Die cast clamping system
**Pascal Die cast clamping system**

### Hydraulic clamp

**model TYB**

T-slotted manual slide type of clamp.
Clamping stroke 10~12mm  

**page → 17**

### Mag clamp

**model MGA**

Clamp system which absorbs and fixes a die with strong magnet.  

**page → 33**

### Control system

**Control unit**
Air-driven hydraulic control unit of the electric control (solenoid operation), combined with Pascal pump and Pascal non leak valve unit.

**model HCS**  
(For small and medium-sized machine)  

**page → 27**

**model HCL**  
(For medium and large-sized machine)  

**page → 29**

### Operation panel & Control box

**Opertaion panel**
Operation panel and Control box for hydraulic clamp. It simply displays the interlock state of clamp.

**model ESTE-D**  

**page → 31**

**model ECTE-D**  

**page → 32**

### Positioning device

**Die setter**  
**model MDL**
Elevating positioning block. It enables to perform the horizontal and vertical positioning surely and easily by placing a die on die setter.  

**page → 35**

### Ejector related system

**C-plate mag clamp**  
**model MGE**
The system that can instantly detach or attach the machine ejector plate and die ejector plate by the magnet.  

**page → 41**

**Ball lock coupler**  
**model MED**
Automatic connection of ejector cylinder and plate (A and B) on die side by connecting and disconnecting the rod.  

**page → 51**
Pascal Die cast clamping system

Other products

Auto coupler

Automatic connection and disconnection of multiple couplers and electric connectors together at once.

page → 55

Multi coupler

Multi coupler which can be connected securely at once by pushing the gripper slightly with hand.

page → 61

Die changer

Die is changeable quickly and securely, comparing to the conventional forklift or overhead crane.

page → 77

Die rotator

model SMR / SMF

Dies and large sized components can be rotated safely and quickly.

page → 81

Die-casting hydraulic cylinder

model KC / KF

Innovative die-casting hydraulic cylinder with high durability, excellent maintainability and compact size, comparing to the conventional hydraulic cylinder.

page → 83
Pascal clamp model TYB
C-plate mag clamp
Pascal clamp
model TYB
Mag clamp
3 piece cylinder KC
3 piece cylinder KC
Hydraulic clamp TYB-Z

8,500kN (850ton) Die-casting machine fixed side

Hydraulic clamp TYB-Z
C-plate mag clamp & Hydraulic clamp TYB-Z

8,500kN (850ton) Die-casting machine movable side C-plate mag clamp & Hydraulic clamp TYB-Z
By means of the automation of die clamp. The reduction of non-productive time (set up time) can be fulfilled.

Pascal clamp enables to shorten the die change time and improves productivity and enhances the operating rate of production. For a typical introduction example, it shortens the die change time from 60 minutes to 30 minutes for medium and large sized machine. In addition, it enables to reduce numbers of operators and workload.
T-slotted slidable clamp with compact body and long clamp stroke, equipped with a strong clamping force and high rigidity to resist shock.

- Long clamping stroke
- Perfect protection against dust or die release agents.
- Best solution for heat and corrosion

5,000kN (500ton) Die-casting machine  Hydraulic clamp, slidable type TYB

model **TYB**

Clamping stroke: 10 ~ 12 mm
Clamping force: 4, 6, 10, 16, 25 ton
Structure

It has high reliability and durability capable of enduring severe use conditions such as high temperature, foreign substances and release agent scattering. Dust proof seal/cover and viton seals are provided to protect from high temperature (under 120°C).

Dust seal
Grease nipple
For lubrication for clamp lever and shaft (option).

Dust cover
Protect from release agents and foreign substances.

Lever shaft
(Ion-Nitriding)

Non-breathing Ram-cylinder
Protect from intrusion of release agents and foreign substances into the hydraulic cylinder. (Ion-Nitriding)

Hydraulic piston
It is hard chrome plated, which enhances abrasion and corrosion resistant performance.

Long clamping stroke
It can accommodate big tolerance of clamping height and T-slot dimensions.

Secure unclamping operation
Durable return spring is located at dust and vapor free area of the clamp body so that it can exert a stable pulling force.
Hydraulic clamp, slidable type

Clamping stroke: 10 ~ 12 mm
Clamping force: 4, 6, 10, 16, 25 ton

1 Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040</th>
<th>TYB063</th>
<th>TYB100</th>
<th>TYB160</th>
<th>TYB250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping force (at 24.5 MPa)</td>
<td>kN</td>
<td>39.2</td>
<td>61.7</td>
<td>98</td>
<td>156</td>
</tr>
<tr>
<td>Full stroke</td>
<td>mm</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Clamping stroke</td>
<td>mm</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Safety stroke</td>
<td>mm</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Cylinder capacity (at full stroke)</td>
<td>cm³</td>
<td>16.5</td>
<td>26.1</td>
<td>47.2</td>
<td>78.2</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>MPa</td>
<td></td>
<td></td>
<td>36.7</td>
<td></td>
</tr>
<tr>
<td>Max. hydraulic pressure</td>
<td>MPa</td>
<td></td>
<td></td>
<td>24.5</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>°C</td>
<td>5 ~ 120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>4.5</td>
<td>9</td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

Safety stroke and clamping stroke shown above are subject to change depending on dimensions of die and T-slot.

Weight varies according to the dimension of clamp T-leg and die plate thickness h.
## TYB Hydraulic clamp, slidable type

### Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040</th>
<th>TYB063</th>
<th>TYB100</th>
<th>TYB160</th>
<th>TYB250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of lever F range of h inside the brackets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.5 (45 ≤ h)</td>
<td>29.5 (50 ≤ h)</td>
<td>45 (58 ≤ h)</td>
<td>60 (58 ≤ h)</td>
<td>106 (58 ≤ h)</td>
<td></td>
</tr>
<tr>
<td>32.5 (40 ≤ h &lt; 45)</td>
<td>39.5 (40 ≤ h &lt; 50)</td>
<td>55 (48 ≤ h &lt; 58)</td>
<td>70 (48 ≤ h &lt; 58)</td>
<td>116 (48 ≤ h &lt; 58)</td>
<td></td>
</tr>
<tr>
<td>37.5 (35 ≤ h &lt; 40)</td>
<td>49.5 (30 ≤ h &lt; 40)</td>
<td>65 (38 ≤ h &lt; 48)</td>
<td>80 (38 ≤ h &lt; 48)</td>
<td>126 (38 ≤ h &lt; 48)</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>K</td>
<td>145</td>
<td>168</td>
<td>200</td>
<td>235</td>
<td>285</td>
</tr>
<tr>
<td>L</td>
<td>23</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>M</td>
<td>122</td>
<td>138</td>
<td>170</td>
<td>205</td>
<td>250</td>
</tr>
<tr>
<td>N</td>
<td>16</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>P</td>
<td>32.5</td>
<td>38</td>
<td>62</td>
<td>80</td>
<td>95</td>
</tr>
<tr>
<td>Projection length of T-leg allowance at clamped condition Q</td>
<td>32</td>
<td>36</td>
<td>45</td>
<td>55</td>
<td>65</td>
</tr>
<tr>
<td>R</td>
<td>83</td>
<td>103</td>
<td>113</td>
<td>133</td>
<td>168</td>
</tr>
<tr>
<td>S</td>
<td>39.6</td>
<td>49.6</td>
<td>54.6</td>
<td>59.6</td>
<td>72</td>
</tr>
<tr>
<td>T</td>
<td>64.5</td>
<td>71.5</td>
<td>94.5</td>
<td>110</td>
<td>156</td>
</tr>
<tr>
<td>V</td>
<td>-</td>
<td>58</td>
<td>76</td>
<td>96</td>
<td>118</td>
</tr>
<tr>
<td>Min. E</td>
<td>76.5</td>
<td>83.5</td>
<td>107</td>
<td>122</td>
<td>168</td>
</tr>
<tr>
<td>Full stroke X</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Clamping stroke Y</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Safety stroke Z</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>S1 : −</td>
<td>S1 : 14.5</td>
<td>S1 : 16.5</td>
<td>S1 : 19</td>
<td>S1 : 21.5</td>
</tr>
<tr>
<td></td>
<td>S2 : 9</td>
<td>S2 : 9.5</td>
<td>S2 : 11</td>
<td>S2 : 13</td>
<td>S2 : 18</td>
</tr>
<tr>
<td>h (Min. ~ Max.)</td>
<td>35 ~ 50</td>
<td>30 ~ 60</td>
<td>38 ~ 70</td>
<td>38 ~ 70</td>
<td>38 ~ 70</td>
</tr>
</tbody>
</table>

