

Swing clamp

Double acting 50MPa

model **PLB**

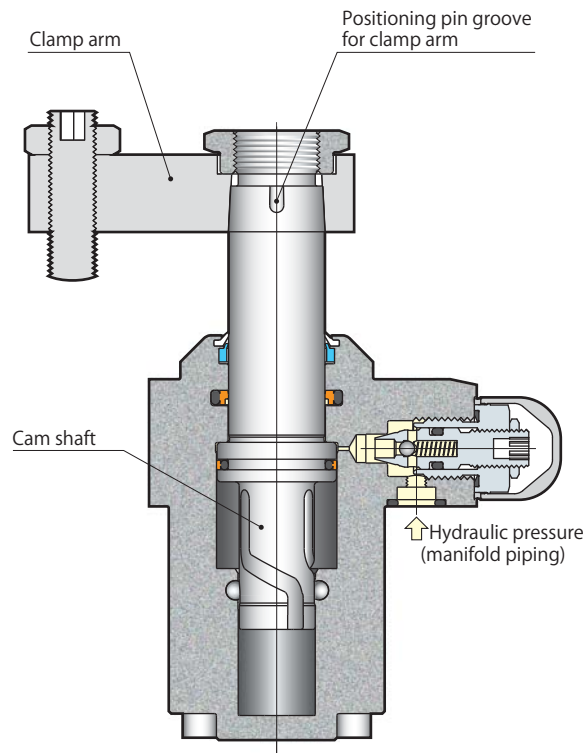


Pascal

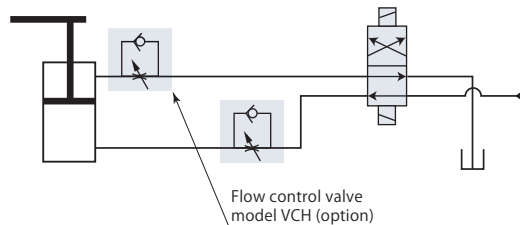
www.pascaleng.co.jp

Swing clamp

model PLB□□-□



Hydraulic circuit diagram



Use flow control valve for meter-in control. If meter-out control is used, due to the area difference, it will cause back pressure and become high pressure. This can lead to damage or malfunction of the system. Please be aware when designing the circuit.

For upper flange manifold piping, flow control valve model VCH can be mounted.

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Specifications

	Size	Mounting and piping types	Swing direction, swing angle (when clamping)
PLB	06	U : Upper flange	L : Counter-clockwise, swing angle 90°
	16	G : Lower flange, manifold piping	L45 : Counter-clockwise, swing angle 45°
	25	S : Lower flange, G port piping	L60 : Counter-clockwise, swing angle 60°
	40	T : Thread	R : Clockwise, swing angle 90°
		M* : Cartridge	R45 : Clockwise, swing angle 45°
			R60 : Clockwise, swing angle 60°
			C : Straight, swing angle 0°

*: Cartridges are available only in 06 and 16 sizes.

■ indicates made to order.

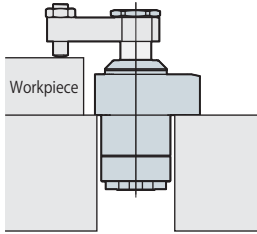
Model		PLB06	PLB16	PLB25	PLB40	
Cylinder force (hydraulic pressure 50 MPa)	kN	8.8	22.6	35.5	57.7	
Cylinder inner diameter	mm	25	40	50	63	
Rod diameter	mm	20	32	40	50	
Effective area (clamp)	cm ²	1.8	4.5	7.1	11.5	
Swing angle		90°±3°				
Positioning pin groove position accuracy		±1°				
Repeated clamp positioning accuracy		±0.5°				
Full stroke	mm	18	22	26	24	
90° swing stroke	mm	7	8	11	9	
Clamp stroke	mm	11	14	15	15	
Cylinder capacity	Clamp	cm ³	3.2	10.0	18.4	27.7
	Unclamp	cm ³	8.8	27.6	51.1	74.8
Recommended tightening torque of nut	N·m	25	100	190	400	

- Pressure range: 3.5~50 MPa ● Operating temperature: 0~70°C
- Fluid used: General mineral based hydraulic oil (ISO-VG32 equivalent)
- Seals are resistant to chlorine-based cutting fluid. (not thermal resistant specification)
- There is no overload protection mechanism.

Mounting and piping types

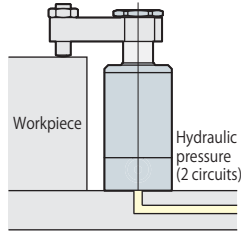
PLB□U-□

Upper flange



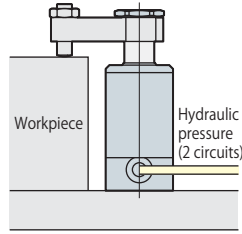
PLB□G-□

Lower flange, manifold piping



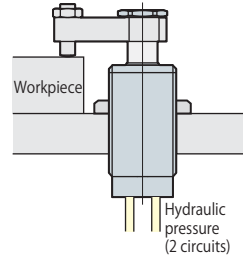
PLB□S-□

Lower flange, G port piping



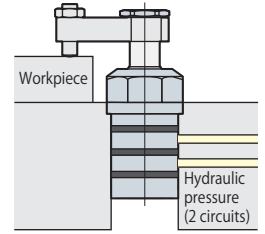
PLB□T-□

Thread



PLB□M-□

Cartridge

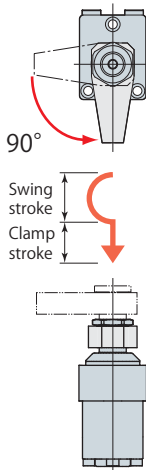


Refer to **page → 4** for details of piping methods.

Swing direction (when clamping)

PLB□□-L

Counter-clockwise, Swing angle 90°



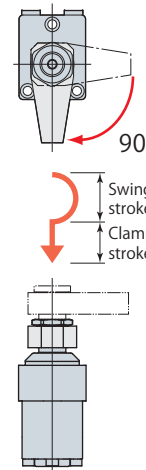
PLB□□-C

Straight, Swing angle 0°



PLB□□-R

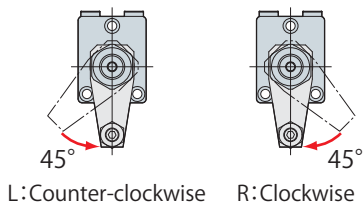
Clockwise, Swing angle 90°



Swing angle

PLB□□-L45
R45

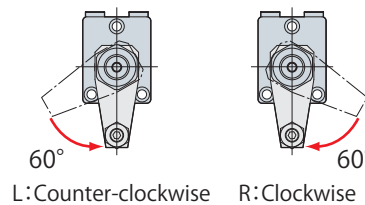
Swing angle 45°



L: Counter-clockwise R: Clockwise

PLB□□-L60
R60

Swing angle 60°



L: Counter-clockwise R: Clockwise

Refer to **pages → 19 to 22** for details

Manifold piping and G port piping are available.

Two piping methods are available for model PLB□U-□ (upper flange), manifold piping and G port piping.

Manifold piping

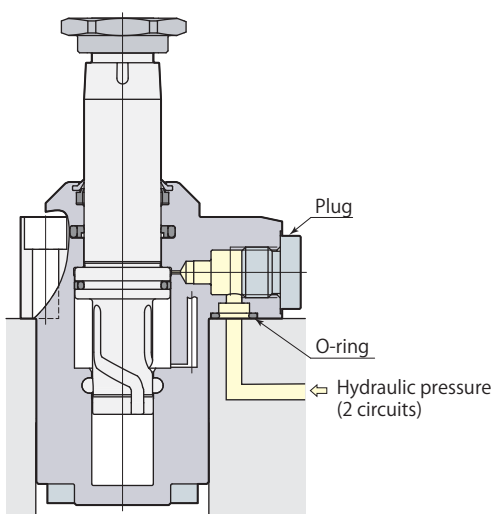
When choosing manifold piping a flow control valve (model VCF) and an air bleeding valve (model VCE) are mountable on the G ports of the clamp.

G port piping

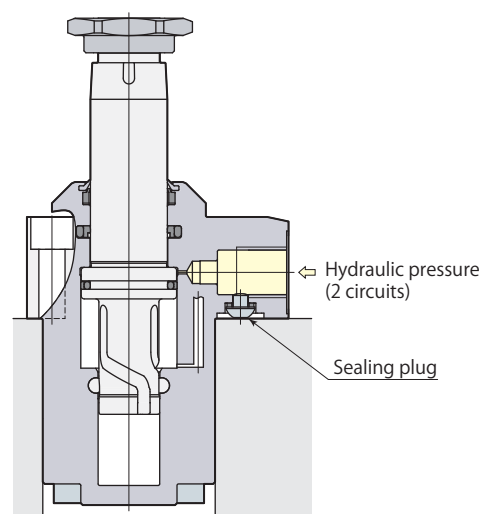
Remove plug and mount sealing plug that is included, when using G port piping. (Sealing plug is not mounted with shipment.)

The flow control valve and the air bleeding valve should be installed in the middle of oil path.

Upper flange manifold piping

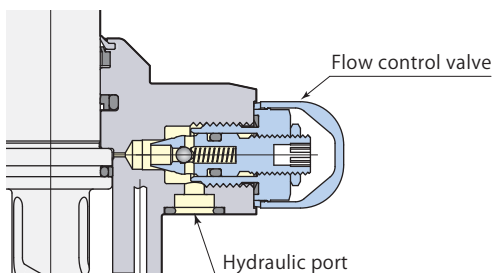


Upper flange G port piping



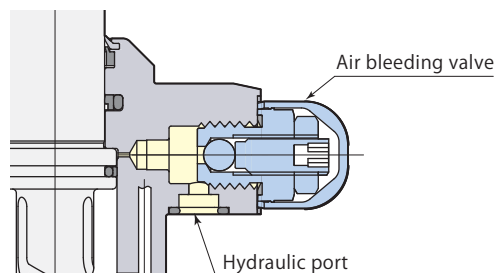
Flow control valve model VCH

Page →25

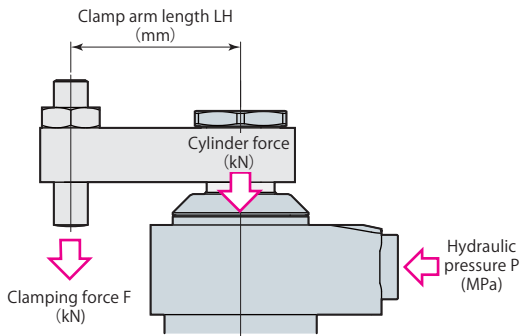


Air bleeding valve model VCE

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Performance table



Clamping force varies depending on the clamp arm length (LH) and hydraulic pressure (P).

