### Valve Gate Components

#### Product Type

Components and accessories to be added to hot runner systems in order to use them as valve gate systems:

1. **Valve gate nozzle head for single nozzles**
   
   Nozzle head for single valve gate nozzles; inherent part of the nozzle which will always be delivered including the complete nozzle.

2. **Actuator, bolted onto the manifold**
   
   Actuator for manifold systems bolted onto the manifold. A required cooling plate is located between the actuator and the manifold in order to cool the actuator and to thermally separate it from the hot manifold surface.

3. **Actuator, in mold plate**
   
   Actuator for manifold systems mounted in the mold plate. The actuator is cooled by the cooling system of the plate.

4. **Cooling unit for single valve gate nozzles**
   
   Without being directly cooled the available single valve gate nozzles can be used up to a mold temperature of 80 °C. For higher temperatures the associated cooling unit has to be used.

5. **SynCool® 1**
   
   The actively-cooled HB actuator series with SynCool® 1 technology allows the user to turn off the actuator cooling together with system shutdown. No post cooling required (see page 20 for more information).

6. **SynCool® 3**
   
   The passively-cooled HB and PB actuator series with SynCool® 3 technology eliminate the need for cooling at pre-heat stations, during operation and post cooling (see page 21 and 24 for more information).

#### Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

<table>
<thead>
<tr>
<th>Operation principle</th>
<th>Actuators for single valve gate nozzles</th>
<th>Actuator, bolted onto manifold</th>
<th>Actuator, in mold plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>pneumatic</td>
<td>CBNS</td>
<td>PNC3008B</td>
<td>VP4008P</td>
</tr>
<tr>
<td></td>
<td>GANS</td>
<td>PNC4508B</td>
<td>VP8016P</td>
</tr>
<tr>
<td></td>
<td>GBNS</td>
<td>PNC4512B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PNC6018B</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PB4008</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PB8016</td>
<td></td>
</tr>
<tr>
<td>hydraulic</td>
<td>HYC2013S</td>
<td>HYC4520M</td>
<td>HYZ3908</td>
</tr>
<tr>
<td></td>
<td>HYC2314S</td>
<td>HB2508</td>
<td>QCVG16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HB4016</td>
<td></td>
</tr>
<tr>
<td>electric</td>
<td>ELA4308P</td>
<td>ELA7616M</td>
<td>ELA5708P</td>
</tr>
<tr>
<td></td>
<td>ELA5708P</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ELA8708P</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pneumatic actuator for single valve gate nozzles; inherent part of the nozzle which will always be delivered including the complete nozzle.

**Valve pin operation**
- Operation medium: pneumatic
- Pressure range: 5...10 bar (72.5 - 145 psi)
- Flow rate: 1.2 l/min
- Reaction time: ~1.2 s
- Valve pin stroke: 8 mm
- Adjustment: ±1.5 mm via adjustment threads from outside
- Closing force: 792 N / 6 bar (87 psi)
- Opening force: 792 N / 6 bar (87 psi)
- Connections: M10x1
  - a) close
  - b) open

**Cooling**
Without being directly cooled the nozzle can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the associated cooling unit has to be used.

**Valve pin**
- Valve pin diameter: Ø 3.8 mm
- Attachment: anti-rotation
Without being directly cooled the single valve gate nozzles 09SVP can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the cooling unit shown here has to be used.

**Cooling**
- **Medium**: Cooling water
- **Flow rate**: 4 l/min
- **Pressure**: max. 8 bar (116 psi)
- **Temperature**: 30...60 °C (86 - 140 °F)
- **Connections**: M14x1.5
Pneumatic actuator for single valve gate nozzles; Inherent part of the nozzle which will always be delivered including the complete nozzle.

**Valve pin operation**
- **Operation medium**: pneumatic
- **Pressure range**: 5...10 bar (72.5 - 145 psi)
- **Flow rate**: 5.4 l/min / 5 bar (72.5 psi)
- **Reaction time**: ~1.2 s
- **Valve pin stroke**: 13 mm
- **Adjustment**: ±1.5 mm via adjustment threads from outside
- **Closing force**: 2081 N / 6 bar (87 psi)
- **Opening force**: 2081 N / 6 bar (87 psi)
- **Connections**: M12x1.5
  - a) close
  - b) open

**Cooling**
Without being directly cooled the nozzle can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the associated cooling unit has to be used.

**Valve pin**
- **Valve pin diameter**: Ø 6 mm
- **Attachment**: anti-rotation
Without being directly cooled the single valve gate nozzles 12SVP can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the cooling unit shown here has to be used.

**Cooling**

- **Medium**: Cooling water
- **Flow rate**: 4 l/min
- **Pressure**: max. 8 bar (116 psi)
- **Temperature**: 30...60 °C (86 - 140 °F)
- **Connections**: M14x1.5
Pneumatic actuator for single valve gate nozzles; inherent part of the nozzle which will always be delivered including the complete nozzle.

**Valve pin operation**
- **Operation medium**: pneumatic
- **Pressure range**: 5...10 bar (72.5 - 145 psi)
- **Flow rate**: 10 l/min / 5 bar (72.5 psi)
- **Reaction time**: ~1.4 s
- **Valve pin stroke**: 14 mm
- **Adjustment**: ±1.5 mm via adjustment threads from outside
- **Closing force**: 3579 N / 6 bar (87 psi)
- **Opening force**: 3579 N / 6 bar (87 psi)
- **Connections**: M12x1.5
  - a) Close
  - b) Open

**Cooling**
Without being directly cooled, the nozzle can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the associated cooling unit has to be used.

**Valve pin**
- **Valve pin diameter**: Ø 8 mm
- **Attachment**: anti-rotation
Without being directly cooled the single valve gate nozzles 16SVP can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the cooling unit shown here has to be used.