- Specify T-slot dimensions (a, b, c, d, j) and die plate thickness (h).
- Regarding “d” dimension of T-slot, for retrofit: specify to 0.1 mm.
- For new machine: machining tolerance shall be ±0.2 mm.
- Dimensions (A, B, C, D, J) shall be determined according to T-slot dimensions.

- When newly machining T-slot, it is recommended to apply the dimensions specified on page 25.
- Height of lever F varies according to the dimension of h. • Min. J dimension varies according to body materials. (Standard: SS400, S1 : S45C, S2 : SCM435) • Special specifications are prepared in case “h” dimension is out of the range.
### TYB

**Hydraulic clamp, slidable type**  
**special type**

<table>
<thead>
<tr>
<th><strong>D</strong> With dust cover</th>
<th><strong>TYB□-D</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied to protect from release agent and foreign substances.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>G</strong> With handle</th>
<th><strong>TYB□-G</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Only for TYB040-250. It is not applicable for TYB010 and TYB020.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>H</strong> Clamp lever high distance type</th>
<th><strong>TYB□-H</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied under condition that the die plate thickness is thicker than standard.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>J</strong> Rear piping type</th>
<th><strong>TYB□-J</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied under condition that there is interference on clamp side and it can not be connected with side hydraulic port (standard specification).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>N</strong> NPT port</th>
<th><strong>TYB□-N</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied under condition that hydraulic connection port is connected with NPT thread.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>P</strong> With grease nipple</th>
<th><strong>TYB□-P</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>For lubrication for clamp lever and shaft (Option).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>S1</strong></th>
<th><strong>Body strengthened</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TYB□-S1, TYB□-S2</strong></td>
<td></td>
</tr>
<tr>
<td>It is applied under condition that the T-slot dimension is under standard and the strength is insufficient.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>S2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>body</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>T</strong> Low distance clamp type</th>
<th><strong>TYB□-T</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied under condition that the die plate thickness is thinner than standard.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>V</strong> High temperature</th>
<th><strong>TYB□-V</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied under condition that the die and its surroundings are in high temperature.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>W</strong> Wide lever</th>
<th><strong>TYB□-W</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is applied with U cut (cut out) in the die.</td>
<td></td>
</tr>
</tbody>
</table>

| **Die detection limit switch** |
| It prevents clamp misplace. |
Hydraulic clamp, slidable type
TYB
special type
11B
Automatic slidable clamp with an air cylinder. It enables to shorten the die change time.

6,500kN (650 ton) Die-casting machine  Hydraulic clamp, automatic slidable type TYB-Z
Hydraulic clamp, automatic slidable type

**TYB-Z**  
Slide direction: Horizontal

**TYB-R**  
Slide direction: Vertical

Control unit HCL-T3  
3-position center exhaustair solenoid valve equipped

Control unit HCL-T2  
2-position double air solenoid valve equipped

* The control method is different between TYB-Z and TYB-R.

**Model designation**

TYB 040 R L - 150

1. Clamping force
2. Slide direction  
   [Z]: Horizontal  [R]: Vertical
3. Air cylinder position
4. Sliding stroke (mm)

**Air cylinder position**

L: Left side  
R: Right side

**Special type**

D: With dust cover  
J: Rear piping type  
N: NPT port  
P: With grease nipple  
S1: Body strengthened (S45C)  
S2: Body strengthened (SCM435)  
T: Low distance clamp type  
V: High temperature  
W: Wide lever

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040Z</th>
<th>TYB063Z</th>
<th>TYB100Z</th>
<th>TYB160Z</th>
<th>TYB250Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYB040R</td>
<td>TYB063R</td>
<td>TYB100R</td>
<td>TYB160R</td>
<td>TYB250R</td>
<td></td>
</tr>
<tr>
<td>Clamping force (at 24.5 MPa)</td>
<td>kN</td>
<td>39.2</td>
<td>61.7</td>
<td>98.0</td>
<td>156</td>
</tr>
<tr>
<td>Full stroke</td>
<td>mm</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Clamping stroke</td>
<td>mm</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Safety stroke</td>
<td>mm</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Cylinder capacity (at full stroke)</td>
<td>cm³</td>
<td>16.5</td>
<td>26.1</td>
<td>47.2</td>
<td>78.2</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>MPa</td>
<td>36.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. hydraulic pressure</td>
<td>MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard sliding stroke *1</td>
<td>mm</td>
<td>50, 75, 100, 125, 150</td>
<td>50, 75, 100, 125, 150, 200</td>
<td>50, 75, 100, 125, 150, 200, 250, 300</td>
<td></td>
</tr>
<tr>
<td>Slider driving air pressure</td>
<td>MPa</td>
<td></td>
<td></td>
<td>0.39 ~ 0.54</td>
<td></td>
</tr>
<tr>
<td>Clamp sliding speed</td>
<td>mm/s</td>
<td></td>
<td>30 ~ 80 (Adjusted by a flow control valve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>°C</td>
<td>0 ~ 70</td>
<td>(5 ~ 120 by heat proof type *2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Mass varies according to specifications. Contact Pascal for the details.
* 1: Contact Pascal for the sliding stroke which is not mentioned above.
* 2: Proximity switch and auto switch is not applied to a heat proof type.
Hydraulic clamp, automatic slidable type specification example

Automatic slidable type

Automatic slidable type with limit switch
(Die detection proximity switch)

At standby

When forwarding

At standby

When forwarding
With limit switch
(die and backward end detection proximity switch)

Limit switch
(backward end detection proximity switch)

Limit switch
(die detection proximity switch)

At standby

Air cylinder

Limit switch
(die detection proximity switch)

Limit switch
(backward end detection proximity switch)

When forwarding

* Configuration varies according to specifications. Contact Pascal for the details.
### T-slot and cutout details

- Process with the below dimension in case of machining T-slot newly.
- Contact Pascal if your T-slot dimensions are less than Min. T-slot dimensions shown below. The main body materials shall be changed and code is S1 and S2 for a special spec.

