Pneumatic cylinders
Series P5T
Short Stroke Thrusters
Catalogue PDE2557TCUK  September 2014
## PDE2557TCUK

### P5T Short Stroke Thrusters

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<td>***</td>
<td>*</td>
</tr>
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<td>***</td>
<td>***</td>
<td>*</td>
</tr>
<tr>
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<td>***</td>
<td>***</td>
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<td>***</td>
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<td>***</td>
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<td>*</td>
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<td>***</td>
<td>*</td>
<td>***</td>
</tr>
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<td>***</td>
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<td>***</td>
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<td>***</td>
<td>***</td>
<td>*</td>
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<td>***</td>
<td>*</td>
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<td>***</td>
<td>**</td>
<td>**</td>
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<tr>
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<td>***</td>
<td>**</td>
<td>*</td>
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<td>**</td>
<td>***</td>
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<td>*</td>
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<tr>
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<td>*</td>
<td>**</td>
<td>***</td>
</tr>
<tr>
<td>Compressor capacity required</td>
<td>*</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

* = good, **=average, ***=excellent

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### Important

Before attempting any external or internal work on the cylinder or any connected components, make sure the cylinder is vented and disconnect the air supply in order to ensure isolation of the air supply.

### Note

All technical data in this catalogue are typical data only. Air quality is essential for maximum cylinder service life (see ISO 8573).

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Short Stroke Thrusters

P5T cylinders are a modern and versatile range of cylinders with integral guides. The cylinders are double-acting, with end stop cushioning for quiet and vibration-free operation. They have strong shafts to prevent twisting, and everything is integrated into the cylinder housing.

The complete programme of cylinders comprises 9 cylinder diameters, Ø16 - Ø100 mm and strokes ranging from 10 to 200 mm. As with other Parker cylinders, the cylinder is initially lubricated with a white, non-poisonous grease which is approved for use in foodstuff preparation (USDA).

The strong guide shafts make it possible to absorb considerable thrust forces and torque. The cylinder is available with two different types of bearing in contact with the shaft, a recirculating ball bearing or plain bearing.

Multiple choice of connections is also a feature, one version has two connections at the rear or two connections from above, selectable by moving the enclosed plugs, and another version with two side connections is also available.

The P5T range has an integrated T-groove for sensors in the body. The T-groove makes it quick and easy to install non-contact sensors without increasing the installation dimensions of the cylinders.

The attachment plate and cylinder housing have dowel holes to give exact location during assembly. This also facilitates cylinder replacement.

The surface-treated steel fixing plate provides robust attachment.
Fixed end stop cushioning
Polyurethane end stop cushioning built in to the end covers is standard

Clean external design
The cylinder is designed without pockets or other cutouts in the body, in which dirt or fluids could collect. This makes cleaning both simple and easy.

Non-contact sensing
All cylinders are supplied with a magnetic piston as standard, for non-contact sensing. Electronic type sensors and reed switches are available. They are supplied with either flying lead or cable plug connector.

Options
In addition to the standard designs, a number of variants of the P5T range are available to special order, to provide effective solutions in a large number of applications.

Cylinders with special strokes
Cylinders with two fixing plates
Cylinders with adjustable stops, with cushioning
High-temperature cylinders for the temperature range of -10°C to +150°C (not magnetic piston).

Plain bearing or recirculating ball bearings
The P5T is supplied with plain bearings as standard. This type of bearing has guide rods of greater diameter, providing excellent support for heavy loads, especially static loads. Plain bearings are highly tolerant of vibration and dirt, and are suitable for regular cleaning.

Recirculating ball bearings are used for applications which require high precision and low friction.

The choice should be based on the following factors:

<table>
<thead>
<tr>
<th>Application requirements</th>
<th>Plain bearing</th>
<th>Recirculating ball bearings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Friction</td>
<td>Higher</td>
<td>Low</td>
</tr>
<tr>
<td>Coefficient of friction</td>
<td>Variable</td>
<td>Constant</td>
</tr>
<tr>
<td>Precision during service life</td>
<td>Variable</td>
<td>Constant</td>
</tr>
<tr>
<td>Static load capacity</td>
<td>Excellent</td>
<td>Good</td>
</tr>
<tr>
<td>Dynamic load capacity</td>
<td>Good, but with friction losses</td>
<td>Good</td>
</tr>
<tr>
<td>Vibration tolerance</td>
<td>Excellent</td>
<td>Average</td>
</tr>
<tr>
<td>Dirt tolerance</td>
<td>Excellent</td>
<td>Poor</td>
</tr>
<tr>
<td>Washing tolerance</td>
<td>Excellent</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Double acting, connections on top.

Double acting, connections at rear.

Double acting, connections on side.

Double acting with two fixing plates, side connections are recommended.

Double acting with two fixing plates and adjustable end stops with cushioning, side connections are recommended.

