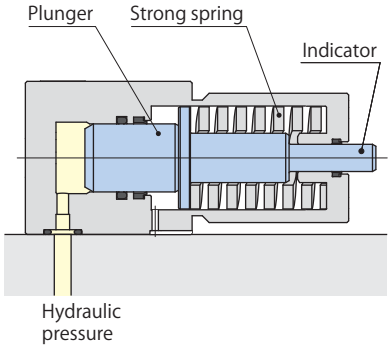
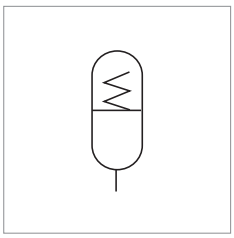
Accumulator model **WPB**





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
WPB	2				
	3	1 : 3.3 cm³	GB : Manifold, GB mounting		(Nil) : NBR (standard)
	4				
–	5	2 : 6.6 cm³	GS : Manifold, GS mounting	–	
	6	3 : 13 cm³	T : Piping		V* : Fluorocarbon
	7				

*: 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).

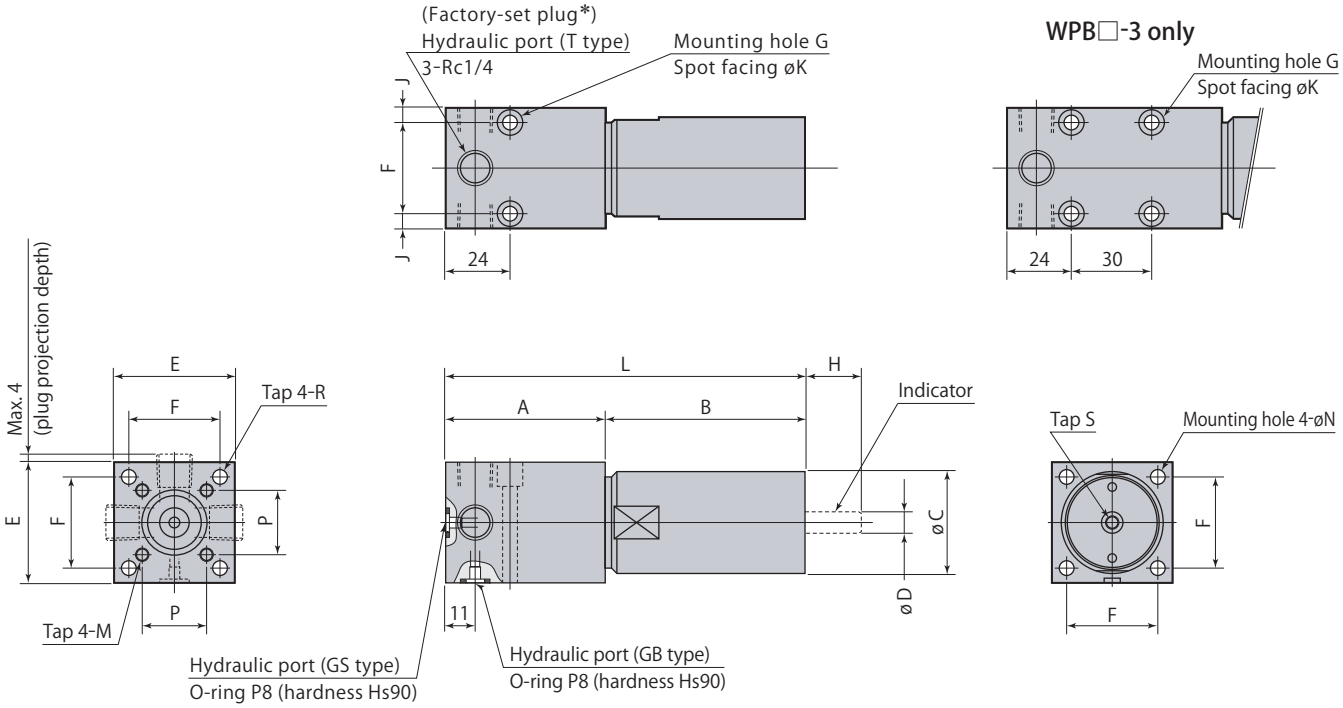
Model		WPB2-1	WPB2-2	WPB2-3	WPB3-1	WPB3-2	WPB3-3	WPB4-1	WPB4-2	WPB4-3
Hydraulic pressure	MPa	Refer to **page →197** for characteristic line diagram.								
Oil capacity	cm³	3.3	6.6	13.0	3.3	6.6	13.0	3.3	6.6	13.0
Pressure fluctuation per 1cm³	MPa	0.55	0.38	0.19	0.50	0.33	0.17	0.43	0.29	0.14
Mass	kg	0.9	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 **page →197** for characteristic line diagram.								
Oil capacity	cm³	3.3	6.6	13.0	3.3	6.6	13.0	3.3	6.6	13.0
Pressure fluctuation per 1cm³	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℃
- Fluid used: General mineral based working fluid (ISO-VG32 or equivalent)