#### Recommended T-slot dimension

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040</th>
<th>TYB063</th>
<th>TYB100</th>
<th>TYB160</th>
<th>TYB250</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYB040Z</td>
<td>TYB063Z</td>
<td>TYB100Z</td>
<td>TYB160Z</td>
<td>TYB250Z</td>
</tr>
<tr>
<td>a</td>
<td>22\pm0.5</td>
<td>28\pm0.5</td>
<td>28\pm0.5</td>
<td>32\pm0.5</td>
<td>36\pm0.5</td>
</tr>
<tr>
<td>b</td>
<td>37\pm0.5</td>
<td>46\pm0.5</td>
<td>46\pm0.5</td>
<td>53\pm0.5</td>
<td>56\pm0.5</td>
</tr>
<tr>
<td>d</td>
<td>22\pm0.2</td>
<td>28\pm0.2</td>
<td>28\pm0.2</td>
<td>28\pm0.2</td>
<td>32\pm0.2</td>
</tr>
<tr>
<td>j</td>
<td>16\pm2</td>
<td>20\pm2</td>
<td>20\pm2</td>
<td>24\pm2</td>
<td>30\pm2</td>
</tr>
</tbody>
</table>

#### Minimum T-slot dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040</th>
<th>TYB063</th>
<th>TYB100</th>
<th>TYB160</th>
<th>TYB250</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYB040Z</td>
<td>TYB063Z</td>
<td>TYB100Z</td>
<td>TYB160Z</td>
<td>TYB250Z</td>
</tr>
<tr>
<td>a</td>
<td>15</td>
<td>19</td>
<td>23</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>b</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>d</td>
<td>11.5</td>
<td>15</td>
<td>17</td>
<td>20</td>
<td>23</td>
</tr>
</tbody>
</table>

#### Clamp area details

- To accommodate the clamp to the die as shown on the right, Pascal can provide a special designed clamp lever with the clamp.
- Specify the dimension H, L and h of the die when ordering. The figures shown in the column L and H in the table are a minimum dimension to make.

#### Clamp area details

<table>
<thead>
<tr>
<th>Model</th>
<th>TYB040</th>
<th>TYB063</th>
<th>TYB100</th>
<th>TYB160</th>
<th>TYB250</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TYB040Z</td>
<td>TYB063Z</td>
<td>TYB100Z</td>
<td>TYB160Z</td>
<td>TYB250Z</td>
</tr>
<tr>
<td>Min. H</td>
<td>20\leq h &lt; 25</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>25\leq h &lt; 30</td>
<td>25</td>
<td>25</td>
<td>35(30)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>30\leq h &lt; 35</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>35\leq h &lt; 40</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>40\leq h &lt; 45</td>
<td>-</td>
<td>30</td>
<td>40</td>
<td>40(30)</td>
</tr>
<tr>
<td></td>
<td>45\leq h &lt; 50</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>40(30)</td>
</tr>
<tr>
<td></td>
<td>50\leq h</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>45(35)</td>
</tr>
</tbody>
</table>

| Min. L| mm     | 15     | 20     | 20     | 25(20) |
|        |        | 10     | 12.5   | 12.5   | 10(12.5)| 10 |
Selection of hydraulic clamp

Selecting table for clamp and control unit

<table>
<thead>
<tr>
<th>Die-casting machines</th>
<th>Die clamping force</th>
<th>Clamp</th>
<th>Model × Quantity *1</th>
<th>Total clamping force *2</th>
<th>kN</th>
<th>~2000</th>
<th>~3500</th>
<th>~5500</th>
<th>~8500</th>
<th>~13000</th>
<th>~20000</th>
<th>~26000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Die</td>
<td>TYB040 × 8</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>clamping</td>
<td>TYB040Z × 8</td>
<td>246</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>force</td>
<td>TYB040R × 8</td>
<td>392</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>TYB063 × 8</td>
<td>624</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>TYB063Z × 8</td>
<td>980 (936)</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>TYB100 × 8</td>
<td>1470 (1248)</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>TYB100Z × 8</td>
<td>1960</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>TYB160 × 8</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>TYB160Z × 8</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>TYB160R × 8</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>TYB250 × 8 (TYB160 × 12)</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>TYB250Z × 8 (TYB160Z × 12)</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>TYB250R × 8 (TYB160R × 12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hydraulic control unit: HCSD-HG2SSS / HCLD-HG2SSS

*1: Quantity for one machine.
*2: Clamping force per platen. (For half of the quantity mentioned above.) Inquire the clamp selection, when the actual die opening force is greater than above value.

Regarding Control unit, refer to page → 27, Operation panel page → 31, and Control box page → 32.
HCS Pascal Control unit  For small and medium-sized die-casting machine

Model designation
HCS D - H G2 S S S - U

Control voltage DC24V
* In case of other solenoid valve voltage, contact Pascal separately.
   In case of AC voltage, CE and UL standard are not applicable.

1 Pascal pump
2 Hydraulic circuit
   * Indicated in 1-4 alphabets.
3 Hydraulic gauge for each circuit
   *

1 Pascal pump (model × quantity)  G2 : X6308UG × 1 unit
   For use of mineral oil, contact Pascal separately.

2 Hydraulic circuit

<table>
<thead>
<tr>
<th>Number of clamp circuit</th>
<th>Pascal pump model × quantity</th>
<th>Control unit model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X6308UG × 1 unit</td>
<td>Single solenoid valve X Double solenoid valve S</td>
</tr>
<tr>
<td>1</td>
<td>X6308UG × 1 unit</td>
<td>XX SS</td>
</tr>
<tr>
<td>1</td>
<td>X6308UG × 1 unit</td>
<td>XXX SSS</td>
</tr>
<tr>
<td>2</td>
<td>X6308UG × 1 unit</td>
<td>XXXXXX SSSSS</td>
</tr>
</tbody>
</table>

Clamp circuit  Single solenoid valve + relief valve : X  Double solenoid valve + relief valve : S

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>HCSD-HG2□-□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump model × quantity</td>
<td>X6308UG × 1 unit</td>
</tr>
<tr>
<td>Valve switching system</td>
<td>Pilot air</td>
</tr>
<tr>
<td>Discharge pressure</td>
<td>MPA</td>
</tr>
<tr>
<td>Driving air pressure</td>
<td>MPA</td>
</tr>
<tr>
<td>Discharge volume (at no load)</td>
<td>L/min</td>
</tr>
<tr>
<td>Oil tank capacity</td>
<td>L</td>
</tr>
<tr>
<td>Set pressure of pressure switch</td>
<td>MPA</td>
</tr>
<tr>
<td>Set pressure of relief valve</td>
<td>MPA</td>
</tr>
<tr>
<td>Air consumption rate</td>
<td>Nm³/min</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>°C</td>
</tr>
</tbody>
</table>

Fluid : water glycol system working oil
### HCS Pascal Control unit For small and medium-sized die-casting machine

#### Table: Number of hydraulic circuit

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>18</td>
<td>21</td>
<td>24</td>
</tr>
</tbody>
</table>

- **Model HCL** should be chosen in case of the following cases:
  1. Double pump type is required.
  2. The signal of abnormal high pressure is required for interlocking.
  3. More than five circuits of hydraulic valve are required.