Clamping force calculation formula

$$F = P / (\text{Coefficient 1} + \text{Coefficient 2} \times LH)$$

F: Clamping force P: Hydraulic pressure LH: Clamp arm length

PLB06 with clamp arm length (LH) = 50 mm at hydraulic pressure of 20 MPa, Clamping force F is calculated by $20 / (5.66 + 0.0213 \times 50) = 3.0$ kN

Do not use the clamp in the nonusable range. It may cause damage to the cylinder and rod.

model PLB06		Clamping force $F = P / (5.66 + 0.0213 \times LH)$										
Hydraulic pressure MPa	Cylinder force kN	Clamping force kN										Max. arm length Max. LH mm
		Clamp arm length LH mm										
		25	30	40	50	60	70	80	90	100	120	
50	8.8	8.1										27
45	8.0	7.3	7.1									30
40	7.1	6.5	6.4									35
35	6.2	5.7	5.6	5.4								41
30	5.3	4.8	4.8	4.6	4.5							50
25	4.4	4.0	4.0	3.8	3.7	3.6						63
20	3.5	3.2	3.2	3.1	3.0	2.9	2.8	2.7				85
15	2.7	2.4	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	1.8	128
10	1.8	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	↑
5	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	128

model PLB16		Clamping force $F = P / (2.21 + 0.00745 \times LH)$												
Hydraulic pressure MPa	Cylinder force kN	Clamping force kN												Max. arm length Max. LH mm
		Clamp arm length LH mm												
		35	40	50	60	70	80	90	100	120	140			
50	22.6	20.2												39
45	20.4	18.2	17.9											44
40	18.1	16.2	15.9	15.5										50
35	15.8	14.2	14.0	13.6										59
30	13.6	12.1	12.0	11.6	11.3	11.0								71
25	11.3	10.1	10.0	9.7	9.4	9.2	8.9							89
20	9.0	8.1	8.0	7.7	7.5	7.3	7.1	6.9	6.8	6.4				121
15	6.8	6.1	6.0	5.8	5.6	5.5	5.3	5.2	5.1	4.8	4.6			186
10	4.5	4.0	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.2	3.1	↑		
5	2.3	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.6	1.5			186

model PLB25		Clamping force $F = P / (1.41 + 0.00412 \times LH)$										
Hydraulic pressure MPa	Cylinder force kN	Clamping force kN										Max. arm length Max. LH mm
		Clamp arm length LH mm										
		40	50	60	70	80	90	100	120	140	160	
50	35.5	31.8										40
45	31.9	28.6										45
40	28.4	25.4	24.8									52
35	24.8	22.2	21.7	21.1								61
30	21.3	19.1	18.6	18.1	17.7							73
25	17.7	15.9	15.5	15.1	14.7	14.4	14.0					91
20	14.2	12.7	12.4	12.1	11.8	11.5	11.2	11.0	10.5			122
15	10.6	9.5	9.3	9.1	8.8	8.6	8.4	8.2	7.9	7.5	7.2	185
10	7.1	6.4	6.2	6.0	5.9	5.7	5.6	5.5	5.3	5.0	4.8	↑
5	3.5	3.2	3.1	3.0	2.9	2.9	2.8	2.7	2.6	2.5	2.4	185

model PLB40		Clamping force $F = P / (0.867 + 0.00247 \times LH)$												
Hydraulic pressure MPa	Cylinder force kN	Clamping force kN												Max. arm length Max. LH mm
		Clamp arm length LH mm												
		45	50	60	70	80	90	100	120	140	160			
50	57.7	51.1											48	
45	51.9	46.0	45.4										54	
40	46.1	40.9	40.4	39.4									62	
35	40.4	35.8	35.3	34.5	33.7								73	
30	34.6	30.7	30.3	29.6	28.8	28.2							89	
25	28.8	25.6	25.2	24.6	24.0	23.5	23.0	22.4					112	
20	23.1	20.4	20.2	19.7	19.2	18.8	18.4	18.0	17.2	16.5			152	
15	17.3	15.3	15.1	14.8	14.4	14.1	13.8	13.5	12.9	12.4	11.9		237	
10	11.5	10.2	10.1	9.9	9.6	9.4	9.2	9.0	8.6	8.2	7.9	↑		
5	5.8	5.1	5.0	4.9	4.8	4.7	4.6	4.5	4.3	4.1	4.0		237	

Swing speed adjustment

Swing time is restricted by the mass and length of the clamp arm (moment of inertia) since the 90° swing action impacts the cam shaft.

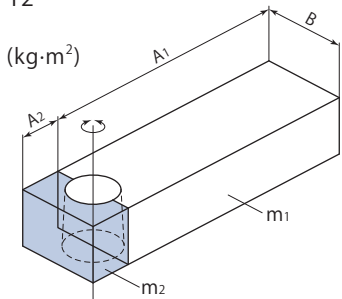
1. Calculate the moment of inertia according to the arm length and mass.
 2. Adjust swing speed with flow control valve to ensure that 90° swing time of the clamp arm is greater than the shortest swing time in the graph shown below.
- The cam groove may be damaged in case the swing speed is set at the nonusable range in the graph.

Example of calculation for moment of inertia

$$I = \frac{1}{12} m_1(4A_1^2 + B^2) + \frac{1}{12} m_2(4A_2^2 + B^2)$$

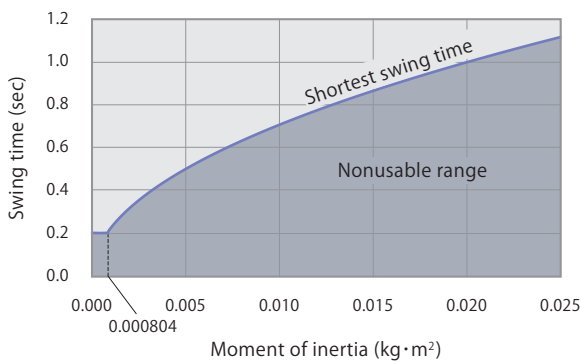
I : Moment of inertia (kg·m²)

m : Mass (kg)



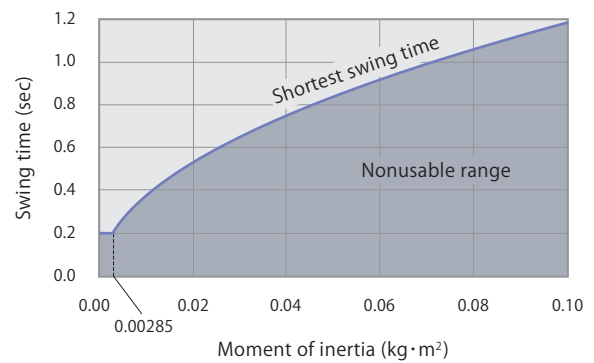
model PLB06

Shortest swing time calculation formula $t = \sqrt{\frac{I}{0.0201}}$



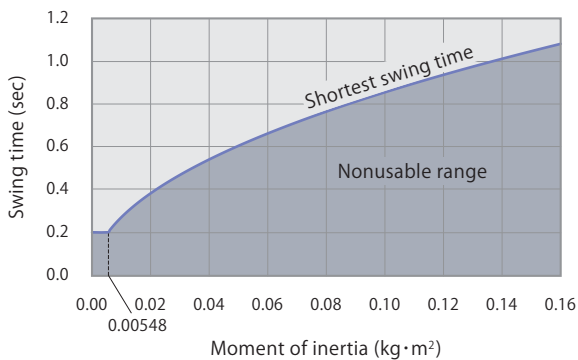
model PLB16

Shortest swing time calculation formula $t = \sqrt{\frac{I}{0.0713}}$



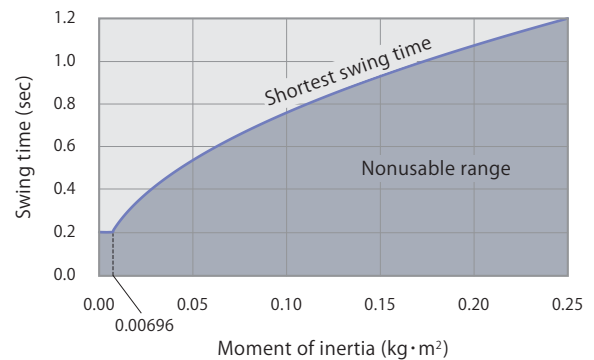
model PLB25

Shortest swing time calculation formula $t = \sqrt{\frac{I}{0.137}}$

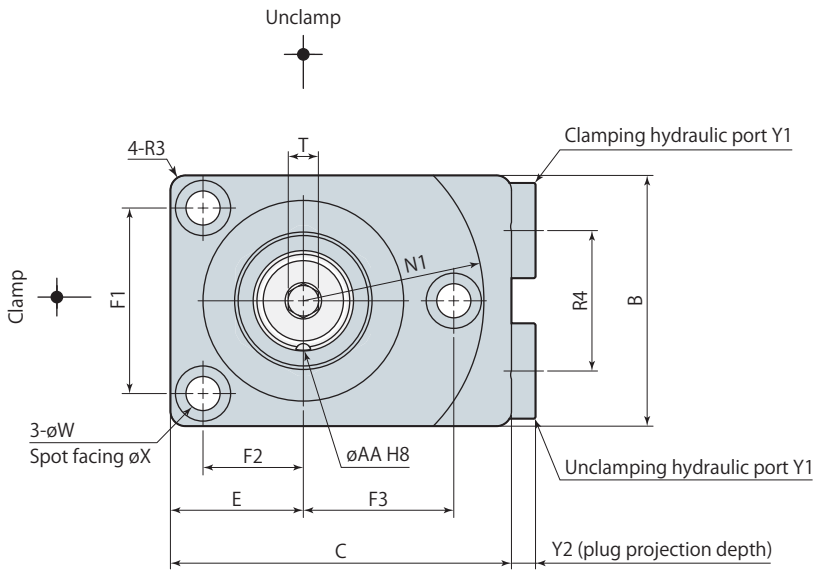


model PLB40

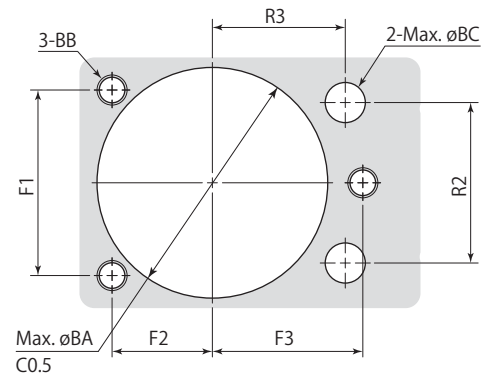
Shortest swing time calculation formula $t = \sqrt{\frac{I}{0.174}}$



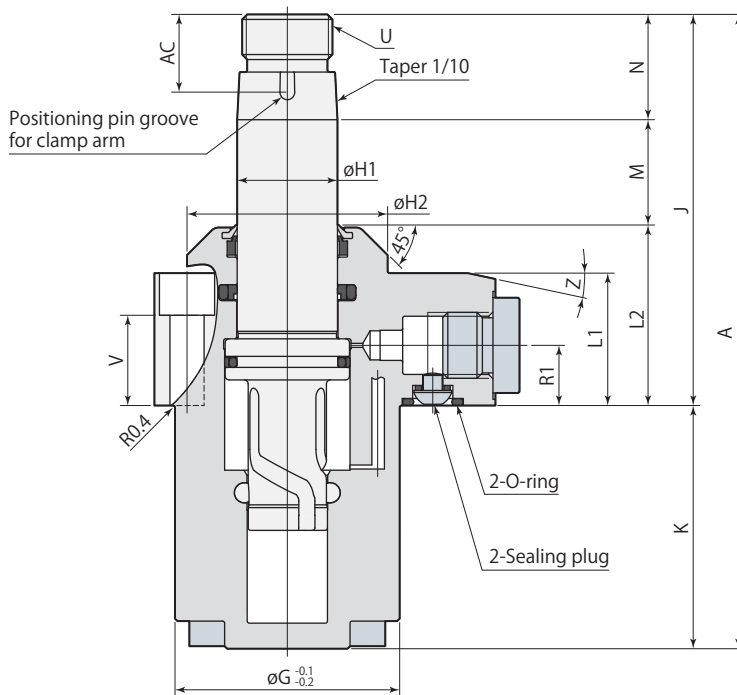
Dimensions



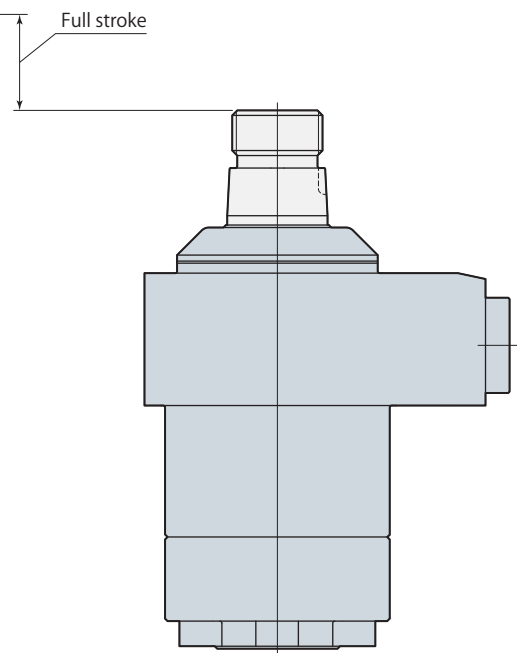
Mounting details



The mounting surface finish must be no rougher than $Rz6.3$ (ISO 4287:1997).