**Cooling**
- **Medium**: Cooling water
- **Flow rate**: 4 l/min
- **Pressure**: max. 8 bar (116 psi)
- **Temperature**: 30...60 °C (86 - 140 °F)
- **Connections**: M14x1.5

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
Hydraulic actuator for single valve gate nozzles; Inherent part of the nozzle which will always be delivered including the complete nozzle.

**Valve pin operation**
- Operation medium: hydraulic
- Operating pressure: 40 bar (580 psi)
- Pressure range*: 40 - 60 bar (580...870 psi)
- Valve pin operation
- Operation medium: hydraulic
- Pressure range*: 40 - 60 bar (580...870 psi)
- Flow rate: 2.5 l/min
- Reaction time: ~0.5 s
- Valve pin stroke: 13 mm
- Adjustment: ±1 mm via adjustment threads from outside
- Closing force: 3770 N (40 bar)
- Opening force: 2825 N (40 bar)
- Connections: M12x1.5 (8-L)
  - a) close
  - b) open

**Cooling**
Without being directly cooled the nozzle can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the associated cooling unit has to be used.

**Valve pin**
- Valve pin diameter: Ø 6 mm
- Attachment: anti-rotation
Without being directly cooled the single valve gate nozzles 12SVH can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the cooling unit shown here has to be used.

**Cooling**

- **Medium**: Cooling water
- **Flow rate**: 4 l/min
- **Pressure**: max. 8 bar (116 psi)
- **Temperature**: 30...60 °C (86 - 140 °F)
- **Connections**: M14x1.5

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
Hydraulic actuator for single valve gate nozzles; Inherent part of the nozzle which will always be delivered including the complete nozzle.

**Valve pin operation**

- **Operation medium**: hydraulic
- **Operating pressure**: 40 bar (580 psi)
- **Pressure range**: 40 - 60 bar (580 - 870 psi)
- **Flow rate**: 2.5 l/min
- **Reaction time**: ~0.5 s
- **Valve pin stroke**: 14 mm
- **Adjustment**: ±1 mm via adjustment threads from outside
- **Closing force**: 4984 N / 40 bar (580 psi)
- **Opening force**: 4043 N / 40 bar (580 psi)
- **Connections**: M12x1.5 (8-L)
  - **a)** close
  - **b)** open

**Cooling**

Without being directly cooled the nozzle can be used up to a mold temperature of 80 °C (176 °F). For higher temperatures the associated cooling unit has to be used.

**Valve pin**

- **Valve pin diameter**: Ø 8 mm
- **Attachment**: anti-rotation
Without being directly cooled the single valve gate nozzles 16SVH can be used up to a mold temperature of 80 °C. For higher temperatures the cooling unit shown here has to be used.

**Cooling**

- **Medium**: Cooling water
- **Flow rate**: 4 l/min
- **Pressure**: max. 8 bar (116 psi)
- **Temperature**: 30...60 °C (86 - 140 °F)
- **Connections**: M14x1.5

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
Actuator for manifold systems, bolted onto the manifold. It is sealed by the back plate based on the thermal expansion of the manifold stack height.

**Valve pin operation**
- Operation medium: pneumatic
- Pressure range: 6...12 bar (87...174 psi)
- Flow rate: 1.5 l/min
- Reaction time: ~0.5 s
- Valve pin stroke: 8 mm
- Adjustment: ± 1 mm via adjustment threads from topside

**Closing force**
- 424 N / 6 bar (87 psi)
- 848 N / 12 bar (174 psi)

**Opening force**
- 332 N / 6 bar (87 psi)
- 663 N / 12 bar (174 psi)

**Cooling**
The design provides an indirect cooling through the back plate (max. 80 °C / 175 °F), otherwise cooling lines are required.

**Connections**
No piping. Pressure line provided by back plate.

**Valve pin**
- Valve pin diameter: Ø 3 mm
- Attachment: T - head

Equal length air pressure (OPEN / CLOSE) lines to each actuator are required in order to achieve balanced air pressure and simultaneous actuation.
Actuator for manifold systems, bolted onto the manifold. It is sealed by the back plate based on the thermal expansion of the manifold stack height.

**Valve pin operation**
- Operation medium: pneumatic
- Pressure range: 6...12 bar (87...174 psi)
- Flow rate: 1.5 l/min
- Reaction time: ~0.5 s
- Valve pin stroke: 8 mm
- Adjustment: ± 1 mm via adjustment threads from topside

**Cooling**
The design provides an indirect cooling through the back plate (max. 80 °C / 175 °F), otherwise cooling lines are required.

**Connections**
No piping. Pressure line provided by back plate.

**Valve pin**
- Valve pin diameter: Ø 3 mm, Ø 3.8 mm
- Attachment: T - head

**Available versions**
- PNC4508B-01 Valve pin Ø 3.8 mm
- PNC4508B-02 Valve pin Ø 3 mm

Equal length air pressure (OPEN / CLOSE) lines to each actuator are required in order to achieve balanced air pressure and simultaneous actuation.
Product Description

Actuator for manifold systems, bolted onto the manifold. It is sealed by the back plate based on the thermal expansion of the manifold stack height.

The Actuator is available with optional Thermocouple (TC) and patent pending Position Sensor (PS).

The Position Sensor detects pin position and sends a signal to activeGate® products providing closed loop position control or pin position indication and speed monitoring with Valve Monitoring Interface (VMI).