#### Anti vibration rubber (option)

**Model ZPS-B5**

![Diagram showing anti vibration rubber for ZPS-B5]

#### Stand (option)

**Model ZPS-S0**

![Diagram showing stand for ZPS-S0]

- The drawings showing: HCSD-HG255S. For 4 circuits application, contact Pascal for details.
Pascal Control unit  For medium and large-sized die-casting machine

**Model designation**

HCL D - H G2 S S S - L

- Control voltage DC24V
- It can not correspond to voltage other than DC24 V.

1. **Pascal pump (model × quantity)**
   - For use of mineral oil, contact Pascal separately.
   - G2: X6308UG × 1 unit
   - G22: X6308UG × 2 units

2. **Hydraulic circuit**
   - Number of clamp circuit
   - Pascal pump model × quantity
   - Control unit model
     - Single solenoid valve
     - Double solenoid valve

<table>
<thead>
<tr>
<th>Fixed side</th>
<th>Movable side</th>
<th>Pascal pump model × quantity</th>
<th>Control unit model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>X6308UG × 1 unit</td>
<td>XXX</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>X6308UG × 1 unit</td>
<td>XXX</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>X6308UG × 2 units</td>
<td>XXX</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>X6308UG × 2 units</td>
<td>XXX</td>
</tr>
</tbody>
</table>

- Clamp circuit: Single solenoid valve + relief valve: X Double solenoid valve + relief valve: S

---

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>HCLD-HG2□-□</th>
<th>HCLD-HG22□-□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump model × quantity</td>
<td>X6308UG × 1 unit</td>
<td>X6308UG × 2 units</td>
</tr>
<tr>
<td>Valve switching system</td>
<td>Air pilot system</td>
<td></td>
</tr>
<tr>
<td>Discharge pressure</td>
<td>MPA</td>
<td>24.5</td>
</tr>
<tr>
<td>Driving air pressure</td>
<td>MPA</td>
<td>0.47</td>
</tr>
<tr>
<td>Discharge volume (at no load)</td>
<td>L/min</td>
<td>1.3</td>
</tr>
<tr>
<td>Oil tank capacity</td>
<td>L</td>
<td>LOW-LEVEL : 1.5 / UPPER : 3.5</td>
</tr>
<tr>
<td>Set pressure of digital pressure gauge</td>
<td>MPA</td>
<td>14.7 / 30.8 (at excessively high pressure)</td>
</tr>
<tr>
<td>Set pressure of relief valve</td>
<td>MPA</td>
<td>27.9</td>
</tr>
<tr>
<td>Air consumption rate</td>
<td>Nm³/min</td>
<td>Max. 0.4</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>°C</td>
<td>5 ~ 50</td>
</tr>
</tbody>
</table>

Fluid: water glycol system working oil
Pascal Control unit  For medium and large-sized die-casting machine

- The drawings showing: HCLD-HG2SSSS For 5 circuits application, contact Pascal for details.
  *1: Digital pressure gauge outputs the signal of pressure build-up and excessive high pressure.
  *2: Piping diameter for 2 pumps.
  (Rc1/4 is for 1 pump type.)

Pascal pump space for maintenance

<table>
<thead>
<tr>
<th>Number of hydraulic circuit</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>L mm</td>
<td>204</td>
<td>179.5</td>
<td>155</td>
<td>155</td>
</tr>
<tr>
<td>Weight kg</td>
<td>26</td>
<td>29</td>
<td>32</td>
<td>34</td>
</tr>
</tbody>
</table>

Weight for 1 unit of pump (dried). 3kg to be added when 2 pumps are applied.

- The dimensions marked * in the diagrams are for 1 to 4 circuits applications. For 5 or more circuits, the dimension increases by 50mm at every additional circuit.

Anti vibration rubber (option)  model ZPS-B6
Anti vibration rubber : ZPS-B6

Stand (option)  model ZPS-S4
Stand : ZPS-S4

Stand (option)  model ZPS-PZXA7320
Stand : ZPS-PZXA7320
User friendly control panels with compact body and clear indication.
It can be installed to die-casting machine or wall utilizing the rear tap hole.
(M4 bolts × 4 accessories)
**Control box**

---

**Model** | **ECTE-D**  
---|---  
Weight | kg | 4

---

### Mounting bracket

- **L type**
- **Self-standing type**

---

### Interlock

The following interlock is incorporated into the electric control circuit for hydraulic clamp, so the die changing operation can be performed safely.

- The operation of hydraulic and air clamp is feasible only when all of conditions ①～⑥ shown below have become complete at time of die changing.

  - **Hydraulic clamp:** ①Die change mode
  - **Die-casting machine:** ②Set-up (or manual) mode, ③Nozzle retracted, ④Ejector retracted, ⑤Platen closed-end, ⑥Safety door closed

The condition of die-casting machine for ②, ③ and ⑤ can be confirmed with LED lamp on operation panel.
Clamp dies instantly with super strong permanent magnet

Pascal mag clamp is a die clamp system for die-casting machines that clamps a die with powerful magnet force. As the mounting bolt and mounting space for automatic clamp are not required, the die-casting machine surface can be maximized.
Mag clamp (Magnet clamp)

Structure and function

Clamp (Magnetized)

Die

Lines of magnetic flux

Effective height of magnetic flux: approx. 20mm

1. Electromagnetic coil is energized for 0.5 sec.
2. Polarity of alnico magnet is inverted.
3. Neodymium magnet and alnico magnet become homopolar.
4. Magnet core becomes a strong magnet to clamp the die.

Unclamp (Demagnetized)

Die

Plate thickness
35mm
50mm
52mm

1. Electromagnetic coil is energized for 0.5 sec.
2. Polarity of alnico magnet is inverted.
3. Magnetic flux of neodymium magnet and alnico magnet is not emitted from the surface of magnet core so that the die can be unclamped.

- The clamp plate is one set of two plates for movable platen and fixed platen sides.
- Die can be adhered and detached instantly (0.5-4.5 seconds).
- Energization is required only when switching on and off. No energization required during clamped condition.
- Die displacement detection and die fall protection hook are equipped as standard.
- 0 ~ 180 for heat proof type.

Contact Pascal for the details.
An elevating positioning block

Introducing a Die setter, the horizontal and vertical positioning can be determined surely and easily by placing a die on a Die setter and it improves the productivity and set up.

Die setter operation panel

The lift of Die set block is operated. It is mountable near the die-casting machine control panel with L type bracket.

Die setter & Clamp Operation panel

There is also a model integrated with clamp and die setter. Contact Pascal for details.

3,500kN(350ton) Die-casting machine  Die setter & Mag clamp
**Leveling block**

It adjusts the height by putting leveling block between a die set block and die set base.

**Model designation**

<table>
<thead>
<tr>
<th>MDL</th>
<th>01</th>
<th>B</th>
</tr>
</thead>
</table>

1. Die weight

<table>
<thead>
<tr>
<th>Model</th>
<th>MDL01B</th>
<th>MDL03B</th>
<th>MDL04B</th>
<th>MDL06B</th>
<th>MDL10B</th>
<th>MDL15B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Die weight (kg)</td>
<td>1000</td>
<td>3000</td>
<td>4000</td>
<td>6000</td>
<td>10000</td>
<td>15000</td>
</tr>
<tr>
<td>Applied die-casting machine (kN/ton)</td>
<td>1000 (100)</td>
<td>2300 (230)</td>
<td>3500 (350)</td>
<td>6500 (650)</td>
<td>8500 (850)</td>
<td>10500 (1050)</td>
</tr>
<tr>
<td>Loading direction</td>
<td>Vertical and horizontal loading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

● 1 set of Leveling block is attached.
Die setting with sleeve and bush

Die center (X, Y) is not stable and hard to load a die. (Hard to position a sleeve and bush.)

