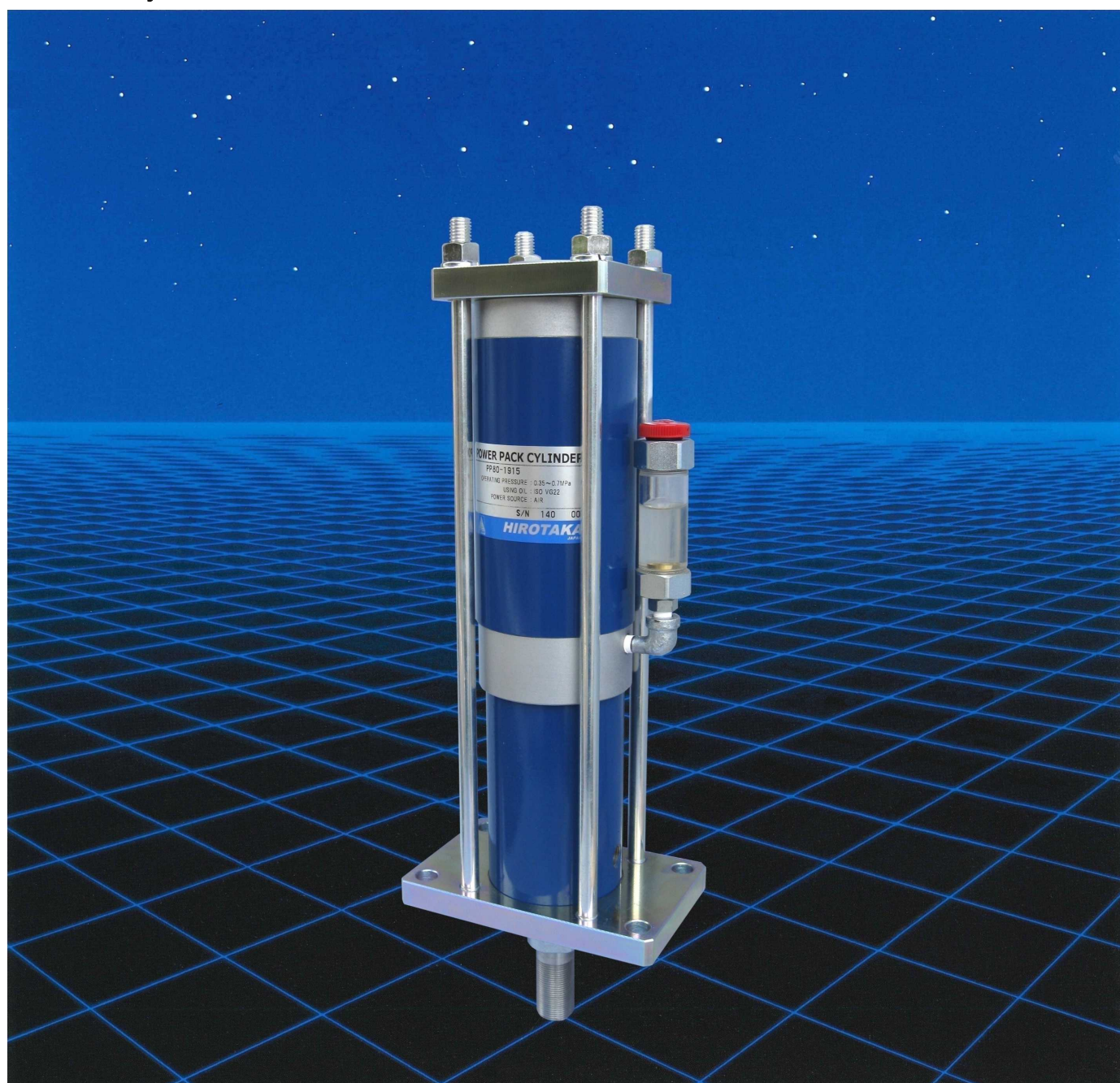




High Thrust Air Cylinder

# POWER PACK CYLINDER

Air cylinder that compactly integrates the hydraulic cylinder and the air-hydro booster.