Valve pin operation

Operation medium: pneumatic
Pressure range: 6...12 bar (87...174 psi)
Flow rate: 1.5 l/min
Valve pin stroke: 12 mm
Adjustment: ± 1 mm via adjustment threads from topside
Closing force:
- 924 N / 6 bar (87 psi)
- 1272 N / 8 bar (116 psi)
- 1590 N / 10 bar (145 psi)
- 1908 N / 12 bar (174 psi)
Opening force:
- 848 N / 6 bar (87 psi)
- 1131 N / 8 bar (116 psi)
- 1414 N / 10 bar (145 psi)
- 1696 N / 12 bar (174 psi)

Valve pin

Attachment: T - head

Available versions

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Position Sensor</th>
<th>Valve Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNC4512B-02</td>
<td>Available with,</td>
<td>Ø3.8 mm</td>
</tr>
<tr>
<td></td>
<td>1 m cable</td>
<td></td>
</tr>
<tr>
<td>PNC4512B-03</td>
<td>Available with,</td>
<td>Ø3 mm</td>
</tr>
<tr>
<td></td>
<td>1 m cable</td>
<td></td>
</tr>
<tr>
<td>PNC4512B-04</td>
<td>----------------</td>
<td>Ø3.8 mm</td>
</tr>
<tr>
<td>PNC4512B-05</td>
<td>----------------</td>
<td>Ø3 mm</td>
</tr>
<tr>
<td>PNC4512B-06</td>
<td>Available with,</td>
<td>Ø3.8 mm</td>
</tr>
<tr>
<td></td>
<td>3 m cable</td>
<td></td>
</tr>
<tr>
<td>PNC4512B-07</td>
<td>Available with,</td>
<td>Ø3 mm</td>
</tr>
<tr>
<td></td>
<td>3 m cable</td>
<td></td>
</tr>
</tbody>
</table>

Cooling

The design provides an indirect cooling through the back plate (max. 80 °C / 175 °F), otherwise cooling lines are required.

Connections

No piping. Pressure line provided by back plate.

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
Actuator for manifold systems, bolted onto the manifold. It is sealed by the back plate based on the thermal expansion of the manifold stack height.

**Valve pin operation**
- **Operation medium**: pneumatic
- **Pressure range**: 6...12 bar (87...174 psi)
- **Flow rate**: 1.5 l/min
- **Reaction time**: ~0.5 s
- **Valve pin stroke**: 18 mm
- **Adjustment**: ± 1 mm via adjustment threads from topside
- **Closing force**: 1696 N / 6 bar (87 psi)
- **Opening force**: 1477 N / 6 bar (87 psi)

**Cooling**
The design provides an indirect cooling through the back plate (max. 80 °C / 175 °F), otherwise cooling lines are required.

**Connections**
No piping. Pressure line provided by back plate.

**Valve pin**
- **Diameter**: Ø 6 mm
- **Attachment**: T - head

**Available versions**
- **PNC6018B-02**: Valve pin, anti-rotation

Equal length air pressure (OPEN / CLOSE) lines to each actuator are required in order to achieve balanced air pressure and simultaneous actuation.
Actuator for manifold systems bolted onto the manifold. A required cooling plate is located between the actuator and the manifold in order to cool the actuator and to thermally separate it from the hot manifold surface.

### Valve pin operation

<table>
<thead>
<tr>
<th>Operation medium</th>
<th>Hydraulic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating pressure</strong></td>
<td>HYC4520M04 series 120 bar (1740 psi)</td>
</tr>
<tr>
<td>HYC4520M05 series 50...60 bar (730...870 psi)</td>
<td></td>
</tr>
<tr>
<td><strong>Flow rate</strong></td>
<td>HYC4520M04 series 6 l/min / 40 bar</td>
</tr>
<tr>
<td>HYC4520M05 series 3 l/min / 40 bar (580 psi)</td>
<td></td>
</tr>
<tr>
<td><strong>Reaction time</strong></td>
<td>~0.5 s / 40 bar (580 psi)</td>
</tr>
<tr>
<td><strong>Valve pin stroke</strong></td>
<td>20 mm</td>
</tr>
<tr>
<td><strong>Adjustment</strong></td>
<td>±1.5 mm via adjustment threads from outside</td>
</tr>
<tr>
<td><strong>Closing force</strong></td>
<td>14100 N / 120 bar (1740 psi)</td>
</tr>
<tr>
<td><strong>Opening force</strong></td>
<td>14100 N / 120 bar (1740 psi)</td>
</tr>
<tr>
<td><strong>Connections</strong></td>
<td>M12x1.5 (8-L)</td>
</tr>
<tr>
<td>a) close</td>
<td></td>
</tr>
<tr>
<td>b) open</td>
<td></td>
</tr>
</tbody>
</table>

### Cooling

<table>
<thead>
<tr>
<th>Medium</th>
<th>Cooling water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow rate</strong></td>
<td>6 l/min</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>30...60 °C (86 - 140 °F)</td>
</tr>
<tr>
<td><strong>Connections</strong></td>
<td>M12x1.5 (8-L)</td>
</tr>
<tr>
<td>max. 3 Actuators in a row</td>
<td></td>
</tr>
<tr>
<td>c) different positions on cooling plate</td>
<td></td>
</tr>
</tbody>
</table>

### Valve pin

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Ø 6 mm, Ø 8 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attachment</strong></td>
<td>Quick coupling, anti-rotation</td>
</tr>
</tbody>
</table>

### Available versions

- HYC4520M04-F/-R with position sensor
- HYC4520M05-F/-R without position sensor
- F = Cooling Full for valve pin guide
- R = Cooling Reduced for valve pin guide

We recommend to cool the actuator after the end of production for 60 minutes at 30°C to protect it against overheat due to heat flow from the manifold.
Available Versions
HB2508
HB4016

Product Description
The actively-cooled HB hydraulic actuator series is bolted onto the manifold.