Die setting with die setter

By placing a die on the die setter, horizontal position (X) is determined quickly and securely and die setting can be performed easily.
Die setter & Automatic clamp (vertical loading)

Die size: large

Die size: small

Die setter & Mag clamp (vertical loading)

Die size: small

Die size: large
Die setter operation panel is used (in case it is controlled by a hand valve)

Movable side Die setter MDL-B  
Fixed side Die setter MDL-B  

Die setter operation panel MDL-BKT  
Air 0.47MPa  
(Up)  
(Down)  

Die setter & clamp operation panel is used (in case it is incorporated in the control device)

It does not correspond to some clamps. Contact Pascal for details.

Movable side Die setter MDL-B  
Fixed side Die setter MDL-B  

Solenoid valve unit GSA  
Air 0.47MPa  
(Up)  
(Down)  

Control box  
Die setter & Clamp Operation panel  
Wiring  
Power  
Machine
**Model designation**

MDL – BKT **01**

Air pressure circuit

MDL – BKT **02**

Air pressure circuit

**Number of circuits**

- **01**: 1 circuit (only fixed side)
- **02**: 2 circuits (fixed side & movable side)

**Table**

<table>
<thead>
<tr>
<th>Model</th>
<th>MDL-BKT01</th>
<th>MDL-BKT02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>kg</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Die setter**

**Operation panel**

**MDL-BKT**
Dramatic shortening of set up time for ejector plate !!

It can instantly detach or attach the die ejector plate by magnetizing the machine ejector plate. Mounting and dismounting a ejector cylinder, rod and plate is not required and it shortens the set up time considerably.

3,500kN (350ton) Die-casting machine  C-plate mag clamp & Hydraulic clamp TYB

Displacement detection core  (Displacement detection system)

Close contact detection limit switch

Clamp plate

Max. clamping force: 59kN
C plate (Magnet plate) and A/B plate connect at once by everlasting magnet and die connection is done.

No need for connecting work of ejector rod, cylinder and plate!
In case of manual tightening connection rod …

1. Ejector rod is screwed on plate, 2. Die is fixed on platen and 3. Ejector rod is mounted on cylinder from the back side in a conventional method. It wastes time to change a die.

Need more time to mount.

Need to work at back side of machine and in a narrow space.

The maintenance cost (repair, purchase for replacement and die repair) is high and there is a risk of production stop.
In case of hydraulic type automatic C plate of clamp …

Hard to insert a connection boss when loading a die. (C plate and connection boss interfere with each other.)

Connection boss is manufactured for each die and it costs too much. Storage space must be secured as well.

When die galling occurs, pull back force causes a damage.

The maintenance cost (repair, purchase for replacement and die repair) is high and there is a risk of production stop.
System configuration

C-plate mag clamp

Power voltage: 200V / 220V
  • Different voltage is available.
  • Cables are not included.

The operation for clamp (connection) and unclamp (disconnection) are performed on operation panel of die-casting machine. Contact Pascal for the details.
Magnet plate
model MGE

Magnet core
Size: 32 × 100 mm
Quantity: 16
Total clamping force: 59 kN

Close contact detection proximity switch
• It detects that the ejector plate (A and B) is in close contact with magnet clamp when clamping.
• It detects a displacement of ejector plate.

Specifications of magnet plate differ depending on dies. Contact Pascal for the details.

Control box
model EMGD-G

Height 400 × Width 350 × Depth 200 (mm)

<table>
<thead>
<tr>
<th>Model</th>
<th>EMGD-G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>kg 25</td>
</tr>
</tbody>
</table>

Mounting bracket

Wall mount type
Self-standing type
Hang down type
Effective height of magnetic flux: approx 20mm

1. Electromagnetic coil is energized for 0.5 sec.
2. Polarity of alnico magnet is inverted.
3. Neodymium magnet and alnico magnet become homopolar.
4. Magnet core becomes a strong magnet to clamp the ejector plate.

1. Electromagnetic coil is energized for 0.5 sec.
2. Polarity of alnico magnet is inverted.
3. Magnetic flux of neodymium magnet and Alnico magnet is not emitted from the surface of the magnet core. Thus, it unclamps the ejector plate.
**Displacement detection system (standard)**

Displacement or lifting of die can be detected by the electromagnetic coils built into the magnet core near the center of clamp plates. (When the ejector plate moves, these electromagnetic coils detect an induction current signal.)

---

**Normal clamping status**

- Close contact with ejector plate (A and B) and magnet core.
- Stable magnetic flux
- Displacement detection core
- Electromagnetic coil

**When the die moves**

1. Displacement or lifting
2. Flux changes due to displacement or lifting
3. Induction current is generated.
**C-plate mag clamp practical example**

Max. clamping force: 50.9kN

8,500kN (850ton) Die-casting machine  C-plate mag clamp & Hydraulic clamp TYB-Z

Max. clamping force: 59kN

8,500kN (850ton) Die-casting machine  C-plate mag clamp & Hydraulic clamp TYB
C-plate mag clamp practical example

40,000kN (4,000ton) Die-casting machine  C-plate mag clamp

Max. clamping force : 118kN (59kN × 2)

16,500kN (1,650ton) Die-casting machine  C-plate mag clamp

Max. clamping force : 61kN
Automatic connection of ejector rod

Connection and disconnection of ejector cylinder and plate (A and B) on die side can be automatic by connecting and disconnecting the ejector rod with ball locking. Connection and disconnection is available outside the machine by button operation and it shortens a set up time.
### Ball lock coupler

#### Model designation

**Machine side**

**MED 25 P**

- **Rod diameter**
  - 25: 25mm
  - 29: 29mm
  - 37: 37mm

**Die side**

**MED 25 S**

- **Rod diameter**
  - 25: 25mm
  - 29: 29mm
  - 37: 37mm

---

#### Operation

- **At disconnection**
  - Air unlock

- **At connection**
  - Spring lock (auto-locking)

---

#### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>MED25</th>
<th>MED29</th>
<th>MED37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rod diameter</td>
<td>25mm</td>
<td>29mm</td>
<td>37mm</td>
</tr>
<tr>
<td>Max. allowable load</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When projected</td>
<td>25N</td>
<td>40N</td>
<td>63N</td>
</tr>
<tr>
<td>When returned</td>
<td>4.0N</td>
<td>6.3N</td>
<td>10N</td>
</tr>
<tr>
<td>Operational system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unlock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating air pressure</td>
<td>0.2~0.7MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0~70°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine side</td>
<td>140g</td>
<td>195g</td>
<td>385g</td>
</tr>
<tr>
<td>Die side</td>
<td>85g</td>
<td>135g</td>
<td>260g</td>
</tr>
</tbody>
</table>

*O-ring is included on machine side. (quantity: 1, material: NBR)*
Operational sequence

1. Initial state

2. Die loading
   → Adjusting die thickness
   → Clamping completion

3. Die opening

4. The ejector cylinder strokes forward to the end*.
   After stroke completion, turn off the air unlocking to complete the connection.

