<td>night</td>
<td>PCB 31 DX</td>
<td>191 080/050</td>
<td>18</td>
<td>20</td>
<td>72</td>
<td>M24 x 1.5</td>
<td>10</td>
<td>36</td>
<td>110</td>
<td>90</td>
<td>195</td>
<td>18</td>
<td>124</td>
<td>33</td>
<td>17</td>
<td>77</td>
<td>10.5</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>24</td>
<td>42</td>
<td>12</td>
<td>3</td>
<td>74</td>
<td>88</td>
<td>night</td>
<td>PCB 41 DX</td>
<td>191 070/050</td>
<td>20</td>
<td>22</td>
<td>65</td>
<td>M30 x 1.5</td>
<td>12</td>
<td>45</td>
<td>125</td>
<td>105</td>
<td>218</td>
<td>18</td>
<td>143</td>
<td>33</td>
<td>22</td>
<td>88</td>
<td>10.5</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>

Definitions:
- PCB = Pressure clamp body
- DX = Double acting
- GX = Single acting

Dimensions: mm
L = Length
L1 = Length 1
L2 = Length 2
L3 = Length 3
m1 = Diameter 1
m2 = Diameter 2
p1 = Pitch 1
p2 = Pitch 2
p3 = Pitch 3

Dimensions and torques: see page 72.
Housing : PCB
For PCB swing clamp cartridges
Machining dimensions - Example

Housing machining dimensions

IMPORTANT :
Allow for venting ports at highest points of assemblies
General tolerances J13
Round off and polish sharp angles

<table>
<thead>
<tr>
<th>Type</th>
<th>øD</th>
<th>b</th>
<th>L1</th>
<th>L2</th>
<th>ed</th>
<th>af</th>
<th>f1</th>
<th>f2</th>
<th>G</th>
<th>h</th>
<th>k</th>
<th>r</th>
<th>s</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB11</td>
<td>36</td>
<td>2</td>
<td>62</td>
<td>79</td>
<td>3</td>
<td>47</td>
<td>14</td>
<td>48.75</td>
<td>1/4''</td>
<td>0.5</td>
<td>4</td>
<td>M5</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>PCB21</td>
<td>52</td>
<td>3</td>
<td>70</td>
<td>97</td>
<td>4</td>
<td>63</td>
<td>16</td>
<td>56</td>
<td>1/4''</td>
<td>1</td>
<td>6</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>PCB31</td>
<td>72</td>
<td>3</td>
<td>95</td>
<td>126</td>
<td>5</td>
<td>90</td>
<td>17</td>
<td>77</td>
<td>1/4''</td>
<td>1</td>
<td>8</td>
<td>M10</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>PCB41</td>
<td>85</td>
<td>4</td>
<td>106</td>
<td>145</td>
<td>5</td>
<td>105</td>
<td>22</td>
<td>88</td>
<td>1/4''</td>
<td>1.25</td>
<td>10</td>
<td>M10</td>
<td>14</td>
<td>17</td>
</tr>
</tbody>
</table>

Example : Fitting through a plate

Example of venting port
Swing clamp: PCV

Double acting - Rotation in a plane
Max force at 250 bar: 4 to 8 kN

Cartridge type supply
Fixing using the threaded body

Characteristics
- rotation in a plane left or right 90°±2°

Options
- clamping arm: see accessories heading
- rotation 60°, 45° or 0° on request

Note
- Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques: see page 72).
  - Indexing of the arm on the rod is not possible.

Indexing of the arm on the rod is not possible.

Defining forces as function of clamping arm: see page 21

Important recommendations: see page 20

| F max at 250 bar | Rod ed | Stroke | Max flow A | Area extend A | Dir. of rotation | Type | Order code | s | c | øD | e | f | k | L | L1 | L2 | L3 | L4 | S/P |
|------------------|--------|--------|------------|---------------|----------------|------|------------|---|---|-----|---|---|---|---|----|----|----|----|----|----|
| kN   | mm   | mm    | l/min   | mm           | mm            | mm  | mm        | mm | mm | mm  | mm | mm | mm | mm | mm |
| 4    | 18   | 8     | 0.4     | 5.3 7.4      | left          | PCV 11 D | 191 160/000 | 13 | 10 | 36  | 5  | M12 x 1.5 | -6g | 121 | 9  | 72.6| 16.4| 6.4 | 34 |
| 8    | 25   | 12    | 0.9     | 15 21        | left          | PCV 21 D | 191 066/000 | 16 | 14 | 52  | 6  | M16 x 1.5 | -6g | 152 | 9  | 91.6| 21.4| 6.4 | 50 |
**Housing: PCV**

For PCV swing clamp cartridges

**Machining dimensions - Example**

### Housing machining dimensions

![Diagram of housing machining dimensions](image)

- Vent ports allow air to be expelled during fitting of the cylinder
- A = Clamping
- B = Release

### IMPORTANT:

- Allow for venting ports at highest points of assemblies
- General tolerances Js13
- Round off and polish sharp angles

<table>
<thead>
<tr>
<th>Type</th>
<th>øD H8</th>
<th>C H6</th>
<th>L1 mini</th>
<th>L2 mini</th>
<th>ad</th>
<th>a</th>
<th>f1</th>
<th>f2</th>
<th>G</th>
<th>h mini</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB 11</td>
<td>36</td>
<td>M45 x1.5</td>
<td>66</td>
<td>83</td>
<td>3</td>
<td>9</td>
<td>20.1</td>
<td>52.95</td>
<td>1/4&quot;</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>PCB 21</td>
<td>52</td>
<td>M64 x2</td>
<td>78</td>
<td>102</td>
<td>5</td>
<td>9</td>
<td>23.1</td>
<td>61.6</td>
<td>1/4&quot;</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

### Example: Fitting through a plate

![Diagram of fitting through a plate](image)

- Example of venting port
- A = Clamping
- B = Release
Examples of assembly: **P_26**

Double acting swing clamps - 100 bar

Types PS, PL, PF, PT and PLS

**Type PF 26**

- Fixing: 4 screws on base
- Supply: Counter-bores under rectangular base
- See page: 37

**Type PL 26**

- Fixing: 4 screws
- Supply: Counter-bores under ring
- See page: 35

**Type PS 26**

- Fixing: 4 screws on base
- Supply: Threads on rectangular base
- See page: 38

**Type PT 26**

- Fixing: 4 screws
- Supply: Threads on ring side
- See page: 36

**Type PLS 26**

- Fixing: 4 vis
- Supply: Counter-bores under ring
- See page: 39
Swing clamp : PL 26
Double acting - Rotation in a plane
Max force at 100 bar : 8 kN

Supply through counter-bores under head
Fixing using screws

Definition
These cylinders are used when the pressure available is limited to 100 bar and for restricted dimensions. At 100 bar, the PF26 develops 7.7 kN that is more than the P31(6kN) which is of larger volume.

Options
- custom clamping arm
- rotation 60°, 45° or 0° on request
- X indexing of the rod (see page 73)

Characteristics
- rod treated to prevent seizure and corrosion
- rotation in plane left or right 90°±2°
- stroke 12 mm
- Body and base are treated against corrosion. Cylinders may be immersed in water for example for cast components pressurisation applications.

Note
Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques : see page 72).
Seals : or 5,28 x 1,78

GRAPHS:
For recommendations : see page 18

<table>
<thead>
<tr>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Indexing</th>
</tr>
</thead>
<tbody>
<tr>
<td>right</td>
<td>PL 26 D</td>
<td>191 131/000</td>
<td>NO</td>
</tr>
<tr>
<td>right</td>
<td>PL 26 G</td>
<td>191 131/100</td>
<td></td>
</tr>
<tr>
<td>right</td>
<td>PL 26 X</td>
<td>191 131/050</td>
<td>YES</td>
</tr>
<tr>
<td>left</td>
<td>PL 26 D</td>
<td>191 131/150</td>
<td></td>
</tr>
<tr>
<td>left</td>
<td>PL 26 G</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PL 26 X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For recommendations :
see page 18
**Swing clamp : PT 26**

Double acting - Rotation in a plane  
Max force at 100 bar : 8 kN

Supply by tapping on head  
Fixing using screw

**Definition**

These cylinders are used when pressure available is limited to 100 bar and for restricted dimensions. At 100 bar, the PT26 develops 7.7 kN that is more than the P31 (6kN) which is of larger volume.

**Options**

- custom clamping arm
- rotation 60°, 45° or 0° on request
- X indexing of the rod (see page 73)

**Characteristics**

- rod treated to prevent seizure and corrosion
- rotation in plane left or right 90°±2°
- stroke 12 mm
- Body and base are treated against corrosion. Cylinders may be immersed in water for example for cast components pressurisation applications.

**Note**

Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques : see page 72).  
Seals : or 5,28 x 1,78

**Supplementary information**

**GRAPHS :**  
For recommendations : see page 18

```
<table>
<thead>
<tr>
<th>P (bar)</th>
<th>F (kN)</th>
<th>Y (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.5</td>
<td>35</td>
</tr>
<tr>
<td>1.5</td>
<td>2.7</td>
<td>20</td>
</tr>
<tr>
<td>2.7</td>
<td>4.4</td>
<td>15</td>
</tr>
<tr>
<td>4.4</td>
<td>6.1</td>
<td>10</td>
</tr>
<tr>
<td>6.1</td>
<td>7.7</td>
<td>5</td>
</tr>
</tbody>
</table>
```

**Table:**  
Direction of rotation | Type | Order code | Indexing |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>right</td>
<td>PT 26 D</td>
<td>191 083/000</td>
<td>NO</td>
</tr>
<tr>
<td>right</td>
<td>PT 26 G</td>
<td>191 083/100</td>
<td>YES</td>
</tr>
<tr>
<td>right</td>
<td>PT 26 D X</td>
<td>191 083/050</td>
<td></td>
</tr>
<tr>
<td>right</td>
<td>PT 26 G X</td>
<td>191 083/150</td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp: PF 26
Double acting - Rotation in a plane
Max force at 100 bar: 8 kN

Supply through counter-bores under base
Fixing using screws on base

Definition
These cylinders are used when pressure available is limited to 100 bar and for restricted dimensions. At 100 bar, the PF26 develops 7.7 kN that is more than the P31 (6kN) which is of larger volume.

Options
- custom clamping arm
- rotation 60°, 45° or 0° on request
- X indexing of the rod (see page 73)

Characteristics
- rod treated to prevent seizure and corrosion
- rotation in plane left or right 90°±2°
- stroke 12 mm
- Body and base are treated against corrosion. Cylinders may be immersed in water for example for cast components pressurisation applications.

Note
Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques: see page 72). Seals: or 5.28 x 1.78

Graphs:
For recommendations: see page 18

<table>
<thead>
<tr>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Indexing</th>
</tr>
</thead>
<tbody>
<tr>
<td>right</td>
<td>PF 26 D</td>
<td>191 130/000</td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td>PF 26 G</td>
<td>191 130/100</td>
<td></td>
</tr>
<tr>
<td>left</td>
<td>PF 26 X</td>
<td>191 130/050</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>PF 26 X</td>
<td>191 130/150</td>
<td></td>
</tr>
</tbody>
</table>

Ed: 10 / 2011
Swing clamp : PS 26
Double acting - Rotation in a plane
Max force at 100 bar : 8 kN

Fixing using screw on base
Supply through tapping on rectangular base

Definition
These cylinders are used when pressure available is limited to 100 bar and for restricted dimensions. At 100 bar, the PS26 develops 7.7 kN that is more than the P31 (6kN) which is of larger volume.

Options
- custom clamping arm
- rotation 60°, 45° or 0° on request
- X indexing of the rod (see page 73)

Characteristics
- rod treated to prevent seizure and corrosion
- rotation in plane left or right 90°±2°
- stroke 12 mm
- Body and base are treated against corrosion. Cylinders may be immersed in water for example for cast components pressurisation applications.

Note
Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques : see page 72).
Seals : or 5,28 x 1,78

Graphs:
For recommendations: see page 18

P [bar] 0 10 20 30 40 50 60 70 80 100
F [kN] 0 1 2 3 4 5 6.1 7.7
Q [mm] 0 1 2 3 4 5 75 50 35

<table>
<thead>
<tr>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Indexing</th>
</tr>
</thead>
<tbody>
<tr>
<td>right</td>
<td>PS 26 D</td>
<td>191 082/000</td>
<td>NO</td>
</tr>
<tr>
<td>left</td>
<td>PS 26 G</td>
<td>191 082/100</td>
<td></td>
</tr>
<tr>
<td>right</td>
<td>PS 26 D X</td>
<td>191 082/050</td>
<td></td>
</tr>
<tr>
<td>left</td>
<td>PS 26 G X</td>
<td>191 082/150</td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp: PLS 26 X
Double acting - Rotation in a plane
Max force at 100 bar: 8 kN

Supply through counter-bores under ring
Fixing using screws

Definition
These cylinders are used when pressure available is limited to 100 bar and for restricted dimensions. At 100 bar, the PLS26 develops 7.7 kN that is more than the P31 (6kN) which is of larger volume.

Options
- custom clamping arm
- rotation 60°, 45° or 0° on request
- version for immersion is treated against corrosion
- X indexing of the rod (see page 73)

Characteristics
- rod treated to prevent seizure and corrosion
- rotation in plane left or right 90° ±2°
- stroke 12 mm
- Body and base are treated against corrosion. Cylinders may be immersed in water for example for cast components pressurisation applications.

Note
Cylinders are supplied with seals, locking nut and lock-washer (dimensions and torques: see page 72).
Seals: or 5,28 x 1,78

Graphs:
For recommendations: see page 18

<table>
<thead>
<tr>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Indexing</th>
</tr>
</thead>
<tbody>
<tr>
<td>left</td>
<td>PLS 26 D X</td>
<td>191 112/050</td>
<td></td>
</tr>
<tr>
<td>left</td>
<td>PLS 26 G X</td>
<td>191 112/150</td>
<td>YES</td>
</tr>
</tbody>
</table>

For recommendations:
see page 18
Swing clamps
with planar rotation

40 QUIRI
67129 MOLSHEIM CEDEX (France) Tel. : +33 (0)3 88 04 84 00 Fax : +33 (0)3 88 04 84 01 Email : quiri.hydro@quiri.com

Ed : 10 / 2011
# Pivoting cylinders with helical rotation

## Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL5</td>
<td>Swing clamp - Fixed by counter-bores on ring</td>
<td>047</td>
</tr>
<tr>
<td>PT5</td>
<td>Swing clamp - Upper flange with thread plug</td>
<td>048</td>
</tr>
<tr>
<td>PF5</td>
<td>Swing clamp - Lower flange manifold mount</td>
<td>049</td>
</tr>
<tr>
<td>PS5</td>
<td>Swing clamp - Lower flange with thread plug</td>
<td>050</td>
</tr>
<tr>
<td>PCV5</td>
<td>Cartridge cylinder - To screw - Hexagonal flange</td>
<td>051</td>
</tr>
<tr>
<td>HL12</td>
<td>Double acting cylinder - Supplied through counter-bores under head</td>
<td>053</td>
</tr>
<tr>
<td>HL21</td>
<td>Double acting cylinder - Supplied through counter-bores under head</td>
<td>053</td>
</tr>
<tr>
<td>HL31</td>
<td>Double acting cylinder - Supplied through counter-bores under head</td>
<td>053</td>
</tr>
<tr>
<td>HLF21</td>
<td>Double acting cylinder - Supplied through counter-bores on base side</td>
<td>054</td>
</tr>
<tr>
<td>HLF31</td>
<td>Double acting cylinder - Supplied through counter-bores on base side</td>
<td>054</td>
</tr>
</tbody>
</table>
Swing clamp characteristics
Double acting
Helical rotation

General points
The swing clamps can clear the working area to facilitate components loading and un-loading operations. Designed for self-controlled systems, they reduce non-productive time.

Construction
- all parts are in high-strength steel.
- rod treated anti-seizure and anti-corrosion.
- the body is protected by an anti-corrosion treatment.

Advantages
- all our swing clamps include venting ports.
- easy removal of clamping arm.
- all cylinders include an index on the rod.

Operations
Clamping phase : Supply at A
During the pressurisation of the cylinder, the piston rod pivots along a helical ramp followed by a linear clamping translation. The total stroke and the linear clamping stroke are indicated on technical data sheet specific to each type of cylinder.