Each Actuator is available with optional Thermocouple (TC) and patented Position Sensor (PS).

The Position Sensor detects pin position and sends a signal to activeGate® products providing closed loop position control or pin position indication and speed monitoring with Valve Monitoring Interface (VMI).

All HB series actuators are provided with the following features:
♦ Automatic bleed for air removal in Hydraulic lines to provide consistent actuation
♦ Easy Valve Pin adjustment through cutout in top clamp plate
♦ Valve Pin quick coupling
♦ Valve Pin anti-rotation feature

Note: An oil filter with a rating of 10 micron or smaller is required in order to ensure proper automatic bleed performance.

Cooling the Actuator
The cooling plate between the Actuator and the manifold (not shown) provides active cooling of the needle guide and the Actuator to thermally separate it from the hot manifold surface.

A maximum of three Actuators can be plumbed in series to create an independent cooling circuit to prevent overheating of the Actuators.

Maintaining Actuator cooling after end of production for fifteen minutes will protect against overheating.

Cooling Plate (B) can be rotated independently of the Actuator Housing (A).

Note: SynCool® 1 option is available to eliminate post-cooling requirement for many applications (see page 20 for more information).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>HB2508</th>
<th>HB4016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Pin Diameter</td>
<td>3 mm, 3.8 mm</td>
<td>5 mm, 6 mm, 8 mm</td>
</tr>
<tr>
<td>Nozzle Series</td>
<td>06E, 09E</td>
<td>12E, 16E, 22E</td>
</tr>
<tr>
<td>Pin Adjustment</td>
<td>+/- 1 mm</td>
<td>+/- 1.5 mm</td>
</tr>
<tr>
<td>Min/Max Close Forces</td>
<td>1963/2943N</td>
<td>5027/7540N</td>
</tr>
<tr>
<td>Min/Max Open Forces</td>
<td>443/2267N</td>
<td>3598/5259N</td>
</tr>
<tr>
<td>Min/Max. Hydraulic Pressure</td>
<td>40/60bar (600/870psi)</td>
<td>40/60bar (600/870psi)</td>
</tr>
<tr>
<td>Valve Pin Stroke</td>
<td>8 mm</td>
<td>16 mm</td>
</tr>
<tr>
<td>Hydraulic Connections</td>
<td>M10x1.0</td>
<td>M10x1.0</td>
</tr>
<tr>
<td>Cooling Temperature</td>
<td>30/80°C</td>
<td>30/80°C</td>
</tr>
<tr>
<td>Cooling Connections</td>
<td>M10x1.0</td>
<td>M12x1.5</td>
</tr>
</tbody>
</table>
Cutout Dimensions
Cutout dimensions are provided for reference as a guide to determine basic requirements. Reference system drawings for actual dimensions.

### Actuator Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HB2508</td>
<td>198</td>
<td>N/A</td>
<td>28</td>
<td>61</td>
<td>30.5</td>
<td>N/A</td>
<td>76</td>
</tr>
<tr>
<td>HB4016</td>
<td>207.5</td>
<td>157.5</td>
<td>37.5(40°)</td>
<td>80</td>
<td>40</td>
<td>60</td>
<td>94(98°)</td>
</tr>
</tbody>
</table>

*SynCool® 3 option dimensions

Pitch Dimensions
Pitch dimensions are provided for reference as a guide to determine minimum basic requirements. Consult Synventive for applications requiring tighter pitches.

**Without Position Sensor**

<table>
<thead>
<tr>
<th>Actuator</th>
<th>“X”</th>
<th>“Y”</th>
<th>“Z” (IB24)</th>
<th>“Z” (IB32)</th>
<th>“Z” (IB50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB2508</td>
<td>38</td>
<td>38</td>
<td>39</td>
<td>43</td>
<td>56</td>
</tr>
<tr>
<td>HB4016</td>
<td>61</td>
<td>56</td>
<td>53</td>
<td>57</td>
<td>70</td>
</tr>
</tbody>
</table>

**With Position Sensor**

<table>
<thead>
<tr>
<th>Actuator</th>
<th>“X”</th>
<th>“Y”</th>
<th>“Z” (IB24)</th>
<th>“Z” (IB32)</th>
<th>“Z” (IB50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB2508</td>
<td>44</td>
<td>38</td>
<td>56</td>
<td>61</td>
<td>83</td>
</tr>
<tr>
<td>HB4016</td>
<td>63</td>
<td>56</td>
<td>65</td>
<td>70</td>
<td>93</td>
</tr>
</tbody>
</table>

Add 12 mm to the “Y” dimension when SynCool® 3 is used.
**Description**

The actively-cooled HB actuator series is available with SynCool® 1 technology. The cooling plate between the actuator and the manifold provides active cooling of the needle guide and the actuator in order to thermally separate it from the hot manifold surface.

SynCool® 1 technology provides indirect cooling from the top clamp plate, which allows the operator to turn off the hotrunner system, actuator and mold cooling without the risk of decomposing hydraulic oil or damaging seals after ending of production.

**Requirements**

- For applications <280 °C processing temperature & <80 °C mold temperature.
- The Actuator stack height and valve pin length increases by 4 mm for HB4016 (2.5 mm for HB2508).
- 28 mm dimension is required for HB4016 Heat Deflector to make contact with mold (25 mm for HB2508).

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
**SynCool® 3**

The passively-cooled HB4016 hydraulic actuator is using the patent pending SynCool® 3 technology that provides passive actuator cooling via spring acting thermal conductors creating contact with the top clamp plate (TCP) having cooling lines.*

**Features**

- Eliminates numerous hose-plumbed cooling circuits to Actuators
- Provides long-term stable performance by eliminating issues (such as damaged seals and oil decomposition) associated with clogged cooling circuits
- Enables safe Hot Runner use at pre-heat stations* without need for cooling
- Improved manifold thermal uniformity
- Facilitates quick mold changes by enabling simultaneous shut down of Mold Cooling* and Hot Runner.