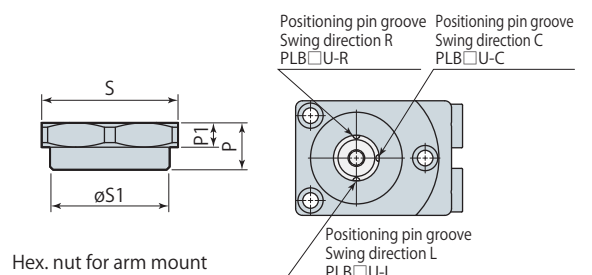
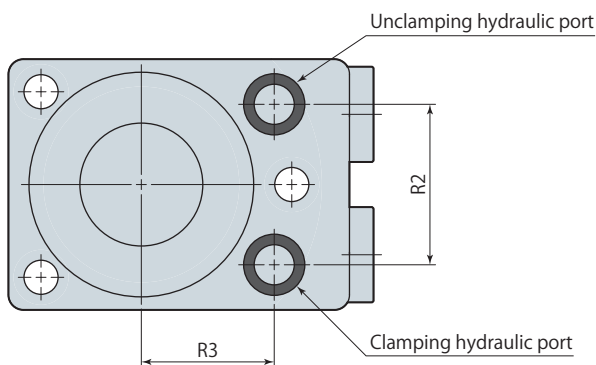
Unclamp



Stroke end

- This diagram indicates a swing direction L (L stands for counter-clockwise).
- Hex. nut for arm mount is included.
- Clamp arm, positioning pin and mounting screws are not included.

Positioning pin position for unclamping



Hex. nut for arm mount

PLB□U-□	Swing clamp Upper flange	50MPa	Double acting
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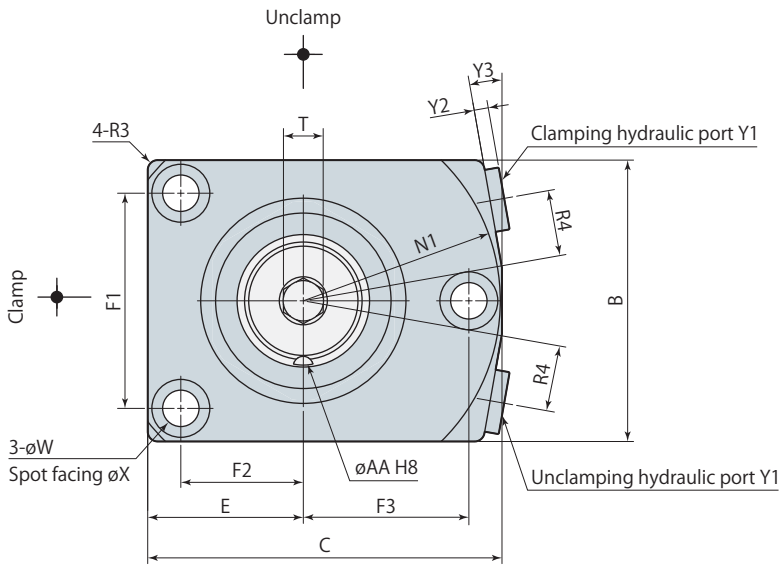
Model	PLB06U-□	PLB16U-□	mm
A	126.5	147.5	
B	50	63	
C	68	80.5	
E	26.5	34.5	
F1	37	48	
F2	20	27	
F3	30	38	
∅ G	44.8	59.8	
∅ H1	20	32	
∅ H2	40	54	
J	78	94	
K	48.5	53.5	
L1	26.4	31.4	
L2	36	42	
M	21	24	
N	21	28	
N1	36	45.3	
P	9	10	
P1	4.5	4.5	
R1	14	14	
R2	32	46	
R3	26.5	31	
R4	28	41	
S (nut width across flats)	27	36	
∅ S1	23.5	33.5	
T (hex. socket)	6	10	
U	M18×1.5	M28×1.5	
V	18	19	
∅ W	6.8	9	
∅ X	11	14	
Y1	G1/4	G1/4	
Y2	4.8	4.8	
Z	12°	27°	
∅ AA (pin groove diameter)	3 ^{+0.014} ₀	5 ^{+0.018} ₀	
AC	15.5	20.5	
Positioning pin	∅3(h8)×6	∅5(h8)×10	
∅ BA	46	61	
BB	M6	M8	
∅ BC	7	7	
O-ring (FKM-90)	P9	P9	
Taper sleeve	PLZ06-BS	PLZ16-BS	
Mass	1.3 kg	2.4 kg	
Flow control valve (meter-in)	VCH02	VCH02	
Air bleeding valve	VCE02	VCE02	
Recommended tightening torque of mounting screws *	12 N·m	29 N·m	

Refer to each page for the details of options.

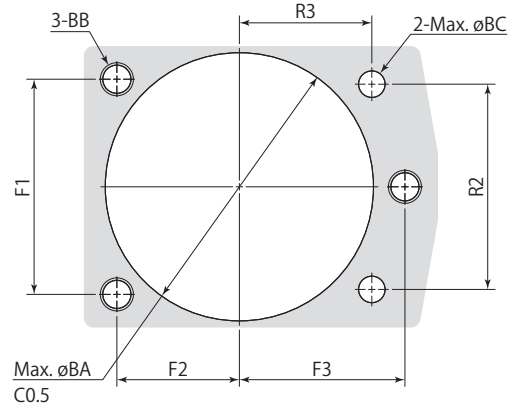
● Taper sleeve **page → 24** ● Flow control valve **page → 25** ● Air bleeding valve **page → 27**

PLB□U-□ (Upper flange) is made to order.

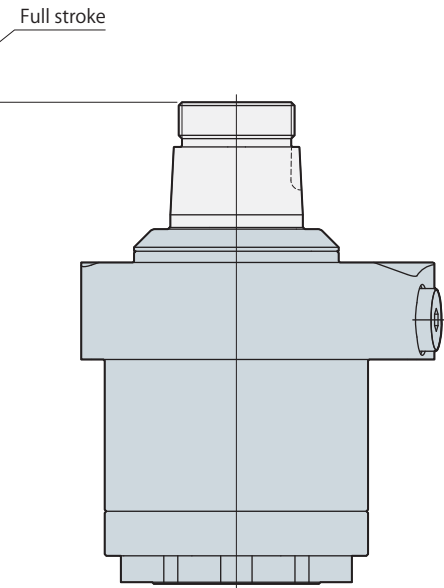
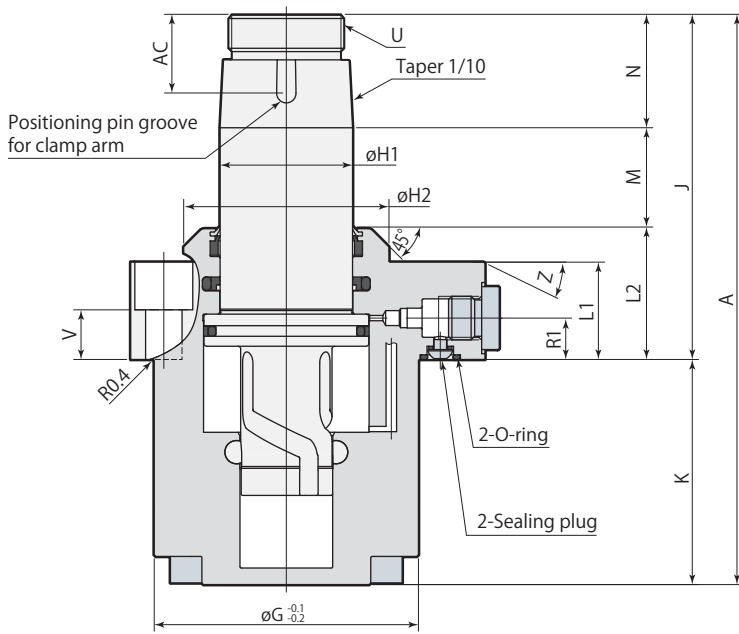
Dimensions



Mounting details

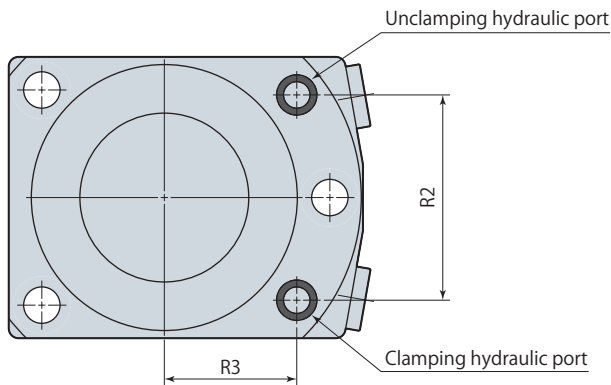


The mounting surface finish must be no rougher than Rz6.3 (ISO 4287:1997).



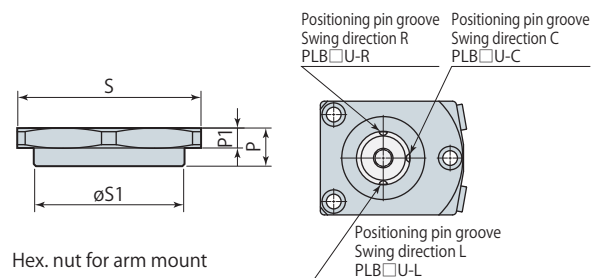
Unclamp

Stroke end



- This diagram indicates a swing direction L (L stands for counter-clockwise).
- Hex. nut for arm mount is included.
- Clamp arm, positioning pin and mounting screws are not included.

Positioning pin position for unclamping



PLB□U-□	Swing clamp Upper flange	50MPa	Double acting
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Model	PLB25U-□	PLB40U-□
A	172	182
B	85	95
C	107	122
E	47	55
F1	65	72
F2	37	42
F3	50	55
∅ G	79.8	89.8
∅ H1	40	50
∅ H2	62	74
J	104	109
K	68	73
L1	29.4	29.4
L2	40	40
M	30	29
N	34	40
N1	59.5	66
P	11	12
P1	5.5	5.5
R1	12	12
R2	62	75
R3	40	45
R4	20.5	23.5
S (nut width across flats)	55	65
∅ S1	45	55.5
T (hex. socket)	12	14
U	M35 × 1.5	M45 × 1.5
V	15	14
∅ W	11	14
∅ X	17.5	20
Y1	G1/4	G1/4
Y2	4.3	4.3
Y3	10°	12°
Z	26°	25°
∅ AA (pin groove diameter)	6 ^{+0.018} ₀	8 ^{+0.022} ₀
AC	23.5	28.5
Positioning pin	∅6(h8) × 12	∅8(h8) × 16
∅ BA	81	91
BB	M10	M12
∅ BC	7	7
O-ring (FKM-90)	P9	P9
Taper sleeve	PLZ25-BS	PLZ40-BS
Mass	4.8 kg	6.5 kg
Flow control valve (meter-in)	VCH02	VCH02
Air bleeding valve	VCE02	VCE02
Recommended tightening torque of mounting screws *	57 N·m	100 N·m

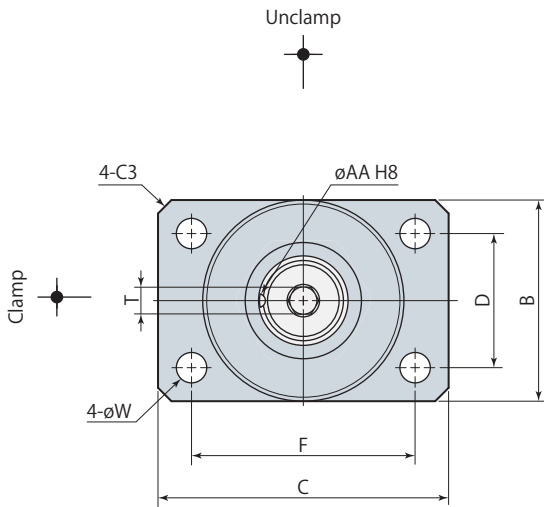
*: ISO R898 class 12.9

Refer to each page for the details of options.