Phase de débridage : Alimentation en B
Supply through the release port item B causes a movement of translation of the rod up, followed by a helical pivoting movement to find the original position.

Direction and angle of rotation
The direction of rotation is indicated from the initial «unclamped» position with the rod extended to the «clamped» position with the rod retracted, rod viewed from top.
Right = clockwise direction
Left = anti-clockwise direction
Standard angle of rotation : 90° ± 2°.
Swing clamp characteristics

Determination of cylinder characteristics

Examples

Determination of cylinder characteristics

The maximum forces are given for a pressure of 250 bar. This pressure is only authorised if the shortest of the three available standard arms is used.

The max force (therefore the max pressure) decreases proportionally with the length of the arm: please see graphs.

The max flow also decreases with the inertia of the arm: refer to the values indicated in the graphs for standard arms. Please contact if you need special arms.

<table>
<thead>
<tr>
<th>Maximum pressure / Standard clamping arm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum pressure</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>250 bar</td>
</tr>
<tr>
<td>175 bar</td>
</tr>
<tr>
<td>125 bar</td>
</tr>
</tbody>
</table>

Minimum using pressure: 30 bar

The use of a double symetric arm allows operation at 250 bar, but you must use the following formula:

\[
\text{Force (daN)} / 2 = \text{Pressure (bar)} \times \text{Section (cm}^2) \div 2
\]

([A in table on page 44])

Examples:

For a double symetric arm and the max force of HL 21:

\[
F/2 = P \times S \div 2 = 250 \times 4.71 \div 2 = 5.8 \text{ kN}
\]

Example of using diagrams

The diagram on the right allows the maximum force developed by the cylinder and the max pressure to be determined for the type of arm used: BC, BM, or BL. They also indicate the limiting values at Q flow.

The maximum force developed by a HL21 type cylinder with a BL 21 75 mm long arm is 4 kN at 120 bar with maximum Q flow of 0.5 l/mn per cylinder.

For the determination of special arm characteristics, please use the graphs on page 45.
Swing clamp characteristics

Important recommendations

Characteristics

Using pressure

- minimum: 30 bar
- maximum: 250 bar with short arms (see graphs)

Maximum temperature

- 70°C
- for temperatures higher than 70°C please contact us

Important recommendations

<table>
<thead>
<tr>
<th>F_{max} at 250 bar</th>
<th>Rod</th>
<th>Stroke</th>
<th>Max flow</th>
<th>Swept volume</th>
<th>Dir. of rotation</th>
<th>Type</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>l/mm</td>
<td>cm³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>0.9</td>
<td>11.06 22.01</td>
<td>right left</td>
<td>HL21 DX</td>
<td>191200/050</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HL21 DX</td>
<td>191200/150</td>
</tr>
</tbody>
</table>

A. This value allows an initial approach to be made in selecting cylinder. Always ensure that you refer to the diagram of forces present on the P5 cylinder drawings or on page 45 for the HL21 and HL31 models to specify the max force and pressure as a function of length for the arm.

B. The rod has a conical end and is threaded for fixing the clamping arm with braking. When locking the nut, the rod must be prevented from rotating in order not to transmit the tightening torque to the internal mechanism.

There are two ways of doing this:

- restrain the rod using a hex wrench (see figure 1)
- maintain the rod in the vice

C. The indicated value corresponds to the max stroke of the cylinder. For clamping a component, the useful stroke is between the minimum and the maximum values indicated in the table of characteristics below.

D. The max recommended flow will vary with the type of cylinder and inertia of the clamping arm. Refer to the table and if possible provide a nozzle or adjustable braking device in the distribution circuit. The flow must be multiplied by the number of cylinders operating at the same time: ensure that minimum flows are observed.

E. This is the volume of oil displaced during total stroke.

F. Direction of rotation of the rod from the unclamped position to the clamped one. Rod viewed from above.

Characteristics

Please see opposite table.

A = clamping  
B = release

<table>
<thead>
<tr>
<th>Unit</th>
<th>P5</th>
<th>HL 12</th>
<th>HL 21</th>
<th>HL 31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>cm²</td>
<td>cm²</td>
<td>cm²</td>
</tr>
<tr>
<td>A</td>
<td>3.01</td>
<td>6.15</td>
<td>9.62</td>
<td>19.63</td>
</tr>
<tr>
<td>B</td>
<td>4.71</td>
<td>9.62</td>
<td>19.63</td>
<td></td>
</tr>
</tbody>
</table>

| | cm³ | | cm³ | | cm³ |
| | 0.9 | | 2 | | 55.84 |

| | l/mm | | l/mm | | l/mm |
| | 0.2 | | 0.9 | | 2 |

| | s | | s | | s |
| | 0.7 | | 0.74 | | 0.8 |

| | mm | | mm | | mm |
| | 10 | | 10 | | 13 |

| | mm | | mm | | mm |
| | 23 | | 23.5 | | 28.5 |

WARNING

Opposite table is given for information purpose.

To determine actual forces, please use the graphs located on page 45 which take the yield into account.
Swing clamp characteristics

Definition of the special arms

Graphs

These graphs take the cylinder yield into account
Swing clamp : PL5
Double acting - Helical rotation
Max force at 250 bar : 1.9 kN

Supply through counter-bores under ring
Fixing using 3 screws on ring

Characteristics
- cylinder body in treated brunished steel
- total stroke : 17 mm
- clamping stroke : 6 mm
- helical rotation left or right 90° ± 2°
- countersink in the arm extension

Options
- custom clamping arm
- rotation 60°, 45° or 0°
- position check
- special dimension
- nozzle on counter-bore ports

Note
Cylinder are supplied with o-ring seals, plugs [depending on version] and ring.
Seals : or 5.25 x 1.78 NBR

Graphs :
Actual force applied at clamping point taking input/output yield into account.

Example : If y = 40 mm, F maxi = 1.23 kN at 162 bar

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Max flow A</th>
<th>Max flow B</th>
<th>Area extend A</th>
<th>Area extend B</th>
<th>Section A</th>
<th>Section B</th>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN/</td>
<td>l/min</td>
<td>cm²/</td>
<td>cm²/</td>
<td>right</td>
<td>left</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>0.2</td>
<td>0.36</td>
<td>1.67</td>
<td>3</td>
<td>0.99</td>
<td>1.77</td>
<td>PL 5 D</td>
<td>181 169/050</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PL 5 G</td>
<td>181 169/150</td>
<td></td>
</tr>
</tbody>
</table>

A = Clamping
B = Release
DA = Venting port

Plane support roughness Ra 0.8
Swing clamp : PT5
Double acting - Helical rotation
Max force at 250 bar : 1.9 kN

Supply through G 1/8” tappings
Fixing using 3 screws on ring

Characteristics
- Cylinder body in treated brunished steel
- Total stroke : 17 mm
- Clamping stroke : 6 mm
- Helical rotation left or right 90° ± 2°
- Countersink in the arm extension

Options
- Custom clamping arm
- Rotation 60°, 45° or 0°
- Position check
- Special dimension
- Nozzle on counter-bore ports

Note
Cylinder are supplied with o-ring seals, plugs [depending on version] and ring.

Graphs:
Actual force applied at clamping point taking input/output yield into account.

Example: If y = 40 mm, F maxi = 1.23 kN at 162 bar
Swing clamp: PF5
Double acting - Helical rotation
Max force at 250 bar: 1.9 kN

Supply through counter-bore under base
Fixing using 4 screws on base plate

Characteristics
- Cylinder body in treated brunished steel
- Total stroke: 17 mm
- Clamping stroke: 6 mm
- Helical rotation left or right: 90° ± 2°
- Countersink in the arm extension

Options
- Custom clamping arm
- Rotation 60°, 45° or 0°
- Position check
- Special dimension
- Nozzle on counter-bore ports

Note
Cylinder are supplied with o-ring seals, plugs (depending on version) and ring.
Seal: 5.25 x 1.78 NBR and plug G 1/8"

Graphs:
Actual force applied at clamping point taking input/output yield into account.
Example: If y = 40 mm, F max = 1.23 kN at 162 bar

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Max flow A</th>
<th>Max flow B</th>
<th>Area extend A</th>
<th>Section A</th>
<th>Section B</th>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9 kN</td>
<td>0.2 l/min</td>
<td>0.36 l/min</td>
<td>1.67 cm²</td>
<td>0.98 mm²</td>
<td>1.77 mm²</td>
<td>Right</td>
<td>PF5 D</td>
<td>181 173/050</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Left</td>
<td>PF5 G</td>
<td>181 173/150</td>
</tr>
</tbody>
</table>
Swing clamp : **PS5**

Double acting - Helical rotation
Max force at 250 bar : 1.9 kN

Supply through G1/8” tapping
Fixing using 4 screws on base plate

**Characteristics**
- cylinder body in treated brunished steel
- total stroke : 17 mm
- clamping stroke : 6 mm
- helical rotation left or right 90° ± 2°
- countersink in the arm extension

**Options**
- custom clamping arm
- rotation 60°, 45° or 0°
- position check
- special dimension
- nozzle on counter-bore ports

**Note**
Cylinder are supplied with o-ring seals, plugs [depending on version] and ring.
Seal : or 5.25 x 1.78 NBR and plug G 1/8"

**Graphs :**
Actual force applied at clamping point taking input/output yield into account.

**Example :** If y = 40 mm, F maxi = 1.23 kN at 162 bar

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Max flow A</th>
<th>Max flow B</th>
<th>Area extend A</th>
<th>Area extend B</th>
<th>Section A</th>
<th>Section B</th>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
<td>0.2</td>
<td>0.36</td>
<td>1.67</td>
<td>3</td>
<td>0.99</td>
<td>1.77</td>
<td>right left</td>
<td>PS 5 G</td>
<td>181 174/050</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PS 5 G</td>
<td>181 174/150</td>
</tr>
</tbody>
</table>

A = Clamping
B = Release
DA = Clamping venting port
DB = Release venting port
Swing clamp : PCV5

Double acting - Helical rotation
Max force at 250 bar : 1.9 kN

Cartridge with hexagonal flange

Characteristics
- Cylinder body in treated brunished steel
- Total stroke : 17 mm
- Clamping stroke : 6 mm
- Helical rotation left or right 90° ± 2°

Options
- Custom clamping arm
- Rotation 60°, 45° or 0°
- Position check
- Special dimension

Note
Cylinders are supplied with seals.
Countersink on the rod is not possible.

Graphs:
Actual force applied at clamping point taking input/output yield into account.

Example: If y = 40 mm, F maxi = 1.23 kN at 162 bar

Total stroke: 17
Pivoting stroke: 11
Clamping: 6

Housing machining: see next page
Housing: PCV5

For swing clamp type PCV5

Machining dimensions

**Housing machining dimensions**

![Diagram of Housing dimensions]

- **A** = Clamping port
- **B** = Release port

**Provide purge ports**

**Rounded edges**

The released port may be on the base

**Detail of a venting port**

![Diagram of Venting port]

- Screw HC M8x8 with flat end
- Flat base with sharp edges
- File a vent on the screw
Swing clamp: HL 21, HL 21 & HL 31

Double acting with helical groove

Supply through counter-bore under ring
Fixing using screws

Characteristics
- total stroke = rot. stroke + linear clamping stroke
- helical groove left or right rotation 90°±2°
- venting port on the clamping side (HL12, HL 21, HL 31)
- venting port on the release side (HL 31)
- indexing of the rod
- maximum using pressure: 250 bar

Options
- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders supplied with o-ring seals, locking nut and lock-washer
(dimensions and tightening torques: see page 72).
Seals on base: 5.28 x 1.78 (HL12, HL 21) 90 NBR
7.65 x 1.78 (HL 31) 90 NBR

| Definition of forces as function of clamping arms: see page 45 |
| Important recommendations: see page 44 |

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod ad</th>
<th>Clamping stroke</th>
<th>Total stroke</th>
<th>Max flow</th>
<th>Area extend A</th>
<th>B</th>
<th>Dir. of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>s</th>
<th>c</th>
<th>a0</th>
<th>e</th>
<th>f</th>
<th>h</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>12</td>
<td>23</td>
<td>0.5</td>
<td>6.9</td>
<td>14.1</td>
<td>right</td>
<td>HL12 DX</td>
<td>181 217/050</td>
<td>14</td>
<td>10</td>
<td>45</td>
<td>M14 x 1.5</td>
<td>138.5</td>
<td>88.5</td>
<td>68.5</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>24</td>
<td>0.9</td>
<td>11.06</td>
<td>22.81</td>
<td>right</td>
<td>HL12 GX</td>
<td>181 217/150</td>
<td>16</td>
<td>14</td>
<td>52</td>
<td>M16 x 1.5</td>
<td>146.5</td>
<td>89.5</td>
<td>63.5</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>15</td>
<td>29</td>
<td>2</td>
<td>20.95</td>
<td>55.64</td>
<td>right</td>
<td>HL21 DX</td>
<td>181 200/050</td>
<td>18</td>
<td>20</td>
<td>72</td>
<td>M24 x 1.5</td>
<td>175.5</td>
<td>80</td>
<td>61</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>25</td>
<td>37</td>
<td>0.9</td>
<td>17.42</td>
<td>25.59</td>
<td>left</td>
<td>HL21 DX C25</td>
<td>181 210/150</td>
<td>16</td>
<td>14</td>
<td>52</td>
<td>M16 x 1.5</td>
<td>175.5</td>
<td>80</td>
<td>61</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>25</td>
<td>39</td>
<td>2</td>
<td>36.85</td>
<td>70.55</td>
<td>left</td>
<td>HL31 DX</td>
<td>182 180/050</td>
<td>18</td>
<td>20</td>
<td>72</td>
<td>M24 x 1.5</td>
<td>175.5</td>
<td>80</td>
<td>61</td>
</tr>
</tbody>
</table>
Swing clamp: HLF 21 & HLF 31

Double acting with helical groove

Supply through counter-bores on base
Fixing using screws

Characteristics

- total stroke = rot. stroke + linear clamping stroke
- helical groove left or right rotation 90°±2°
- venting port on the clamping side (HLF 21 & HLF 31)
- venting port on the release side (HLF 31)
- indexing of the rod
- maximum using pressure: 250 bar

Options

- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note

Cylinders supplied with o-ring seals, locking nut and lock-washer
(dimensions and tightening torques: see page 72).
Seals on base:

- 5.28 x 1.78 [HLF 21] 90 NBR
- 7.65 x 1.78 [HLF 31] 90 NBR

Definition of forces as function of clamping arms: see page 45
Important recommendations: see page 44

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod</th>
<th>Clamping stroke</th>
<th>Total stroke</th>
<th>Max. flow</th>
<th>Area extend A</th>
<th>B</th>
<th>Dir. of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>cm²</td>
<td></td>
<td></td>
<td></td>
<td>L mm</td>
<td>L1 mm</td>
<td>L2 mm</td>
<td>L3 mm</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>24</td>
<td>0.9</td>
<td>11.06</td>
<td>droite</td>
<td>gauche</td>
<td>HLF 21 DX</td>
<td>191 201/050</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>15</td>
<td>29</td>
<td>2</td>
<td>26.95</td>
<td>droite</td>
<td>gauche</td>
<td>HLF 21 DX</td>
<td>191 201/150</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>25</td>
<td>37</td>
<td>0.9</td>
<td>17.42</td>
<td>droite</td>
<td>gauche</td>
<td>HLF 21 DX C25</td>
<td>191 211/050</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>25</td>
<td>39</td>
<td>2</td>
<td>36.85</td>
<td>droite</td>
<td>gauche</td>
<td>HLF 21 DX C25</td>
<td>192 182/050</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