**Examples**

Figure A on the right shows the temperature of an actuator with SynCool® 3 for applications not requiring TCP cooling, as well as the temperature of an actuator with active cooling. The Hot Runner is at the same operating temperature for both actuators.

The temperature of the actuator with active cooling spikes into a temperature range that could lead to issues when cooling is shut off, while the actuator with SynCool®3 operates at a stable temperature at all times.

Figure B on the right shows the temperature of an actuator with SynCool® 3 for applications requiring TCP cooling, as well as the temperature of an actuator with active cooling. The Hot Runner is at the same operating temperature for both actuators.

Upon shutting off cooling, the temperature of the actuator with active cooling spikes into a temperature range that could lead to issues, while the temperature of the actuator with SynCool® 3 remains cooler during production.

SynCool®3 is ideally suited for use when molding PP, TPO, or HDPE, eliminating the need for actuator cooling lines. To confirm suitability with other materials, please contact Synventive.
Available Versions
PB4008
PB6016
PB8016

Product Description
The actively-cooled PB pneumatic actuator series is bolted onto the manifold.

Each Actuator is available with optional
♦ Thermocouple (TC)
♦ and patented Position Sensor (PS)

The Position Sensor detects pin position and sends a signal to activeGate® products providing closed loop position control or pin position indication and speed monitoring with Valve Monitoring Interface (VMI).

All PB series actuators are provided with the following features:
♦ Easy Valve Pin adjustment through cutout in top clamp plate
♦ Valve Pin quick coupling
♦ Valve Pin anti-rotation feature

Cooling the Actuator
The cooling plate between the Actuator and the manifold (not shown) provides active cooling of the needle guide and the Actuator to thermally separate it from the hot manifold surface.

A maximum of three Actuators can be plumbed in series to create an independent cooling circuit to prevent overheating of the Actuators.

Maintaining Actuator cooling after end of production for fifteen minutes will protect against overheating.

Cooling Plate (B) can be rotated independently of the Actuator Housing (A).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>PB4008</th>
<th>PB6016</th>
<th>PB8016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Pin Diameter</td>
<td>3 mm, 3.8 mm</td>
<td>5 mm</td>
<td>5 mm, 6 mm, 8 mm</td>
</tr>
<tr>
<td>Nozzle Series</td>
<td>06E, 09E</td>
<td>12E</td>
<td>12E, 16E, 22E</td>
</tr>
<tr>
<td>Pin Adjustment</td>
<td>+/- 1 mm</td>
<td>+/- 1.5 mm</td>
<td>+/- 1.5 mm</td>
</tr>
<tr>
<td>Min/Max Close Forces</td>
<td>754/1508N</td>
<td>1696/3393N</td>
<td>3016/6032N</td>
</tr>
<tr>
<td>Min/Max Open Forces</td>
<td>520/1052N</td>
<td>1468/2937N</td>
<td>2788/5578N</td>
</tr>
<tr>
<td>Min/Max. Pneumatic Pressure</td>
<td>6/12 bar (87/175psi)</td>
<td>6/12 bar (87/175psi)</td>
<td>6/12 bar (87/175psi)</td>
</tr>
<tr>
<td>Valve Pin Stroke</td>
<td>8 mm</td>
<td>16 mm</td>
<td>16 mm</td>
</tr>
<tr>
<td>Pneumatic Connections</td>
<td>M10x1.0</td>
<td>M10x1.0</td>
<td>M10x1.0</td>
</tr>
<tr>
<td>Cooling Temperature</td>
<td>30/60 °C</td>
<td>30/60 °C</td>
<td>30/60 °C</td>
</tr>
<tr>
<td>Cooling Connections</td>
<td>M12x1.5</td>
<td>M12x1.5</td>
<td>M12x1.5</td>
</tr>
</tbody>
</table>
**Cutout Dimensions**
Cutout dimensions are provided for reference as a guide to determine basic requirements. Reference system drawings for actual dimensions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PB4008</td>
<td>207.5</td>
<td>157.5</td>
<td>37.5</td>
<td>80</td>
<td>40</td>
<td>55</td>
<td>77.5</td>
</tr>
<tr>
<td>PB6016</td>
<td>215.5</td>
<td>165.5</td>
<td>45.5 (48°)</td>
<td>96</td>
<td>48</td>
<td>60</td>
<td>94 (98°)</td>
</tr>
<tr>
<td>PB8016</td>
<td>225.5</td>
<td>175.5</td>
<td>55.5 (58°)</td>
<td>116</td>
<td>58</td>
<td>60</td>
<td>98 (102°)</td>
</tr>
</tbody>
</table>

*SynCool® 3 option dimensions

**Pitch Dimensions**
Pitch dimensions are provided for reference as a guide to determine minimum basic requirements. Consult Synventive for applications requiring tighter pitches.

