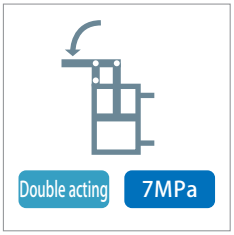
Link clamp

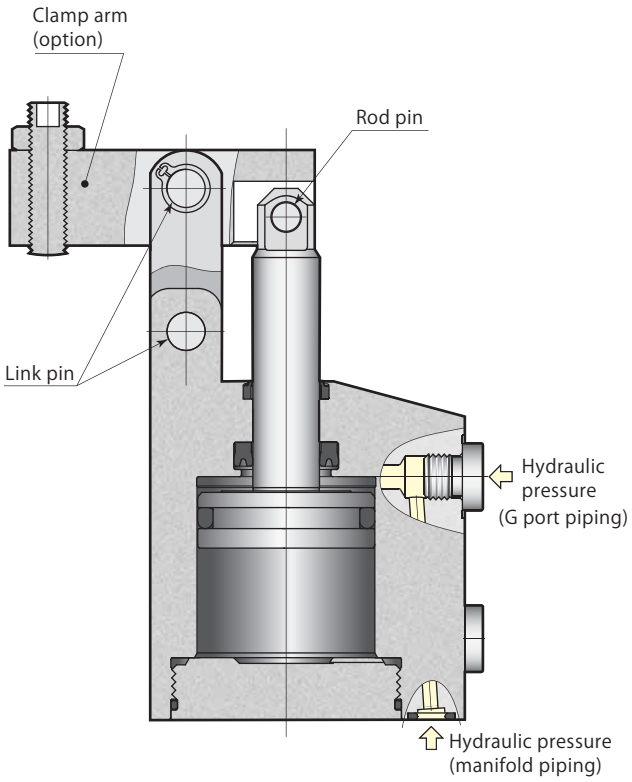
model
BLU



Block-type link clamp that requires no spacer

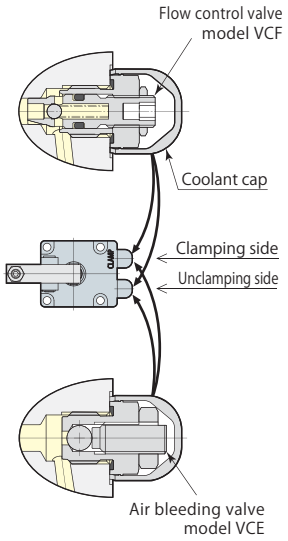
High strength & integrated construction

Compact with higher output is sought through integrated structure of link pin support section and cylinder body.



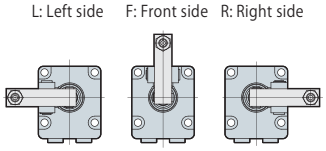
Flow control valve

Operating speeds can be adjusted individually by mounting a flow control valve (option), making sequential operation on same circuit or control of synchronization operation easier. **page → 151**



Three-directional clamp arm

Three types, each with different clamp arm mounting direction, are available. These may be selected to accommodate jig layout, such as workpiece or hydraulic piping.



Furthermore, standard and long clamp arms are available as optional components. **page → 91**

2-way hydraulic piping

G thread piping connection port and manifold piping connection port are available.

Specifications

Model			BLU02	BLU04	BLU06	BLU10	BLU16	BLU25
Cylinder force (hydraulic pressure 7 MPa)		(kN)	3.4	5.0	6.7	10.6	17.2	26.9
Clamping force (hydraulic pressure 7 MPa) *1		(kN)	2.6	3.5	4.4	7.3	12.1	18.2
Standard clamp arm length (LH)		(mm)	36.5	42	50	56.5	69.5	87.5
Cylinder inner diameter		(mm)	25	30	35	44	56	70
Rod diameter		(mm)	12	14	14	16	22.4	28
Effective area (clamp)		(cm^2)	4.9	7.1	9.6	15.2	24.6	38.5
Full stroke		(mm)	20.5	23.5	26	29.5	36	45
Clamp stroke		(mm)	17.5	20.5	23	26.5	33	42
Stroke margin		(mm)	3	3	3	3	3	3
Max. oil flow rate		(ℓ/min)	1.0	1.6	2.6	4.7	9.5	18.9
Cylinder capacity	Clamp	(cm^3)	10.0	16.7	25.0	44.8	88.6	173.3
	Unclamp	(cm^3)	7.7	13.0	21.0	38.9	74.5	145.5
Mass		(kg)	1.0	1.4	1.9	3.2	5.3	9.7
Recommended tightening torque of mounting screws *2		(N·m)	7	7	11	25	49	60