Hydromecanique
www.quiri.com

Swing clamps with helical rotation

54 QUIRI 67129 MOLSHEIM CEDEX (France) Tel.: +33 (0)3 88 04 84 00 Fax: +33 (0)3 88 04 84 01 Email: quiri.hydro@quiri.com

ed: 10 / 2011
## Swing clamps with position detection

### Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL**XA</td>
<td>Swing clamp with helical groove</td>
<td>056</td>
</tr>
<tr>
<td></td>
<td>- Sensor rod</td>
<td></td>
</tr>
<tr>
<td>HLF**XA</td>
<td>Swing clamp with helical groove</td>
<td>057</td>
</tr>
<tr>
<td></td>
<td>- Sensor rod</td>
<td></td>
</tr>
<tr>
<td>HL**XB12</td>
<td>Swing clamp with helical groove</td>
<td>058</td>
</tr>
<tr>
<td></td>
<td>- Pneumatic detection of clamped and released positions</td>
<td></td>
</tr>
<tr>
<td>HLF**XB12</td>
<td>Swing clamp with helical groove</td>
<td>059</td>
</tr>
<tr>
<td></td>
<td>- Pneumatic detection of clamped and released positions</td>
<td></td>
</tr>
<tr>
<td>PL**XA</td>
<td>Swing clamp with rotation in a plane</td>
<td>060</td>
</tr>
<tr>
<td></td>
<td>- Sensor rod</td>
<td></td>
</tr>
<tr>
<td>PL**XB1</td>
<td>Swing clamp with rotation in a plane</td>
<td>061</td>
</tr>
<tr>
<td></td>
<td>- Pneumatic detection of the released position</td>
<td></td>
</tr>
<tr>
<td>PL**XB12</td>
<td>Swing clamp with rotation in a plane</td>
<td>062</td>
</tr>
<tr>
<td></td>
<td>- Pneumatic detection of clamped and released positions</td>
<td></td>
</tr>
<tr>
<td>PL**D/GXE</td>
<td>Swing clamp with rotation in a plane</td>
<td>063</td>
</tr>
<tr>
<td></td>
<td>- Electrical detection</td>
<td></td>
</tr>
<tr>
<td>PL21D/GXH</td>
<td>Swing clamp with rotation in a plane</td>
<td>064</td>
</tr>
<tr>
<td></td>
<td>- Hydraulic detection</td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp: HL ** X A

Double acting with helical groove
With sensor rod

Supply through counter-bores under ring
Fixing using screws

Characteristics
• stroke from 8 to 12 mm
• helical groove right and left rotation 90°±2°
• clamping venting port
• indexing on the rod
• maximum using pressure: 250 bar

Options
• clamping arms: see accessories heading
• rotation 60°, 45° or 0° on request

Note
Cylinders supplied with o-ring seals, locking nut and lockwasher [dimensions: see page 72]. Seals: 5.28 x 1.78 90 NBR

Definition of forces as function of clamping arms: see pages 21 and 45
Important recommendations: see page 44
Swing clamp: **HLF ** X A

Double acting with helical groove
With sensor rod

Supply through counter-bores on base side
Fixing using screws

Characteristics
- stroke from 8 to 12 mm
- helical groove right and left rotation 90°±2°
- clamping venting port
- indexing on the rod
- maximum using pressure: 250 bar

Options
- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions: see page 72].
Seals: 5.28 x 1.78  90 NBR

Definition of forces as function of clamping arms: see pages 21 and 45
Important recommendations: see page 45

<table>
<thead>
<tr>
<th>F max at 250 bar</th>
<th>Rod</th>
<th>Clamping stroke</th>
<th>Total stroke</th>
<th>Max flow</th>
<th>Area extend</th>
<th>A</th>
<th>B</th>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>8</td>
<td>19</td>
<td>0.4</td>
<td>4.48 6.40</td>
<td></td>
<td></td>
<td>right</td>
<td>HLF SX A</td>
<td>191 195/050</td>
<td>L1 140 53</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>12</td>
<td>23</td>
<td>0.9</td>
<td>10.83 18.56</td>
<td></td>
<td></td>
<td>left</td>
<td>HLF SX A</td>
<td>191 196/050</td>
<td>191 196/150</td>
</tr>
</tbody>
</table>
Swing clamp: **HL ** X B12

Double acting with helical groove
With pneumatic detection of clamped and released positions

Supply through counter-bores under ring
Fixing using screws

**Characteristics**

- stroke from 8 to 12 mm
- helical groove right and left rotation 90°±2°
- clamping venting port
- indexing on the rod
- maximum using pressure: 250 bar
- detection by valves with no leaks.

Clamped and released positions on base of cylinder adjusted by a screw

**Options**

- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

**Note**

Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions: see page 72].
Seals: 5.28 x 1.78 90 NBR

---

Definition of forces as function of clamping arms: see pages 21 and 45

Important recommendations: see page 44

| F max at 250 bar | Rod | Clamping stroke | Total stroke | Area extend A | Dir. rotation | Type | Order code | a | c | aD | e | f | h | ak1 | ak2 | L | L1 | L2 | L3 | m | p1 | p2 | p3 |
|------------------|-----|-----------------|--------------|--------------|--------------|------|------------|---|---|----|---|---|---|-----|-----|---|---|---|---|---|---|---|---|---|
| 4                | 18  | 19              | 0.4          | 4.48 6.40    | right        | HL 11 DX B12 181 186/050 181 186/150 | 13 | 10 | 42 | 5  | 23 | 64 | 53  | 203 | 164 | 142 | 44 | 21 | 5.5 | 9  | 13 |
| 8                | 25  | 23              | 0.9          | 10.83 18.56  | right        | HL 21 DX B12 181 187/050 181 187/150 | 16 | 14 | 52 | 6  | 28 | 76 | 63  | 248 | 192 | 168 | 52 | 24 | 6.5 | 10.5 | 16 |
Swing clamp: HLF ** X B12

Double acting with helical groove
With pneumatic detection of clamped and released positions

Supply through counter-bores under ring
Fixing using screws

Characteristics

- stroke from 8 to 12 mm
- helical groove right and left rotation 90°±2°
- clamping venting port
- indexing on the rod
- maximum using pressure: 250 bar
- detection by valves with no leaks.
  Clamped and released positions on base of cylinder adjusted by a screw

Options

- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note

Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions: see page 72].
Seals: 5.28 x 1.78 90 NBR

Definition of forces as function of clamping arms: see pages 21 and 45
Important recommendations: see page 44
Swing clamp : PL ** X A
Double acting - Rotation in a plane
With sensor rod

Supply through counter-bores under ring
Fixing using screw

Characteristics
- detection by sensor rod
- rotation in plane left or right 90°±2°
- released and clamping side venting port
- indexing of the rod
- maximum using pressure : 160 bar

Options
- clamping arms : see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions : see page 72].
Seals : 7.65 x 1.78 90 NBR

Definition of forces as function of clamping arms : see page 21
Important recommendations : see page 20

<table>
<thead>
<tr>
<th>F max at 160 bar</th>
<th>Rod</th>
<th>Stroke</th>
<th>Max flow A</th>
<th>Area extend A</th>
<th>B</th>
<th>Dir. of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>a</th>
<th>c</th>
<th>aØ</th>
<th>e</th>
<th>f</th>
<th>h</th>
<th>Dimensions</th>
<th>a1</th>
<th>a2</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>m</th>
<th>p1</th>
<th>p2</th>
<th>p3</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>36</td>
<td>12</td>
<td>2</td>
<td>41</td>
<td>3</td>
<td>right left</td>
<td>PL 31 DX A</td>
<td>192 046/050</td>
<td>18</td>
<td>20</td>
<td>80</td>
<td>211.5</td>
<td>138.5</td>
<td>130.5</td>
<td>14</td>
<td>43</td>
<td>9.5</td>
<td>14</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>42</td>
<td>12</td>
<td>3</td>
<td>74</td>
<td>18</td>
<td>right left</td>
<td>PL 41 DX A</td>
<td>192 047/050</td>
<td>20</td>
<td>22</td>
<td>93</td>
<td>238 179 149</td>
<td>45</td>
<td>31</td>
<td>10.5</td>
<td>17</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp: PL ** X B1

Double acting - Rotation in a plane
Pneumatic detection of the released position

Supply through counter-bores under ring
Fixing using screws

Characteristics

- detection by valves with no leaks, released position
- rotation in plane left or right 90°±2°
- released and clamping side venting port
- indexing of the rod
- maximum using pressure: 160 bar

Options

- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note

Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions: see page 72].
Seals: 7.65 x 1.78 90 NBR

Definition of forces as function of clamping arms: see page 21
Important recommendations: see page 20

<table>
<thead>
<tr>
<th>F max at 160 bar (kN)</th>
<th>Stroke (mm)</th>
<th>Area extend (A mm²)</th>
<th>Dir. of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>a (mm)</th>
<th>c (mm)</th>
<th>ad (mm)</th>
<th>e (mm)</th>
<th>f (mm)</th>
<th>h (mm)</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L1 (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L2 (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>L3 (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>m (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p1 (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p2 (mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>p3 (mm)</td>
</tr>
<tr>
<td>10</td>
<td>36</td>
<td>12</td>
<td>2</td>
<td>41</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10 110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45 242.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43 189.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.5 161.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.5 43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14 111</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11 12</td>
</tr>
</tbody>
</table>

PL 31 DX B1 192 048/050
PL 31 GX B1 192 048/150
PL 41 DX B1 192 048/050
PL 41 GX B1 192 048/150

PL 31 DX B1 192 048/050
PL 31 GX B1 192 048/150
PL 41 DX B1 192 048/050
PL 41 GX B1 192 048/150

Definition of forces as function of clamping arms: see page 21
Important recommendations: see page 20
Swing clamp : **PL X B12**

Double acting - Rotation in a plane

Pneumatic detection of clamped and released positions

Supply through counter-bores under ring
Fixing using screws

**Characteristics**

- Detection by valves with no leaks.
- Clamped and released positions on base of cylinder adjusted by a screw
- Rotation in plane left or right 90°±2°
- Released and clamping side venting port
- Indexing of the rod
- Maximum using pressure : 160 bar

**Options**

- Clamping arms : see accessories heading
- Rotation 60°, 45° or 0° on request

**Note**

Cylinders supplied with o-ring seals, locking nut and lock-washer (dimensions : see page 72).
Seals : 7.65 x 1.78 90 NBR

**Definition of forces as function of clamping arms** : see page 21

**Important recommendations** : see page 20
Swing clamp: PL ** D/G X E
Double acting - Rotation in a plane
Electrical position check

Supply through counter-bores under ring
Fixing using screws

Characteristics
- detection using inductive sensor,
  released position on cylinder base
- sensor position is adjustable
- rotation in plane left or right 90°±2°
- released and clamping side venting port
- indexing of the rod
- maximum using pressure: 160 bar

Options
- clamping arms: see accessories heading
- rotation 60°, 45° or 0° on request

Note
Cylinders supplied with o-ring seals, locking nut and lock-washer [dimensions: see page 72].
Seals: 7.65 x 1.78, 90 NBR

Definition of forces as function of clamping arms: see page 21
Important recommendations: see page 20

| F max at 160 bar | Rod ød | Stroke | Max flow A | Area extend A | B | Dir. of rotation | Type | Order code | a | c | a0 | øD | ø | f | h | ak1 | ak2 | L | L1 | L2 | L3 | m | p1 | p2 | p3 | y |
|------------------|--------|--------|-----------|---------------|---|-----------------|------|------------|---|---|----|----|---|---|---|-----|-----|---|---|---|---|---|---|---|---|---|---|
| kN   | mm   | mm   | l/min | cm² | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| 10   | 36   | 12   | 2     | 41  | 53 | left | PL 31 DX E | 192 026/050 | 20 | 20 | 80 | M24 x 1.5 | 10 | 41 | 110 | 95 | 319 | 266 | 238 | 43 | 29 | 8.5 | 14 | 11 | 45 |
| 15   | 42   | 12   | 2     | 74  | 88 | left | PL 31 GX E | 192 026/150 | 20 | 22 | 93 | M30 x 1.5 | 12 | 48 | 130 | 112 | 338 | 281 | 251 | 45 | 31 | 10.5 | 17 | 12 | 30 |
|      |      |      |       |     |    |      | PL 41 DX E | 192 146/050 | 20 | 22 | 93 | M30 x 1.5 | 12 | 48 | 130 | 112 | 338 | 281 | 251 | 45 | 31 | 10.5 | 17 | 12 | 30 |
|      |      |      |       |     |    |      | PL 41 GX E | 192 146/150 | 20 | 22 | 93 | M30 x 1.5 | 12 | 48 | 130 | 112 | 338 | 281 | 251 | 45 | 31 | 10.5 | 17 | 12 | 30 |
Swing clamp: **PL 21 D/G XH**

Double acting - Rotation in a plane

Hydraulic control position

**Definition**

This double acting swing clamp includes a hydraulic position check system. The cylinder includes a pressure limiter which closes at a pre-defined pressure.

This system allows the position of the component to be checked before the machining cycle starts.

This check is carried out without any additional circuits electrical connections, thus reducing the risk of breakdown and fitting costs.

**Characteristics**

- clamping arm, see accessories heading
- rotation in plane left or right 90°±2°
- other angles of rotation on request
- rod indexing X in option (see page 73)
- maximum using pressure : 160 bar

**Note**

Cylinders are supplied with o-ring seals, lock nut, lock-washer (dimensions and tightening torque : see page 72).

Seals :  or 5.28 x 1.78  90 NBR

---

**Definition of forces as function of clamping arms**: see page 21

**Important recommendations**: see page 20

<table>
<thead>
<tr>
<th>Direction of rotation</th>
<th>Type</th>
<th>Order code</th>
<th>Indexing</th>
</tr>
</thead>
<tbody>
<tr>
<td>left</td>
<td>PL 21 D H</td>
<td>181 113/000</td>
<td>ND</td>
</tr>
<tr>
<td></td>
<td>PL 21 G H</td>
<td>181 113/100</td>
<td></td>
</tr>
<tr>
<td>right</td>
<td>PL 21 D HX</td>
<td>181 113/050</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>PL 21 G HX</td>
<td>181 113/150</td>
<td></td>
</tr>
</tbody>
</table>
Swing clamp: **PL 21 D/G XH**

Functioning of the hydraulic control position

Pivoting cylinders with hydraulic control position allow to check the right position of the component before the machining cycle start. This check is carried out without any additional circuit.

**The component is in the good position**

- the cylinder clamps the component in the pre-defined position
- the circuit raises the normal clamping pressure
- the pressure valve switches
- the machining cycle can start

**The component is in bad position**

- the cylinder clamps the component in a different position as the pre-defined one
- the circuit stays in low pressure
- the pressure valve does not switch
- the machining cycle can not start
## Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>P5</td>
<td>Clamping arms for P5 swing clamps</td>
<td>068</td>
</tr>
<tr>
<td>BC</td>
<td>Short clamping arms</td>
<td>069</td>
</tr>
<tr>
<td>BM</td>
<td>Medium clamping arms</td>
<td>070</td>
</tr>
<tr>
<td>BL</td>
<td>Long clamping arms</td>
<td>071</td>
</tr>
<tr>
<td>E et R</td>
<td>Clamping arm fixing accessories</td>
<td>072</td>
</tr>
<tr>
<td>EMB</td>
<td>Fixing accessories - Ends of rod details</td>
<td>073</td>
</tr>
</tbody>
</table>
Clamping arms for
P5 swing clamps

Description

The arms for P5 swing clamps are available as standard in one length: short with indexing. We make special arms on request.

Clamping force decreases as the length of arms increase: for details see graphs in sheets for the various versions of the P5 swing clamps (pages 47 to 51).

These arms are treated against corrosion and can be oriented through 360°.

STANDARD SHORT ARM

Max using pressure for cylinder with arm B5: 250 bar

Description

Standard short arm 26 mm: B5 26
Order code: 811 268/000

CUSTOM ARMS

Max using pressure for cylinder as shown in graphs

Description

Long arm on request: B5 __
Order code: Specific

Graph:

Actual force applied at clamping point taking input/output yield into account.

Example: If \( y = 40 \) mm, \( F_{\text{max}} = 1.23 \) kN at 162 bar

Details of the special arm machining

Section AA

Section BB
Short clamping arm : BC

For swing clamp size : 11 - 12 - 21 - 31 - 41

Description

Available as standard in three different versions :

- with chamfers
- with chamfers and indexing
- without chamfer, with indexing.

Note

The clamping force decreases as the length of arms increases [for details, see tables page 21].

Restrain the rod when tightening the screw .

[see figure 1 page 44]

Characteristics

- can be oriented through 360°
- treated against corrosion
- material : 2C45
- maximum using pressure : 250 bar

Option

Special arms made on request.