5. The ejector cylinder retracts to the second original position* (position for die-casting).
   * Determined in accordance with die size.
**Air circuit diagram**

*In case that interlock is required, contact Pascal.*

**Caution in use**

- When the air pressure is insufficient, unlocking may not be performed.
- Mount the ball lock couplers on machine side and die side with the tightening torque shown below. Excess and deficiency of tightening torque causes a malfunction.

<table>
<thead>
<tr>
<th>Model</th>
<th>MED25</th>
<th>MED29</th>
<th>MED37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque</td>
<td>N⋅m</td>
<td>50</td>
<td>80</td>
</tr>
</tbody>
</table>

- Applying glue (moderate strength) is recommended on die side. Recommended glue for screw lock: Loctite 243

- Make sure to use the adaptor which material has more strength than carbon steel for machine structural use (S45C etc.). In case of using a rolled steel for general structural use (SS400 etc.), adaptor may be worn, deformed and damaged due to strength deficiency.
Pascal has an extensive delivery records of automatic coupling system in the plastic molding, die stamping and die-casting line.

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Size</th>
<th>Auto coupler Max. working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil, Water, Air</td>
<td>3/8&quot;, 1/2&quot;, 3/4&quot;, 1&quot;, 1 1/4&quot;, 1 1/2&quot;, 2&quot;</td>
<td>1 ~ 35 MPa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electric connector</th>
<th>Lock guide, self-alignment mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. current</td>
<td>Allowable eccentricity ± 5mm</td>
</tr>
<tr>
<td>60A</td>
<td></td>
</tr>
</tbody>
</table>
Auto coupler practical example

4,500kN (450ton) IMM Horizontal loading  Auto coupler & Mag clamp

35,000kN (3,500ton) IMM Horizontal loading  Auto coupler & Air clamp

35,000kN (3,500ton) IMM Horizontal loading  Auto coupler
Auto coupler  vertical loading  configuration example

**Fixed side**

![Diagram of the fixed side showing various components such as Auto coupler (die side), Auto coupler (machine side), Bracket, Die, Clamp TYB-Z, T-slot, and other annotations for connections and ports.]

**Machine side**

- Electric connector
- Oil 3/8" × 4 ports
- Water, Air Rc1/2" × 2 ports
- Water, Air 3/8" × 2 ports
- Lock guide socket
- Self-alignment mechanism

**Die side**

- Electric connector
- Oil 3/8" × 4 ports
- Water, Air Rc1/2" × 2 ports
- Water, Air 3/8" × 2 ports
- Lock guide pin
Easy and quick coupling

Multiple couplers are connectable easily and securely by pushing the gripper slightly. It prevents misplace of couplers and can shorten the coupling time.
Multi coupler - open model

Structure

- Lock guide pin
- Incorrect connecting prevention pin
- Incorrect connecting prevention hole
- Piping connection port (Mold side)
- Mold side block
- Coupler open type (Plug)
- Coupler open type (Socket)
- Fluid
- Piping connection port (Supply side)
- Machine side block
- Lock ring
- Gripper
- Lock guide socket
Insert the couplers along the guide.

Push the gripper slightly and the locking has been completed.
**Release operation**

Hold the gripper and pull the lock ring slightly and the couplers disconnect.

Die side coupler

Incorrect connecting prevention hole

Incorrect connecting prevention pin

Machine side coupler

Gripper

Lock ring

**Multi coupler - open model**

The locking completion can be recognized at a glance with this indicator.
8 ports Mold side

4-Ø6.8 hole
Spot facing Ø13 depth 8
(Back side)

173
148
35
60

3 x 28 pitch

Rc1/4

13.5
25
23
48

The mounting bolt on mold side is not included.

Lock guide pin

12 ports Mold side

4-Ø6.8 hole
Spot facing Ø13 depth 8
(Back side)

225
200
35
60

5 x 26 pitch

Rc1/4

13.5
25
23
48

The mounting bolt on mold side is not included.

Lock guide pin
The breadth is 136mm when mold side and machine side are coupled together.
**MCA02**

**Single row type Rc1/4**

### 6 ports Mold side

**MCA02-06 P - B 1**

- Lock guide pin
- 2-ø6.8 hole
- Spot facing ø13 depth 8
- (Back side)
- The mounting bolt on mold side is not included.

### 8 ports Mold side

**MCA02-08 P - B 1**

- Lock guide pin
- 2-ø6.8 hole
- Spot facing ø13 depth 8
- (Back side)
- The mounting bolt on mold side is not included.
**6 ports Machine side**

MCA02 - 06 S - B

- Lock guide socket
- Incorrect connecting prevention pin
- Gripper
- Lock ring

The breadth is 136mm when mold side and machine side are coupled together.

**8 ports Machine side**

MCA02 - 08 S - B

- Lock guide socket
- Incorrect connecting prevention pin
- Gripper
- Lock ring

The breadth is 136mm when mold side and machine side are coupled together.

Rc1/4

5 x 26 pitch: 223

7 x 26 pitch: 275
8 ports Mold side

MCA03-08 P - A 1

- Lock guide pin
- The mounting bolt on mold side is not included.

4-Ø6.8 hole
Spot facing ø13 depth 8
(Back side)

180
155
35
60

16
30
23
53

3×28 pitch

12 ports Mold side

MCA03-12 P - A 1

- Lock guide pin
- The mounting bolt on mold side is not included.

4-Ø6.8 hole
Spot facing ø13 depth 8
(Back side)

235
210
35
60

16
30
23
53

5×28 pitch

Double row type Rc3/8
MCA03  
Double row type Rc3/8

8 ports Machine side
MCA03-08 S-A

- Lock guide socket
- Incorrect connecting prevention pin
- Gripper
- Lock ring

The breadth is 141mm when mold side and machine side are coupled together.

12 ports Machine side
MCA03-12 S-A

- Lock guide socket
- Incorrect connecting prevention pin
- Gripper
- Lock ring

The breadth is 141mm when mold side and machine side are coupled together.
6 ports Mold side

2-Ø6.8 hole
Spot facing Ø13 depth 8
(Back side)

5×28 pitch

16
30
23
53

Rc3/8

The mounting bolt on mold side is not included.

8 ports Mold side

2-Ø6.8 hole
Spot facing Ø13 depth 8
(Back side)

7×28 pitch

16
30
23
53

Rc3/8

The mounting bolt on mold side is not included.
6 ports Machine side

MCA 03-06 S - B

Lock guide socket
Incorrect connecting prevention pin
Gripper
Lock ring

The breadth is 141mm when mold side and machine side are coupled together.