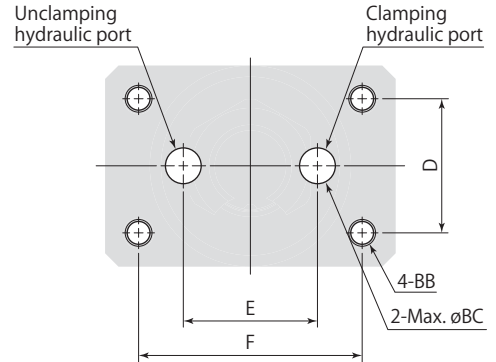
● Taper sleeve **page → 24** ● Flow control valve **page → 25** ● Air bleeding valve **page → 27**

PLB□U-□ (Upper flange) is made to order.

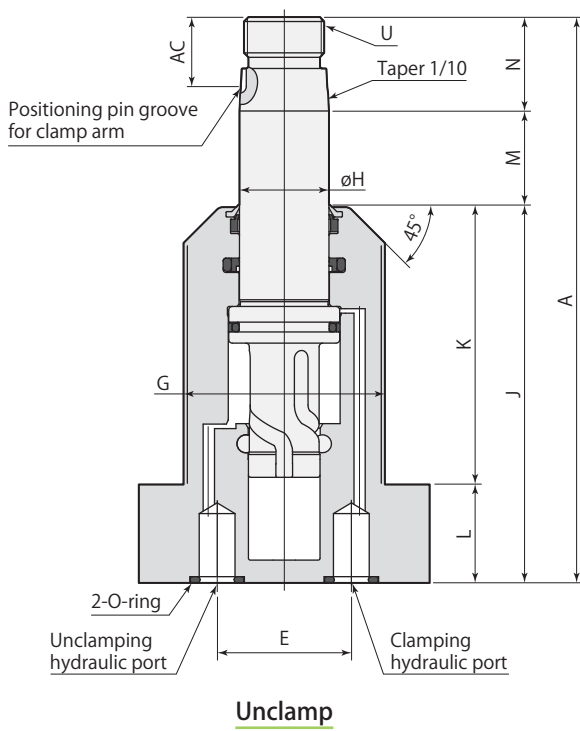
Dimensions



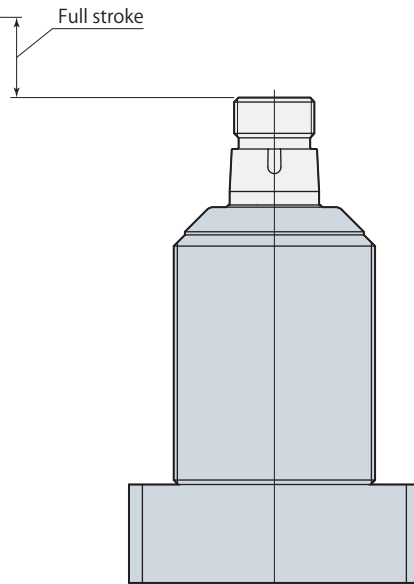
Mounting details



The mounting surface finish must be no rougher than Rz6.3 (ISO4 287:1997).



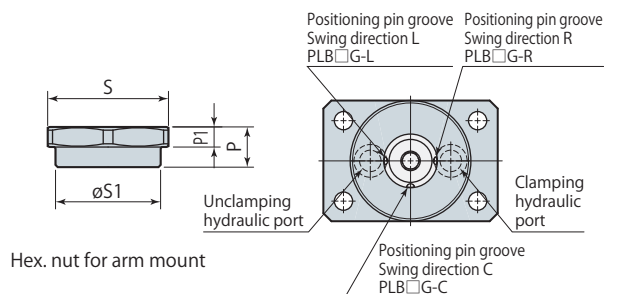
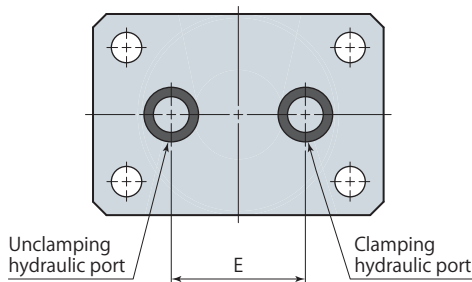
Unclamp



Stroke end

- This diagram indicates a swing direction L (L stands for counter-clockwise).
- Hex. nut for arm mount is included.
- Clamp arm, positioning pin and mounting screws are not included.

Positioning pin position for unclamping



PLB□G-□	Swing clamp Lower flange, manifold piping	50MPa	Double acting
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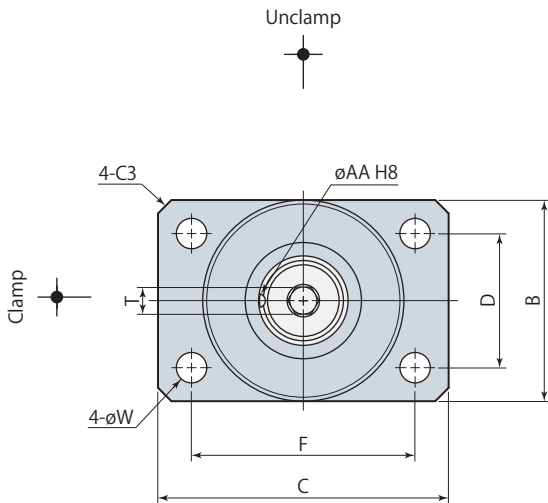
Model	PLB06G-□	PLB16G-□	PLB25G-□	PLB40G-□
A	126.5	147.5	172	182
B	45	63	80	90
C	65	85	100	115
D	30	44	60	68
E	30	56	62	75
F	50	65	80	90
G	M45×1.5	M60×1.5	M80×2.0	M90×2.0
ø H	20	32	40	50
J	84.5	95.5	108	113
K	62.5	73.5	86	91
L	22	22	22	22
M	21	24	30	29
N	21	28	34	40
P	9	10	11	12
P1	4.5	4.5	5.5	5.5
S (nut width across flats)	27	36	55	65
ø S1	23.5	33.5	45	55.5
T (hex. socket)	6	10	12	14
U	M18×1.5	M28×1.5	M35×1.5	M45×1.5
ø W	6.8	9	14	15.5
ø AA (pin groove diameter)	3 ^{+0.014} ₀	5 ^{+0.018} ₀	6 ^{+0.018} ₀	8 ^{+0.022} ₀
AC	15.5	20.5	23.5	28.5
Positioning pin	ø3(h8)×6	ø5(h8)×10	ø6(h8)×12	ø8(h8)×16
BB	M6	M8	M12	M14
ø BC	7	7	7	7
O-ring (FKM-90)	P9	P9	P9	P9
Taper sleeve	PLZ06-BS	PLZ16-BS	PLZ25-BS	PLZ40-BS
Mass	1.2 kg	2.4 kg	4.5 kg	6.2 kg
Recommended tightening torque of mounting screws *	12 N·m	29 N·m	100 N·m	166 N·m

*: ISO R898 class 12.9

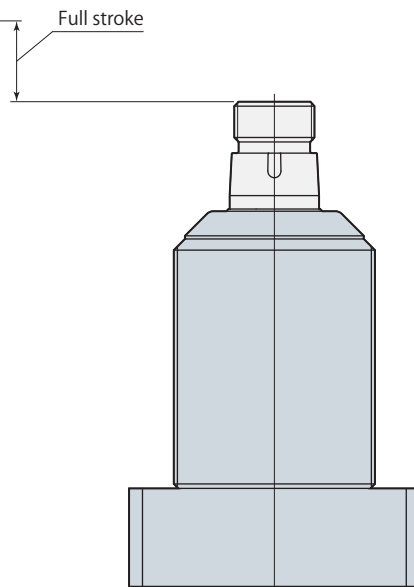
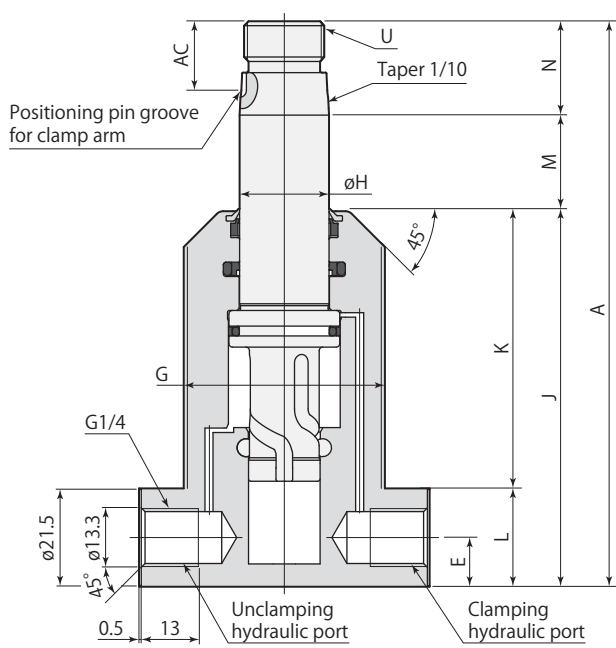
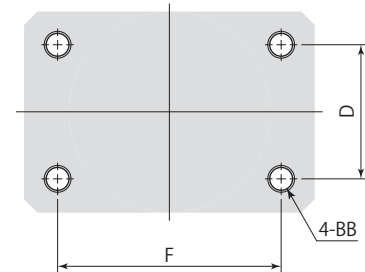
● Refer to **page →24** for the details of taper sleeve.

PLB□G-□ (Lower flange, manifold piping) is made to order.

Dimensions



Mounting details

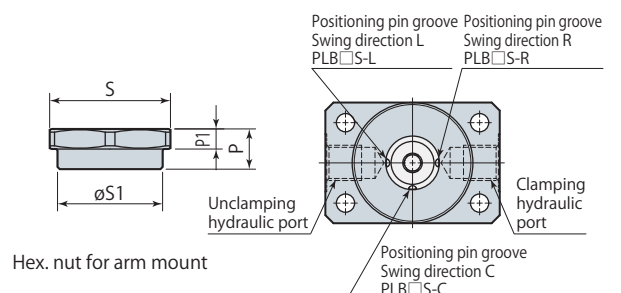
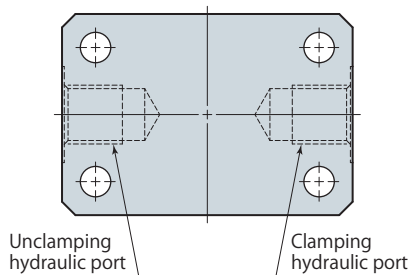


Unclamp

Stroke end

- This diagram indicates a swing direction L (L stands for counter-clockwise).
- Hex. nut for arm mount is included.
- Clamp arm, positioning pin and mounting screws are not included.