Double acting with one fixing plate adjustable end stops with cushioning, connections on side, on top or at rear.
## Cylinder forces, double acting variants

<table>
<thead>
<tr>
<th>Cyl. bore/ pist. rod mm</th>
<th>Stroke</th>
<th>Piston area cm²</th>
<th>Max theoretical force in N (bar)</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td>1.0  2.0  3.0  4.0  5.0  6.0  7.0  8.0  9.0  10.0</td>
<td></td>
</tr>
<tr>
<td>16/8</td>
<td>+</td>
<td>2.0  20  40  60  80  100 120 141 161 181 201</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>1.5  15  30  45  60  75  90 106 121 136 151</td>
<td></td>
</tr>
<tr>
<td>20/10</td>
<td>+</td>
<td>3.1  31  63  94 126 157 188 220 251 283 314</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>2.3  23  46  69  92 115 138 161 184 207 231</td>
<td></td>
</tr>
<tr>
<td>25/10</td>
<td>+</td>
<td>4.9  49  98 147 196 245 295 344 393 442 491</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>4.1  41  82 124 165 206 247 289 330 371 412</td>
<td></td>
</tr>
<tr>
<td>32/16</td>
<td>+</td>
<td>7.9  79 158 237 316 394 473 552 631 710 789</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>5.9  59 118 178 237 296 355 418 473 533 592</td>
<td></td>
</tr>
<tr>
<td>40/16</td>
<td>+</td>
<td>12.6 126 251 377 503 628 754 880 1005 1131 1257</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>10.6 106 211 317 422 528 633 739 844 950 1056</td>
<td></td>
</tr>
<tr>
<td>50/20</td>
<td>+</td>
<td>19.6 196 393 589 785 982 1178 1374 1571 1767 1963</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>16.5 165 330 495 660 825 990 1155 1319 1484 1649</td>
<td></td>
</tr>
<tr>
<td>63/20</td>
<td>+</td>
<td>31.2 312 623 935 1247 1559 1870 2182 2494 2806 3117</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>28.0 280 561 841 1121 1402 1682 1962 2242 2523 2803</td>
<td></td>
</tr>
<tr>
<td>80/25</td>
<td>+</td>
<td>50.3 503 1005 1508 2011 2513 3016 3619 4021 4524 5027</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>45.4 454 907 1361 1814 2268 2721 3175 3629 4082 4536</td>
<td></td>
</tr>
<tr>
<td>100/25</td>
<td>+</td>
<td>78.5 785 1571 2356 3142 3927 4712 5498 6283 7069 7854</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>73.6 736 1473 2209 2945 3682 4418 5154 5890 6627 7363</td>
<td></td>
</tr>
</tbody>
</table>

Note! Select a theoretical force 50-100% larger than the force required.

### Working medium, air quality

Working medium: Dry, filtered compressed air to ISO 8573-1 class 3.4.3.

Recommended air quality for cylinders

For best possible service life and trouble-free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5 µm filter (standard filter) dew point +3 °C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m³, which is what a standard compressor with a standard filter gives.

ISO 8573-1 quality classes

<table>
<thead>
<tr>
<th>Quality class</th>
<th>Pollution particle size (µm)</th>
<th>Pollution max. concentration (mg/m³)</th>
<th>Water max. press. dew point (°C)</th>
<th>O³ max. concentration (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1</td>
<td>0.1</td>
<td>-70</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-40</td>
<td>0.1</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>5</td>
<td>-20</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>8</td>
<td>+3</td>
<td>5.0</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>10</td>
<td>+7</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>+10</td>
<td>-</td>
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</tbody>
</table>

+ = Outward stroke  
- = Return stroke
Parker Hannifin Corporation
Pneumatic Division - Europe

PDE2557TCUK
P5T Short Stroke Thrusters

Main data: P5T

<table>
<thead>
<tr>
<th>Cylinder designation</th>
<th>Cylinder diam.</th>
<th>Piston rod diam.</th>
<th>Theoretical cylinder thrust at 6 bar</th>
<th>Air consumption</th>
<th>Connection thread</th>
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<tbody>
<tr>
<td></td>
<td>mm</td>
<td>mm</td>
<td>outward stroke</td>
<td>N</td>
<td>litre</td>
</tr>
<tr>
<td>P5T-016+G+XXX(1)</td>
<td>16</td>
<td>8</td>
<td>120</td>
<td>0.026</td>
<td>M5</td>
</tr>
<tr>
<td>P5T-020+G+XXX(1)</td>
<td>20</td>
<td>10</td>
<td>188</td>
<td>0.040</td>
<td>G1/8</td>
</tr>
<tr>
<td>P5T-025+G+XXX(1)</td>
<td>25</td>
<td>10</td>
<td>295</td>
<td>0.063</td>
<td>G1/8</td>
</tr>
<tr>
<td>P5T-032+G+XXX(1)</td>
<td>32</td>
<td>16</td>
<td>482</td>
<td>0.105</td>
<td>G1/8</td>
</tr>
<tr>
<td>P5T-040+G+XXX(1)</td>
<td>40</td>
<td>16</td>
<td>754</td>
<td>0.162</td>
<td>G1/8</td>
</tr>
<tr>
<td>P5T-050+G+XXX(1)</td>
<td>50</td>
<td>20</td>
<td>1178</td>
<td>0.253</td>
<td>G1/4</td>
</tr>
<tr>
<td>P5T-063+G+XXX(1)</td>
<td>63</td>
<td>20</td>
<td>1870</td>
<td>0.414</td>
<td>G1/4</td>
</tr>
<tr>
<td>P5T-080+G+XXX(1)</td>
<td>80</td>
<td>25</td>
<td>3016</td>
<td>0.669</td>
<td>G3/8</td>
</tr>
<tr>
<td>P5T-100+G+XXX(1)</td>
<td>100</td>
<td>25</td>
<td>4712</td>
<td>1.043</td>
<td>G3/8</td>
</tr>
</tbody>
</table>

