Accumulator **model WPC**

Gas type accumulator

Special check valve (relief valve)

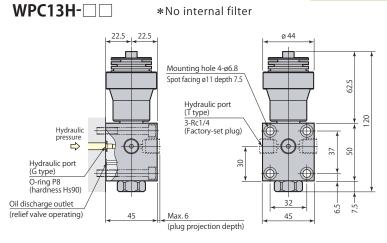Hydraulic pressure

Oil discharge outlet (relief valve operating)

N2 pressure type accumulator.

Equipped with a relief valve for preventing breakdown of device in case of problems with circuit pressure (high pressure).
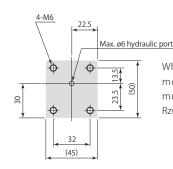
## Specifications

| Model | WPC13H-G Gas pressure* | WPC13H-T Gas pressure* | WPC40H-G Gas pressure* | WPC40H-T Gas pressure* |
|---|---|---|---|---|
| Mounting, piping methods | Manifold mounting | Piping mounting | Manifold mounting | Piping mounting |
| Pressure range　　　　MPa | Refer to **page →167** for characteristic line diagram. | | | |
| Gas capacity　　　　cm³ | 13 | | 40 | |
| Oil capacity　　　　cm³ | 10 | | 30 | |
| Mass　　　　　　　kg | 1.1 | | 1.6 | |

● Proof pressure：37.5 MPa　● Operating temperature：0–60°C　● Fluid used：General mineral based hydraulic oil (ISO-VG32 equivalent)
● There is also a type that adopts fluorocarbon for seal sections where cutting fluid is applied, as a measure for the use of chlorine-based cutting fluid (this is not thermal resistant specification. Model designation WPC☐H-☐☐-V).
＊：Initially filled gas pressure can be set in range of 7 MPa to 25 MPa with 1 MPa increment. Specify gas pressure when ordering.
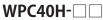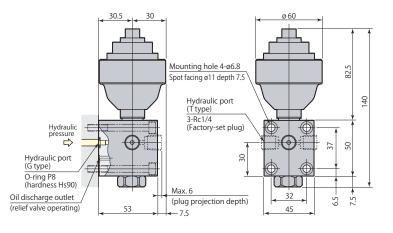　 Example：WPC13H-T10 (gas pressure 10 MPa)

## Dimensions

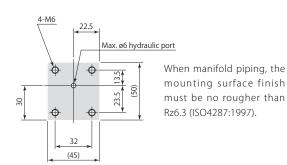### WPC13H-☐☐　　＊No internal filter

22.5　22.5

ø 44

Mounting hole 4-ø6.8
Spot facing ø11 depth 7.5

Hydraulic port (T type)
3-Rc1/4
(Factory-set plug)

Hydraulic pressure

Hydraulic port (G type)
O-ring P8 (hardness Hs90)

Oil discharge outlet (relief valve operating)

45　　Max. 6 (plug projection depth)

62.5　120　50　37　30　6.5　7.5　32　45

**Mounting details**

4-M6　22.5

Max. ø6 hydraulic port

30　13.5　23.5　(50)　32　(45)

When manifold piping, the mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

### WPC40H-☐☐　　＊No internal filter

30.5　30

ø 60

Mounting hole 4-ø6.8
Spot facing ø11 depth 7.5

Hydraulic port (T type)
3-Rc1/4
(Factory-set plug)

Hydraulic pressure

Hydraulic port (G type)
O-ring P8 (hardness Hs90)

Oil discharge outlet (relief valve operating)

53　7.5　Max. 6 (plug projection depth)

82.5　140　50　37　30　6.5　7.5　32　45

**Mounting details**

4-M6　22.5

Max. ø6 hydraulic port

30　13.5　23.5　(50)　32　(45)

When manifold piping, the mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

● Mounting screws are not included.

Accumulator

WPC
N2 gas

## Characteristic line diagram

### WPC13H

Gas pressure 25 MPa | Gas pressure 20 MPa | Gas pressure 15 MPa | Gas pressure 10 MPa

Gas pressure 7 MPa



Hydraulic pressure (MPa) vs Oil capacity (cm³)

### WPC40H

Gas pressure 25 MPa | Gas pressure 20 MPa | Gas pressure 15 MPa | Gas pressure 10 MPa

Gas pressure 7 MPa



Hydraulic pressure (MPa) vs Oil capacity (cm³)

This characteristic line diagram represents theoretical values.