**HIROTAKA MFG. CO.,LTD.**

Only air pressure

Generates high thrust of 7 tons or more !

Compact air cylinder

## POWER PACK CYLINDER

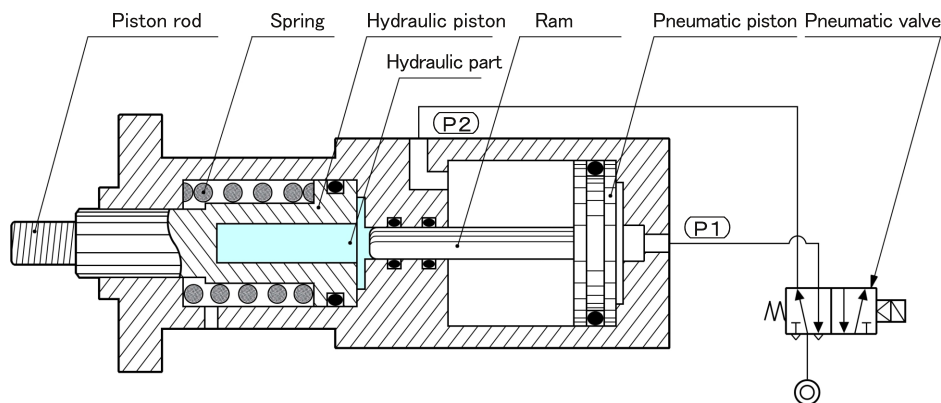
### Overview

The power pack cylinder is a high thrust air cylinder that compactly integrates an air-hydro booster and a hydraulic cylinder.

### Feature

- 1 High thrust of 0.5 to 7.9 tons is generated only by air pressure.
- 2 It can output 1 ton with the same inner diameter as a  $\phi 50$  air cylinder.
- 3 As with pneumatic cylinders, control can be done with an one pneumatic valve.
- 4 The thrust can be changed steplessly by changing the air pressure.
- 5 It can reciprocate more than 50 times per minute.

### Operating principle



When the pneumatic valve is energized, the pneumatic piston advances, the oil in the hydraulic part becomes high pressure, and the piston rod advances with high thrust. When the pneumatic valve is de-energized, the pneumatic piston return and the piston rod return due to the built-in spring.

### Specification

| Model No.                   |                       | PP50-0510                                                         | PP50-1005 | PP80-1324 | PP80-1915 | PP80-2910 | PP100-2135 | PP100-2727 | PP100-3620 | PP100-5514 | PP100-7908 |      |
|-----------------------------|-----------------------|-------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------|
| Pneumati cylinder diameter  |                       | φ 50                                                              |           | φ 80      |           |           | φ 100      |            |            |            |            |      |
| Ram diameter                |                       | φ 20                                                              | φ 14      | φ 30      | φ 25      | φ 20      | φ 40       | φ 35       | φ 30       | φ 25       | φ 20       |      |
| Pressure boosting ratio     |                       | 1:6.2                                                             | 1:12.7    | 1:7.1     | 1:10.2    | 1:16      | 1:6.2      | 1:8.1      | 1:11.1     | 1:16       | 1:25       |      |
| Hydraulic cylinder diameter |                       | φ 40                                                              |           | φ 60      |           |           | φ 80       |            |            |            |            |      |
| Nominal thrust (kN)         |                       | 05                                                                | 10        | 13        | 19        | 29        | 21         | 27         | 36         | 55         | 79         |      |
| Stroke (mm)                 |                       | 10                                                                | 5         | 24        | 15        | 10        | 35         | 27         | 20         | 14         | 8          |      |
| Forward thrust<br>(kN)      | Air pressure<br>(MPa) | 0.4                                                               | 2.6       | 6.0       | 7.0       | 10.5      | 17.0       | 12.0       | 15.3       | 21.0       | 31.0       | 49.0 |
|                             |                       | 0.5                                                               | 3.4       | 7.6       | 9.0       | 13.5      | 21.0       | 15.0       | 19.3       | 26.0       | 39.0       | 59.0 |
|                             |                       | 0.6                                                               | 4.2       | 9.2       | 11.0      | 16.5      | 25.0       | 18.0       | 23.3       | 31.0       | 47.0       | 69.0 |
|                             |                       | 0.7                                                               | 5.0       | 10.8      | 13.0      | 19.5      | 29.0       | 21.0       | 27.3       | 36.0       | 55.0       | 79.0 |
| Backward thrust (N)         |                       | 340                                                               |           | 670       |           |           | 670        |            |            |            |            |      |
| Fluid                       |                       | Air                                                               |           |           |           |           |            |            |            |            |            |      |
| Hydraulic fluid             |                       | Standard mineral hydraulic fluid ISO viscosity grade : VG22 or 32 |           |           |           |           |            |            |            |            |            |      |
| Proof pressure              |                       | 1.5MPa                                                            |           |           |           |           |            |            |            |            |            |      |
| Operating pressure          |                       | 0.35 to 0.7MPa                                                    |           |           |           |           |            |            |            |            |            |      |
| Mass (kg)                   |                       | 6.0                                                               |           | 14.5      |           |           | 19.5       |            |            |            |            |      |