Option

Tapping | Chamfer | Indexing | Type | Order code | Dimensions

| | | | a | b | c | d | e | f | h | k | l | n | o | p | r | s | t | u | v | w |
| NO | YES | NO | BC 11 | 811 159/000 | 40 | 30 | 25 | 17.46 | 18 | 15 | 17 | 1 | 3 | 23 | 12.2 | 12 | 26 | 25 | 25 | - | - |
| NO | YES | YES | BC 11 X | 811 159/050 | 40 | 30 | 25 | 17.46 | 18 | 15 | 17 | 1 | 3 | 23 | 12.2 | 12 | 26 | 25 | 25 | 63 | 78 | r1.5
| NO | NO | YES | BC 11 X N | 811 159/150 | 40 | 30 | 25 | 17.46 | - | 15 | 17 | 1 | 3 | 23 | 12.2 | 26 | - | - | 63 | 78 | r1.5
| NON | GIU | NO | BC 12 | 811 309/000 | 49 | 34 | 32 | 19.46 | 20 | 17 | 19 | 1 | 5 | 25 | 14.2 | 14 | 28 | 25 | 25 | - | - |
| NON | GIU | GIU | BC 12 X | 811 309/050 | 49 | 34 | 32 | 19.46 | 20 | 17 | 19 | 1 | 5 | 25 | 14.2 | 14 | 28 | 25 | 25 | 7.3 | 8.8 | r1.5
| NON | GIU | NON | BC 12 X N | 811 309/150 | 49 | 34 | 32 | 19.46 | 17 | 19 | 1 | 5 | 25 | 14.2 | 14 | 28 | - | - | 7.3 | 8.8 | r1.5
| NO | YES | NO | BC 21 | 811 160/000 | 55 | 40 | 35 | 24.46 | 23 | 20 | 23 | 1 | 4 | 31 | 16.2 | 16.5 | 34 | 30 | 30 | - | - |
| NO | YES | YES | BC 21 X | 811 160/050 | 55 | 40 | 35 | 24.46 | 23 | 20 | 23 | 1 | 4 | 31 | 16.2 | 16.5 | 34 | 30 | 30 | 10.4 | 10.25 | r1.5
| NO | NO | YES | BC 21 X N | 811 160/150 | 55 | 40 | 35 | 24.46 | 20 | 23 | 1 | 4 | 31 | 16.2 | 34 | - | - | 10.4 | 10.25 | r1.5
| NO | YES | NO | BC 31 | 811 163/000 | 72 | 55 | 44.5 | 25.46 | 30 | 27.5 | 30 | 1 | 5 | 41 | 24.5 | 20 | 45 | 30 | 30 | - | - |
| NO | YES | YES | BC 31 X | 811 163/050 | 72 | 55 | 44.5 | 25.46 | 30 | 27.5 | 30 | 1 | 5 | 41 | 24.5 | 20 | 45 | 30 | 30 | 17 | 14.5 | r2
| NO | NO | YES | BC 31 X N | 811 163/150 | 72 | 55 | 44.5 | 25.46 | - | 27.5 | 30 | 1 | 6 | 41 | 24.5 | 45 | - | - | 14.5 | r2
| NO | YES | NO | BC 41 | 811 161/000 | 85 | 70 | 50 | 30.93 | 36 | 35 | 33 | 2 | 6 | 51 | 30.5 | 20 | 52 | 45 | 45 | - | - |
| NO | YES | YES | BC 41 X | 811 161/050 | 85 | 70 | 50 | 30.93 | 36 | 35 | 33 | 2 | 6 | 51 | 30.5 | 20 | 52 | 45 | 45 | 18 | 17.5 | r2
| NO | NO | YES | BC 41 X N | 811 161/150 | 85 | 70 | 50 | 30.93 | - | 35 | 33 | 2 | 6 | 51 | 30.5 | - | 52 | - | - | 18 | 17.5 | r2

Dimensions

- a, b, c, d, e, f, h, k, l, n, o, p, r, s, t, u, v, w
Medium clamping arm : BM

For swing clamp size : 11 - 12 - 21 - 31 - 41

Description
Available as standard in three different versions :
- with tappings and chamfers, without indexing
- with tappings, chamfers and indexing
- with indexing, without tapping or chamfer

Note
The clamping force decreases as the length of arms increases [for details, see tables page 21].

Restrain the rod when tightening the screw .
[see figure 1 page 44]

Characteristics
- can be oriented through 360°
- treated against corrosion
- material : 2C45
- maximum using pressure : 250 bar

Option
Special arms made on request.

Table: Medium clamping arm : BM

| Tapping | Chamfer | Indexing | Type | Order code | a | b | c | d | e | f | g | h | k | l | n | o | p | r | s | t | u | v | w |
| YES     | YES     | NO       | BM 11 | 811 153/000 | 55 | 30 | 32 | 17.46 | 20 | 40 | M8 | 17 | 1 | 3 | 23 | 12.2 | 15.5 | 26 | 12.5 | 6 | - | - | - |
| YES     | YES     | YES      | BM 11 X | 811 153/050 | 55 | 30 | 32 | 17.46 | 20 | 40 | M8 | 17 | 1 | 3 | 23 | 12.2 | 15.5 | 26 | 12.5 | 6 | 6.3 | 7.8 | r1.5 |
| NO      | NO      | YES      | BM 11 X N | 811 153/150 | 55 | 30 | - | 17.46 | - | 40 | - | 17 | 1 | 3 | 23 | 12.2 | - | 26 | - | 6.3 | 7.8 | r1.5 |
| oui     | oui     | non      | BM 12 | 811 309/000 | 72 | 34 | 45 | 19.46 | 22 | 55 | M8 | 19 | 1 | 5 | 25 | 14.2 | 17.5 | 28 | 12.5 | 6 | - | - | - |
| oui     | oui     | oui      | BM 12 X | 811 309/050 | 72 | 34 | 45 | 19.46 | 22 | 55 | M8 | 19 | 1 | 5 | 25 | 14.2 | 17.5 | 28 | 12.5 | 6 | 7.3 | 8.8 | r1.5 |
| non     | non     | oui      | BM 12 X N | 811 309/150 | 72 | 34 | - | 19.46 | - | 55 | - | 19 | 1 | 5 | 25 | 14.2 | - | 28 | - | 7.3 | 8.8 | r1.5 |
| YES     | YES     | NO       | BM 21 | 811 154/000 | 85 | 40 | 50 | 24.46 | 21 | 65 | M12 | 23 | 1 | 4 | 31 | 16.2 | 21.5 | 34 | 25 | 10 | - | - | - |
| YES     | YES     | YES      | BM 21 X | 811 154/050 | 85 | 40 | 50 | 24.46 | 21 | 65 | M12 | 23 | 1 | 4 | 31 | 16.2 | 21.5 | 34 | 25 | 10 | 10.4 | 10.25 | r1.5 |
| NO      | NO      | YES      | BM 21 X N | 811 154/150 | 85 | 40 | - | 24.46 | - | 65 | - | 23 | 1 | 4 | 31 | 16.2 | - | 34 | - | 10.4 | 10.25 | r1.5 |
| YES     | YES     | NO       | BM 31 | 811 164/000 | 108 | 55 | 65 | 35.46 | 35 | 80.5 | M16 | 30 | 1 | 5 | 41 | 24.5 | 25 | 45 | 15 | 12.5 | - | - | - | - |
| YES     | YES     | YES      | BM 31 X | 811 164/050 | 108 | 55 | 65 | 35.46 | 35 | 80.5 | M16 | 30 | 1 | 5 | 41 | 24.5 | 25 | 45 | 15 | 12.5 | 17 | 14.5 | r2 |
| NO      | NO      | YES      | BM 31 X N | 811 164/150 | 108 | 55 | - | 35.46 | - | 80.5 | - | 30 | 1 | 5 | 41 | 24.5 | - | 45 | - | 17 | 14.5 | r2 |
| YES     | YES     | NO       | BM 41 | 811 155/000 | 125 | 70 | 70 | 40.93 | 43 | 90 | M20 | 30 | 2 | 6 | 51 | 30.5 | 30.5 | 52 | 20 | 10 | - | - | - |
| YES     | YES     | YES      | BM 41 X | 811 155/050 | 125 | 70 | 70 | 40.93 | 43 | 90 | M20 | 30 | 2 | 6 | 51 | 30.5 | 30.5 | 52 | 20 | 10 | 18 | 17.5 | r2 |
| NO      | NO      | YES      | BM 41 X N | 811 155/150 | 125 | 70 | - | 40.93 | - | 90 | - | 30 | 2 | 6 | 51 | 30.5 | - | 52 | - | 18 | 17.5 | r2 |
Long clamping arm: BL

For swing clamp size: 11 - 12 - 21 - 31 - 41

Description

Available as standard in three different versions:
- with tappings and chamfers, without indexing
- with tappings, chamfers and indexing
- with indexing, without tapping or chamfer

Note

The clamping force decreases as the length of arms increases [for details, see tables page 21].

Restrain the rod when tightening the screw. [see figure 1 page 44]

Characteristics

- can be oriented through 360°
- treated against corrosion
- material: 2C45
- maximum using pressure: 250 bar

Option

Special arms made on request.

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>VB 15.8</td>
<td>811 261/000</td>
<td>M6</td>
</tr>
<tr>
<td>VB 40.12</td>
<td>811 222/000</td>
<td>M12</td>
</tr>
<tr>
<td>VB 65.16</td>
<td>811 223/000</td>
<td>M16</td>
</tr>
<tr>
<td>VB 100.20</td>
<td>811 224/000</td>
<td>M20</td>
</tr>
</tbody>
</table>

Tapping | Chamfer | Indexing | Type | Order code |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 11</td>
<td>811 158/000</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 11 X</td>
<td>811 158/050</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>BL 11 X N</td>
<td>811 158/150</td>
</tr>
<tr>
<td>OUI</td>
<td>OUI</td>
<td>NON</td>
<td>BL 12</td>
<td>811 311/000</td>
</tr>
<tr>
<td>OUI</td>
<td>OUI</td>
<td>OUI</td>
<td>BL 12 X</td>
<td>811 311/050</td>
</tr>
<tr>
<td>NON</td>
<td>NON</td>
<td>OUI</td>
<td>BL 12 X N</td>
<td>811 311/150</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 21</td>
<td>811 157/000</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 21 X</td>
<td>811 157/050</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>BL 21 X N</td>
<td>811 157/150</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 31</td>
<td>811 165/000</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 31 X</td>
<td>811 165/050</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>BL 31 X N</td>
<td>811 165/150</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 41</td>
<td>811 158/000</td>
</tr>
<tr>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>BL 41 X</td>
<td>811 158/050</td>
</tr>
<tr>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>BL 41 X N</td>
<td>811 158/150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>R</th>
<th>S/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>68</td>
<td>30</td>
<td>45</td>
<td>17.46</td>
<td>21</td>
<td>53</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>3</td>
<td>23</td>
<td>12.2</td>
<td>13.5</td>
</tr>
<tr>
<td>68</td>
<td>30</td>
<td>-</td>
<td>17.46</td>
<td>-</td>
<td>53</td>
</tr>
<tr>
<td>91</td>
<td>34</td>
<td>64</td>
<td>19.46</td>
<td>22</td>
<td>74</td>
</tr>
<tr>
<td>91</td>
<td>34</td>
<td>-</td>
<td>19.46</td>
<td>-</td>
<td>74</td>
</tr>
<tr>
<td>110</td>
<td>40</td>
<td>75</td>
<td>24.46</td>
<td>24</td>
<td>90</td>
</tr>
<tr>
<td>110</td>
<td>40</td>
<td>-</td>
<td>24.46</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>134</td>
<td>55</td>
<td>90</td>
<td>35.46</td>
<td>40</td>
<td>106.5</td>
</tr>
<tr>
<td>134</td>
<td>55</td>
<td>-</td>
<td>35.46</td>
<td>-</td>
<td>106.5</td>
</tr>
<tr>
<td>134</td>
<td>55</td>
<td>90</td>
<td>35.46</td>
<td>40</td>
<td>106.5</td>
</tr>
<tr>
<td>134</td>
<td>55</td>
<td>-</td>
<td>35.46</td>
<td>-</td>
<td>106.5</td>
</tr>
<tr>
<td>155</td>
<td>70</td>
<td>100</td>
<td>40.93</td>
<td>50</td>
<td>120</td>
</tr>
<tr>
<td>155</td>
<td>70</td>
<td>-</td>
<td>40.93</td>
<td>-</td>
<td>120</td>
</tr>
<tr>
<td>155</td>
<td>70</td>
<td>100</td>
<td>40.93</td>
<td>50</td>
<td>120</td>
</tr>
<tr>
<td>155</td>
<td>70</td>
<td>-</td>
<td>40.93</td>
<td>-</td>
<td>120</td>
</tr>
</tbody>
</table>
Fixing accessories : E and R

Rod nuts and lock-washer for fixing of arm onto the rod

The arm lock nut and lock-washer are supplied with the cylinder.

Nut for cylinder type P11, P21 and P26

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>S/P</th>
<th>C</th>
<th>E</th>
<th>G</th>
<th>N</th>
<th>Mean tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>E 11</td>
<td>191 056/007</td>
<td>22</td>
<td>22</td>
<td>5.9</td>
<td>1.8</td>
<td>M12 x 1.5</td>
<td>15</td>
</tr>
<tr>
<td>E 12</td>
<td>191 055/007</td>
<td>24</td>
<td>24</td>
<td>7</td>
<td>3</td>
<td>M14 x 1.5</td>
<td>20</td>
</tr>
<tr>
<td>E 21</td>
<td>191 057/007</td>
<td>30</td>
<td>30</td>
<td>7.3</td>
<td>2.8</td>
<td>M16 x 1.5</td>
<td>40</td>
</tr>
</tbody>
</table>

IMPORTANT NOTE:
Restrain the rod when tightening the screw.
See figure 1 pages 20 and 44

Nut for cylinder type P31 and P41

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>S/P</th>
<th>C</th>
<th>E</th>
<th>G</th>
<th>N</th>
<th>Mean tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>E 31</td>
<td>191 077/009</td>
<td>40</td>
<td>40</td>
<td>12.5</td>
<td>9</td>
<td>M24 x 1.5</td>
<td>125</td>
</tr>
<tr>
<td>E 41</td>
<td>191 083/010</td>
<td>46</td>
<td>50</td>
<td>15</td>
<td>10.5</td>
<td>M30 x 1.5</td>
<td>230</td>
</tr>
</tbody>
</table>

IMPORTANT NOTE:
Restrain the rod when tightening the screw.
See figure 1 pages 20 and 44

Lock-washer for cylinder type P11, P21 and P26

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>D</th>
<th>d</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 11</td>
<td>AQ 1406</td>
<td>19.5</td>
<td>13</td>
<td>2.6</td>
</tr>
<tr>
<td>R 12</td>
<td>AQ 1407</td>
<td>23</td>
<td>145</td>
<td>3.7</td>
</tr>
<tr>
<td>R 21</td>
<td>AQ 1408</td>
<td>24.5</td>
<td>17</td>
<td>3.7</td>
</tr>
</tbody>
</table>
Fixing accessories: EMB

Nut for threaded swing clamps
P11 - P21 - P31 - P41

Special nut for threader swing clamps
Recommended fitting to prevent loosening of nut

Details of ends of rod for swing clamps

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Type of cylinder</th>
<th>Tapping d</th>
<th>D</th>
<th>d2</th>
<th>h</th>
<th>b</th>
<th>t</th>
<th>n</th>
<th>Screw</th>
<th>Mean tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMB 3615</td>
<td>811 263/000</td>
<td>P11 M36 x 1.5</td>
<td>68</td>
<td>60</td>
<td>11</td>
<td>8</td>
<td>3.5</td>
<td>4</td>
<td>4</td>
<td>M6</td>
<td>5</td>
</tr>
<tr>
<td>EMB 5215</td>
<td>811 270/000</td>
<td>P21 M52 x 1.5</td>
<td>92</td>
<td>82</td>
<td>13</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>M8</td>
<td>13</td>
</tr>
<tr>
<td>EMB 7220</td>
<td>811 271/000</td>
<td>P31 M72 x 2</td>
<td>122</td>
<td>112</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>M12</td>
<td>34</td>
</tr>
<tr>
<td>EMB 8520</td>
<td>811 272/000</td>
<td>P41 M85 x 2</td>
<td>142</td>
<td>132</td>
<td>16</td>
<td>10</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>M14</td>
<td>62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Indexing pin</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>k</th>
</tr>
</thead>
<tbody>
<tr>
<td>P11</td>
<td>A 94 026</td>
<td></td>
<td>18</td>
<td>10</td>
<td>13</td>
<td>M12 x 1.5</td>
<td>30</td>
<td>5</td>
<td>15</td>
<td>18</td>
<td>78</td>
</tr>
<tr>
<td>P21 / P26</td>
<td>A 94 026</td>
<td></td>
<td>25</td>
<td>14</td>
<td>16</td>
<td>M16 x 1.5</td>
<td>45</td>
<td>5</td>
<td>19</td>
<td>1225</td>
<td>3</td>
</tr>
<tr>
<td>P31</td>
<td>A 94 026</td>
<td></td>
<td>36</td>
<td>20</td>
<td>18</td>
<td>M24 x 1.5</td>
<td>53</td>
<td>8</td>
<td>21</td>
<td>145</td>
<td>4</td>
</tr>
<tr>
<td>P41</td>
<td>A 94 026</td>
<td></td>
<td>42</td>
<td>22</td>
<td>20</td>
<td>M30 x 1.5</td>
<td>57</td>
<td>8</td>
<td>23</td>
<td>175</td>
<td>4</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Page</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVV_11</td>
<td>Work supports - To screw</td>
<td>079</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVV_12</td>
<td>Work supports - To screw</td>
<td>080</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVC</td>
<td>Work supports - Cartridge</td>
<td>081</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVB</td>
<td>Work supports - Block</td>
<td>083</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVL</td>
<td>Work supports - Counter-bore on head</td>
<td>084</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVF</td>
<td>Work supports - Counter-bore on base</td>
<td>085</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVCH</td>
<td>Work supports - Cartridge 1 Hydraulic port</td>
<td>086</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVBH</td>
<td>Work supports - Block 1 Hydraulic port</td>
<td>088</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVLH</td>
<td>Work supports - Counter-bore on head 1 Hydraulic port</td>
<td>089</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVLHT</td>
<td>Work supports - Threaded plugs on head 1 Hydraulic port</td>
<td>090</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVFH</td>
<td>Work supports - Counter-bore on base 1 Hydraulic port</td>
<td>091</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVFHT</td>
<td>Work supports - Threaded plugs on base 1 Hydraulic port</td>
<td>092</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Work supports
Principle of operation
Locking force at 300 bar : 5 to 22 kN

Type : AVF__R

Contact force exerted by spring.
The rod is extended at rest.