## Model selection example

Condition (estimated temperature drop：20℃ )

| Working clamp | CLW16×8 pieces | Piping | Inner diameter ø6×0.5 m×8 pieces |
|---|---|---|---|
| Hydraulic pressure：P | 25 MPa | Valve & hydraulic pressure equipment | VCB：1 piece, VRG：2 pieces |

### Selection procedure

1. Calculation of circuit capacity
   Clamping capacity：6.16×3.3×8 = 163 cm³
   (Pressure bearing area / Stroke / Qty)

   Piping capacity：0.283×50×8＝113 cm³
   Valve & hydraulic equipment capacity：8×3＝24 cm³
   (Perform calculation with capacity of 8 cm³ for each of valves and hydraulic equipment in hydraulic circuit, when using Pascal product.)
   Circuit capacity：163＋113＋24＝300 cm³

2. Selection of oil capacity
   Select the equipment having oil capacity capable of keeping volumetric change.
   Volumetric change is obtained by using formula shown below.
   $\Delta V＝V×\Delta T×\alpha$　　$\Delta V$：Volumetric change (cm³)　　$V$：Circuit capacity (cm³)
   $\Delta T$：Temperature change (℃)　$\alpha$：Thermal expansion coefficient ($7.8×10^{-4}$)
   $\Delta V＝ 300×20×7.8×10^{-4}＝4.7$ cm³
   Here, WPC40H is selected as an example (∗1).

3. Selection of gas pressure
   Select the pressure whose oil discharge amount (∗2) under hydraulic pressure satisfies $\Delta V$ calculated in step 2. Read off characteristic line diagram.
   If the hydraulic pressure of the clamping circuit is 25 MPa, select gas pressure 10 MPa, 15 MPa, or 20 MPa.

4. Verification of hydraulic pressure and residual discharge amount (∗2) after temperature change
   Select the one whose hydraulic pressure drop after temperature change is low and residual discharge amount (∗2) satisfies the marginal oil amount (∗3). Read off characteristic line diagram.
   The hydraulic pressure after temperature change drops to 19.3 MPa with 10 MPa gas pressure (P10), to 21 MPa with 15 MPa gas pressure (P15), and to 22 MPa with 20 MPa gas pressure (P20), respectively.
   The residual oil discharge amount (∗2) is 19.3 cm³ for 10 MPa gas pressure (V10), 11.3 cm³ for 15 MPa (V15), and 3.3 cm³ for 20 MPa (V20), respectively.
   Here, select WPC40H-□20 whose pressure drop is low.

5. Select piping method.

∗1：WPC13H is also available. Likewise, select appropriate one in consideration of steps 3 and 4.
∗2：For when the temperature decreases. If the temperature increases, check the absorption amount.
∗3：Allow adequate margin for residual discharge amount after temperature change, as there may be margin of error with gas filling pressure. Marginal oil amount：About 2.0 cm³

### WPC40H

Gas pressure 20 MPa | Gas pressure 15 MPa | Gas pressure 10 MPa



Hydraulic pressure (MPa) vs Oil capacity (cm³)
Hydraulic pressure：P

| 20MPa | Discharge amount | Absorption amount |
| 15MPa | Discharge amount | Absorption amount |
| 10MPa | Discharge amount | Absorption amount |

### WPC40H

Gas pressure 20 MPa | Gas pressure 15 MPa | Gas pressure 10 MPa



Hydraulic pressure (MPa) vs Oil capacity (cm³)
Hydraulic pressure：P
Hydraulic pressure after temperature change：P20
Hydraulic pressure after temperature change：P15
Hydraulic pressure after temperature change：P10
Residual discharge amount (V20)

| 20MPa | | $\Delta V$=4.7 | Absorption amount |
| 15MPa | Residual discharge amount (V15) | $\Delta V$=4.7 | Absorption amount |
| 10MPa | Residual discharge amount (V10) | $\Delta V$=4.7 | Absorption amount |

Accumulator

WPC N2 gas