<table>
<thead>
<tr>
<th>Actuator</th>
<th>“X”</th>
<th>“Y”</th>
<th>“Z” (IB24)</th>
<th>“Z” (IB32)</th>
<th>“Z” (IB50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB4008</td>
<td>61</td>
<td>56</td>
<td>53</td>
<td>57</td>
<td>70</td>
</tr>
<tr>
<td>PB6016</td>
<td>77</td>
<td>72</td>
<td>61</td>
<td>65</td>
<td>78</td>
</tr>
<tr>
<td>PB8016</td>
<td>97</td>
<td>92</td>
<td>71</td>
<td>75</td>
<td>88</td>
</tr>
</tbody>
</table>

**Without Position Sensor**

<table>
<thead>
<tr>
<th>Actuator</th>
<th>“X”</th>
<th>“Y”</th>
<th>“Z” (IB24)</th>
<th>“Z” (IB32)</th>
<th>“Z” (IB50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB4008</td>
<td>63</td>
<td>56</td>
<td>65</td>
<td>70</td>
<td>93</td>
</tr>
<tr>
<td>PB6016</td>
<td>79</td>
<td>72</td>
<td>73</td>
<td>78</td>
<td>101</td>
</tr>
<tr>
<td>PB8016</td>
<td>99</td>
<td>92</td>
<td>83</td>
<td>88</td>
<td>111</td>
</tr>
</tbody>
</table>

Add 12 mm to the “Y” dimension when SynCool® 3 is used.
The passively-cooled PB6016 & PB8016 pneumatic actuators are using the patent pending SynCool® 3 technology that provides passive actuator cooling via spring acting thermal conductors creating contact with the active cooled top clamp plate (TCP).

Features
♦ Eliminates numerous hose-plumbed cooling circuits to Actuators
♦ Provides long-term stable performance by eliminating issues (such as damaged seals) associated with clogged cooling circuits.
♦ Enables safe Hot Runner use at pre-heat stations* without need for cooling
♦ Improved manifold thermal uniformity
♦ Facilitates quick mold changes by enabling simultaneous shut down of Mold Cooling* and Hot Runner.

Requirements
Reference the Temperature Requirements Guideline shown to the right to determine when TCP cooling* is required.

Examples
Figure A on the right shows the temperature of an actuator with SynCool® 3 for applications not requiring TCP cooling, as well as the temperature of an actuator with active cooling. The HotRunner is at the same operating temperature for both actuators.

The temperature of the actuator with active cooling spikes into a temperature range that could lead to issues when cooling is shut off, while the actuator with SynCool® 3 operates at a stable temperature at all times.

Figure B on the right shows the temperature of an actuator with SynCool® 3 for applications requiring TCP cooling, as well as the temperature of an actuator with active cooling. The HotRunner is at the same operating temperature for both actuators.

Upon shutting off cooling, the temperature of the actuator with active cooling spikes into a temperature range that could lead to issues, while the temperature of the actuator with SynCool® 3 remains cooler during production.

Temperature Requirements Guideline
Actuators without Position Sensors
TCP cooling not required for Hot Runners operating lower than 320°C.

Actuators with Position Sensors
SynCool3 is ideally suited for use when molding PP, TPO, or HDPE, eliminating the need for actuator cooling lines. To confirm suitability with other materials, please contact Synventive.
Pneumatic actuator for manifold systems mounted in the back plate. The actuator is cooled by the cooling system in the plate.

**Valve pin operation**
- **Operation medium**: pneumatic
- **Operating pressure**: 6 - 10 bar (87 - 145 psi)
- **Operation pressure max.**: 11 bar (160 psi)
- **Flow rate**: 1.5 l/min
- **Valve pin stroke**: 8 mm
- **Adjustment**: By adjusting a height adjustment piece
- **Closing force**: 754 N / 6 bar (87 psi)
- **Opening force**: 686 N / 6 bar (87 psi)
- **Connections**: M10x1

**Cooling**
- **Medium**: Clamping plate cooling
- **Operation pressure max.**: 11 bar (160 psi)
- **Flow rate**: 1.5 l/min
- **Valve pin diameter**: Ø 3.0 mm, Ø 3.8 mm
- **Attachment**: Valve pin head inside piston

**Different Informations**
- **Minimum clamping plate thickness**: 32 mm
- **Minimum distance between two actuators**: 55 mm
- **Max. distance from actuator to center support**: 650 mm

**Important**
Customer must use clean, lubricated air for proper actuation.
HOT RUNNER TECHNOLOGY
Actuators and Accessories

VP8016P Series - Pneumatic Actuator, in mold plate

Pneumatic actuator for manifold systems mounted in the back plate. The actuator is cooled by the cooling system in the plate.

Valve pin Operation
- Operation medium: pneumatic
- Pressure range: 6 - 10 bar (87 - 145 psi)
- Operation pressure max: 11 bar (160 psi)
- Flow rate: 10 l/min
- Valve pin stroke: 16 mm
- Adjustment: By adjusting a height adjustment piece
- Closing force: 3016 N / 6 bar (87 psi)
- Opening force: 2788 N / 6 bar (87 psi)
- Connections: M12x1.5

Valve pin
- Valve pin diameter: Ø 5 mm, Ø 6 mm, Ø 8 mm
- Attachment: Valve pin head inside piston

Cooling
- Medium: Clamping plate cooling
- Maximum temperature: 100 °C (210 °F)
- Clamping lines are required in clamping plate.

Different Informations
- Minimum clamping plate thickness: 50 mm
- Minimum distance between two actuators: 97 mm
- Max. distance from actuator to center support: 650 mm

Important
- Customer must use clean, lubricated air for proper actuation

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

Master Language is English
© 2019 Synventive Molding Solutions
All rights reserved. Errors and exceptions excepted.
Hydraulic actuator for manifold systems mounted in the clamping plate. The actuator is cooled by the cooling system in the plate.

**Valve pin operation**
- **Operation medium**: hydraulic
- **Operating pressure max.**: 40 bar (600 psi)
- **Flow rate**: 1.5 l/min
- **Reaction time**: ~0.2 s
- **Valve pin stroke**: 8 mm
- **Adjustment**: By height adjusting of washers above and below valve pin head
- **Closing force**: 1964 N / 40 bar (580 psi)
- **Opening force**: 1512 N / 40 bar (580 psi)
- **Connections**: Ø 5 mm

**Cooling**
- **Medium**: Clamping plate cooling max. 60 °C (140 °F).
- **Cooling lines are required in clamping plate.**

**Valve pin**
- **Valve pin diameter**: Ø 3.8 mm
- **Attachment**: Valve pin head inside piston.

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
Hydraulic actuator for manifold systems mounted in the clamping plate. The actuator is cooled by the cooling system in the plate, and features a mechanism that automatically bleeds air out of the hydraulic lines when the piston is in the fully retracted position.