## How to order

# PP 80 - 13 24 - B - G

Example for model number

PP 80 - 1324 - B - G

Bore size:  $\phi 80$ , Nominal thrust: 1.3 ton, Stroke: 24 mm

Type with oil film removal specification for rod, With oil pressure gauge

| Series              |
|---------------------|
| Power Pack Cylinder |

| Symbol | Bore size  |
|--------|------------|
| 50     | $\phi 50$  |
| 80     | $\phi 80$  |
| 100    | $\phi 100$ |

| Symbol | Nominal thrust |
|--------|----------------|
| 05     | 0.5 ton        |
| 10     | 1.0 ton        |
| 13     | 1.3 ton        |
| 19     | 1.9 ton        |
| 21     | 2.1 ton        |
| 27     | 2.7 ton        |
| 29     | 2.9 ton        |
| 36     | 3.6 ton        |
| 55     | 5.5 ton        |
| 79     | 7.9 ton        |

| Symbol | Stroke |
|--------|--------|
| 05     | 5 mm   |
| 08     | 8 mm   |
| 10     | 10 mm  |
| 14     | 14 mm  |
| 15     | 15 mm  |
| 20     | 20 mm  |
| 24     | 24 mm  |
| 27     | 27 mm  |
| 35     | 35 mm  |

| Symbol | Oil pressure gauge     |
|--------|------------------------|
| NIL    | Without pressure gauge |
| G      | With pressure gauge    |

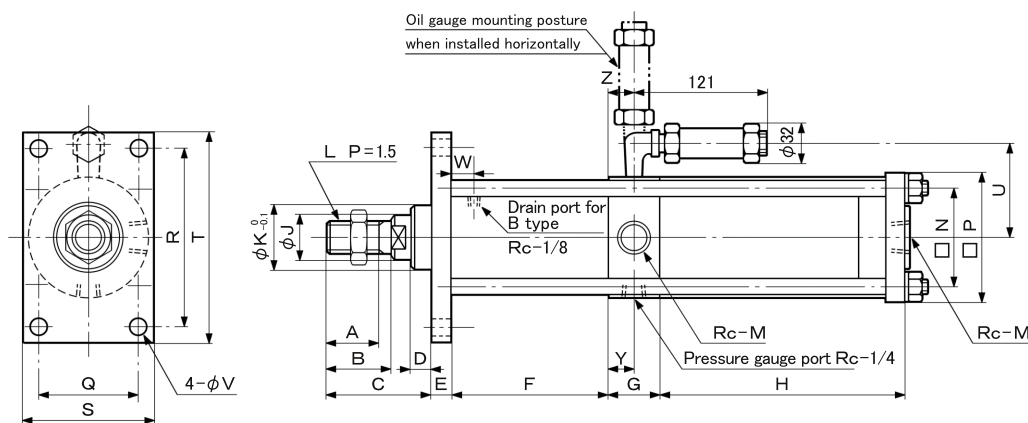
| Symbol | Oil film removal specification for rod |
|--------|----------------------------------------|
| Nil    | Without measures                       |
| B      | With measures                          |

