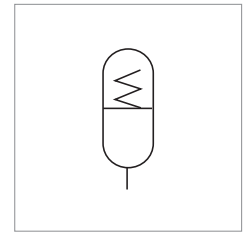
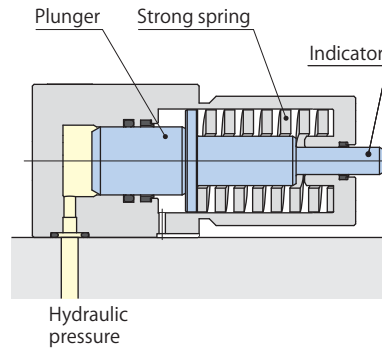




Accumulator model **WPB**



Spring pressure type accumulator. Pressure fluctuation that occurs due to temperature change after disengaging hydraulic pressure source is suppressed.

Specifications

		Oil discharge, absorption amount	Mounting method	Scraper, seal material	
<b>WPB</b>	2				
	3	1	<b>GB</b> : Manifold, GB mounting	<b>(Nil)</b> : NBR (standard)	
	4	2			
	5	3	2	3	<b>GS</b> : Manifold, GS mounting
	6	1	2	3	
	7	1	2	3	
					<b>V*</b> : Fluorocarbon

\*:Fluorocarbon has been adopted 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	WPB2-1	WPB2-2	WPB2-3	WPB3-1	WPB3-2	WPB3-3	WPB4-1	WPB4-2	WPB4-3	
Hydraulic pressure MPa	Refer to <b>page →197</b> for characteristic line diagram.									
Oil capacity cm <sup>3</sup>	3.3	6.6	13.0	3.3	6.6	13.0	3.3	6.6	13.0	
Pressure fluctuation per 1cm <sup>3</sup> MPa	0.55	0.38	0.19	0.50	0.33	0.17	0.43	0.29	0.14	
Mass kg	0.9	1.2	1.8	0.9	1.2	1.8	0.9	1.2	1.8	

Model	WPB5-1	WPB5-2	WPB5-3	WPB6-1	WPB6-2	WPB6-3	WPB7-1	WPB7-2	WPB7-3	
Hydraulic pressure MPa	Refer to <b>page →197</b> for characteristic line diagram.									
Oil capacity cm <sup>3</sup>	3.3	6.6	13.0	3.3	6.6	13.0	3.3	6.6	13.0	
Pressure fluctuation per 1cm <sup>3</sup> MPa	0.41	0.27	0.16	0.90	0.61	0.36	0.84	0.59	0.34	
Mass kg	1.3	1.7	2.4	1.3	1.7	2.4	1.3	1.7	2.4	

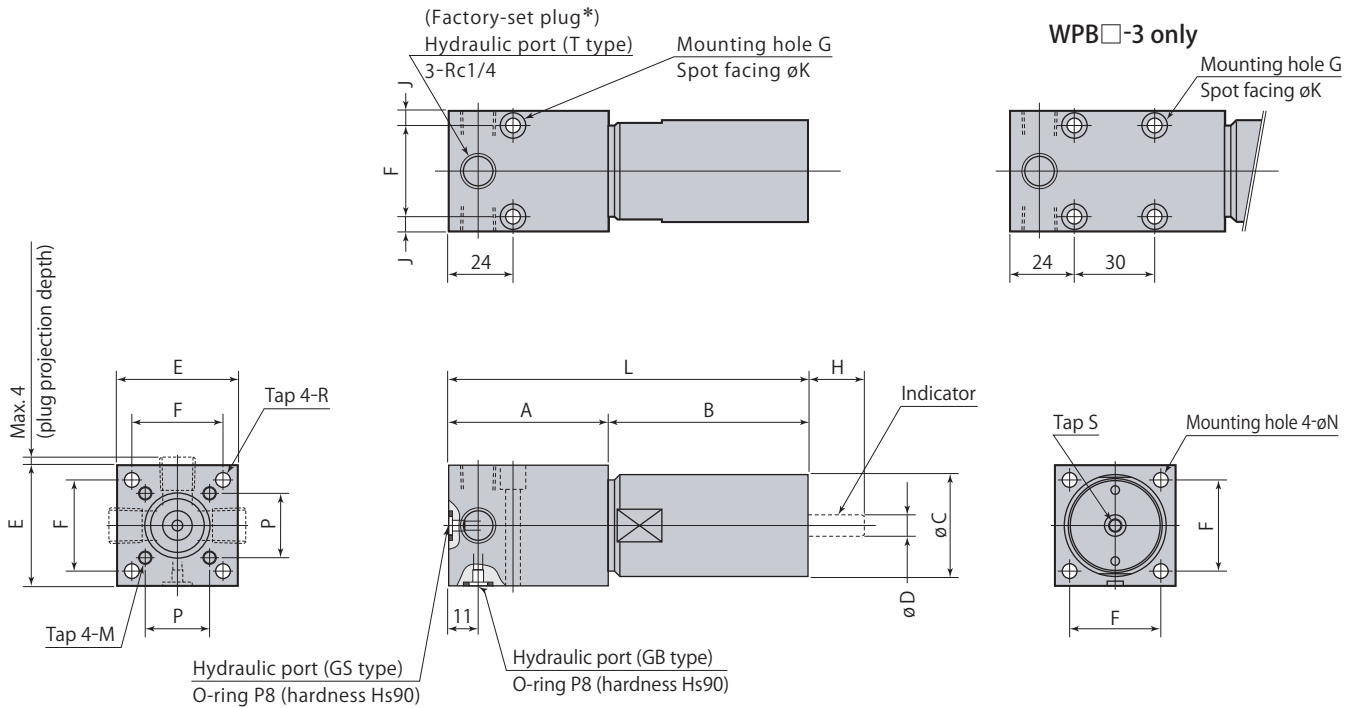
- Proof pressure: 7 MPa (WPB2, 3, 4) , 15 MPa (WPB5, 6, 7)    ● Operating temperature: 0–70°C
- Fluid used: General mineral based working fluid (ISO-VG32 or equivalent)