The component to be machined contacts the end of the rod [1] and compresses spring [2].
The rod is locked in position by the locking ring [3] by the action of the pressure of the oil at port B.
The contact force on the component is adjustable with screw [4].

Port A : Vent
To be piped to a location that is dry and contamination free.

Type : AVF__A

Contact force exerted by air pressure.
The rod may be in any position.

This type allows precise adjustment of the contact force to be obtained.
The rod emerges by supplying air to port A.
The rod is locked in position by the locking ring [3] under the action of the oil pressure at port B.
In this version, the spring [2] is absent and the screw [4] is sealed.

This model does not require a vent
Use dry filtered air.
Work supports
Principle of operation
Locking force at 300 bar: 5 to 22 kN

**Type: AVF_AR**

Contact force exerted by air pressure.
The rod is retracted at rest

This model allows lateral loading of the component.
The rod emerges by supplying air to port \( A \).
The rod is locked in position by the locking ring \( [3] \) by the action of the pressure of the oil at port \( B \).
The rod is retracted through the use of the spring \( [5] \).

**Type: AVF_AR**

Contact force exerted by spring.
The rod is retracted at rest.

This model has the advantage of using a single port for hydraulic supply for extension and locking of the rod.

Under the action of oil pressure at port \( B \), the rod emerges until it comes into contact with the component through the spring \( [2] \).

After the internal end-stop for piston \( [4] \) is reached, the pressure increases and the locking ring \( [3] \) lock the rod.
The rod is retracted through the use of the spring \( [5] \).

**Port A**: Vent
To be piped to a location that is dry and contamination free.
Work supports

Examples of assembly
Type AVC, AVB, AVF and AVL

Type: AVC

Technical characteristics, see pages 81, 82, 86, 87

Type: AVB

Technical characteristics, see pages 83, 88

Type: AVL

Technical characteristics, see pages 84, 89

Type: AVF

Technical characteristics, see pages 85, 91
Work supports: **AVV_11**

**Type:** To screw

**Locking force at 350 bar:** 4 kN

---

**Description**

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

**Note**

**IMPORTANT for AVVH**

To allow spring to retract the rod, the counter-pressure must be less than 2 bar.

---

**Characteristics**

- anti-corrosion treated threaded steel body
- piston made from treated steel
- very compact design
- strokes: 8 mm and 15 mm
- hydraulic extension and locking

**Option**

Special models on request.

---

**Housing machining dimensions**

**Connection block:** B34 A94/000

---

<table>
<thead>
<tr>
<th>Minimum spring force</th>
<th>Maximum spring force</th>
<th>Admissible load at 350 bar</th>
<th>Stroke</th>
<th>ø of the rod</th>
<th>Type</th>
<th>Order code</th>
<th>Admissible flow rate</th>
<th>Minimum recommended oil pressure</th>
<th>Tightening torque</th>
<th>Weigh</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td>cm³/s</td>
<td>bar</td>
<td>Nm</td>
<td>kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>13</td>
<td>4</td>
<td>9</td>
<td>16</td>
<td>-</td>
<td>160</td>
<td>60</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>23</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>25</td>
<td>160</td>
<td>60</td>
<td>0.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>23</td>
<td>4</td>
<td>15</td>
<td>16</td>
<td>25</td>
<td>160</td>
<td>60</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Locking force graph**

---

**Type AVVR**

Contact by spring

---

**Type AVVH**

Extension by hydraulic pressure contact by spring

---

**Connection block:** B34 A94/000

---

**Support plane**

maxi. ø 20

mini. ø2

---

**Minimum spring force**

**Maximum spring force**

**Admissible load at 350 bar**

**Stroke**

**ø of the rod**

**Type**

**Order code**

**Admissible flow rate**

**Minimum recommended oil pressure**

**Tightening torque**

**Weigh**

---

**Ed. 10 / 2011**

**QUIRI 67129 MOLSHEIM CEDEX (France) Tel.: +33 (0)3 88 04 84 00 Fax: +33 (0)3 88 04 84 01 Email: quiri.hydro@quiri.com**
**Work supports : AVV_12**

**Type : To screw**

Locking force at 350 bar : 6 kN

---

### Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

### Note

**IMPORTANT for AVVH**

To allow spring to retract the rod, the counter-pressure must be less than 2 bar.

### Characteristics

- anti-corrosion treated threaded steel body
- piston made from treated steel
- very compact design
- stroke : 8 mm
- hydraulic extension and locking

### Option

Special models on request.

---

**Type AVVR**

Contact by spring

**Type AVVH**

Extension by hydraulic pressure contact by spring

---

**Housing machining dimensions**

**Connection block : 834 A94/000**

---

<table>
<thead>
<tr>
<th>Minimum spring force</th>
<th>Maximum spring force</th>
<th>Admissible load at 350 bar</th>
<th>Stroke</th>
<th>ø of the rod</th>
<th>Type</th>
<th>Order code</th>
<th>Admissible flow rate</th>
<th>Minimum recommended pressure</th>
<th>Tightening torque</th>
<th>Weigh</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td></td>
<td>cm³/s</td>
<td>bar</td>
<td>Nm</td>
<td>kg</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>6</td>
<td>B</td>
<td>16</td>
<td>AVV</td>
<td>781 108/200</td>
<td>-</td>
<td>160</td>
<td>60</td>
<td>0.26</td>
</tr>
<tr>
<td>10</td>
<td>23</td>
<td>6</td>
<td>B</td>
<td>16</td>
<td>AVVH</td>
<td>781 108/000</td>
<td>25</td>
<td>160</td>
<td>60</td>
<td>0.26</td>
</tr>
<tr>
<td>10</td>
<td>23</td>
<td>6</td>
<td>15</td>
<td>18</td>
<td>AVVH</td>
<td>781 157/000</td>
<td>15</td>
<td>160</td>
<td>60</td>
<td>0.30</td>
</tr>
</tbody>
</table>
Work supports: **AVC**

**Type:** Cartridge

**Locking force at 300 bar:** 5 to 20 kN

---

### Description

Hydraulic mounting are intended to support components being machined in a precise plane and to eliminate vibration during machining. The cartridge type mountings allow particularly compact assemblies to be made and allow direct supply through the drilled block.

Supply using compress air provides precise adjustment of the contact force.

Example of assembly see page 82

Principle of operation see pages 76, 77.

### Option

For clamping pressure less than 150 bar, please contact us.

---

### Characteristics

- fixing using front clamp
- direct supply through the drilled block
- contact force generated by the spring, air pressure, or air pressure with retraction of rod by spring
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supplied with o-rings and anti-extrusion rings

---

### Note

**IMPORTANT**

The venting port point must always be located at the highest point of the assembly.

---

### Locking force graph

![Graph showing locking force variation with pressure for different types of AVC mounts.](image)

- **Type AVC 41**
- **Type AVC 11/21**

---

### Supply ports, see page 82

---

### Table: Contact force by spring

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact force by spring</th>
<th>Retracted rod Maxi</th>
<th>Extended rod Maxi</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVC 11 R</td>
<td>36</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>AVC 21 R</td>
<td>52</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>AVC 41 R</td>
<td>100</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

---

### DESCRIPTION:

- **Rod extended at rest** = Contact force exerted by spring
- **Free rod** = Contact force exerted by compressed air
- **Retracted rod at rest** = Contact force exerted by compressed air and return by spring

---

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th># of the rod</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>12</td>
<td>20</td>
<td>AVC 11 R</td>
<td>751 042/000</td>
<td>D</td>
</tr>
<tr>
<td>3.7</td>
<td>10</td>
<td>18</td>
<td>30</td>
<td>AVC 21 R</td>
<td>751 048/100</td>
<td>40</td>
</tr>
<tr>
<td>6.3</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>AVC 41 R</td>
<td>751 081/200</td>
<td>50</td>
</tr>
</tbody>
</table>

---

**Note:**

- When choosing the right product, ensure the venting port point is located at the highest point of the assembly.

---

**Supply ports:**

- See page 82 for more information on supply port locations.
Housing : **AVC**

For anti-vibration mounting type AVC
Machining dimensions - Example

---

**Housing machining dimensions**

**Examples**

**Mounting with rod upwards**

**Mounting with rod downwards**

---

**IMPORTANT :**

Venting port must be located at the highest point in the assembly
Venting port must be made at low pressure (< 20 bar)
General tolerances Js13
Round off and polish sharp angles

<table>
<thead>
<tr>
<th>Type</th>
<th>øD</th>
<th>b</th>
<th>L</th>
<th>f1</th>
<th>f2</th>
<th>f3</th>
<th>G</th>
<th>h</th>
<th>k</th>
<th>m</th>
<th>r</th>
<th>s</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>AVC 11</td>
<td>30</td>
<td>3</td>
<td>64</td>
<td>13</td>
<td>24</td>
<td>46</td>
<td>G1/4''</td>
<td>0.5</td>
<td>3</td>
<td>40</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>AVC 21</td>
<td>40</td>
<td>3</td>
<td>82</td>
<td>14</td>
<td>30</td>
<td>63</td>
<td>G1/4''</td>
<td>1</td>
<td>4</td>
<td>50</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>AVC 41</td>
<td>50</td>
<td>3</td>
<td>92</td>
<td>13.5</td>
<td>30</td>
<td>75</td>
<td>G1/4''</td>
<td>1</td>
<td>5</td>
<td>60</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

---

a3 max
Vent ports allow air to be expelled during fitting of the mounting

A = Air supply or vent
B = Locking rod
C = Venting port

---

Screw Hc M6x6
Ra 0.8
ø3 mini
Vent ports allow air to be expelled during fitting of the mounting

---

Ra0.8
2ø
f3
r
Dø
s
b
L
f1
f2 f3 G h k m r s t

---

Detail of groove

---

IMPORTANT :

Venting port must be located at the highest point in the assembly
Venting port must be made at low pressure (< 20 bar)
General tolerances Js13
Round off and polish sharp angles

<table>
<thead>
<tr>
<th>Type</th>
<th>øD</th>
<th>b</th>
<th>L</th>
<th>f1</th>
<th>f2</th>
<th>f3</th>
<th>G</th>
<th>h</th>
<th>k</th>
<th>m</th>
<th>r</th>
<th>s</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>AVC 11</td>
<td>30</td>
<td>3</td>
<td>64</td>
<td>13</td>
<td>24</td>
<td>46</td>
<td>G1/4''</td>
<td>0.5</td>
<td>3</td>
<td>40</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>AVC 21</td>
<td>40</td>
<td>3</td>
<td>82</td>
<td>14</td>
<td>30</td>
<td>63</td>
<td>G1/4''</td>
<td>1</td>
<td>4</td>
<td>50</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>AVC 41</td>
<td>50</td>
<td>3</td>
<td>92</td>
<td>13.5</td>
<td>30</td>
<td>75</td>
<td>G1/4''</td>
<td>1</td>
<td>5</td>
<td>60</td>
<td>M6</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>
Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Locking is achieved by maintenance of the oil pressure.

Operating principle see pages 76, 77

Option

For clamping pressures less than 150 bar, please contact us.

Special models can be made on request.

Characteristiques

- fixing by screws
- direct supply through the drilled block
- contact force generated by the spring, air pressure, or air pressure with retraction of rod by spring
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supplied with o-rings 5.28 x 1.78 - 90 NBR

Note

IMPORTANT

The venting port point must always be located at the highest point of the assembly.

**DESCRIPTIONS:**

Rod extended at rest = Contact force exerted by spring
Free rod = Contact force exerted by compressed air
Rod retracted at rest = Contact force exerted by compressed air and return by spring

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>Rod at d</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>2.8</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td>AVB 12 R</td>
<td>751 058/000</td>
<td>56 48 74 98 34 24 10 6 8.8 M12 lg. 12 8 20 17 20 28 40</td>
</tr>
<tr>
<td>4.7</td>
<td>12.5</td>
<td>12</td>
<td>30</td>
<td>AVB 22 R</td>
<td>751 059/000</td>
<td>58 80 72 34 44 29 11 25 4 8.8 M12 lg. 12 10 22 26 20 28 52</td>
</tr>
</tbody>
</table>

For clamping pressures less than 150 bar, please contact us.

Special models can be made on request.

Contact force by spring

<table>
<thead>
<tr>
<th>Type</th>
<th>Retracted rod Max</th>
<th>Extended rod Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVB 12 R</td>
<td>28</td>
<td>10</td>
</tr>
<tr>
<td>AVB 22 R</td>
<td>48</td>
<td>15</td>
</tr>
</tbody>
</table>
Work supports : AVL
Type : Counter-bores on head
Locking force at 300 bar : 7 to 12.5 kN

Description
Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining. Supply using compressed air provides precise adjustment of the contact force. Locking is achieved by maintenance of the oil pressure. Operating principle see pages 76, 77.

Option
For clamping pressures less than 150 bar, please contact us.

Characteristics
- fixing using flange
- supply through counter-bores
- contact force generated by the spring, air pressure, or air pressure with retraction of rod by spring
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supplied with o-rings 5.28 x 1.78 - 90 NBR

Note
IMPORTANT
The venting port point must always be located at the highest point of the assembly.

Description
Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining. Supply using compressed air provides precise adjustment of the contact force. Locking is achieved by maintenance of the oil pressure. Operating principle see pages 76, 77.

Option
For clamping pressures less than 150 bar, please contact us.

Characteristics
- fixing using flange
- supply through counter-bores
- contact force generated by the spring, air pressure, or air pressure with retraction of rod by spring
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supplied with o-rings 5.28 x 1.78 - 90 NBR

Note
IMPORTANT
The venting port point must always be located at the highest point of the assembly.