8 ports Machine side

MCA 03-08 S - B

Lock guide socket
Incorrect connecting prevention pin
Gripper
Lock ring

The breadth is 141mm when mold side and machine side are coupled together.
MCA
Multi coupler - open model

Model designation

MCA 03 - 08 P - A 1

Connection port
02: Rc1/4  03: Rc3/8
Number of port
6 ports, 8 ports, 12 ports
Machine side / Mold side
S: Machine side  P: Mold side
Row type
A: Double row type  B: Single row type

<table>
<thead>
<tr>
<th>Connection port</th>
<th>Number of port</th>
<th>Machine/Mold side</th>
<th>Mass kg</th>
<th>Model</th>
<th>Row type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 ports</td>
<td>Machine side</td>
<td>1.1</td>
<td>MCA02 - 08S - A</td>
<td>Double row type</td>
</tr>
<tr>
<td>Rc1/4</td>
<td></td>
<td>Mold side</td>
<td>0.8</td>
<td>MCA02 - 08P - A1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 ports</td>
<td>Machine side</td>
<td>1.4</td>
<td>MCA02 - 12S - A</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>1.0</td>
<td>MCA02 - 12P - A1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 ports</td>
<td>Machine side</td>
<td>0.9</td>
<td>MCA02 - 06S - B</td>
<td>Double row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>0.6</td>
<td>MCA02 - 06P - B1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>Machine side</td>
<td>1.1</td>
<td>MCA02 - 08S - B</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>0.8</td>
<td>MCA02 - 08P - B1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>Machine side</td>
<td>1.2</td>
<td>MCA03 - 08S - A</td>
<td>Double row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>1.0</td>
<td>MCA03 - 08P - A1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 ports</td>
<td>Machine side</td>
<td>1.5</td>
<td>MCA03 - 12S - A</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>1.3</td>
<td>MCA03 - 12P - A1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 ports</td>
<td>Machine side</td>
<td>1.0</td>
<td>MCA03 - 06S - B</td>
<td>Double row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>0.8</td>
<td>MCA03 - 06P - B1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>Machine side</td>
<td>1.1</td>
<td>MCA03 - 08S - B</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mold side</td>
<td>1.0</td>
<td>MCA03 - 08P - B1</td>
<td></td>
</tr>
</tbody>
</table>

Model

<table>
<thead>
<tr>
<th>Model</th>
<th>MCA02</th>
<th>MCA03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rc1/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rc3/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. Passage area (per 1 port) mm²</td>
<td>57</td>
<td>86</td>
</tr>
<tr>
<td>Number of ports</td>
<td>6, 8, 12</td>
<td></td>
</tr>
<tr>
<td>Max. working pressure At connection MPa</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>At disconnection</td>
<td>Open</td>
<td></td>
</tr>
<tr>
<td>Body material Coupler</td>
<td>Stainless steel (Surface treatment: Electrolytic nickel plating)</td>
<td></td>
</tr>
<tr>
<td>Plate</td>
<td>Aluminium alloy (Surface treatment: Electrolytic nickel plating)</td>
<td></td>
</tr>
<tr>
<td>Lock guide</td>
<td>Carbon steel (Surface treatment: Electrolytic nickel plating)</td>
<td></td>
</tr>
<tr>
<td>Material of seal</td>
<td>Nitrile rubber (NBR)</td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Water, Air, General mineral based hydraulic oil</td>
<td></td>
</tr>
<tr>
<td>Operating temperature °C</td>
<td>0 ~ 70 (No freezing)</td>
<td></td>
</tr>
</tbody>
</table>

- Select the multi coupler check valve model MCB in case that the operating temperature is over 70°C.
- Both machine side and mold side have no check valve for preventing fluid leakage inside the coupler.
The multi coupler and mold can be installed by one touch operation with powerful permanent magnet.

**Model designation**

**Double row type**  
MCA – MG – A

<table>
<thead>
<tr>
<th>Connection port</th>
<th>Number of port</th>
<th>Magnet mounting model</th>
<th>Row type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc1/4</td>
<td>8 ports</td>
<td>MCA-MG-A</td>
<td>Double row type</td>
</tr>
<tr>
<td>Rcm</td>
<td>12 ports</td>
<td>–</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td>6 ports</td>
<td>–</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>–</td>
<td>Single row type</td>
</tr>
</tbody>
</table>

* The double row type is applicable for mounting the magnet. The single row type can not be applied.

Mold plate

Magnet (4pcs)

Multi coupler

Mold (Body)

**Dimensions**

MCA02 Rc1/4  
8 Ports: 148  
12 Ports: 200

MCA03 Rc3/8  
8 Ports: 155  
12 Ports: 210

Accessory is not included. Purchase it separately.
Temporary holder for multi coupler

The plug is provided to coupler holder and the fluid does not leak outside even when couplers are pressurized the machine side.

Model designation

![Model designation](image)

<table>
<thead>
<tr>
<th>Connection port</th>
<th>Number of port</th>
<th>Coupler holder model</th>
<th>Row type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc1/4</td>
<td>8 ports</td>
<td>MCA02-08H-A</td>
<td>Double row type</td>
</tr>
<tr>
<td></td>
<td>12 ports</td>
<td>MCA02-12H-A</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td>6 ports</td>
<td>MCA02-06H-B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>MCA02-08H-B</td>
<td></td>
</tr>
<tr>
<td>Rc3/8</td>
<td>8 ports</td>
<td>MCA03-08H-A</td>
<td>Double row type</td>
</tr>
<tr>
<td></td>
<td>12 ports</td>
<td>MCA03-12H-A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 ports</td>
<td>MCA03-06H-B</td>
<td>Single row type</td>
</tr>
<tr>
<td></td>
<td>8 ports</td>
<td>MCA03-08H-B</td>
<td></td>
</tr>
</tbody>
</table>

Accessory is not included. Purchase it separately.
Accessory Coupler holder (Including the mounting bolt)

**Dimensions**

**MCA02-08H-A**

- 8
- 144

**MCA02-12H-A**

- 8
- 144

**MCA02-06H-B**

- 8
- 144

**MCA02-08H-B**

- 8
- 144

**MCA03-08H-A**

- 8
- 144

**MCA03-12H-A**

- 8
- 144

**MCA03-06H-B**

- 8
- 144

**MCA03-08H-B**

- 8
- 144
Overhead crane (vertical loading) to Die changer (horizontal loading)

Die changer is an automatic die changing system, which can change a die quickly and shorten the die change time a great deal, compared with the conventional type of die change operation by means of a forklift or overhead crane.
Die changer configuration example

*For the installation of pusher, there are stand type (installed separately) and incorporated type in Die changer.
Die changer layout example

**Manual loading**  **Non track**

**Manual loading**  **Box framed rail type**

**Pusher**  **Short distance traveling 2 dies**
Die changer layout example

**Drive rollers**  1 pitch traveling  2 dies  Face to face layout

**Pusher**  1 pitch traveling  1 die  Pushing in/out style
Dieses and large sized components

The employer must take necessary action to protect workers from
For safe and quick rotating operation, Consider Pascal Rotator

Roller gear driven type

Model SMR

Model SMR rotates the table with high rigidity roller gear and large sized sprocket, which enables excellent in durability and safety by introducing roller gear driven type (PAT.)

<table>
<thead>
<tr>
<th>Model</th>
<th>SMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driven type</td>
<td>Roller gear driven (electric motor) type</td>
</tr>
<tr>
<td>Max. rotation weight</td>
<td>ton 1, 3, 5, 10, 15, 20, 30, 50</td>
</tr>
</tbody>
</table>
can be rotated safely and quickly. dangerous work in accordance with Industrial Safety and Heath Law. for the die and coil materials in place of overhead cranes.