Working pressure range: 1 ～ 7 MPa Proof pressure: 10.5 MPa Operating temperature: 0 ～ 70°C

Fluid used：General mineral based hydraulic oil (ISO-VG32 equivalent)

*1 : Clamping force at time standard clamp arm is mounted. Clamping force varies depending on clamp arm length. Refer to section on 7 MPa link clamp model CLU (refer to **pages →73 and 74**) for details.

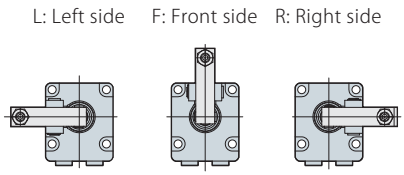
*2 : Strength classification of mounting screws is 12.9.

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).

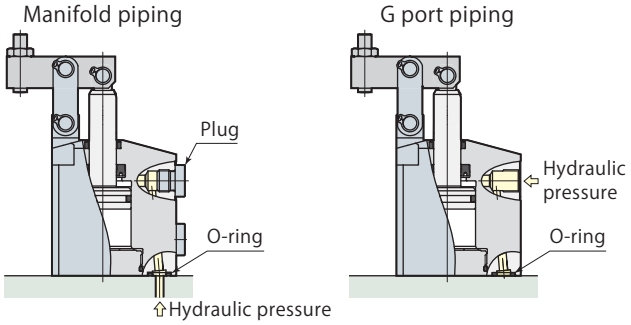
Model designation

BLU ①-② (Example : BLU06-F)

	① Size (refer to specification table)		② Clamp arm mounting direction
BLU	**02** **04** **06** **10** **16** **25**	–	**L** : Left side **F** : Front side **R** : Right side



Piping method

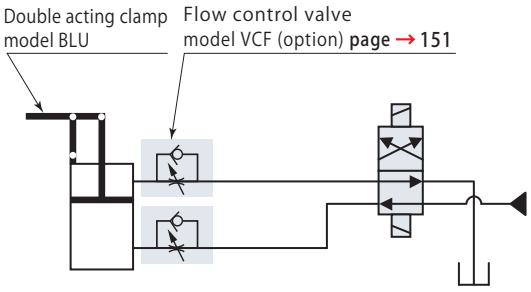


Two piping methods are available for model BLU, manifold piping and G port piping.

Dismount plug when using G port piping. Whichever method is chosen for piping, O-ring must be used.

Refer to **page →155** for details on G port piping flareless fitting.

Hydraulic circuit diagram (reference)