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 2 3 4	-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 5 6 7	-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					

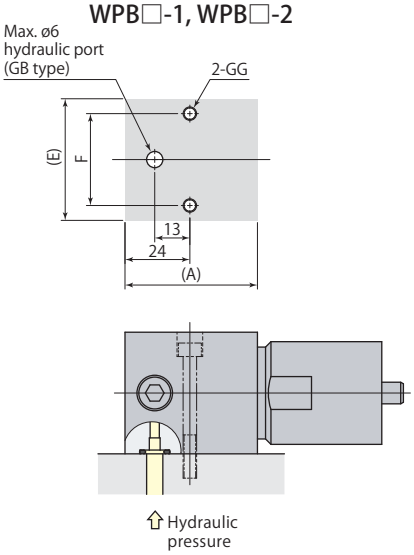
＊: Included plug T type: 2 pieces, GB & GS type: 3 pieces.

● Mounting screws are not included.

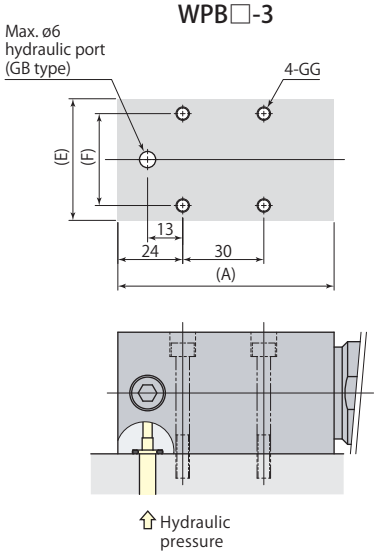
Mounting details

Manifold, GB mounting / Piping mounting

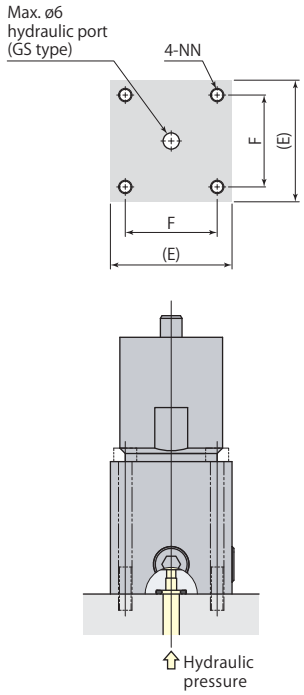
WPB□-1, WPB□-2



WPB□-3

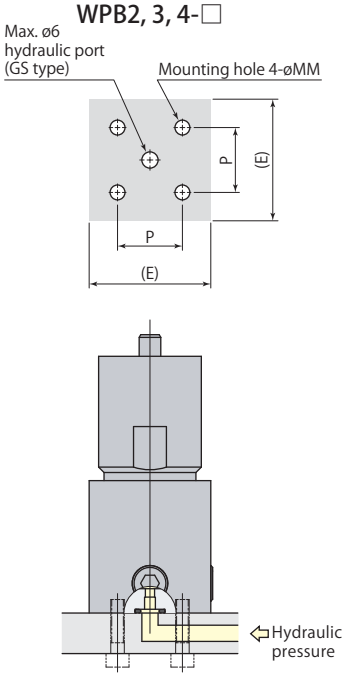


Manifold, GS mounting ① / Piping mounting ①

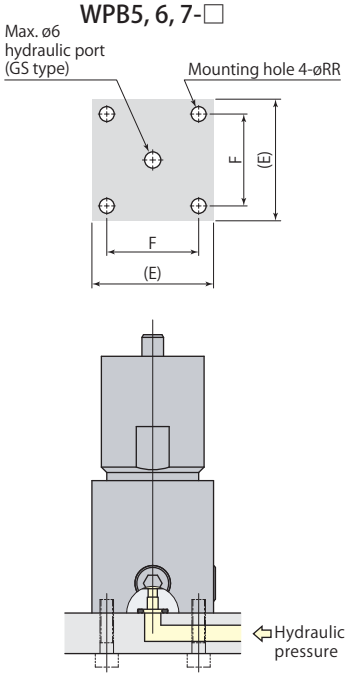


Manifold, GS mounting ② / Piping mounting ②

WPB2, 3, 4-□



WPB5, 6, 7-□



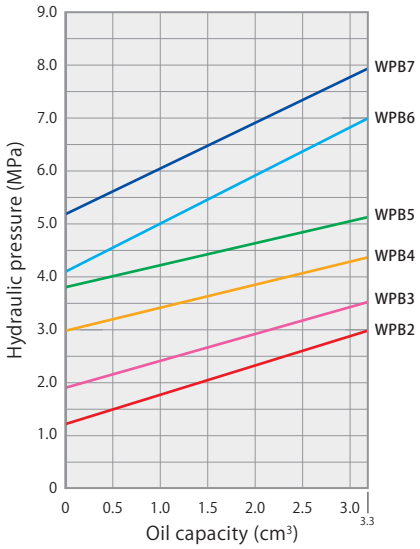
When manifold piping, the mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