Positioning pin position for unclamping



PLB□S-□	Swing clamp Lower flange, G port piping	50MPa	Double acting
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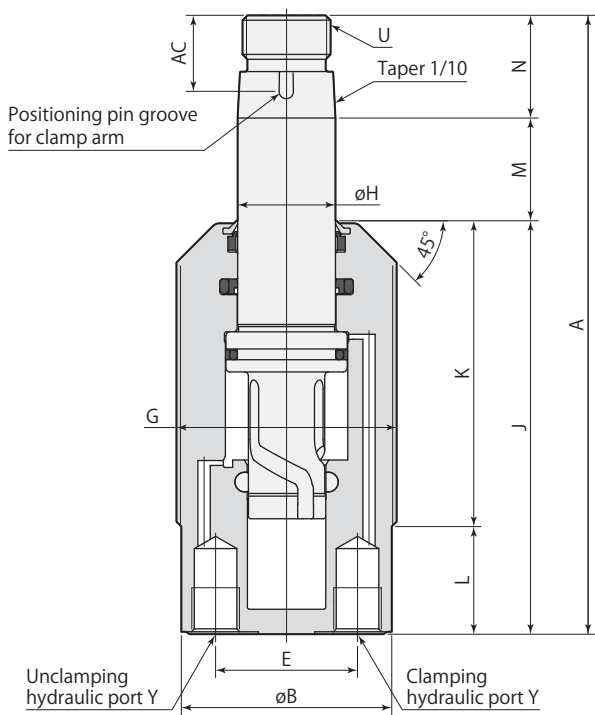
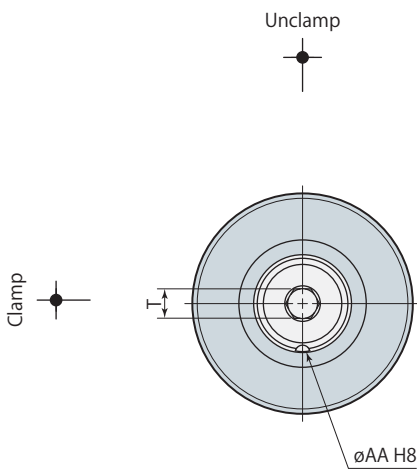
Model	PLB06S-□	PLB16S-□	PLB25S-□	PLB40S-□
A	126.5	147.5	172	182
B	45	63	80	90
C	65	85	100	115
D	30	44	60	68
E	11	11	11	11
F	50	65	80	90
G	M45×1.5	M60×1.5	M80×2.0	M90×2.0
∅ H	20	32	40	50
J	84.5	95.5	108	113
K	62.5	73.5	86	91
L	22	22	22	22
M	21	24	30	29
N	21	28	34	40
P	9	10	11	12
P1	4.5	4.5	5.5	5.5
S (nut width across flats)	27	36	55	65
∅ S1	23.5	33.5	45	55.5
T (hex. socket)	6	10	12	14
U	M18×1.5	M28×1.5	M35×1.5	M45×1.5
∅ W	6.8	9	14	15.5
∅ AA (pin groove diameter)	3 ^{+0.014} ₀	5 ^{+0.018} ₀	6 ^{+0.018} ₀	8 ^{+0.022} ₀
AC	15.5	20.5	23.5	28.5
Positioning pin	∅3(h8)×6	∅5(h8)×10	∅6(h8)×12	∅8(h8)×16
BB	M6	M8	M12	M14
Taper sleeve	PLZ06-BS	PLZ16-BS	PLZ25-BS	PLZ40-BS
Mass	1.2 kg	2.4 kg	4.5 kg	6.2 kg
Recommended tightening torque of mounting screws *	12 N·m	29 N·m	100 N·m	166 N·m

*: ISO R898 class 12.9

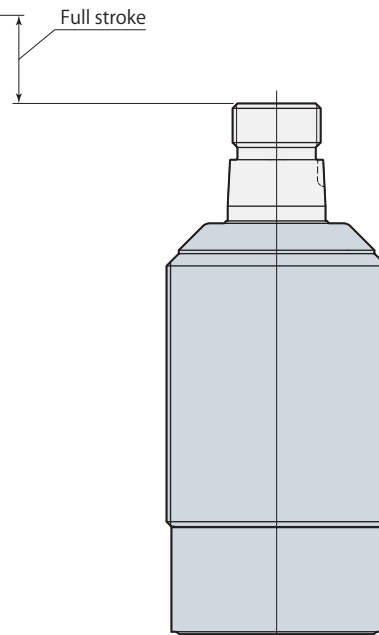
● Refer to **page →24** for the details of taper sleeve.

PLB□S-□ (Lower flange, G port piping) is made to order.

Dimensions

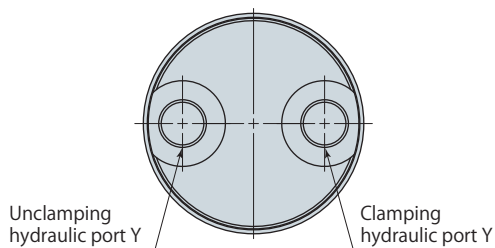


Unclamp

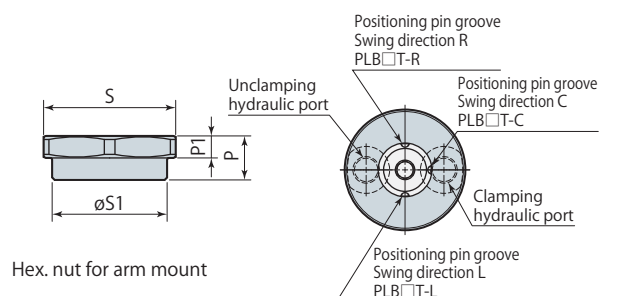


Stroke end

- This diagram indicates a swing direction L (L stands for counter-clockwise).
- Hex. nut for arm mount is included.
- Clamp arm and positioning pin are not included.



Positioning pin position for unclamping



Hex. nut for arm mount

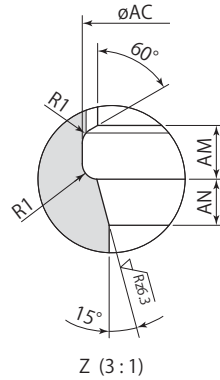
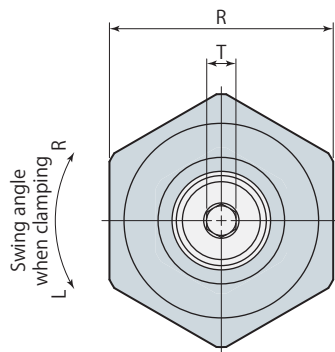
PLB□T-□	Swing clamp Thread	50MPa	Double acting
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Model	PLB06T-□	PLB16T-□	PLB25T-□	PLB40T-□
A	126.5	147.5	172	182
∅B	43	58	77	87
E	29	41	54	68
G	M45×1.5	M60×1.5	M80×2.0	M90×2.0
∅H	20	32	40	50
J	84.5	95.5	108	113
K	62.5	73.5	86	91
L	22	22	22	22
M	21	24	30	29
N	21	28	34	40
P	9	10	11	12
P1	4.5	4.5	5.5	5.5
S (nut width across flats)	27	36	55	65
∅S1	23.5	33.5	45	55.5
T (hex. socket)	6	10	12	14
U	M18×1.5	M28×1.5	M35×1.5	M45×1.5
Y	G1/8	G1/8	G1/4	G1/4
∅AA (pin groove diameter)	3 ^{+0.014} ₀	5 ^{+0.018} ₀	6 ^{+0.018} ₀	8 ^{+0.022} ₀
AC	15.5	20.5	23.5	28.5
Positioning pin	∅3(h8)×6	∅5(h8)×10	∅6(h8)×12	∅8(h8)×16
Taper sleeve	PLZ06-BS	PLZ16-BS	PLZ25-BS	PLZ40-BS
Mass	1.0 kg	2.0 kg	4.0 kg	5.5 kg

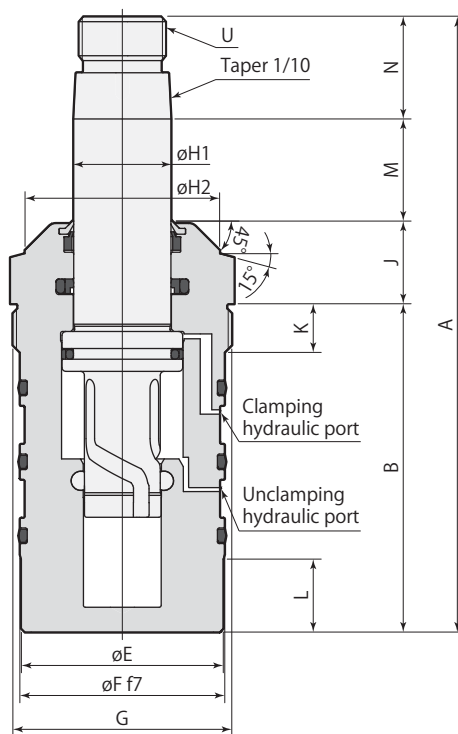
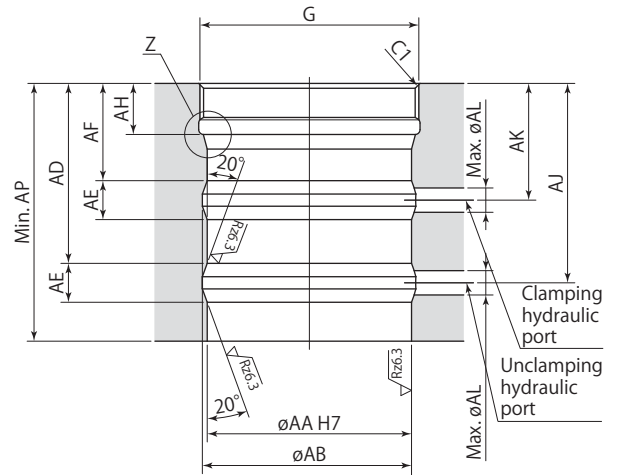
● Refer to **page →24** for the details of taper sleeve.

PLB□T-□ (Thread) is made to order.

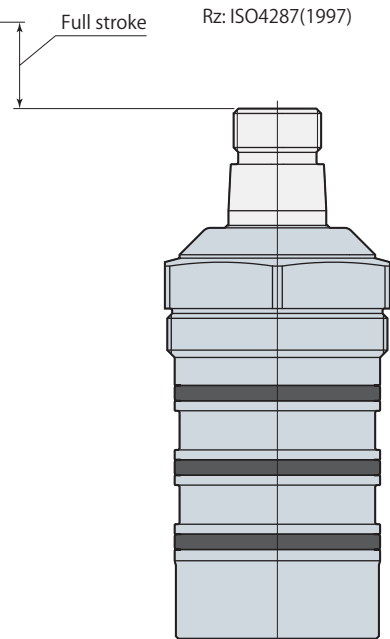
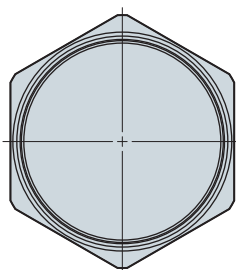
Dimensions



Mounting details

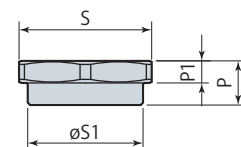


Unclamp



Stroke end

- A positioning pin is unusable due to the threaded body. The pin groove orientation varies depending on the mounting thread.
- Hex. nut for arm mount is included.
- Clamp arm is not included.



Hex. nut for arm mount

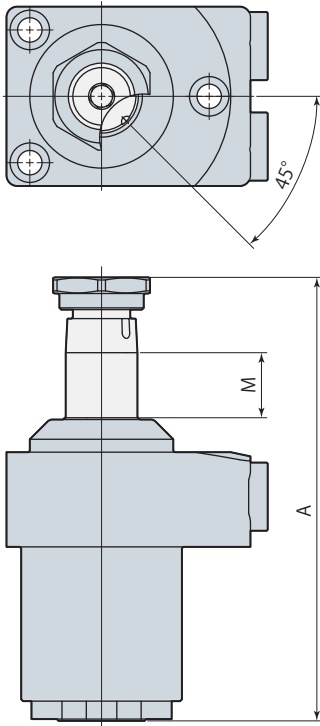
PLB□M-□	Swing clamp Cartridge	50MPa	Double acting
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Model	PLB06M-□	PLB16M-□	mm
A	126.5	162	
B	67.5	76	
∅ E	41.5	54.5	
∅ F	42 ^{-0.025} _{-0.050}	55 ^{-0.030} _{-0.060}	
G	M45×1.5	M60×1.5	
∅ H1	20	32	
∅ H2	40	54	
J	17	34	
K	10	11	
L	15	15	
M	21	24	
N	21	28	
P	9	10	
P1	4.5	4.5	
R (hex width across flats)	46	55	
S (nut width across flats)	27	36	
∅ S1	23.5	33.5	
T (hex. socket)	6	10	
U	M18×1.5	M28×1.5	
∅ AA	42 ^{+0.025} ₀	55 ^{+0.030} ₀	
∅ AB	44	57	
∅ AC	45.5	60.5	
AD	37	41.5	
AE	8	10	
AF	20	24	
AH	10.5	12.5	
AJ	41	46.5	
AK	24	29	
∅ AL	5	5	
AM	3.5	3.5	
AN	3	3	
AP	52.5	61	
Taper sleeve	PLZ06-BS	PLZ16-BS	
Mass	0.9 kg	2.1 kg	
Recommended tightening torque of body	65 N·m	220 N·m	

● Refer to **page →24** for the details of taper sleeve.

PLB□M-□ (Cartridge) is made to order.

