For proper function and to achieve best workpiece quality, the following preconditions for mould design and installation of the cylinder must be accomplished:

**Design preconditions (mould):**
- Consideration of highest possible rigidity of coupling elements between cylinder and mould, like traverses, angular and adaptor flanges, screwed joints
- Avoidance of bending forces: any transmission of cross or bending moments into the piston rod is forbidden!
- Shortest distribution of forces as possible
- Regard screw recommendations for mounting the flange implicitly! (see table page 24 in CyPull-catalogue)

**Preconditions with installation (cylinder):**
- The front pressure port (retract) must be depressurised and open during the locking process!
- The piston rod must have reached its extended end position and be locked!
- When using alignment screws and other coupling elements, a secure connection of the elements must be provided (Screw joints must be tightened carefully!)
- Third-party manufactured alignment screws must fulfil the following criteria:
  - the surface must have a spherical contour to be able to compensate angular and offset tolerances. Regard the detailed information about the alignment screws on page 25 in CyPull-catalogue.
  - Alignment screws must be hardened especially in the area of ist spherical shape.
  - Especially for series HX: the piston rod must not be twisted!

**Installation instructions**

1. With pressurising the back port with air the piston rod is put into locked position. Only for series HX and HD: a click will be heard when the rod locks up. **Caution:** when the rod moves and when it reaches the locked position, small amounts of oil may be sprayed from the front port!

Only for series HX: when no proximity switches are used the locking position is indicated by a pin retracted into the front end of the cylinder.

- Pin protrudes: rod unlocked
- Pin retracted: rod locked

2. Screw lock nut to the end of the thread. The bevel must face the front end of the cylinder. Then screw the cylinder into the flange until only the half of its thread is visible.
3. Provided with an alignment screw, the rod can be connected to the core using a counterpiece. Ensure that all threads and screwed joints between piston rod, coupling elements and core are tightened and secured.

4. Now the flange is mounted to the mould carefully using the recommended socket screws.

### Adjustment of the locking up point

With screwing in the cylinder into the mounting flange, the “core in” position and the locking up of the piston rod is put into alignment. In case of using contacting cores it is recommended that the cylinder is screwed in securely, e.g. using adequate tools.

**A full resistance must be found!**

When the cylinder is in its correct adjusted axial position the lock nut is tightened. The bevel of the lock nut must face the flange.

#### Additional advice for series HS

To achieve an optimal pre-load proceed as follows:

1. Installation and adjustment according to the table above
2. Remeasure the flash, if necessary.
3. Release the lock nut.
4. The cylinder must be re-adjusted regarding the measured flash (refer to table above).
5. Tighten lock nut.

Further adjustments can be made step by step until the proper position is reached.

#### Advice for the programming of the machine control for series HS

If the core pull control of the injection moulding machine offers the possibility to hold the control valve in “Core in”-position during the injection process, this position should be used. By means of this it is avoided that proximity switches eventually switch too early and inhibit a complete locking or that the pre-load cannot come into effect. A creeping back of the core in case of mould deformation is also enabled.

### Series HS: Adjustment of maximum pre-load

<table>
<thead>
<tr>
<th>Piston Ø</th>
<th>Thread size</th>
<th>max. pretension distance</th>
<th>Degree</th>
<th>Rotation adjustment range</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>M5x2</td>
<td>0,5mm</td>
<td>90°</td>
<td>0,1mm ≈ 18°</td>
</tr>
<tr>
<td>32</td>
<td>M7x2</td>
<td>0,5mm</td>
<td>90°</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>M8x2</td>
<td>0,5mm</td>
<td>90°</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>M9x2</td>
<td>1,0mm</td>
<td>180°</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>M11x2</td>
<td>1,0mm</td>
<td>180°</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>M14x2</td>
<td>1,0mm</td>
<td>180°</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>M16x3</td>
<td>1,0mm</td>
<td>120°</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>M19x3</td>
<td>1,0mm</td>
<td>120°</td>
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</tr>
<tr>
<td>160</td>
<td>M23x3</td>
<td>1,0mm</td>
<td>120°</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>M29x3</td>
<td>1,0mm</td>
<td>120°</td>
<td></td>
</tr>
</tbody>
</table>
Inductive proximity switches enable the electronic sensing of the locked condition and core position respectively.

Two types of inductive sensors are available:
- 3-wire DC PNP, positive switching (on request: 3-wire DC NPN negative switching)
- 2-wire DC NAMUR

in two designs each:
- with cable or
- with angled plug

PNP Sensor
Type: with cable: B6, B7, B8, B9
with angled plug: B27, B28, B29

NAMUR Sensor
Type: with cable: B1, B2, B3, B4
with angled plug: B22, B23, B24

Mounting instructions for proximity switches

The integrated switches are adjusted by the manufacturer and do not require any further adjustment.
In exceptional cases it can be necessary that the sensors are exchanged. Please proceed as follows:

Inquiry “piston rod locked - core in”:
This condition is detected by the front sensor (rod side). Before fitting the switch, the piston rod of the cylinder must be in the completely extended position. The locking slide is in locked position.

Now screw the switch in until you just get a signal on the switch and then, wind in another half a turn.

Then tighten the sensor in its position using the lock nuts.

Inquiry “piston rod unlocked - core out”:
This condition is detected by the rear sensor (piston side). Before fitting the switch, the piston rod of the cylinder must be in the completely retracted position. Then follow the above procedure.
Then tighten the sensor in its position using the lock nuts.

Caution: It is possible to screw the switches in too far, then, when the slide moves across, or the piston moves back, it will collide with the switch and break the ceramic front face.

Provide for highest cleanliness! With screwing the sensor into the cylinder body the O-ring seal must not be damaged!
As an option, a handheld proximity switch tester is available for testing the PNP switches. It can be helpful especially for the mounting of the sensors.

A serial connection of the sensors of parallel working cylinders is forbidden because of security reasons. Possibly there can occur undefined signals for short periods, though the second (third o.s.) cylinder isn't retracted or locked. A generated peak voltage causes a misinterpretation of the signals in the control system. That leads to faulty switching and can cause a machine crash.