Accumulator

WPB Spring

Dimensions

WPB□-□□□-□ \*No internal filter



mm																	
Model		A	B	øC	øD	E	F	G	Max. H	J	øK	L	M	øN	P	R	S
WPB <sup>2</sup> <sub>3</sub> <sup>4</sup>	-1	49	46	38	8	45	34	2-ø5.5	10.5	5.5	9.5 depth 9	95	M5×0.8 depth 10	5.5	24	-	M5×0.8 depth 9
	-2	59.5	74.5					2-ø5.5	21			134					
	-3	80	151					4-ø5.5	41.5			231					
WPB <sup>5</sup> <sub>6</sub> <sup>7</sup>	-1	49	70	42.7	10	50	38	2-ø6.8	10.5	6	11 depth 11	119	-	6.8	-	M8×1.25 depth 16	M6×1 depth 11
	-2	59.5	105					2-ø6.8	21			164.5					
	-3	80	186					4-ø6.8	41.5			266					

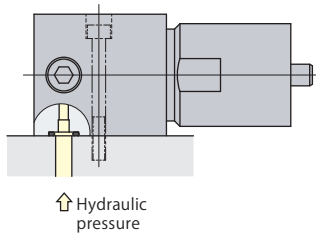
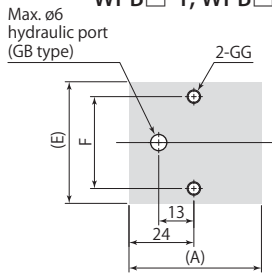
\* : Included plug T type: 2 pieces, GB & GS type: 3 pieces.

● Mounting screws are not included.

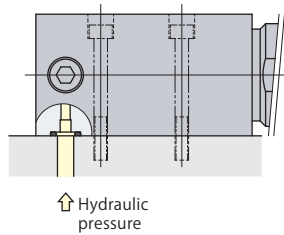
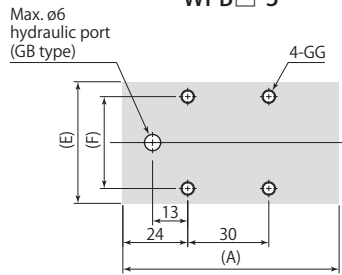
Mounting details

Manifold, GB mounting / Piping mounting

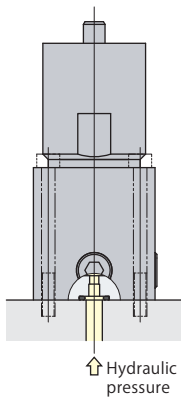
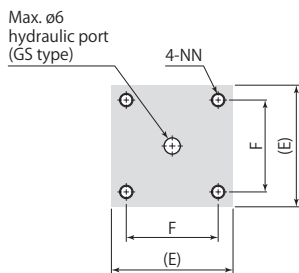
WPB□-1, WPB□-2