Flat type
model SMF

Model SMF is embeddable and flat table. The table is rigid enough to be passed over by a forklift or a truck.

<table>
<thead>
<tr>
<th>Model</th>
<th>SMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driven type</td>
<td>Roller gear driven(electric motor) type</td>
</tr>
<tr>
<td>Max. rotation weight</td>
<td>1, 3, 5</td>
</tr>
</tbody>
</table>
Innovation of die-casting hydraulic cylinder

Innovative die-casting hydraulic cylinder with durability, excellent maintainability and compact size comparing to the conventional hydraulic cylinder.
### 3 piece cylinder (core cylinder)

#### Selection of 3 piece cylinder

**Cylinder**
- **KCL**
- **KFL**

**B-type switch**
- **KCB**
- **KFB**

**S-type switch**
- **KCS**
- **KFS**

**C-type switch**
- **KCC**
- **KFC**

---

#### Cylinder inner diameter and stroke (mm)

<table>
<thead>
<tr>
<th>Cylinder inner diameter</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 40</td>
<td>10 15 20 25 50 65 80 100 125 150 –</td>
</tr>
<tr>
<td>Ø 50</td>
<td>10 15 20 25 50 65 80 100 125 150 –</td>
</tr>
<tr>
<td>Ø 63</td>
<td>10 15 20 25 50 65 80 100 125 150 –</td>
</tr>
</tbody>
</table>

#### Cylinder inner diameter and stroke (mm)

<table>
<thead>
<tr>
<th>Cylinder inner diameter</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 80</td>
<td>10 15 20 25 50 65 80 100 125 150 200*</td>
</tr>
<tr>
<td>Ø 100</td>
<td>10 15 20 25 50 65 80 100 125 150 200*</td>
</tr>
<tr>
<td>Ø 125</td>
<td>– – – – 50 65 80 100 125 150 200*</td>
</tr>
</tbody>
</table>

- The Full bore cylinder model KF is selectable for Ø50, Ø63, Ø80, Ø100, Ø125.
- *: B-type switch is not available for stroke 200 mm.
3 piece cylinder

**30% shorter** in overall length and **30% lighter** of mass
(compared with standard type of cylinder)

Sleeve

Integrated structure of cap, cylinder and flange

Integrated structure of piston and rod

Excellent durability and maintenance performance
### Model designation

<table>
<thead>
<tr>
<th>KC</th>
<th>S</th>
<th>080</th>
<th>S</th>
<th>N</th>
<th>150</th>
<th>L</th>
</tr>
</thead>
</table>

1. **Limit switch**

<table>
<thead>
<tr>
<th>Code</th>
<th>L</th>
<th>B</th>
<th>S</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit switch</td>
<td>Without limit switch</td>
<td>B-type switch</td>
<td>S-type switch</td>
<td>C-type switch</td>
</tr>
</tbody>
</table>

2. **Cylinder inner diameter**

<table>
<thead>
<tr>
<th>Code</th>
<th>040</th>
<th>050</th>
<th>063</th>
<th>080</th>
<th>100</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder inner diameter (mm)</td>
<td>Ø40</td>
<td>Ø50</td>
<td>Ø63</td>
<td>Ø80</td>
<td>Ø100</td>
<td>Ø125</td>
</tr>
</tbody>
</table>

3. **Rod tip section**

<table>
<thead>
<tr>
<th>Code</th>
<th>S</th>
<th>F</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rod tip section</td>
<td>Stepped (standard)</td>
<td>Female thread</td>
<td>Male thread</td>
</tr>
</tbody>
</table>

4. **Packing seal**

<table>
<thead>
<tr>
<th>Code</th>
<th>N</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing Material</td>
<td>NBR (standard) Operating temperature: 0~70°C</td>
<td>Fluorocarbon (thermal resistant specification) Operating temperature: 5~120°C</td>
</tr>
</tbody>
</table>

5. **Stroke**

<table>
<thead>
<tr>
<th>Code</th>
<th>010</th>
<th>015</th>
<th>020</th>
<th>025</th>
<th>050</th>
<th>065</th>
<th>080</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke (mm)</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>50</td>
<td>65</td>
<td>80</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>200</td>
</tr>
</tbody>
</table>

6. **Limit switch mounting position** (S-type switch, C-type switch only)

<table>
<thead>
<tr>
<th>Code</th>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit switch mounting position</td>
<td>Left</td>
<td>Right</td>
</tr>
</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>KC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. working pressure</td>
<td>MPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>MPa</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>°C</td>
</tr>
<tr>
<td>Cushion</td>
<td>No</td>
</tr>
</tbody>
</table>

- Fluid: General mineral based hydraulic oil (ISO-VG32 equivalent)
- Water glycol system working oil (set the temperature range as 0~70°C when using water glycol hydraulic oil.)
- *: The heatproof temperature is limited according to the specification of limit switch.
3 piece Full bore cylinder

Pull out force **1.5 times** (compared with standard type of cylinder)
## Model designation

### KF S 080 S N 150 L

<table>
<thead>
<tr>
<th>1 Limit switch</th>
<th>2 Cylinder inner diameter</th>
<th>3 Rod tip section</th>
<th>4 Packing seal</th>
<th>5 Stroke</th>
<th>6 Limit switch mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>L</td>
<td>B</td>
<td>S</td>
<td>C</td>
<td>(S-type switch, C-type switch only)</td>
</tr>
<tr>
<td>Limit switch</td>
<td>Without limit switch</td>
<td>B-type switch</td>
<td>S-type switch</td>
<td>C-type switch</td>
<td></td>
</tr>
</tbody>
</table>

### Code

<table>
<thead>
<tr>
<th>Code</th>
<th>Limit switch mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>10</td>
</tr>
<tr>
<td>015</td>
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</tr>
<tr>
<td>020</td>
<td>20</td>
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<td>025</td>
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<tr>
<td>050</td>
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<tr>
<td>065</td>
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<tr>
<td>080</td>
<td>80</td>
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<tr>
<td>100</td>
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<tr>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

### Fluid

- General mineral based hydraulic oil (ISO-VG32 equivalent)
- Water glycol system working oil (Set the temperature range as 0~70°C when using water glycol hydraulic oil.)

### Operating temperature

- When using water glycol hydraulic oil:
  - 0~70°C

### Stroke

- Operating temperature: 0~70°C
- Fluorocarbon (thermal resistant specification)
  - Operating temperature: 5~120°C

### Cushion

- No
Pascal all products

For plastic molding
- Mag clamp
- Mold die clamping system
- Auto coupler

For sheetmetal stamping
- Traveling clamp
- Stamping die clamp

For automotive parts die & mold
- N2 gas springs

Press machine:
Body, Roof, Door etc...

Molding machine:
Bumper, Instrument panel etc...
Pascal products support automotive production lines globally.

For die cast machine
- Die-clamping system
- C-plate mag clamp

For metal cutting work
- Work clamp
- Pallet clamp
- Index table
- N2 gas balancer
DOMESTIC LOCATIONS

JAPAN

Head office / R & D center  ................................  ･ Itami, Hyogo

- Osaka, Hyogo
- Kumagaya, Saitama,
- Atsugi, Kanagawa

Sales office  ..............................................

- Nagoya, Aichi
- Yamagata
- Hiroshima

Plant  ......................................................

- Oita
- Yamagata