1) XXX = stroke
   • = option, as in ordering key
2) Free air consumption for 10 mm stroke for a double stroke at 6 bar.

Weights in kg

| Cylinder diam. mm | Type of bearing  | Shaft diam. mm | Standard stroke | 10 | 25 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
|-------------------|------------------|----------------|----------------|----|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 16                | Plain bearing    | 0.35           | 0.43           | 0.51| 0.57| 0.70| 0.84|     |     |     |     |     |     |
|                   | Recirculating ball | 0.32          | 0.39           | 0.46| 0.51| 0.64| 0.76|     |     |     |     |     |     |
| 20                | Plain bearing    | 0.76           | 0.86           | 0.94| 1.11| 1.29| 1.47|     |     |     |     |     |     |
|                   | Recirculating ball | 0.70          | 0.80           | 0.86| 1.03| 1.19| 1.36|     |     |     |     |     |     |
| 25                | Plain bearing    | 1.13           | 1.39           | 1.65| 1.91| 2.17| 2.43|     |     |     |     |     |     |
|                   | Recirculating ball | 0.98          | 1.20           | 1.43| 1.65| 1.88| 2.11|     |     |     |     |     |     |
| 32                | Plain bearing    | 1.67           | 2.07           | 2.46| 2.86| 3.26| 3.65| 4.05| 4.45|     |     |     |     |
|                   | Recirculating ball | 1.51          | 1.86           | 2.21| 2.56| 2.91| 3.27| 3.62| 3.97|     |     |     |     |
| 40                | Plain bearing    | 2.00           | 2.42           | 2.84| 3.26| 3.68| 4.10| 4.52| 4.84|     |     |     |     |
|                   | Recirculating ball | 1.82          | 2.20           | 2.57| 2.95| 3.32| 3.70| 4.08| 4.45|     |     |     |     |
| 50                | Plain bearing    | 2.69           | 3.22           | 3.81| 4.40| 4.99| 5.59| 6.18| 6.77|     |     |     |     |
|                   | Recirculating ball | 2.35          | 2.87           | 3.39| 3.92| 4.44| 4.96| 5.48| 6.01|     |     |     |     |
| 63                | Plain bearing    | 3.29           | 3.98           | 4.66| 5.34| 6.02| 6.71| 7.39| 8.07|     |     |     |     |
|                   | Recirculating ball | 2.99          | 3.60           | 4.22| 4.83| 5.45| 6.06| 6.67| 7.29|     |     |     |     |
| 80                | Plain bearing    | 6.06           | 7.12           | 8.18| 9.24| 10.30| 11.36| 12.42| 13.48|     |     |     |     |
|                   | Recirculating ball | 5.66          | 6.63           | 7.61| 8.58| 9.56| 10.53| 11.51| 12.49|     |     |     |     |
| 100               | Plain bearing    | 10.69          | 12.03          | 13.37| 14.47| 16.05| 17.39| 18.73| 20.08|     |     |     |     |
|                   | Recirculating ball | 10.16         | 11.40          | 12.64| 13.89| 15.13| 16.37| 17.61| 18.85|     |     |     |     |

Material specification

<table>
<thead>
<tr>
<th>Standard specification</th>
<th>Material specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Natural anodised aluminium</td>
</tr>
<tr>
<td>End pieces</td>
<td>Black anodised aluminium</td>
</tr>
<tr>
<td>Piston rod</td>
<td>Stainless steel (SS 2346)</td>
</tr>
<tr>
<td>Guide rods</td>
<td>Stainless steel (SS 2346)</td>
</tr>
<tr>
<td>Plain bearing</td>
<td>PTFE / Steel</td>
</tr>
<tr>
<td>Ball bushing</td>
<td>Steel</td>
</tr>
<tr>
<td>Plate</td>
<td>Surface treated steel</td>
</tr>
<tr>
<td>Screws</td>
<td>Surface treated steel</td>
</tr>
<tr>
<td>Piston</td>
<td>Natural anodised aluminium</td>
</tr>
<tr>
<td>Magnetic ring</td>
<td>Rubber-bound magnetic material</td>
</tr>
<tr>
<td>Cushioning rings</td>
<td>Polyurethane</td>
</tr>
<tr>
<td>Piston seal</td>
<td>Nitrile rubber, NBR</td>
</tr>
<tr>
<td>O-rings</td>
<td>Nitrile rubber, NBR</td>
</tr>
<tr>
<td>Piston bearing</td>
<td>UHMWPE plastic</td>
</tr>
</tbody>
</table>