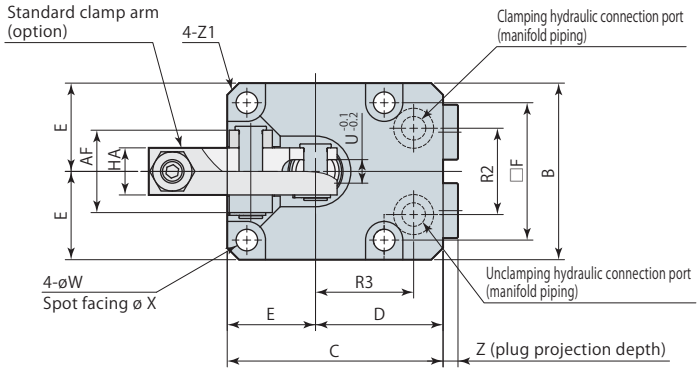


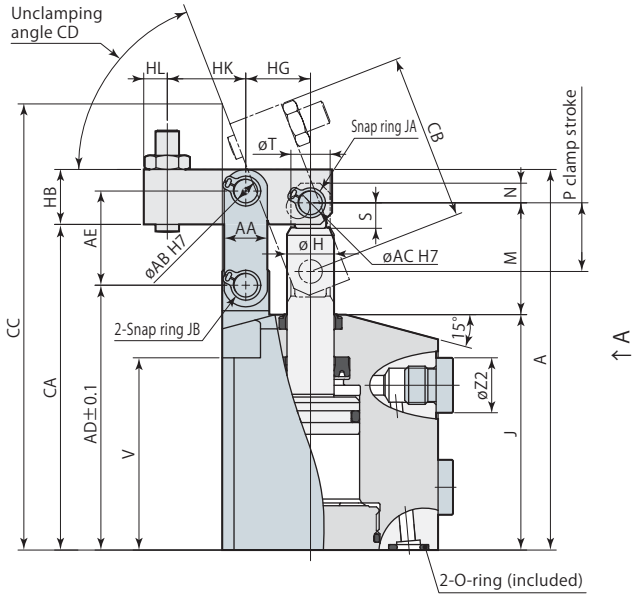
For flow control valve, we recommend the meter-in control. If meter-out control is used, due to the area difference, it will cause back pressure and become high pressure. This can lead to malfunction of the system. Please be aware when designing the circuit.

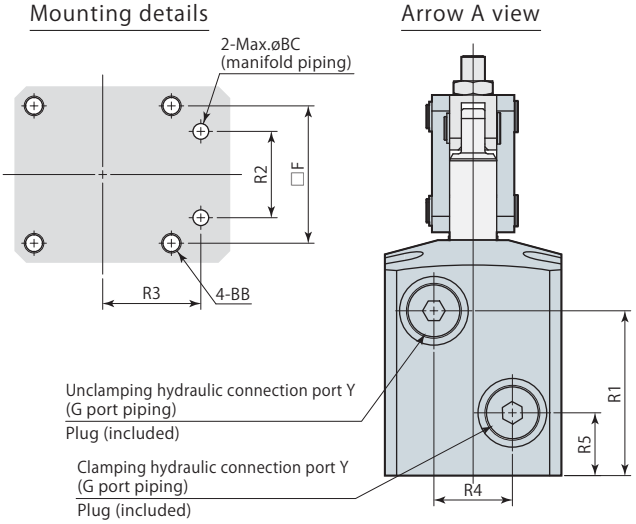
Dimensions

BLU 02 04 06 10 16 25 - L F R

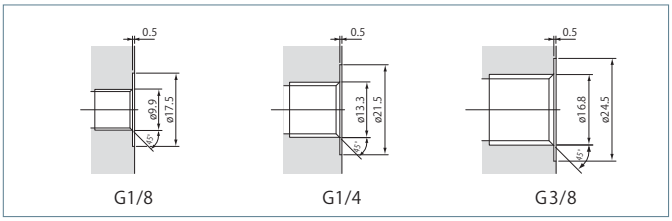
(mm)