Locking force graph

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact force by spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retracted rod Max</td>
<td>Extended rod Min</td>
</tr>
<tr>
<td>AVL 12 R</td>
<td>AVL 12 A</td>
</tr>
<tr>
<td>AVL 22 R</td>
<td>AVL 22 AR</td>
</tr>
<tr>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>Rod extended at rest</th>
<th>Contact force exerted by spring : AVL_R</th>
<th>Contact force exerted by compressed air : AVL_A</th>
<th>Contact force exerted by compressed air and return by spring : AVL_AR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8 kN</td>
<td>7 kN</td>
<td>12 mm</td>
<td>12 mm</td>
<td>20 mm</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>AVL 12 R</td>
<td>AVL 12 A</td>
<td>751 056/000</td>
<td>751 056/100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVL 22 R</td>
<td>AVL 22 AR</td>
<td>751 057/000</td>
<td>751 057/100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.7 kN</td>
<td>12.5 kN</td>
<td>12 mm</td>
<td>12 mm</td>
<td>30 mm</td>
<td>54</td>
<td>32</td>
</tr>
<tr>
<td>AVL 22 R</td>
<td>AVL 22 AR</td>
<td>751 057/000</td>
<td>751 057/100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Work supports: AVF

Type: Counter-bore on base

Locking force at 300 bar: 7 to 12.5 kN

Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining. Supply using compressed air provides precise adjustment of the contact force. Locking is achieved by maintenance of the oil pressure. Operating principle see pages 76, 77

Option

For clamping pressures less than 150 bar, please contact us.

Characteristics

- fixing using flange
- supply through counter-bores
- contact force generated by the spring, air pressure, or air pressure with retraction of rod by spring
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supplied with o-rings 5.28 x 1.78 - 90 NBR

Note

IMPORTANT

The venting port point must always be located at the highest point of the assembly.

Locking force graph

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>Rod at</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8 kN/mm</td>
<td>2.8 7 12 20</td>
<td>AVF 12 R</td>
<td>751 053/000</td>
<td>42 92 10 84 67</td>
<td>42</td>
<td>54</td>
</tr>
<tr>
<td>7 kN/mm</td>
<td>7 12 20</td>
<td>AVF 12 A</td>
<td>751 053/100</td>
<td>42 92 10 84 67</td>
<td>42</td>
<td>54</td>
</tr>
<tr>
<td>7 kN/mm</td>
<td>7 12 20</td>
<td>AVF 15 AR</td>
<td>751 053/200</td>
<td>42 92 10 84 67</td>
<td>42</td>
<td>54</td>
</tr>
<tr>
<td>4.7 kN/mm</td>
<td>4.7 12.5 12 30</td>
<td>AVF 22 R</td>
<td>751 054/000</td>
<td>54 100 10 90 79</td>
<td>54</td>
<td>68</td>
</tr>
<tr>
<td>4.7 kN/mm</td>
<td>4.7 12.5 12 30</td>
<td>AVF 22 A</td>
<td>751 054/100</td>
<td>54 100 10 90 79</td>
<td>54</td>
<td>68</td>
</tr>
<tr>
<td>4.7 kN/mm</td>
<td>4.7 12.5 12 30</td>
<td>AVF 22 AR</td>
<td>751 054/200</td>
<td>54 100 10 90 79</td>
<td>54</td>
<td>68</td>
</tr>
</tbody>
</table>

A = Air supply or vent
B = Locking rod
C = Venting port

Contact force graph

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact force by spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retracted rod</td>
<td>Extended rod</td>
</tr>
<tr>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>AVF 12 R</td>
<td>26</td>
</tr>
<tr>
<td>AVF 22 R</td>
<td>48</td>
</tr>
</tbody>
</table>
Work supports: AVCH

Type: Cartridge

Locking force at 300 bar: 7 to 22 kN

ONE SINGLE HYDRAULIC PORT

Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Mounting with one single hydraulic supply port for extension and locking of the rod.

Operating principle see page 77

Supply ports see page 87

Option

For clamping pressures less than 150 bar, please contact us.

Characteristics

- fixing using front flange
- direct supply through the drilled block
- rod treated to prevent seizure and corrosion
- stainless steel spring
- supply with o-ring and anti-extrusion ring

Note

IMPORTANT

The venting port point must always be located at the highest point in the assembly.

In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.

Maximum flow: 1.5 l/min

Possible to lead vent to a clean area of the assembly if there is a risk of liquid being aspirated.

Vent filter + plug

Remove the plug if the vent is not led inside the assembly.

Locking force graph

Contact force graph

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>ø of the rod</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td>AVCH 12</td>
<td>751 047/000</td>
<td>øD øa b c øe øf g h1 h2 h3 m n p r s u</td>
</tr>
<tr>
<td>47</td>
<td>12.5</td>
<td>12</td>
<td>30</td>
<td>AVCH 22</td>
<td>751 050/000</td>
<td>42 28 20 84 67 54 M12 lg 15 10 44 59 11 6.5 7 42 17 30</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>16</td>
<td>40</td>
<td>AVCH 42</td>
<td>751 079/000</td>
<td>54 32 22 82 79 66 M12 lg 18 10 44 59 11 6.5 7 54 26 30</td>
</tr>
</tbody>
</table>

Using pressure

Minimum pressure P (bar) F (kN)

Using pressure

Minimum pressure P (bar) F (kN)
Housing : AVCH

For anti-vibration mounting type AVCH
Machining dimensions - Example

**Housing machining dimensions**

![Diagram of housing machining dimensions](image)

**Examples**

**Mounting with rod upwards**

- Venting port at A if the mounting venting port is inaccessible.

**Mounting with rod downwards**

- [Reverse B and C]

**IMPORTANT :**

- Venting port must be located at the highest point in the assembly
- Venting port must be made at low pressure (< 20 bar)
- General tolerances Js13
- Round off and polish sharp angles

<table>
<thead>
<tr>
<th>Type</th>
<th>øD</th>
<th>b</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>G</th>
<th>h</th>
<th>f1</th>
<th>f2</th>
<th>f3</th>
<th>G</th>
<th>maxi</th>
<th>h</th>
<th>k</th>
<th>m</th>
<th>s</th>
<th>t</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVCH 12</td>
<td>H7</td>
<td>42</td>
<td>66</td>
<td>16</td>
<td>33</td>
<td>50</td>
<td>5</td>
<td>0.7</td>
<td>8</td>
<td>54</td>
<td>M6</td>
<td>10</td>
<td>13</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVCH 22</td>
<td></td>
<td>54</td>
<td>84</td>
<td>16</td>
<td>33</td>
<td>49</td>
<td>5</td>
<td>0.7</td>
<td>8</td>
<td>86</td>
<td>M6</td>
<td>10</td>
<td>13</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVCH 42</td>
<td></td>
<td>67</td>
<td>112</td>
<td>16</td>
<td>46.5</td>
<td>68</td>
<td>6</td>
<td>1</td>
<td>10</td>
<td>82</td>
<td>M8</td>
<td>15</td>
<td>22</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Work supports : AVBH**

**Type : Block**

Locking force at 300 bar : 7 to 22 kN

---

**ONE SINGLE HYDRAULIC PORT**

**Description**

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Mounting with one single hydraulic supply port for extension and locking of the rod.

Operating principle see page 77

**Option**

For clamping pressures less than 150 bar, please contact us.

---

**Characteristics**

- fixing using screws
- rod treated to prevent seizure and corrosion
- stainless steel spring
- initial force generated by spring supplied with o-rings:
  - 5.28 x 1.78 - 90 NBR for AVBH 12 and AVBH 22
  - 7.65 x 1.78 - 90 NBR for AVBH 42

**Note**

**IMPORTANT**

The venting port point must always be located at the highest point in the assembly.

In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.

Maximum flow : 1.5 l/mn

---

**Dimensions**

| Force at 150 bar | Min locking force at 300 bar | Stroke | ø of the rod | Type | Order code | a | b | c | e | f | g | h | k | m | n | p | r | s | u | v | L1 | L2 | L3 |
|------------------|-----------------------------|--------|--------------|------|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.8              | 7                           | 12     | 20           | AVBH 12 | 751 060/000 | 104| 56| 48| 83| 68| M12 lg. 15 | 29 | 24| 9 | 18 | 4 | 8.8 | 34 | 9 | 17 | 20 | 28 | 40 |
| 4.7              | 12.5                        | 12     | 30           | AVBH 22 | 751 061/000 | 104| 70| 58| 83| 72| M12 lg. 18 | 44 | 29| 11 | 25 | 4 | 8.8 | 34 | 10 | 26 | 20 | 28 | 52 |
| 7                | 22                          | 16     | 40           | AVBH 42 | 751 072/000 | 138| 96| 70| 109| 98| M16 lg. 18 | 55 | 35| 15 | 25 | 5 | 11 | 42 | 12 | 34 | 23 | 38 | 74 |

---

**Force at 150 bar**

**Min locking force at 300 bar**

**Stroke**

**ø of the rod**

**Type**

**Order code**

**Dimensions**

---

---

---
**Work supports : AVLH**

**Type : Counter-bores on head**

Locking force at 300 bar : 7 to 22 kN

---

### ONE SINGLE HYDRAULIC PORT

**Description**

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Mounting with one single hydraulic supply port for extension and locking of the rod.

Operating principle see page 77

**Option**

Special models available on request.

For clamping pressures less than 150 bar, please contact us.

---

### Characteristics

- fixing using screws
- rod treated to prevent seizure and corrosion
- stainless steel spring
- initial force generated by spring
- supplied with o-rings :
  - 5.28 x 1.78 - 90 NBR for AVLH 12 and AVLH 22
  - 7.65 x 1.78 - 90 NBR for AVLH 42

### Note

**IMPORTANT**

The venting port point must always be located at the highest point in the assembly.

In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.

Maximum flow : 1.5 l/mn

---

### Locking force graph

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>ø of the rod</th>
<th>Type</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td>AVLH 12</td>
</tr>
<tr>
<td>28</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td>AVLH 12</td>
<td>751 048/000</td>
</tr>
<tr>
<td>47</td>
<td>12.5</td>
<td>12</td>
<td>30</td>
<td>AVLH 22</td>
<td>751 051/000</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>16</td>
<td>40</td>
<td>AVLH 42</td>
<td>751 070/000</td>
</tr>
</tbody>
</table>

---

### Contact force graph

---

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>D</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>j</th>
<th>p</th>
<th>m</th>
<th>n</th>
<th>r</th>
<th>s</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>nm *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>28</td>
<td>29</td>
<td>20</td>
<td>84</td>
<td>67</td>
<td>54</td>
<td>M12 lg. 15</td>
<td>4</td>
<td>8.8</td>
<td>7</td>
<td>11</td>
<td>6.5</td>
<td>42</td>
<td>17</td>
<td>30</td>
</tr>
<tr>
<td>54</td>
<td>32</td>
<td>32</td>
<td>22</td>
<td>82</td>
<td>78</td>
<td>66</td>
<td>M12 lg. 18</td>
<td>4</td>
<td>8.8</td>
<td>7</td>
<td>11</td>
<td>6.5</td>
<td>54</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>67</td>
<td>40</td>
<td>40</td>
<td>28</td>
<td>110</td>
<td>98</td>
<td>82</td>
<td>M16 lg. 16</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>14</td>
<td>9</td>
<td>67</td>
<td>34</td>
<td>35</td>
</tr>
</tbody>
</table>
Work supports: AVLHT
Type: Tappings on head
Locking force at 300 bar: 7 to 22 kN

ONE SINGLE HYDRAULIC PORT

Description
Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.
Mounting with one single hydraulic supply port for extension and locking of the rod.
Operating principle see page 77

Option
Special models available on request.
For clamping pressures less than 150 bar, please contact us.

Characteristics
- fixing using screws
- rod treated to prevent seize and corrosion
- stainless steel spring
- initial force generated by spring

Note
IMPORTANT
The venting port point must always be located at the highest point in the assembly.
In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.
Maximum flow: 1.5 l/min

Possible to lead vent to a clean area of the assembly if there is a risk of liquid being aspirated

Vent filter + plug
Remove the plug if the vent is not led inside the assembly

A = Vent
B = Oil supply
C = venting port

<table>
<thead>
<tr>
<th>Force at 150 bar</th>
<th>Min locking force at 300 bar</th>
<th>Stroke</th>
<th>ø of the rod</th>
<th>Type</th>
<th>Order code</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>kN</td>
<td>kN</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td>AVLHT 12</td>
<td>mm mm mm mm mm mm mm mm mm mm mm mm °</td>
</tr>
<tr>
<td>28</td>
<td>7</td>
<td>12</td>
<td>20</td>
<td>AVLHT 12</td>
<td>751 147/000</td>
<td>42 28 20 84 54 M12 lg. 15 0 1/8 &quot;</td>
</tr>
<tr>
<td>47</td>
<td>12.5</td>
<td>12</td>
<td>30</td>
<td>AVLHT 22</td>
<td>751 149/000</td>
<td>54 32 22 82 66 M12 lg. 18 0 1/8 &quot;</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>16</td>
<td>40</td>
<td>AVLHT 42</td>
<td>751 149/000</td>
<td>67 40 28 110 82 M16 lg. 16 0 1/4 &quot;</td>
</tr>
</tbody>
</table>

Contact force graph

Locked value

Dimensions

Locking force graph

Load vs. Locking force

Minimum pressure

Minimum pressure vs. load

Possible to lead vent to a clean area of the assembly if there is a risk of liquid being aspirated

G 1/8"

A = Vent
B = Oil supply
C = venting port
Work supports: AVFH

Type: Counter-bores on base
Locking force at 300 bar: 7 to 22 kN

ONE SINGLE HYDRAULIC PORT

Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Mounting with one single hydraulic supply port for extension and locking of the rod.

Operating principle see page 77

Option

Special models available on request.

For clamping pressures less than 150 bar, please contact us.

Characteristics

- fixing using screws
- rod treated to prevent seizure and corrosion
- stainless steel spring
- initial force generated by spring supplied with o-rings: 5.28 x 1.78 - 90 NBR for AVFH 12 and AVFH 22
- 7.65 x 1.78 - 90 NBR for AVFH 42

Note

IMPORTANT

The venting port point must always be located at the highest point in the assembly. In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.

Maximum flow: 1.5 l/min

Force at 150 bar | Stroke of the rod | Type | Order code | Dimensions
---|---|---|---|---
2.8 | 12 | AVFH 12 | 751 048/000 | D a b c e f g h j p r s u
4.7 | 30 | AVFH 22 | 751 052/000 | M12 lg. 15 4 8.8 7 42 17 30
7 | 40 | AVFH 42 | 751 071/000 | M16 lg. 18 5 11 9 67 34 35

Locking force graph

Contact force graph
ONE SINGLE HYDRAULIC PORT

Description

Hydraulic mountings are intended to support components being machined in a precise plane and to eliminate vibration during machining.

Mounting with one single hydraulic supply port for extension and locking of the rod.

Operating principle see page 77

Option

Special models available on request.
For clamping pressures less than 150 bar, please contact us.

Characteristics

- fixing using screws
- rod treated to prevent seizure and corrosion
- stainless steel spring
- initial force generated by spring

Note

IMPORTANT

The venting port point must always be located at the highest point in the assembly.

In order to allow the rod to be retracted by springs the counter pressure must not exceed 2 bar.

Maximum flow : 1.5 l/min

Locking force graph

Contact force graph

| Force at 150 bar (kN) | Min locking force at 300 bar (kN) | Stroke (mm) | ø of the rod (mm) | Type | Order code | D | a | b | c | e | f | g | p | r | s | u |
|----------------------|----------------------------------|-------------|-------------------|------|------------|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.8                  | 7                                | 12          | 20                | AVFHT 12 | 751 068/000 | 42 | 121 | 23.5 | 104 | 79 | 54 | M12 lg 15 | 7 | 42 | 17 | 20 |
| 4.7                  | 12.5                             | 12          | 30                | AVFHT 22 | 751 079/000 | 54 | 123 | 23.5 | 104 | 79 | 66 | M12 lg 18 | 7 | 54 | 26 | 20 |
| 7                    | 22                               | 16          | 40                | AVFHT 42 | 751 069/000 | 87 | 155.5 | 23.5 | 142.5 | 98 | 82 | M16 lg 18 | 9 | 87 | 34 | 35 |

Dimensions

éd øp øf u Flats s
## Positive locking cylinders

Table of content

<table>
<thead>
<tr>
<th>TL</th>
<th>Linear translatve autolock cylinder <strong>T-Lock®</strong> - Threaded</th>
<th>096</th>
</tr>
</thead>
<tbody>
<tr>
<td>RL</td>
<td>Pivoting autolock cylinder <strong>R-Lock®</strong> - Threaded</td>
<td>097</td>
</tr>
<tr>
<td>TLF et RLF</td>
<td>Autolock cylinders <strong>T-Lock®</strong> and <strong>R-Lock®</strong> - Flanged</td>
<td>098</td>
</tr>
<tr>
<td>RLC</td>
<td>Pivoting autolock cylinder <strong>R-Lock®</strong> - Compact</td>
<td>099</td>
</tr>
<tr>
<td>AVTL</td>
<td>Work supports <strong>T-Lock®</strong></td>
<td>100</td>
</tr>
</tbody>
</table>
T-Lock® & R-Lock® cylinders

Description

T-Lock® [translation] and R-Lock® [rotation] cylinders, developed and patented by QUIRI, incorporate a system based on the principle of locking through the absence of pressure. Unlocking is achieved by the use of a pressurised fluid.