Upper flange, swing angle 45°



Size Mounting and piping types Swing direction, swing angle (when clamping)

06

16

25

40

PLB **U** : Upper flange —

L45 : Counter-clockwise, swing angle 45°

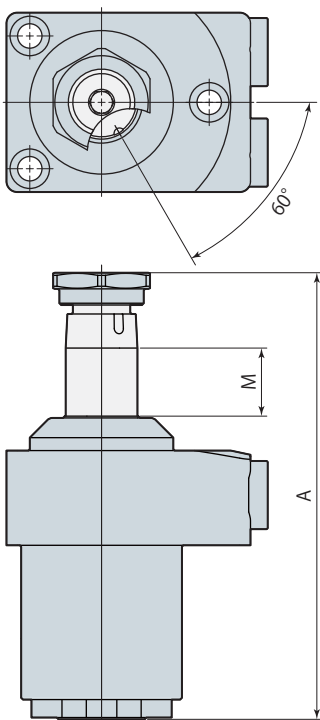
R45 : Clockwise, swing angle 45°

■ indicates made to order.

Model		PLB06U-□45	PLB16U-□45	PLB25U-□45	PLB40U-□45
Swing angle		45° ± 5°			
Full stroke		15.1	18.7	21.2	20.1
Swing stroke		4.1	4.7	6.2	5.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.7 cm ³	8.5 cm ³	15.0 cm ³	23.2 cm ³
	Unclamp	7.4 cm ³	23.5 cm ³	41.6 cm ³	62.7 cm ³
A		123.6	144.2	167.2	178.1
M		18.1	20.7	25.2	25.1
Mass		1.8 kg	2.5 kg	4.9 kg	6.4 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 7 ~ 10) for other specifications and dimensions that are not shown in the diagram.

Upper flange, swing angle 60°



Size Mounting and piping types Swing direction, swing angle (when clamping)

06

16

25

40

PLB **U** : Upper flange —

L60 : Counter-clockwise, swing angle 60°

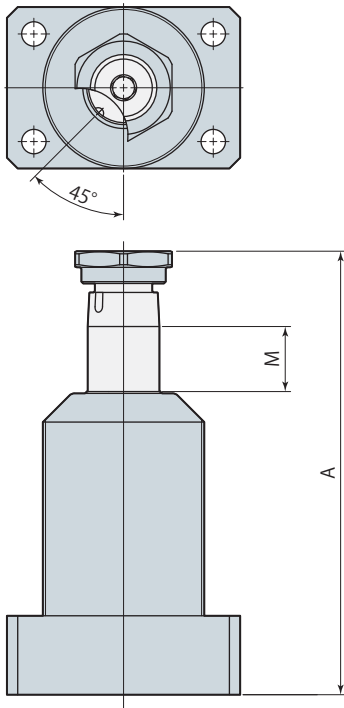
R60 : Clockwise, swing angle 60°

■ indicates made to order.

Model		PLB06U-□60	PLB16U-□60	PLB25U-□60	PLB40U-□60
Swing angle		60° ± 5°			
Full stroke		16	19.7	22.5	21.1
Swing stroke		5	5.7	7.5	6.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.8 cm ³	8.9 cm ³	15.9 cm ³	24.3 cm ³
	Unclamp	7.9 cm ³	24.8 cm ³	44.2 cm ³	65.8 cm ³
A		124.5	145.2	168.5	179.1
M		19	21.7	26.5	26.1
Mass		1.8 kg	2.5 kg	4.9 kg	6.4 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 7 ~ 10) for other specifications and dimensions that are not shown in the diagram.

Lower flange (Manifold piping, G port piping), swing angle 45°



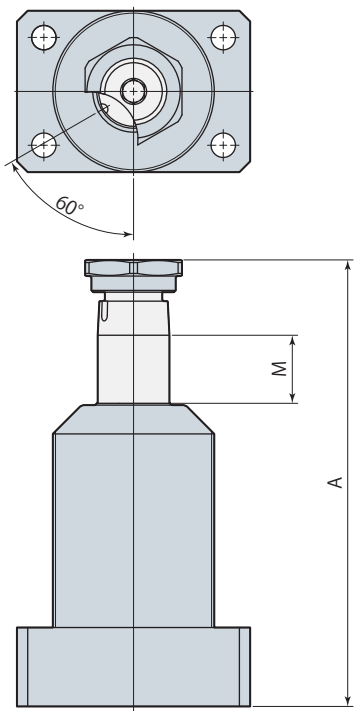
Size	Mounting and piping types	Swing direction, swing angle (when clamping)
06	G : Lower flange, manifold piping	L45 : Counter-clockwise, swing angle 45°
16		
25	S : Lower flange, G port piping	R45 : Clockwise, swing angle 45°
40		

■ indicates made to order.

Model		PLB06 ^G -□45	PLB16 ^G -□45	PLB25 ^G -□45	PLB40 ^G -□45
Swing angle		45° ± 5°			
Full stroke		15.1	18.7	21.2	20.1
Swing stroke		4.1	4.7	6.2	5.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.7 cm ³	8.5 cm ³	15.0 cm ³	23.2 cm ³
	Unclamp	7.4 cm ³	23.5 cm ³	41.6 cm ³	62.7 cm ³
A		123.6	144.2	167.2	178.1
M		18.1	20.7	25.2	25.1
Mass		1.2 kg	2.5 kg	4.6 kg	6.3 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 11~14) for other specifications and dimensions that are not shown in the diagram.

Lower flange (Manifold piping, G port piping), swing angle 60°



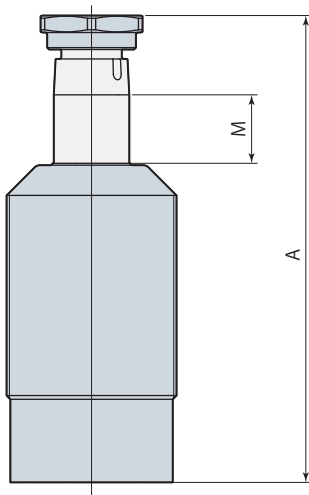
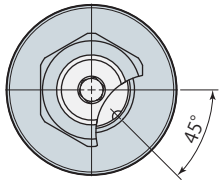
Size	Mounting and piping types	Swing direction, swing angle (when clamping)
06	G : Lower flange, manifold piping	L60 : Counter-clockwise, swing angle 60°
16		
25	S : Lower flange, G port piping	R60 : Clockwise, swing angle 60°
40		

■ indicates made to order.

Model		PLB06 ^G -□60	PLB16 ^G -□60	PLB25 ^G -□60	PLB40 ^G -□60
Swing angle		60° ± 5°			
Full stroke		16	19.7	22.5	21.1
Swing stroke		5	5.7	7.5	6.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.8 cm ³	8.9 cm ³	15.9 cm ³	24.3 cm ³
	Unclamp	7.9 cm ³	24.7 cm ³	44.2 cm ³	65.8 cm ³
A		124.5	145.2	168.5	179.1
M		19	21.7	26.5	26.1
Mass		1.2 kg	2.5 kg	4.6 kg	6.3 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 11~14) for other specifications and dimensions that are not shown in the diagram.

Thread, swing angle 45°



Size	Mounting and piping types	Swing direction, swing angle (when clamping)
06	T : Thread	—
16		
25		
40		

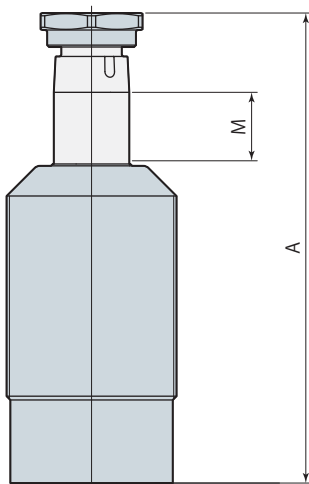
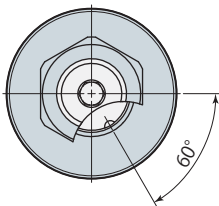
L45 : Counter-clockwise, swing angle 45°
R45 : Clockwise, swing angle 45°

■ indicates made to order.

Model		PLB06T-□45	PLB16T-□45	PLB25T-□45	PLB40T-□45
Swing angle		45° ± 5°			
Full stroke		15.1	18.7	21.2	20.1
Swing stroke		4.1	4.7	6.2	5.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.7 cm ³	8.5 cm ³	15.0 cm ³	23.2 cm ³
	Unclamp	7.4 cm ³	23.5 cm ³	41.6 cm ³	62.7 cm ³
A		123.6	144.2	167.2	178.1
M		18.1	20.7	25.2	25.1
Mass		1.0 kg	2.1 kg	4.1 kg	5.6 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 15, 16) for other specifications and dimensions that are not shown in the diagram.

Thread, swing angle 60°



Size	Mounting and piping types	Swing direction, swing angle (when clamping)
06	T : Thread	—
16		
25		
40		

L60 : Counter-clockwise, swing angle 60°
R60 : Clockwise, swing angle 60°

■ indicates made to order.

Model		PLB06T-□60	PLB16T-□60	PLB25T-□60	PLB40T-□60
Swing angle		60° ± 5°			
Full stroke		16	19.7	22.5	21.1
Swing stroke		5	5.7	7.5	6.1
Clamp stroke		11	14	15	15
Cylinder capacity	Clamp	2.8 cm ³	8.9 cm ³	15.9 cm ³	24.3 cm ³
	Unclamp	7.9 cm ³	24.7 cm ³	44.2 cm ³	65.8 cm ³
A		124.5	145.2	168.5	179.1
M		19	21.7	26.5	26.1
Mass		1.0 kg	2.1 kg	4.1 kg	5.6 kg

- This diagram indicates unclamped condition of swing direction L (L stands for counter-clockwise).
- Refer to specifications (page → 2), dimensions (page → 15, 16) for other specifications and dimensions that are not shown in the diagram.

Cartridge, swing angle 45°

Size Mounting and piping types Swing direction, swing angle (when clamping)

06

L45 : Counter-clockwise, swing angle 45°

PLB

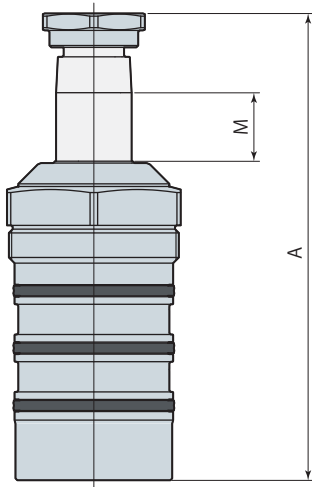
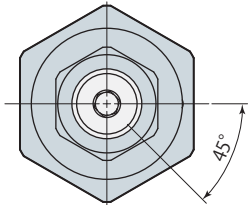
M : Cartridge —

16

R45 : Clockwise, swing angle 45°

■ indicates made to order.

mm



Model		PLB06M-□45	PLB16M-□45
Swing angle		45° ± 5°	
Full stroke		15.1	18.7
Swing stroke		4.1	4.7
Clamp stroke		11	14
Cylinder capacity	Clamp	2.7 cm ³	8.5 cm ³
	Unclamp	7.4 cm ³	23.5 cm ³
A		123.6	158.7
M		18.1	20.7
Mass		0.9 kg	2.3 kg

- This diagram indicates unclamped condition.
- Refer to specifications (page → 2), dimensions (page → 17, 18) for other specifications and dimensions that are not shown in the diagram.