High temperature option

Seals | Fluorocarbon rubber, FPM |
Piston bearing | Bronze filled PTFE |

Other data

| Working medium | Dry, filtered air |
| Working pressure | max. 10 bar |
| Working temperature | max +80 °C |
| min -20 °C |

High temp. option | max +150 °C |
| min -10 °C |
Guide for selecting suitable tubing

The selection of the correct size of tubing is often based on experience, with no great thought to optimizing energy efficiency and cylinder velocity. This is usually acceptable, but making a rough calculation can result in worthwhile economic gains.

The following is the basic principle:

1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore throttles the flow and thus limits the cylinder speed, while an oversized pipe creates a dead volume which increases the air consumption and filling time.

The chart below is intended to help when selecting the correct size of tube to use between the valve and the cylinder.

The following prerequisites apply:

The cylinder load should be about 50% of the theoretical force (= normal load). A lower load gives a higher velocity and vice versa. The tube size is selected as a function of the cylinder bore, the desired cylinder velocity and the tube length between the valve and the cylinder.

If you want to use the capacity of the valve to its maximum, and obtain maximum speed, the tubing should be chosen so that they at least correspond with the equivalent restriction diameter (see description below), so that the tubing does not restrict the total flow. This means that a short tubing must have at least the equivalent restriction diameter. If the tubing is longer, choose it from the table below. Straight fittings should be chosen for highest flow rates. (Elbow and banjo fittings cause restriction.)

1) The "equivalent throttling bore" is a long throttle (for example a tube) or a series of throttles (for example, through a valve) converted to a short throttle which gives a corresponding flow rate. This should not be confused with the "orifice" which is sometimes specified for valves. The value for the orifice does not normally take account of the fact that the valve contains a number of throttles.

2) Qn is a measure of the valve flow capacity, with flow measured in litre per minute (l/min) at 6 bar(e) supply pressure and 1 bar pressure drop across the valve.
Example 1: Which tube diameter should be used?
A 50 mm bore cylinder is to be operated at 0.5 m/s. The tube length between the valve and cylinder is 2 m. In the diagram we follow the line from 50 mm bore to 0.5 m/s and get an “equivalent throttling bore” of approximately 4 mm. We continue out to the right in the chart and intersect the line for a 2 m tube between the curves for 4 mm (6/4 tube) and 6 mm (8/6 tube). This means that a 6/4 tube throttles the velocity somewhat, while an 8/6 tube is a little too large. We select the 8/6 tube to obtain full cylinder velocity.

Example 2: What cylinder velocity will be obtained?
A 80 mm bore cylinder will be used, connected by 8 m 12/10 tube to a P2L-B valve. What cylinder velocity will we get? We refer to the diagram and follow the line from 8 mm tube length up to the curve for 12/10 tube. From there, we go horizontally to the curve for the Ø80 cylinder. We find that the velocity will be about 0.5 m/s.

Example 3: What is the minimum inner diameter and maximum length of tube?
For a application a 125 mm bore cylinder will be used. Maximum velocity of piston rod is 0.5 m/s. The cylinder will be controlled by a P2L-D valve. What diameter of tube can be used and what is maximum length of tube. We refer to the diagram. We start at the left side of the diagram cylinder Ø125. We follow the line until the intersection with the velocity line of 0.5 m/s. From here we draw a horizontal line in the diagram. This line shows us we need an equivalent throttling bore of approximately 10 mm. Following this line horizontally we cross a few intersections. These intersections shows us the minimum inner diameter (rightside diagram) in combination with the maximum length of tube (bottomside diagram).

For example:
Intersection one: When a tube (14/11) will be used, the maximum length of tube is 0.7 meter.
Intersection two: When a tube (—/13) will be used, the maximum length of tube is 3.7 meter.
Intersection three: When a tube (—/14) will be used, the maximum length of tube is 6 meter.

Example 4: Determining tube size and cylinder velocity with a particular cylinder and valve?
For an application using a 40 mm bore cylinder with a valve with Qn=800 Nl/min. The distance between the cylinder and valve has been set to 5 m.
Tube dimension: What tube bore should be selected to obtain the maximum cylinder velocity? Start at pipe length 5 m, follow the line up to the intersection with 800 Nl/min. Select the next largest tube diameter, in this case Ø10/8 mm.
Cylinder velocity: What maximum cylinder velocity will be obtained? Follow the line for 800 Nl/min to the left until it intersects with the line for the Ø40 mm cylinder. In this example, the speed is just above 1.1 m/s.
Dimensions, P5T basic cylinder

Connection option D

(definition from above or rear)

Note!
The P5T cylinder with bore 16 mm has only one groove for sensors. When 2 sensors are used for stroke 25 mm or shorter, sensors with 90 degree cable outlet has to be used, see page 23.