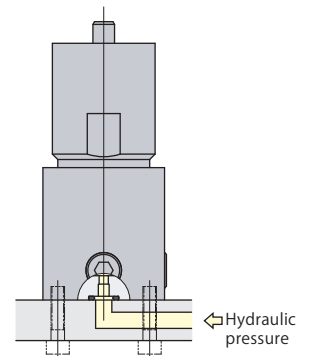
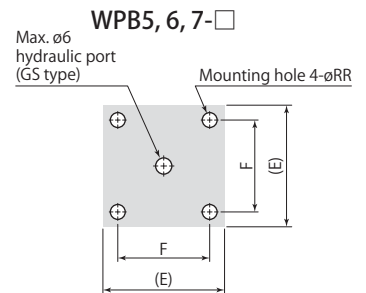
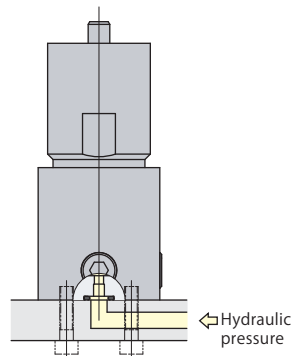
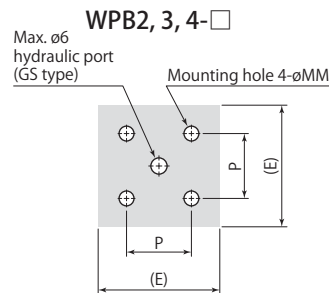
WPB□-3



Manifold, GS mounting ① / Piping mounting ①



Manifold, GS mounting ② / Piping mounting ②

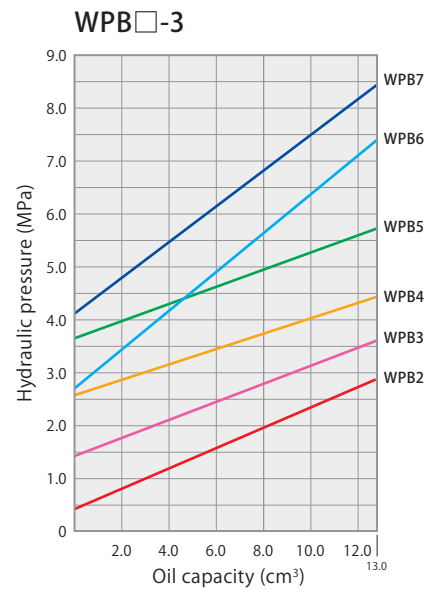
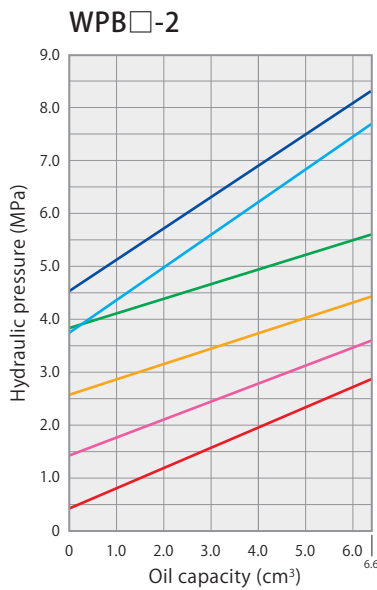
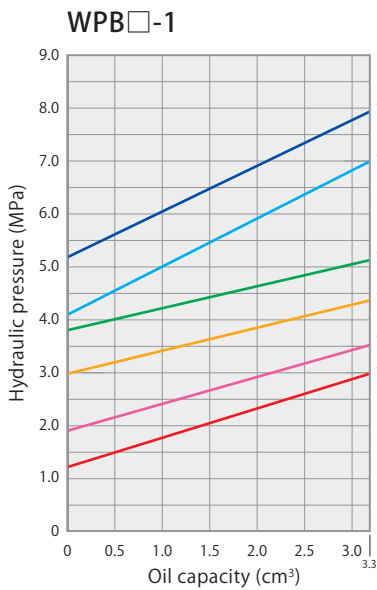


When manifold piping, the mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

Model	A	E	F	GG	øMM	NN	P	øRR
WPB 2 3 4	-1	49	45	M5	5.5	M5	24	-
	-2	59.5						
	-3	80						
WPB 5 6 7	-1	49	50	M6	-	M6	-	9
	-2	59.5						
	-3	80						

Accumulator  
WPB Spring

Characteristic line diagram



This characteristic line diagram represents theoretical values.