Cartridge, swing angle 60°

Size Mounting and piping types Swing direction, swing angle (when clamping)

06

L60 : Counter-clockwise, swing angle 60°

PLB

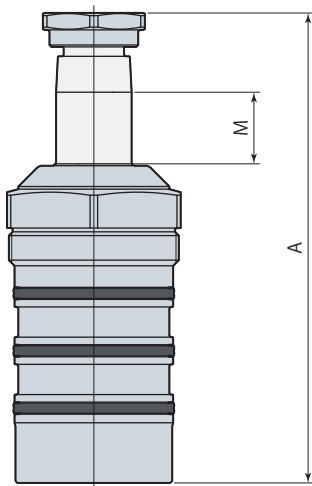
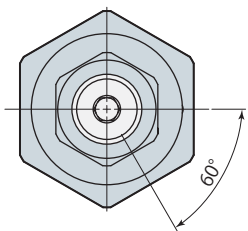
M : Cartridge —

16

R60 : Clockwise, swing angle 60°

■ indicates made to order.

mm

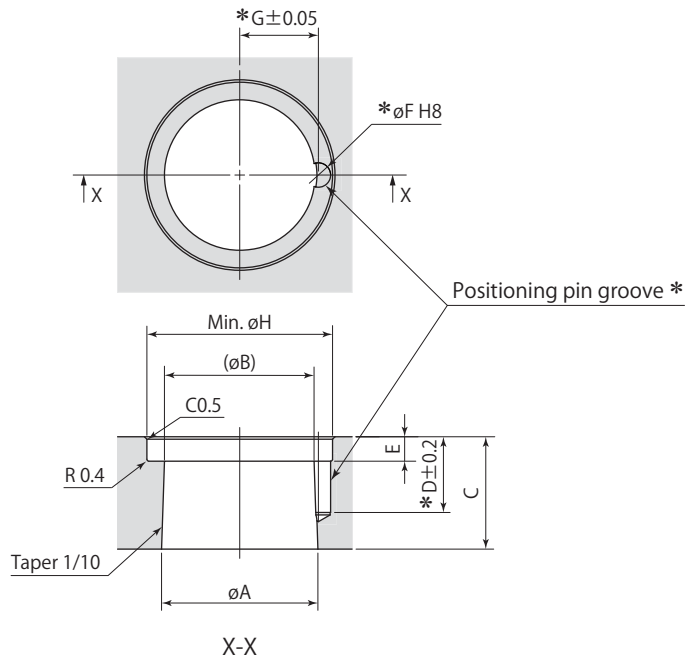


Model		PLB06M-□60	PLB16M-□60
Swing angle		60° ± 5°	
Full stroke		16	19.7
Swing stroke		5	5.7
Clamp stroke		11	14
Cylinder capacity	Clamp	2.8 cm ³	8.9 cm ³
	Unclamp	7.9 cm ³	24.7 cm ³
A		124.5	159.7
M		19	21.7
Mass		0.9 kg	2.3 kg

- This diagram indicates unclamped condition.
- Refer to specifications (page → 2), dimensions (page → 17, 18) for other specifications and dimensions that are not shown in the diagram.

Clamp arm details

Clamp arm is not included. Manufacture a clamp arm with the dimensions shown in the table below.



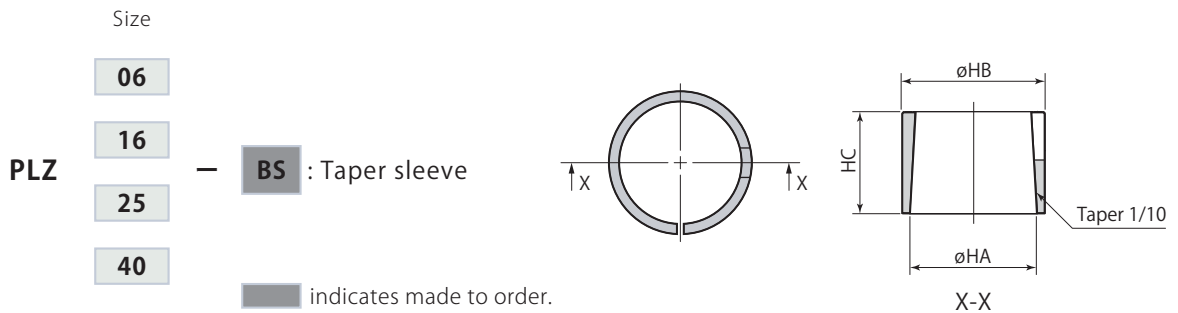
*: No need to machine the pin groove (D, ϕF , G) unless positioning pin is used for the arm.
The positioning pin enables a clamp arm to locate on the clamp firmly and easily.

Swing clamp	PLB06	PLB16	PLB25	PLB40
ϕA	20 ^{-0.020} _{-0.041}	32 ^{-0.025} _{-0.050}	40 ^{-0.025} _{-0.050}	50 ^{-0.025} _{-0.050}
ϕB	18.8	30.2	37.7	47.2
C	16	23	28	34
D	10.5	15.5	17.5	22.5
E	4	5	5	6
ϕF (pin groove diameter)	3 ^{+0.014} ₀	5 ^{+0.018} ₀	6 ^{+0.018} ₀	8 ^{+0.022} ₀
G	10.1	16.1	20.1	25.1
ϕH	24	38	47	59

mm

PLZ□-BS	Taper sleeve	Option
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Taper sleeve

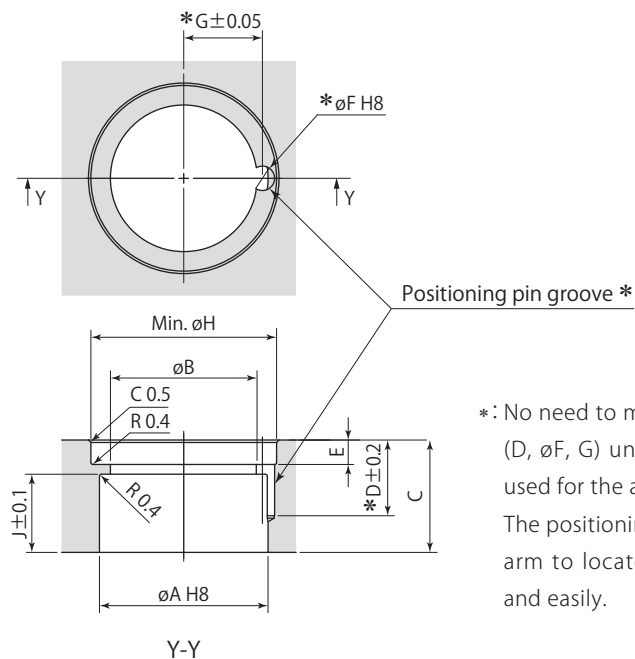


Taper sleeve	PLZ06-BS	PLZ16-BS	PLZ25-BS	PLZ40-BS
Applicable swing clamp	PLB06	PLB16	PLB25	PLB40
ø HA	20 $\begin{smallmatrix} -0.020 \\ -0.041 \end{smallmatrix}$	32 $\begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$	40 $\begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$	50 $\begin{smallmatrix} -0.025 \\ -0.050 \end{smallmatrix}$
ø HB	22 $\begin{smallmatrix} +0.033 \\ 0 \end{smallmatrix}$	34.5 $\begin{smallmatrix} +0.039 \\ 0 \end{smallmatrix}$	43 $\begin{smallmatrix} +0.039 \\ 0 \end{smallmatrix}$	54 $\begin{smallmatrix} +0.046 \\ 0 \end{smallmatrix}$
HC	10	16	21	26

Clamp arm details

(Using taper sleeve)

Clamp arm is not included. Manufacture a clamp arm with the dimensions shown in the table below.



*: No need to machine the pin groove (D, øF, G) unless positioning pin is used for the arm.

The positioning pin enables a clamp arm to locate on the clamp firmly and easily.

Taper sleeve	PLZ06-BS	PLZ16-BS	PLZ25-BS	PLZ40-BS
Applicable swing clamp	PLB06	PLB16	PLB25	PLB40
ø A	22 $\begin{smallmatrix} +0.033 \\ 0 \end{smallmatrix}$	34.5 $\begin{smallmatrix} +0.039 \\ 0 \end{smallmatrix}$	43 $\begin{smallmatrix} +0.039 \\ 0 \end{smallmatrix}$	54 $\begin{smallmatrix} +0.046 \\ 0 \end{smallmatrix}$
ø B	19	30	38	47
C	16	23	28	34
D	10.5	15.5	17.5	22.5
E	4	5	5	6
ø F (pin groove diameter)	3 $\begin{smallmatrix} +0.014 \\ 0 \end{smallmatrix}$	5 $\begin{smallmatrix} +0.018 \\ 0 \end{smallmatrix}$	6 $\begin{smallmatrix} +0.018 \\ 0 \end{smallmatrix}$	8 $\begin{smallmatrix} +0.022 \\ 0 \end{smallmatrix}$
G	10.1	16.1	20.1	25.1
ø H	24	38	47	59
J	10	16	21	26

Specification



Body color : Silver

G port size

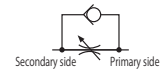
VCH

01 : G1/8

02 : G1/4

Control method

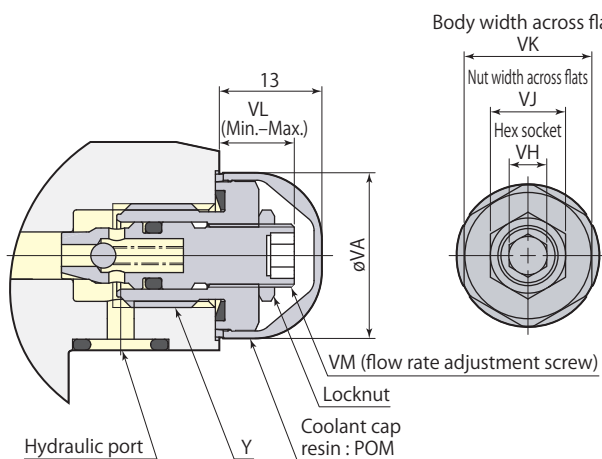
(Nil) : Meter-in



Model		VCH01	VCH02
G port size		G1/8	G1/4
Cracking pressure	MPa	0.04	
Orifice area	mm ²	3.1	6.2
Recommended tightening torque	N-m	10	30
Mass	kg	0.06	0.07

- Pressure range: 1–50 MPa
- Operating temperature: 0–70 °C
- Fluid used: General mineral based hydraulic oil (ISO-VG32 equivalent)

Dimensions



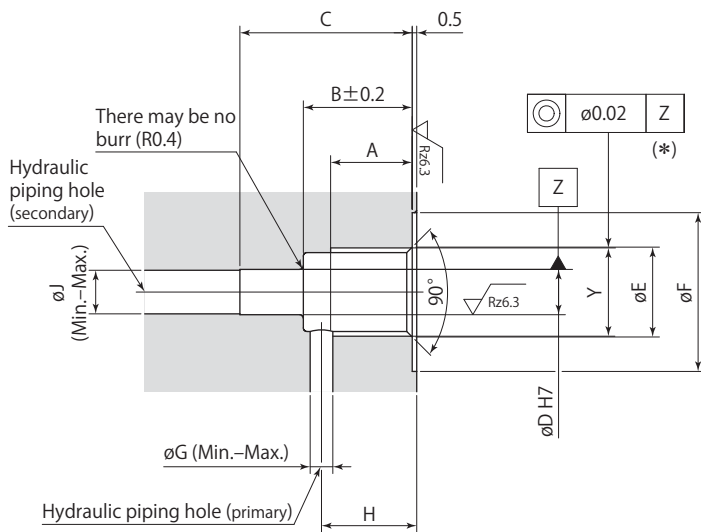
Model	VCH01	VCH02
Y	G1/8	G1/4
øVA	16	21
VH	3	5
VJ	8	10
VK	12	17
VL	7–11	7.5–11.5
Adjustment screw number of turns	5.3 rotations	5.3 rotations
VM	M6×0.75	M8×0.75

- Use a closed wrench or socket wrench for mounting and dismounting.
- Flow control valve can be mounted on hydraulic port (G port) when manifold piping.
- Adjust flow rate without hydraulic pressure. Conducting adjustments with hydraulic pressure may result in damaging seal.
- VCH is shipped with the valve fully open. Adjust the flow rate by loosening the screws after it is screwed in to close totally. Tighten the locknut after adjustment is completed.