Model	BLU02-L/F/R	BLU04-L/F/R	BLU06-L/F/R	BLU10-L/F/R	BLU16-L/F/R	BLU25-L/F/R
A	97	108	119.5	140	166	199
B	45	50	57	70	86	108
C	55	60	66	82	96	120
D	32.5	35	37.5	47	53	66
E	22.5	25	28.5	35	43	54
F	35	40	46	56	68	88
H	12	14	14	16	22.4	28
J	60	66	71	83	95	112
M	28.5	32	34.5	40	49	61.5
N	5	6	6	8	11	13
P	17.5	20.5	23	26.5	33	42
R1	42	48	51	56.5	64.5	80.5
R2	22	24	28	36	45	50
R3	25	28	30.5	36	42	57
R4	20	22	26	30	38	50
R5	16	17	17	22	23	28
S	6.5	7	7	9	10.8	14.5
T	10	12	12	14	20	26
U *1	6	6	8	10	11	16
V	49	54	57	66	73.5	83
W	5.5	5.5	6.8	9	11	14
X	9.5	9.5	11	14	17.5	20
Y	G1/8	G1/8	G1/8	G1/4	G1/4	G3/8
Z	3.8	3.8	3.8	4.8	4.8	4.8
Z1	C3	C3	C3	C4	C6	C6.5
Z2	14	14	14	19	19	22
O-ring *2	P7	P7	P7	P8	P8	P10
AA	11	13	15	19	25	32
AB	6 +0.012 0	6 +0.012 0	8 +0.015 0	10 +0.015 0	14 +0.018 0	16 +0.018 0
AC	6 +0.012 0	6 +0.012 0	6 +0.012 0	8 +0.015 0	12 +0.018 0	14 +0.018 0
AD	67.5	75.5	81.5	95	109.5	130
AE	24	26	30	35.5	44	53
AF	21	21	28	37	46	56
BB	M5	M5	M6	M8	M10	M12
BC	4	4	4	6	6	8
CA	83	92	99.5	115	135	161
CB	48.0	59.6	67.3	78.7	98.2	133.5
CC	113.7	132	143.8	167.4	199.7	254.2
CD	About 69°	About 71°	About 70°	About 70°	About 69°	About 72°
HA	12	12	16	19	22	32
HB	14	16	20	25	31	38
HG	16.5	18.5	21	24.5	30.5	37.5
HK	20	23.5	29	32	39	50
HL	6	6	8	10	11	15
JA *3	STW-6	STW-6	STW-6	STW-8	STW-12	STW-14
JB *3	STW-6	STW-6	STW-8	STW-10	STW-14	STW-16



Note 1. Diagram above represents external contour of BLU□-F. BLU□-L and BLU□-R differ only in terms of mounting direction of clamp arm and otherwise all dimensions are identical to those of BLU□-F.

2. The mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

3. Mounting screws are not included.

4. Refer to **page → 91** for details on clamp arm.

*1 : Dimensions of area across flats at tip section of piston rod are shown.

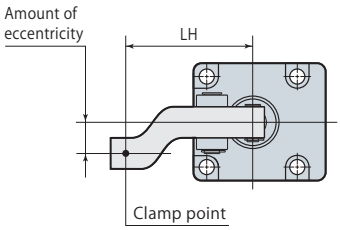
*2 : Material of O-ring is fluorocarbon (with hardness Hs90).

*3 : Snap ring is made by Ochiai Corporation.

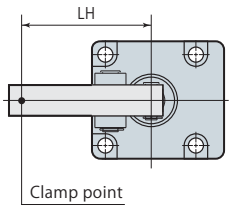
Allowable eccentricity of clamp arm

An eccentric shape clamp arm, as shown in diagram on right can be used with link clamp model BLU, if it is not possible to set clamp point at tip section of clamp arm in alignment with center line of piston rod and clamp arm.
Amount of eccentricity, however, must be within allowable eccentricity shown below. Using a clamp arm that exceeds allowable eccentricity results in significant eccentric load on link mechanism and piston rod, leading to malfunction.

Eccentric shape clamp arm



Ordinary clamp arm



BLU 02

▒ indicates nonusable range

Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)							
	27	30	36.5	40	50	60	80	100
7			10	14	25	35	55	60
6.5			12	16	28	40	60	↑
6		8	16	20	35	48	↑	↑
5.5		10	20	25	40	55	↑	↑
5	8	14	25	32	50	60	↑	↑
4.5	10	16	30	36	60	↑	↑	↑
4	15	23	39	48	↑	↑	↑	↑
3.5	20	28	47	57	↑	↑	↑	↑
3	25	35	58	60	↑	↑	↑	↑
2.5	33	45	60	↑	↑	↑	↑	↑
2	44	60	↑	↑	↑	↑	↑	↑
1.5	60	↑	↑	↑	↑	↑	↑	↑
1	60	60	60	60	60	60	60	60