Cylinder diam. mm

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Length tolerance ± 1 mm

Stoke tolerance + 1.5/0 mm

*) D1 = bearing rod diameter for recirculating ball bearing

*) D2 = bearing rod diameter for plain bearing

**) Stroke 25 mm, A=75 mm, E=28 mm
## Dimensions, P5T basic cylinder

### Standard lengths

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### Dimensions, P5T basic cylinder

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PDE2557TCUK
P5T Short Stroke Thrusters

Dimensions, P5T basic cylinder
Option D

Dimensions, P5T with two fixing plates and adjustable end stop with cushioning (outward stroke)
Option A

Dimensions, P5T with adjustable end stop with cushioning (outward stroke)
Option E

Please note that load capacity increases with two fixing plates, due to greater bearing distance.

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<td>21.7</td>
</tr>
<tr>
<td>35</td>
<td>102.0</td>
<td>123.7</td>
<td>107.7</td>
<td>65.0</td>
<td>21.7</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Parker Hannifin Corporation
Pneumatic Division - Europe
Maximum load
P5T cylinders can absorb the same load, irrespective of how it is installed. The loading diagram is based on a service life for the cylinder of at least 10 million cycles. At higher loadings, the service life will be reduced.

Example
Estimate the load limit for a P5T-16 with plain bearing and stroke + d = 75 mm has load capacity 50 N.

Load capacity as a function of Stroke + d
Maximum Torsional Capacity for Symmetrical Torsion

When symmetrical loads are applied, P5T Series load ratings are greater than with asymmetrical loads because both pairs of shaft bearings equally resist the load.

Example:
A wrist rotate mechanism symmetrically grabs and rotates a part. The mechanism exerts a 20 Nm torque on a P5T-50 with 25mm stroke. The center of gravity for the wrist rotate mechanism is 25mm from the face of the P5T-50.

The "stroke + d" dimension equals 50mm (25 + 25). The P5T-50 with plain bearing will have adequate torsional capacity (22.5 Nm).

Maximum torque as a function of Stroke + d
Maximum Torsional Capacity for Asymmetrical Torque

Asymmetrical loading occurs when the load is applied to one side of the unit. P5T Series units can resist torsional loads that are asymmetrical according to the diagrams below.

**Example:**
A mechanism exerts an asymmetrical load of 15 Nm on a P5T-50 with 30 mm stroke. The centre of asymmetric torque $d = 20$ mm. Stroke + $d$ (30+20) = 50 mm. The P5T-50 with plain bearing will have adequate torsional capacity (21 Nm).

**Maximum torque as a function of Stroke + $d$**

- **Cylinder bore 16 mm**
- **Cylinder bore 20 mm**
- **Cylinder bore 25 mm**
- **Cylinder bore 32 mm**
- **Cylinder bore 40 mm**
- **Cylinder bore 50 mm**
- **Cylinder bore 63 mm**
- **Cylinder bore 80 mm**
- **Cylinder bore 100 mm**

![Graphs showing maximum torque as a function of Stroke + $d$ for different cylinder bores and bearing types.](image-url)
Maximum load during vertical lift

The PST cylinder has the capacity to absorb eccentric loadings irrespective of location. The load is assumed to be placed directly on the plate.

Maximum vertical load as a function of eccentricity

- Cylinder bore 16 mm
- Cylinder bore 20 mm
- Cylinder bore 25 mm
- Cylinder bore 32 mm
- Cylinder bore 40 mm
- Cylinder bore 50 mm
- Cylinder bore 63 mm
- Cylinder bore 80 mm
- Cylinder bore 100 mm

<table>
<thead>
<tr>
<th>Cylinder bore</th>
<th>Load [N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 mm</td>
<td></td>
</tr>
<tr>
<td>20 mm</td>
<td></td>
</tr>
<tr>
<td>25 mm</td>
<td></td>
</tr>
<tr>
<td>32 mm</td>
<td></td>
</tr>
<tr>
<td>40 mm</td>
<td></td>
</tr>
<tr>
<td>50 mm</td>
<td></td>
</tr>
<tr>
<td>63 mm</td>
<td></td>
</tr>
<tr>
<td>80 mm</td>
<td></td>
</tr>
<tr>
<td>100 mm</td>
<td></td>
</tr>
</tbody>
</table>
Maximum loading as a stop cylinder
The P5T cylinder can be used as a stop cylinder. It can be used both horizontally and vertically.

NOTE! Cylinders with plain bearings are recommended for this type of application.

Example:
A P5T-50 unit with a stroke up to 50 mm will stop an object moving at 0.5 m/s that weighs up to 50 kg.