Applicable clamp

Model	VCH01	VCH02
Swing clamp (double acting)	—	PLB06U, 16U, 25U, 40U

Mounting details



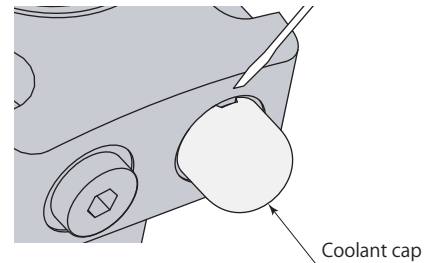
Rz: ISO4287(1997)

mm		
Model	VCH01	VCH02
A	9	13
B	13	18
C	17.5	22.5
øD	5 ^{+0.012} ₀	6 ^{+0.012} ₀
øE	9.9	13.3
øF	17.5	21.5
øG	2.5-3	3.5-5
H	9.5-11.5	14.5-15.5
øJ	2.5-5	3.5-6
Y	G1/8	G1/4

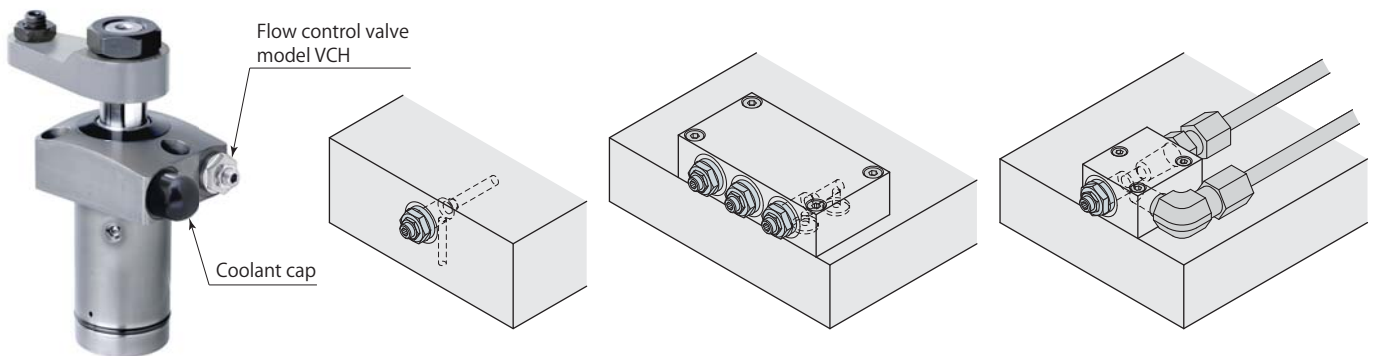
*: Concentricity is required when machining øD and Y-portion thread. Misalignment or machining defect may cause the trouble of installation and adjusting flow rate.

Mounting & dismounting of flow control valve, air bleeding valve

- When mounting or dismounting a flow control valve or air bleeding valve, be sure to set pressure within hydraulic circuit to 0 MPa before starting.
- When mounting a flow control valve or air bleeding valve, be sure to tighten it with the recommended tightening torque.
- When mounting a coolant cap (resin:POM), firmly press the body of cover. If it is not mounting properly, use a plastic mallet to tap it into place.
- When dismounting a coolant cap, use a sharp-pointed tool such as a precision screw driver by hooking the notched portion.



Mounting example



Cylinder mounting

Pallet mounting

Block mounting ①

Block mounting ②

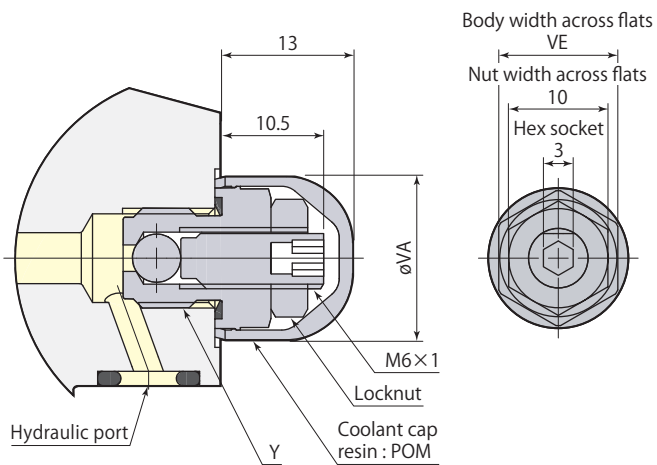
Specification

G port size

VCE

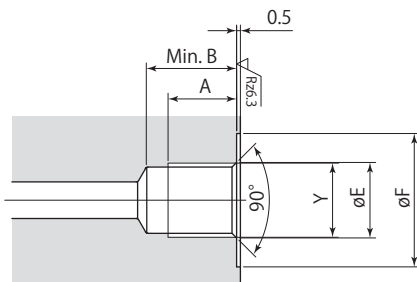
01 : G1/8**02** : G1/4

Model	VCE01	VCE02
G port size	G1/8	G1/4
Recommended tightening torque	N-m 10	30
Mass	kg 0.017	0.029
Pressure range	MPa 0-50	
Operating temperature	°C 0-70	
Fluid used	General mineral based hydraulic oil (ISO-VG32 equivalent)	

Dimensions

Model	VCE01	VCE02
A	9	13
B	10	14
øE	9.9	13.3
øF	17.5	21.5
Y	G1/8	G1/4
øVA	16	21
VE	12	17

- Use a closed wrench or socket wrench for mounting and dismounting.
- Air bleeding valve can be mounted on hydraulic port (G port) when manifold piping.

Mounting details

Rz: ISO4287(1997)

Applicable clamp

Model	VCE01	VCE02
Swing clamp (double acting)	—	PLB06U, 16U, 25U, 40U

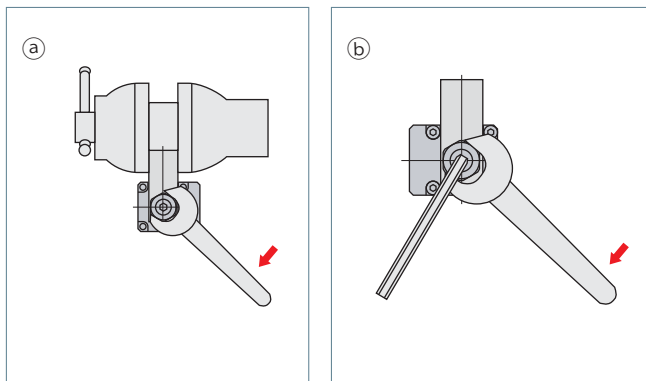
Mounting & dismounting of clamp arm

- Swing clamp may be damaged if excessive torque is applied to piston rod, since structure is intended for swinging using cam mechanism with lead grooves. Follow instructions shown below to prevent excessive torque from being applied on piston rod when mounting or dismounting clamp arm.
- Be sure to tighten the locknut with recommended tightening torque. If the tightening torque is insufficient, clamp arm may slip during operation.

Model		PLB06	PLB16	PLB25	PLB40
Recommended tightening torque of locknut	N·m	25	100	190	400

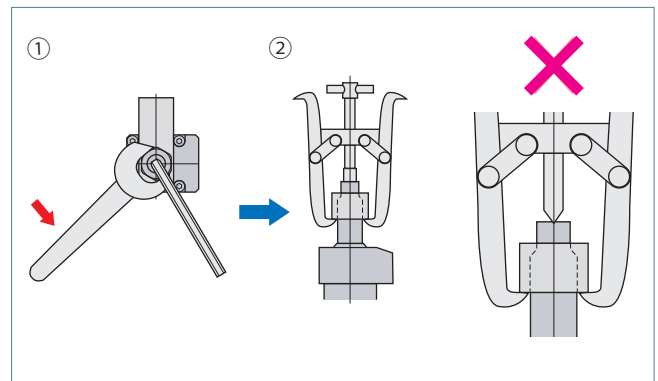
Mounting of clamp arm

- Fix the clamp arm in a vise, then set the clamp body and clamp arm at the desired orientation, and tighten locknut with a wrench.
- For clamps that are mounted on jig, set clamp arm at desired orientation as shown in diagram below. Insert a hex wrench to hex socket at tip section of piston rod to hold it and tighten locknut with a wrench.



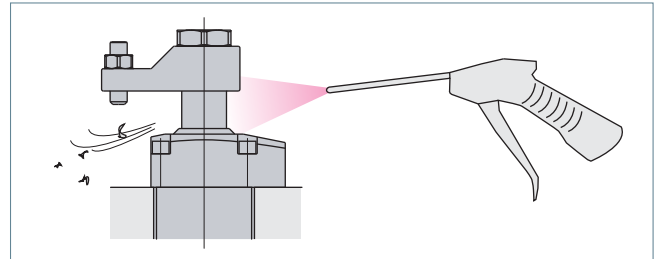
Dismounting of clamp arm

- Insert hex wrench to hex socket at tip section of piston rod to ensure that piston rod is held in place, then loosen locknut with wrench.
- After dismantling the locknut, pull out clamp arm using gear puller. A flat saddle type of gear puller should be used when removing an arm not to enlarge the hole on the tip of the piston rod. In addition, be careful not to rotate the rod when removing the arm.



Caution in use of equipment

1. Clamp and work supports have been developed for the purpose of clamping workpiece for machine tools. Do not use them for other purposes.
2. Always protect them with a cover to ensure sliding surfaces are not exposed to weld slags when using them as jig for welding.
3. Clean sliding surfaces and top part of clamp body with air blowing periodically to ensure smooth operations.



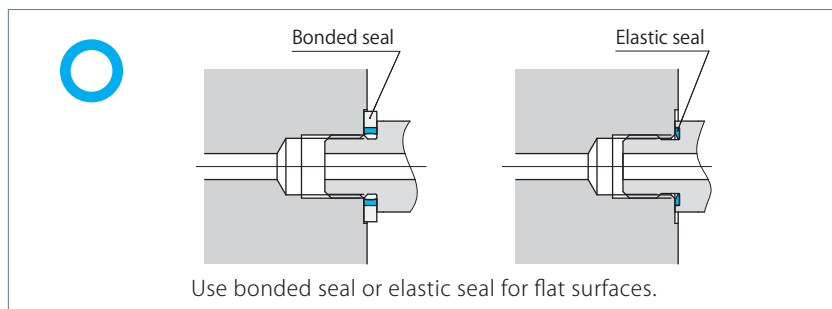
Caution for hydraulic piping

1. Most problems that occur with hydraulic equipment are caused by foreign substances such as metal chips and dust that enter into hydraulic circuits. Refer to "Piping Hydraulic & Pneumatic Equipment-Practical Notes" provided with the product for mounting and hydraulic piping of the product.
2. After performing hydraulic piping, always be sure to bleed out air in the hydraulic circuit. Insufficient bleeding can lead to malfunction.
3. When using multiple clamps, operating speeds and timings vary due to variance in pipe resistance and internal resistance of clamps. Adjust operating speeds and timings using flow control valve.

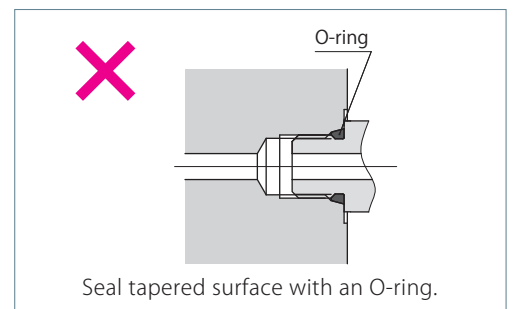
G port sealing method

1. "Sealing method for flange surfaces" has been adopted as standard means for this product. Use fittings and connectors of bonded seal or elastic body seal. Do not use fittings of "Sealing method for tapered surfaces" (O-ring seal method).
2. Seal tapes and liquid packing are not necessary. Seal fittings are included with packing.
3. When mounting, clean metal chips and dust off surfaces that will come into contact with packing.

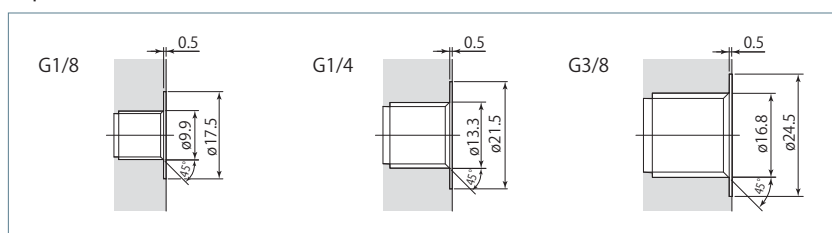
Sealing method for flange surfaces



Sealing method for tapered surfaces



G port details



Pascal

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CERTIFICATE OF APPROVAL ISO9001