**Valve pin operation**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation medium</td>
<td>hydraulic</td>
</tr>
<tr>
<td>Pressure range</td>
<td>35 - 42 bar (500 - 600 psi)</td>
</tr>
<tr>
<td>Operating pressure max.</td>
<td>103 bar (1500 psi)</td>
</tr>
<tr>
<td>Flow rate</td>
<td>1.8 l/min</td>
</tr>
<tr>
<td>Valve pin stroke</td>
<td>16 mm</td>
</tr>
<tr>
<td>Adjustment</td>
<td>± 1 mm</td>
</tr>
<tr>
<td>Closing force</td>
<td>6670 N / 100 bar (1450 psi)</td>
</tr>
<tr>
<td>Opening force</td>
<td>6670 N / 100 bar (1450 psi)</td>
</tr>
<tr>
<td>Connections</td>
<td>Ø 1/8 NPT</td>
</tr>
</tbody>
</table>

**Cooling Medium**

Clamping plate cooling max. 100 °C (210 °F). Cooling lines are required in clamping plate.

**Valve pin**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve pin diameter</td>
<td>Ø 5 mm, Ø 6 mm, Ø 8 mm</td>
</tr>
<tr>
<td>Attachment</td>
<td>Quick coupling, anti-rotation</td>
</tr>
</tbody>
</table>

**Available versions**

- **QCVG16M04** Standard Offering (Cutout shown on the right hand side)
- **QCVG16M06** Position sensor Option for hGate® applications.
- **QCVG16M07** Limit Switch Option

**Note**

The QCVG16M04 is available with optional Position Sensor for detecting and sending pin position signals for use with applications utilizing Synflow® and valve monitoring interface (VMI).

^ Minimum top clamp plate thickness when using Position Sensor:
- 80 mm
- 95 mm when used with magnetic platen

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
**Electrical Actuator**

For manifold systems mounted in mold plate.

**Valve pin operation**

- **Operation medium**: electrical
- **Valve pin stroke**: up to 9 mm
- **Adjustment**: High precision, individual pin position, 0.01 mm fine increments with flexibility to adjust in user-defined increments.

**Cooling**

A separate actuator retainer plate cooling circuit at a temperature less than or equal to 26°C (80°F) is required. An insulator plate (6 mm) is required if the cavity plate temperature exceeds 26°C (80°F).

**Valve pin**

- **Valve pin diameter**: Ø 2 mm
- **Attachment**: Quick coupling, no anti-rotation

**Available versions**

- **ELA4308P05**: 1000 mm cable length
- **ELA4308P06**: 2000 mm cable length

**Components for the Mounting of the Actuator**

- (1) Actuator
- (SF) Spacer plate
- (RP) Retainer plate
- (IP) Insulator plate
- (VPG) Valve pin guide
- (M) Manifold
- (CP) Cavity plate

**Cutout**
**Electrical Actuator**
For manifold systems mounted in mold plate.

**Valve pin operation**
- **Operation medium**: electrical
- **Valve pin stroke**: up to 9 mm
- **Adjustment**: High precision, individual pin position, 0.01 mm fine increments with flexibility to adjust in user-defined increments.

**Cooling**
A separate actuator retainer plate cooling circuit at a temperature less than or equal to 26°C (80°F) is required.
An insulator plate (6 mm) is required if the cavity plate temperature exceeds 26°C (80°F)

**Valve pin**
- **Valve pin diameter**: Ø 2 mm
- **Attachment**: Quick coupling, no anti-rotation

**Available versions**
- ELA5708P01 1000 mm cable length
- ELA5708P02 2000 mm cable length

**Components for the Mounting of the Actuator**
- (1) Actuator
- (SP) Spacer plate
- (RP) Retainer plate
- (VPG) Valve pin guide
- (M) Manifold
- (IP) Insulator plate
- (CP) Cavity plate

**Cutout**

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
**Electrical Actuator**
For manifold systems mounted in mold plate.

**Valve pin operation**
- **Operation medium**: electrical
- **Valve pin stroke**: up to 9 mm
- **Adjustment**: High precision, individual pin position, 0.01 mm fine increments with flexibility to adjust in user-defined increments.

**Cooling**
A separate actuator retainer plate cooling circuit at a temperature less than or equal to 55 °C (131 °F) is required. An insulator plate (6 mm) is required if the cavity plate temperature exceeds 55 °C (131 °F).

**Valve pin**
- **Valve pin diameter**: Ø 3 mm
- **Attachment**: Quick coupling, no anti-rotation

**Available versions**
- ELA8708P01: 1000 mm cable length
- ELA8708P02: 2000 mm cable length
- ELA8708P03: 3000 mm cable length

**Components for the Mounting of the Actuator**
- (1) Actuator
- (SP) Spacer plate
- (RP) Retainer plate
- (IP) Insulator plate
- (VPG) Valve pin guide
- (M) Manifold
- (CP) Cavity plate

**Cutout**
Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.
**Electrical Actuator**

Actively-cooled Electric Actuator Assembly that is bolted onto the manifold. The Electric Actuator Assembly has pre-terminated cable connections for easy installation to the Junction Box.

**Valve pin operation**

- **Operation medium**: electrical
- **Valve pin stroke**: up to 16 mm
- **Adjustment**: High precision, individual pin position, 0.01 mm fine increments with flexibility to adjust in user-defined increments.