Model selection example

Condition (estimated temperature drop : 20°C )

Working clamp	CLU06×4 pieces	Piping	Inner diameter ø6×0.6m×4 pieces
Hydraulic pressure:P	3.5 MPa	Valve & hydraulic pressure equipment	VCB : 1 piece, VRG : 2 pieces

Selection procedure

1. Calculation of circuit capacity

$$\text{Clamping capacity} = \frac{9.6 \times 2.6 \times 4}{\text{Pressure bearing area} \times \text{Stroke} \times \text{Qty}} = 100 \text{ cm}^3$$

$$\text{Piping capacity} = 0.283 \times 60 \times 4 = 68 \text{ cm}^3$$

$$\text{Valve \& hydraulic equipment capacity} = 8 \times 3 = 24 \text{ cm}^3$$

(Perform calculation with capacity of 8 cm<sup>3</sup> for each of valves and hydraulic equipment in hydraulic circuit, when using Pascal product.)

$$\text{Circuit capacity} = 100 + 68 + 24 = 192 \text{ cm}^3$$

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.

$$\Delta V = V \times \Delta T \times \alpha \quad \Delta V: \text{Volumetric change (cm}^3\text{)} \quad V: \text{Circuit capacity (cm}^3\text{)}$$

$$\Delta T: \text{Temperature change (}^\circ\text{C)} \quad \alpha: \text{Thermal expansion coefficient (7.8} \times 10^{-4}\text{)}$$

$$\Delta V = 192 \times 20 \times 7.8 \times 10^{-4} = 3.0 \text{ cm}^3$$

Here, WPB□-2 is selected as an example (\*1).

3. Selection of WPB hydraulic pressure

Select the pressure whose oil discharge amount (\*2) under hydraulic pressure satisfies ΔV calculated in step 2. Read off characteristic line diagram.

If the hydraulic pressure is 3.5 MPa, select WPB3-2 or WPB4-2.

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.

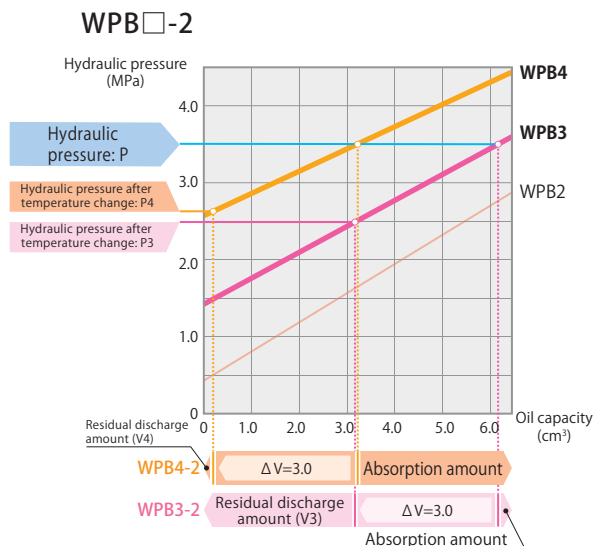
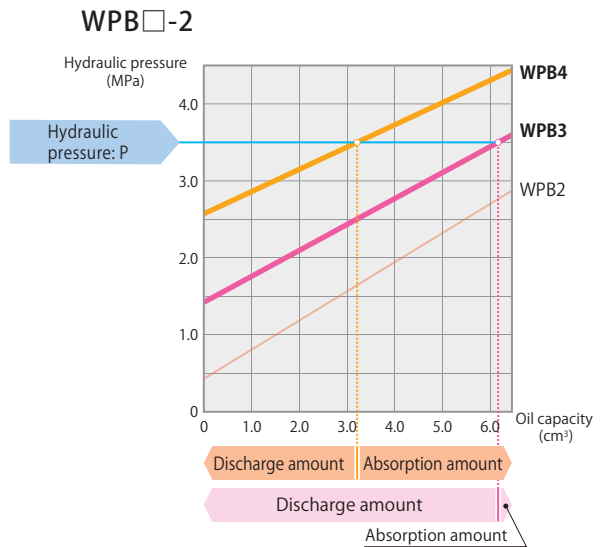
The Hydraulic pressure drops to 2.5 MPa with WPB3-2 (P3) and to 2.6 MPa with WPB4-2 (P4) after temperature change.

The residual discharge amount (\*2) becomes 3.3 cm<sup>3</sup> with WPB3-2 (V3) and 0.3 cm<sup>3</sup> with WPB4-2 (V4).

In this case, select WPB3-2□ with the marginal amount retained.

5. Select piping method.

- \*1 : WPB□-1 and WPB□-3 are also selectable. 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 spring force of internal spring. Marginal oil amount : WPB□-1 : About 0.5 cm<sup>3</sup>, WPB□-2 : About 1.0 cm<sup>3</sup>, WPB□-3 : About 1.5 cm<sup>3</sup>



Accumulator  
WPB Spring