BLU 04

▒ indicates nonusable range

Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)							
	30	35	42	50	60	80	100	120
7					7	16	25	32
6.5					10	22	32	42
6				8	16	28	40	54
5.5			7	13	21	36	52	60
5			10	18	26	45	60	↑
4.5		7	15	24	35	56	↑	↑
4		10	20	30	45	60	↑	↑
3.5	8	16	27	40	56	↑	↑	↑
3	13	23	37	54	60	↑	↑	↑
2.5	18	30	48	60	↑	↑	↑	↑
2	26	42	60	↑	↑	↑	↑	↑
1.5	39	60	↑	↑	↑	↑	↑	↑
1	60	60	60	60	60	60	60	60

BLU 06

▒ indicates nonusable range

Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)						
	35	45	50	60	80	100	120
7			8	8	8	8	8
6.5		8	8	8	8	8	8
6		12	13	15	19	23	26
5.5		18	20	24	32	41	49
5	8	24	28	35	48	62	76
4.5	12	32	37	48	68	80	80
4	18	42	49	64	80	↑	↑
3.5	24	51	65	80	↑	↑	↑
3	31	63	79	↑	↑	↑	↑
2.5	41	80	80	↑	↑	↑	↑
2	55	↑	↑	↑	↑	↑	↑
1.5	80	↑	↑	↑	↑	↑	↑
1	80	80	80	80	80	80	80

BLU 10

▒ indicates nonusable range

Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)								
	40	50	56.5	60	80	100	120	140	160
7		12	17	18	23	28	33	38	43
6.5		15	24	26	35	45	54	64	73
6		18	27	33	50	65	79	94	95
5.5		22	32	38	67	88	95	95	↑
5	9	27	38	45	80	95	↑	↑	↑
4.5	12	32	46	53	93	↑	↑	↑	↑
4	17	40	55	63	95	↑	↑	↑	↑
3.5	22	49	66	76	↑	↑	↑	↑	↑
3	30	61	82	93	↑	↑	↑	↑	↑
2.5	40	79	95	95	↑	↑	↑	↑	↑
2	56	95	↑	↑	↑	↑	↑	↑	↑
1.5	82	↑	↑	↑	↑	↑	↑	↑	↑
1	95	95	95	95	95	95	95	95	95

BLU 16

▒ indicates nonusable range

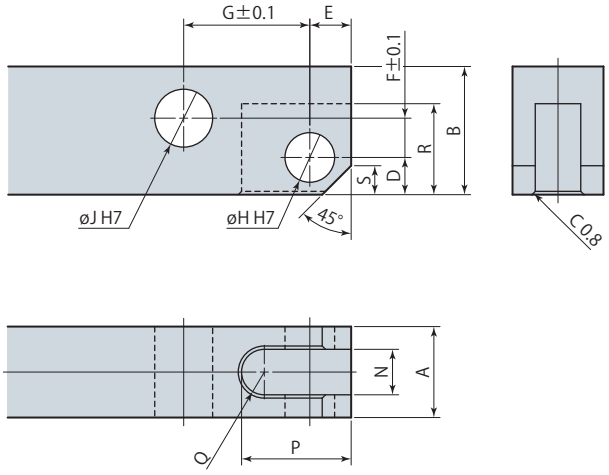
Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)								
	50	60	69.5	80	100	120	140	160	180
7				14	30	45	60	75	90
6.5			12	20	38	56	75	92	110
6			18	28	50	70	90	110	↑
5.5		12	25	38	62	86	110	↑	↑
5		20	34	50	78	110	↑	↑	↑
4.5		28	45	62	97	↑	↑	↑	↑
4	16	38	58	80	110	↑	↑	↑	↑
3.5	25	50	75	100	↑	↑	↑	↑	↑
3	35	65	95	110	↑	↑	↑	↑	↑
2.5	52	90	110	↑	↑	↑	↑	↑	↑
2	75	110	↑	↑	↑	↑	↑	↑	↑
1.5	110	↑	↑	↑	↑	↑	↑	↑	↑
1	110	110	110	110	110	110	110	110	110