Principle of operation of the Lock®

The Lock® cylinder has a diameter which is less than the piston one, thus creating a connection through adhesion due to the deformation of the materials present. Unlocking is achieved by means of hydraulic pressure applied uniformly between the surfaces in contact.

Principle of operation of the T-Lock® cylinder

- The piston is fitted with an adjustment locked in the cylinder.
- Supplying the unlocking port (C) makes the cylinder deform, allowing the piston to move freely.
- The cylinder then functions as a standard double acting cylinder in traction (PB) or in thrust (PA).
- When the unlocking pressure is removed, the piston is retained by being ‘gripped’ within the cylinder.
- The clamping force is thus maintained in the absence of pressure.

Phases diagrams: During the clamping phase the cylinder is unpressurised
**T-Lock® & R-Lock® cylinders**

**Description**

**Principle of operation**

The **R-Lock®** cylinders use the same principle as the **T-Lock®** ones, with, in addition, a system for planar rotation of the arm. This pivoting system is a derivative of the hydraulic rack and pinion system. The various phases - pivoting in a plane, clamping, release and unlocking of the **Lock®** - are achieved using only three supply ports, which considerably simplifies the hydraulic supply system.

---

**Phases diagram**

**During clamping**

1. **Rotation**
   - Rotation of the: PB
   - PB=0 => Piston locked

2. **Piston unlocking**
   - PC = 500 + 30 bar

3. **Clamping**
   - PB

4. **Force maintaining**
   - Piston locking: PC = 0 then PB=0
   - Cylinder no longer supplied

**During release**

5. **Loading**
   - Supply of the port: B
   - PB=0 => Piston locked

6. **Piston unlocking**
   - PC = 500 + 30 bar
   - PB: maintained

7. **Release**
   - PB = PC
   - Extension of the rod in linear axis section SA > SB
   - The rod is at equalised pressure since PA = PB therefore no rotation

8. **Return rotation**
   - PB = 0 then PC = 0
   - Maintaining PA
   - The rack moves to return to the initial position
**T-Lock® cylinder : TL**

Double acting - Gas tapping  
Force : 15 to 50 kN

**Description**

This system of locking by absence of pressure is used to maintain a fully controlled clamping force when the cylinder is not connected to its source. In addition, it is completely unaffected by the vibrations.

In all applications for palletisation, transfer, rapid tool changes for presses, mould closure, test benches, these cylinders provide secure clamping.

**Characteristics**

- supply through gas tappings
- locked by absence of pressure
- Lock® unlocking pressure : 300 or 500 bar

**Options**

- rear sensor rod meets CNOMO standards
- custom double clamping arm supplied on request.
- pressure multipliers - see pages 112 and 113.

**Description**

The length «a» of the cylinder is a function of the unlocking pressure and the clamping force required.

Special models made on request.

**Table:**

<table>
<thead>
<tr>
<th>Type</th>
<th>A Rod extension</th>
<th>B Rod retraction</th>
<th>C Unlocking</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL 15</td>
<td>G 1/8”</td>
<td>G 1/8”</td>
<td>G 1/4”</td>
</tr>
<tr>
<td>TL 30</td>
<td>G 1/4”★</td>
<td>G 1/4”★</td>
<td>G 1/4”</td>
</tr>
<tr>
<td>TL 50</td>
<td>G 1/4”★</td>
<td>G 1/4”★</td>
<td>G 1/4”</td>
</tr>
</tbody>
</table>

★ G 3/8” on request

**Dimensions:**

- **Type:** TL 15, TL 30, TL 50
- **Dimensions:** A, B, C
- **Unlocking force:** 300 or 500 bar
- **Other dimensions on request.**
R-Lock® cylinder : RL
Double acting - Gas tapping
Force : 15 to 50 kN

Description
This system of locking by absence of pressure is used to maintain a fully controlled clamping force when the cylinder is not connected to its source. In addition, it is completely unaffected by the vibrations.

In all applications for palletisation, transfer, rapid tool changes for presses, mould closure, test benches, these cylinders provide secure clamping.

The clamping arm pivots in a plane then translates. The component is clamped. Pressure may be removed.

Characteristics
- supply through gas tappings
- locked by absence of pressure
- Lock® unlocking pressure : 300 or 500 bar

Options
- angles of pivoting 60°, 45°, or 30° on request
- rear sensor rod meets CNOMO standards
- custom double clamping arm supplied on request.
- pressure multipliers - see pages 112 and 113.

![Diagram of R-Lock® cylinder]

## Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Rod extension</td>
<td>Rod retraction</td>
</tr>
<tr>
<td>RL 15</td>
<td>G 1/8&quot;</td>
</tr>
<tr>
<td>RL 30</td>
<td>G 1/4&quot;</td>
</tr>
<tr>
<td>RL 50</td>
<td>G 1/4&quot;</td>
</tr>
</tbody>
</table>

* G 3/8" on request

** The length «a» of the cylinder is a function of the unlocking pressure and the clamping force required.

Special models made on request.

<table>
<thead>
<tr>
<th>Traction force</th>
<th>Stroke (m)</th>
<th>Active section (øD)</th>
<th>Piston øD</th>
<th>Rod ød</th>
<th>Locking force (kN)</th>
<th>Unlocking pressure (bar)</th>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 at 230 bar</td>
<td>10</td>
<td>P 6.04</td>
<td>32</td>
<td>14</td>
<td>15 mm</td>
<td>500</td>
<td>RL 15/5</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RL 15/3</td>
<td>226</td>
</tr>
<tr>
<td>30 at 299 bar</td>
<td>10</td>
<td>P 12.56</td>
<td>40</td>
<td>18</td>
<td>30 mm</td>
<td>500</td>
<td>RL 30/5</td>
<td>178</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RL 30/3</td>
<td>251</td>
</tr>
<tr>
<td>50 at 250 bar</td>
<td>10</td>
<td>P 23.75</td>
<td>55</td>
<td>22</td>
<td>50 mm</td>
<td>500</td>
<td>RL 50/5</td>
<td>202</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RL 50/3</td>
<td>280</td>
</tr>
</tbody>
</table>
T-Lock® & R-Lock®: TLF & RLF

Flanged
Front counter-bores: __AV - Rear counter-bores: __AR

Description

These cylinders are designed to be mounted directly onto a drilled block. Supply is achieved through drillings in the body thus the use of pipework and connections is avoided.

These cylinders offer the same characteristics as those with gas threads.

Other dimensions shown on the drawings for T-Lock® cylinders
See page 96.

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>l</th>
<th>m</th>
<th>n</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLF 15 AV</td>
<td>29</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TLF 15 AR</td>
<td>35</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TLF 30 AV</td>
<td>43.5</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>RLF 15 AV</td>
<td>29</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>RLF 15 AR</td>
<td>35</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>RLF 30 AV</td>
<td>43.5</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Other dimensions shown on the drawings for R-Lock® cylinders
See page 97.

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>l</th>
<th>m</th>
<th>n</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLF 15 AV</td>
<td>29</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>RLF 15 AR</td>
<td>35</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>RLF 30 AV</td>
<td>43.5</td>
<td>12.5</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

A = Rod extension
B = Rod retraction
C = Piston unlocking
R-Lock® cylinder : RLC
Double acting - Cylindrical body with ring
Force : 15 kN - Compact version

Description
This system of locking by absence of pressure is used to maintain a fully controlled clamping force when the cylinder is not connected to its source. In addition, it is completely unaffected by the vibrations. In all applications for palletisation, transfer, rapid tool changes for presses, mould closure, test benches, these cylinders provide secure clamping. The clamping arm pivots in a plane then translate. The component is clamped. Pressure may be removed.

Options
- supply through counter-bores under ring
- angles of pivoting 60°, 45°, or 30° on request
- rear sensor rod meets CNOMO standards
- custom double clamping arm supplied on request
- pressure multipliers - see page 112 and 113

General characteristics
- supply through gas threads in the ring
- locking through absence of pressure

Technical characteristics
- section at rod extension : 12.56 cm²
- section at rod retraction : 7.65 cm²
- cylinder using pressure : 160 bar maxi
- cylinder proof pressure : 240 bar
- unlocking pressure : 300 ≤ P ≤ 330 bar
- Lock® locking force : 1500 daN
- stroke : 12 mm
- rotation left / right : 90°

Description :
RLC 15/3 D90 T
- cylinder type : R-Lock® 15 kN
- unlocking : 300 bar
- supply : through threads
- rotation : to right 90°

RLC 15/3 G90 L
- cylinder type : R-Lock® 15 kN
- unlocking : 300 bar
- supply : through counter-bores on ring
- rotation : at left 90°
Description
This mounting uses the same principle of locking as the T-Lock® cylinder and allows a precise support position to be maintained after hydraulic disconnection. It is completely unaffected by vibrations.

Options
- rear sensor rod meets CNOMO standards
- custom double clamping arm supplied on request
- pressure multipliers - see page 112 and 113

Note
For information on contact forces, residual support forces and using pressure, please contact us.

Principle of operation
These mountings use the principle of elasticity of materials. Their operation involves 4 phases:

1) Unlocking of the mounting piston: PC = 300 bar
2) Contact with the component: Simultaneous pressure PA + PB = elastic deformation of the clamped component
3) Removal of pressure: PA + PB = 0
   The component then pushes against the rod due to elasticity. The residual support force is provided by seal friction
4) Piston locking PC = 0
   The position is maintained without pressure.

Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Rod extension</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVTL 5</td>
<td>G 1/8’’</td>
<td>G 1/8’’</td>
<td>G 1/4’’</td>
</tr>
<tr>
<td>AVTL 10</td>
<td>G 1/4’’</td>
<td>G 1/4’’</td>
<td>G 1/4’’</td>
</tr>
<tr>
<td>AVTL 20</td>
<td>G 1/4’’</td>
<td>G 1/4’’</td>
<td>G 1/4’’</td>
</tr>
</tbody>
</table>

Active section with differential supply = Rod section.
To know contact forces, residual support forces and using pressure, please contact us.

| Max force | Stroke | Active section | Piston øD | Rod ød | Locking force | Unlocking pressure | Type | Order code | a | b | c | e | f | g | h | k | m | n1 | n2 | p | r | s | t | u |
|-----------|--------|----------------|------------|--------|---------------|-------------------|------|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 at 200 bar | 10 | 2.54 | 32 | 18 | 5 mini | 300 | AVTL 5 | 781 042/000 | 120 | 74 | 65 | 60 | 48 | 9 | 26 | 30 | M6 | 10 | 10 | 10 | 15 | 14.5 | 8 | 18 |
| 10 at 265 bar | 10 | 3.90 | 40 | 22 | 10 mini | 300 | AVTL 10 | 781 023/000 | 142 | 90 | 79 | 72 | 56 | 11 | 30 | 35 | M6 | 12.5 | 11 | 12 | 19 | 16 | 8 | 20 |
| 20 at 325 bar | 10 | 8.16 | 55 | 28 | 20 mini | 300 | AVTL 20 | 781 043/000 | 160 | 108 | 96 | 87 | 60 | 13 | 32 | 37 | M10 | 14 | 12 | 16 | 21 | 21 | 8 | 26 |
## Auto-coupler cylinders

### Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA - 4V - H</td>
<td>Auto-coupler cylinder 4 channels</td>
<td>103</td>
</tr>
<tr>
<td>AA - 5V - H</td>
<td>Auto-coupler cylinder 5 channels</td>
<td>104</td>
</tr>
<tr>
<td>AA - 6V - H</td>
<td>Auto-coupler cylinder 6 channels</td>
<td>105</td>
</tr>
</tbody>
</table>
Auto-coupler cylinders

Description

The automatic coupling system allows automatic connection and disconnection to the pressure source of cylinders on board a pallet. These coupling are in particular found in palletised systems using T-Lock® or R-Lock® type cylinders.

Application

Example: The pendular assembly

Component is fixed onto the pallette by T-Lock® and R-Lock® cylinders: Clamping is maintain without pressure. Once the component is machined, the pallet returns to the loading/unloading station:

- lateral coupling: the pallet is connected to the hydraulic plant
- release
- locating an unfinished (or semi-finished) component in place
- clamping and check
- uncoupling: the pallet returns towards the pin

Principle of operation

Coupling

- The on-board plate 2 engages laterally into the fixed plate 1: position detection.
- Supply to B: Male couplings are connected to female couplings
- Cylinders are connected to the pressure source.

Uncoupling

- Supply to A: Male couplings return to their initial position.
Auto-coupler cylinder: AA - 4V - H

Automatic - 4 channels

Dimensions

Options
- swivelling protective cover
- all options on request
- elastic support and stub

Options

<table>
<thead>
<tr>
<th>Ident.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Inductive position sensors</td>
</tr>
<tr>
<td>B</td>
<td>Coupling supply port G 1/4&quot;</td>
</tr>
<tr>
<td>C</td>
<td>Uncoupling supply port G 1/4&quot;</td>
</tr>
<tr>
<td>D</td>
<td>Two fixing options:</td>
</tr>
<tr>
<td></td>
<td>- lateral</td>
</tr>
<tr>
<td></td>
<td>- above</td>
</tr>
<tr>
<td>E</td>
<td>4 holes ø 9 mm</td>
</tr>
<tr>
<td>F</td>
<td>2 centring device ø 8 H7 depth 10 mm</td>
</tr>
<tr>
<td>G</td>
<td>4 x M6 depth 12 mm - plate fixing</td>
</tr>
<tr>
<td>H</td>
<td>3 x M6 depth 10 mm - swivel slope</td>
</tr>
<tr>
<td>K</td>
<td>Pallet supply: O-ring ø 8 mm x 1.5</td>
</tr>
</tbody>
</table>

Dimensions

- Loading station
- On-board plate
- Elastic support and stub option
- Pressure connection through 4 tappings G 1/4"
Auto-coupler cylinder: AA - 5V - H

Automatic - 5 channels

Options

- swivelling protective cover
- all options on request
- elastic support and stub

Dimensions

<table>
<thead>
<tr>
<th>Ident.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Inductive position sensors</td>
</tr>
<tr>
<td>B</td>
<td>Coupling supply port G 1/4&quot;</td>
</tr>
<tr>
<td>C</td>
<td>Uncoupling supply port G 1/4&quot;</td>
</tr>
<tr>
<td>D</td>
<td>4 holes ø 9 mm</td>
</tr>
<tr>
<td>E</td>
<td>2 centring device ø 8 H7 depth 10 mm</td>
</tr>
<tr>
<td>F</td>
<td>4 x M6 depth 12 mm - plate fixing</td>
</tr>
<tr>
<td>G</td>
<td>Pallet supply: O-ring ø 8 mm x 1.5</td>
</tr>
</tbody>
</table>

Pressure connection through 5 tappings G1/4"
Auto-coupler cylinder: AA - 6V - H

Automatic - 6 channels

Dimensions

Options

- swivelling protective cover
- all options on request
- elastic support and stub

Options

<table>
<thead>
<tr>
<th>Ident.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Inductive position sensors</td>
</tr>
<tr>
<td>B</td>
<td>A: coupled</td>
</tr>
<tr>
<td>B</td>
<td>B: uncoupled</td>
</tr>
<tr>
<td>C</td>
<td>Two fixing options:</td>
</tr>
<tr>
<td>D</td>
<td>- lateral</td>
</tr>
<tr>
<td>E</td>
<td>- above</td>
</tr>
<tr>
<td>C</td>
<td>Coupling supply port G 1/4''</td>
</tr>
<tr>
<td>D</td>
<td>Uncoupling supply port G 1/4''</td>
</tr>
<tr>
<td>E</td>
<td>6 holes ø 9 mm</td>
</tr>
<tr>
<td>F</td>
<td>2 centring device ø 8 H7 depth 10 mm</td>
</tr>
<tr>
<td>G</td>
<td>4 x M8 depth 12 mm - plate fixing</td>
</tr>
<tr>
<td>H</td>
<td>4 x M6 depth 10 mm - swivel slope</td>
</tr>
<tr>
<td>K</td>
<td>Pallet supply: O-ring ø 8 mm x 1.5</td>
</tr>
</tbody>
</table>