NOTE: The following graphs are based on 50mm of stroke.
Parker Hannifin Corporation
Pneumatic Division - Europe

PDE2557TCUK
P5T Short Stroke Thrusters

Ordering key

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Cylinder diam. (mm)</th>
<th>Stroke in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>P5T-016•G••XXX</td>
<td>016</td>
<td>025</td>
</tr>
<tr>
<td>P5T-020•G••XXX</td>
<td>020</td>
<td>025</td>
</tr>
<tr>
<td>P5T-025•G••XXX</td>
<td>025</td>
<td>025</td>
</tr>
<tr>
<td>P5T-032•G••XXX</td>
<td>032</td>
<td>025</td>
</tr>
<tr>
<td>P5T-040•G••XXX</td>
<td>040</td>
<td>025</td>
</tr>
<tr>
<td>P5T-050•G••XXX</td>
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<td>025</td>
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<tr>
<td>P5T-063•G••XXX</td>
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</tr>
<tr>
<td>P5T-080•G••XXX</td>
<td>080</td>
<td>025</td>
</tr>
<tr>
<td>P5T-100•G••XXX</td>
<td>100</td>
<td>025</td>
</tr>
</tbody>
</table>

Double acting

- C: Composite bearing, stainless steel shafts
- H: Ball bearing, stainless steel shafts
- G: Nominal bore size
- D: Air ports location
  - On the top face
  - On one side
- N: None
- E: Bumpers and adjustable stop collars (extend only)
- A*: Bumpers and adjustable stop collars (extend only) and dual tool plate

* Please note that the load capacity increases for the versions with two fixing plates, due to greater bearing distance.

Standard strokes

For cylinders with special stroke lengths, use the next longest standard stroke length with adjustable stop, option E.
PDE2557TCUK
P5T Short Stroke Thrusters

Short Stroke Thrusters with plain bearing, stainless steel shafts, standard temperature range, BSPP air ports on the top

<table>
<thead>
<tr>
<th>Cyl. bore</th>
<th>Stroke</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 mm</td>
<td>10 mm</td>
<td>P5T-C016DGSN010</td>
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<tr>
<td></td>
<td>25 mm</td>
<td>P5T-C016DGSN025</td>
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<tr>
<td></td>
<td>40 mm</td>
<td>P5T-C016DGSN040</td>
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<td></td>
<td>50 mm</td>
<td>P5T-C016DGSN050</td>
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<tr>
<td></td>
<td>75 mm</td>
<td>P5T-C016DGSN075</td>
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<td></td>
<td>100 mm</td>
<td>P5T-C016DGSN100</td>
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<tr>
<td>20 mm</td>
<td>25 mm</td>
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<td>200 mm</td>
<td>P5T-C040DGSN200</td>
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<table>
<thead>
<tr>
<th>Cyl. bore</th>
<th>Stroke</th>
<th>Order code</th>
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<tbody>
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<td>50 mm</td>
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<tr>
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<td>50 mm</td>
<td>P5T-C050DGSN050</td>
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<td>75 mm</td>
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</tr>
<tr>
<td></td>
<td>200 mm</td>
<td>P5T-C100DGSN200</td>
</tr>
</tbody>
</table>

Note!
The P5T cylinder with bore 16 mm has only one groove for sensors. When 2 sensors are used for stroke 25 mm or shorter, sensors with 90 degree cable outlet has to be used, see page 23.
Drop-in sensors
The P1D sensors can easily be installed from the side in the sensor groove, at any position along the piston stroke. The sensors are completely recessed and thus mechanically protected. Choose between electronic or reed sensors and several cable lengths and 8 mm and M12 connectors. The same standard sensors are used for all P1D versions.

Electronic sensors
The electronic sensors are “Solid State”, i.e. they have no moving parts at all. They are provided with short-circuit protection and transient protection as standard. The built-in electronics make the sensors suitable for applications with high on and off switching frequency, and where very long service life is required.

**Technical data**

<table>
<thead>
<tr>
<th>Design</th>
<th>GMR (Giant Magnetic Resistance) magneto-resistive function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>From side, down into the sensor groove, so-called drop-in</td>
</tr>
<tr>
<td>Outputs</td>
<td>PNP, normally open (also available in NPN design, normally closed, on request)</td>
</tr>
<tr>
<td>Voltage range</td>
<td>10-30 VDC</td>
</tr>
<tr>
<td>Ripple</td>
<td>max 10%</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>max 2.5 V</td>
</tr>
<tr>
<td>Load current</td>
<td>max 100 mA</td>
</tr>
<tr>
<td>Internal consumption</td>
<td>max 10 mA</td>
</tr>
<tr>
<td>Actuating distance</td>
<td>min 9 mm</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>max 1.5 mm</td>
</tr>
<tr>
<td>Repeatability accuracy</td>
<td>max 0.2 mm</td>
</tr>
<tr>
<td>On/off switching frequency</td>
<td>max 5 kHz</td>
</tr>
<tr>
<td>On switching time</td>
<td>max 2 ms</td>
</tr>
<tr>
<td>Off switching time</td>
<td>max 2 ms</td>
</tr>
<tr>
<td>Encapsulation</td>
<td>IP 67 (EN 60529)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>−25 °C to +75 °C</td>
</tr>
<tr>
<td>Temperature range</td>
<td>−20 °C to +45 °C</td>
</tr>
<tr>
<td>Indication</td>
<td>LED, yellow</td>
</tr>
<tr>
<td>Material housing</td>
<td>PA 12</td>
</tr>
<tr>
<td>Material screw</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Cable</td>
<td>PVC or PUR 3x0.25 mm²</td>
</tr>
</tbody>
</table>