BLU 25

▒ indicates nonusable range

Hydraulic pressure (MPa)	Allowable eccentricity (mm) Clamp arm length LH (mm)								
	60	65	87.5	100	120	140	160	180	200
7			25	38	60	80	100	120	140
6.5			32	48	72	95	120	145	160
6			42	60	87	115	142	160	↑
5.5			52	72	105	135	160	↑	↑
5		24	65	90	126	160	↑	↑	↑
4.5	20	32	82	110	150	↑	↑	↑	↑
4	31	44	104	137	160	↑	↑	↑	↑
3.5	41	56	125	160	↑	↑	↑	↑	↑
3	53	71	153	↑	↑	↑	↑	↑	↑
2.5	71	93	160	↑	↑	↑	↑	↑	↑
2	97	125	↑	↑	↑	↑	↑	↑	↑
1.5	141	160	↑	↑	↑	↑	↑	↑	↑
1	160	160	160	160	160	160	160	160	160

Clamp arm details



(mm)

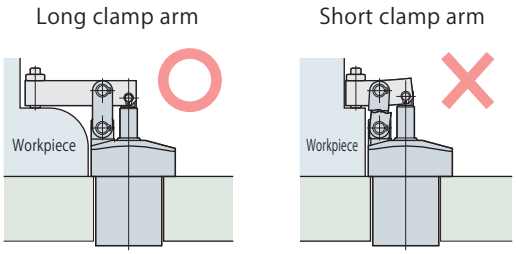
Clamp models	CLU02 CLT02 BLU02	CLU04 CLT04 BLU04	CLU06 CLT06 BLU06	CLU10 CLT10 BLU10	CLU16 CLT16 BLU16	CLU25 CLT25 BLU25
A	12 $^{0}_{-0.1}$	12 $^{0}_{-0.1}$	16 $^{0}_{-0.1}$	19 $^{0}_{-0.1}$	22 $^{0}_{-0.1}$	32 $^{0}_{-0.1}$
B	14	16	20	25	31	38
D	5.5	6	6	8	9	12.5
E	5.5	6	6	7	10	13
F	3	3.5	6	7.5	9.5	9.5
G	16.5	18.5	21	24.5	30.5	37.5
H	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	12 $^{+0.018}_{0}$	14 $^{+0.018}_{0}$
J	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	10 $^{+0.015}_{0}$	14 $^{+0.018}_{0}$	16 $^{+0.018}_{0}$
N	6 $^{+0.1}_{0}$	6 $^{+0.1}_{0}$	8 $^{+0.1}_{0}$	10 $^{+0.1}_{0}$	11 $^{+0.1}_{0}$	16 $^{+0.1}_{0}$
P	14	17	17	20	26.5	36
Q	R3	R3	R4	R5	R5.5	R8
R	12	13.5	13.5	17.5	22	28
S	3	4	4	5	7	8

Note 1. Manufacture a clamp arm with the above dimensions. Manufacturing a clamp arm with dimensions different from the dimension table may cause damage or malfunction.

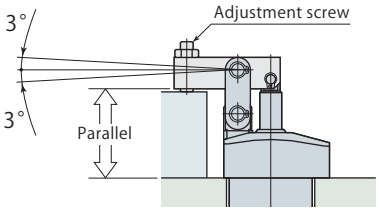
2. Be sure to remove burr. It can cause malfunction.

3. When mounting the clamp arm, use included pins and snap rings.

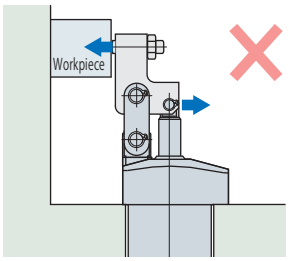
1. With link clamps, force acting on link mechanism becomes larger as clamp arm becomes shorter. Exceeding maximum allowable load for link mechanism will lead to malfunction. Depending on clamp arm length, it would be necessary to lower clamping force (hydraulic pressure). Use appropriate clamping force that is suitable for clamp arm length, by referring to performance table and performance diagram (refer to **pages → 73 and 74** for CLU and BLU series, **pages → 83 and 84** for CLT series).