Pressure connection through 6 tappings G1/4''

Elastic support and stub option

On-board plate

Loading station
## Hydraulic power units & components

### Table of content

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHB</td>
<td>Hydraulic power units</td>
<td>108</td>
</tr>
<tr>
<td>ACHB</td>
<td>Accessories for hydraulic power units</td>
<td>110</td>
</tr>
<tr>
<td>AC et AS</td>
<td>Spherical accumulators</td>
<td>111</td>
</tr>
<tr>
<td>MDP_L</td>
<td>Pressure multipliers in line</td>
<td>112</td>
</tr>
<tr>
<td>MDP_M</td>
<td>Modular pressure multipliers</td>
<td>113</td>
</tr>
<tr>
<td>FLTM</td>
<td>Filters for pressure multipliers</td>
<td>114</td>
</tr>
<tr>
<td>BMP</td>
<td>Pressure maintenance block</td>
<td>115</td>
</tr>
<tr>
<td>VDS</td>
<td>Sequence valve</td>
<td>116</td>
</tr>
<tr>
<td>RPH et RH</td>
<td>Check valve</td>
<td>117</td>
</tr>
<tr>
<td>RDP</td>
<td>Pressure reducer</td>
<td>118</td>
</tr>
<tr>
<td>CDIST</td>
<td>Distribution components</td>
<td>119</td>
</tr>
</tbody>
</table>
Clamping hydraulic power unit: CHB

Electric motor
0.55 à 2.2 kW - 1.3 à 5 l/min - 250 bar

Caractéristiques techniques

Motor-pump set:

Gear pump
- peak pressure: 300 bar
- using pressure: 250 bar

Electric motor
- supply voltage: 220 - 240V - 50 Hz
- speed of rotation: 1450 rpm
- protection: IP54
- duty ratio: S3

Tank:
- total capacity: 12 and 20 liters
- useful capacity: 8 and 14 liters

Equipment:
- suction strainer size 150 microns
- filling port
- visual oil level indicator
- breather with air filter

Options:
Electrical minimum oil level indicator with thermostatic sensor.
Order code: A 36 365

Connection flange for motor-pump unit equipped with:
- 1 adjustable pressure limiter from 0 to 300 bar
- 1 check valve
- 1 pattern for CETOP 03 distribution
- 1 tapped G1/4” port
- 1 pressure switch, gauge or pressure supply point
- 1 outlet A and B tapping G3/8”
- 1 direct return tapped port B 3/8”

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Pump flow</th>
<th>Motor power</th>
<th>Maximum pressure</th>
<th>Tank capacity</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>l/min</td>
<td>kW</td>
<td>bar</td>
<td>Total</td>
<td>Useful</td>
</tr>
<tr>
<td>CHB 1.3 - 0.55 - 12</td>
<td>902 230/111</td>
<td>1.3</td>
<td>0.55</td>
<td>250</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>CHB 1.3 - 0.55 - 20</td>
<td>902 230/112</td>
<td>2.2</td>
<td>0.55</td>
<td>250</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>CHB 2.7 - 1.50 - 12</td>
<td>902 230/113</td>
<td>3.7</td>
<td>1.5</td>
<td>250</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>CHB 2.7 - 1.50 - 20</td>
<td>902 230/114</td>
<td>3.7</td>
<td>1.5</td>
<td>250</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>CHB 5 - 2.20 - 12</td>
<td>902 230/115</td>
<td>5.3</td>
<td>2.2</td>
<td>250</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>CHB 5 - 2.20 - 12</td>
<td>902 230/116</td>
<td>5.3</td>
<td>2.2</td>
<td>250</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>
Hydraulic power units

The basic plant allows CETOP 03 standard modular components and manifold to fitted.

Extension block

Fitting of extension blocks allows additional manifolds to be added.

1 Extension block
2 manifolds with or without modular components

2 Extension blocks
3 manifolds with or without modular components

3 Extension blocks
4 manifolds with or without modular components
Accessories: ACHB

Prises de pression - Capillaires - Manomètres

- **Complete screw-in supply plug with cap.**
  [with built-in seals]
  Order code: **A 65 035**

- **Gauge plug.**
  Order code: **A 65 038**

- **High pressure capillary hose LG.630**
  Order code: **A 65 036**

- **Glycerine filled gauge.**

  **Ajustable**
  With connections for mounting onto the block (standard G1/4’’ port)

  **Not ajustable**
  To be screwed directly into the block with aluminium seal **A 51 088**
  [Housing machining dimensions, see the sketch below]

<table>
<thead>
<tr>
<th>Graduation</th>
<th>Order code</th>
<th>Connection type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 250 bar</td>
<td>A 69 033</td>
<td>Bottom</td>
</tr>
<tr>
<td>0 to 400 bar</td>
<td>A 69 030</td>
<td>Bottom</td>
</tr>
<tr>
<td>0 to 250 bar</td>
<td>A 69 251</td>
<td>Rear</td>
</tr>
<tr>
<td>0 to 400 bar</td>
<td>A 69 252</td>
<td>Rear</td>
</tr>
</tbody>
</table>
**Spherical accumulators: AC & AS**

**pressure**: 210 bar - 250 bar - 400 bar

### Principle of operation

The hydro-pneumatic accumulator is a reservoir of power which is called on if needed.

### Characteristics

- **membrane accumulator**
- **recommended pre-pressurisation with nitrogen**: $0.8 \times \text{la pression de service}$

#### 400 bar accumulators

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Max pressure</th>
<th>Capacity (cm³)</th>
<th>Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 020</td>
<td>A 66 316</td>
<td>400</td>
<td>20</td>
<td>0.64</td>
</tr>
<tr>
<td>AC 200</td>
<td>A 66 317</td>
<td>400</td>
<td>200</td>
<td>1.20</td>
</tr>
</tbody>
</table>

#### 210 - 250 bar accumulators

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Max pressure</th>
<th>Capacity (cm³)</th>
<th>Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 075</td>
<td>A 66 314</td>
<td>250</td>
<td>75</td>
<td>0.7</td>
</tr>
<tr>
<td>AS 160</td>
<td>A 66 318</td>
<td>210</td>
<td>160</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Pressure multiplier: MDP__L

In line dynamic

Description

The MDP is an oscillating hydraulic pressure multiplier which increases the output pressure. It maintains this pressure whilst automatically compensating for the consumption in any receivers that may be mounted on the high pressure side.

The MDP operates within a supply pressure range of from 20 to 200 bar and delivers an output pressure which is proportional to the supply pressure (800 bar max). The outlet pressure is adjusted by adjusting the input pressure.

The MDP includes a controlled check valve ‘CAR’ which maintains the pressure in the system and allows decompression by reversing the distributor.

Characteristics

- supply pressure from 20 to 200 bar
- maximum output pressure 500 bar
- temperature from -40°C to +120°C
- filtration 10 µ max. 19/16 as per ISO 4406
- zinc plated body
- the MDP contains no hydraulic seal

Options

In order to prevent leaks due to contamination by metallic particles, we recommend that a filter is fitted to the inlet P. To choose the filter, see page 114.

Recommendations

The assembly design study must take into account the fact that the multiplier represents an internal loss between P and R.

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Multiplication ratio or gain</th>
<th>Maximum input flow</th>
<th>Maximum output flow</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDP 2.0 L</td>
<td>A 66 331</td>
<td>2.0</td>
<td>8.0</td>
<td>0.8</td>
<td>1</td>
</tr>
<tr>
<td>MDP 3.2 L</td>
<td>A 66 332</td>
<td>3.2</td>
<td>15.0</td>
<td>2.5</td>
<td>1</td>
</tr>
<tr>
<td>MDP 4.0 L</td>
<td>A 66 873</td>
<td>4.0</td>
<td>14.0</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>MDP 5.0 L</td>
<td>A 66 333</td>
<td>5.0</td>
<td>14.0</td>
<td>1.6</td>
<td>1</td>
</tr>
</tbody>
</table>
Pressure multiplier: MDP__M

Modular dynamic

Description
The MDP is a oscillating hydraulic pressure multiplier which increases the output pressure. It maintains this pressure whilst automatically compensating for the consumption in any receivers that may be mounted on the high pressure side.

The MDP operates within a supply pressure range of from 20 to 200 bar and delivers an output pressure which is proportionnal to the supply pressure (800 bar max). The outlet pressure is adjusted by adjusting the input pressure.

The MDP includes a controlled check valve ‘CAR’ which maintains the pressure in the system and allows decompression by reversing the distributor.

Characteristics
- supply pressure from 20 to 200 bar
- maximum output pressure 500 bar
- temperature from -40°C to +120°C
- filtration 10 µ max. 19/16 as per ISO 4406
- zinc plated body
- the MDP contains no internal hydraulic seal
- base fitted with orings

Options
- 10 µ thin sandwich filter plate with filling in visual level indicator. To choose the filter, see page 114.

Recommendations
The assembly design study must take into account the fact that the multiplier represents an internal loss between P and R.

### Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Multiplication ratio or gain</th>
<th>Maximum input flow</th>
<th>Maximum output flow</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDP 2.0 M</td>
<td>A 66 328</td>
<td>2.0</td>
<td>8.0</td>
<td>0.8</td>
<td>2.5</td>
</tr>
<tr>
<td>MDP 3.2 M</td>
<td>A 66 330</td>
<td>3.2</td>
<td>15.0</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>MDP 4.0 M</td>
<td>A 66 241</td>
<td>4.0</td>
<td>140</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>MDP 5.0 M</td>
<td>A 66 328</td>
<td>5.0</td>
<td>140</td>
<td>1.6</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Filters for multipliers: FLTM

In line or NG6

**T 10μ filter** - R1/4" or R 3/8"
Max pressure: 350 bar

The filter cartridge is detachable and cleanable.

**R 1/4"** - Order code: **A 36 428**
**R 3/8"** - Order code: **A 36 414**
**Filter cartridge** - Order code: **A 36 429**

**In-line 10μ filter**
Max pressure: 350 bar

**R 1/4"** - Order code: **A 68 457**
**R 3/8"** - Order code: **A 68 458**

**NG6 filter**
Max pressure: 200 bar
(with filling in visual level indicator)

Order code: **A 63 715**
Pressure maintenance block with accumulator

Order code: **834 A97/100**

Includes:

- 1 gauge allowing the pressure to be visually checked (**MA**)
- 1 pressure switch (**MC**) to:
  - Stop the motor when the using pressure is reached
  - Restart if the pressure falls by about 10%
- 1 accumulator to maintain the pressure and prevents over-frequent start-up of the motor during a long clamping period (**AC**)
- 1 safety pressure limiter (**LP2**)
- 1 decompression valve with nozzle (**RB**)
- 1 brake on the discharge from the accumulator (**FR**)

Example of assembly:
**Sequence valve : VDS**

*With check valve*

*Maximum service pressure : 350 bar*

**Principle of operation**

The sequence valve allows a secondary circuit to be supplied when the pre-set pressure is reached in the primary circuit. It is used to sequence the movement of cylinders, or, for example, to clamp a component before anti-vibration mounting provide support. At the end of the cycle the pressure in the secondary circuit is equal to the pressure in the primary one.

**Table**

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Pressure range</th>
<th>Max flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDS 5</td>
<td>354 007/100</td>
<td>10 to 100</td>
<td>12</td>
</tr>
<tr>
<td>VDS 5</td>
<td>354 006/200</td>
<td>50 to 250</td>
<td>12</td>
</tr>
<tr>
<td>VDS 5</td>
<td>354 006/100</td>
<td>10 to 100</td>
<td>12</td>
</tr>
<tr>
<td>VDS 5</td>
<td>354 006/200</td>
<td>50 to 250</td>
<td>12</td>
</tr>
<tr>
<td>VDS 5</td>
<td>A 66 257</td>
<td>10 to 100</td>
<td>12</td>
</tr>
<tr>
<td>VDS 5</td>
<td>A 66 258</td>
<td>50 to 250</td>
<td>12</td>
</tr>
</tbody>
</table>
Controled check valve: **HRP & RH**

On a plate or in-line assembly

**Principle of operation**

The check allows free flow in the B to A direction, and prevents passage from A to B. Opening of A to B occurs under the hydraulic control Z. The pipe L is provided for decompression of the valve and must be connected to the return circuit (no pressure).

### Check valve HRP1

![Diagram of Check valve HRP1]

**Symbol**

- **4x Screws DHc M4x25**
- **Dn=2.6Nm**
- **2x o-rings 6.07x1.78**
- **2x o-ring 4.47x1.78**

### Check valve RH1

![Diagram of Check valve RH1]

**Symbol**

- **Ra 0.6**
- **Plane support surface condition**

### Table

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Port pressure</th>
<th>Max flow</th>
<th>Weight</th>
<th>Pressure ratio: (Control / A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRP 1</td>
<td>A 64 034</td>
<td>A 700</td>
<td>B 700</td>
<td>Z 700</td>
<td>L 0</td>
</tr>
<tr>
<td>RH 1</td>
<td>A 64 383</td>
<td>A 700</td>
<td>B 700</td>
<td>Z 700</td>
<td>L -</td>
</tr>
</tbody>
</table>
**Pressure reducer: RDP**

Sealed with check valves
Max using pressure: 400 bar

### Principle of operation

The function of the pressure reducer is to maintain a constant receiver side pressure (secondary circuit) in spite of there being a higher variable inlet pressure (primary circuit). This model is made up of a check valve with no leak in close state (does not require any drainage oil port). When the primary pressure level at P is less than the secondary pressure at A, reversed circulation A to P for the valve (which is then open) is possible.

### Type RDP 3_T

![Type RDP 3_T Diagram]

### Type RDP 3_P

![Type RDP 3_P Diagram]

### Type RDP 3_C

![Type RDP 3_C Diagram]

### Symbol

![Symbol Diagram]

### Table: Pressure reducer RDP

<table>
<thead>
<tr>
<th>Type</th>
<th>Order code</th>
<th>Pressure range</th>
<th>Max flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDP 3</td>
<td>1 A 66 277</td>
<td>15 a 130</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2 A 66 325</td>
<td>20 a 200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A 66 324</td>
<td>30 a 330</td>
<td></td>
</tr>
<tr>
<td>RDP 3</td>
<td>1 A 66 323</td>
<td>15 a 130</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2 A 66 288</td>
<td>20 a 200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A 66 322</td>
<td>30 a 330</td>
<td></td>
</tr>
<tr>
<td>RDP 3</td>
<td>1 A 66 319</td>
<td>15 a 130</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2 A 66 320</td>
<td>20 a 200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 A 66 321</td>
<td>30 a 330</td>
<td></td>
</tr>
</tbody>
</table>
### Modular check valve - CETOP 03

Valve reference on A and B: **A 64 463**  
Valve reference on A: **A 64 464**  
Valve reference on B: **A 64 471**

### Modular pressure reducer - CETOP 03

Order code for adjustable pressure from 20 to 100 bar: **A 66 327**  
Order code for adjustable pressure from 50 to 210 bar: **A 66 326**

### Pressure switch

Order code for adjustable pressure from 20 to 250 bar: **A 63 528**  
Order code for adjustable pressure from 100 to 400 bar: **A 63 362**

### Intermediate block

Order code: **834 A95/000**
Solenoid block assembly DN6 - CETOP 03
2 solenoids - 3 positions - centred by spring.

Order code: A 63 699

Characteristics

- maximum pressure: 315 bar
- maximum flow: 60 l/mn
- fluid: hydraulic mineral oil
- control voltage: 24 V
- electrical power: 33 W

Solenoid block assembly DN6 - CETOP 03
1 solenoid - 2 positions - return by spring.

Order code: A 63 703

Order code: A 63 698

Solenoid block assembly DN6 - CETOP 03
2 solenoids - 2 end positions with slots.

Order code: A 63 704

Order code: A 63 704
Other products

Hydraulic snubbers

Gas springs

Hydraulic cam unit

Actuators for moulds

Lifting tools & equipments

Quiri HydroSystems

Catalogs and application files are available on demand.

Please, contact us or visit our web site:

www.quiri.com