## Standard model

The following combinations of bore size, nominal thrust, and stroke are standard models.

| Bore size  | Standard models                            |
|------------|--------------------------------------------|
| $\phi 50$  | PP 50 - 0510<br>- 1005<br>- 1324           |
| $\phi 80$  | PP 80 - 1915<br>- 2910<br>- 2135<br>- 2727 |
| $\phi 100$ | PP100 - 3620<br>- 5514<br>- 7908           |

## Dimension



(Unit: mm)

| Rod end nut  |          |          |          |
|--------------|----------|----------|----------|
|              | C        | d        | H        |
| Screw Symbol | M20      | M24      | M30      |
| d            | M20 P1.5 | M24 P1.5 | M30 P1.5 |
| H            | 12       | 14       | 18       |
| B            | 30       | 36       | 46       |
| C            | 34.6     | 41.6     | 53.1     |

| Model | A  | B  | C  | D  | E  | F   | G  | H   | J         | K         | L   | M   | N  | P   | Q  | R   | S   | T   | U  | V  | W  | Y  | Z  |
|-------|----|----|----|----|----|-----|----|-----|-----------|-----------|-----|-----|----|-----|----|-----|-----|-----|----|----|----|----|----|
| PP 50 | 30 | 35 | 55 | 10 | 12 | 71  | 38 | 107 | $\phi 25$ | $\phi 35$ | M20 | 1/4 | 53 | 75  | 53 | 110 | 75  | 135 | 60 | 11 | 18 | 26 | 26 |
| PP 80 | 40 | 50 | 80 | 15 | 16 | 120 | 38 | 192 | $\phi 35$ | $\phi 50$ | M24 | 1/2 | 75 | 100 | 75 | 135 | 100 | 160 | 65 | 13 | 22 | 25 | 27 |
| PP100 | 50 | 55 | 95 | 20 | 22 | 139 | 45 | 250 | $\phi 55$ | $\phi 70$ | M30 | 1/2 | 95 | 130 | 90 | 180 | 130 | 220 | 75 | 19 | 30 | 25 | 31 |

Note) PP50 to PP100 are attached a rod end nut.

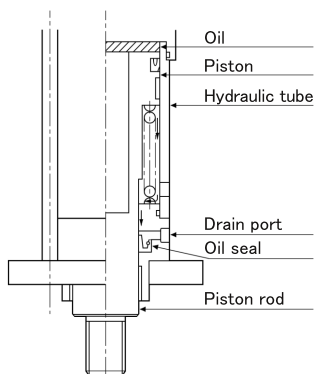
※ Only PP100-7908 has a F value of 137.

## Oil film removal specification for rod

The rod oil film removal specification protects parts from oil by minimizing oil discharge discharge from the sliding parts of the piston rod.

### Internal structure

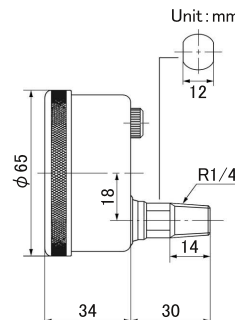
As the piston slides, the oil adhering to the inner surface of the hydraulic tube becomes a thin oil film and exits from the piston rod surface. Before this oil exit, the oil film is removed by the oil seal and discharged from the drain port.



## Oil pressure gauge

|                             |                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------|
| Model No.                   | 2315 - 63 - 25B                                                                             |
| Pressure range              | 0 to 25MPa                                                                                  |
| Accuracy                    | $\pm 1.6\%$ or less of full scale                                                           |
| Heat resistance temperature | - 5 to + 45°C                                                                               |
| Glycerine filling           | This pressure gauge is filled with pure glycerine.                                          |
| Temperature characteristic  | Accuracy change of +0.3 % for each +10°C rise based on +20°C, and - 0.3 % for every - 10°C. |

Unit: mm





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