2. Determine height and mount clamp, ensuring that clamp arm becomes parallel to clamping surface and mounting surface when workpiece is clamped (allowable angle ±3°). Adjustment screw at tip section may be used for adjustment when using standard clamp arm.



3. Using a method such as that shown in the figure on the right will apply a transverse force on the piston rod and cause the piston rod to break. Please avoid the usage that may apply a non-axial force to the piston rod.



Mounting of clamp and work support

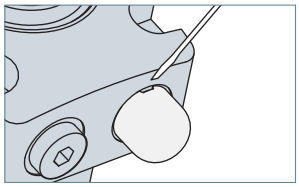
Use screws with ISO R898 class 12.9 for mounting clamp and work support and be sure to apply recommended torque for tightening, by referring to recommended tightening torque of mounting screws indicated below.

Recommended tightening torque of mounting screws (ISO R898 class 12.9)

Mounting screws size	Tightening torque
M4 ×0.7	2.8 N·m
M5 ×0.8	7 N·m
M6 ×1	11 N·m
M8 ×1.25	25 N·m
M10×1.5	49 N·m
M12×1.75	60 N·m

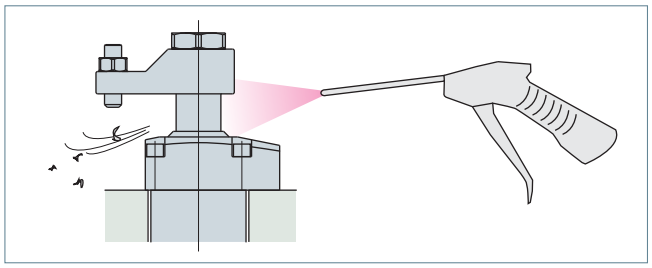
Mounting & dismounting of optional parts

1. 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.
2. When mounting a flow control valve or air bleeding valve, be sure to tighten it with the recommended tightening torque (refer to **pages →151 and 152** for recommended tightening torque).
3. 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.
4. When dismounting a coolant cap, use a sharp-pointed tool such as a precision screw driver by hooking the notched portion.



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.
4. The special scraper has superior scraping capability to remove oil film on the surface of the rod, there are cases where grease and working fluid (oil films) inside the clamp are scraped and expelled to the outside. This may result in accumulation of oil in the external perimeters of piston rod on the upper part of the scraper, but this does not indicate an oil leak.

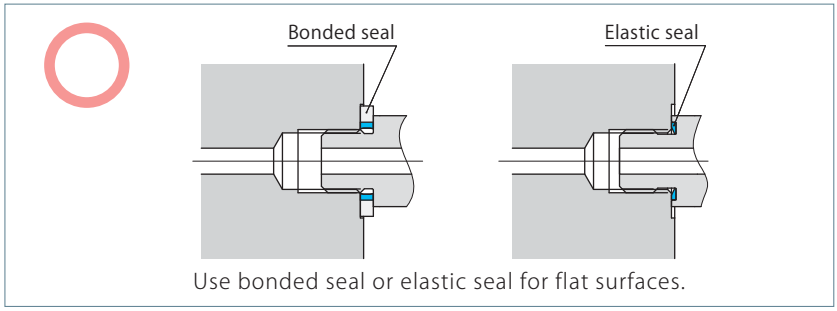
G port sealing method

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 with included with packing.

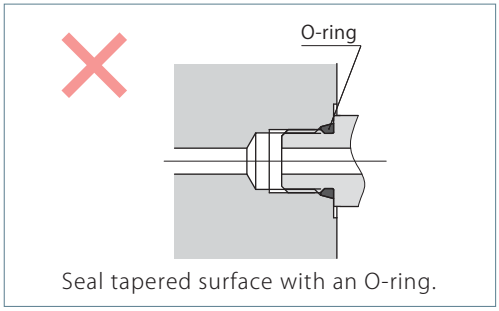
3. When mounting, clean metal chips and dust off surfaces that will come into contact with packing.

Sealing method for flange surfaces



Use bonded seal or elastic seal for flat surfaces.

Sealing method for tapered surfaces



Seal tapered surface with an O-ring.