mm

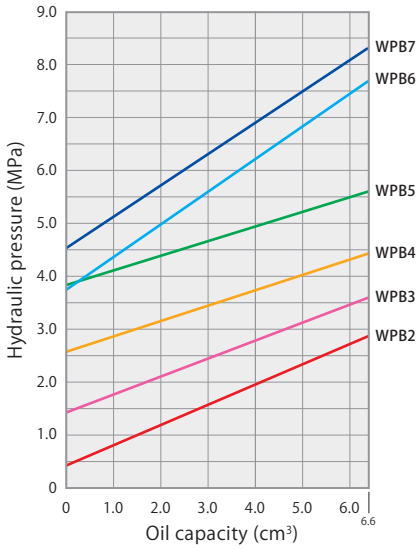
Model		A	E	F	GG	øMM	NN	P	øRR
WPB 2 3 4	-1	49	45	34	M5	5.5	M5	24	–
	-2	59.5							
	-3	80							
WPB 5 6 7	-1	49	50	38	M6	–	M6	–	9
	-2	59.5							
	-3	80							

Characteristic line diagram

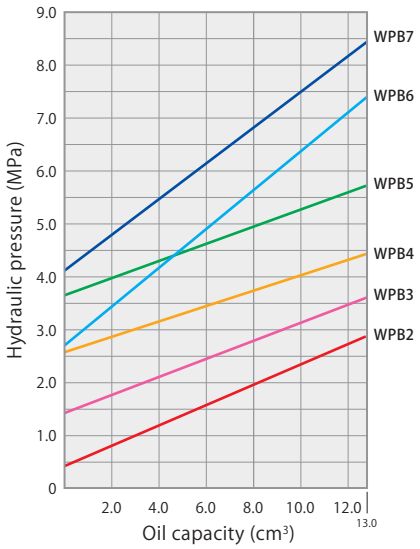
WPB□-1



WPB□-2



WPB□-3



This characteristic line diagram represents theoretical values.

Model selection example

Condition (estimated temperature drop：20℃)

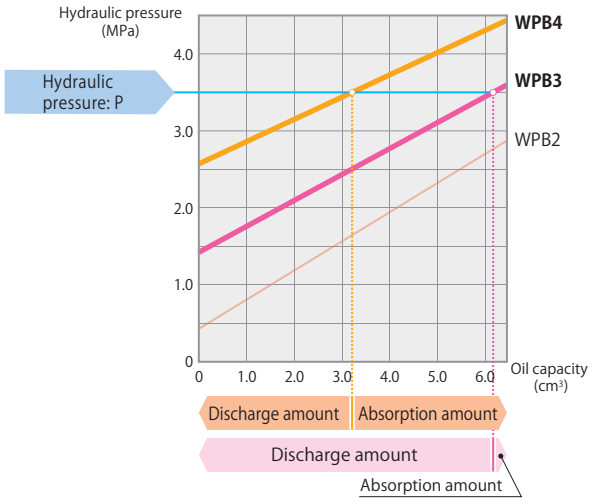
Working clamp	CLU06×4 pieces	Piping	Inner diameter ø6×0.6m×4 pieces
Hydraulic pressure：P	3.5 MPa	Valve & hydraulic pressure equipment	VCB：1 piece, VRG：2 pieces

Selection procedure

1. Calculation of circuit capacity
   Clamping capacity：$\underset{\text{Pressure bearing area}}{9.6}\times\underset{\text{Stroke}}{2.6}\times\underset{\text{Qty}}{4}=100\ \text{cm}^3$
   Piping capacity：$0.283\times60\times4=68\ \text{cm}^3$
   Valve & hydraulic equipment capacity：$8\times3=24\ \text{cm}^3$
   (Perform calculation with capacity of 8 cm^3 for each of valves and hydraulic equipment in hydraulic circuit, when using Pascal product.)
   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.
   $\Delta V=V\times\Delta T\times\alpha$ ΔV：Volumetric change (cm^3) V：Circuit capacity (cm^3)
   ΔT：Temperature change (℃) α：Thermal expansion coefficient (7.8×10^{-4})
   $\Delta V=192\times20\times7.8\times10^{-4}=3.0\ \text{cm}^3$
   Here, WPB□-2 is selected as an example (∗1).
3. Selection of WPB hydlaulic 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^3 with WPB3-2 (V3) and 0.3 cm^3 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^3, WPB□-2：About 1.0 cm^3, WPB□-3：About 1.5 cm^3

WPB□-2



WPB□-2