**Cooling**

The plate between the actuator and manifold provides indirect cooling of the needle guide via the actuator cooling jacket, while also providing thermal isolation from the hot manifold surface.

A maximum of three Actuators can be plumbed in series to create an independent cooling circuit to prevent overheating of the Actuators. Maximum temperature of each cooling circuit is 55°C / 131°F.

Consult Synventive for applications processing at temperatures greater than 260°C

**Valve pin**

- **Valve pin diameter**: Ø 5 mm, Ø 6 mm, Ø 8 mm
- **Attachment**: Quick coupling, anti-rotation

**Available versions**

- ELA7616M01 1000 mm cable length
- ELA7616M03 3000 mm cable length
- ELA7616M06 6000 mm cable length

Reference to eGate Product Catalog 2.0 for Medium to Large Part Molding CAT-16-0039_EN-Rev##

**Cutout**

Cutout dimensions are provided for reference as a guide to determine basic requirements. Reference system drawings for actual dimensions.
Servo valves to operate the valve pins of valve gate hot runner systems. Servo valves are mounted to a valve block. This valve block and its components can either be mounted to the hot runner system or directly to the tool.

**Operating Data**
- **Pressure**: 40 bar (600 psi)
- **max. inlet pressure**: 250 bar
- **Connection**: G 1/2"
- **Operating voltage**: 24 VDC
- **Supported hydraulic Actuators and Nozzle Series**: Actuator Series for all available needle Ø and Nozzle Series
- **Type of reset**: Air spring
- **Operating medium**: Hydraulic oil HLP 32 DIN 51524-2, purity level 2/1/10/13 according ISO 4406

**Configure your valve manifold here**

1. Example of description

```
XDM | 05 | 1
```

   A - Product group
   B - Number of circuits
   C - Type of recovery

2. Selection of variables

<table>
<thead>
<tr>
<th>A - Product group</th>
<th>XDM - hydraulic valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>B - Number of circuits</td>
<td># - number of circuits / valve gate nozzles</td>
</tr>
<tr>
<td>C - Type of recovery</td>
<td>1 - spring recovery</td>
</tr>
</tbody>
</table>

3. Your specification

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
</table>

Fill in your specification according to the explanation given above.

**Note**

“The Hydraulic Valve manifold is available as XFM in China, unless otherwise specified”

**Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.**
Servo valves to operate the valve pins of valve gate hot runner sytems. Servo valves are mounted to a valve block. This valve block and its components can either be mounted to the hot runner system or directly to the tool.

**Operating Data**
- Pressure: 40 bar (600 psi)
- max. inlet pressure: 250 bar
- Connection: G 1/2"
- Operating voltage: 24 VDC
- Supported hydraulic Actuators and Nozzle Series: Actuator series for all available needle diameter and nozzle series
- Type of reset: Air spring or double solenoid operated
- Operating medium: Hydraulic oil HLP 32 DIN 51524-2, purity level 21/18/13 according ISO 4406

Configure your valve manifold here

1. Example of description
   - XDM 05

2. Selection of variables
   - **A - Product group**
     - XDM - hydraulic valves
   - **B - Number of circuits**
     - # - number of circuits / valve gate nozzles
   - **C - Type of recovery**
     - 2 - electrically operating of both side, with latching function

3. Your specification

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Fill in your specification according to the explanation given above.

**Note**
"The Hydraulic Valve manifold is available as XFM ... in China, unless otherwise specified"
Servo valves to operate the valve pins of valve gate hot runner systems. Servo valves are mounted to a valve block. This valve block and its components can either be mounted to the hot runner system or directly to the tool.

**Operating Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>40 bar</td>
</tr>
<tr>
<td>Max. inlet pressure</td>
<td>250 bar</td>
</tr>
<tr>
<td>Connection</td>
<td>G 1/2&quot;</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Supported hydraulic actuators and nozzle series</td>
<td>Actuator series with needle diameter up to 3.8 mm for nozzle series 06E, 09E</td>
</tr>
<tr>
<td>Type of reset</td>
<td>Air spring</td>
</tr>
<tr>
<td>Operating medium</td>
<td>Hydraulic oil HLP 32 DIN 51524-2, purity level 21/18/13 according ISO 4406</td>
</tr>
</tbody>
</table>

**Configure your valve manifold here**

1. Example of description

   XCM 05 C

   B - Number of circuits
   A - Product group

2. Selection of variables

   **A - Product group**
   
   XCM - hydraulic valves

   **B - Number of circuits**
   
   # - number of circuits / valve gate nozzles

3. Your specification

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Fill in your specification according to the explanation given above.
Servo valves to operate the valve pins of valve gate hot runner systems. Servo valves are mounted to a valve block. This valve block and its components can either be mounted to the hot runner system or directly to the tool.

**Operating data**

- **Pressure**: 2 - 10 bar / 29 - 145 psi
- **Connections**: G 3/8" G 1/8"
- **Operating voltage**: 24 VDC / 230VAC
- **Type of reset**: Air spring
- **Operating medium**: Filtered compressed air, grade of filtration 40 μm, lubricated or unlubricated
- **Medium temp.**: -5 - 50 °C / 23 - 122 °F

**Configure your valve manifold here**

1. **Example of description**

   - XBM - pneumatic valves
   - B - Number of circuits
   - C - Type of recovery

2. **Selection of variables**

   - **A - Product group**
     - XBM - pneumatic valves
   - **B - Number of circuits**
     - # - number of circuits / valve gate nozzles
   - **C - Type of recovery**
     - 1 - spring recovery
     - 2 - electrically operating of both side

3. **Your specification**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Fill in your specification according to the explanation given above.