Reed sensors
The sensors are based on proven reed switches, which offer reliable function in many applications. Simple installation, a protected position on the cylinder and clear LED indication are important advantages of this range of sensors.

**Technical data**

<table>
<thead>
<tr>
<th>Design</th>
<th>Reed element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting</td>
<td>From side, down into the sensor groove, so-called drop-in</td>
</tr>
<tr>
<td>Output</td>
<td>Normally open, or normally closed</td>
</tr>
<tr>
<td>Voltage range</td>
<td>10-30 V AC/DC or 10-120 V AC/DC or 24-230 V AC/DC</td>
</tr>
<tr>
<td>Load current</td>
<td>max 500 mA for 10-30 V or max 100 mA for 10-120 V max 30 mA for 24-230 V</td>
</tr>
<tr>
<td>Breaking power (resistive)</td>
<td>max 6 W/VA</td>
</tr>
<tr>
<td>Actuating distance</td>
<td>min 9 mm</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>max 1,5 mm</td>
</tr>
<tr>
<td>Repeatability accuracy</td>
<td>0.2 mm</td>
</tr>
<tr>
<td>On/off switching frequency</td>
<td>max 400 Hz</td>
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<tr>
<td>On switching time</td>
<td>max 1.5 ms</td>
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<tr>
<td>Off switching time</td>
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<td>Encapsulation</td>
<td>IP 67 (EN 60529)</td>
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<tr>
<td>Temperature range</td>
<td>−25 °C to +75 °C</td>
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<tr>
<td>Indication</td>
<td>LED, yellow</td>
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<tr>
<td>Material housing</td>
<td>PA12</td>
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<tr>
<td>Material screw</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Cable</td>
<td>PVC or PUR 3x0.14 mm²</td>
</tr>
</tbody>
</table>

see order code respectively
PDE2557TCUK
P5T Short Stroke Thrusters

**Electronic sensors**

- **M8**
  - Signal: 4
  - +V DC: 1
  - – V DC: 3

- **M12**
  - Signal: 4
  - +V DC: 1
  - – V DC: 3

**Reed sensors**

- **M8**
  - Signal: 4
  - (+) V AC/DC: 1
  - – (+) V AC/DC: 3

- **M12**
  - Signal: 4
  - (+) V AC/DC: 1
  - – (+) V AC/DC: 3

**Dimensions (mm)**

- **Sensors**
  - Insert sensor
  - LED
  - Torque: 0.20 ±0.05Nm

**Sensor Installation**

- Insert sensor
- Turn sensor
- Tighten screw
## Ordering data

<table>
<thead>
<tr>
<th>Output/function</th>
<th>Cable/connector</th>
<th>Weight</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic sensors, 10-30 V DC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNP type, normally open</td>
<td>0,27 m PUR-cable and 8 mm snap-in male connector</td>
<td>0,007</td>
<td>P8S-GPSHX</td>
</tr>
<tr>
<td>PNP type, normally open</td>
<td>0,27 m PUR-cable and M12 screw male connector</td>
<td>0,015</td>
<td>P8S-GPMMHX</td>
</tr>
<tr>
<td>PNP type, normally open</td>
<td>3 m PVC-cable without connector</td>
<td>0,030</td>
<td>P8S-GPFLX</td>
</tr>
<tr>
<td>PNP type, normally open</td>
<td>10 m PVC-cable without connector</td>
<td>0,110</td>
<td>P8S-GPFTX</td>
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<tr>
<td><strong>Reed sensors, 10-30 V AC/DC</strong></td>
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<td></td>
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<tr>
<td>Normally open</td>
<td>0,27 m PUR-cable and 8 mm snap-in male connector</td>
<td>0,007</td>
<td>P8S-GSSHX</td>
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<tr>
<td>Normally open</td>
<td>0,27 m PUR-cable and M12 screw male connector</td>
<td>0,015</td>
<td>P8S-GSMMHX</td>
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<tr>
<td>Normally open</td>
<td>3 m PVC-cable without connector</td>
<td>0,030</td>
<td>P8S-GSFLX</td>
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<tr>
<td>Normally open</td>
<td>10 m PVC-cable without connector</td>
<td>0,110</td>
<td>P8S-GSFTX</td>
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<tr>
<td>Normally closed</td>
<td>5 m PVC-cable without connector</td>
<td>0,050</td>
<td>P8S-GCFPX</td>
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<tr>
<td><strong>Reed sensors, 10-120 V AC/DC</strong></td>
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<tr>
<td>Normally open</td>
<td>3 m PVC-cable without connector</td>
<td>0,030</td>
<td>P8S-GRFLX</td>
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<tr>
<td><strong>Reed sensors, 24-230 V AC/DC</strong></td>
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<tr>
<td>Normally open</td>
<td>3 m PVC-cable without connector</td>
<td>0,030</td>
<td>P8S-GRFLX2</td>
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</table>

2) Without LED

### Connecting cables with one connector

The cables have an integral snap-in female connector.

<table>
<thead>
<tr>
<th>Type of cable</th>
<th>Cable/connector</th>
<th>Weight</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cables for sensors, complete with one female connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable, Flex PVC</td>
<td>3 m, 8 mm Snap-in connector</td>
<td>0,07</td>
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<td>10 m, 8 mm Snap-in connector</td>
<td>0,21</td>
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<td>5 m, M12 screw connector</td>
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<td>10 m, M12 screw connector</td>
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</tr>
</tbody>
</table>

### Male connectors for connecting cables

Cable connectors for producing your own connecting cables. The connectors can be quickly attached to the cable without special tools. Only the outer sheath of the cable is removed. The connectors are available for M8 and M12 screw connectors and meet protection class IP 65.

<table>
<thead>
<tr>
<th>Connector</th>
<th>Weight</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8 screw connector</td>
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<td>P8CS0803J</td>
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<tr>
<td>M12 screw connector</td>
<td>0,022</td>
<td>P8CS1204J</td>
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</table>
Sensors for special applications

Sensors for applications where the short installation length and the 90 degree cable outlet are important factors. This type of sensor is an good alternative if a cylinder has a short stroke or tight installation.

Reed switch sensors

The reed switch sensors incorporate a well-proven, universal-voltage, compact reed switch element, making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems. No environment is too severe.

Technical data

Design Reed
Output Making
Voltage range 10 to 120 VAC/VDC
Max permissible ripple 10%
Max voltage drop 3 V
Max load current 100 mA
Max breaking power (resistive) 10 W
Min actuating distance 5 mm
Hysteresis ≤1,0 mm
Repeatability accuracy ≤0,2 mm
Max on/off switching frequency 400 Hz
Max on/off switching time 1 ms
Encapsulation IP 67
Temperature range −25 °C to +75 °C
Indication LED, yellow
Shock resistance 30 g
Material, housing PA 12
Material, mould Epoxy
Cable PVC 3x0,14 mm²
Cable incl. female part connector PVC 3x0,14 mm²
Mounting T slot

Ordering data

Output Cable Cable Weight Order code
connection length kg
Reed sensors
making 90° 3,0 m 0,030 P8S-SRELX
making 90° 10,0 m 0,110 P8S-SRETX
making 90° 0,3 m* 0,005 P8S-SRTHX

Electronic sensors

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

Technical data

Design Hall element
Output PNP resp. NPN, N.O.
Voltage range 10-30 VDC
Max permissible ripple 10%
Max voltage drop ≤2 V
Max load current 150 mA
Max breaking power (resistive) 6 W
Internal consumption 15 mA
Min actuating distance 5 mm
Hysteresis ≤1,5 mm
Repeatability accuracy ≤0,2 mm
Max on/off switching frequency 50 Hz
Others 5 kHz
Max on/off switching time 0,8/3,0 ms
Encapsulation IP 67
Temperature range −25 °C to +75 °C
Indication LED, yellow
Shock resistance 30 g
Material, housing PA 12
Material, mould Epoxy
Cable PVC 3x0,14 mm²
Cable incl. female part connector PVC 3x0,14 mm²
Connector Diam. 8 mm snap on
Mounting T slot

Ordering data

Output Cable Cable Weight Order code
connection length kg
Electronic sensors
PNP, N.O. 90° 3,0 m 0,030 P8S-SPELXD
PNP, N.O. 90° 10,0 m 0,110 P8S-SPETXD
PNP, N.O. 90° 0,3 m* 0,005 P8S-SPTHXD

*) Cable shall be ordered separately.
Dimensions (mm)

Reed sensor symbol

Electronic sensor symbol
Symbol which indicates sub-components in seal kit (for replacement during maintenance)

**Seal kits**

<table>
<thead>
<tr>
<th>Cylinder diam. mm</th>
<th>Standard temperature</th>
<th>High temperature</th>
</tr>
</thead>
<tbody>
<tr>
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<td>PSK-P5T16</td>
<td>PSK-P5T16F</td>
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<tr>
<td>16</td>
<td>PSK-P5T20</td>
<td>PSK-P5T20F</td>
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<td>80</td>
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**Grease**

<table>
<thead>
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<th>High temperature</th>
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</thead>
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<td>9127394521</td>
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